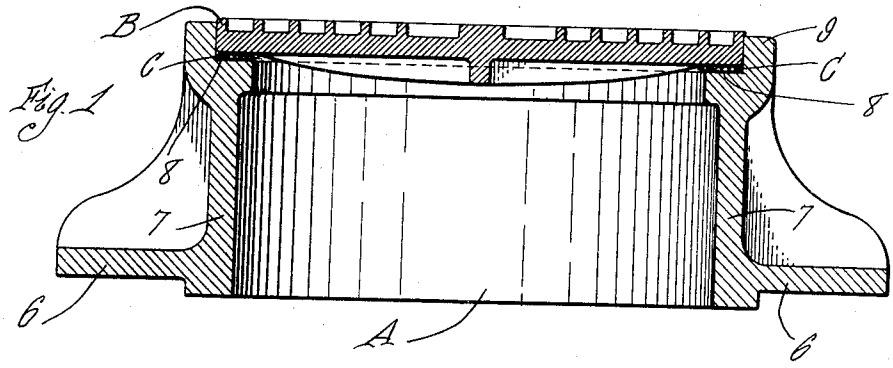
Dec. 26, 1933. I. F. TAYLOR 1,940,924

CUSHION MATERIAL

Filed Nov. 16, 1931

Fig. 1



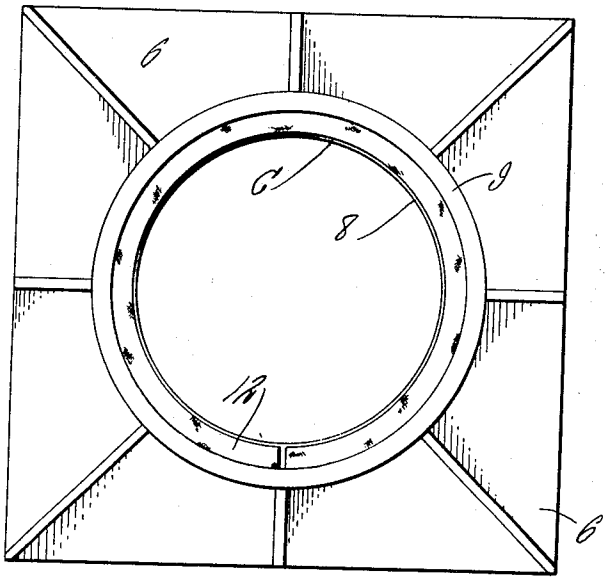
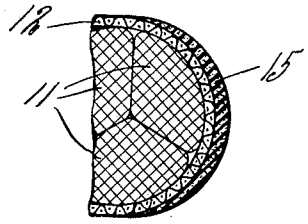


Fig. 2

Fig. 4



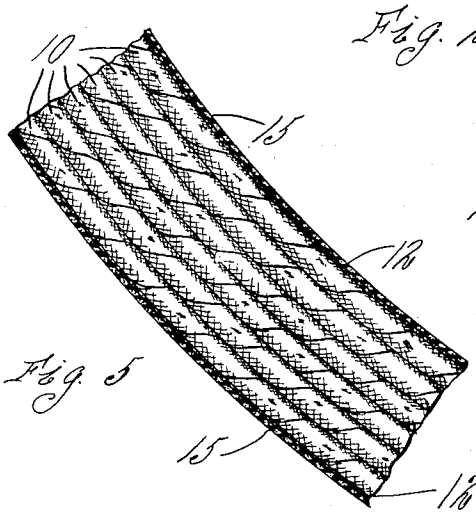


Fig. 5

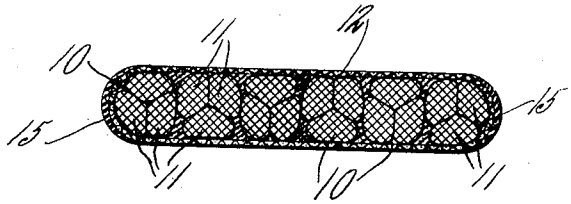


Fig. 3

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CUSHION MATERIAL

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Application November 16, 1931
Serial No. 575,308

8 Claims. (Cl. 154—45.5)

This invention relates to improvements in packings or gaskets for street manhole covers or similar covers to prevent the rattling and pounding of these covers when a vehicle passes over the same.

Street manhole covers are initially made to fit fairly snugly in seats formed in the manhole frames. Both the frames and covers are generally made of cast iron and no machining is done to accurately form the seats. Consequently, some of the covers as they come from the foundry do not correctly fit the seats in the frames and other covers which initially fit the seats, warp after being in use for a period of time, so that they also cease to fit accurately on the seats in the frames. When a vehicle drives over a loosely fitting manhole cover, the cover is frequently rocked on its seat and a portion thereof brought into violent contact with the seat causing objectionable noises or pounding and in some cases, this results in the breaking of the manhole cover or in the bounding of the cover from the frame, thus uncovering the manhole.

Attempts have been made to remedy this defect by providing gaskets of various kinds, all of which, however, have been found unsatisfactory for various reasons. Certain materials, such as paper or wood pulp gaskets can not withstand the elements to which a manhole cover is exposed. Gaskets made of fairly hard materials, such as vulcanized rubber and asbestos, are too hard to take up the irregularity of the seat and cover and such hard gaskets are, consequently, cut by the rocking of the cover and then break and drop down into the manhole. Gaskets made of soft rubber will not stay in place on a seat for a manhole cover as commonly used, and it is not practical to provide special seats on manhole covers, in order to retain the soft rubber in place. Soft rubber, furthermore, while deadening the noises resulting from badly fitting manhole covers, does not prevent movement of these covers, and results in the gasket working from beneath the cover. Such materials as felts treated with tar or asphalt are unsatisfactory, because this material is soon squeezed out of the space between the seat and the manhole cover.

The objects of this invention are to provide a packing or gasket, which is capable of being molded by pressure to a limited extent into a desired shape, and of retaining such shape upon the removal of pressure; also to provide a packing for a street manhole cover or the like having the property of adapting itself or flowing into the shape or form necessary to form a seat between the manhole cover and the fixed seat of the manhole frame, and which gasket, furthermore, will flow only to a limited extent, so that it cannot be squeezed out of its operative position on the seat, and which will retain the form or shape necessary to prevent movement of the manhole cover relatively to its frame; also to provide a packing of this kind, in which a plurality of parallel strands of long fibered material are employed which are impregnated with a bituminous substance, in which the fibrous material limits the extent to which the packing can flow or be shaped by the pressure of the manhole cover; also to provide an improved packing of this kind, which is capable of adapting itself to the shape necessary to uniformly support a manhole cover on all parts of its bearing surface to prevent movement of the manhole cover relatively to its frame; also to provide a packing, which can be easily handled and cut to the desired length and bent or shaped to fit seats of different curvatures; also to improve packing of this kind in other respects hereinafter specified.

In the accompanying drawing:

Fig. 1 is a transverse sectional elevation of a street manhole frame and cover, showing a gasket embodying my invention in position between the cover and frame;

Fig. 2 is a top plan view of the manhole frame with the cover removed, showing the packing applied to the seat of the frame;

Fig. 3 is a transverse sectional view of my improved packing, on an enlarged scale;

Fig. 4 is a fragmentary sectional view of an edge portion of this packing, on a still larger scale.

Fig. 5 is a sectional plan view of a portion of the packing, the section being taken below the upper layer of the covering material, to show the parallel arrangement of the strands of fibrous material.

While my improved packing is primarily intended for use in connection with street manhole covers and the like, and is illustrated in Figs. 1 and 2 as applied to a manhole, yet it will be understood that it is not intended to limit this packing to use in connection with manholes, for the reason that the packing may be applied to form a seat, joint or cushion between any two adjacent members.

In Figs. 1 and 2, A represents a street manhole frame which is generally provided with an outwardly extending flange 6 which may rest upon the upper edge of the wall of an underground structure, and an upwardly extending cylindrical part 7, the upper end of which extends substan-

tially to the surface of the pavement and is provided at 8 with an annular seat upon which the outer edge of a manhole cover B may rest. 9 represents an upright wall or shoulder extending upwardly from the outer edge of the seat 8 and serving to hold the manhole cover in operative position on the seat. C represents my improved packing, which is shown in Figs. 1 and 2 as lying on the seat 8, and upon which the edges of the manhole cover B rest. The manhole cover and frame are generally made of cast iron or steel, and because of the added expense which would be involved, the seat 8 is generally not machined to accurately fit the edge portion of the manhole cover B. Furthermore, after these devices have been installed for a period of time, it is found that these castings warp or change their shapes, and consequently, if the seats and bearing portions of the covers had been originally machined to fit snugly one against the other, they would no longer fit in this manner after warping.

My improved packing C is shown in Figs. 1 and 2 as used on the seat 8, so that the lower edge portion of the cover rests on the packing. This packing includes a plurality of strands of coarse and long fibered material, such for example as jute, hemp, flax, or the like. These strands 10 are arranged parallel to each other and the crossing of one strand over another is avoided. The individual strands may be made up in any suitable or desired manner, for example, by means of any desired number of plies 11, three plies being shown in each strand in the construction illustrated in Fig. 3. These plies may be loosely twisted in the usual manner to form the strands. By using a number of strands in parallel relationship, it will be obvious that if pressure is applied to a greater extent to one portion of the length of this packing material than to another portion, the strands subjected to the greater amount of pressure may flatten out or spread laterally without in any way damaging the fibers of the strands. On the other hand, if one strand crossed over another strand, the spreading of the packing at the point of intersection would be interfered with and a large amount of pressure would be concentrated upon the strands at the point of crossing, instead of having this pressure distributed over a number of parallel strands. This excessive pressure on the strands which cross each other would result in the rupture of these strands.

In order to make the packing easy to handle and to keep the strands approximately in correct relation to each other, the strands are contained in an outer covering 12 of suitable flexible material, such for example as a braided cotton covering. This cotton covering is approximately of a shape to contain the strands when arranged in parallel relationship and being of braided material, the covering may also stretch at portions where the packing is subjected to pressure, to permit the packing to flatten out at such points. While a braided cotton covering has been found very satisfactory, yet any other fabric, webbing or flexible means for holding the parallel strands in correct relation to each other may be employed, if desired, and if desired, this covering may be entirely omitted.

The entire packing is saturated or impregnated with a suitable viscous material, which is slow flowing at ordinary or normal atmospheric temperatures, such for example as bituminous material, asphaltum, or tar. The material preferred for this purpose is a residue from the distillation of petroleum, although natural asphalt or other products may be employed. The material employed should be such as not to become brittle when subjected to freezing temperatures, and should not become too freely flowing when subjected to summer heat, but should have the property of yielding or flowing under pressure at ordinary atmospheric temperatures. This material is somewhat sticky at ordinary atmospheric temperatures, and a bituminous material having a melting point of about 110° F. has been found very satisfactory.

The bituminous material is preferably applied to the strands before the covering is applied thereto. For example, the individual strands may be passed through a container of hot bituminous material which will readily penetrate into the strands and these strands are then passed through a weaving mechanism which weaves or otherwise applies a braided or woven cotton covering 12 around the same. The resulting packing is then pulled through a die having an opening or aperture therein conforming approximately to the cross sectional shape desired in the final packing. The pressure applied to the packing in passing through the die forces the hot bituminous material through the covering 12. Preferably, the die is slightly wider than the width of the cotton covering, so that a slight excess of bituminous material will collect at the edges of the finished packing as indicated by 15. The material may then be wound on rolls and suitable lengths can be unwound from the rolls, as needed, and cut off and these lengths may be easily bent or shaped to fit the seats on which they are to be used, without the necessity of heating the packing.

The packing described has the advantage that it is easily handled and applied to the seat on which it is to be used and does not have to be heated or subjected to any special treatment in order to apply the same to a manhole. When placed on a seat in a manhole frame and when a manhole cover is placed on the packing, the packing will yield or flow in accordance with the pressure applied to different portions thereof. This is made possible by the parallel arrangement of the strands 10 and by the flexible covering material 12, and also due to the fact that the bituminous material is sufficiently fluid at normal temperatures to permit the gasket to assume the desired shape. The parallel strands 10, however, restrict or limit the extent to which the packing can flow due to the pressure thereon of the manhole cover, and consequently, this packing can flow or yield sufficiently to compensate for irregularities or warping of the manhole cover or frame, but cannot, under any conditions, be squeezed out of the space between the seat 8 and the edge of the manhole cover. The bituminous material is sufficiently slow flowing so that once the fibrous portion of the packing material has been pressed into the desired shape, for example, by the weight of the manhole cover and by vehicle wheels passing over the manhole cover, it will be caused to stay in this shape by the bituminous material. Because of the stickiness of the bituminous material, the packing will adhere to the bearing surface of the manhole cover and seat and thus cement the manhole cover in place. The excess of bituminous material 15 at the outer edge of the packing will also adhere to the upright wall 9 of the manhole frame, so that the packing material will adhere more rigidly to the manhole frame than to the

manhole cover. The packing when bent from a straight into a curved shape to fit a seat will, of course, tend to straighten itself, which insures placing of the edge thereof against the shoulder 9. Consequently, when the manhole cover is removed, the packing will in most cases remain on the seat of the manhole frame. The packing becomes formed into such shape that all portions of the bearing surface of the manhole cover are equally supported by the packing, so that no movement of the cover relatively to the manhole frame takes place. This eliminates the wear on the manhole cover and frame and also avoids all wear on the packing, so that the life of the packing is practically unlimited. By using a bituminous material which is slow flowing and not hard or brittle at ordinary atmospheric temperatures, the manhole cover does not become rigidly cemented in place on the manhole frame, and consequently it can be removed, if necessary, and may be replaced without renewing and packing. If the manhole cover is not restored to its initial relative position, the packing member or gasket will again yield or flow into a new shape to again form a uniform seat for the edge of the manhole cover, so that the packing member may be used repeatedly. The bituminous material in addition to the function described also thoroughly waterproofs the fibrous material of the gasket and prevents rotting or deterioration of the same.

I claim as my invention:

1. A seat facing, joint or cushion for street manhole covers, comprising a plurality of strands of long fibered material arranged parallel to each other and side by side, and an adhesive slow flowing material impregnating said strands.

2. A seat facing, joint or cushion for street manhole covers, comprising a plurality of strands of long fibered material arranged parallel to each other and side by side, and a bituminous material which is slightly fluid at normal atmospheric temperatures and which impregnates said strands and permits said cushion to assume various shapes under slight pressures, said fibered material limiting the flow of said bituminous material.

3. A cushion, comprising a plurality of strands of fibrous material of vegetable origin arranged parallel to each other side by side, each strand comprising a plurality of plies of twisted coarse long fibered material, and a viscous slow flowing material impregnating said strands.

4. A cushion for use between a street manhole cover and its seat, comprising a plurality of strands of long fibered material arranged parallel to each other and side by side, flexible means for yieldingly holding said strands in connected relation, and a viscous slow flowing material impregnating said strands for holding said cushion in the form into which it is shaped, and for adhering said manhole cover to its seat.

5. A cushion, comprising a plurality of strands of long fibered material arranged parallel to each other and side by side, flexible means for yieldingly holding said strands in connected relation, and a bituminous adhesive material which is slightly fluid at normal atmospheric temperatures, and which impregnates said strands and permits said cushion under slight pressure to assume various shapes.

6. A cushion, comprising a plurality of strands of long fibered material arranged parallel to each other and side by side, flexible means for yieldingly holding said strands in connected relation, a viscous slow flowing material impregnating said strands and for holding said cushion in the form into which it is shaped, and an excess of said viscous material forming a layer on an outer edge of said cushion.

7. A cushion, comprising a plurality of strands of fibrous material arranged parallel to each other side by side, each strand comprising a plurality of twisted plies of coarse long fibered material, a covering of cotton fabric surrounding said strands for holding the same against separation, and a viscous bituminous adhesive material which is slow flowing at normal atmospheric temperatures, and which impregnates said strands and covering, and which holds said cushion in the form into which it is shaped.

8. A cushion, comprising a plurality of strands of coarse long fibered material arranged parallel to each other, a fabric covering for said fibrous material for holding the same in the desired form, and a viscous bituminous material which is slightly fluid at normal atmospheric temperatures and which impregnates said strands and covering material and which holds said cushion in the shape into which it is formed and which forms an adhesive between any parts connected by said cushion.

IVY F. TAYLOR.