Oct. 3, 1933. J. W. POULTER 1,929,215

PROCESS OF TREATING SUNKEN PAVEMENTS

Filed June 4, 1931

Fig 1.

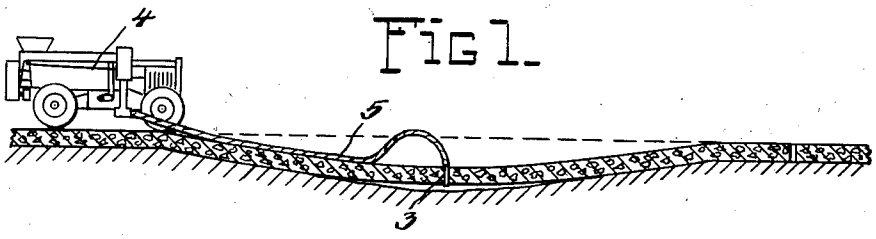


Fig. 2.

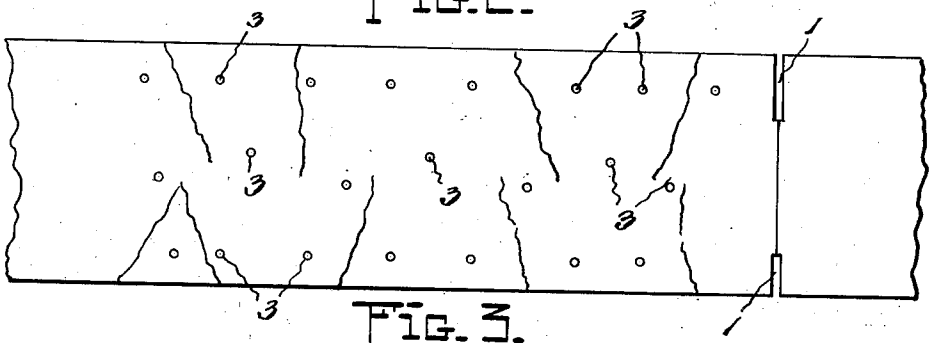


Fig. 3.

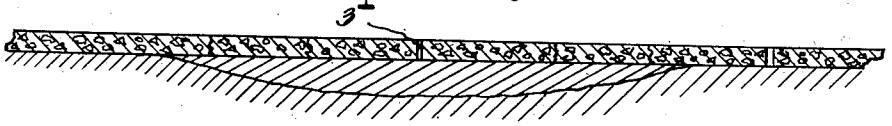


Fig. 4.

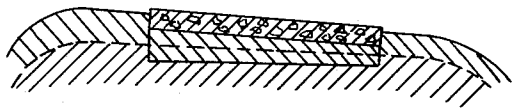


Fig. 5.

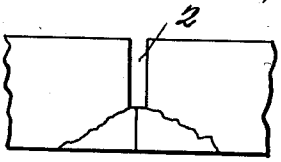


Fig. 6.

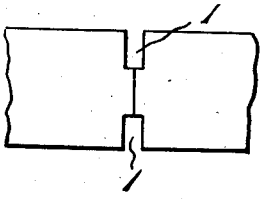
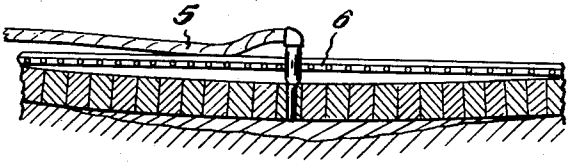


Fig. 7.



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PROCESS OF TREATING SUNKEN PAVEMENTS

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Application June 4, 1931. Serial No. 542,154

6 Claims. (Cl. 61—35)

This invention relates to a novel composition of matter for use in pressure producing apparatus for the purpose of raising and backfilling pavement constructions, road or other constructions and to a method of using the same.

The primary object in view is the production of a mobile mixture especially designed not only to freely pass through pumping instrumentalities of a pressure unit, its pressure lines and fixtures without clogging, but which will constitute a hydrostatic filler capable of forming a more or less solid and non-shrinkable mass suitable for maintaining the pavement slab in the position of desired elevation. To this end, the composition comprises a mixture of soil, cement and water mixed in the desired proportions hereinafter set forth.

It is further contemplated to employ this composition in a novel manner in the art of maintaining what are known as rigid types of pavements by correction of settlements or deficiencies in subgrades. Almost invariably in road construction work, it is necessary to fill in depressions to preserve a definite grade upon which the concrete slab is laid, but compaction of such fills is a problem which it is difficult to meet. Subsequent settlement or compacting of the subgrade results in cracking and sinking of the slab. By the use of the present composition, it is possible to backfill, or where settlement has occurred to elevate to normal grade at a minimum of expense and labor and without disturbance of traffic to any material extent.

Other objects and advantages will become apparent as this description proceeds.

In the drawing,

Fig. 1 illustrates a sunken section of pavement prior to restoration to grade by my hydrostatic means and method,

Fig. 2 is a plan view thereof showing more clearly the distribution of pressure openings,

Fig. 3 illustrates the pavement after elevation,

Fig. 4 illustrates the application of my invention to super-elevation of pavement on curves,

Figs. 5 and 6 disclose wrong and right methods of treating relief joints preparatory to raising and filling, and

Fig. 7 shows the method of handling brick pavement.

Before setting forth in detail my method of pavement elevation, it is desirable to describe the mixture employed therein. The composition comprises the following proportions (by volume)

Soil	25
Cement	1
Water (100 gallons per cubic yard of soil)	12

It will be understood the process consists in mixing the soil and water with a relatively small amount of cement until the mixture has a consistency between that of thick cream and mortar, this being varied to accommodate for different conditions, thick or heavy mud being used for raising pavements or uneven or badly broken slabs and light or thin mud for filling at the finish so that all spaces beneath the pavements are filled.

While it has been found that white oak, top soil and various clay soils are very desirable, almost any loose soil which will hold water and is easily mixed into a thin mud can be used. This may contain a large amount of fine or coarse sand with no ill effects either on the pump or the working units. However, it is noted that pure sand when mixed with water will not hold the water which will flow away and leave sand to pile up around the holes in the pavement or road through which it is being pumped. Consequently the filler does not flow evenly under the pavement and no lifting or hydrostatic power is obtained.

In carrying out the complete operation, the cement is evenly distributed over a load of soil just before it is introduced into a mixing machine of the type especially devised for this operation and set forth in a companion application. The amount of water added depends, as stated before, upon the kind of work to be done, but averages usually 100 gallons per cubic yard of material used. The mixture is stirred by revolving paddles in the mixing tank until thoroughly admixed to proper consistency.

The cement is employed for three reasons. It causes the mud to set up in a short time until it is more solid than the rest of the fill. It stops some of the leakage and eliminates about 85% of the shrinkage that would occur without its use.

Before passing the mixture to place, the pavement to be raised is first prepared. It is usually advisable to cut a "relief opening" in order to relieve the end pressure that might result when the slab is being raised. This is a slot about four inches wide cut at one end of the dip along a transverse expansion or construction joint. This slot should be cut from both sides of the road toward the center as shown at 1 in Fig. 6 rather than from one side as shown at 2 in Fig. 5 which would result in corner fracture.

This joint is now filled with mud and allowed to set to prevent leakage at joint. A series of openings should now be drilled through the slab distributed over the surface as indicated at 3 in Fig. 2.

The mud is then pumped from the machine 4 through the hose 5, the nozzle of which is inserted into one of the holes. As soon as the pressure is built up and the slab has been raised a small amount, the nozzle is moved to a second and third point until the slab has been raised to the desired height. This process gives a uniform raising and a complete filling in of the spaces beneath without breaking of the slab.

When the filler is forced under brick pavement, it is desirable at times to place a large iron grating 6 over the section of pavement to be worked on to prevent the bricks from raising to an uneven surface, and permit the operator to observe the operation.

After elevation the relief openings can be cleaned out and filled with any suitable expansion joint filler and the other openings in the slab filled with the mud or cement.

In Fig. 4, my method is shown applied to curves where the pavement was not originally super elevated and it is to be thus understood that the operation is not confined to raising and filling in sunken pavement. Obviously the mixture can be utilized as a filler before sinking takes place and can be employed for elevating or moving any slab, wall or like construction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of raising pavement slabs which comprises the steps of forcing a mobile filler therebeneath at a series of points successively to gradually move the slab to desired position.

2. The process of treating sunken pavement construction which comprises cutting a relief slot at one end of the depression, filling the same to prevent leakage, and then forcing a mobile filler beneath the pavement until it has been raised to desired level.

3. The process of treating sunken slabs which comprises cutting a series of openings through the slab at distributed points, and forcing through said openings one at a time a mobile filler material to progressively elevate the slab.

4. The process of treating sunken slabs which comprises cutting relief slots from opposite sides of the slab, cutting a series of openings through the slab at distributed points, and forcing through said openings one at a time a mobile filler material to progressively elevate the slab.

5. The process of elevating pavement slabs which comprises forcing a relatively thick mobile filler, capable of hardening, beneath the slab until elevated and then forcing a thin filler therebeneath to completely fill the spaces thereunder.

6. The process of treating sunken pavement construction which comprises cutting a relief slot adjacent one end of the depression, and then forcing a mobile filler beneath the pavement until it has been raised to the desired level.

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