S. G. HOWE.

METHOD OF ROAD CONSTRUCTION AND REPAIR.

APPLICATION FILED JULY 12, 1909.

940,971. Patented Nov. 23, 1909.

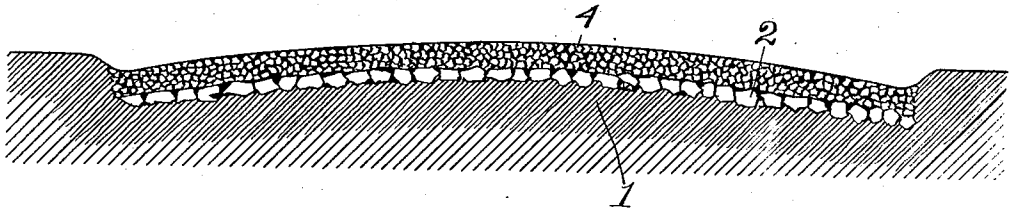


Fig. 1.

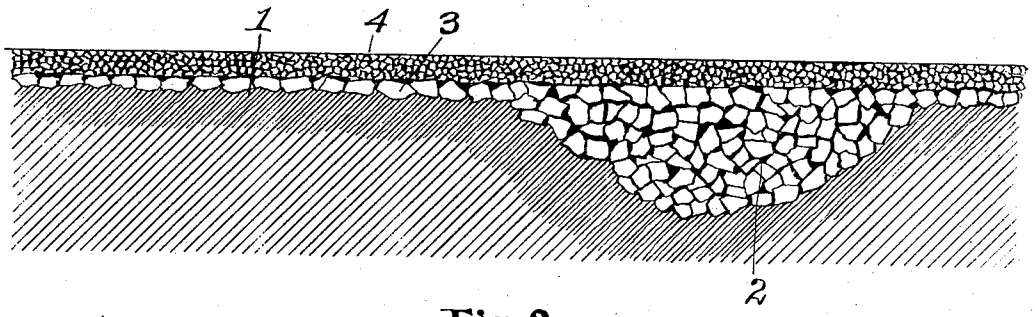


Fig. 2.

Witnesses

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# UNITED STATES PATENT OFFICE.

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## METHOD OF ROAD CONSTRUCTION AND REPAIR.

940,971. Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed July 12, 1909. Serial No. 507,075.

*To all whom it may concern:*

Be it known that I, SOLON G. HOWE, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented a new and useful Method of Road Construction and Repair; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a method of surface road construction and repair, and consists in the steps hereinafter more fully set forth and particularly pointed out in the claims.

The object of the invention is to provide a simple and efficient method of constructing a road surface and repairing ruts or depressions therein, which may be practiced at all seasons of the year with comparatively little expense, and which will result in a smooth hard road surface free from dust.

The above object is attained in carrying out my method as illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse section through a roadway constructed in accordance with my method, and Fig. 2 is a longitudinal section through a portion of said roadway, showing the manner of filling in and leveling the surface of the road over a depression.

Referring to the drawings by means of the characters of reference, 1 designates the road-bed, and 2 a base or anchorage of broken stone or cobbles employed to fill depressions and soft spots in the road.

3 designates a course of anchor stones employed upon the surface of the road-bed after being leveled.

4 designates a surfacing layer consisting of comparatively fine broken stone, mixed with sand or other fine substance and granules of calcium chlorid.

It is the common practice in road construction where a permanent and lasting roadway is desired, to excavate from twelve to twenty inches in depth the width and length of the road and fill said trench with materials of various kinds to form the roadway proper. This practice has entailed considerable expense varying in degree accordingly as a deep or shallow excavation is made, and in the cost of the materials with which said trench is filled, and the expense incident to the carrying on of such work, including the carting away of the material excavated and the hauling of the material with which the excavation is filled, while the results from this expensive method of road building are not always satisfactory.

It is conceded by those familiar with road construction that the natural earth where firm and compact makes the best roadway for all practical purposes. Roads in their natural condition are unsatisfactory for the reason that they become very dusty in dry weather and in wet weather they become muddy and rutty and present an uneven surface. It is to overcome these last-mentioned objections that I have devised my method of road construction. In applying my method it is not necessary to excavate; I simply build on the surface.

In practicing my method, I take the earth as I find it and level it off so as to render it smooth the entire width and length of the roadway desired. The depressions and soft spots I fill in, preferably with large broken stone 2, crushed stone with cinders or slag although cobbles and gravel may be used where the other materials are not obtainable except at too great a cost. The voids in the coarse material employed to fill the depressions and soft spots in the road may be filled with the soil of the roadway, provided said soil be sandy loam which will not wash; otherwise said voids should be filled with sand which should be thoroughly mixed with the coarse material to insure a thorough filling of all of the voids and afford a firm

base or anchorage for the materials with which the depressions are filled. The depressions after being filled should be thoroughly tamped or rolled to render them solid and level with the rest of the road surface. I prefer the rough, uneven crushed stone, cinders or slag, to the smooth, round cobble stones or gravel, for the reason that the rougher material when once packed, will not roll or shift so easily under weight or pressure, and will thereby become more firmly fixed in place by the travel thereover.

After leveling the road and reducing the surface thereof to as nearly an even degree of firmness as is practicable, I place thereon a layer or course of relatively large broken stone 3 to serve as an anchorage. Over this anchor course I then spread to a thickness of from three to four inches a mixture of crushed hard stone, the largest of which should not exceed one and one-half inches in diameter, sand and granules of calcium chlorid, the sand and chemical being employed to fill the voids between the particles of crushed stone; the mixture so formed constituting the wearing surface of the road, the proportion of granulated calcium chlorid employed being from thirty-five to fifty pounds to a ton of sand, and a sufficient quantity of the sand and chemical being mixed with the crushed stone to completely fill all of the voids therein and form a homogenous mass. This mixture after being spread upon the surface of the road, is rolled or tamped to slightly crown the surface, as shown in Fig. 1, and increase the drainage action.

While I prefer crushed stone in the top mixture, gravel and sand may be used, but the smooth surface of the gravel is more likely to cause it to roll and render it less stable when placed in position. A low grade sand with some clay or loam may be advantageously employed in this top dressing. The calcium chlorid in this top mixture or surface coating absorbs moisture and gives it out by evaporation to such an extent as to keep up a constant state of moisture, causing the sand and stone to pack, forming a firm but elastic surface. This packing prevents the formation of ruts and a continuous presence of dampness due to the evaporation of moisture from the calcium chlorid will hold in bondage the dust which may come from the wear of the road surface or which may be deposited on said surface from other sources, if not excessive.

Under ordinary conditions, the moisture absorbed from the air, the dew and rain by the calcium chlorid will be sufficient to maintain a degree of dampness necessary to prevent the accumulation of dust. Should there be a continuous dry spell, it may be found necessary to occasionally sprinkle the surface of the road to supply a sufficient quantity of moisture which may under such a condition be lacking from natural sources.

It is obvious that a roadway so constructed may be continuously treated from the surface at all times and that all that is necessary to keep it in perfect condition is an occasional leveling to fill in depressions or wheel ruts which may develop from time to time. This leveling may be accomplished after a period of wet weather when the material of the road surface is in a soft and pliable condition. After a road has been constructed as herein specified, it will soon be ironed into a hard, smooth surface by the wheels of vehicles passing thereover.

Should depressions develop in the road surface caused by a sinking of the base of the roadway, all that is required in the way of repair is to pick up and loosen the surface of said depression and fill it with the top mixture of stone, sand and calcium chlorid so as to render said depression slightly crowning, and then roll or tamp it down to the level of the road surface. This method of repair will afford a smooth and even surface without the removal, loss or waste of any portion of the road building material.

The presence of calcium chlorid in the top dressing or mixture which forms the surface of the road, prevents the freezing thereof and enables it to be spread at all times when the road surface is not covered with snow or ice. This is of considerable advantage as it enables the work of building or repairing roads to be prosecuted during the winter months.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent is:—

1. Method of road construction which consists in leveling the road surface, placing on said leveled surface a course of relatively large anchor stones, or analogous material, filling the voids between said anchor stones to unite and bind them together, and placing upon said anchor stones a surfacing course consisting of a mixture of stone, sand and calcium chlorid.

2. Method of road construction which consists in filling depressions and covering the surface of the road-bed with relatively large anchor stones, filling the voids between said stones with material capable of being compacted, covering said anchor stones with a layer of surfacing material comprising a mixture of stone, sand and granules of calcium chlorid, and rolling said layer of surfacing material to render the mass compact.

3. Method of road construction which consists in leveling the road-bed, placing upon

the leveled surface a base of heavy material, and covering said base with a finishing course of plastic substance comprising a mixture of stone, sand and granules of calcium chlorid.

4. Method of road construction which consists in placing upon the road-bed a base of heavy material, and covering said base with a finishing course comprising a mixture of stone, sand and chemical granules having the property of absorbing and evaporating moisture.

In testimony whereof, I sign this specification in the presence of two witnesses.

SOLON G. HOWE.

Witnesses:
E. S. WHEELER,
I. G. HOWLETT.