E. H. CARY.

METHOD OF CONSTRUCTING STREETS AND HIGHWAYS.

APPLICATION FILED APR. 5, 1920.

1,410,733. Patented Mar. 28, 1922.

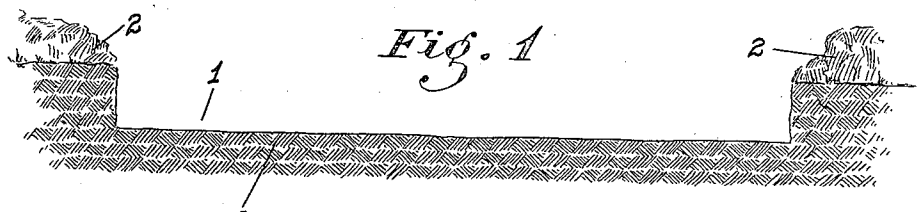


Fig. 1

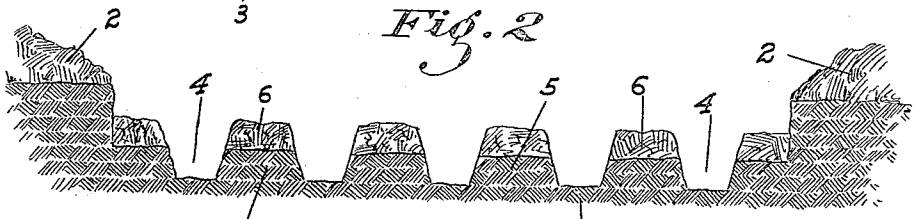


Fig. 2



Fig. 3

Fig. 4

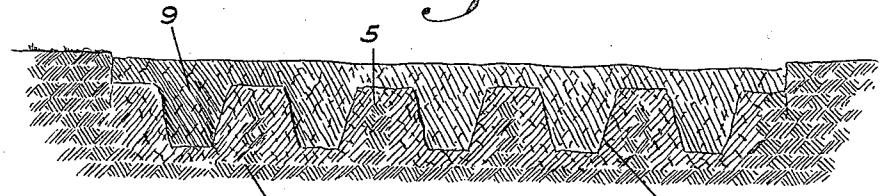
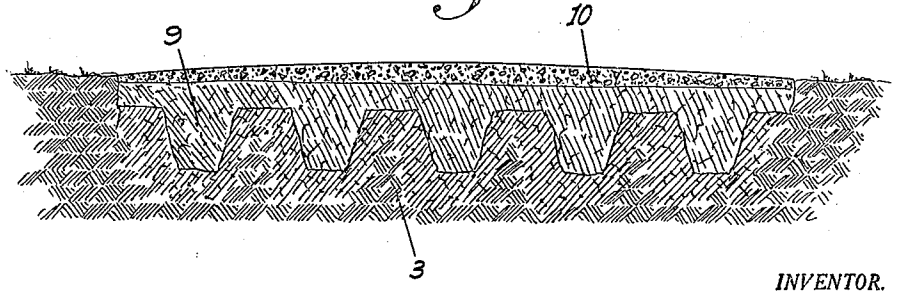


Fig. 5



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METHOD OF CONSTRUCTING STREETS AND HIGHWAYS.

1,410,733. Specification of Letters Patent. Patented Mar. 28, 1922.

Application filed April 5, 1920. Serial No. 371,519.

To all whom it may concern:

Be it known that I, EDWIN H. CARY, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Methods of Constructing Streets and Highways; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in road construction, and particularly to a method of treating or preparing the earth on which the road surface is laid.

This method is also adapted to be used in the construction of any earthworks which are required to be of a firm and substantial character, such as embankments, railroad fills, levees, dams and the like.

The principal object of the invention is to so treat the earth that it will be firm and unyielding, and will be unaffected by moisture or the elements, and will therefore serve as a firm and lasting foundation for a roadway, which will require a minimum of expense for upkeep, since the road-surface will not sag in spots and form depressions due to the sinking of the foundation-ground beneath.

A further object is to devise a method which will only need the dirt itself for the carrying out thereof, other than some sort of fuel for creating heat. This method is simple and inexpensive, and does not need skilled labor in the utilization thereof in earthwork construction of any kind.

These objects I accomplish by means of a series of steps or processes, as will be seen from a perusal of the accompanying drawings.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Fig. 1 is a cross sectional view exaggerated as to the vertical scale, showing the first step in the construction of a roadway.

Fig. 2 is a similar view illustrating the next step.

Fig. 3 is a similar view illustrating the baking or burning process.

Fig. 4 shows the foundation work completed.

Fig. 5 shows the finished roadway.

In carrying out my improved method of construction, the first step is to excavate the ground for the full width to be occupied by the roadway, to a depth of six or more inches as at 1, depending on the depth of road-foundation required. The dirt thus excavated is removed to the side of the roadway, as shown at 2 (see Fig. 1).

After this is done, the ground 3 for a certain depth below this new level is plowed or otherwise worked to thoroughly pulverize the same, water being added if necessary, until the whole mass is about the consistency of brick-making clay so that it will retain its form when shaped in any manner.

This process should be carried to an average depth of about twelve inches, depending also on the depth of the foundation required.

This mass is then formed into parallel trenches 4 extending longitudinally of the roadway, some of the dirt from the trenches being placed on top of the side walls 5 therebetween, to deepen the same, as shown at 6 (see Fig. 2).

These trenches are spaced apart so that the thickness of the walls therebetween is about the same width as the trenches.

The bottom and sides of these trenches are thoroughly rammed and tamped, this being a very important feature.

The object of these trenches is two-fold—a relatively large area is exposed for the action thereon of a drying and baking agent, and flues are formed through which to carry the heated air, as will be seen hereinafter.

The trenches being rammed and tamped, they are allowed to stand and dry out by natural means as much as is possible or convenient, and are then covered for a certain portion of their length at a time by sheet iron or other removable cover members 7, thus converting the trenches into horizontal flues to create a draft and carry the heated air from portable burners or furnaces 8 stationed at one end of such flues (see Fig. 3). The natural draft thus had will preferably be enhanced by blowers or fans suitably positioned, so that the heated air is forced throughout the length of the flues, and thus utilizing every possible bit of heat, and saving much that would otherwise go to waste.

As fast as the burning proceeds, the burners are moved forward, the cover members at that end, being removed and placed over

the front end, so that the burning or baking process is continuous.

The action of these burners on the bottoms and sides of the trenches gradually raises the temperature thereof and the walls are very quickly baked and vitrified for a certain thickness, which baking will of course be accomplished first at the point of location of the burners, owing to the relatively intense heat which may be had therefrom.

The next step in the method is annealing, which consists of taking the dirt 2 previously thrown up by the roadside, and placing it in the trenches after they have been vitrified, as shown at 9 in Fig. 4.

This dirt should be prepared or worked in the same manner as the foundation dirt; i. e. worked to the consistency of brick-making clay, before being placed in the trenches. This preparation should take place while the trenches are being burned, so that immediately on completion of the burning process, this clay-like mass of dirt may be placed in the trenches while the latter are still hot, the dirt being then thoroughly tamped and pressed, and covering the trenches to a depth of a few inches. In this manner, the entire baked surface is sealed and the heat retained therein, so that the whole mass anneals in the same manner as in brickmaking, and the foundation continues to bake and to change in character, becoming more unified and firm, for several days, and with no further expense.

After the above steps are completed, a top surfacing 10 (see Fig. 5) of concrete, asphalt, macadam, or any desired material may be spread on the foundation in the usual manner, and the road is ready for traffic.

If desired, the baking may be carried just far enough to barely change the character of the material, and merely render it impervious to moisture.

The burning and trench making may also be carried out in continuous vertical layers, one set of trenches being formed and burned, another set of trenches formed on top thereof and spaced but a few inches from the under ones and similarly burned, and so on indefinitely, so that a foundation would then consist of a series of vitrified ribbons impervious to water or the elements, which would not settle or break up.

This latter method of formation would be especially adapted for building dams and the like, the trenches running either transversely or longitudinally, and the outer surfaces being exposed to the elements, being also tamped and burned as much as possible.

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

1. A method of constructing earthworks consisting of working the dirt to the consistency of a clay, subjecting the exposed surfaces to an intense heat, said dirt being in its permanent location and covering up such baked surfaces with other dirt while still in a heated condition, whereby such surfaces will be annealed.

2. A method of constructing earthworks consisting of working the dirt to the consistency of a clay, subjecting the exposed surfaces to an intense heat, and covering up such baked surfaces with other dirt while still in a heated condition, such latter dirt being also worked to the consistency of clay before being placed on the baked surfaces, and being then tamped firmly down.

3. A method of constructing earthworks consisting of working the dirt to the consistency of clay, shaping the same to allow the greatest possible area to be exposed, tamping such exposed surfaces firmly down, and subjecting such surfaces to an intense heat until vitrified.

4. A method of constructing earthworks consisting of working the dirt to the consistency of a clay, shaping the same to allow the greatest possible area to be exposed, tamping such exposed surfaces firmly down, subjecting such surfaces to an intense heat until vitrified, and then covering such surfaces with clay-like dirt while still in a heated condition, such latter dirt being also tamped.

5. A method of constructing earth foundations consisting of working the dirt to the consistency of a clay, forming the same in trenches, the sides and bottoms of the trenches being thoroughly tamped, and providing means for subjecting the trench-surfaces to an intense heat and for retaining such heat therein after the heating element has been removed.

6. A method of constructing earth foundations consisting of working the dirt to the consistency of a clay, forming the same in trenches, the sides and bottoms of the trenches being thoroughly tamped, and then covered with removable members, providing heating means at one end of the trenches, whereby the trenches will act as flues to carry and utilize the heated air produced, and then filling in the trenches with clay-like dirt, while the trench surfaces are still hot, and being tamped down, the trench covers being first removed.

In testimony whereof I affix my signature.

EDWIN H. CARY.