H. P. Russ.

Stone Pavement.

No. 5,475. Patented Mar. 14, 1848.

Fig. 2.

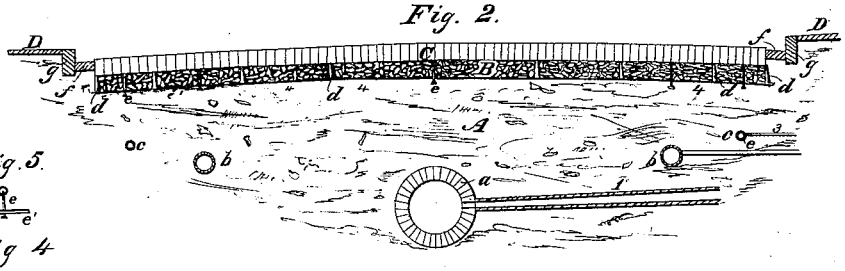

Fig. 5.

Fig 4

Fig 1

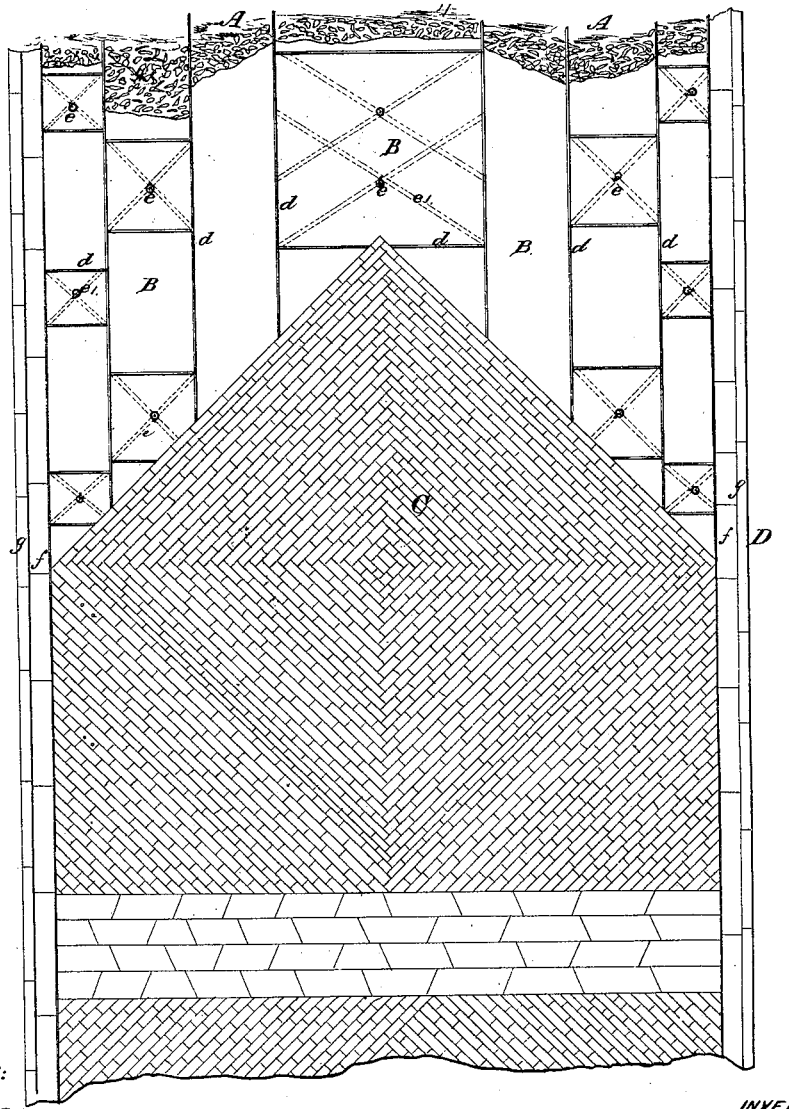

Fig 3

WITNESSES:

H. B. Serrell

Edw. N. Serrell

INVENTOR:

Horace P. Russ

UNITED STATES PATENT OFFICE.

H. P. RUSS, OF NEW YORK, N. Y.

SUBSTRATA FOR PAVEMENTS.

Specification forming part of Letters Patent No. 5,475, dated March 14, 1848; Reissued March 28, 1854, No. 261.

To all whom it may concern:

Be it known that I, HORACE P. RUSS, of the city, county, and State of New York, civil engineer, have invented and made and applied to use certain new and useful improvements in the construction and arrangement of the parts constituting the carriageways of streets and roads by which, while the durability is maintained, access can be had to sewers, water-pipes, or gas-pipes or other needful fixtures beneath the surface and the carriageway be replaced without injury and at little cost, for which improvement I seek Letters-Patent of the United States, and that the said improvements and the mode of arranging and constructing the same, and the effects obtained thereby are fully and substantially set forth and shown in the following description and in the drawings annexed to and making part of this specification, wherein—

Figure 1, is a plan of a street, road, or highway formed with my improvements and showing the progressive arrangements that commence with clearing the subsoil to receive the structure and terminate with the finish of the roadway. Fig. 2, is a section of the same across the street or road.

The detached figures are separately referred to and the same letters numbers and other marks of reference apply to the like parts in all the figures.

A, is the subsoil cleared to a proper depth and grade to finish the work as required, in this; *a*, is a sewer and 1, is a side drain to a culvert or dwelling; *b*, are water mains and 2 is a supply branch from one; *c*, are gas pipes and 3, a supply branch; these are all to be made and placed before or after the construction of the road above in the usual way and are only represented herein to identify them with the means of access to them as shown hereafter.

When the subsoil is graded and ready a quantity of granite, or other mason's or quarry chips each from four to six or eight inches in diameter and about half that thickness are to be laid with the flattest side upward in the manner shown by 4, 4, in Fig. 1, and rammed down flush with the grading so as to form an open heading or partial pavement foundation for the next part of the work. This is to be proceeded in as follows.

The positions of the sewers pipes and branches are to be defined, and metal or wood frames laid out in the manner shown by *d*, *d*. These are thicker at the bottoms than at the tops. The frames successively laid are to circumscribe a space or spaces forming a panel or panels over each sewer pipe and branch beneath, and may be made of sound wood though common cast iron or iron stone pottery burned earth or any other fit material may be used for the frame pieces in the sectional form shown in larger size in the detached Fig. 3, and placed on the graded subsoil and partial pavement, then a proper set of open wooden shallow vats are to be prepared for mixing in them what is now well known by the technical name of "concrete" namely a mixture of mason's chips, broken stone, hydraulic cement clean sand (not salt beach sand) and fresh water in such proportions as the quality of the cement will require to form a sound foundation B, above the subsoil A, that will in a short time become an artificial flag or slab of rock about eight to ten inches thick to bear the pavement above, but before the mixture is placed into the panels or sections formed by the frames *d*, *d*, those panels that may hereafter have to be lifted out for access to the parts beneath are to have bars of iron laid into them forming crosses *e*, 1, with holes in them through which they are united by an eye bolt *e*, with a ring in the head of each bolt as shown in Figs. 4 and 5 and in the larger panels two or more of these sets of bars, bolts and rings may be used while in the smaller panels one will be sufficient the bolts employed for these purposes may be of a small extra length that will find place in the subsoil and a countersink in the face of the concrete is to receive the ring in this way on applying power to raise the panel the ring will lift clear of the face without breakage or injury to the concrete. The concrete is then to be filled in and consolidated after which it may be lifted out of any panel or section as may be required by shears or derricks placed above with tackles hooked into the rings *e*, *e*, in the panel the inverted wedge formed portions of the frame *d*, *d*, allowing each panel of cement to be freely lifted out and placed on one side while access is needed to the parts beneath and receiving the panel of cement in replacement again when the access beneath is no longer needed.

The gutter stones *f*, curb stones *g*, and flagging of the side walks D, may all be laid on paneled and divided sections of concrete in the same manner and with the same advantages and effects, but in the drawing the roadway only is shown thus prepared and fitted.

When the concrete foundation is fully consolidated, a pavement of granite or sienite stone blocks *e*, averaging about ten to twelve inches long four to five inches wide and a nearly equal depth of about ten inches are to be carefully laid to an even surface commencing so as to form the ranges of stones into lozenge formed divisions as shown in Fig. 1 by which the edges are presented diagonally to the wheel tires of carriages or to any other passing weight, the stone over the center of each section or panel is to have two countersunk holes to receive an inverted lewis by which it may be lifted out so as to furnish the commencement of a removal to obtain access to the panel beneath, and this stone should be only set in clean sand and all the rest of the stones are to be covered with sand that must be well washed into the interstices between the stones and then consolidated by a portion of loose grouting, that is hydraulic cement in a sufficient quantity of water to run freely into the sand and harden between the stones.

The formation of the pavement in diagonal lines with the street is to be commenced and followed up by placing the first stone of each range so that side shall form an abutment and tie for the head or fore end of the first stone in the next range and the dimensions of the panels or sections and paving stones may be varied as required.

I do not claim to have invented or discovered any of the materials or parts described as used herein all being well known, but

I do claim as new and of my own invention—

The constructing a concrete foundation B in panels or sections (to give access to pipes and conduits below) by the application and combination therewith of frames *d*, *d*, formed of any suitable material with a thinner edge upward to allow of the concrete mass to be lifted out when needed, substantially as described when this is combined with a paved road way of any kind laid thereon, as described.

In witness whereof I have hereunto set my hand in the city of New York this twenty sixth day of December one thousand eight hundred and forty six.

HORACE P. RUSS.

Witnesses:
WM. SERRELL,
EDW. W. SERRELL.

[FIRST PRINTED 1913.]