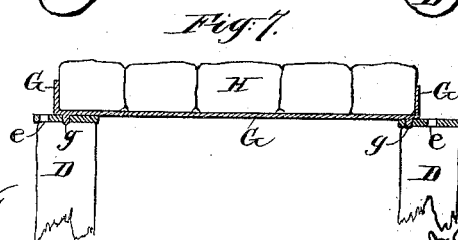
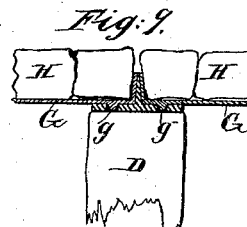
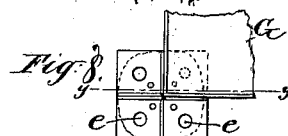
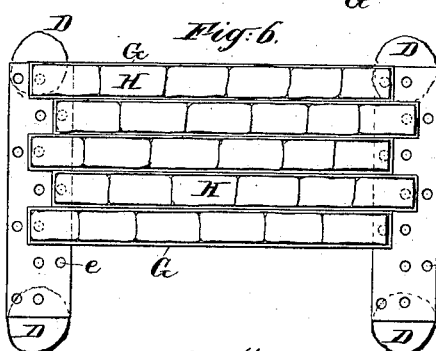
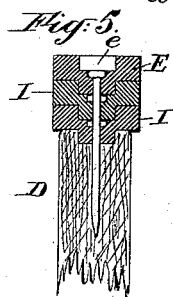
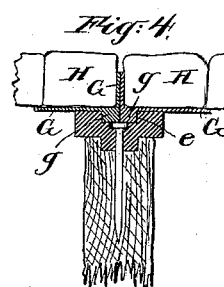
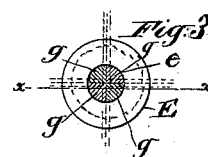
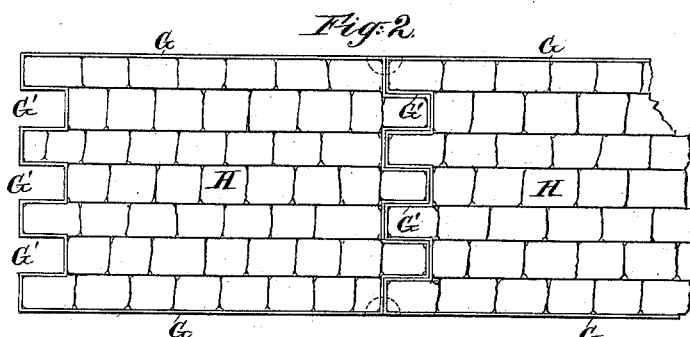
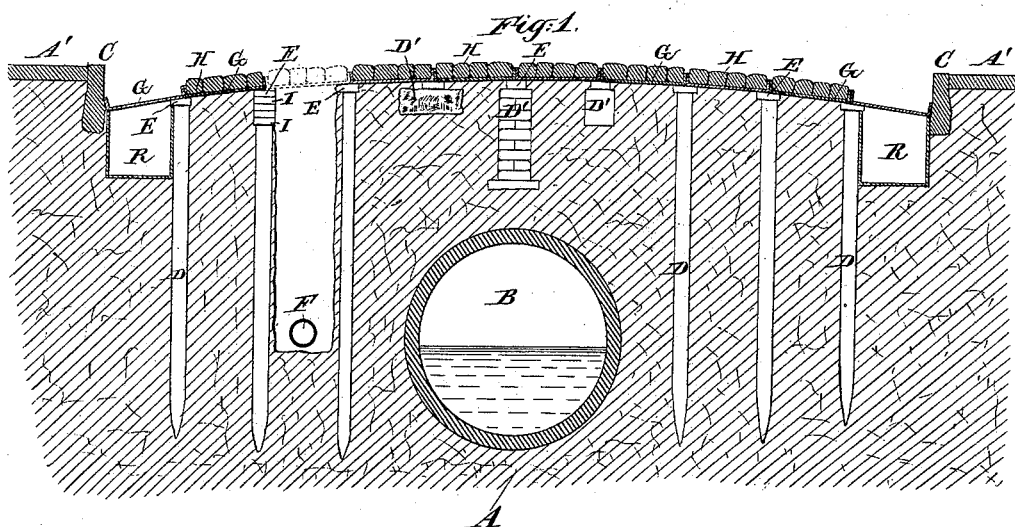


C. H. HOYT.

PAVEMENT.

No. 383,528.

Patented May 29, 1888.



Witnesses:
Charles H. Searle,
J. C. Johnson.

Inventor:
Charles H. Hoyt.
By his attorney
James D. Stetson

C. H. HOYT.

PAVEMENT.

No. 383,528.

Patented May 29, 1888.

Fig. 12.

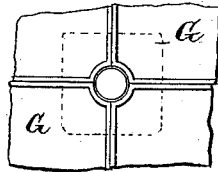
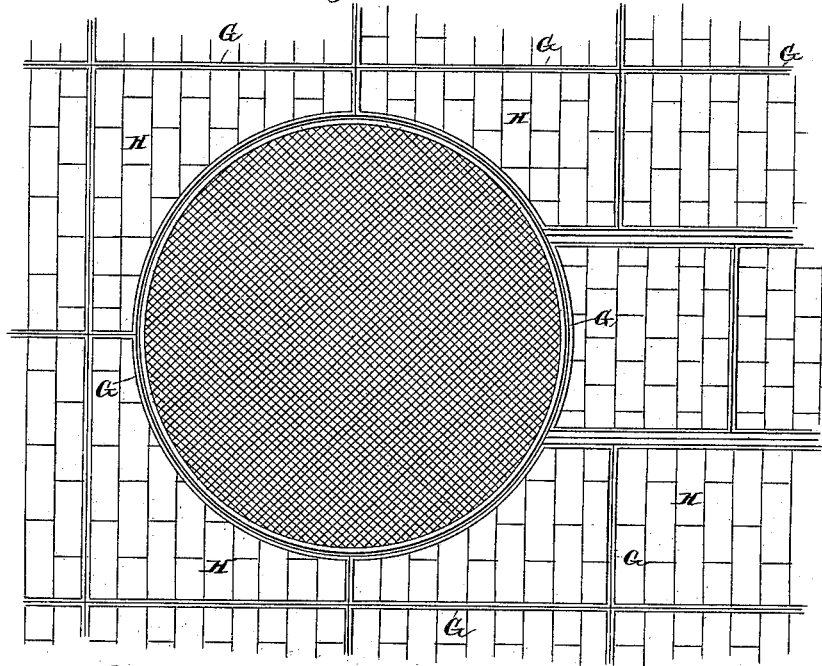


Fig. 10.

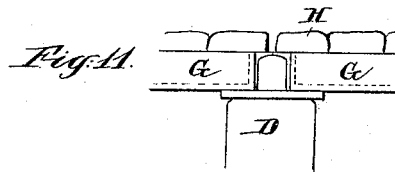


Fig. 11.

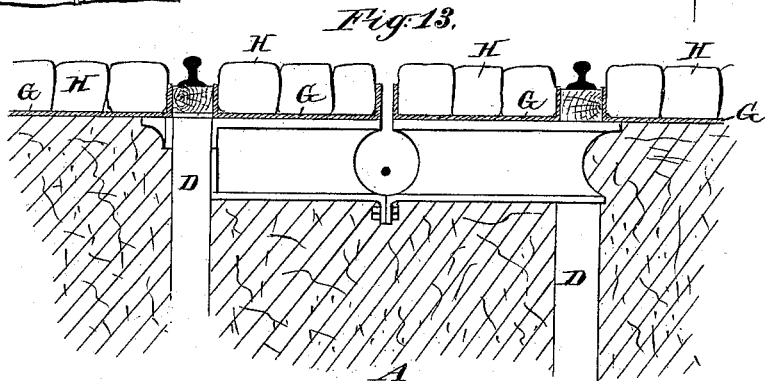


Fig. 13.

Witnesses:
Charles F. Searle.
H. A. Johnstone.

Inventor:
Charles H. Hoyt.
by his attorney
Thomas Drew Peterson

UNITED STATES PATENT OFFICE.

CHARLES HERBERT HOYT, OF NEW YORK, N. Y.

PAVEMENT.

SPECIFICATION forming part of Letters Patent No. 383,528, dated May 29, 1888.

Application filed February 25, 1883. Serial No. 265,296. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HERBERT HOYT, of the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Pavements, of which the following is a specification.

My improved pavement may be used for sidewalks and other surfaces, but is more particularly intended for the middle or main portions of streets which are much used. It is adapted to present a suitable surface very firmly supported, and to afford unusual facilities for removing and replacing any desired portions, as may be required. The streets of cities are often underlaid, sets of pipes or covered ways being used for drainage—sometimes two sets, one for the filthiest water from sinks, water-closets, and the like, and another set for rain-water from the roofs and from the streets—while other pipes bring water to the houses and manufactories—sometimes two sets, bringing fresh and salt, or two qualities, of water—and other pipes bring gas. The tendency of modern progress is to increase the number and variety of such underlying constructions, and we are liable to have steam for heating and for power, compressed air for the latter alone, and endless varieties of subways for electric wires for telegraphing, telephoning, and lighting, and perhaps other uses. All these require portions of the pavement to be taken up and relaid so frequently as to become an important element in the pavement question. My invention provides efficient supports for the pavement, which supports may remain in place, while the earth between is excavated to the required depth to lay or otherwise attend to the pipes, wires, &c., and allows the pavement to be easily taken up along a narrow line and relaid, and allows the pavement to be as complete after such operation as before, and all without special skilled labor. I attain the end by planting posts, which may in many cases be wooden piles, so placed as to afford supports for the corners of rectangular sections of pavement. I insure the correct position of the support, even if the piles are a little out of place, by securing an adjustable cap upon each, and I provide a suitable surface for the pavement itself by making rectangular vessels or receptacles of cast-iron or

other suitable material filled with blocks of stone, concrete, wood, or other suitable material to serve for the pavement. In streets containing a large water-pipe or sewer or other obstruction requiring special treatment I propose to modify the construction over that portion of the street thus traversed.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a cross-section of a street having my pavement with one line of pans removed and a trench dug along such line to lay or attend to a pipe. The portion of the pavement which should lie over such trench is indicated in dotted lines. The remaining figures are on a larger scale. Fig. 2 is a plan view of one pan and a portion of another. Fig. 3 is a horizontal section in the plane of the top of a cap. Fig. 4 is a vertical section on the line *x x* in Fig. 3. Fig. 5 is a vertical section of the top of a post with its cap elevated by introducing washers under it. The washers in this case are shown as being similar caps. Figs. 6 and 7 show a modification. Fig. 6 is a plan view, and Fig. 7 is a vertical section. Figs. 8 and 9 show another modification. Fig. 8 is a plan view of a cap with a post below in dotted lines and the corner of one pan in position. Fig. 9 is a corresponding vertical section with both pans in position. Figs. 10 and 11 show another modification. Fig. 10 is a plan view showing the adjacent corners of four pans. Fig. 11 is a vertical section. Fig. 12 is a plan view showing a turn-table and the adjacent pavement. Fig. 13 is a vertical section showing the invention applied to cable roads.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is the earth under the street, B a brick sewer extending along near its central line, and A' A' the sidewalks. These latter may be separated from the general surface of the street by curbstones C C, as will be understood.

D D, &c., are wooden piles set by driving or otherwise in rows extending longitudinally of the street, and spaced so as to be at uniform distances in the length thereof. These piles

may in some kinds of earth be put down mainly or entirely by driving without previous preparation; but in most cases holes should be previously bored or otherwise made
 5 by hand or machinery to nearly the proper diameter and depth. They should at the close of the operation be set down firmly. Under the conditions which obtain in practice—with
 10 unequal resistance in different portions of the soil, imperfections in the form of the cheap wood piles, and only moderate degree of skill and care in placing them—the locations of the upper ends of these piles will be appreciably irregular. I finish the upper ends by
 15 hand or by machinery to receive caps E. I take care in preparing the head of the pile and applying the cap E to so locate the latter on the pile as to compensate for the irregularities. The caps form parallel lines extending
 20 along the street uniformly spaced.

G are pans of cast-iron or other suitable material, the bottom being either close or sufficiently open work to allow moisture to rise from below and evaporate from the surface in
 25 dry weather, and to allow water which is received from above in wet weather to flow downward into the soil below. Certain portions of these pans will be designated, when necessary, by additional marks, as G' G².
 30 These pans are filled even with or somewhat above their rims with blocks, H, of stone, wood, or other material, to constitute the pavement. The filling of these pans or covering of surfaces, as specified below, may vary with the
 35 locality and the consequent cost of different materials at that point, and partly with the uses to which the street is to be exposed. For a street on which travel is light—such as streets for private residences or retail trade,
 40 or more especially hospitals—it may be expedient to provide blocks of wood or masses of cement, over which wheels shall run almost noiselessly, while for streets having heavy travel and miscellaneous business, or where
 45 noise is not an objection, squared masses of trap-rock, the pavement sometimes known as "Belgian," or other material, may be preferable. The edges of the pans G, which extend transversely of the street, may be straight.
 50 The other edges, which extend longitudinally of the street, are formed with rectangular projections and indentations, as indicated by G'. These rectangular serrations in one pan match to those of the adjacent pan, and each being
 55 properly filled with its material, H, they produce an even surface on the street without any considerable longitudinal seam or joint into which the wheels of passing vehicles can drop so as to make ruts. There is no liability to
 60 form ruts in the other direction transversely, except at the intersections of the streets. In the direction longitudinally of the street the wheels which pass along the general line of junction travel alternately on one or the other
 65 block and find no continuous joint. For uniformity of the completed surface the blocks at the edge may overhang a little, so as to nearly

or quite cover the side of the pan; but this is not essential.

In some cases ordinary cobble-stone may be
 70 used. With any or all the materials the spaces between the blocks may be filled with a tarry or other cement, or with sand, gravel, or other material, if desired. The center of each cap E is sunk or perforated, as indicated by e. Each
 75 corner of the several pans G is provided with a projection, g, adapted to fill about a quarter of the cavity e, into which it applies. When these parts match together properly, they maintain each other very firmly in place. When
 80 the displacement or irregularity of positions of the parts is so great as to prevent these parts from fitting, a portion or the whole of the projections g must be chipped off or otherwise removed.

F is a pipe for water, gas, steam, compressed
 85 air, or other purpose. It may be an insulated wire or set of wires serving to conduct electricity, with or without an inclosing structure. They are laid in the ordinary manner. When
 90 it is required to obtain access to them, only the pans G, which are immediately over the pipe F require to be removed and replaced. After removing the pans G and their contents, access may be obtained to the pipes by digging
 95 in the ordinary manner. So soon as the pipe F has been properly attended to and the earth has been refilled into the excavation made, the pans G may be returned to their places with celerity and certainty, and all is again as before.

The pans, as above explained, may vary in size. It is expedient to make them as large as can be conveniently handled. A portable
 105 derrick may be used to facilitate the lifting and removal of the pans with their contents. In commencing to remove a line of pans there may be some difficulty in raising the first block by finding the joint and removing the street dirt, and getting hold by tongs or otherwise
 110 of the edge of the pan and lifting that end. So soon as one is loosened and removed the adjacent pans in that line may be detached and lifted by the aid of the derrick.

In case my pavement is applied where no
 115 pipes or wires have been previously laid, the piles D may be set any distance apart, and the pans G may be of corresponding size; but as it may frequently occur in practice that certain pipes, &c., have been laid in the street
 120 without any reference to this paving, it may become necessary to plant the rows of piles or supports D at unequal distances apart. To facilitate the manufacture and application of the pavement, I propose to construct the pans
 125 in two or more standard sizes, by properly distributing which I can provide for any ordinary position of the pipes. This structure may be modified over a large pipe or sewer. It will be observed that over the sewer B, instead of
 130 piles D, I use shallow foundations—such as blocks of stone, wood, or other material, as indicated by D'. These may be finished to receive the caps, and the caps may hold the

corners of the pans in the same manner as the pans are held on the deeper piles D.

Whenever it is desired to lay down a new line of pipes, wires, or other longitudinal structure under my street-pavement, it is simply necessary to take up one line of the pans G. This exposes the earth below and allows a trench to be dug, the wires to be laid, and the earth again returned, in the obvious manner, after which the pans are again relaid without disturbing the material in the pans, leaving the street as complete as before. The fact that the pavement rests on the substantial piles D insures a good support for the pavement under all circumstances of wetness or dryness of the earth or other varying conditions. The caps being adjusted on the piles with care allows the pans and their contents to be accommodated even if the piles are imperfectly placed. The trenches may be excavated and refilled without disturbing the piles.

I are washers, which may be placed under such caps as shall be found to require them, either at the first laying of the pavement or at any subsequent period, to raise the bearing and maintain the proper level of the top after a pile or foundation has been sunk a little by excessive wet or other cause.

R is a box, of wood, metal, or other material, extending longitudinally of the street and of sufficient size to receive one or more of the pipes, wires, or other longitudinally-extended structures under the pavement. The boxes may be left empty, or may be filled with any material desired to serve as an additional support to the pavement or to retain or absorb the odor of gas or to retain the heat of steam-pipes or to keep water-pipes from freezing. These boxes R lie between the rows of piles D. On removing the pans G, which overlie the boxes and other covering which may be employed below in any case, the contents of the boxes are accessible for any purpose. On returning the covering material to place all is again as before.

The sections may be raised and lowered by various mechanical devices, one being a hook or hooks, which could be put down through an opening in the bottom of the pan with or without a pipe-like inclosure covering the same and extending to nearly the surface of the paving material and provided or not with a plug-screw or other device. The sections being heavy, the use of a movable derrick on wheels or otherwise would undoubtedly facilitate the rapid and easy removal and replacing of the sections. Little skill is required in making and laying or in taking up and relaying my pavement. The paving blocks or material may be set in my pans in sand-tar cement or other substance, the same as is found most desirable in the present methods, thus taking advantage of the experience already gained.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

I can in place of the piles D use posts of wood, metal, or other material, masonry, brick, cement, or other construction, natural foundation, such as the surface of the earth, rock, sand, clay, &c., strips of iron, wood, or other material; or the sectional pan-like receptacle or intervening supporting surface material or substance may rest directly on the natural foundation, according to its character, where the pavement is to be laid.

In applying the invention to streets having railroad-tracks the rails may be laid in any ordinary or suitable way; or they may be supported by a line or lines of the supports to my pavement, and the pans lying between and adjacent may be formed with straight or irregular edges, matching as closely to the rails as may be desirable.

For a cable road the cable-space may be similarly provided for, with the additional provision of an opening for the machinery, and supported by a suitable device, like Fig. 13, or by a more desirable one, if necessary.

I provide curved or other shaped pans with curved or other shaped edges for curved or other shaped portions of the track or street, and for curves generally, especially turntables.

Fig. 12 is a plan showing such modification.

My system is equally adapted to the laying of pipes, wires, &c., in any direction, longitudinally, transversely, or otherwise, as the supports may be suitably arranged, and the pan-like receptacles adapted both in size and shape to the requirements. Pneumatic tubes or other devices for the transmission of messages, telegrams, freight, or other purpose can be accommodated, as my system is adapted so that anything underneath can be gotten at for any purpose. One or more eyes, shoulders, depressions, sockets, or other device, into or onto which hooks or other mechanical devices could be attached, could be used to remove the sections.

A portion of a street may be paved, according to this invention, to accommodate pipes, sewers, wires, &c., which need attention at various times, and the remainder of the street may be common pavement, or pavement constructed according to any of the plans already known.

It is not obligatory that the corners or other portion of the receptacle must rest on a cap, as, if the foundation is suitable, the cap may be dispensed with.

The surface which is to directly support the paving material may be of rectangular or other shape, with or without flanges of any height on one or more sides, like pans, and may be made of wood, iron, stone, composition cement, or other suitable substance or material.

Any shaped pans may be employed with serrations on such edges as may be deemed best or necessary.

The caps E or their equivalents may rest on whatever foundation is employed, whether

natural or artificial—as, for instance, when a suitable foundation is hewed out of rock, or otherwise made or formed, then the caps E may rest on or in that place and bear the superstructure.

The washers or other devices for adjusting the heights of sections of pavement may be placed over or under the caps.

I propose in some cases to use the pans G without either the caps E or the posts D, simply laying the pans on the natural bed of rock or hard earth, where such can be commanded, or on a bed of broken stone, or of other stone or material which may be easily laid and taken up, to form a reliable support lying under the whole pavement or under any part of it.

Fig. 6 shows a modification, in which there are stout plates of iron supported by the posts, and serving themselves as supports for pans, which may in such case be narrow, and are so represented.

I claim as my invention—

1. In a pavement, a series of receptacles, G, and piles or analogous firm supports D under their corners, in combination with inclosed paving material H, as herein specified.

2. In a pavement, the supports D with caps E, in combination with a series of pan-like receptacles, G, containing paving material H, arranged to serve as herein specified.

3. In a pavement, the caps E, having recesses *e*, in combination with the supports D and pans G, having projections *g* to engage in the said recesses, and filling material H in the said pans, all arranged to serve substantially as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand, at New York city, this 20th day of February, 1888, in the presence of two subscribing witnesses.

CHARLES HERBERT HOYT.

Witnesses:

JOHN Q. HOYT,

CHARLES R. SEARLE.