

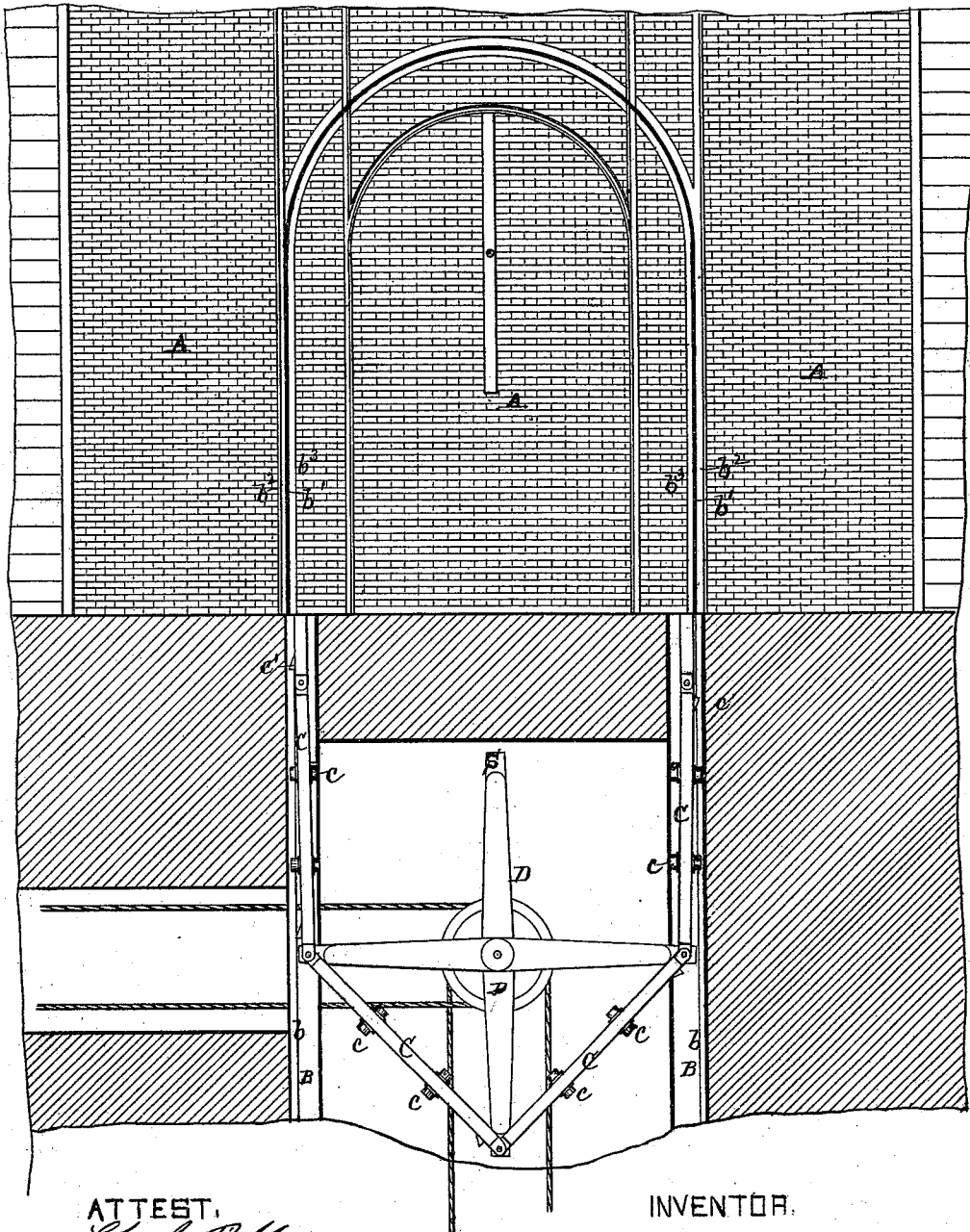
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SUBWAY FOR STREET RAILWAY AND IN MEANS OF PROPULSION.

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Fig. 1.



ATTEST.

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IMPROVEMENT IN SUBWAYS FOR STREET-RAILWAYS AND IN MEANS OF PROPULSION.

Specification forming part of Letters Patent No. **174,384**, dated March 7, 1876; application filed August 19, 1875.

To all whom it may concern:

Be it known that I, MORRILL A. SHEPARD, of the city of Lebanon, county of St. Clair and State of Illinois, have invented an Improved Mode of Constructing a Road-Bed with Drain or Drains, so that street-cars may be propelled by stationary power over an endless track, of which the following is a specification, in connection with the accompanying drawings, forming a part of the same, in which—

Figure 1 is a view of the street, showing half-section and half-elevation; Fig. 2, cross-section of the street; Fig. 3, cross-section of the street, showing the driving mechanism in elevation; Fig. 4, side elevation of the forward end of a car. Fig. 5 is a bottom view of forward end of car.

The object of my invention is, first, to make a roadway, A A, Fig. 1, in such a manner that, instead of two side drains adjoining the sidewalks of each street, in which frequently the most filthy fluids run or stand, and soak up, I make one or more central drains or sewers, B B, Figs. 1, 2, and 3, at or near the center of the roadway A, so that all filthy substances will flow or be washed into the center of the street, and be carried off underground by the drain B. This drain and arrangement will remedy the unpleasantness of a filthy drain just where horses are hitched, or carriages halt to receive or unload, and will prevent the overflow of cellars which frequently occurs from side drains; also, being directly, or nearly, over the main leading-sewers, a direct vertical connection can be made with them, instead of the elbow-drains now in use from the side drains. This drain or drains will not need to be more than about one foot wide, and eighteen to thirty inches deep, which, if dug out of the earth, may be walled cheaply by using, say, about two-by-four-inch pieces of timber of any length required, which can be formed into a longitudinal trough by nailing together; and, after the trough is formed, the remainder of the perpendicular wall required to finish the drain may be made in the same way; or the lower portion of the drain may be formed out of brick or stone and smoothly cemented. By either of these plans (or half-circular tiling) a drain will be formed that will readily carry off all the drainage; but where

they can be afforded, nothing will be better adapted to make a thorough and smooth drain than cast-iron troughs in the shape shown in Fig. 2. A cover, b^2 , Fig. 1, of timber, forming a portion of the street-pavement, projects nearly over the top of the drain, except about one inch space, b^1 , Fig. 1, which will be guarded by fastening to the end of the pavement-timber. (See Fig. 1.) Parallel with the wall of the drain an iron bar, b^3 , Fig. 1, is fastened, so that a carriage-wheel could not get fast between the top edge of the drain and this protecting iron bar. This continuous narrow channel-way will afford sufficient room for all the water to drain through into the drain below; and in order to give the water more space, if required, it will be advisable to cut the end of the timbers directly under the guard-bar at an angle of about thirty degrees, which will give more space, and not materially weaken the strength of the timbers.

I further propose to utilize this drain, if of cast-iron, by having, about eighteen inches from the top edge of said drain, a flange, $d d$, Fig. 2, cast on the right and left side of the drain-pipe; or, if the drain is made of wood or other material, I shall use wooden cross-ties built in the wall at the same depth from its upper surface, to answer for a railway-track, on which a continuous train may run, C C C C, Fig. 1, composed of reach-timbers or links, with wheels $C' C'$, Figs. 1 and 3, on each side, and securely coupled together at their ends. This continuous train passes around the end and under the flange S, Fig. 1, of the long arms of the drive-wheels D, of which there are two to each endless train, driven by stationary power. The object is to secure a means of propelling street-cars or other vehicles which are so constructed that they may be attached or detached to or from the propelling-train below at pleasure.

In order to connect the continuous train to the cars or vehicles above on the main roadway, I make use of the bar E, Fig. 4, which is attached to the car or vehicle by its connection with pivoting-link F and the handle I. Said draw-bar E can be made wide enough to have the required strength, and narrow enough (and with a sharp edge in front, if desired) to

pass freely between the tracks formed on the upper edge of the drain B, Fig. 1, and the guard b^3 , Fig. 1.

When it is desired to move the car or vehicle, this draw-bar E is lowered by raising the handle I, Fig. 4, so that its lower end comes in contact with lugs or catches C' C' , Fig. 1. These catches or lugs may have small rollers fastened to them, if found necessary, to cause the draw-bar E to be more readily detached when it is desired to stop the car instantly. They are fastened at the front end of each reach of timber or link C C, Fig. 1, in order to pull the car at the end of the route around the end of the trackways, as the ends of these timbers follow in the line of the circle of the trackway, which is not the case with any other portion of the reaches of timbers.

In order to bring the strain of the draw-bar E as close as possible to the power train below, I fasten the link F just so that it will clear the rail on which the car runs, with its front end turned up so as to clear the narrow longitudinal channel b^1 , Fig. 2, from obstructions that may be on it; and in order to give the device which moves the car or vehicle a central draft I use, connected with the link F, Fig. 4, the lever G, fastened at one end to the opposite side of the bottom of the car, and upheld by a support, in which also is secured the spring H, which, when the draw-bar E suddenly comes in contact with the lugs C' of the driving-train C below, transmits a gentle and forward motion to the car. Perhaps a cushion formed of rubber may answer a better purpose than this spring. At the terminus of each driving-train, where the street-car route is longer, the car-track, if necessary, may be inclined a very little, and, with the momentum that the car will acquire while in motion, it will be carried forward on the straight trackway, as shown in Fig. 1, until the draw-bar E comes in contact with the pulling-lugs C' of the succeeding endless train, and thus pass on continuously, as may be desired.

The steam or other stationary power used to propel this endless drive-train may be placed in a vault under the street, or be to the right or left in line of the buildings, and the power transmitted to the drive-wheel by shafts and

bevel-cog wheels, or, in all probability, wire-ropes will be preferable. Each stationary power will drive, when required, two endless trains. The train-belt will cause the support-wheel at the end of the trainways to revolve.

As this manner of running street-cars can only operate one way in a city, in order to accommodate travel both ways a trackway and its connections can be supported upon stationary pillars or posts in the streets or over the sidewalks, and my endless train may run on rails fastened on longitudinal timbers supported by arms and brackets from said pillars or posts, and the propelling attachment can be connected from the car to the driving-train above, instead of below.

I claim as my invention—

1. The street or roadway A, inclined toward its center, and having one or more drains or sewers, B, arranged at or near the center of the road or street, substantially as and for the purpose set forth.

2. The drain or sewers B, having a narrow longitudinal opening, b^1 , in combination with the covering b^2 and projecting bar b^3 , substantially as set forth.

3. The drains B, provided with rails or flanges b , for supports or rails of the endless driving-train C, composed of reach-timbers or links, with wheels c upon each side, and linked together, substantially as set forth.

4. The endless driving-train C, composed of a series of bars linked together, and each bar consisting of a reach or link, c , supported on two pairs of wheels, c' , in combination with the track b and driving-wheels D, substantially as herein set forth.

5. The combination of the driving-train C c and projecting lugs c' with an adjustable draw-bar, E, projecting down from the car, substantially as and for the purpose set forth.

6. The combination of the draw-bar E, pivot-link F, lever G, spring or cushion H, standard J, and operating-handle I, substantially as set forth.

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Witnesses:

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