W. H. & H. M. STOW.

STREET-RAILROAD.

No. 193,291. Patented July 17, 1877.

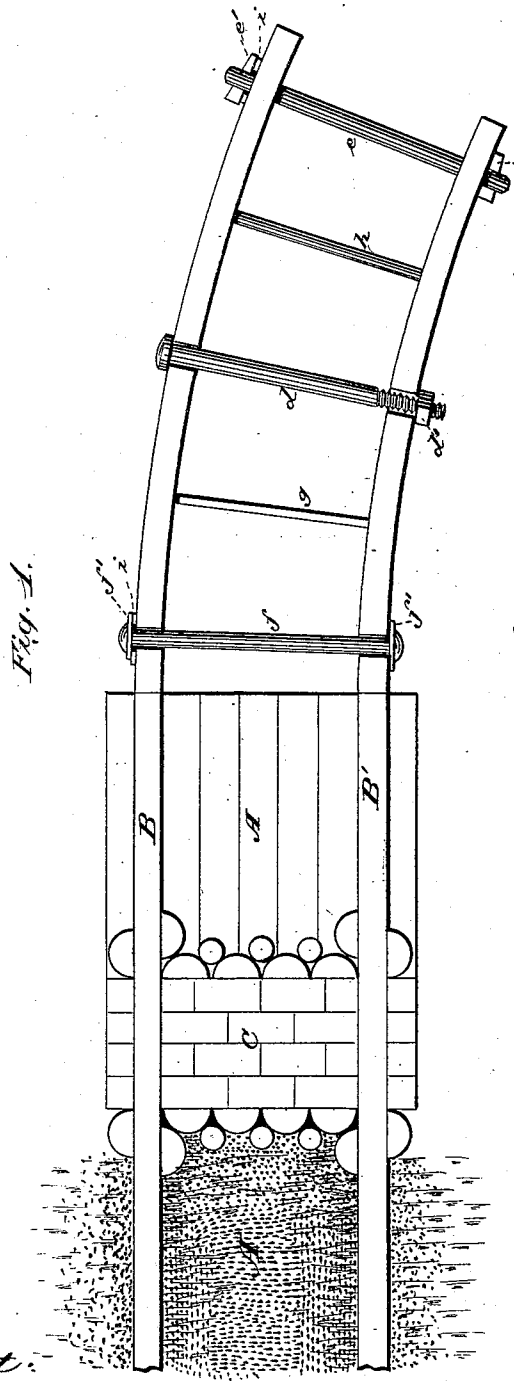


Fig. 1.

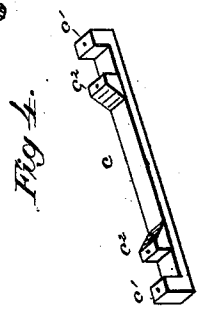


Fig. 4.

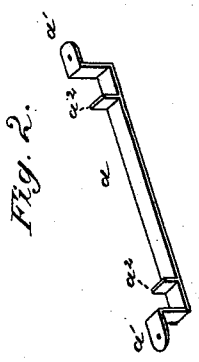


Fig. 2.

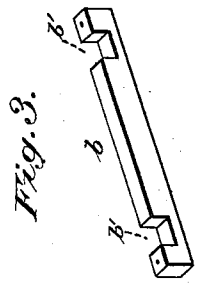


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM H. STOW, OF CHICAGO, ILLINOIS, AND HENRY M. STOW, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN STREET-RAILROADS.

Specification forming part of Letters Patent No. **193,291**, dated July 17, 1877; application filed March 14, 1877.

To all whom it may concern:

Be it known that we, WILLIAM H. STOW, of Chicago, in the county of Cook and State of Illinois, and HENRY M. STOW, of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Improvement in the Construction of Street-Railroads; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our invention relates to that class of street-railroads wherein the longitudinal sills are laid down without cross-ties or sleepers, and are held by the binding force of a suitable pavement; and its object is to construct such railroads to adapt them for use with the smooth-surfaced pavements now in vogue, so as to insure great durability, combined with facility and cheapness in repairing and replacement, which may be done with little injury to the pavement.

Our invention therein consists in laying the rectangular longitudinal sills without cross-sleepers, the sills being surrounded and held in place by the pavement, and, further, supporting such sills at the curves, and at other points subject to strain, by clamps and braces, as fully hereinafter explained.

In the drawings, Figure 1 represents a portion of a horse-railroad, showing the sills in the course of being laid partly upon a board and partly upon an earth foundation, and also showing the manner of paving upon each foundation with square, round, and split blocks. Figs. 2, 3, and 4, separate view of the gages employed.

The street is first graded, leveled, and prepared to form a foundation, A, for the pavement to be used. This foundation is usually of earth, sand, gravel, or broken stones, rolled or made compact in any convenient manner, or, in the case of some wood pavements, may be composed of boards either laid lengthwise or across the street. The longitudinal sills B B′ of the railroad, constructed in the usual rectangular form, with parallel sides, are set upon this foundation, and several of the gages, *a b c*, Figs. 2, 3, and 4, are placed in position upon them, maintaining such sills the desired distance apart. The roadway is then paved, both inside and outside of the sills, with any pavement, C, the gages being moved farther along and additional sills provided as the paving advances. The sills are described as being laid upon the earth, board, or other foundation of the pavement; but in the case of concrete or other composition pavement the sills may be made rather smaller than usual, and be placed upon any of the intermediate courses of such pavements. The sills would thus be held in place by the binding force of the pavement which surrounds them; but at curves and other points especially subject to strain it is necessary to provide additional support for such sills, so as to prevent them from spreading apart or working loose in the pavement. This we effect by means of the clamps or supports *d e f* and braces *g h*. Where it is intended to place the clamps and braces each sill is bored with holes in line with similar holes in the opposite sill, or slots are cut in the tops of such sills, extending down to or below the center of the same. The required number of the clamps are then secured to the sills, keeping them from spreading apart, and the braces, placed at regular intervals, hold the sills from being forced together. The roadway can then be paved, either before or after the track is spiked in position.

The clamps or supports *d e f* and the braces *g h* are constructed differently, and any one or all of the clamps or supports, and either or both of the braces, may be used, if desired.

The clamp *d* is made of stout iron rod, with a head welded on one end and a screw-thread cut on the other, upon which a nut, *d′*, turns; or the rod may have both ends screw-threaded and two nuts working on the same. This clamp is adapted to be passed through holes in the sills, and the nut *d′* turned to give the clamp the proper length; or the nut can first be turned to the desired point and the clamp dropped into slots in the sills.

The clamp or support *e* is a cheaper form, and consists of a piece of rod or bar iron cut the proper length, and having holes punched through its ends, in which fit keys *e′*.

A still cheaper clamp is shown by *f*, which

is made from rod or bar iron, and has its ends upset to hold the large washers f'. This last clamp or support is adapted only for use with slots in the sills.

The brace g is made of wood, in any desired form, and cut of the proper length, while the brace h is constructed of either square or round iron.

When the sills are either thicker or thinner than usual, where the clamps or supports d are used, the distance between them can be regulated by the nuts d'. With the clamps e and f the same result is obtained by means of wedges i, which can also be used at the ends of the braces, if it is desired to spread the sills.

The number of clamps and braces necessary to be used in the construction of a street-railroad can only be determined by practice; but we consider it requisite that they should be placed in every curve, and especially in short curves, where there should be one brace or clamp every four or five feet. We have also designed to place a clamp and brace at wide intervals throughout the road, so as to better preserve the distance between the sills and insure greater durability.

When it is desired to build the railroad for temporary use, before and while the street is being paved, the roadway is first graded and leveled properly, and the sills are then laid in position, having previously had holes bored through them, or slots cut or sawed in their tops. The required number of the clamps and braces are secured to the sills, holding them rigidly the desired distance apart, and the track being spiked in place, the railroad is in condition for temporary use. When the street is paved the clamps and braces can be removed as the paving advances, and the sills and track held entirely by the binding force of the pavement, the necessary number of clamps and braces being retained to give additional strength, as above described.

The construction of the gages a b c is also somewhat peculiar. The gage a, Fig. 2, is designed to be made from bar-iron cut the proper length, with the ends a^1 bent down at right angles to the body of the gage. To the under side of the gage, the desired distance inside of the ends a^1, are riveted or welded two pieces, a^2. When this gage is in position the sills rest between the ends of the same and the pieces a^2.

A cheaper form of the gage, designed only for temporary use, is shown at b, Fig. 3, and is constructed of a board or plank of wood, which is first sawed the desired length. A space, b', of the width of the sill, is then cut near each end of the board, and a metal rivet is passed through the pieces left at the ends, to strengthen the same.

The gage c, Fig. 4, is also made of a wooden board, and has cleats c^1 c^2, nailed to the same at the proper places, near the ends of the board, between which the sills rest.

It will be noticed that with our manner of constructing street-railroads the same character of pavement can be laid down inside the track as upon the outside, and that a solid body of pavement between the track is secured, since there are no sleepers to affect the integrity of the same. The sills may also be readily taken up and replaced by others with very little cutting away or displacement of the pavement between them, and at the same time, by our invention, a strong and durable street-railroad is produced.

We wish it understood that we do not confine ourselves to the peculiar gages, and clamps, and braces above described, since others of different construction might be employed with equal success.

Having thus fully described our invention, and explained some of its advantages, what we claim as new therein, and desire to secure by Letters Patent, is—

In street-railroads, the rectangular longitudinal sills laid without cross-sleepers, the said sills being surrounded and held in place by the pavement, and supported at the curves and at other points by clamps and braces, substantially as described.

This specification signed and witnessed this 18th day of January, 1877.

WILLIAM H. STOW.
HENRY M. STOW.

Witnesses:
J. F. SMITH,
I. S. REID.