

(No Model.)

2 Sheets—Sheet 1.

A. B. WILSON.

CONDUIT AND PULLEY FOR CABLE TRACTION.

No. 587,353.

Patented Aug. 3, 1897.

Fig. 1

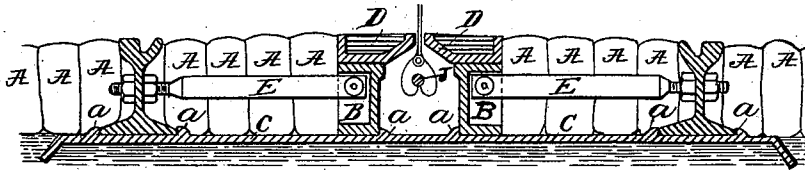


Fig. 2

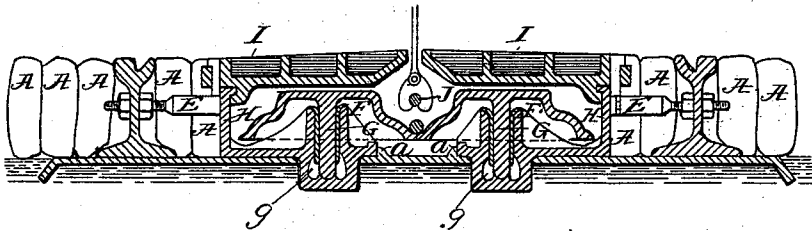
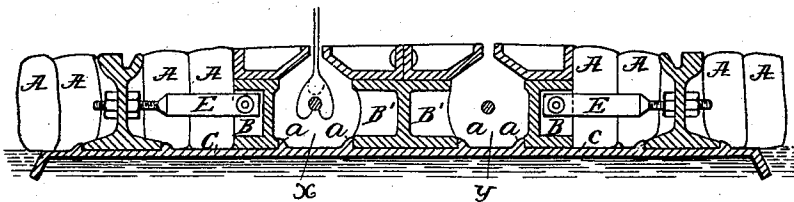


Fig. 3.



WITNESSES:

Edward L. Rowland
William M. Roper

A. B. Wilson INVENTOR

BY *John W. Rowland*
ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

A. B. WILSON.
CONDUIT AND PULLEY FOR CABLE TRACTION.

No. 587,353.

Patented Aug. 3, 1897.

Fig. 4.

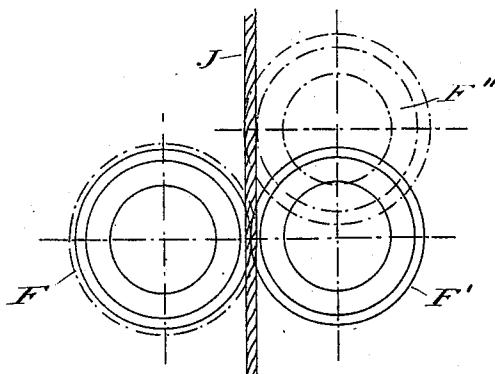
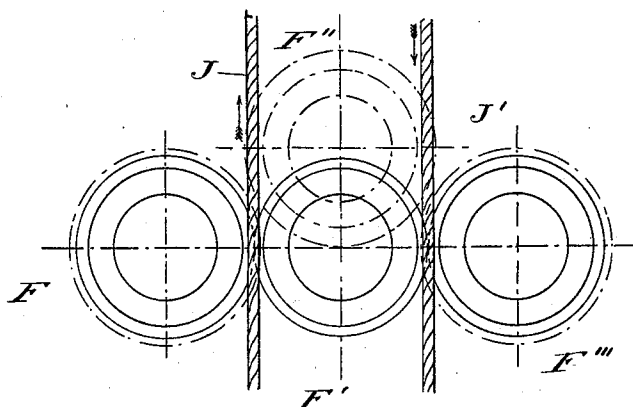


Fig. 5.



WITNESSES:

Edward C. Rowland.
William M. Fisher.

INVENTOR

A. B. Wilson

BY

James L. Rowland
ATTORNEY

UNITED STATES PATENT OFFICE.

ALEXANDER BASIL WILSON, OF HOLYWOOD, IRELAND.

CONDUIT AND PULLEY FOR CABLE TRACTION.

SPECIFICATION forming part of Letters Patent No. 587,353, dated August 3, 1897.

Application filed December 4, 1895. Serial No. 571,079. (No model.) Patented in England September 17, 1894, No. 17,622.

To all whom it may concern:

Be it known that I, ALEXANDER BASIL WILSON, a citizen of Great Britain, and a resident of Holywood, in the county of Down, Ireland, have invented certain new and useful Improvements in Conduits and Pulleys for Cable Traction, (patented in Great Britain September 17, 1894, No. 17,622,) of which the following is a specification.

10 My invention relates to the conduits and pulleys used in the operation of cable traction, more especially to that system of cable traction which is applicable to street-railways.

15 The objects of my invention are to, first, cheapen the cost of construction; second, cheapen the expense of maintenance; third, provide a conduit the parts of which shall be accessible; fourth, simplify and facilitate the cleaning and repairing.

20 Heretofore cable conduits or tubes, hereinafter referred to as "conduits," have been made of such a depth below the surface of the road as to entail great cost in construction and maintenance owing to the conduit cutting through the concrete bedding on which the rails and upper surface of roadways are commonly placed. The necessary strength in such bed which has been removed has to be replaced by additional masses of concrete or by other expensive means, such as forming the sides of conduit with numerous metal braces to maintain the strength removed by the opening, and the maintenance is increased by the difficulty of removing the dirt which from time to time gets in from such a depth below the surface of the roadway, as is common. This depth of conduit, which further frequently involves the removal and alteration of gas, water, and other connections, has been found necessary on systems of cable traction heretofore on account of the depth required for the pulleys supporting the cable and on which it runs. 25 These pulleys having been in straight lengths of the road and in curves of a greater radius than forty feet placed with the axles horizontal, the depth of the opening was therefore determined by the necessary diameter of pulley with clearance above and below.

To avoid the difficulties and expense of cutting through the concrete bed as afore-

said, a system of construction has been adopted whereby that portion of the concrete foundation between the supporting-pulleys has been untouched or only removed to a comparatively small extent and the supporting-pulleys placed in recesses or wells of the necessary depth. This arrangement has the objection that the dirt which is carried through the slot from the surface of the road becomes washed or blown into the recesses, thereby preventing the pulleys from revolving freely, and, further, that each pulley-recess has to be provided with a special drain-pipe to remove water and dirt that may collect therein or may be used for washing the conduit out. To obviate these difficulties and to enable the supporting-pulleys to come within the depth of the square setting or pavement between the rails and to maintain the same bottom depth of conduit all through, I form the sides of the conduit of shallow continuous girders or bars of cast-iron or other suitable material set and held at the requisite distance apart by gage bars or ties, and bedded on the top of the concrete foundation on which the rails and square setting are laid, the depth and shape of the girders being such that when in position they form a trough or channel the sides of which are somewhat below the surface of the road. On the top of these side girders I bolt or fasten covers of steel or other suitable material of channel-section and of depth sufficient to fill up the remaining space to the surface of the road, such covers overhanging the trough inward on each side, but leaving a narrow open space or slot between them for the stem or shank of the gripper to pass. I fill in the hollow of these channel-bars with rock-asphalt or other suitable material and form them so that they can be readily removed when required without disturbing the roadway, and so connect them to the side girders that they can be moved inward toward the center of slot as the sides of slot may wear from time to time. Moreover, the construction of the covers over the pulley-box is such that lifting the gripper up opens the lids and enables the grippers to be moved at any of the double boxes.

The ability of the gripper when raised to open the covers and free itself from the conduit is most valuable, for the reason that

where traffic on branch lines does not warrant the laying of the cable the grippers can be withdrawn from the conduit and the cars operated by horses without greatly increasing the weight of the cars.

To be more specific, I accomplish the objects of my invention by the means shown in the accompanying drawings, in which similar letters of reference refer to similar parts throughout the several views.

Figure 1 is a transverse section of the road-bed and conduit. Fig. 2 is a transverse section of the same on a line passing through the axes of the pulleys. Fig. 3 is essentially similar to Fig. 1, with the exception that it shows a double conduit for two cables traveling in opposite directions. Fig. 4 is a plan showing the arrangement of the pulleys for a single cable. Fig. 5 is a plan showing the arrangement of the pulleys for two cables traveling in opposite directions.

Referring to Fig. 1, A A is the ordinary pavement of the roadway; B B, the side girders, (shown in section;) C, the ties or sole-plates resting on the bottom of the conduit, having flanges *a a* upon their upper surfaces to form bearings for the girders B and bed-plates for the rails, as shown in the drawings. D D are covers fitting over the conduit and by their position forming the slot. E E are stays supporting and adjusting the girders B. J is the cable. The space within the covers D (shown shaded horizontally) may be filled with rock-asphalt or other suitable material.

Referring to Fig. 2, F F are pulley-wheels supported in sockets G, forming part of or are attached to the box H, which is in its turn connected by suitable means to the girders B in Figs. 1 and 3 and to stays E, this box being fitted with removable covers I, the cable J resting between the flanges or pulleys F, and the spindles of said pulleys revolving in chambers *g*, supplied with lubricating material. The pulleys F, as shown in section in Fig. 2, have their centers opposite each other, as also shown in plan in Fig. 4 for the single and in Fig. 5 for the double cable. Under suitable conditions I place these pulleys one in advance of the other, as shown in dotted lines in Figs. 4 and 5, and make the flanges of larger diameter.

I am aware that pulleys of substantially bell shape have been used in cable systems; but so far as I know they have none of them been made closed on the top and perimeter and having bearings projecting so far into the interior as to tend to prevent the entrance of liquid to these bearings.

The construction and formation of the pulleys, pulley-spindles, and sockets are such that the body of the pulley being closed acts as a diving-bell, being hollowed underneath, and prevents water from obtaining access to the bearing-surface of the spindle in the event of the conduit being washed out or flooded.

By using the word "closed" I mean to indicate a pulley of substantially an inverted

cup or saucer shaped section, closed on the top and having no openings, such as oil-holes, spaces between spokes, &c., to admit liquid or permit the expulsion of air from the hollow interior.

Referring now to Fig. 3, here two conduits *x* and *y* are shown, each containing a cable, the method of construction being the same as that already illustrated, except that the I-girder B' is placed between and forms the inside of *x* and *y* and is retained by the shoulders *a a*.

Referring to Fig. 4, F F' show the usual arrangement of the pulleys, while F'' shows a second position in which the wheel F' may occasionally be placed to advantage, especially in a curve.

J J', Fig. 5, are the two cables running in separate conduits and in opposite directions, supported and guided by the three pulleys F, F', and F'', while F'' shows the alternate position for F', as before explained.

It will be noticed that the cable is supported between the flanges of the two pulleys, these flanges working close together and so shaped as to form a recess for the cable to lie in corresponding to the usual groove in a pulley running in horizontal bearings. I carry the body of these pulleys, above their flanges, up nearly to the top of the said girders forming the conduit to guide the cable sidewise in passing around curves. The under sides of the pulleys are hollowed or dished out, and the bearings in which their pins or spindles work are carried well up to near their top, so as to obtain long bearing-surfaces. The lower ends of the spindles rest upon raised bosses, around which are formed recessed chambers for oil, so that the spindles run in a bath of oil, as has been shown. The boxes containing these pulleys, which are covered with removable lids, are so arranged as to form a continuation of the cable conduit and covers already described.

Having thus described my invention, what I claim is—

1. In a conduit-railway system, a cable-conduit formed of girders, suitably secured at proper distances from the rails, and closed bell-shaped pulleys therein, having bearings adapted to project so far into the interior of the pulley as to tend to prevent the entrance of liquid thereto.

2. In a cable-conduit system, the combination of side girders suitably stayed and secured to the ties, with a removable cover, and having at suitable intervals chambers of substantially the same depth as the main conduit, containing pulleys revolving in vertical bearings, said pulleys so shaped inside as to prevent the entrance of liquids to the bearings.

3. In a cable-conduit system, the combination of a conduit of substantially the same depth as the road-bed, with a cover removable throughout its whole length, so as to expose the entire conduit; with pulleys of bell

shape, and running in vertical bearings, which project so far into the bell, that water is prevented from entering the bearings.

4. A cable-conduit of substantially the same depth as the pavement in which it is laid, said conduit being formed of side girders, secured by stays to the rails, and abutting against shoulders on the ties; in combination with a removable cover, in two portions, the distance between which portions constituting a slot; and having at suitable intervals chambers of substantially the same depth as the main conduit; said chambers containing bell-shaped pulleys revolving in vertical bearings; said bearings having recessed lubricating-chambers.

5. The combination of a closed bell-shaped pulley, with the pulley-shaft, and substantially vertical bearings for the same, said bearings projecting so far into the under part of the confined air-space in the pulley as to tend to prevent the entrance of water to the shaft.

6. As a new article of manufacture, a pulley having a closed top and perimeter, having its shaft depending from the top, and adapted to run in substantially vertical bearings, projecting so far into the interior of the pulley, as to tend to prevent the entrance of liquids thereto.

7. The combination of a closed pulley, with substantially vertical bearings, said bearings formed with a lubricating-recess, and said bearings adapted to project so far into the

closed interior of the pulley, as to tend to prevent the entrance of liquid thereto.

8. In a cable system, the combination of a conduit, a plurality of closed bell-shaped pulleys oppositely disposed with regard to the cable, with bearings projecting so far into the interior of the pulleys; as to tend to prevent the entrance of liquid thereto.

9. In a cable-railway system, the combination of a conduit, a cable, and closed pulleys, with bearings projecting so far into the hollow of said pulleys as to tend to prevent the entrance of liquids thereto.

10. The combination of a cable, and closed pulleys, with bearings projecting so far into the hollow of the same as to tend to prevent the entrance of liquids thereto.

11. In a conduit-railway system, the combination of girders suitably supported at the proper distances from the rails, forming one or more cable-conduits, with chambers at suitable distances, hollow pulleys in said chambers, having a closed top and perimeter with substantially vertical bearings, projecting so far into the pulleys as to tend to prevent the entrance of liquids thereto.

Signed at Belfast, in the county of Antrim, Ireland, this 11th day of September, A. D. 1895.

ALEXANDER BASIL WILSON.

Witnesses:

JOHN MCQUADE,
JOSEPH GLANCY.