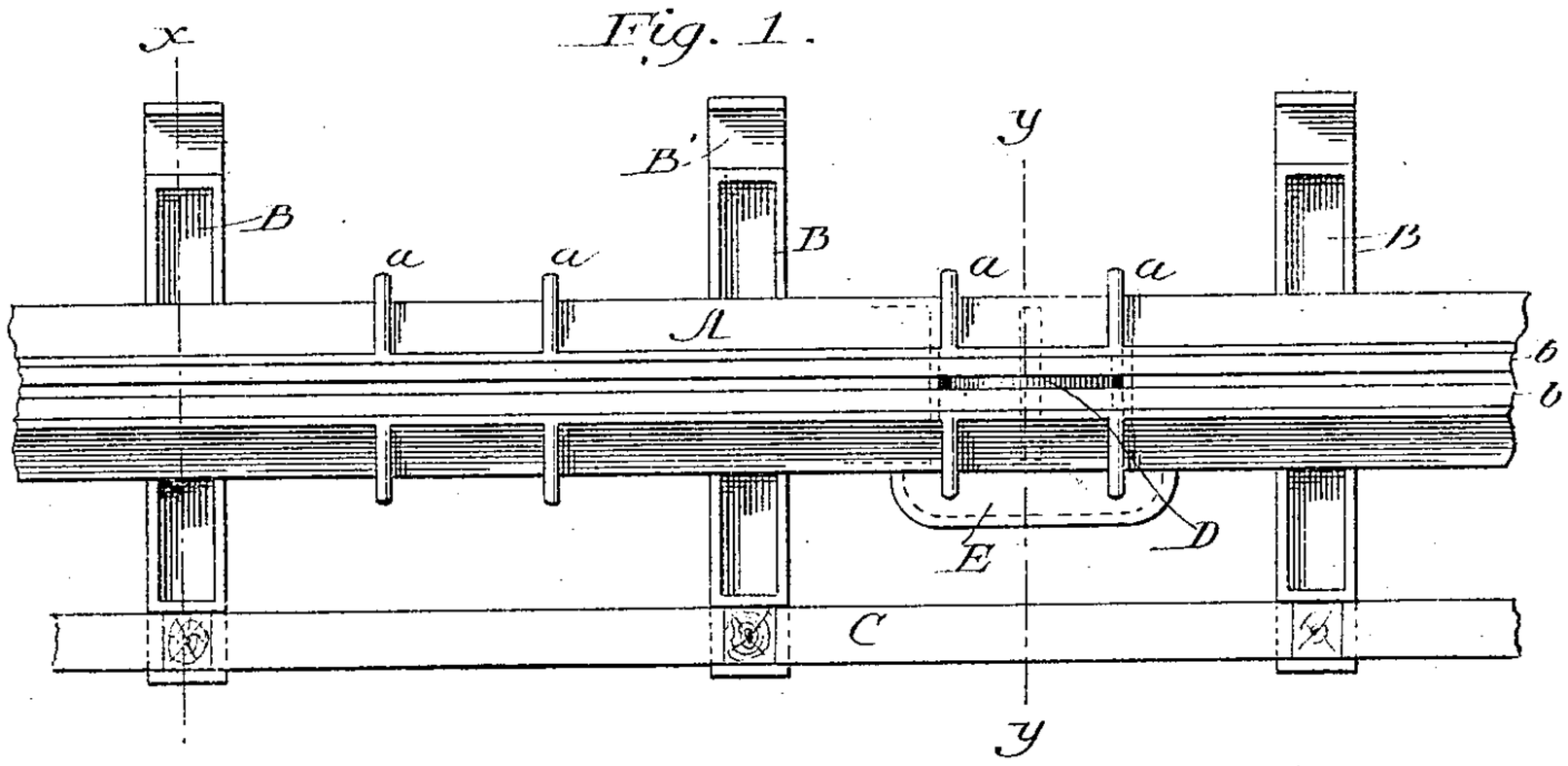
(No Model.) 2 Sheets—Sheet 1.

S. H. TERRY.

CABLE TUBE FOR TRACTION RAILWAYS.

No. 270,506. Patented Jan. 9, 1883.

Fig. 1.



x Fig. 2.

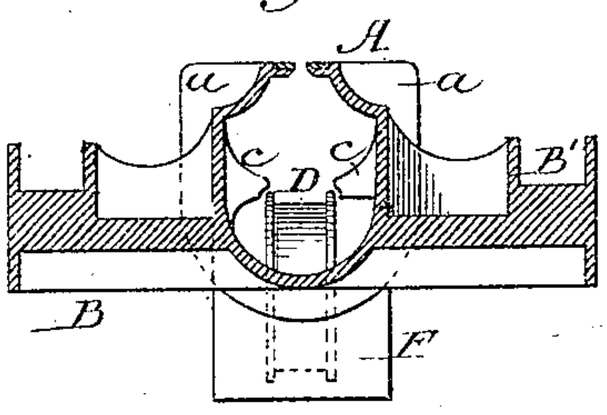


Fig. 3.

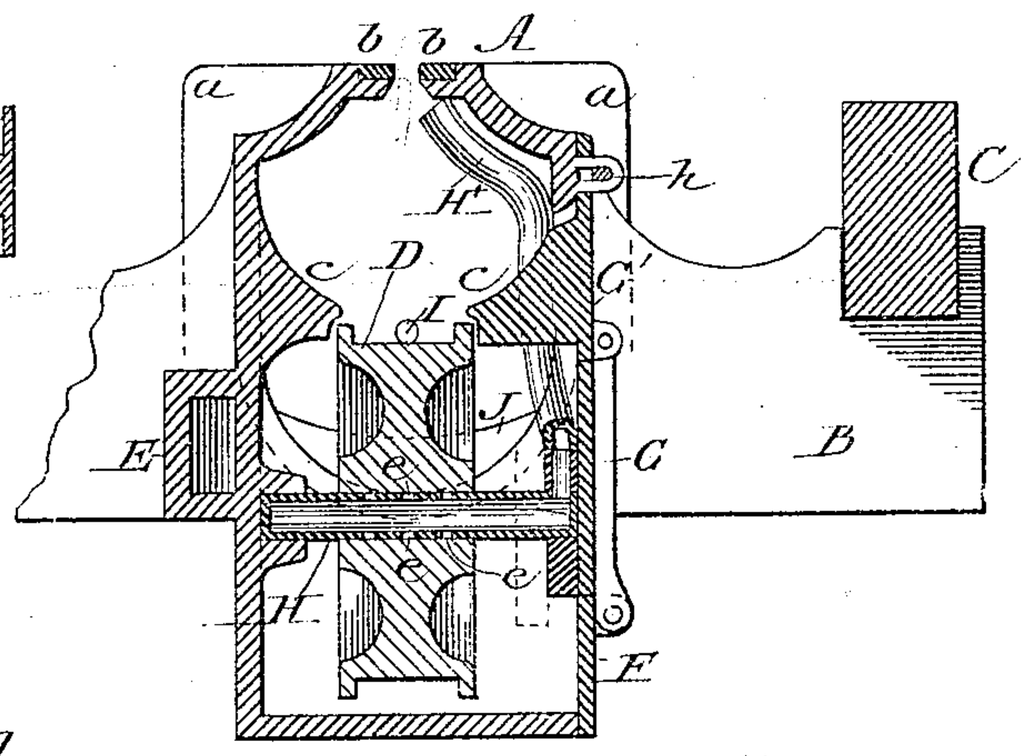


Fig. 4.

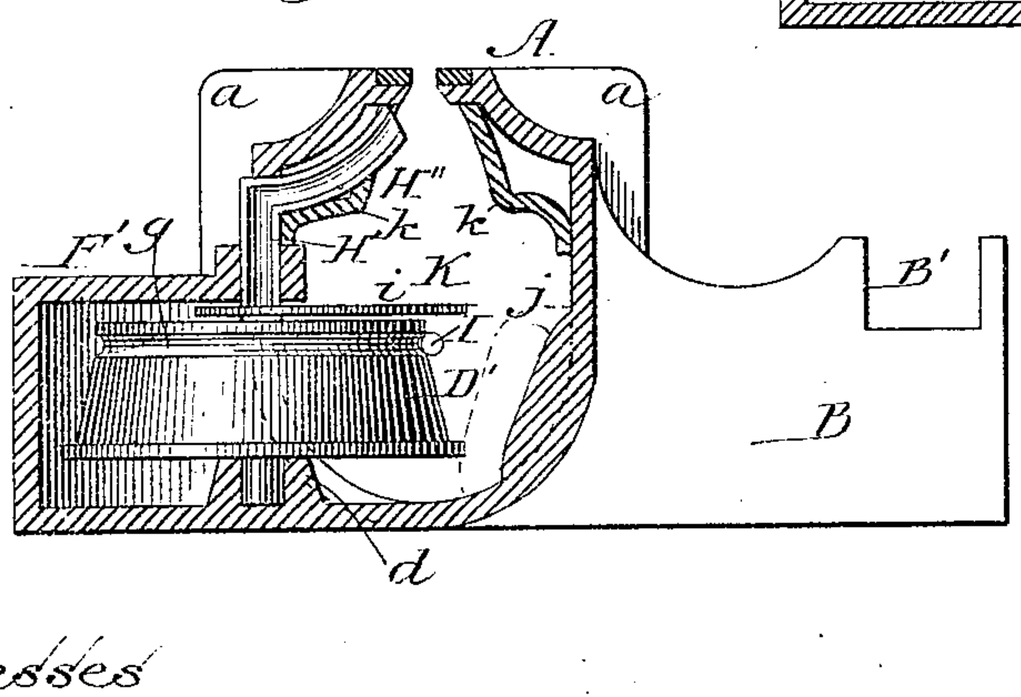
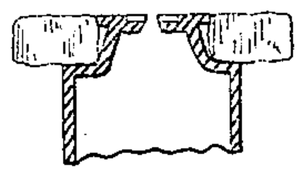


Fig. 8.



Witnesses

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Albert H. Adams.

Inventor:

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(No Model.) 2 Sheets—Sheet 2.

S. H. TERRY.

CABLE TUBE FOR TRACTION RAILWAYS.

No. 270,506. Patented Jan. 9, 1883.

Fig. 5.

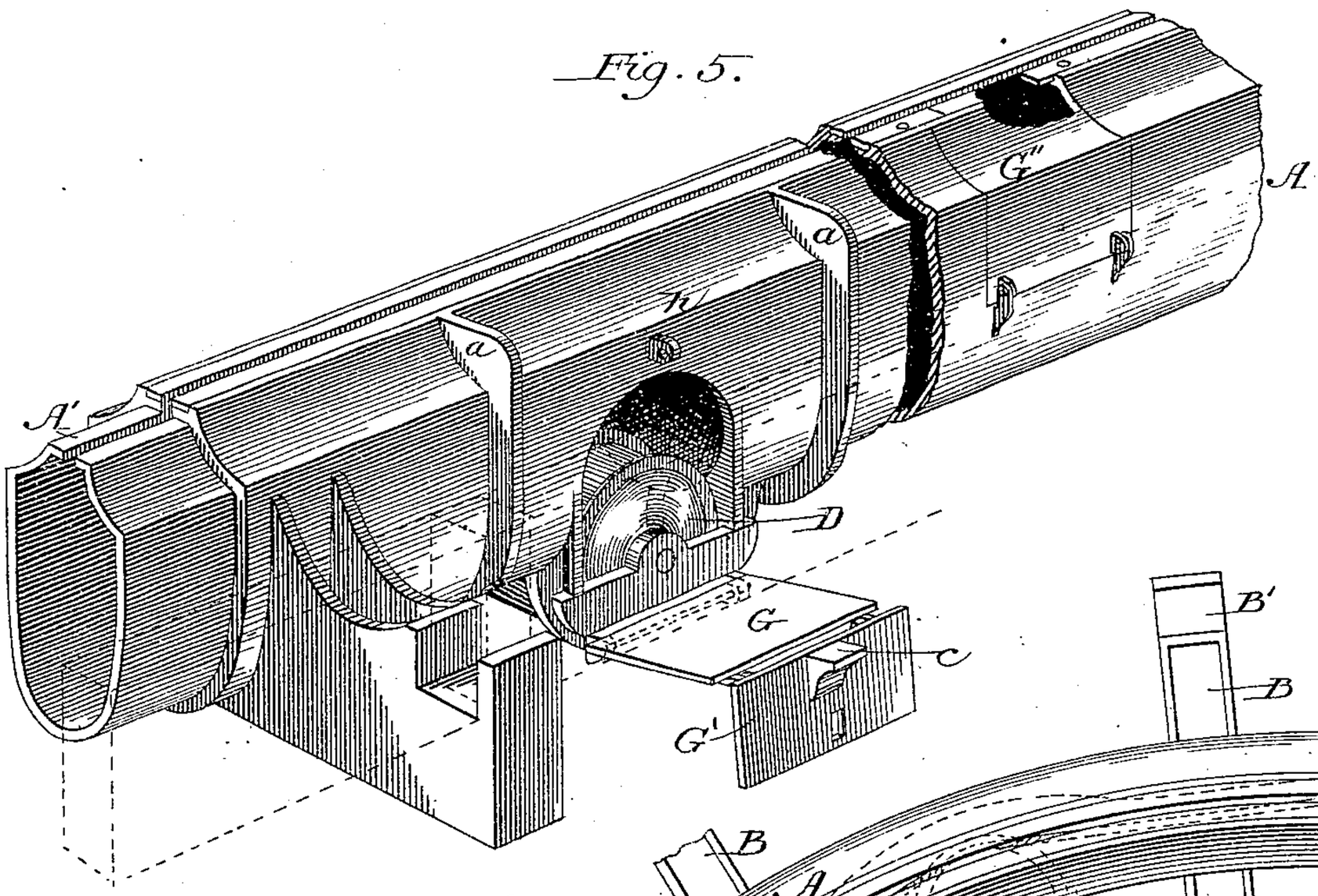

Fig. 6.

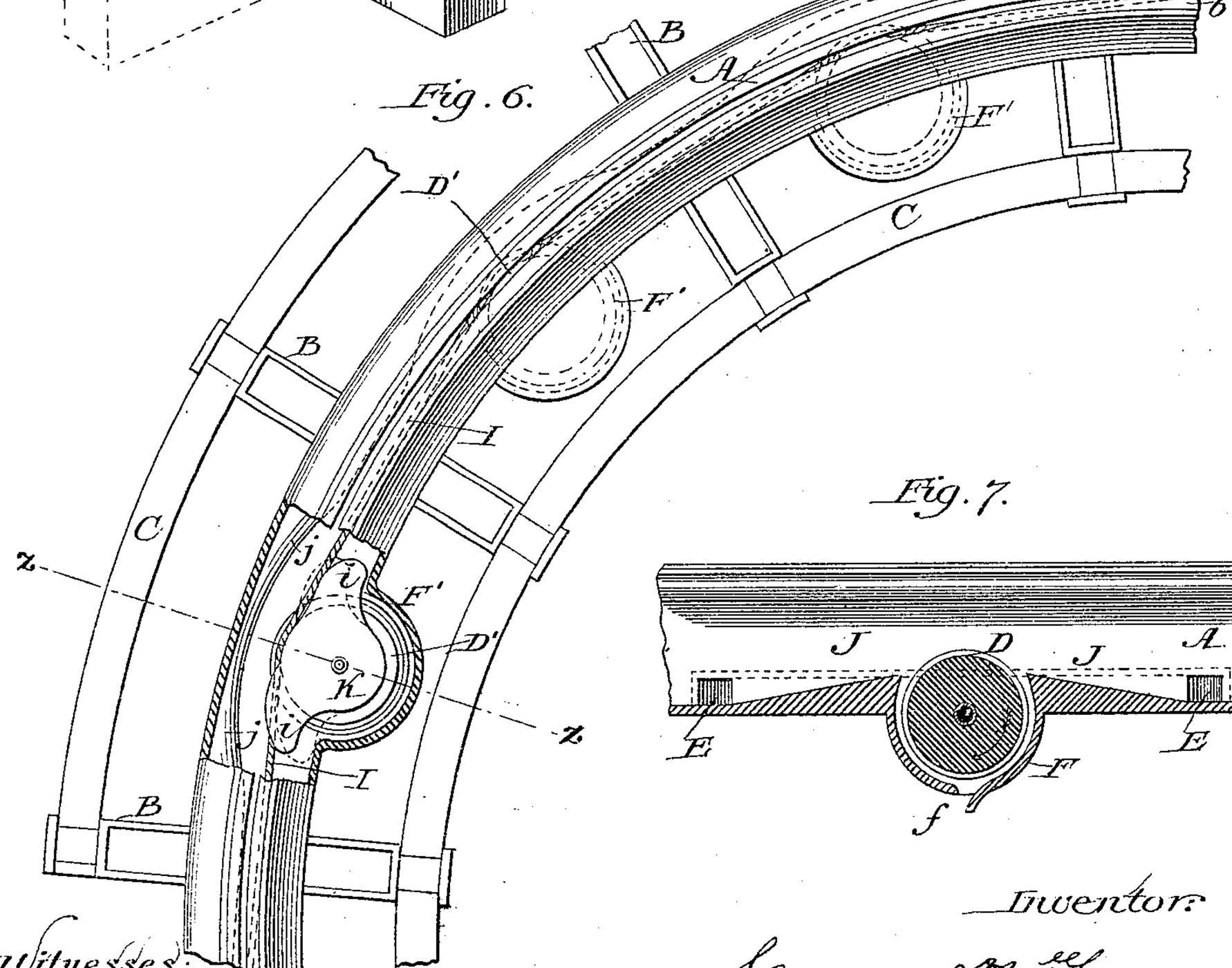

Fig. 7.

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UNITED STATES PATENT OFFICE.

SAMUEL H. TERRY, OF CHICAGO, ILLINOIS.

CABLE-TUBE FOR TRACTION-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 270,506, dated January 9, 1883.

Application filed April 4, 1882. (No model.) Patented in England September 27, 1882, No. 4,601.

To all whom it may concern:

Be it known that I, SAMUEL H. TERRY, formerly of Guthrie, Calloway county, Missouri, now residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Tubes or Passage-Ways of Cables used in Propelling Cars, &c., of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view; Fig. 2, a cross-section on line *x x* of Fig. 1; Fig. 3, an enlarged cross-section on line *y y* of Fig. 1; Fig. 4, a cross-section on line *z z* of Fig. 6; Fig. 5, a perspective side elevation; Fig. 6, a plan view of the curved section; Fig. 7, a longitudinal section, showing a method of constructing the tube where the anti-friction or bearing wheels are placed; and Fig. 8 is a modification of the main tube for better adaptation to paving-blocks.

The object of this invention is to form an improved tube or passage-way for cables used in propelling cars; and its nature consists in providing the tube with enlargements or pockets, so that large bearing or anti-friction wheels may be used with a small tube; in providing the horizontal bearing-wheels with a device for retaining the cable; in providing the main tube at the pockets or near the vertical bearing-wheels with inclines for lifting the gripper or easing it over the bearing-wheels; in providing the tube with a side pipe or passage for conveying the water around the box, and in the several devices and combinations of devices hereinafter set forth and claimed as new.

In the drawings, A indicates the main tube; B, the cross-ties; C, the stringers or longitudinal timbers upon which the rails for the cars are fastened; D, the vertical and D′ the horizontal bearing anti-friction wheels; E, the water passage around the bearing-wheel pocket; F and F′, pockets for the vertical and horizontal bearing-wheels; G, G′, and G″, doors or man-hole covers for obtaining access to the bearing-wheels or into the tube; H, hollow axles for the bearing-wheels; H′ and H″, bent portions of the axles or tubular connections therewith for lubricating the wheels; I, the cable; J, the inclines at the pockets and within the main tube; K, shields or guards by which the cable is prevented from getting above the horizontal bearing-wheels on curves; *a*, strengthening flanges or ribs on the main tube; *b*, boundary-plates; *c*, interior projections for keeping the cable on the bearing-wheels; *d*, bearing for the horizontal wheels; *e*, perforations for lubricating the bearings or shafts H; *f*, opening at the bottom of a pocket for the escape of any water which may get in; *g*, groove in the bearing-wheel D′; *h*, fastening for the door or man-hole covering; *i*, points or projections on the guard-plate K; *j*, a curve-guide, and *k* ledge or stop.

The main tube A is made of cast-iron, and is cast with the cross-ties B attached, which cross-ties not only form the supports for the stringers of the track, but also for the tube itself. The tube is provided with strengthening flanges or ribs *a*, which may be placed as frequently as desired, and their number would be somewhat in accordance with the thickness of the main plate, which thickness for ordinary purposes will be about three-eighths of an inch. This tube is made in sections, and one end may be reduced in size, as shown at A′ in Fig. 5, to fit a corresponding socket on the end of the adjoining section; or both ends may be formed as shown at A′ and fitted into a corresponding but separate socket wide enough for both ends; or the ends may be secured by providing them with flanges, which can be bolted together with or without intervening packing material. Alternate sections, or as many sections as may be needed for that purpose, are provided with depressions or pockets F for the purpose of inserting large bearing anti-friction wheels.

Whenever it is desired to run a cable rapidly small bearing-wheels cannot be used, as their motion becomes so rapid that they wear rapidly and are liable to heat. Their situation is such that their wear or heating cannot be observed in time to take care of them, and running, as they do, where dirt and dust are always liable to accumulate or settle, this difficulty is a serious one; and I avoid it by the use of the pockets, which enable me to insert bearing-wheels two or three feet in diameter, so that the cable may have a travel of six or nine feet to each revolution of the bearing-wheel, and I am thereby enabled to give the cable a much greater speed with the use of a small or ordinary sized tube than has heretofore been given them for their ordinary working. These bearing-wheels D are supported in

said pockets, as shown in Figs. 3 and 5, and I prefer to support them on the non-rotating hollow axles H, as shown, as they are less liable to accumulate dirt, and are much more easily lubricated, for by extending the parts H′ up oil can be turned in without opening the man-hole covering or door, so that the door is only required to be opened when changes or repairs are necessary.

The hollow axles are provided with small or fine openings *e* when oil is to be used for the lubricator. If, however, heavy oils or tallow is to be used, then they will be made somewhat larger, but still not large enough to pass oil or tallow too easily.

The perforations *e* are not shown for the horizontal wheels D′, but they are used the same, and their position is such that sufficient oil or lubricating material will flow down and lubricate the shoulder or bearing *d*. These axles may also be projected up, as shown at H″, Fig. 4, so that they may be oiled through the slit or opening at the top of the main tube.

In order to prevent any water which may gather within the main tube from running into and remaining in the pockets F, I have provided a side tube or passage, E, which takes the water around the pocket, as shown in Figs. 1, 3, and 7. This passage may be cast with the pipe, or sections of round iron pipe may be used for this purpose, and in some localities it may be advisable to run a side tube the whole length of the main tube, and connect it with the main tube by side openings, so as to relieve the main tube from water its entire length; but for ordinary purposes the passages E around the pockets F will be sufficient. The inclines J, Figs. 3 and 7, prevent the water from following the main pipe into the pockets F and cause it to pass into the passage or tube E. These inclines also serve to gradually raise the gripper, so that in its approach to the bearing-wheels D it will not strike them so as to injure either wheel or gripper. For this one of the inclines would be sufficient; but I prefer to ease the gripper down, instead of allowing it to drop, so that I place these inclines J on both sides of the pockets or of the bearing-wheels, as shown at Fig. 7. This causes the gripper to pass each vertical bearing-wheel with an easy movement.

The doors or man-hole covers may be made single and fit into the tube, as shown at G″, Fig. 5; but I prefer to make them lap over the tube, as shown at G, and to provide them with a flap or secondary hinged portion, G′. By this arrangement the portion G′ can be turned back for inspection or oiling, and the entire door will only require to be turned back when a new wheel or axle is to be introduced. The form of door or cover shown at G″ may be used in connection with the horizontal bearing-wheels. Its position is such that it does not require any special fastening, while the door or cover G′ is fastened by the staple *h* and a key or by a lock, if desired.

Whenever a curve in the main tube becomes necessary, as in turning street corners or in making branches, the bearing-wheels are placed horizontally, as shown at Figs. 4 and 6. In this case the bearing wheel pockets or enlargements extend horizontally, as at F′.

The bearing-wheels D′ are shown at Fig. 4, and provided near their upper ends with a groove, *g*, to hold and carry the cable I when in its ordinary travel; but as the gripper lifts the cable out from the groove, and is liable to lift it away from the wheel, I provide these horizontal bearing-wheels with guide-plates K, which are attached to the wheel-axles, and are provided with two prongs or projections, *i*, as shown in Fig. 6.

When the gripper, in operation, comes against one of these projections it is so inclined as to turn the plate back and bring the opposite projection out over the cable, and as the gripper passes away from the wheel it strikes the farther point *i* and thereby throws the first one back again over the cable, so that it is impossible for the gripper to lift the cable away from the bearing-wheel, while at the same time it readily passes the bearing-wheel in its travel.

The pockets F F′ may be provided with openings *f* for the escape of any water that may accumulate therein while the cable is not in motion. The ordinary movement of the cable gives the bearing-wheels a sufficient movement to throw the water out of the pockets.

The cross-ties are provided with sockets B′, for holding the stringers in place; but they may be left with inner shoulders and the stringers be bolted down, if desired.

The bars *b* of the main tube form the boundaries for the opening or passage into the tube through which the gripper passes, and by their use a smooth finished boundary is given to the groove or opening, and by making them of wrought-iron they are less liable to be chipped or broken by the passage of heavy teams over or across them than they would be if made of cast-iron. They are bolted or riveted on, and may be made to lap joints with the casting or not, as desired, for when bolted on they may be made longer than the cast-iron sections.

In turning a curve it will be understood that the cable passes from wheel to wheel in a straight line, and that as heretofore constructed great difficulty has been experienced in gripping on a curve when the gripper has been released by stopping, which was frequently necessary in order to avoid collisions. I avoid this difficulty by projecting the bearing-wheels D′ somewhat beyond the tube slit or opening, as shown in Fig. 6, and by providing the interior of the tube on its longest side with the guide *j*, which in its construction follows the dotted lines of said figure. This projection may be an interior plate when the form of the tube is preserved, or it may be made in the tube itself by causing it to conform in its construction to the dotted line. By this construction and arrangement and the use of a yielding or jointed gripper the cable can be grasped

at any point along the cable, except at a wheel. The guide-plate or conformation *j* guides the gripper to the cable, and by carrying the bearing-wheels beyond the opening the effect of the tendency of the cable to run in a straight line is divided between the two sides of the slit or opening. For large or easy curves it will not be necessary to project the bearing-wheels across the opening, but it is important in short curves.

It will be understood that where heavy T or other strong rails are used stringers may not be necessary, and in that case all that will be required will be to place some wooden plank ends or blocks in the openings B′ to avoid undue solidity of the structure; and it will of course be understood that in leaving out the stringers the outer ends of the ties will be made higher, so as to give the rails their proper position, and when stringers are used blocks may be placed with their fiber vertical between the ends of the stringer-sections, as shown in Fig. 1, which will prevent any settling or bending of the rail at the points of junction in the timber, and when stringers are not used the openings B′ may be formed into suitable chairs to hold the rail, or may be made large enough to admit of the insertion of wrought-iron or other suitable chairs.

If the gripper should inadvertently be released on a curve when against one of the wheels D′ or under the plate K, I prevent the gripper from being drawn up so that it cannot be again applied, and also so that it will not throw the cable off from the wheel, by providing the main-tube with ledges or shoulders *k*, as shown at Fig. 4, which will prevent the lifting of the gripper and the consequent lifting of the cable. These ledges are made of the form shown in cross-section, and are of the length of the plate K with its projections. With some forms of grippers one of the ledges or stops *k* will be sufficient. In other forms it will be desirable to use both, as shown. By this arrangement it is impossible to lift the gripper away from the cable at a point where it cannot be re-attached, and the cable is secured against being lifted out of or upon its bearing-wheel.

I do not claim a traction-rope railway-tube made in sections, each section being formed with arms adapted to support a tie on sills or stringers of a track, as such is not my invention.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The side passages, E, in combination with the pockets F and main tube A, substantially as set forth.

2. The inclines J, in combination with the bearing-wheels D and main tube A, substantially as specified.

3. The inclines J, in combination with the pockets F, main tube A, and side passages, E, substantially as and for the purpose described.

4. The interior projections, *c*, in combination with the bearing-wheels D and main tube A, for preventing the cable from getting away from the bearing-wheels, substantially as set forth.

5. The hollow axle H, having the perforations *e*, in combination with the wheels D and tubular extensions H′, substantially as and for the purpose specified.

6. The combination of the horizontal wheels D′ with side extensions or pockets, F′, and the vertical hollow axle H and H″, substantially as specified.

7. The oscillating plate K, having the projections or arms *i*, in combination with the horizontal bearing-wheel D′, substantially as and for the purpose described.

8. The firmly-attached soft-iron or steel boundary bars or plates *b*, in combination with cast sections of the tube A, to preserve the edges of the casting from chipping or breaking, substantially as described.

9. The gripper-guide *j*, in combination with a curved main tube, constructed and operating substantially as specified.

10. The gripper-guide *j* and curved main tube, in combination with the wheels D′, located within or partly within said main tube, and projecting across the gripper slit or opening of the main tube, substantially as and for the purpose specified.

11. The stop or stops *k*, in combination with the oscillating plate K and horizontal bearing-wheel D′, substantially as and for the purpose described.

12. The stop or stops *k*, in combination with the main tube A and a horizontal bearing-wheel, substantially as set forth.

13. The combination of a curved main tube, having the guide *j* and the stop or stops *k*, with the horizontal bearing-wheel D′ and the oscillating plate K, substantially as specified.

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ALBERT H. ADAMS.