(No Model.) 2 Sheets—Sheet 1.

F. G. CORNING.

ENDLESS CABLE TRACTION RAILWAY.

No. 297,068. Patented Apr. 15, 1884.

Fig. 1.

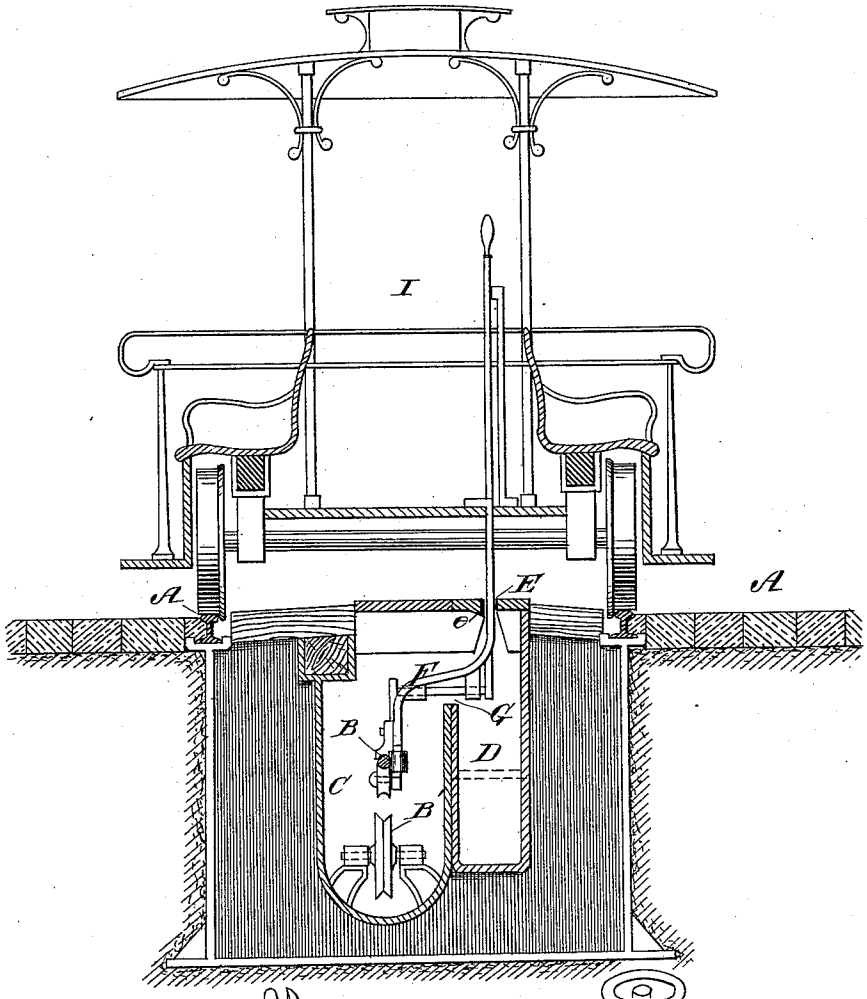


Fig. 3.

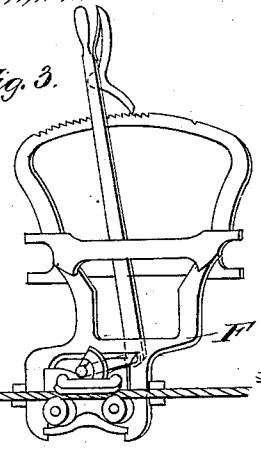
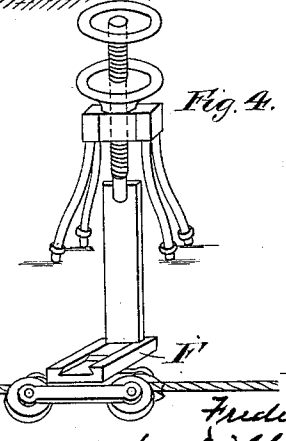


Fig. 4.



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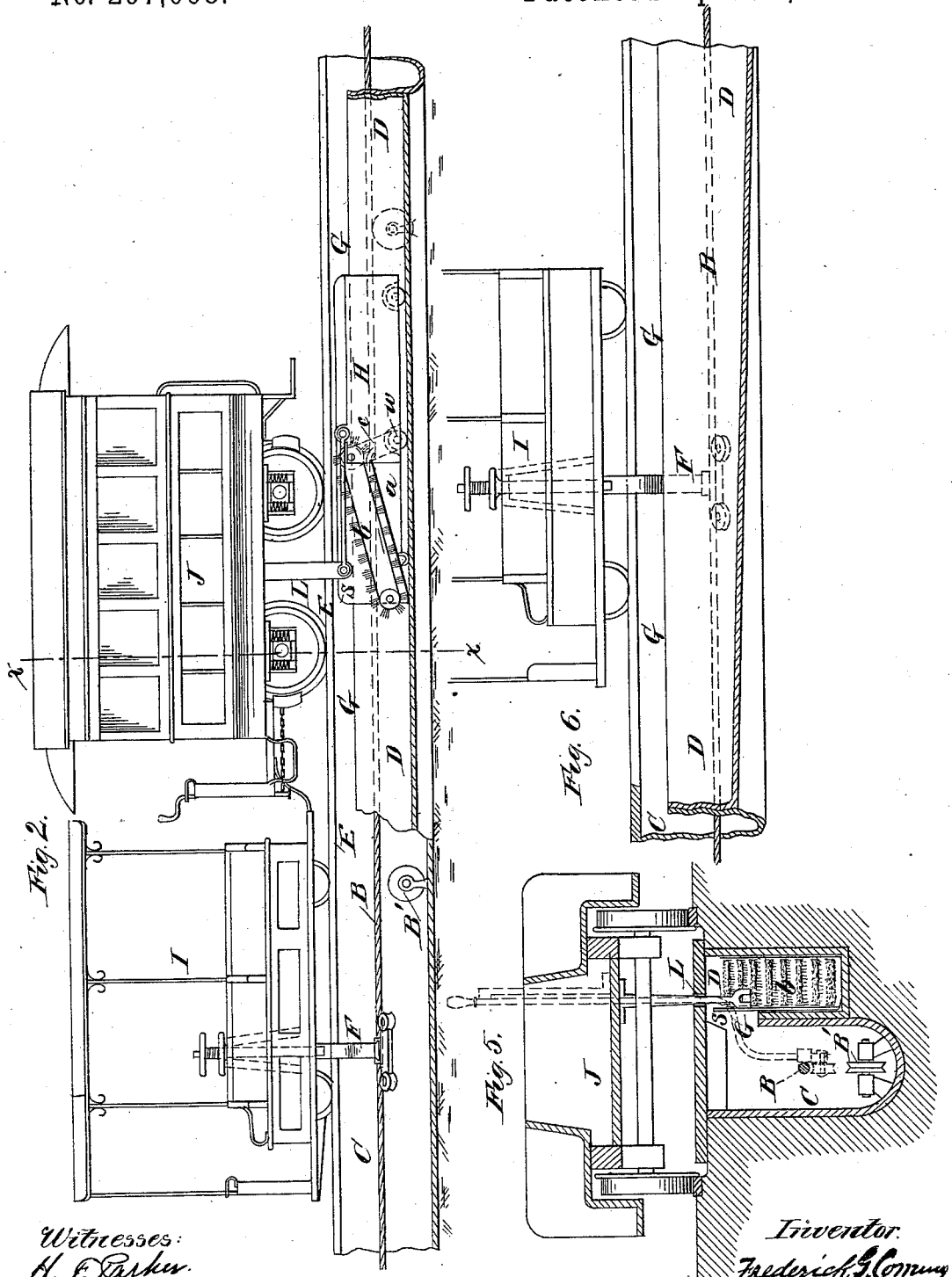
N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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ENDLESS CABLE TRACTION RAILWAY.

No. 297,068. Patented Apr. 15, 1884.



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UNITED STATES PATENT OFFICE.

FREDERICK G. CORNING, OF BROOKLYN, NEW YORK.

ENDLESS-CABLE-TRACTION RAILWAY.

SPECIFICATION forming part of Letters Patent No. 297,068, dated April 15, 1884.

Application filed January 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK G. CORNING, of the city of Brooklyn, county of Kings, and State of New York, have invented new and useful Improvements in Endless-Cable-Traction Railways; and I do hereby declare that the following specification and accompanying drawings, forming a part thereof, is a true, clear, and complete description of my invention.

My invention relates to that class of street-railways in which the cars are propelled along the track by means of an endless cable, which is arranged to travel in an underground tube or tunnel, and in which a gripping apparatus or device is used to connect the cars with the rope through a slot in the tube. This system of propelling railway-cars has long been in use, though frequently its regularity of operation has been disturbed and the running and repair expenses increased by the influx through the slot of water, snow, ice, dirt, and gravel, and the accumulation of such foreign materials in the cable tube or tunnel. The automatic and economic cleaning and extraction of such matter, and, furthermore, the entire prevention of its entrance into the actual cable tunnel or tube has never been effected previous to my invention.

Heretofore the tunnel has been constructed with the slot directly or nearly above the cable and its friction-sheaves, whereby water, mud, and other foreign material from the street would fall directly within the tunnel through which the cable passes, and which is rendered difficult to clean, owing to the mechanical obstructions in the tunnel, such as the cable and its supporting-sheaves, for instance. Likewise in many instances, on horizontal or nearly horizontal streets, there is difficulty experienced in using the bottom of the main cable-tube as a draining-gutter because of its dependency on the grade given the tube or tunnel.

The foregoing disadvantages are eliminated by my invention, which consists in placing a supplementary tunnel or way alongside and parallel with the usual cable-tunnel, and in locating the slot directly over the supplementary tunnel or passage in such manner that whatever foreign material falls through the slot will be deposited therein, from which it can be readily removed by suitable appliances. This tunnel is given a grade suitable to conducting or drawing off the water entering through the slot, and may have, according to requirements, a different grade from that of the cable-tunnel. It contains no obstructions, and therefore admits of applying a cheap mechanical cleaning system for the extraction of the sediment and deposit accumulating and remaining therein.

Referring to the drawings accompanying the description, Figure 1 represents a cross-section, in which I is a street-car with gripping mechanism F, by means of which connection is effected at will with endless cable B.

A A represent the street-car surface and rails; E, the slot through which the grip mechanism F passes, and beneath which the passage D is located. The grip mechanism F is offset, so as to pass through the continuous opening or horizontal slot G, over into the main cable-tunnel C, which is rendered free from the accumulation or entrance of foreign matter detrimental to the working as well as to the duration of the cable mechanism B and B′. The under side of the slot E is provided with a lip, *e*, which prevents any drip from passing into the cable-tunnel C, conducting such drip into passage, drain, or supplementary tunnel D, which is the receptacle for all matter falling through slot E from the street.

In Fig. 2 are shown a side elevation and longitudinal section, illustrating a manner of automatically cleaning and removing the accumulation in tunnel D. I is a car, from which grip F is actuated; C, the cable-tunnel; B, the cable, and B′ a friction-sheave guiding cable B; J, street-car coupled to car I, from which dirt-truck H is propelled underground in supplementary tunnel D by joint-rod connection L through slot E; *b*, an endless series of brushes passing and conveying dirt over apron *a* into dirt-truck H, operated by chains *c* from wheels *w* of dirt-truck H; S, sheet shutting off opening G from cleaning-machine, preventing dirt spattering into tunnel C during cleaning of tunnel D, the whole being propelled and operated by the motion of car J above. The tunnel D may be built when required with a grade more or less independent of that of tunnel C, thereby constituting a drain conducting the contents to suitable depositories.

Figs. 3 and 4 are modifications of grips, showing in perspective manner of offsetting to reach through opening G cable B, as illustrated and described in Fig. 1.

Fig. 5 is a cross-section through Fig. 2, according to line *x x*, showing car J connected with and propelling by joint-rod L the cleaning mechanism, of which *b* is the endless series of brushes. S is the sheet traveling with the cleaning mechanism and completely shutting off canal D from canal C during operation of cleaning. G is the opening from D to C; B, the cable; B′, a sheave.

Fig. 6 is a side sectional elevation, showing car I, grip F, main cable-tunnel C, supplementary canal D, having different grade than that of tunnel C. G is connecting-opening or horizontal slot; B, cable in tunnel C.

By the use of this invention, substantially as above described, I am enabled, in addition to the above-mentioned advantages, to shut out water and all moist impurities from the cable-tunnel, whose freezing would hinder the operation of this otherwise ideal method of propelling street-cars; and in so doing I remove and obviate the main objection to this method of propelling street-cars through streets and cities.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an underground tunnel for endless-cable traction, the combination of a tube containing an endless cable, with a second tube, at the top of which is a vertical slot opening upward to the street, both tubes or tunnels being continuously connected by a horizontal slot or opening, and in combination with a gripping device passing through both the vertical and the horizontal slots, substantially as described.

2. In an underground tunnel for endless-cable traction, the combination of tube C, containing the endless cable B, with a second tube, D, having an independent inclined bottom, at the top of which tube is a vertical slot, E, provided with lip *e*, said slot opening upward to the street, both tube C and D being continuously connected by the horizontal slot G, and in combination with a gripping device passing through both the vertical and horizontal slots, substantially as described.

3. In an underground tunnel for endless-cable traction, the combination of a tube containing an endless cable with a second tube containing any suitable brush connected through a vertical slot opening upward to the street, both tubes being connected by a horizontal slot, with a gripping device passing through both the vertical and horizontal slots, substantially as described.

4. In an underground tube or tunnel with a vertical slot in which an endless cable travels, the combination of a partition, P, in such tunnel, placed between the cable and the vertical slot, with a continuous horizontal slot or opening, G, between the edge of such partition and the top of the tube or tunnel, substantially as described.

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