

(No Model.)

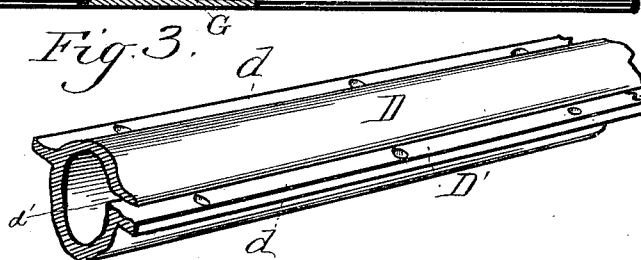
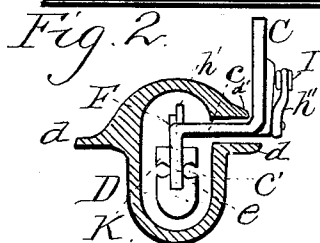
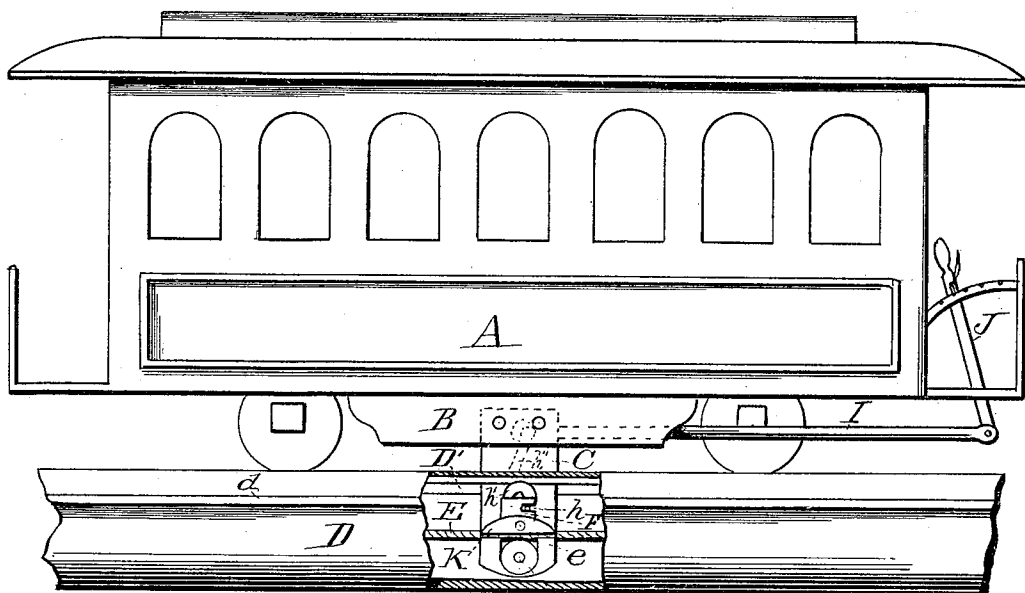
E. C. PHILLIPS.

CABLE RAILWAY.

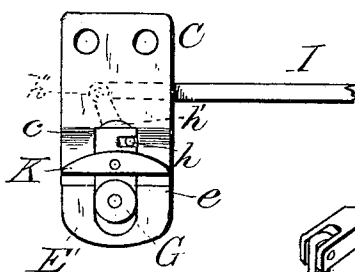
No. 388,072.

Patented Aug. 21, 1888.

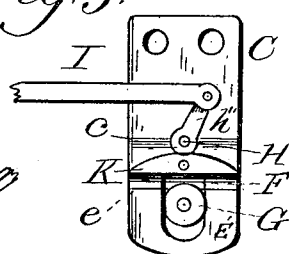
*Fig. 1*



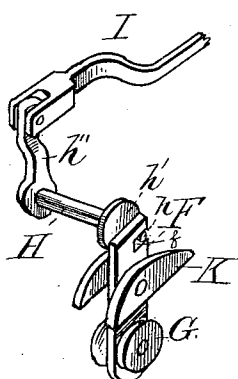
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses.  
*Andrew Schwartz.*  
*J. B. Nicholson.*

Inventor,  
*Elwood C. Phillips.*  
by *W. H. Babcock.*  
Attorney.

# UNITED STATES PATENT OFFICE.

ELWOOD C. PHILLIPS, OF GARDEN CITY, KANSAS, ASSIGNOR TO THE  
PHILLIPS ECONOMICAL CABLE GRIP CONSTRUCTION COMPANY, OF  
CHICAGO, ILLINOIS.

## CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 388,072, dated August 21, 1888.

Application filed October 18, 1887. Serial No. 252,682. (No model.)

*To all whom it may concern:*

Be it known that I, ELWOOD C. PHILLIPS, a citizen of the United States, residing at Garden City, in the county of Finney and State of Kansas, have invented certain new and useful Improvements in Cable Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cable railroads which make use of a cable traveling in a longitudinally-slotted tube or conduit and gripping devices which enter said conduit through said slot to engage said cable, said gripping devices traveling along said slot and being attached to the cars which are drawn by said cable. Hitherto the tube or conduit has been slotted on top or at upper corners; but this construction allows earth and sand to descend into its interior and impede the movement of the gripping devices and cable unless additional devices are employed for protection. To obviate this defect, I make the slot in the side of the tube, not extending it to the top thereof, using in combination with this side-slotted tube or conduit a set of gripping devices attached to a correspondingly-bent plate, which enters the conduit through said slot.

Another important feature of my invention consists in the combination of two stationary shoulders with a movable clamping-piece, a roller, and a vertically-movable slide carrying said clamping-piece and roller, the rope being gripped between said shoulders and said clamping-piece and the roller being used merely for freeing the cable and allowing it to run without moving the car when the latter is to stop. This construction makes the gripping more certain than when the cable is held between the roller and some other part, the combination heretofore generally in use. A roller used for gripping will almost certainly allow at least some slight motion of the rope past it, with wear of said rope as a consequence. This I avoid.

There are also some novel minor details of construction, which will be hereinafter described, and more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents in side elevation a part of a car and the cable-gripping devices attached thereto, also the tube or conduit, partly broken away, and the cable therein. Fig. 2 represents the conduit in vertical cross-section, giving also an edge view in elevation of the gripping devices within said tube. Fig. 3 represents a part of said tube in detail perspective. Fig. 4 represents in front elevation one side of the bent supporting-plate and the gripping devices thereon. Fig. 5 represents a similar view of the other side of the plate and its gripping devices. Fig. 6 represents a detail perspective view of the slide, the pivoted clamping-pieces thereon, the pulleys or rollers, and the actuating shaft and rod.

A designates the body of a car, to the bottom of which a longitudinal beam, B, is attached, having a bent plate, C, fastened on one side of it. This plate extends first vertically downward, then horizontally outward, then vertically downward again. Its function is to support the cable-gripping devices.

D designates a tube or conduit which contains and protects the cable E, and is secured by bolts passed through its lateral flanges *d* into wood-work below. A longitudinal slot, D', runs from end to end of the conduit D in the side nearer to plate C. A flange, *d'*, extends laterally outward above said slot for greater protection against the entrance of earth and other foreign matter. The horizontal part *c* of said plate enters and travels in said slot, and the lower vertical part, *c'*, of said plate is normally within said conduit. This plate has a block or frame, E', fast on its lower end, which presents two upward shoulders, *e*, on each side of said plate, these shoulders being preferably grooved on top. A recess is left between these shoulders to allow the vertical play of a slide, F, and two rollers or pulleys, G, carried thereby. The said slide moves freely up and down in a slot of the lower part, *c'*, of said plate, and has a recess, *f*, near its upper end, which receives a wrist-pin, *h*, on a disk, *h'*, carried by a horizontal shaft, H. This shaft is journaled in small bearings attached to said plate and has at the end remote from disk *h* a rigid arm, which is jointed to a

longitudinal rod, I. The other end of this rod is similarly jointed to the lower end of a hand-lever, J. By rocking this lever in one direction the slide F is necessarily caused to descend. By rocking it in the other the slide is caused to ascend, motion being transmitted in either case from said lever through the end-wise-movable rod I, the rocking-shaft H, and wrist-pin h to said vertically-movable slide.

On each side of the lower part, *e'*, of plate C a clamping-piece, K, having a long grooved bottom, is pivoted at its middle to slide F. Each of these pieces K is adapted to clamp the cable between it and the pair of shoulders *e* on that side of the plate whenever the slide F descends. When said slide again rises, the clamping-piece K is raised from the cable and the roller G immediately thereafter lifts said cable from said shoulders. The cable then runs freely over said roller without moving the car; but when the clamping-piece K is down on the cable the latter, being held by said piece and shoulders *e*, draws the car along with it. The pivoted attachment of each piece K allows its ends free play to enable its lower face to fit more exactly on the cable, which is always more or less uneven in texture, shape, and motion.

One pair of shoulders *e* and one clamping-piece K will suffice to grip a cable. Two pairs of the former and two pieces K are employed to provide for switching on cross-lines or branch lines. The clamping devices which were on the right side of plate C for gripping the cable before the switching would of course be on the wrong side of said plate for gripping the cross-line cable after switching. The other pair of shoulders *e* and pivoted clamping piece K then come into use. The devices K *e* of either side hold the cable very securely and with the least possible risk of injury or wear. The slot D', being in the side of tube D, is not exposed to falling particles of earth, sand, or

rubbish, which consequently fall outside of the tube instead of within it. This slot, being located no farther down than is necessary to secure this result, does not require any difficult or costly construction of the gripping devices or their support.

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

1. A conduit having its side longitudinally slotted and provided with a flange above said slot for greater protection against the entry of foreign matter, substantially as set forth.

2. A movable roller for the cable to rest on when running freely, in combination with fixed shoulders and a pivoted clamping-piece for gripping the rope, a slide to which both said roller and said pivoted piece are attached, and mechanism for raising and lowering said slide, for the purposes set forth.

3. A vertically-movable slide and mechanism for operating it, in combination with a clamping device and a lifting device, both attached to said slide, a cable running in the interval between said devices, and fixed shoulders arranged below said cable, substantially as and for the purpose set forth.

4. A hand-lever, a longitudinally-movable rod jointed thereto, a shaft having at one end an arm jointed to said rod and at the other a disk and wrist-pin, a slide engaging with said wrist-pin and raised and lowered thereby, a clamping-piece and roller on said slide, and a pair of fixed shoulders arranged to assist said clamping-piece in gripping a cable, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ELWOOD C. PHILLIPS.

Witnesses:

WM. H. BABCOCK,  
J. B. NICHOLSON.