

(No Model.)

H. W. McNEILL.  
CABLE RAILWAY CAR.

No. 379,407.

Patented Mar. 13, 1888.

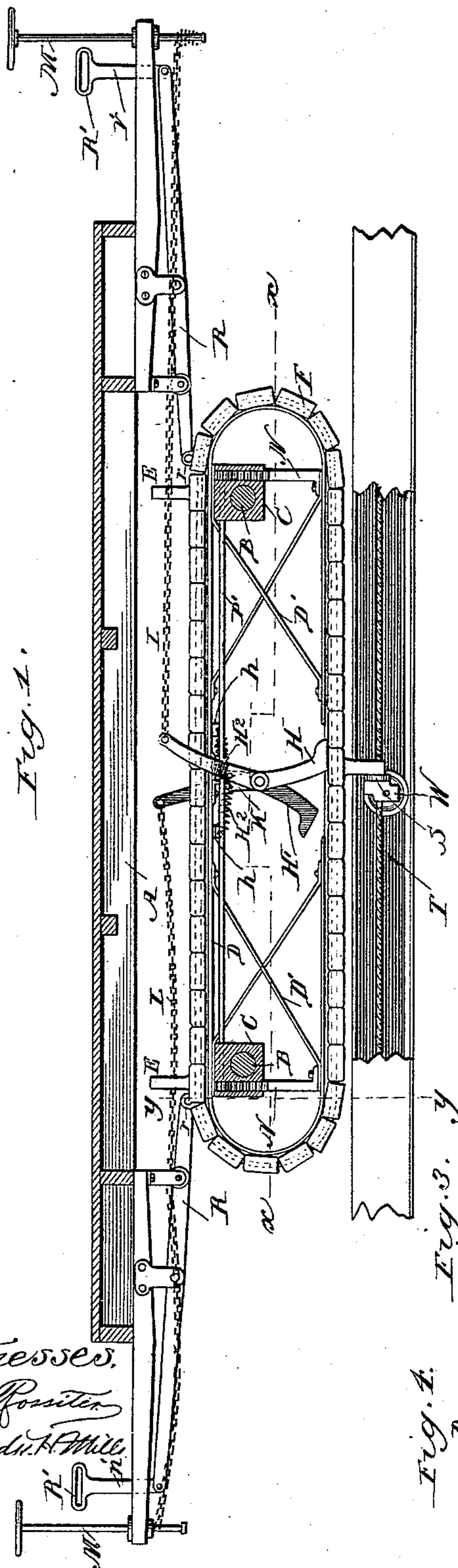


Fig. 1.

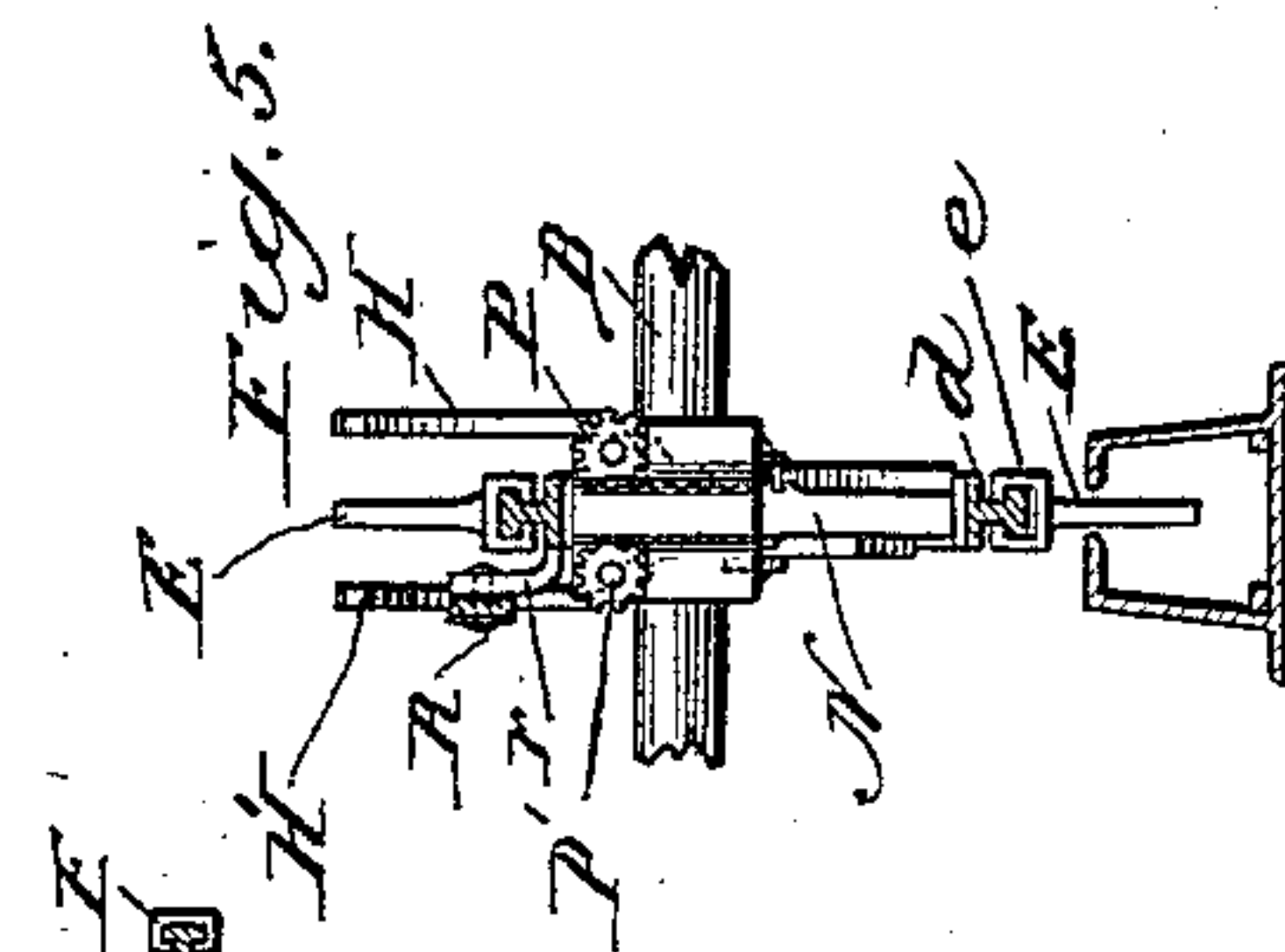


Fig. 5.

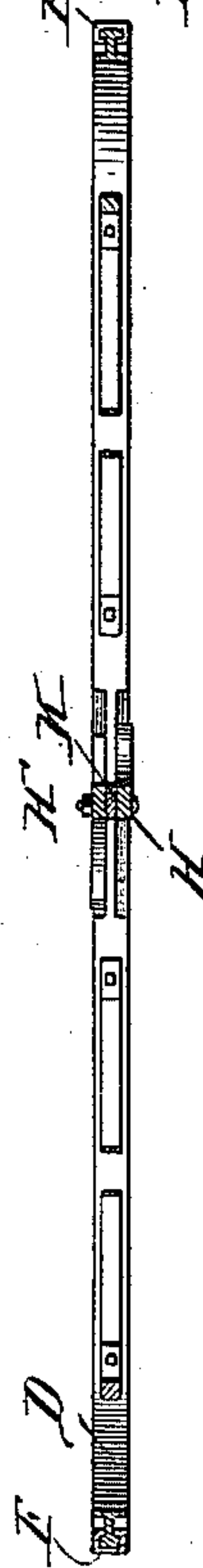


Fig. 2.

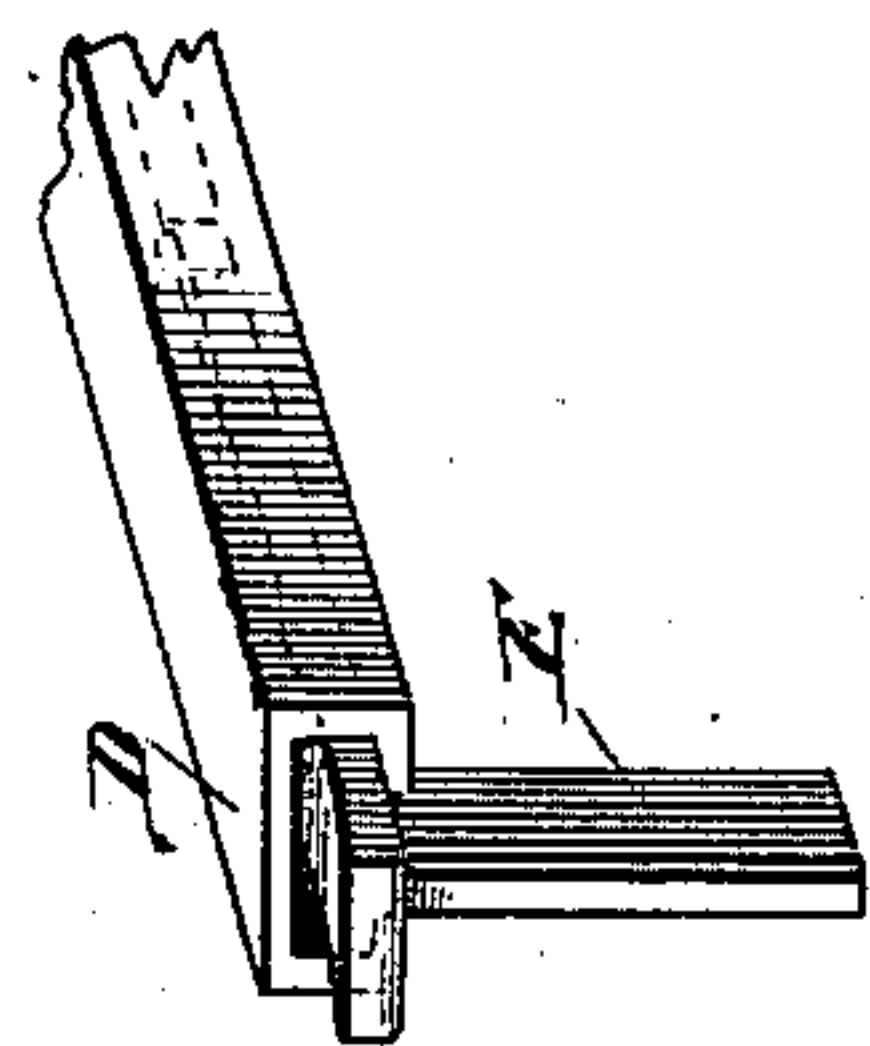


Fig. 6.

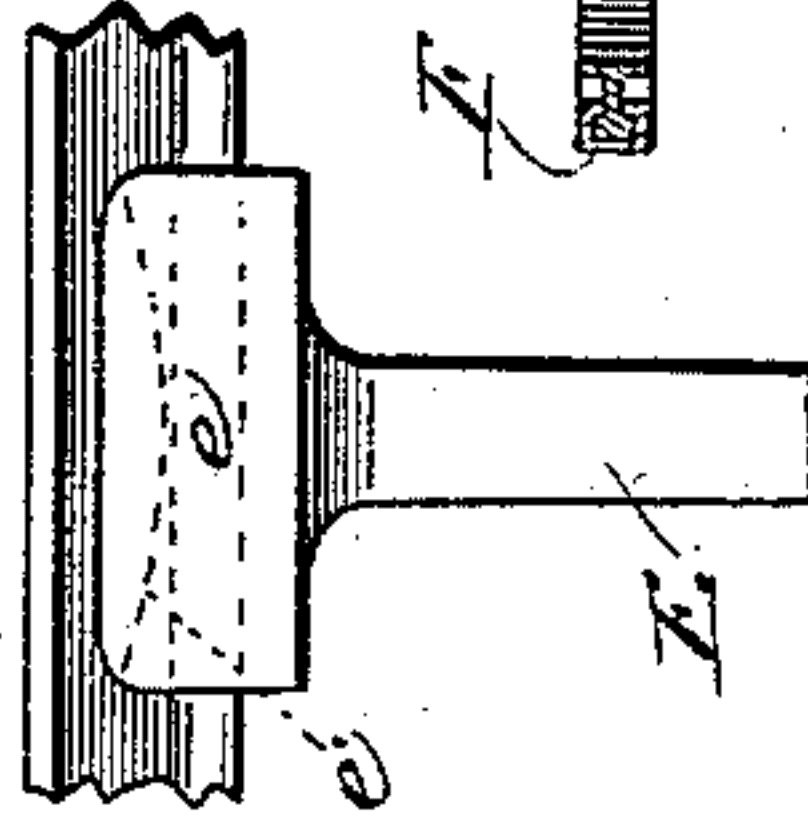


Fig. 3.

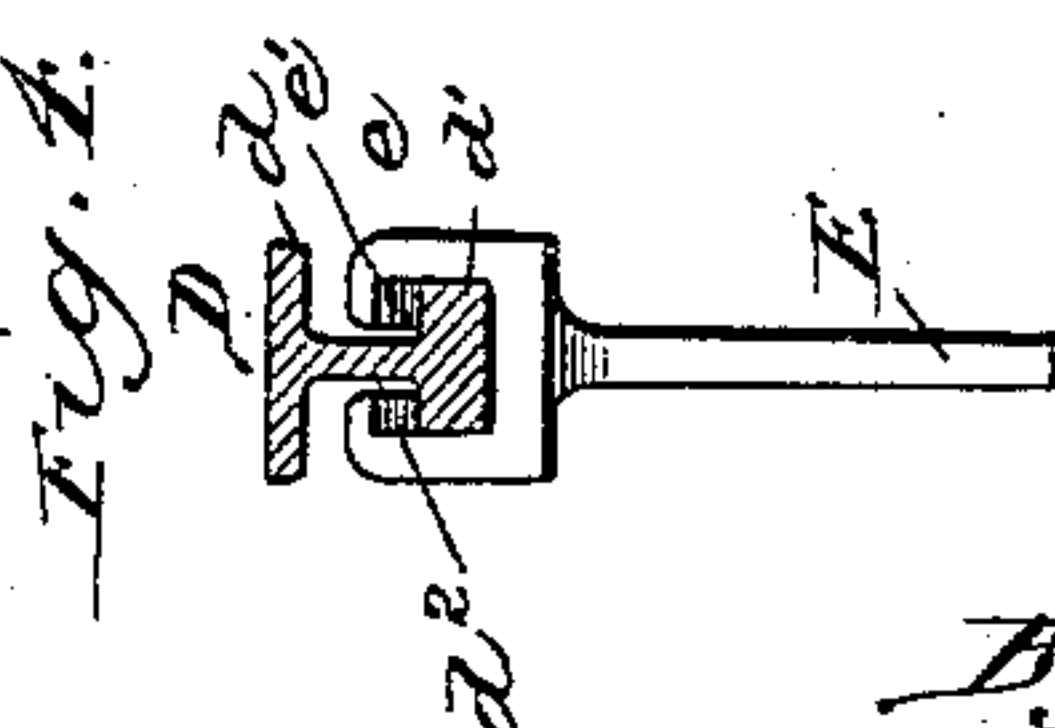


Fig. 4.

Witnesses:  
H. Rossiter  
Frederic A. Mill

Inventor  
Hobart W. McNeill  
By R. C. Fisher  
Atty.



# UNITED STATES PATENT OFFICE.

HOBART W. McNEILL, OF OSKALOOSA, IOWA.

## CABLE-RAILWAY CAR.

SPECIFICATION forming part of Letters Patent No. 379,407, dated March 13, 1888.

Application filed January 27, 1888. Serial No. 262,106. (No model.)

*To all whom it may concern:*

Be it known that I, HOBART W. McNEILL, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska, State of Iowa, have invented certain new and useful Improvements in Cable-Railway Cars, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention has relation particularly to that class of cable-railway apparatus in which the propulsion of the car is effected by means of an endless traveling cable provided at suitable intervals throughout its length with stops or trucks, which serve to engage with an arm or arms projecting from beneath the car into the slot of the cable tube. In this class of apparatus it has been heretofore proposed to provide the car with an endless sprocket chain or band having a series (usually three in number) of sprocket-arms arranged at such distance apart as to insure one of these arms being at all times within the cable-tube. As a consequence of this construction, when the car was at a standstill, the sprocket-arms were successively caught and moved by the stops or trucks of the traveling cable, and when the car was to be propelled the movement of the sprocket-chain was gradually checked by means of a friction-drum under the control of the operator until the car moved at the same speed as the cable. An example of this type of apparatus is illustrated in Letters Patent Nos. 290,707 and 290,708, granted to C. W. Rasmussen, December 25, 1883.

My present invention has for its object to provide a new and improved means whereby the cable-car may be connected with the stops or trucks fixed at intervals upon the traveling cable; and to this end my invention consists, primarily, in the combination, with the cable-railway car, of mechanism for connecting it with the moving cable, comprising a series of movable arms, a series of space blocks or buttons intermediate said arms, and a suitable frame that sustains said arms and space blocks.

In cable-railway systems in which the car is connected by means of depending arms with

a constantly-moving cable located beneath the roadway, it is desirable that provision shall be made whereby such arms shall be so sustained as to be capable of being lifted from out the slot of the cable-tube, so that the car may be moved over any obstructions in the roadway, over intersecting tracks or cables, or may be switched from one track to another.

A further object of my present invention is to provide means whereby the movable arms which serve to connect the car with the cable may be so sustained as to permit of their being lifted from out the slot of the cable-tube when desired; and to this end my invention consists in the combination, with a cable-railway car, of mechanism for connecting it with the moving cable, comprising a series of horizontally-movable arms and a vertically-movable frame for sustaining said arms. It will be readily understood that while I have shown this feature of my invention as embodied in a novel construction and arrangement of movable arms it will be applicable as well to other constructions—such, for example, as that illustrated in the before-mentioned Rasmussen patents, wherein the movable arms are carried by a sprocket chain or belt.

My invention also consists in sundry novel features and details of construction, herein-after described, illustrated in the accompanying drawings, and particularly defined in the claims at the end of this specification.

Figure 1 is a view in side elevation, parts being shown in vertical section, of a cable railway car having my present invention applied thereto, a portion of the subjacent cable-tube and moving cable being also illustrated. Fig. 2 is a view in longitudinal section on line *xx* of Fig. 1. Fig. 3 is an enlarged fractional view of a portion of the sustaining-frame and one of the sprocket-arms. Fig. 4 is an end view of the parts shown in Fig. 3. Fig. 5 is a view in vertical section on line *yy* of Fig. 1. Fig. 6 is a detail perspective view illustrating a modified form of sustaining-frame and sprocket-arms.

A designates the floor of the car-body, which is sustained upon suitable journal-bearings in the usual manner at the ends of the car-axes B. Centrally upon these car-axes B are mounted the boxes C, upon which rests the



frame D, that serves to sustain the movable arms E and their intermediate space blocks or buttons, F.

The sustaining-frame D is by preference formed in the shape of a T-rail with its ends united, so as to form an oblong loop extending between and beyond the axles of the car, the flanged portion  $d$  of this frame being upon the inner side throughout the loop. Upon the outer flanged portion,  $d'$ , of the sustaining-frame D are fitted the recessed inner ends or heads,  $e$ , of the sprocket-arms E, these inner ends or heads being provided each with a suitable slot somewhat greater in width than the web  $d^2$  of the sustaining-frame D, so as to permit the arms to move upon the frame.

It will be observed that the interior of the ends  $e$  of the sprocket-arms E are so shaped as to form the curved surfaces  $e'$ , the purpose of this construction being to permit the heads or ends of these arms to pass around the curved portions of the sustaining-frame without binding thereon. I have shown in the accompanying drawings three sprocket-arms E, mounted upon the sustaining-frame, this number being all that is sufficient to insure one of the arms being at all times within the slot of the cable-tube and in position to engage with the buttons S, that are fixed to the cable T in proximity to the trucks W, whereby said cable is sustained.

It will be understood, of course, that the sprocket-arms E shall be of proper size to enter the slot of the cable-tube and engage with the stops upon the cable, and it will also be understood that the distance between these arms shall correspond with the distance between the stops of the traveling cable, so that the arms shall at all times properly engage with such stops.

Upon the sustaining-frame D, and intermediate the sprocket-arms E, are placed the space blocks or buttons F, the shape of these space blocks or buttons corresponding with the ends or heads of the sprocket-arms, so that the buttons can pass freely around the curved portions of the sustaining-frame. It will be readily understood, however, that the precise form of heads whereby the sprocket-arms are connected with the sustaining-frame, and as well also the precise form of intermediate space blocks or buttons, are not essential to my invention, as these may be modified within wide limits by the skilled mechanic.

From the construction of parts as thus far defined it will be seen that when either of the sprocket-arms is within the cable-tube, and is caught by one of the stops S, affixed to the traveling cable, this arm will be caused to move in horizontal direction along the sustaining-frame D until it reaches the curved portion of the frame, when it will escape from engagement with the stop S, and will pass from out the slot of the cable-tube. It is apparent, however, that as the sprocket-arm E is being thus moved by the stop S of the traveling cable it is causing a corresponding movement of the

other sprocket-arms by means of the intermediate space blocks or buttons F, so that before this arm has passed out of engagement with the stop of the traveling cable the next sprocket-arm will have entered the slot of the cable-tube, and will have passed into engagement with the next succeeding stop of the cable. It will thus be seen that so long as the car is at rest the sprocket-arms E will be successively moved into and out of the slot of the cable-tube, and during such movement will be held at all times in proper relative position by means of the intermediate space blocks or buttons.

In order to enable the car to have motion imparted thereto from the cable, it is necessary that provision be made whereby the movement of the sprocket-arms E can be gradually checked. I have therefore provided a friction brake mechanism adapted to bear upon heads of the projecting arms and intermediate space blocks or buttons, so that the movement of such arms and space blocks or buttons around the sustaining-frame can be gradually arrested in order to effect the gradual starting and stopping of the car. The form of brake mechanism illustrated in the drawings consists of two brake-arms, H and H', which are pivoted to the lower end of a dependent bracket, K, that is bolted to the under side of the sustaining-frame D about its center, and these brake-arms H and H' have their upper ends bent outwardly, as shown, so as to avoid contact with the sustaining-frame and adjacent parts. From the upper end of each of these brake-arms leads a chain, L, that connects with the lower end of the winding-post M at each end of the car. It will be readily understood, however, that when the car is to move in but one direction but one of these brake-levers and connections need be employed. The lower end of the brake-arms H and H' is suitably shaped to bear upon the upper face of the sprocket arms E and the intermediate buttons, F, the flange  $d$  of the sustaining-frame being cut away for this purpose at a point beneath the brake-arms; or, if desired, brake-shoes or rollers of any suitable construction may be applied to the ends of these arms. To each of the brake-arms H and H' is connected a coiled spring, H<sup>2</sup>, the opposite end of such spring being fastened to a lug,  $h$ , upon the under side of the sustaining-frame D, the purpose of these springs being to hold the brake-shoes or lower ends of the brake-arms normally out of engagement with the sprocket-arms and intermediate buttons when the winding-chain has been released. Thus in the construction illustrated in Fig. 1 it will be seen that the brake-arm H has been so moved by the winding of the chain L as to throw the lower end of this arm into frictional contact with the heads of the sprocket-arm and with the space blocks or buttons. The brake-arm H', on the other hand, is held out of contact with the sprocket-arms and intermediate buttons by the action of its coiled spring H<sup>2</sup>. From this construction it will be seen that when the car is at a standstill each



of the brake-arms H and H' will be held out of contact with the ends of the sprocket-arms and the space blocks or buttons, and at such time the sprocket-arms will be successively  
 5 caught with the trucks or stops of the traveling cable, and will be moved around the sustaining-frame D. When it is desired to gradually start the car, it is only necessary to turn the winding-post M until the chain L causes  
 10 the lower end of one of the brake-arms to bear against the upper ends of the sprocket-arms and the space blocks or buttons, it being readily seen that when sufficient frictional contact is produced between the lower end of the  
 15 brake-arm and the sprocket-arms and buttons to overcome the momentum of the car the movement of the sprocket-arms around the sustaining frame will be arrested more or less, and the car will be moved forward by the cable.  
 20 It will be readily understood, however, that any suitable form of brake mechanism may be employed instead of that shown for the purpose of arresting the movement of the sprocket-arms upon the sustaining frame.  
 25 In order to enable the sustaining-frame D, whereby the movable arms are carried, to be lifted when it is desired to withdraw such arms from the slot of the cable-tube, I have provided the sustaining-frame at its ends with the  
 30 rack-bars N, that extend between the parallel portions of the frame and are bolted to the flanges thereof, these rack-bars being provided with cog-teeth upon their opposite sides, as more particularly shown in Figs. 1 and 5 of  
 35 the drawings. Each of the rack-bars N extends through a suitable slot or opening formed in the front portion of its respective box or bearing B, and with each rack-bar engage the  
 40 the shafts P', that extend between the boxes B, and are journaled in suitable seats or openings formed therein. My purpose in providing the double rack-bars N and the corresponding pinions and shafts, P and P', is to  
 45 insure a uniform movement of the sustaining-frame throughout its entire length. To each end of the sustaining-frame is attached, by means of a suitable projecting bracket, r, the inner end of a lifting-lever, R, that is suspended from a suitable bracket beneath the  
 50 platform of the car, and has its outer end provided with a treadle, R', the stem of which, r', projects through the platform of the car and is hinged to the outer end of the lifting-lever.  
 55 From this construction it will be seen that when the treadle R' is depressed it will cause the sustaining-frame D to be lifted, the rack-bars N, the pinions P, and the connecting-shafts P' serving during this lifting movement  
 60 to insure the uniform raising of the sustaining-frame. By this means it is obvious that the sprocket-arms E can be readily lifted from out the slot of the cable-tube.

It will be readily understood that if desired  
 65 the lifting-levers may extend to and connect centrally with the sustaining frame instead of at the ends thereof; or any other suitable form

of lifting mechanism may be employed instead of the levers shown. In the accompanying drawings I have shown the sustaining-  
 70 frame D as braced throughout its length by the bars D', although these need not necessarily be employed.

It is obvious that instead of forming the sustaining-frame in the shape of a T-rail embraced by the ends of the sprocket-arms and the space-blocks this sustaining-frame may be made hollow, as illustrated in Fig. 6 of the drawings, and the ends or heads of the sprocket-arms be made of shape corresponding to the  
 75 interior of the frame; and when this construction is followed the space blocks or buttons may be simply oblong and adapted to fit within the interior of the sustaining-frame. If desired, the upper portion of the sustaining-  
 80 frame D may be twisted a quarter-revolution, so that as the sprocket-arms pass beneath the floor of the car they will be turned into a horizontal position, and by this arrangement all danger of the sprocket-arms striking the car-  
 85 floor will be avoided, and the sprocket-arms may be made of any desired length.  
 90

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

95 1. The combination, with a cable-railway car, of mechanism for connecting it with a moving cable, said mechanism comprising a series of movable arms, a series of space blocks or buttons intermediate to said arms, and a  
 100 sustaining-frame for said arms and space-blocks, substantially as described.

2. The combination, with a cable-railway car, of mechanism for connecting said car with the moving cable, said mechanism comprising  
 105 a series of movable arms, a series of space blocks or buttons intermediate to said arms, and a sustaining-frame for said arms and said space blocks or buttons, provided with flanges for holding said arms in proper position, sub-  
 110 stantially as described.

3. The combination, with a cable-railway car, of mechanism for connecting it with a moving cable, said mechanism comprising a series of movable arms, a series of space blocks  
 115 or buttons intermediate to said arms, and a suitable frame or support for sustaining said arms and space blocks or buttons, and a brake for checking the movement of said arms, substantially as described.  
 120

4. The combination, with a cable-railway car, of mechanism for connecting it with a moving cable, said mechanism comprising a series of movable arms, a series of space blocks  
 125 or buttons intermediate to said arms, a sustaining-frame for said arms and space blocks or buttons, a brake mechanism for arresting the movement of said arms, and a suitable connection leading from said brake mechanism to the platform of the car, substantially as de-  
 130 scribed.

5. The combination, with a cable-railway car, of mechanism for connecting it with a moving cable, said mechanism comprising a



vertically-movable frame, and a series of horizontally-movable arms sustained by said frame, substantially as described.

5 6. The combination, with a cable-railway car, of mechanism for connecting it with a moving cable, said mechanism comprising a vertically-movable frame, a series of movable arms sustained by said frame, and suitable

lifting mechanism extending from said frame to the platform of the car, substantially as described. 10

HOBART W. McNEILL.

Witnesses:

GEO. P. FISHER, Jr.,

A. W. RASMUSSEN.