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PATENTED NOV. 1, 1904.

C. L. VARNER.  
TRACTION MEANS FOR STREET RAILWAYS.

APPLICATION FILED APR. 28, 1904.

NO MODEL.

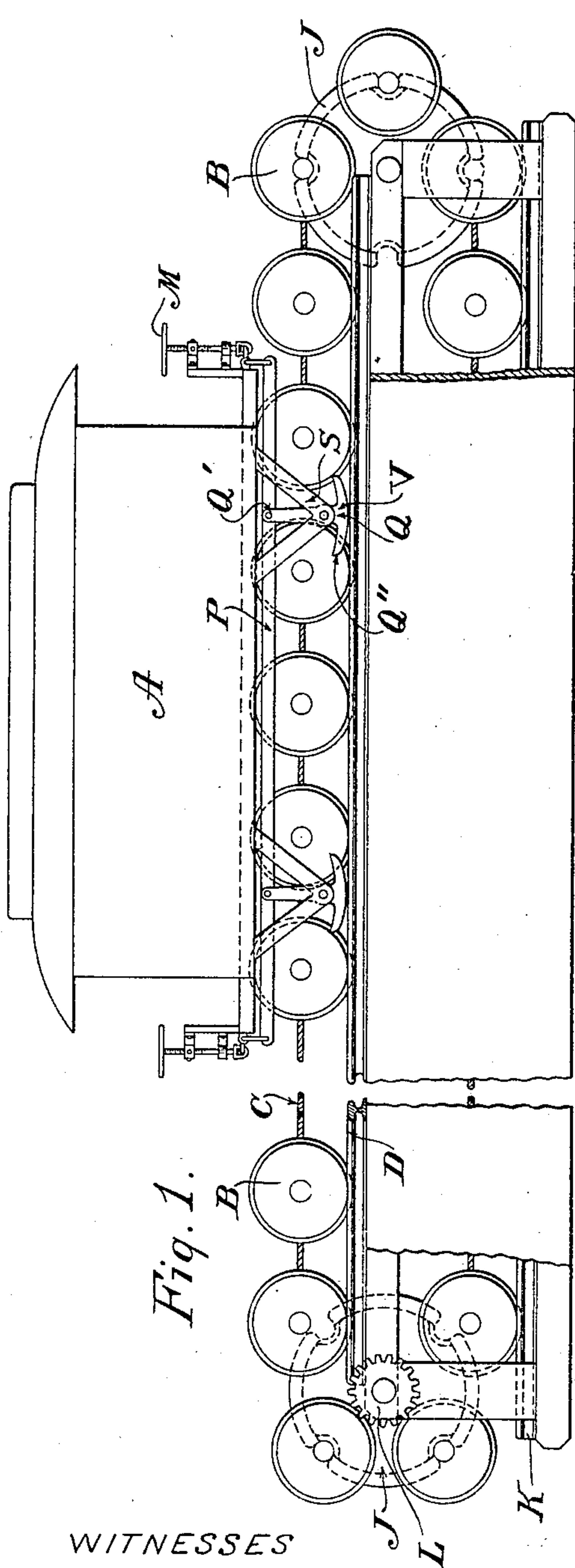


Fig. 1.

WITNESSES

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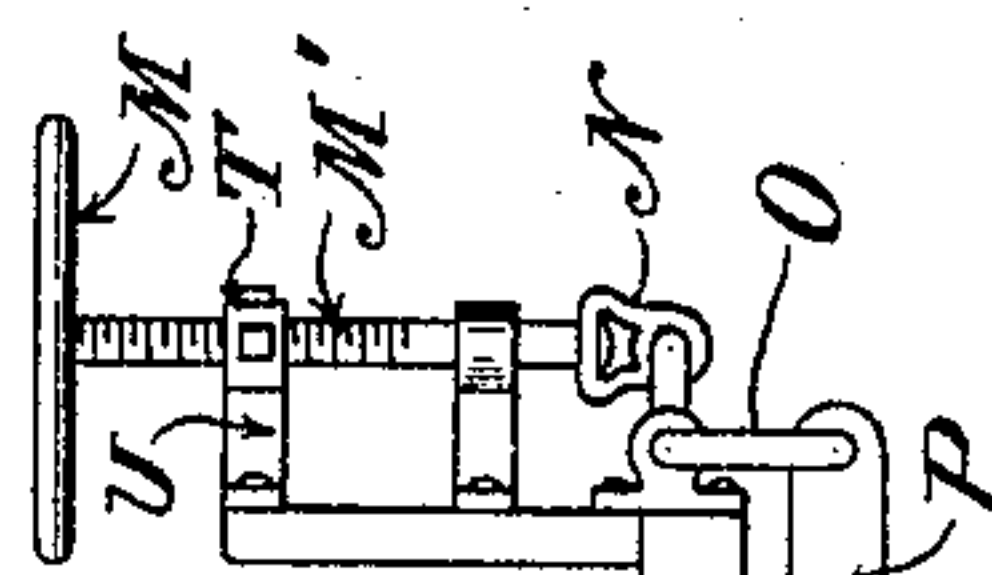
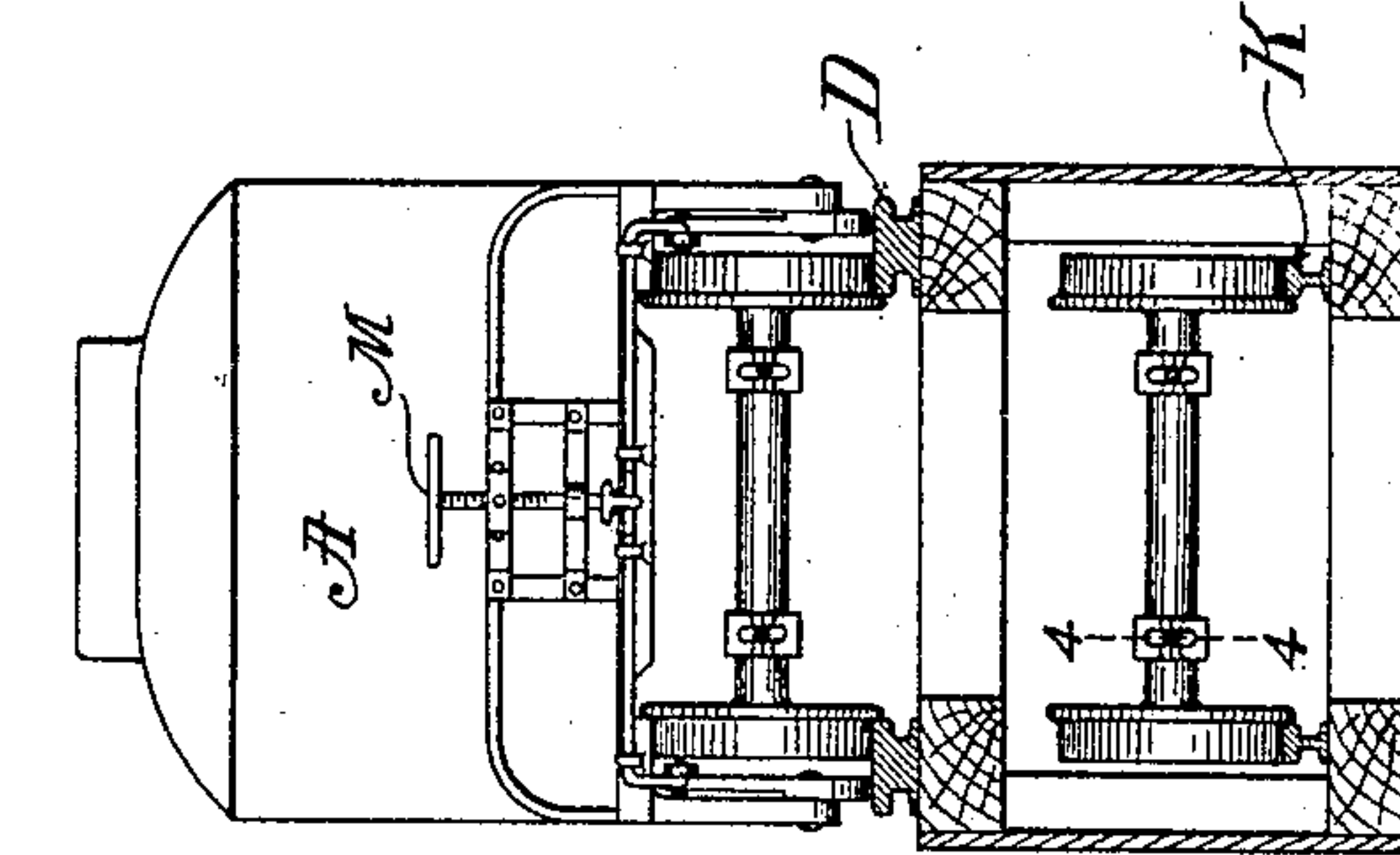


Fig. 3.

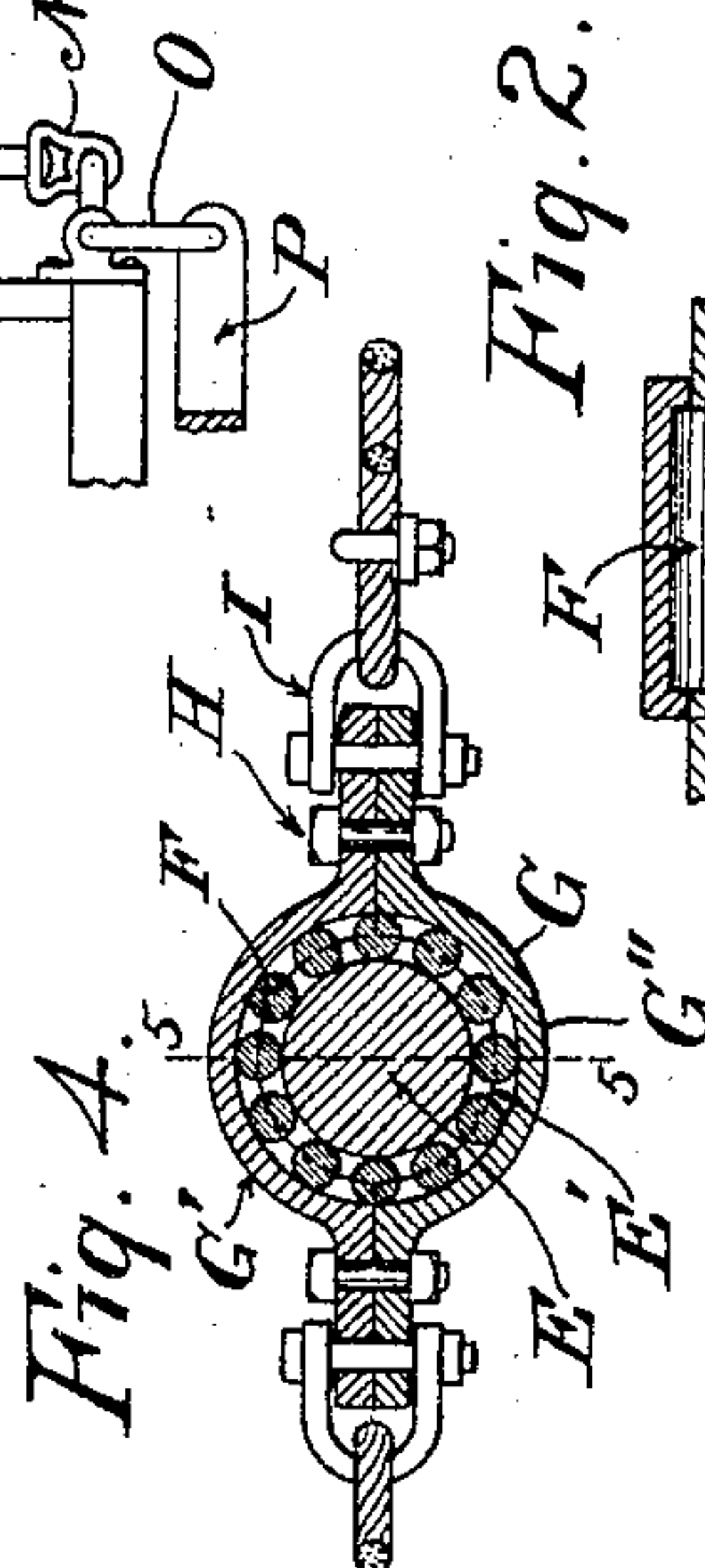


Fig. 4.

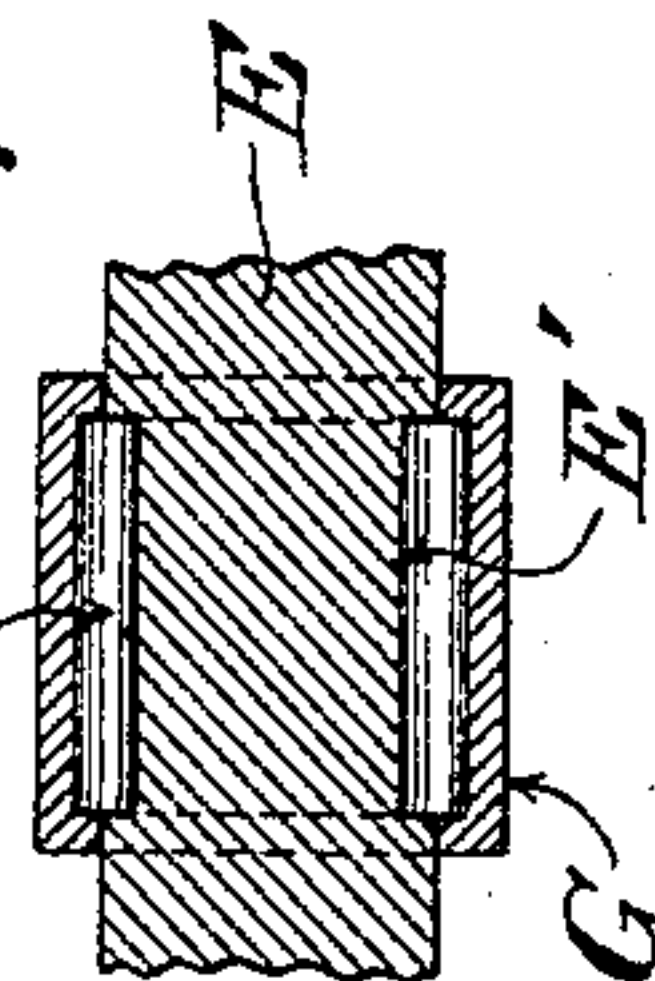


Fig. 5.

Fig. 6.

INVENTOR

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# UNITED STATES PATENT OFFICE.

CLARK L. VARNER, OF SANTA PAULA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO WALTER W. VARNER, OF SANTA PAULA, CALIFORNIA.

## TRACTION MEANS FOR STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 773,694, dated November 1, 1904.

Application filed April 28, 1904. Serial No. 205,386. (No model.)

*To all whom it may concern:*

Be it known that I, CLARK L. VARNER, a citizen of the United States, residing at Santa Paula, in the county of Ventura and State of California, have invented new and useful Traction Means for Street-Railways, of which the following is a specification.

My invention relates to means whereby the power to impel the cars is located at a central station from which endless cables extend to certain limits on the line of the track, the said cables being carried by a plurality of wheels rigidly mounted on or keyed to axles to which the cables are workably connected. These wheels, in pairs, are spaced apart to properly support the cars adapted to rest thereon; and it is one of the objects of my invention to provide simple and reliable means whereby cars moved from a central station along a railroad-track by means of a double cable-line thereon carrying car-wheels (the cars being adapted to rest upon and move with the line of wheels attached to the cable) at twice the speed of the wheels. I accomplish these objects by the means herein described and shown in the accompanying drawings, in which—

Figure 1 is an elevation of a car-line embodying my invention. Fig. 2 is a transverse section thereof. Fig. 3 is a plan view of the end of a street-car line embodying my invention, showing the rotary driving-drum. Fig. 4 is a transverse section of the axle, taken on line 4 4 of Fig. 2. Fig. 5 is a fragmentary view in section of the axle, taken on line 5 5 of Fig. 4, showing the antifriction-rollers. Fig. 6 is an enlarged detail view of a portion of the braking mechanism.

In the drawings, A represents the car adapted to rest upon the wheels B and be moved thereby as the wheels are being carried around by the connecting-cables C. To hold these wheels in line upon the track D, they are provided with the usual rail-engaging flange B'. These wheels are cast integral with or keyed upon the axle E and are provided with recesses E' for the reception of the antifriction-rollers F, adapted to fit longitudinally into said recesses in the axle. The recesses E have a depth in the axle equal to one-half of the

diameter of the antifriction-rollers. (More particularly shown in Figs. 4 and 5.) That portion of the axle in which the recesses are placed forms bearings for the antifriction-rollers. To hold these rollers in place in the recesses in the axle, I have provided removable housings G therefor. These housings are adapted to fit loosely on the axle around the recesses therein and chamber the antifriction-roller therein, whereby the antifriction-rollers will engage the axle on their inner side and the housing on their outer side, holding the housings directly over the antifriction-rollers working in the recesses in the axles. These housings are composed of two members, an upper and a lower member G' and G'', and have means, as by bolts H, to securely hold them together in place on the axle. On the projecting flanges of these members is bolted the clevis I. By this arrangement the different axles can be detachably secured to the cable, forming an endless row of companion wheels. These wheels, with their connecting-axles, when thus secured together, will form an endless cable adapted to be drawn over the upper track, passing over the propelling-drum J and brought down upon the lower and return track K and are returned thereon. Power is imparted to these propelling-drums through the main driving-gear L, operatively connected with the source of power.

To control the car as it moves along upon the upper rails B, I have provided simple braking means. (Shown on the car in Fig. 1 and in enlarged detail in Fig. 6.) The hand brake-wheel M has a threaded shank M', in the lower end of which is the swivel N. Projecting through this swivel is the upper arm of the bell-crank lever O, pivoted on the frame of the car, the lower arm of which is pivotally connected with the brake-bar P. Pivotally connected, as at Q', with this brake-bar is the upper arm of the brake Q. Projecting downwardly from the frame of the car are the brake-holding brackets S, to which the lower end of the brake is pivotally connected. The brake-shoe V will contact with the rails and raise the car off the wheels when the brake-bar is moved to the limits of its stroke, for the shoe



is provided with projecting ends Q'', which engage or release the rail upon movement backward or forward of the brake-bar. Movement is imparted to the brake-bar by the rotation of the hand brake-wheel M. A traction-line of this character can be divided into as many sections as desired, having separate cables for each section, the cars passing from one section to another section, and thereby the car-track can be extended. It will be manifest by this arrangement that the system of antifriction-rollers on the axles, together with the car resting on and moving with the upper periphery of the wheels, will eliminate the friction caused by the wheels revolving in the usual manner on the axles, the cars resting meanwhile on the axles.

The wheels might be rotatively mounted on the ends of the axles, and the axles could then be non-rotatably attached to the cables and the antifriction device on the axles where the cables engage the same dispensed with without departing from the spirit of my invention.

I have provided means to release the threaded shank M' on the hand brake-wheel from engagement with the female thread through which it passes when the motorman is operating the other end of the car. This is accomplished by retracting the female-threaded nut T, releasing thereby the threaded shank from engagement with the female thread on the bracket U, by means of which the car can be operated from either end.

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

1. In a traction-line of the character herein described the combination with moving companion cables of wheels in pairs rigidly affixed to the axle thereof, the said cable being workably secured to the axle as shown, and adapted to carry the cars resting loosely on the wheels.

2. The herein-described means to move cars at twice the speed at which the wheels move upon which the cars are operated, comprising two endless cables, having means for their operation substantially as shown, carrying wheels workably secured on said cables and arranged to pass over an upper and outgoing track and to drop at the end of their movement downwardly upon a return or lower track, in combination with cars adapted to rest upon said wheels and having means to brake the same substantially as shown and described.

3. In traction means for cars, a series of wheels mounted upon the outer ends of axles, the axles connected together by endless cables and having an upper and lower track for said wheels, the said wheels being arranged in pairs substantially as shown and adapted to receive a car resting thereon, the said pairs

of wheels being properly spaced apart on said cables whereby a plurality of wheels will always be under and support the car in alignment with the track, and means to operate said cables.

4. In a traction-line of the character herein described, means to raise the car from contact with the wheels and thereby stop the car, and at the same time permit the wheels to move on comprising the herein-described braking means, consisting of the brake-supporting brackets S; secured to the bottom of the car and adapted to project downwardly on each side of the wheels; a brake pivoted on said bracket and having on its lower end a brake-shoe adapted to engage the rail upon the swinging movement of the brake-bar; a brake-bar longitudinally mounted on the car and having means for its longitudinal movement, the upper arm of the brake being pivoted to said brake-bar substantially as herein shown and described.

5. Traction means for street-cars, comprising motion-imparting drums rotatively mounted at the ends of the street-car line, and having means to engage endless cables moving thereon the cable carrying wheels; wheels rotatively mounted on said cables, cables arranged to pass from one drum to and around another drum and adapted to move upon an upper and to return on a lower track and having means to hold a car resting upon the wheels, in combination with means to operate said drums substantially as herein shown and described.

6. The herein-described means to propel cars and to brake the same, comprising a companion pair of endless cables C, axles E rotatively mounted at proper intervals in said cables, wheels B keyed upon said axles and arranged to pass over an upper and a lower track; an upper and a lower track for said wheels, the said cables adapted to pass around rotating drums at the ends of the track; rotating drums being operatively connected with the power operating plant at the end of the car-line, the said wheels being arranged to run on the said track and to carry the cars resting thereon, in combination with cars resting on said wheels and carried thereby; braking means on said cars substantially as herein shown and described whereby cars resting on said wheels will be propelled at twice the speed at which the wheels are propelled.

In witness that I claim the foregoing I have hereunto subscribed my name this 21st day of April, 1904.

CLARK L. VARNER.

Witnesses:

J. F. POWELL,  
MARTIN WOOD.