(No Model.) 2 Sheets—Sheet 1.

J. KAHN.

STREET CAR MOTOR.

No. 385,631. Patented July 3, 1888.

Fig. 1.

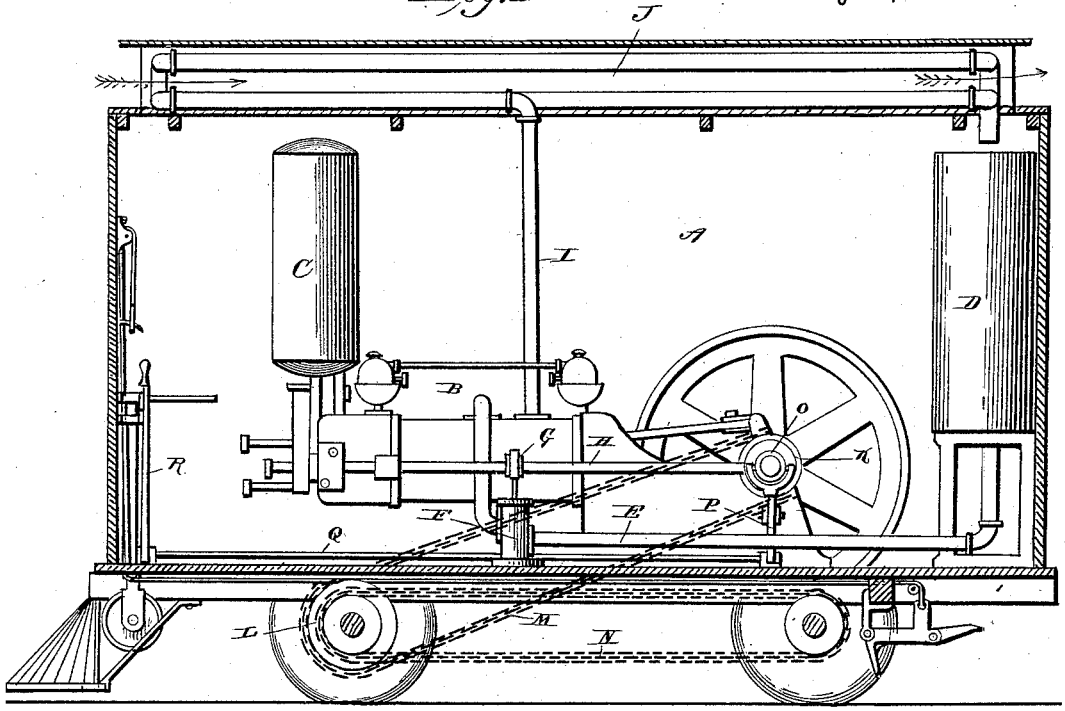
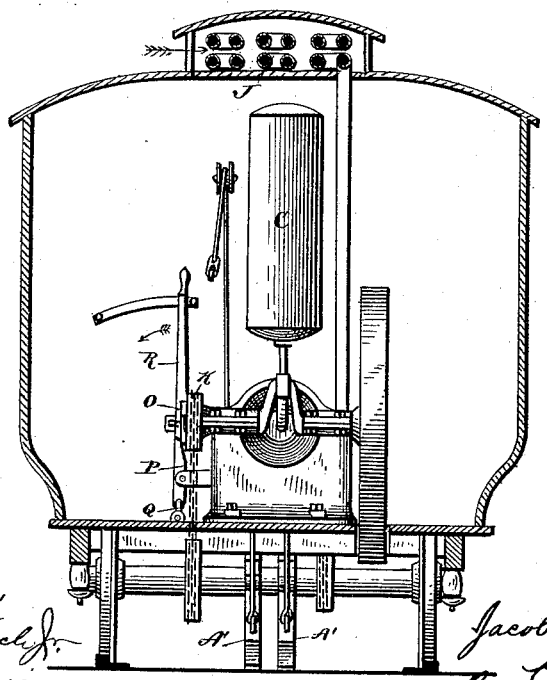


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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STREET CAR MOTOR.

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Fig. 3.

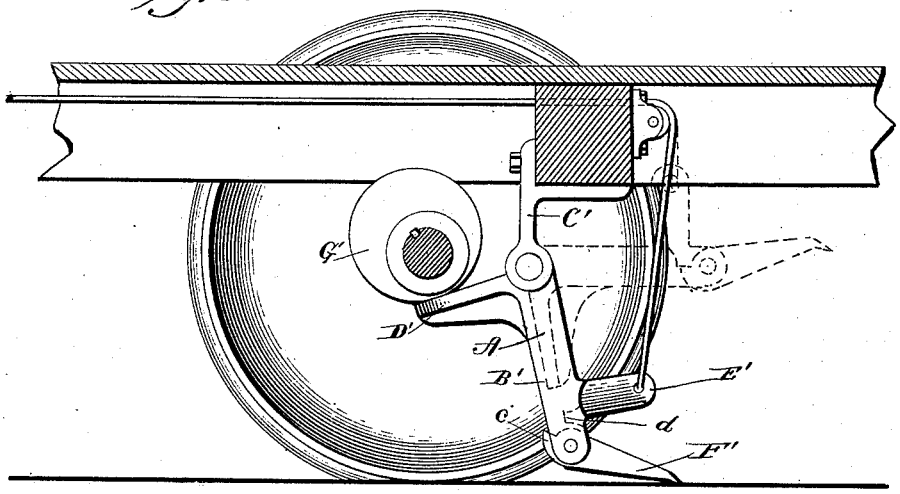


Fig. 4.

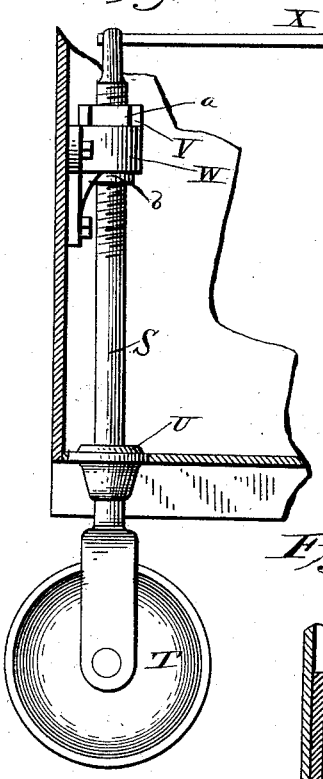


Fig. 5.

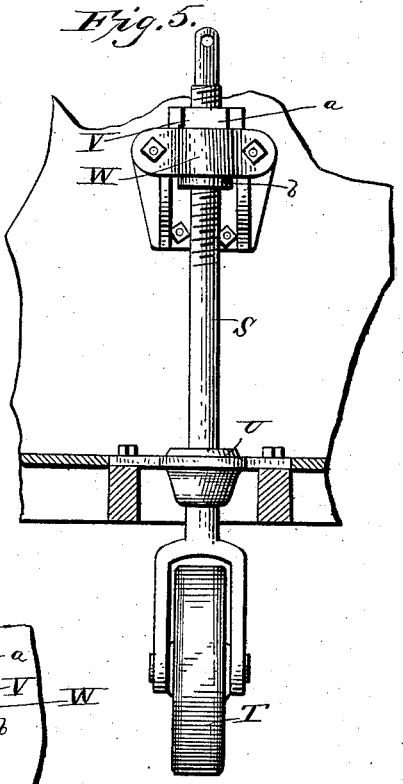
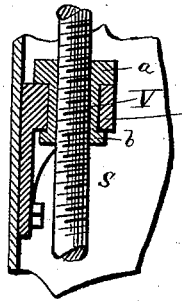


Fig. 6.



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UNITED STATES PATENT OFFICE.

JACOB KAHN, OF CLEVELAND, OHIO.

STREET-CAR MOTOR.

SPECIFICATION forming part of Letters Patent No. 385,631, dated July 3, 1888.

Application filed April 30, 1888. Serial No. 272,322. (No model.)

To all whom it may concern:

Be it known that I, JACOB KAHN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Street-Car Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to certain new and useful improvements in motor-cars for hauling street-cars; and the object I have in view is, essentially, to provide a motor-car that will be complete in all its details of construction and arrangements, whereby the engineer may retain control of the entire machine and attached car or cars without leaving his post in the motor-car, thus enabling him to avoid accidents by keeping a vigilant watch over the street and track ahead, as will be more fully hereinafter set forth.

The invention also has other minor objects in view that will be fully described herein.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 represents a longitudinal sectional view of my improved motor-car; Fig. 2, a transverse sectional view of the same; Fig. 3, a detail view of a pushing device employed to assist in starting and propelling the car in ascending hills, turning curves, &c.; Figs. 4 and 5, detail views of a device employed to assist in replacing the car upon the rails should it become derailed, and Fig. 6 a detail sectional view of the bearing and screw-threaded nut for adjusting the replacing device.

Referring to the annexed drawings by letter, A designates the car, which may be of any improved construction and is mounted upon suitable flanged car-wheels. To propel the car, I employ a hot air motor or engine, B, of any approved pattern, this motor being supplied with fuel (liquid or gaseous, as the case may be) from a reservoir or tank, C, located in any convenient part of the car. Should gas be employed as fuel, it is evident that it will have to be carried in the reservoir in a compressed state, the reservoir being charged by means of suitable compresses located along the route or at the termini of the same. As all motors of this kind have to be constantly cooled by keeping up a continuous flow of cooling-liquid around their cylinders, I have provided a liquid-tank, D, and connected the same to the cylinder-jacket of the motor by means of a pipe, E. Interposed in this pipe E is a pump, F, which is operated by an eccentric, G, upon a horizontal shaft, H, suitably geared with the drive-shaft of the motor, the object of this pump being to draw the liquid from the tank D and force it into and around the cylinder-jacket and through a vertical pipe, I, connected to the jacket, thence through a coil of pipe, J, located preferably in an open compartment upon the roof of the car, and then back into the tank again, the liquid being used over and over again, as is evident. By passing the liquid through the coil or system of pipe upon the roof of the car, where the air has free access to the coil, (especially while the car is moving,) the liquid will be cooled before it is returned to the tank. As a cooling-liquid, I prefer to use brine, or its equivalent, as I find that this liquid will not be as likely to congeal in cold weather as water would, and for the further reason that it will absorb a greater quantity of heat while passing around the cylinder of the motor.

Mounted loosely upon the drive-shaft of the motor is a chain or sprocket wheel, K, which is connected to a similar wheel, L, upon one of the axles of the car-axles by means of a suitable drive-chain, M, the two axles being in turn connected and rotated at the same rate by means of another drive-chain, N. Secured upon the drive shaft, so as to turn with it, but at the same time have a longitudinal movement thereon, is a clutch-wheel, O, which is adapted to engage the chain-wheel K and rotate the same when the car is in motion. This clutch-wheel is thrown in and out of engagement with the chain-wheel by means of a pivoted clutch-lever, P, which is controlled by a rock-shaft, Q, provided with an operating-lever, R, at the forward end of the car, where it will be within easy reach of the engineer. By this arrangement the car may be stopped and started instantly without stopping or changing the speed of the motor.

Should the car become derailed from any cause, the device shown most clearly in Figs. 4, 5, and 6 is brought into play to assist in re-

placing it upon the tracks, thus obviating the necessity of employing a number of lifting-jacks and a gang of men for that purpose. This replacing device is located at the forward end of the car, as shown in Fig. 1, and is constructed as follows:

The letter S designates a vertical shaft or support which is bifureated or forked at its lower end and provided with a wheel, T. This vertical shaft passes through and is guided vertically by a guide-plate, U, which is bolted firmly to the floor or floor-beams of the car. The upper end of this vertical rod S is screw-threaded, and passes through a similarly screw-threaded nut, V, supported in a two-part bracket or bearing, W, bolted to the front end of the car. The nut V is provided with a squared or angular portion, *a*, which rests upon the top of the bracket, and a collar, *b*, which abuts against the lower side of the bracket, these two portions *a* and *b* securing the nut against vertical movement without preventing its free rotation in its bracket. By turning the nut V, by means of a wrench or other tool applied to the squared portion *a*, the vertical shaft may be either lowered or raised, as desired. When the car leaves the track, the engineer may raise the front pair of car-wheels off the ground by turning the nut V and forcing the shaft S down, the wheel T resting upon the ground in a line with the center of the car. By this means the car may be replaced upon the track without requiring the engineer to leave his post, and without the employment of extra help. The shaft S may be turned by a removable lever, X, inserted in an opening in its upper end, thus enabling the engineer to guide or steer the car back upon the track.

It is obvious that I may use one or more of the replacers, as the exigencies of the case may require, without departing from the spirit of my invention.

Hung upon one of the transverse beams of the car-track, immediately to the rear of the rear table, are one or more pushers, A′, which will now be described. Each of these pushers consists of an arm, B′, pivotally hung to a bracket, C′, bolted to the truck-frame, this arm being provided at its upper end with a forwardly-extending thumb, D′, and at its lower end with a rearwardly-extending weighted projection, E′. Pivotally attached to the extreme lower end of the arm B′ is a rearwardly-extending pawl, F′, which rests upon the paving-stones of the street when the pusher is let down, as shown in Fig. 3. This pawl is provided with a projection, *c*, which engages a shoulder, *d*, on the arm B′ when the same is elevated, the pawl being thus held up in proper position and out of the way, as shown in dotted line in Fig. 3. Secured upon the rear axle, in line with the depending arm B′, is an eccentric, G′, which is adapted to impinge against the thumb D′ and oscillate the arm B′ as the axle revolves, the weight E′ serving to keep the thumb against the eccentric while the same is receding. As the arm B′ is forced back by the eccentric, the pawl F′ engages the paving-stones between the tracks and assists in propelling the car forward. To draw up or suspend the pushers when not in use, I attach a cord or wire, H′, to the weighted projection E′, and pass the cord over suitable pulleys to the front of the car and there secure it within easy reach of the engineer. In this instance I attach a link, *e*, to the end of the cord H′, and hook the same over a pin or nail, *f*, in the front of the car in order to secure the cord. When two or more of these pushers are employed on a car, I prefer to arrange the eccentrics so that they will operate the pusher alternately. These pushers will assist greatly in overcoming the inertia in starting the car, and also assist in propelling the car up grades and around sharp curves.

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

1. The combination, with the car, of the motor B and fuel-reservoir C, the said motor being connected by suitable gearing to the axles of the car, the liquid-tank D, connected to the cylinder-jacket of the motor by a pipe, E, a pump, F, interposed in this pipe E and operated continuously by the said motor B, and the overhead cooling-coil J, also connected to the cylinder-jacket of the motor, the outlet end of this overhead coil emptying into the said tank D, substantially as described.

2. The combination, with a car, of the replacing device, consisting, essentially, of a vertically-movable vertical shaft, S, provided with a wheel, T, at its lower end, the said shaft being screw-threaded at its upper end, and a nut, V, supported in a bracket, W, bolted to the car, the said shaft S passing through the nut V, as described, whereby it may be raised or lowered.

3. The combination, with a car mounted upon suitable wheels and axles, one of the said axles being provided with an eccentric, G′, of a pushing device consisting of a depending pivoted arm, B′, provided with a forwardly-extending thumb, D′, which impinges against the eccentric G′ on the axle, and a rearwardly-extending weighted projection, E′, a rearwardly-extending pawl, F′, pivoted to the lower end of the said arm B′, and means for suspending the arm B′ and its attachments when not in use, all arranged as and for the purpose set forth.

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

JACOB KAHN.

Witnesses:
L. HERMAN,
W. B. PAGE.