JONES & TERFLOTH.

Street-Car Propeller.

No. 105,088. Patented July 5, 1870.

Fig. 1.

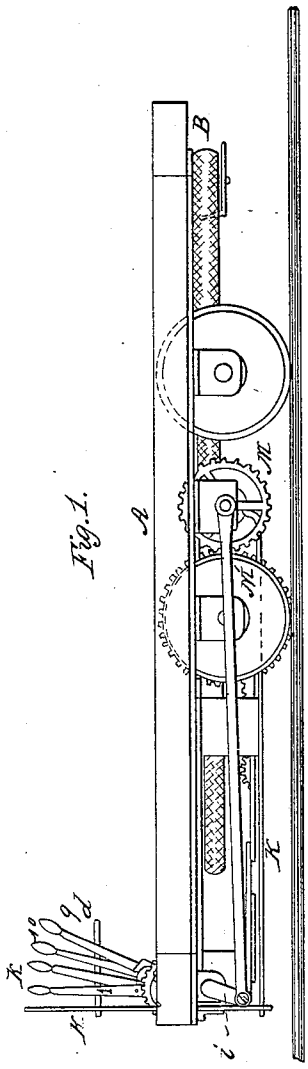
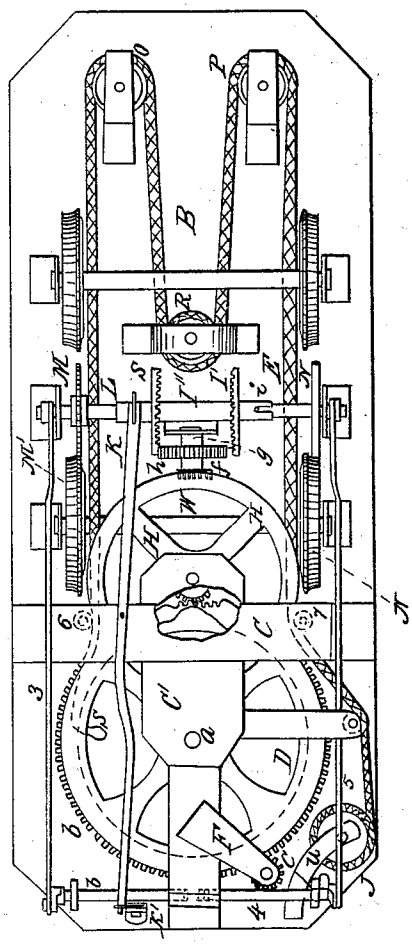


Fig. 2.



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UNITED STATES PATENT OFFICE.

SOLOMON JONES AND BERNARD TERFLOTH, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN DEVICES FOR PROPELLING STREET-CARS.

Specification forming part of Letters Patent No. **105,088**, dated July 5, 1870.

We, SOLOMON JONES and BERNARD TERFLOTH, of the city of New Orleans and State of Louisiana, have invented a certain Improved Mode of Starting and Propelling Street-Railroad Cars without the use of steam or compressed air as a motor, or horses or mules to draw the same, of which the following is a specification:

To state its nature in general and comprehensive terms, our invention may be said to consist of a mechanical arrangement, through the agency of which a man on a car can, without other aid, develop the tensile force of a powerful elastic-gum spring sufficiently to start the car from a state of rest, and then, after it is started, to bring into use the momentum of the car, whenever it is stopped or checked in its speed, to propel or drive the same on for an indefinite time or distance by throwing it (the momentum, or, more accurately, the force which it develops) into the spring, and storing it therein for the continuous propulsion of the car.

The special object of our invention is to create or produce a motive power which may be applied, at less expense and with equal or better effect, to the propulsion of street-railroad cars than any now in use, and which shall, at the same time, be adapted to a variety of other useful and economic purposes, which it is not necessary herein to enumerate or specify. It is sufficient, in this connection, to say that, whenever the motion to be brought into action is rotary, or may be produced through the instrumentality of a crank or cranks, or by means of pulleys and belts, or cog-gearing, or by a combination of the same, our invention may be profitably employed; but our invention will be more quickly and readily understood by reference to the drawing, whereon, at—

Figure 1, it is shown by a sectional side view in connection with the floor of an ordinary street-car, to which it is attached, and at Fig. 2 by a bottom-plan view under the same conditions as at Fig. 1.

A represents the floor of a car, and B a metallic plate covering the lower surface thereof, and secured thereto by any proper or sufficient means. This plate constitutes the means by which all the parts that make up our invention are fixed and maintained in proper position to fulfill their functions alike in their separate and collective capacities.

In lieu of the plate B, we shall use, in the actual practice of our invention, a skeleton-plate frame, it being lighter and equally as effective.

At the front end of the car a cross-frame, C C′, is secured to the plate B by bending both ends of C and the front end of C′ upwardly sufficiently below said plate to receive a large power-pulley, D, and support it on an axis, *a*. This power-pulley has rims on each of its sides, that project sufficiently beyond its perimeter proper to produce the effect of preventing the india-rubber or other elastic-gum spring E from slipping off said perimeter, although it may be wound around the same until its folds overlie one another in multiple convolutions, and also to provide the cogs *b* on one of said rims, as shown on the drawing.

A projecting arm or support, F, is secured, substantially as shown, to C′, in order to hold in position an upright rod passing through the plate B and the floor of the car in such manner that it may be rotated easily, to which said rod a pinion, *c*, is firmly secured at its lower end, so as to mesh in the cog-rim of the power-pulley D, as shown, while at its upper extremity it is provided with a circular hand-crank, *d*. This crank *d*, through the medium of the rod and the pinion *c*, affords a means for the rotation of the power-pulley D by hand and, as will be more clearly shown hereafter, of starting the car by hand.

Behind the power-pulley D, and supported, like it, by means of an axis taking into the part C′ of the cross-frames C C′ and the plate B, is arranged a wheel, H, on the axis of which is mounted a small pinion, *e*, which meshes in the cog-rim of the power-pulley D, as shown through the broken-away part of the cross-frame C C′.

Underneath the rim of the wheel H a circle of cogs is provided, which mesh in a pinion, *f*, that is fixed on a short shaft or axis, that is supported in pendent standards projecting from the plate B. Midway between its supports a larger pinion, *h*, is mounted on the axis *g* in such manner that its cogs will take into those which are provided on the wheels I I′ alternately, or whenever either of said wheels is thrown into contact with them, as shown

by I at Fig. 2. These wheels I I′ are fitted on a loose sleeve, J″, which encircles the shaft L, at a sufficient distance apart to prevent both from ever coming into connection with pinion *h* at one and the same time, substantially as shown on the drawing.

The sleeve J″ has a sufficient endwise movement to bring into connection the wheels I I′, respectively, with the pinion *h*, as may be desired, through the agency of a lever, K, which has its fulcrum on a pivot projecting from the part C of the cross-frame C C′, which lever K is actuated by the handle K′, which has its fulcrum on a pivot in the floor of the car. A pin, *i*, or its equivalent, uprising from the shaft L in a slot in the sleeve J″, insures the rotation of the latter with the shaft L.

The shaft L is supported in journals in line with the journals of the car-axles, but in such manner that they have a fore-and-aft traverse or sliding motion, in order that the cog-wheel M and friction-pulley N, respectively, may be thrown back and forward sufficiently to take the first out of and put it back into connection with a rim of cogs on the car-wheel M′ by means of a lever, 1, a rock-shaft, 2, and a connecting-rod, 3, and to do the same thing with respect to the friction-pulley N to withdraw it from and put it again in contact with the car-wheel N′ by means of a lever, *k*, a rock-shaft, 4, and a connecting-rod, 5.

The wheel M constitutes, as will be presently seen, one means by which the tensile force of the spring E is directly communicated to the car-wheel to rotate the same, and thus to drive the car forward, while the friction-pulley N, on the other hand, is the mechanical agent for stopping the car, and at the same time of garnering up in the spring E the momentum of the car while it is stopping it, to restart and run the car.

The pulleys O P R, which may be multiplied indefinitely, or as far as there is room to place them, to increase the length of the spring E, constitute revolving bearings for said spring, as do also the rollers 6, 7, and 8. This spring is the power which gives vitality to our invention, and is therefore in truth, as in name, its "mainspring." It is secured to the master-wheel or power-pulley D between the side rims, and on the outside of its periphery, as shown at S, passes backward inside the roller 6, over the pulley O, back to and over pulley P, then around pulley R, thence outside roller 7 and inside roller 8 to the pulley T, to which it is made fast after being stretched as much as possible by hand.

The pulley T rotates on its axis, which is provided with a pawl and ratchet, in order that any slack in the spring E may be taken up by winding it on this pulley, which is rotated by means of a proper wrench, and is held in position by means of a bent bracket, U, in which one of its journals is established, while the other is fixed in the plate B.

The parts we have enumerated being all in their proper place, the operation of our invention is as follows: The man on the car who is assigned the duty winds up the spring E on the power-pulley D by turning by hand the circular crank *d*. The rotation of the parts and their relative dimensions, it will be observed, make this an easy task because of the multiplied power which they develop. As soon as this is done the car is ready to start; but if it is heavily laden it may be necessary to reverse the motion of the crank *d* for a quarter or half turn, in order to assist the tensile force of the spring E in overcoming the inertia of the car; but as a general thing this will not be necessary. If the car is not ready to start the moment the spring is wound up, a pawl and ratchet on the floor of the car, which are not shown on the drawing, afford the means of holding it still. When the car is to be stopped the cog-wheel M is thrown out of connection with the car-wheel M′ by a movement of the lever 1, and held out of position by the lever-pawl and ratchet *j*, while the friction-pulley N is thrown in contact with the perimeter or tread of the car-wheel N′, and maintained in contact therewith by means of the lever-pawl 10 and a ratchet exactly similar to *j*. The lever K′ is now moved in order to throw the wheel I out of and the wheel I′ into connection with the pinion *h*, which reverses the direction of the rotation of the shaft L, and hence also of the friction-pulley N, and makes it act as a brake, while at the same time reversing the motion of all the parts, and hence winding up the spring E on the power-pulley D by diverting the force developed by the momentum of the car which it is overcoming, and throwing it into the spring E. The moment the car stops the operator seizes the circular crank *d* and winds up what has not been taken up of the spring before the car has ceased its motion, or so much of the same as may be necessary to start and run the car until another stop is made, when the same operation we have just described is repeated, and so on indefinitely. By having a spring, which may be easily done, two or three hundred feet long, a car may be run a mile and a half or two miles without taking up any of the spring which has left the power-pulley D; but it may be taken up, as we have shown, at much shorter intervals, or whenever, indeed, it becomes necessary to do it.

In the practice of our invention we may dispense with the wheel H and bring the pinion *f* in direct connection with the power-pulley D, or we may gear said pinion into another (by beveling both) that is placed on the car-axle W, or we may modify in other respects the arrangement of the parts without at all affecting the general characteristics or the mode of operation of our invention.

Our invention affords a simple and, as we have demonstrated by experiment, a most effective means for propelling cars, which is far cheaper than steam, pneumatic, or any other engines yet employed for such purpose, and their horses or mules to pull them along.

What we claim is—

1. The application of the tensile force of an elastic-gum spring, E, to the propulsion of city railroad-cars, when the said spring is arranged in the manner described and for the purposes set forth.

2. The combination of the plate B, or a skeleton-plate frame in lieu thereof, with the cross-frame C C′, the power-pulley D, the wheel H, pinions *e f g*, wheels I I′, shaft L, wheel M, pulley N, levers K K′, 10, and *k*, pulleys O, P, R, and T, rollers 6, 7, and 8, and an elastic-gum spring, E, when these several parts are constructed, arranged, applied, and operate substantially as described, for the purpose set forth.

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