

(No Model.)

J. L. BOONE.

SYSTEM OF PROPELLING CARS BY MEANS OF CABLES.

No. 296,916.

Patented Apr. 15, 1884.

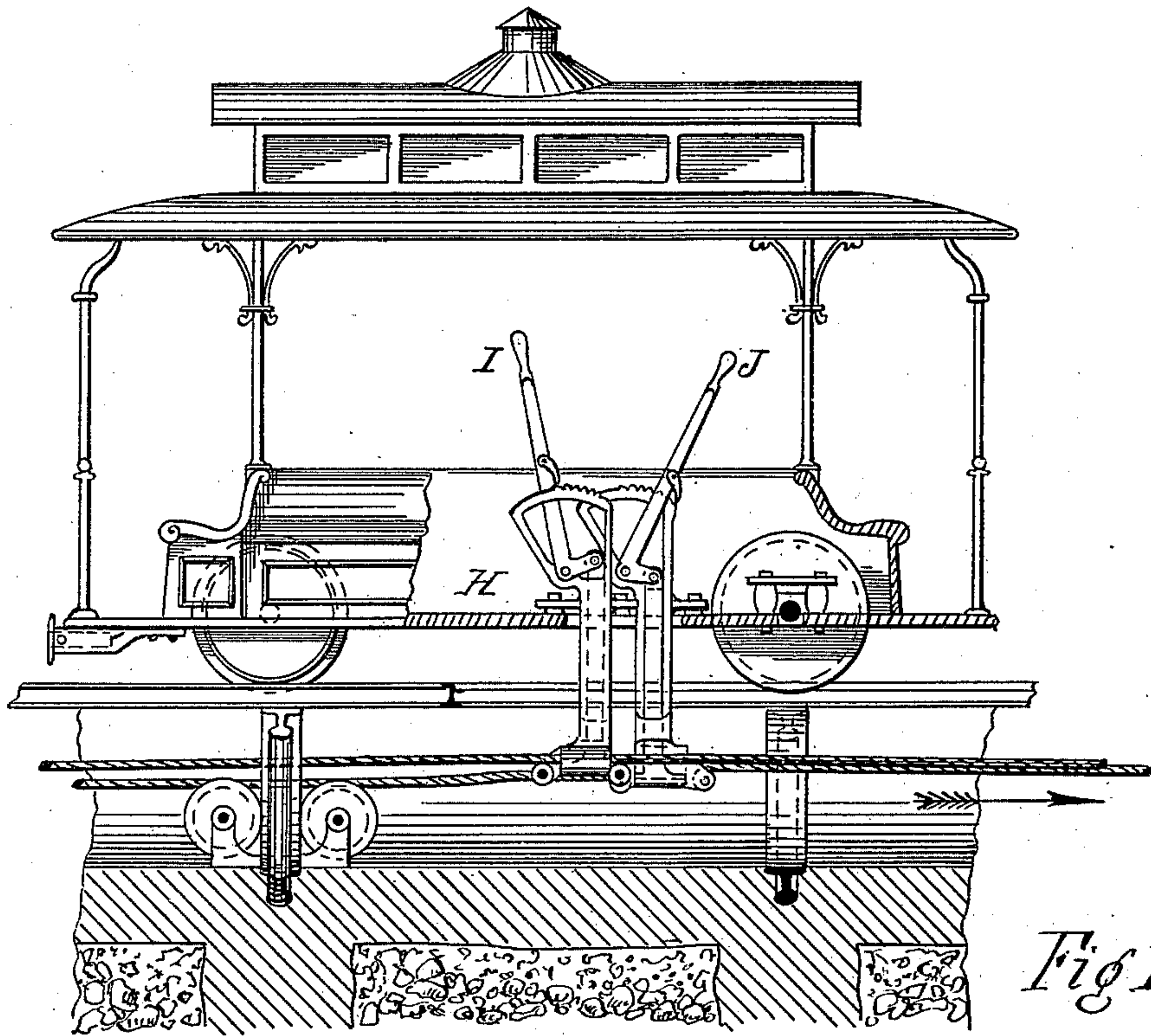


Fig 1.

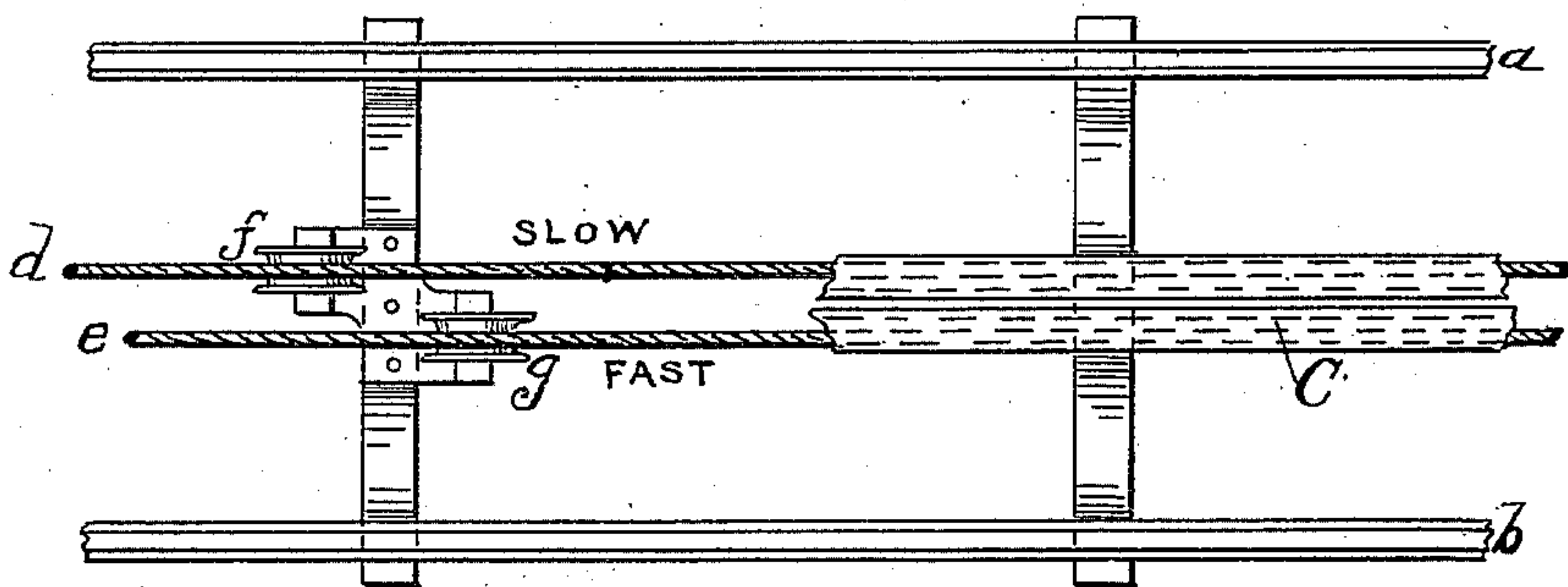
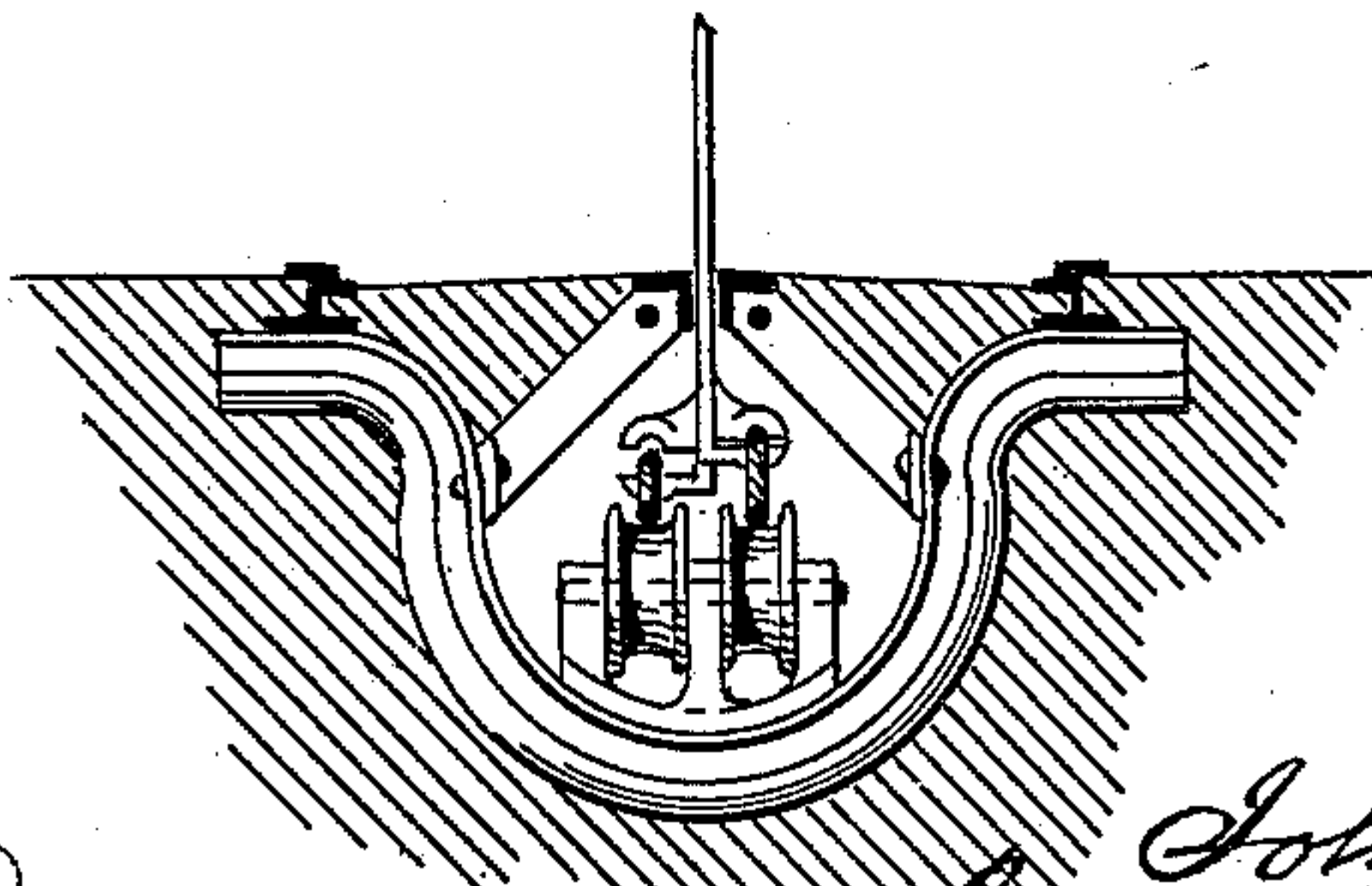


Fig 2.



Witnesses.  
*H. Mouton de.*  
*George W. Rea.*

Inventor.  
*John L. Boone*  
By *James H. Mandeville*  
his Counsel.



# UNITED STATES PATENT OFFICE.

JOHN L. BOONE, OF SAN FRANCISCO, CALIFORNIA.

## SYSTEM OF PROPELLING CARS BY MEANS OF CABLES.

SPECIFICATION forming part of Letters Patent No. 296,916, dated April 15, 1884.

Application filed January 22, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN L. BOONE, of the city and county of San Francisco, State of California, have invented certain Improvements in the System of Propelling Cars by Means of Cables; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to an improvement in the system of propelling cars along a track by means of an endless wire rope, chain, or cable moving in an underground slotted tube or tunnel. As at present operated, a single rope is mounted on pulleys in the tube or tunnel, which is constructed under the surface of the ground midway between the two tracks, and a thin shank extends down from the car or dummy through a slot in the tube, to the lower end of which a gripper is attached, which is made to grasp the running rope in order to propel the car. This rope travels at a uniform speed of six or eight miles an hour, and the gripper must be made to grasp it as it travels at this speed. Experience has shown that this system is destructive not only to the gripper, but also to the rope, because the car must be started from a state of rest, and as it would be too much of a strain on both car and rope to start the car suddenly at the same rate of speed that the rope is moving at, the gripping-jaws are applied gradually, so as to allow the rope to run through the gripper, and thus move the car slowly at first. The outside small wires of which the rope is made are thus continually broken, so that after a short time the entire length of the rope has a hairy appearance from the projecting ends of the broken wires. At times an entire strand of wire will break, and thus disable the rope, so that the whole line must be stopped until the break is repaired. The destruction of grippers on a cable line is also a material expense, as they must be continually replaced and repaired. My invention contemplates the employment of two independent ropes or cables mounted parallel with each other upon independent sets of pulleys in the same tube and driven at different rates of speed. One of the ropes I drive at a slow speed and the other at a fast speed. I then use a separate gripper for connecting the car or dummy with each rope, so that the car can be started by means of the slow rope, and after it has attained the speed of that rope the

slow rope is released and the other gripper connected with the fast rope, thus starting the car without material strain or injury to either gripper or rope.

Referring to the accompanying drawings, Figure 1 is a vertical longitudinal section through a car and tube, showing the two ropes and two grippers. Fig. 2 is a plan of the track, showing the slot-plates broken away and the two ropes. Fig. 3 shows a cross-section of the underground tube with the two ropes and their pulleys.

Let *a b* represent the two rails of a street or other railway, and *c* the underground tube or tunnel within which the propelling rope or cable is mounted and driven. Inside of this tube or tunnel I mount two separate and independent endless ropes or cables, *d e*, on two separate and independent sets of pulleys, *f g*, so that one rope will be on each side of a perpendicular line drawn through the slot. Both of these ropes or cables can be driven by the same engine, or they can be driven by separate engines at the central station, from whence the power is derived. One of the ropes or cables I drive at a high speed—say from six to eight miles an hour, according to the maximum speed it is desired to propel the cars on the track. The other rope or cable I drive at a slow speed—say one-half the speed of the fast cable, so that both cables travel simultaneously side by side, one on each side of the slot, one, *d*, moving fast and the other, *e*, moving slow. I then connect the car or dummy *H* with the two cables by means of two independent grippers, *I J*. These grippers can be connected with the car by a single shank, or each gripper can have a separate shank. I have represented two shanks and two grippers. In this case one gripper will be a short distance in advance of the other, so that the shanks will not interfere with each other in passing through the slot. I shall, however, devise a double gripper and connect it with the car or dummy by a single shank, so as to be operated by a single lever—that is, when the lever stands vertical both grippers are free, when drawn in one direction one gripper will be caused to seize its rope, and when moved in the opposite direction the opposite gripper will be made to seize the opposite rope; but this gripper I will make the subject



of a separate patent. With this arrangement of ropes and grippers the car can be started from a state of rest by engaging the gripper J with the slow-moving rope or cable *e*, until the car has attained the speed of the slow cable, and then if it is desired to proceed faster the slow rope can be released and the gripper I attached to the fast-moving cable *d*. This gradual manner of starting the car and increasing its speed will avoid the great wear and tear of the single-cable system, while it provides a means for moving the cars at a slow speed whenever desired, and this is necessary in passing around curves or moving through crowded streets.

By this improvement I render the cable system of propelling cars thoroughly practical, and avoid the numerous delays from broken or stranded ropes, as the line need never be stopped unless both cables should give out at once, which is not likely to occur. In case the fast cable should give out, the slow cable can do the work, or its speed increased, so as to keep the usual time-table until the broken cable is repaired and again started.

In the Letters Patent No. 279,694, which were issued to me on the 19th day of June, 1883, I described and claimed two ropes in one tube; but one of these was an idle rope, and was not to be used until the working-rope gave out; but in this case both ropes are working-ropes.

I am aware that it is not new, broadly speaking, in cable propulsion of cars, to provide two propelling-ropes that run at different rates of speed. Such an invention is described in English Patent No. 1,526 for the year 1866.

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

1. In the cable system of propelling cars, the endless ropes or cables *d e*, mounted parallel with each other, and driven at different rates of speed, in combination with two grippers, I J, for connecting the car or dummy with said ropes.

2. The combination of a fast and a slow moving cable, *d e*, with a car to be moved on a track, and separate gripping devices for connecting the car with either cable, substantially as described.

3. The improvement in starting cars from a state of rest, consisting in first connecting them by a suitable gripper, J, with a slow-moving rope or cable, and then, when the car has attained the speed of the slow-moving rope or cable, releasing the gripper from said rope or cable and connecting the car with a fast-moving rope or cable, substantially as described.

4. The improvement in the cable system of propelling cars on a track by means of an endless rope or cable mounted on pulleys in an underground slotted tube or tunnel, consisting of the two separate and independent cables *d e*, mounted on two separate and independent sets of pulleys in the same tube, one of said cables being located on each side of a perpendicular line drawn through the slot in the tube or tunnel, and separate gripping devices for connecting the car with either cable at will, substantially as described.

In witness whereof I have hereunto subscribed my name.

JOHN L. BOONE.

Witnesses:

JOHN D. GAGNON,  
M. MACDONALD.