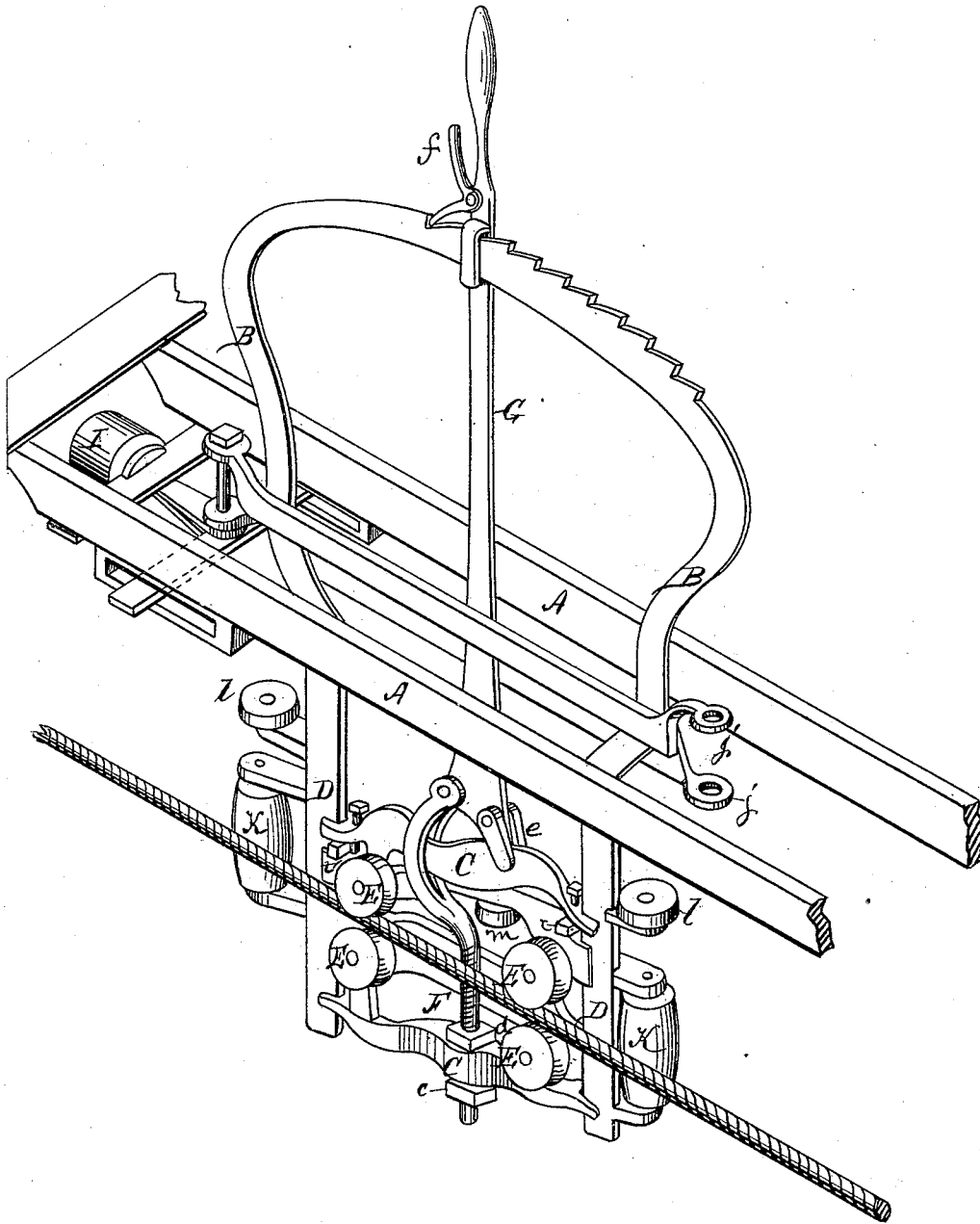


A. E. HOVEY.

ROPE GRIPPING DEVICE FOR PROPELLING VEHICLES.

No. 176,136.

Patented April 18, 1876.



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IMPROVEMENT IN ROPE-GRIPING DEVICES FOR PROPELLING VEHICLES.

Specification forming part of Letters Patent No. **176,136**, dated April 18, 1876; application filed March 4, 1876.

To all whom it may concern:

Be it known that I, ASA E. HOVEY, of the city and county of San Francisco and in the State of California, have invented certain new and useful Improvements in Wire-Rope-Griping Devices for Propelling Vehicles; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improved griping device for connecting cars and other vehicles of transportation with an endless rope or wire cable, which is arranged to travel in an underground tube for the purpose of propelling the car or other vehicle along a track.

In propelling cars along a track by this system, the tube in which the endless rope moves is usually located midway between the rails of the track, and a longitudinal slot along the upper side of the tube permits the passage of the shank of the rope-griper.

The griping device is inside of the tube and a narrow shank connects it with the car or dummy outside of the tube. The griping device is operated from the car or dummy by means of a lever.

The griping-jaws are operated by a lever or other device which passes up through the slot and can be operated to gripe or release the rope by a person standing on the platform or floor of the car or dummy.

I am aware that an underground tube with a slot along its upper side placed between the rails of a railway-track has been long known and used for containing an endless wire-rope for propelling vehicles; and I am also aware that it is not new to connect the car or other vehicle with the endless rope in the tube by means of a griping attachment connected with and operated from the floor or platform of the car; but my invention relates to the novel construction and arrangement of the griping device by which I am able to seize the rope or release it at will, by the simple movement of a lever, and by which arrangement I secure several advantages not possessed by other gripers of this class.

In order to describe my improved griping

device reference is had to the accompanying drawings, forming a part of this specification, in which—

A A represents the longitudinal timbers of a dummy truck or car, such as is used for carrying the griping attachment which gripes the rope or cable, and to which the car or vehicle to be propelled is coupled. These timbers extend lengthwise of the truck and carry the griping attachment below them, midway between the tracks of the railway, so that its shank will pass directly down through the slot in the tube below.

In the construction of my griping device I take a narrow metal plate, B, and bend it, as represented in the drawing, so that its two ends will form the side-bars, which support the gripers inside of the tube, while its middle is bent in a circular form, as represented, and extends above the truck-frame or dummy-platform A.

The gripers consist of two horizontal bars, C C, of equal length, which are arranged one above the other between the upright parallel ends D of the frame or plate B inside of the tube, so that their ends will slide upon and be guided by the plate D.

Near both ends of each bar C I secure a roller or pulley, E, on a short horizontal shaft or journal, so that the roller or pulleys of the upper bar will be above the pulleys or rollers of the lower bar. It is between these two rollers that the endless rope will pass and be griped, as hereinafter described.

F is a screw-bolt, the upper end of which is bifurcated, so as to admit the upper bar C between the separated portions, while the screw or bolt end passes through the middle of the lower bar, and can be adjusted up or down as desired by means of set-nuts *e d*, one below and one above the bar. Short bifurcated arms *e e* extend upward from the middle of the upper bar C, to which they are rigidly attached.

G is the operating lever, by means of which the rollers or pulleys are forced together upon the rope or released from it. The lower end of this lever is secured to the short arms *e e* of the upper bar C at one side and to the upper end of the bifurcated bar F at the oppo-

site side, thus giving a powerful leverage to force the rollers together. A hub cast and turned upon each of the pulleys E, so as to form a solid part thereof, extends from the pulleys E to the further side of the bars C, so that when the bars C are drawn toward each other they press upon and are stopped by the said hubs.

Shoes of ordinary construction can be put upon the bars C at the places where they press upon the said hubs, so that the friction occasioned by the contact will come upon the shoes, which, when worn, can be replaced by new shoes without making new bars. When the bars C are drawn toward each other by operation of the lever G they press upon the hubs of the pulleys E, and thus press the pulleys together, and make them gripe the rope or cable between them. At the same time the pressure of the bars C upon the hubs creates a friction which stops the revolving of the hubs and pulleys and the moving rope or cable being thus gripped between the pulleys draws them and the car or vehicle along with it.

The hubs should be smaller than the pulleys, so that the friction of the rope or cable upon the face of the pulleys will overcome the friction of the bars upon the hubs.

By this means, while the car is being started, the pulleys will continue to revolve until the car gets under full headway, and travels as fast as the rope or cable does.

While the car is being started the pressure and friction of the bars C upon the hubs does not stop them at once; but they and the pulleys with them continue to revolve, but at constantly-decreasing speed, until the car gets under full headway, when they entirely stop revolving. By this means the car can be started gradually while being gripped to a cable running at a constant rate of speed. This is one of the most important results of my invention.

The lever G extends upward through the slot in the tube, and above the curved upper portion of the metal plate B. This upper curved portion of the plate has ratchet-teeth formed on its upper edge, and the lever has a spring-pawl, *f*, attached to it, so that it will engage with the ratchet-teeth when the jaws or rollers are forced together.

The upper bar C rests upon india-rubber buffers or springs *t t*, which are compressed when the jaws are forced together, and serve, by their elasticity, to withdraw the bar when the lever-pressure is removed.

The set-nuts *c d* serve to adjust the two bars to or from each other, to take up any useless motion.

It will thus be seen that I use the rollers or pulleys not only for supporting the rope when it is running freely through the griper, but also as gripping-jaws, to seize the rope and hold it when it is desired to move the car. A slight movement of the lever G is all that is required to release or grasp the rope, and

as the pressure increases upon the rollers they take hold so gradually that the start of the car will not be so sudden as when immovable gripping-jaws are used to grasp a rope, which is traveling at a uniform speed.

With my device the rollers will be gradually deadened, or rendered rigid by the pressure upon them, so that no jar or sudden impulse will be imparted to the vehicle to be moved.

As heretofore stated, this griper is suspended between the two beams or timbers of the truck or dummy, A A being attached, both in front and rear, to a vibrating bar, H, only one of which is shown.

Each of these vibrating bars has an india-rubber buffer, I, arranged to receive the strain upon it, as shown, while the opposite end to which the griper is attached, is free to swing or move laterally a limited distance.

The griper has eyes *j j* both in front and rear, so that it can be easily attached to the bar H by means of bolts, or detached, as desired.

An upright roller, K, is supported by lugs on the outside edge of each of the upright plates, which form the guides and supports for the griper-bars, and these rollers serve to prevent the rope from chafing against the edges of the plates. These rollers also serve, in passing around a curve, to prevent the friction which would otherwise occur.

Just above each of these rollers another roller, L, is secured horizontally, so as to prevent the shank of the griper from coming in contact with the sides of the slot as it moves through the tube.

On the side of the griper opposite the gripping-rollers E I mount a friction-roller, *m*, in the middle of a strong bar, which connects the two side plates, so that when the strain of the rope comes upon the pulleys, and the griper is thereby forced in an opposite direction, the roller *m* will receive the friction and strain that would otherwise occur by bearing against the opposite side of the tube.

These several devices combined provide for all the conditions required in rope-gripping apparatus. It is easily operated, and is quite positive in its action.

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

1. A rope-gripping apparatus or device, consisting of the two parallel bars C C, carrying the opposing rollers E E within their hubs *e*, said bars being connected together and operated by means of the screw-bolt F, short arms *e*, and operating-lever G, all combined to operate substantially as above described.

2. The metal plate B, bent as described, so as to form the entire frame of the gripping apparatus, and having the upper edge of its middle or circular portion provided with ratchet-teeth, in combination with gripping-jaws or pulleys E E, which are forced together by a lever, G, said lever being provided with a

spring-pawl, which engages with the ratchet-teeth, substantially as and for the purpose described.

3. A gripping apparatus, consisting of the metal frame B, with its upright friction-rollers K K, horizontal friction-rollers l l, and counteracting friction-roller m, arranged as described, and provided with rope-gripping jaws or rollers E E, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of February, 1876.

ASA E. HOVEY.

Witnesses:

E. J. SMITH,
J. H. BLOOD.