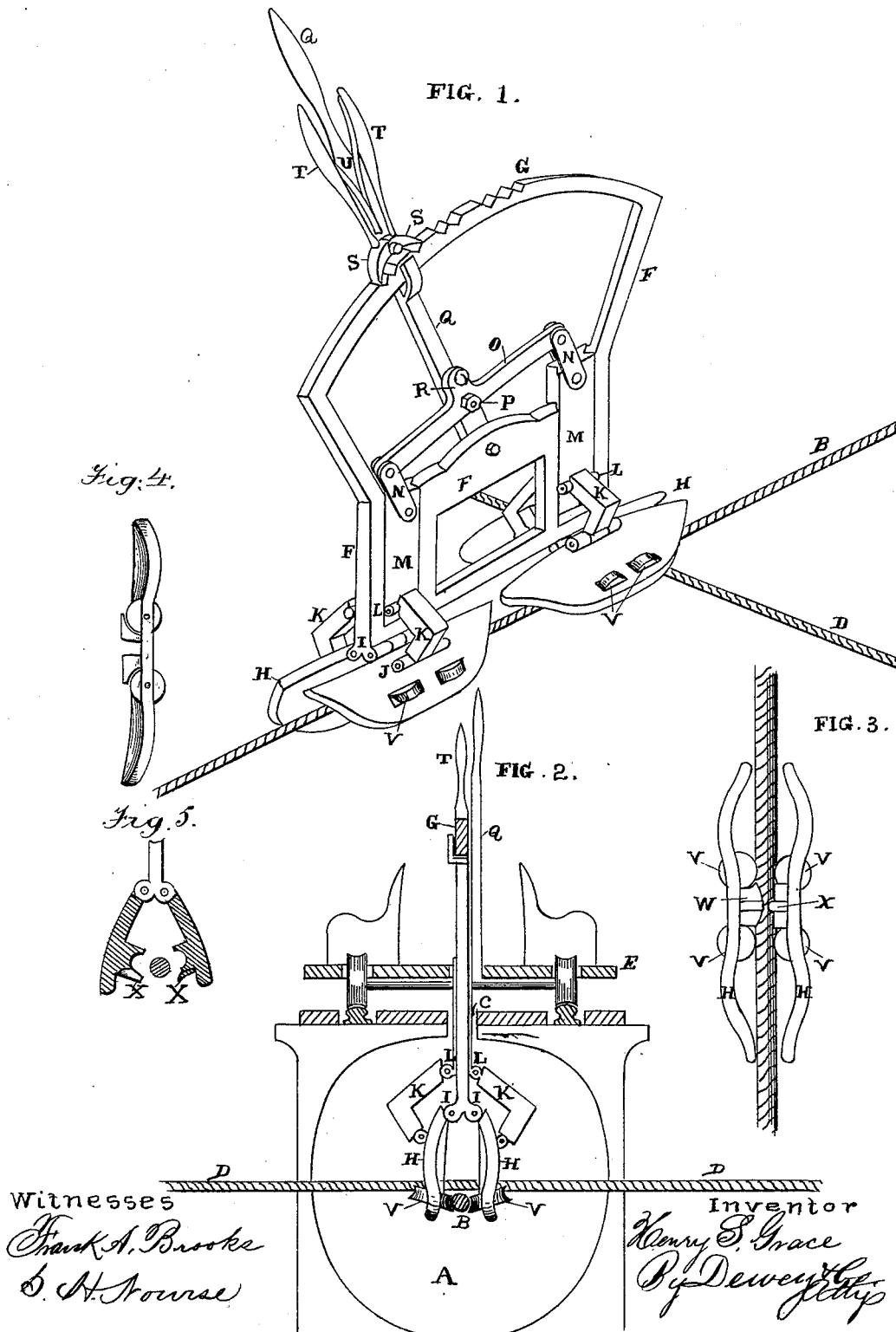


H. S. GRACE.  
Automatic Grip for Rope-Railway.

No. 220,283.

Patented Oct. 7, 1879.



# UNITED STATES PATENT OFFICE.

HENRY S. GRACE, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN AUTOMATIC GRIPES FOR ROPE-RAILWAYS.

Specification forming part of Letters Patent No. **220,283**, dated October 7, 1879; application filed May 22, 1879.

*To all whom it may concern:*

Be it known that I, HENRY S. GRACE, of the city and county of San Francisco, and State of California, have invented an Automatic Gripe for Rope-Railways; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improved apparatus for connecting a car with the continually-moving rope or cable by which it is to be driven; and it consists in the combination of two gripping devices connected with each other and with a mechanism within the car to be propelled, so that when one gripe is released, the other, which follows or is behind the first one, will be caused to take hold, and vice versa, the object being to enable one cable-road to cross another one without entirely disconnecting the car from the cable which drives it.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view of the apparatus. Fig. 2 shows a section of the road-bed having two crossing-cables and a car with my device attached. Fig. 3 is a detail sectional view of the gripes. Fig. 4 is a detail view of one of the gripes. Fig. 5 is a cross-sectional view of the gripes.

A is a section of a road having a rope or cable, B, running in a proper channel beneath the surface, said channel having a longitudinal slot, C, in its upper side, through which connection may be made between the rope and the car to be driven as is usual in this class of roads. D is a second cable, which crosses the first, and operates another line of cars.

My device is intended to permit each of these lines of road to be operated without interfering with the other, and to enable the cars to pass the crossing cables without stopping or being disconnected from the cable which drives them.

E represents a car, which is provided with bearing-wheels running upon a line of rails in the street. A frame, F, is mounted upon this car, and carries the arc or rack G above, while its lower end extends downward into the slot between the rails, and supports the gripes and the operative mechanism, as shown.

The gripes H consist of two leaves each, which have their upper edges hinged to the lower portion of the frame F, as shown at I. A joint, J, is formed upon the back of each leaf of the gripe, and a bent arm, K, connects this joint with a joint, L, upon the slide M. The slides M move up and down in guides in the frame F, and are united by links N to the oscillating bar O, which is pivoted at the center at P, so that when one end is elevated the other will be depressed.

The action will then be as follows: The oppositely-closing leaves of the gripe being hinged to the frame, and opened or closed by the action of the connecting-rods, slide, and pivoted oscillating bar O, it will be readily seen that when one pair of gripping-jaws close the other pair will be opened, so that when a transverse cable is to be crossed, the forward gripe being closed and the rear one open, said forward or first gripe will be thrown open by striking the cable so as to be entirely free of it, and the rear one closed by the same motion. When the rear one reaches the cable the action will be reversed, and the rear gripe will be thrown open and the front one closed.

In order to control the action of these gripes I have hinged the lever-bar O to a hand-lever Q, which has its lower end connected with the frame F. An extension, R, upward from the center of the bar O, and by the side of the lever Q, acts as such a hinge-connection, and the pawls S S upon the lever engaging with the teeth of the rack, enable me to close either of the gripes upon the rope as tightly as may be desired.

When the lever O is disconnected from lever Q it will be free to move independently of the lever Q, and thus allows the two gripes connected with it to be automatically actuated by the rope, which they strike in crossing. The pawls which I employ to control the lever Q are of novel construction, the two opposite detents S being mounted upon a single pin passing into the side of the lever. The handles T of these pawls extend upward one upon each side, as shown, and the springs U, secured to the inside of each handle, meet in the center, so that each presses against the other when its lever is moved.

The pawls have their lower surfaces arched, so that when one is lifted the other will drag across the teeth without catching, and it is thus necessary to handle but one pawl in moving the lever.

The gripping-jaws H are each provided with rollers V, which first take the cable, and between them are the permanent gripping-blocks W, which seize the cable when the gripes are firmly closed.

As the rope or cable will drop down considerably between its bearing-pulleys, I have fitted lugs or points X along the lower edges of the plates or jaws H, and these points will pick the cable up when the jaws are closed, and lift it to its proper position between the rollers and blocks.

The ends of the jaws H are rounded and curved, and concaved or hollowed out on their inner faces, as clearly shown in Fig. 6, by which, when they strike a transverse cable, they will be thrown wide open without damage to the cable, and standing out horizontally, so as to entirely clear it while crossing it.

It will thus be seen that I am enabled to cross any cable-road by another, either upon a line or an incline, as my automatically-working double gripe will propel the car, each one letting go as the other takes hold.

It will be seen that this device also enables the cars to be used with a cable which turns a corner, as the gripes are easily detached, and the momentum will carry the car around the corner, where it again meets the cable and connects with it.

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

1. The gripes H H, hinged to the frame F,

and connected with the slides M by the arms K, as shown, in combination with the links N and centrally-pivoted oscillating bar O, substantially as herein described.'

2. The gripe consisting of the hinged plates H, with their rollers or pulleys V and jaws W, and the points X, for picking up the cable, the plates H being rounded and curved at their ends, and concaved or hollowed out on their inner faces, as shown, substantially as and for the purpose herein described.

3. The gripes H, with their centrally-pivoted oscillating bar O, so connected that one pair of gripes shall be closed when the other pair are opened, in combination with the hand-lever Q, which may be connected with or detached from the bar O, substantially as herein described.

4. The combination, with the bar O, arc or rack G, and lever Q, of the double-arched pawls S S, mounted upon a single pin, and provided with the handles T T, and the springs U U, secured to the inside of each handle and meeting in the center, whereby each presses against the other when its lever is moved, substantially as herein shown and described.

5. The frame F, with its guides, and the slides M moving therein, and the curved rack G, in combination with the double operating-gripes H H, the oscillating connecting-bar O, and the detachable hand-lever Q, and the pawls S S, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

HENRY S. GRACE.

Witnesses:

S. H. NOURSE,  
FRANK A. BROOKS.