

905,217.

Patented Dec. 1, 1908.
2 SHEETS—SHEET 1.

Fig. 1.

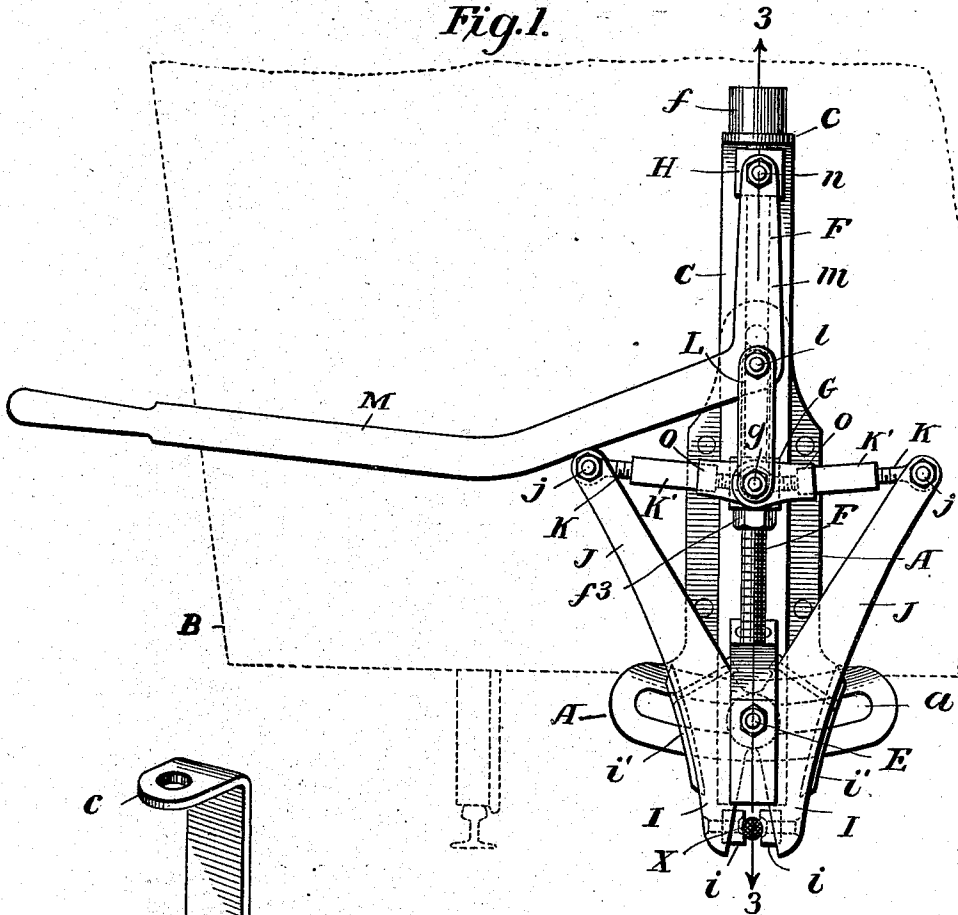
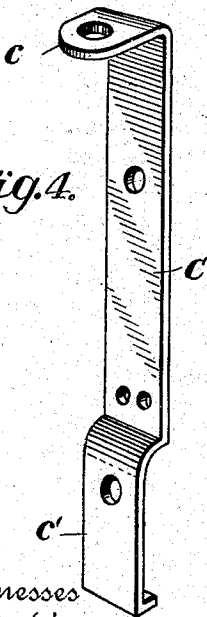
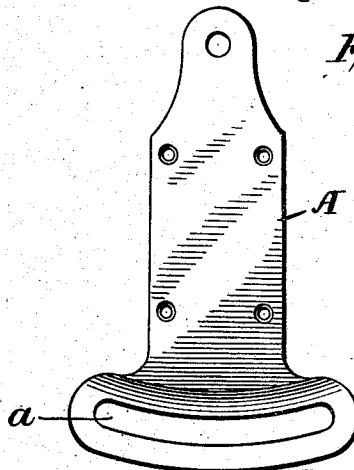


Fig. 4.



Witnesses
J. S. Stink
M. S. Adams.

Fig. 5.



Inventor

H. O. Ofstad
By *Balpin & Mylt*
Attorneys

905,217.

Patented Dec. 1, 1908.
2 SHEETS—SHEET 2.

Fig. 2.

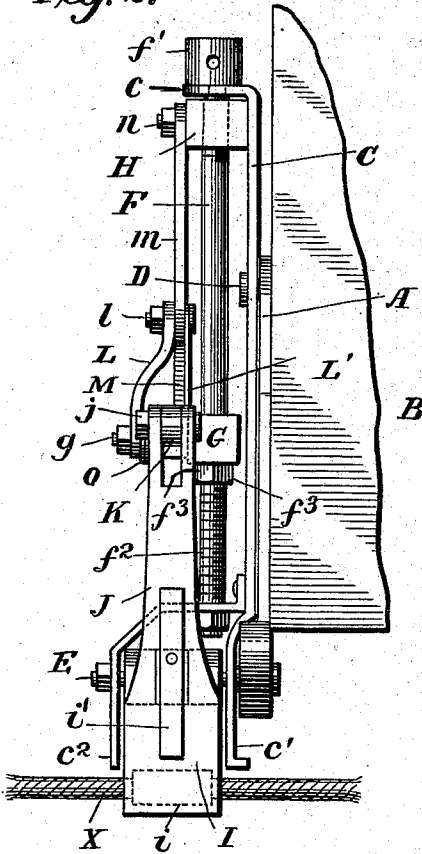


Fig. 3.

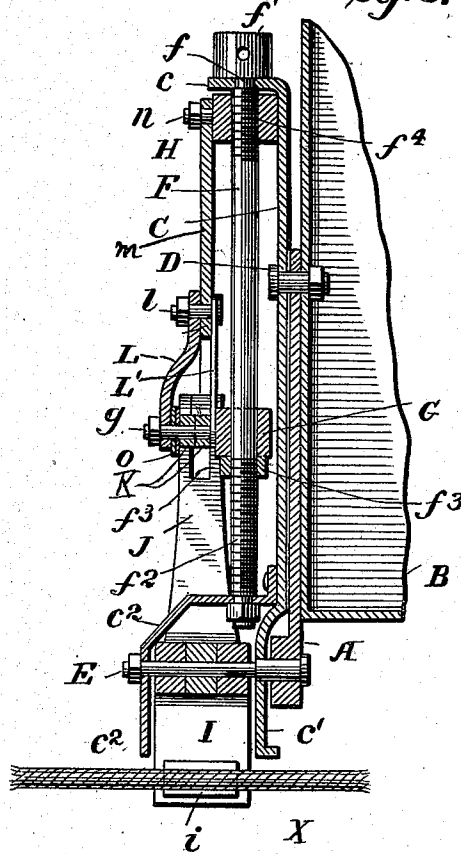


Fig. 6.

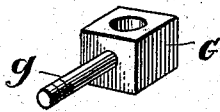
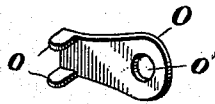


Fig. 7.



Witnesses
J. S. Stink
M. S. Adams.

Inventor
H. O. Ofstad
By *Baldwin & Wright*
his *Attorneys*

UNITED STATES PATENT OFFICE.

HARTVIG O. OFSTAD, OF SUPERIOR, WISCONSIN.

CABLE-GRIP FOR TRAM-CARS.

No. 905,217.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed September 21, 1908. Serial No. 453,959.

To all whom it may concern:

Be it known that I, HARTVIG O. OFSTAD, a citizen of the United States, residing in Superior, in the county of Douglas and State of Wisconsin, have invented certain new and useful Improvements in Cable-Grips for Tram-Cars, of which the following is a specification.

My invention relates to cable-grips for tram-cars of the class in which the cable is grasped by jaws which are opened and closed by lever-mechanism and the objects of my invention are to provide improved mechanism whereby the jaws may be more conveniently operated and more securely locked to the cable, novel means for holding the cable in position between the jaws and improved devices for adjusting the mechanism for operating the jaws.

In carrying out my invention I attach to one end of the tram-car a plate or frame, to the upper end of which is pivotally connected a supporting plate, through the lower portion of which extends a pivot-rod which also extends through a curved slot in the lower end of the stationary frame-plate. The swinging supporting plate is provided with downwardly extending arms which serve to prevent the cable from rising from proper position between the jaws, which latter are pivotally mounted on the pivot-rod above referred to. A vertical bar is supported by the lower portion of the swinging supporting frame and this bar is threaded at its lower portion and carries a nut, on which rests a block, carrying the pivot-pin for the inner ends of the adjustable links connecting the upper ends of the upwardly projecting arms or shanks of the jaws. This pivot-pin is connected by links with an operating-lever jointed to a block mounted on the threaded upper end of the vertical bar before referred to. The arrangement is such that by turning said vertical bar, the block on the threaded upper end thereof may be raised and lowered for a purpose hereinafter explained. The connections between the operating-lever, the upwardly projecting arms or shanks of the jaws and the pivot-pin for the links connecting these shanks, is such that the jaws may be easily and quickly opened and closed and when closed they will be securely locked, the links being so adjusted that when the jaws are made to grip the cable, the axis of the pivot-pin which connects the inner ends of

the links will be slightly below the plane of the axes of the pivots which connect the outer ends of the links with the jaw-shanks and in like manner the operating-lever is so connected by links with the links connecting the jaw-shanks, that when the jaws are gripped to the cable, the axis of the pivot-pin at the lower end of said vertical links is slightly to one side of a vertical plane passing through the upper pivot point of said vertical links, and in this manner the jaws are doubly locked and some additional power is required to start the operating-lever in order to free the jaws, the operation thereafter being comparatively easy. The horizontal links connecting the upper ends of the jaw-shanks are adjustable in length to compensate for the wear on the shoes of the jaws and as this adjustment of the horizontal links necessarily varies the movement of the pivot-pin which connects their inner ends, I have provided for the positive vertical adjustment of this pivot-pin by the turning of the vertical bar above referred to, which changes vertically the position of said pin in the manner above described.

In the accompanying drawings, Figure 1 shows a front elevation of a cable-grip constructed in accordance with my invention, a tram-car to which it is applied being indicated by dotted lines. Fig. 2 is a side elevation of the same. Fig. 3 shows a vertical central section on the line 3-3 of Fig. 1. Fig. 4 is a perspective view of the swinging supporting plate. Fig. 5 shows a front elevation of the stationary frame-plate. Fig. 6 is a perspective view of the pivot-block and pivot-pin to which the inner ends of the horizontal links and the lower ends of the vertical links above referred to are connected. Fig. 7 is a perspective view of a nut-locking device which may be employed.

The stationary frame-plate A, shown detached in Fig. 5, may be bolted, riveted or otherwise suitably secured to the end of a tram-car B, preferably midway between the wheels. The plate A is enlarged at its lower end and has a curved slot *a*. The vertical supporting plate C, shown in perspective in Fig. 4, has a laterally projecting upper end portion or head *c*, and a lower arm *c'*. Just above the upper end of this lower arm *c'*, is secured another arm *c''*, as indicated in Figs. 2 and 3. The arms *c'*, *c''*, are designed to prevent the cable X from rising out of

proper position to be gripped by the jaws. The supporting plate C is connected to the upper end of the stationary plate A, by means of a bolt D and the plate C is adapted
 5 to swing on this bolt. The plate C is also connected with the plate A by means of a bolt E, which extends through the arms c^2 , c' , and through the curved slot a of the stationary plate. A vertical rod F is attached
 10 at its lower end to the arm c^2 and at its upper end it has a boss f , mounted to turn in the head or flange c , at the upper end of the swinging plate C. It is also provided with a head f' , by means of which it may
 15 be turned. The lower portion of the rod F is threaded at f^2 , and carries an adjustable nut f^3 , on which is supported a block G, carrying a forwardly projecting pivot-pin g . The upper portion f^4 of the rod F, is
 20 threaded and operates in a correspondingly threaded hole in the pivot carrying block H. The gripping jaws I, are pivotally mounted on the pivot-bolt E. They have shoes i for gripping the cable and they have wearing-
 25 plates i' , to prevent the jaws themselves from being worn by the cable-guides. These wearing-plates may be readily removed and replaced. The upwardly projecting arms or shanks J are connected by links K with
 30 the pivot-bolt g . These links have adjusting nuts K', by means of which they may be varied in length. The pivot-bolt g is connected by means of links L, L', and a pivot-pin l , with the vertically arranged arm m
 35 of the operating-lever M, and the vertical arm m of this lever is pivotally connected at its upper end n with the pivot-block H. The parts are so arranged that when the lever M is raised the jaws are made to open.
 40 When the lever is depressed, the jaws are closed upon and grip the cable securely. The relative lengths of the links L, L', and K are such that when the lever M is depressed to its full extent, the axis of the
 45 pivot-pin g will be below the horizontal plane of the axes of the pivots j , which connect the links K with the upper outer ends of the shanks J and the axis of the pin g will be to one side of the axis of the
 50 pivot-pin l and at that time the lever M will rest on the upper end of one of the shanks J. In this way the jaws are not only made to grip the cable securely, but they are locked in this position and cannot
 55 accidentally be moved therefrom. When the jaws are designedly opened by the lever, it is first necessary to shift the positions of the pivot-pins l and g relatively to a vertical plane and then to raise the pivot-pin g
 60 to a higher horizontal plane before the gripping action is released. The first movement of the lever operates to impart additional pressure to the grip but immediately after this, this pressure is relieved and then by a
 65 further upward movement of the lever the

jaws are opened. This double locking of the jaws is found to be most secure and efficient.

As before stated, the links K may be adjusted in length to accommodate the wearing away of the shoes i but any such adjustment of the links K will interfere with the locking operation above referred to and in order to compensate for this the pivot-pin g is made vertically adjustable by means of the rod F. By turning this rod, the pivot-
 75 block H may be raised and lowered and thus correspondingly, by the connections shown, adjust the position of the pin g , so that the relative arrangement of the parts may be preserved to obtain the locking action
 80 before referred to.

In order to prevent the sleeve nuts K' from turning after they are once set, I prefer to employ nut-locking devices such as shown in perspective in Fig. 7 and also indicated in Figs. 1, 2 and 3. As shown, each
 85 of these devices consists of a plate O having laterally projecting lugs o at one end and a hole o' at the opposite end. The pivot-pin g extends through the hole o' , while the lugs
 90 o extend partway across the sleeve nut in the manner indicated. Two such devices O are employed as indicated and they overlap at their connection with the pin g .

By the construction shown, the cable is
 95 prevented from rising out of proper position to be engaged by the shoes of the jaws. The jaws may be easily adjusted to compensate for all wear on the shoes and to cause them to at all times grip the cable securely,
 100 the jaws are not only made to securely grasp the cable when the lever is operated but the full force of this grasping action is preserved by the locking mechanism before described and this locking action is made avail-
 105 able, whatever be the adjustment of the devices for compensating for wear on the shoes. All of the working parts of the mechanism are mounted on a swinging frame which moves freely when passing around curves,
 110 doing away with all side stresses on the grip and car when rounding curves or traversing uneven tracks. On curves, the grip swings past the cable-guides without tending to crowd the car as would otherwise
 115 be the case.

I claim as my invention:—

1. A cable-grip comprising a supporting-frame free to swing sidewise, gripping-jaws pivotally connected therewith, an operating-
 120 lever pivotally connected with the swinging-frame, and link connections between the operating-lever and the jaws.

2. A cable-grip comprising a supporting-frame, gripping-jaws pivotally connected
 125 therewith, adjustable, horizontally-arranged links pivotally connected with each other and with the upper outer ends of the jaws, an operating-lever pivotally connected with the frame and link connection between the
 130

operating-lever and the inner ends of the horizontally-arranged links.

3. A cable-grip comprising a supporting-frame, gripping-jaws pivotally connected therewith, adjustable, horizontally-arranged links pivotally connected with the upper ends of the jaw-shanks, a pivot-pin connecting the inner ends of the links with each other, an operating-lever, a link connecting the operating-lever with the pivot-pin of the horizontal links of such length that when the lever is operated to close the grip the axis of the pivot-pin which connects the inner ends of the horizontal links will be below the axes of the pivots of the outer ends of the links and the axis of said inner pivot-pin will be to one side of the axis of the connection between the upper end of the vertical link and the operating-lever.

4. A cable-grip comprising a supporting-frame, gripping-jaws pivotally connected therewith, horizontally-arranged links connecting the upper ends of the jaw-shanks with each other, means for adjusting the lengths of said links, an operating-lever, a vertically adjustable block to which it is connected, and a link connection between

the lever and the inner ends of the horizontally-arranged links.

5. A cable-grip comprising a supporting-frame, gripping-jaws pivotally connected therewith, a vertical bar carried by the frame, a pivot-pin carrying block supported on the bar, horizontally-arranged links pivotally connected with the shanks of the jaws and pivotally connected with said pivot-pin, a vertically adjustable block carried by said vertical bar, an operating-lever pivotally connected therewith, and link connections between said operating-lever and the pivot-pin of said horizontal links.

6. A cable-grip comprising a stationary frame-plate, a swinging supporting-frame having downwardly projecting arms to prevent the cable from rising, gripping-jaws pivotally connected with the supporting-frame, and mechanism for operating the gripping-jaws.

In testimony whereof, I have hereunto subscribed my name.

HARTVIG O. OFSTAD.

Witnesses:

H. H. GRACE,

HELEN A. HILL.