

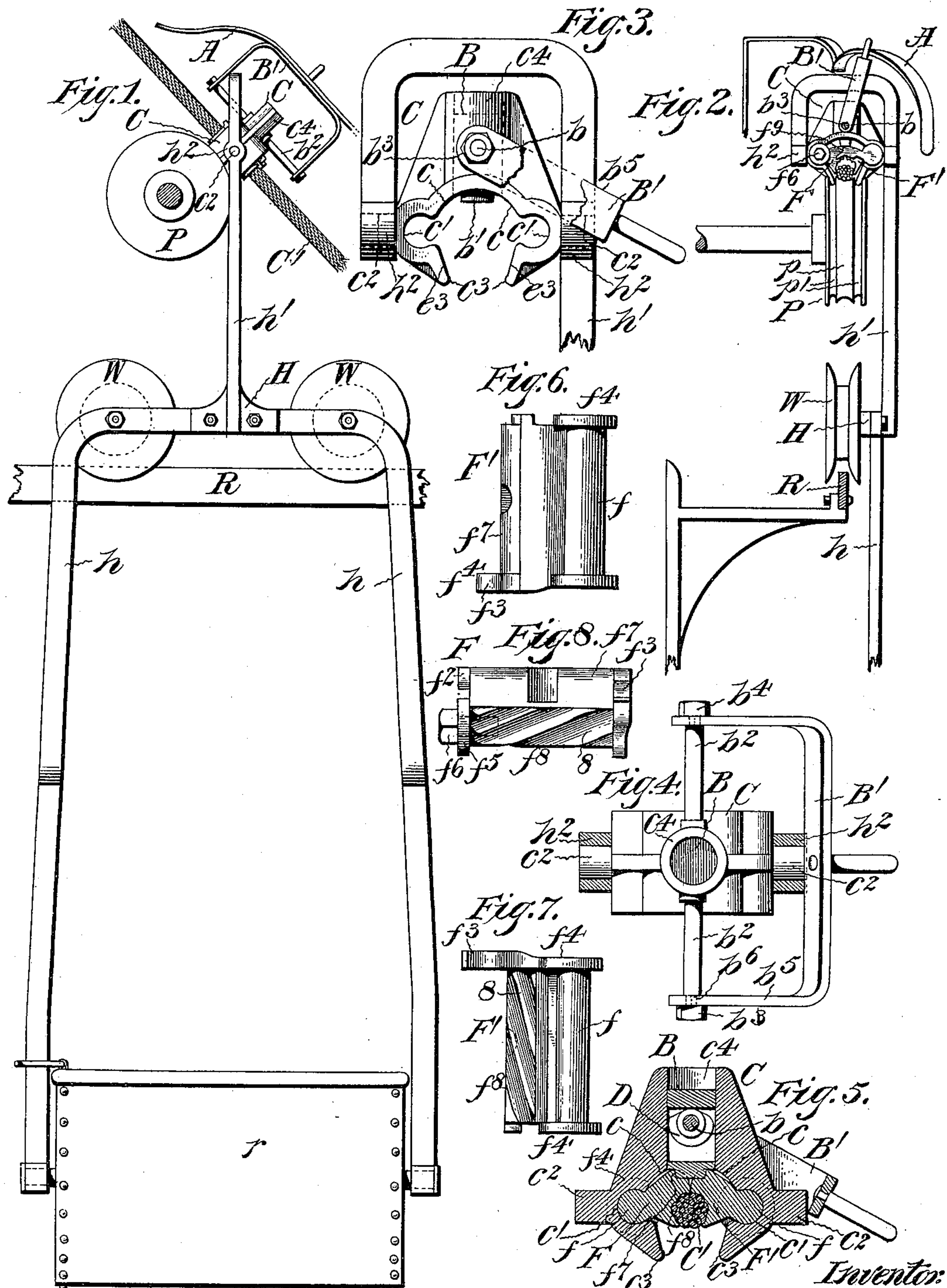
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Patented Nov. 15, 1898.

J. FRIGARD.
CABLE GRIP.

(Application filed Jan. 18, 1898.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE.

JULIO FRIGARD, OF CARTHAGENA, SPAIN.

CABLE-GRIP.

SPECIFICATION forming part of Letters Patent No. 614,380, dated November 15, 1898.

Application filed January 18, 1898. Serial No. 667,105. (No model.)

To all whom it may concern:

Be it known that I, JULIO FRIGARD, a subject of the King of Spain, residing at Carthagena, in the Province of Murcia, in the Kingdom of Spain, have invented certain new and useful Improvements in Rope or Cable Grips; and I do hereby declare that the following is a full, clear, and exact description of my said invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

15 This invention has relation to overhead or aerial cableways; and it has for its object certain improvements, hereinafter fully described, in the gripping device and in other features of cableways.

20 In the accompanying drawings, Figure 1 is a side elevation illustrating the arrival of a vehicle at a terminal station—as, for instance, the charging or loading station of an overhead cableway—showing a portion of the single-rail station-track. Fig. 2 is a front view of Fig. 1. Fig. 3 is a like view of the carrier for the gripping-jaws, the bail which actuates the locking-bolt for the jaws being partly broken away. Fig. 4 is a top plan view thereof; and Fig. 5, a vertical central transverse section, showing the gripping-jaws in position and closed upon the cable. Fig. 6 is a top plan view of one of the gripping-jaws. Fig. 7 is an under side view, and Fig. 8 an inside elevation, of the other gripping-jaw.

35 In Figs. 1 and 2, R indicates the single-rail track at the loading-station, for instance, so arranged relatively to the cable C' that the wheels W of the vehicle when on said rail will relieve the cable of its load, at which moment an arm A, of suitable curvature or inclination, lifts the bail B', that actuates the locking-bolt, and moves said bolt out of engagement with the gripping-jaws F F'.

40 The vehicle consists, essentially, of a hanger H, in the arms h of which the receptacle or carrier r for the load is journaled, and to said hanger are journaled two wheels W, adapted to run on the single-rail tracks R at the loading and dumping stations. The hanger H has a vertical arm h', whose upper end is bent

into U shape and provided with bearings h^2 for the journals c^2 , formed on the cable-grip.

The cable-grip consists of a casting C, two gravitating gripping-jaws F and F', and locking devices for said jaws. The casting C is 55 arched to form two converging jaws c, in the proximate inner faces of which are formed open or recessed bearings c' for the corresponding bearings on the gripping-jaws, said jaws c of the casting terminating in guide lips or flanges c^3 . Centrally from the top of the arch projects a boss c^4 , in the bore of which is loosely fitted a locking-bolt B, said boss having transverse bearings for a spindle 65 b, that has secured thereto a cam D, which works in a slot of the bolt B, which latter has slot-bearings for the cam-spindle b, whereby said bolt is adapted to move vertically in the boss c^4 independently of the cam D. To the 70 spindle b is secured a bail B', that encompasses the upper end of the hanger-arm h', the arrangement being such that when the bail is in a horizontal position the bolt B will be in its lowermost position in engagement 75 with the gripping-jaws F and F', while when said bail B' is lifted into a nearly vertical position the said bolt B will likewise be lifted out of engagement with the gripping-jaws and practically withdrawn into the boss c^4 . 80

The bail B' acts, of course, as a lever on the spindle b, which is of different diameters, to form a shoulder b' , which acts as an abutment to prevent the spindle from being slipped too far through its bearings in the boss c^4 . 85 The attenuated portion of the spindle is for a portion of its length angular in cross-section and fits a corresponding opening in the cam D to cause the same to revolve with said spindle, and on the attenuated end of said 90 spindle, outside of the boss, there is a spacing-sleeve b^2 , that prevents the spindle from endwise motion. The opposite ends of the spindle have a squared portion to fit square holes in the bail-lever B' and screw-threaded 95 outer ends for the fastening-nuts b^3 b^4 . The bearing b^6 on the arm b^5 of the bail-lever B', which fits onto the squared portion of the spindle at the end of greatest diameter of the spindle, is an open or forked bearing, so that 100 when the nuts b^3 b^4 are removed and the arm b^5 disengaged from its bearing the spindle b

can be drawn out of the boss c^4 and cam D, leaving the bolt and cam free for removal from the bore of the boss.

The gripping-jaws F F' consist of an oblong 5 block of steel provided along the outer edge with a substantially semicylindrical bearing-surface f , terminating at each end in one of the jaws, as the jaw F', in a flange or head f^4 of greater diameter than the bearings c^2 in 10 the casting C, in which said bearing-surfaces of the jaws are seated and adapted to turn freely. The other jaw F has a like flange or head f^4 at one end only, that on the other end being replaced by a washer f^5 , secured thereto 15 on the outside of the bearing c^2 of the casting C by a screw-bolt f^6 . The object of this arrangement is to provide a ready means for introducing or removing the gripping-jaws from the casting C, inasmuch as by the un- 20 screwing of the screw-bolt f^6 and removal of the washer f^5 the jaw F can be slipped out of its bearing in the casting C, thus allowing the other jaw F' to be moved out of its bearing and out of the casting through the space 25 between the converging lips e^3 of the arched portion c of the casting.

The upper face of the jaws F and F' is flat and horizontal and terminates in a vertical abutting face f^7 , that merges into a concave 30 gripping-face f^8 , which is or may be suitably roughened or serrated, as usual; but I prefer to provide a striated gripping-face, the grooves of which have a spiral trend corresponding substantially with the pitch of the 35 strands of the cable they are to grip, whereby a better hold is afforded and slipping on and injury to the cable prevented.

From a glance at the drawings Figs. 2 and 5 it will readily be seen that the jaws will 40 turn toward each other in their bearings c^2 by gravity, while the gripping-faces practically on the under side of said jaws will move away from each other or into the open position, in which position the vertical faces f^7 45 will abut, thereby limiting the rotation of the jaws toward each other. Midway of the length of these vertical abutting faces and in the plane of motion of the locking-bolt B are formed concave recesses, the diameter of 50 which gradually increases toward the gripping-faces f^8 , so that when said jaws are turned outwardly to cause the abutting faces to move away from and the gripping-faces toward each other a substantially cylindrical 55 bearing will be formed for the reception of the locking-bolt B, which is thus enabled when lowered to lock the jaws with their gripping-faces closed upon the cable C'.

At one end—say at the front end—of the 60 jaw F, at the angle of the horizontal or substantially horizontal upper face and the vertical abutting face f^7 , is formed a stop-lug f^2 , and on the same end of the jaw F' there is a downwardly-projecting arm f^3 starting from 65 a point below the line of junction of the aforesaid vertical and horizontal faces of the jaw to form an abutting shoulder f^9 , the upper

face of the arm or finger being suitably curved, so that when the jaws are in their open position the lug f^2 will rest against the 70 said shoulder, while when the jaw F' is turned into its closed position, or from left to right, the finger f^3 on said jaw, impinging upon the stop-lug f^2 on jaw F, will turn the latter from right to left. Similar provisions are made 75 on the opposite or rear end of the jaws, with the exception that the lifting appliances are reversed—that is to say, the finger is on the jaw F and the lug on the jaw F', so that should the cable come in contact with one of 80 the gripping-faces only when connection between the cable and vehicle is to be made both jaws will nevertheless be turned in opposite directions to cause their gripping-faces to close upon the cable. It is obvious there- 85 fore that the moment the open jaws contact with the cable and strain is applied thereto at right angles to its axis by the weight of the vehicle or the loaded vehicle the said jaws will be automatically turned so as to cause 90 the gripping-faces thereof to close upon the cable.

In order that the grip may pass over cable guide or supporting pulleys P without danger 95 of jumping the same with the cable, the said pulleys have a central groove p , over which the gripping-jaws readily pass, and on each side of said groove p there is a deeper groove p' for the guide-lips c^3 on the casting C. It is obvious that when so constructed the grip 100 cannot jump a pulley in passing over it.

The operation of the grip may be briefly described as follows: As soon as the vehicle lands on the single-rail track and thereby 105 relieves the cable from its load the bail B' is lifted by the tripping-arm A, thereby releasing the gripping-jaws by lifting the bolt B out of engagement therewith. If the single rail has a slight upward incline, so that the gripping-jaws will clear the cable as soon as 110 released, the said jaws will immediately turn in their bearings by gravity toward each other into their open position. The arrangement of the spindle b and cam D is such that the bail B' cannot be moved vertically to a 115 dead-point, so that as soon as released by the tripping-arm A the bail B', with the bolt B, will drop, and as the gripping-jaws are now open the bolt cannot pass into the recesses f^7 , but rests on the two jaws, ready to drop 120 into said recesses as soon as the jaws F and F' are turned upwardly to a closed position. The vehicle may now be run along the single rail R to the point where it is loaded, the 125 workman guiding and steadying it by means of the hanger-arm h' . When so loaded, it is run to that part of the cable which moves in an opposite direction, the single-rail track R having here a slight downward incline, or 130 away from the cable, so that as the open gripping-jaws contact therewith the weight of the vehicle will turn the jaws F F' in their bearings, thereby lifting the locking-bolt until the said jaws close upon the cable, when

the locking-bolt will drop under its own weight into the recesses between the jaws and lock the same, in which position the upper end of the slot in the bolt will rest upon the portion of least diameter of the cam D, ready to be lifted on the arrival of the carriage at its destination.

Inasmuch as the gripping-jaws are closed by a reciprocal rotation on their axes in a direction opposite to the direction of strain of the load on the cable it is obvious that the heavier the load the greater will be the gripping action of the jaws, so that where very heavy loads are to be transported the locking device may be dispensed with.

When cables made of fibrous material are used which yield more or less under the pressure thereon by the gripping-jaws, the locking end *b'* of the bolt B is made conical, so that as the cable yields and the jaws close tighter thereon, hence form a greater angle between their vertical abutting faces *f'*, the bolt will move farther into the recesses *f'* until it reaches the bottom thereof.

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

1. In a cable-grip, the combination with the gravitating jaws, of a bolt resting on them, said jaws adapted to automatically engage a cable, throw up the bolt, and allow it to fall between and lock said jaws, substantially as set forth.

2. In a cable-grip, two gravitating jaws, a bolt resting on said jaws when open, and notches in the meeting faces of the jaws, said jaws adapted to throw up the bolt, engage the cable and allow the bolt to fall into the spread notches and lock the grip, substantially as set forth.

3. In a cable-grip having gravitating jaws, a finger and lug on each jaw, the finger on one jaw adapted to engage the lug on the other, a bolt resting on the jaws, and notches in the jaws, said jaws adapted to grip the cable, throw up the bolt and allow it to fall into the spread notches and lock the grip, substantially as described.

4. In a cable-grip, the combination with gravitating jaws, means on said jaws adapted to mutually engage and cause the simultaneous action thereof; of a bolt resting on said jaws, and an unlocking-lever operatively con-

nected to the bolt, said jaws adapted to grip a cable, throw up the bolt and lever, and allow the bolt to fall between and lock said jaws without actuating said lever, substantially as set forth.

5. A cable-grip comprising a casting arched to form two jaws having open bearings, gripping-jaws having complementary bearing-surfaces, stops at the ends of said bearing-surfaces, embracing the casting to prevent endwise motion of the jaws, and stops on the outer lower edge of the jaws to limit their drop, a gravity-bolt resting on the jaws, a hanger pivoted at right angles to the jaws, and an unlocking-bail riding over the hanger and adapted to operate said gravity-bolt, said bolt adapted to drop between the abutting faces of the jaws when lifted thereby, substantially as and for the purpose set forth.

6. A vehicle for overhead cableways, comprising the receptacle or vehicle proper *r*, a hanger H in which said vehicle is journaled, said hanger having a vertical extension *h'* whose upper end is bent into an inverted-U shape, a cable-grip journaled in said bent end of the extension, and wheels W, journaled to the hanger above the receptacle, for the purpose set forth.

7. In an overhead cable-road, a vehicle comprising the receptacle or vehicle proper *r*, a hanger H having carrier-wheels W above the point of suspension of the receptacle, and an extension whose upper end is bent into an inverted-U shape, the casting C journaled in said bent end, the gravitating gripping-jaws pivoted in the jaws of said casting, the locking-bolt B adapted to engage the gripping-jaws when closed and lock the same closed; in combination with a cable adapted to be gripped by the gripping-jaws, a single-rail line-terminal arranged relatively to the cable to relieve the same of its load when the vehicle reaches the rail, and means for automatically lifting the locking-bolt out of engagement with the gripping-jaws when said vehicle is on the single-rail terminal, for the purposes set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

J. FRIGARD.

Witnesses:

JOSÉ CARRENO,
A. GARAT.