

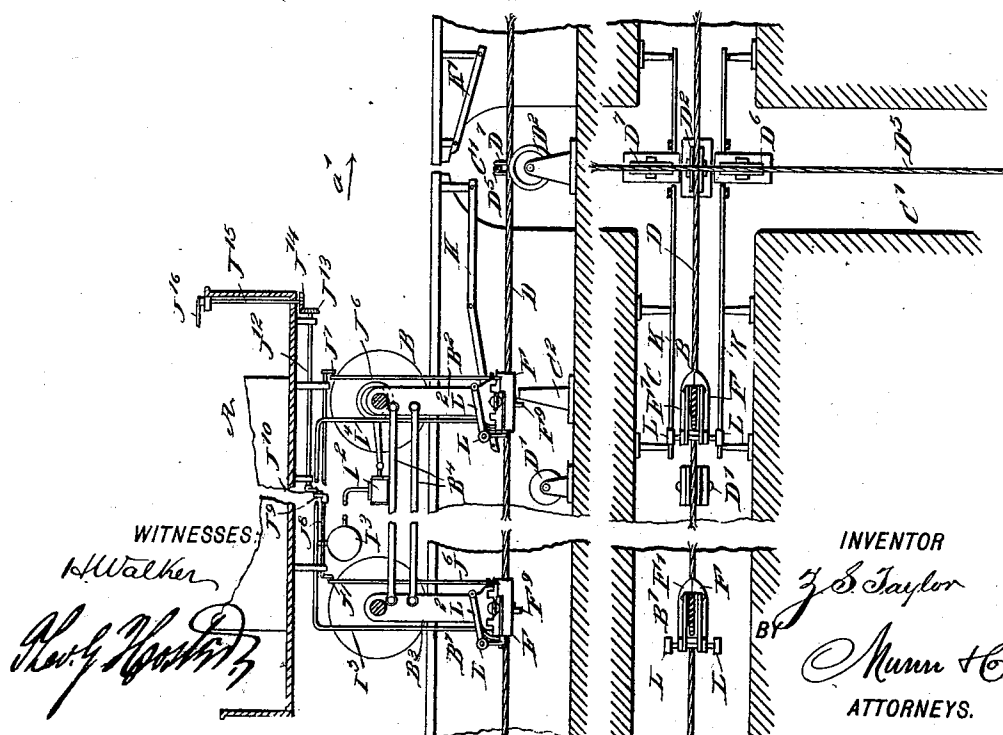
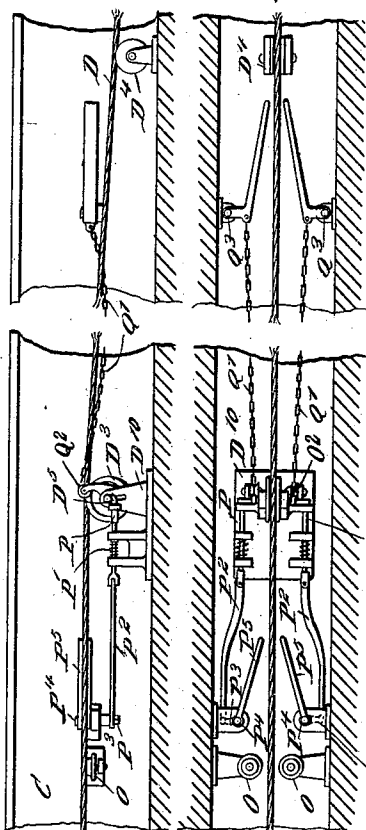
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Z. S. TAYLOR.
CABLE GRIP.

No. 549,033.

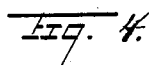
Patented Oct. 29, 1895.



6 Sheets—Sheet 2.

No. 549,033.

Patented Oct. 29, 1895.



WITNESSES:

H. Walker

Rev. G. Hooper,

INVENTOR

J. S. Taylor

BY

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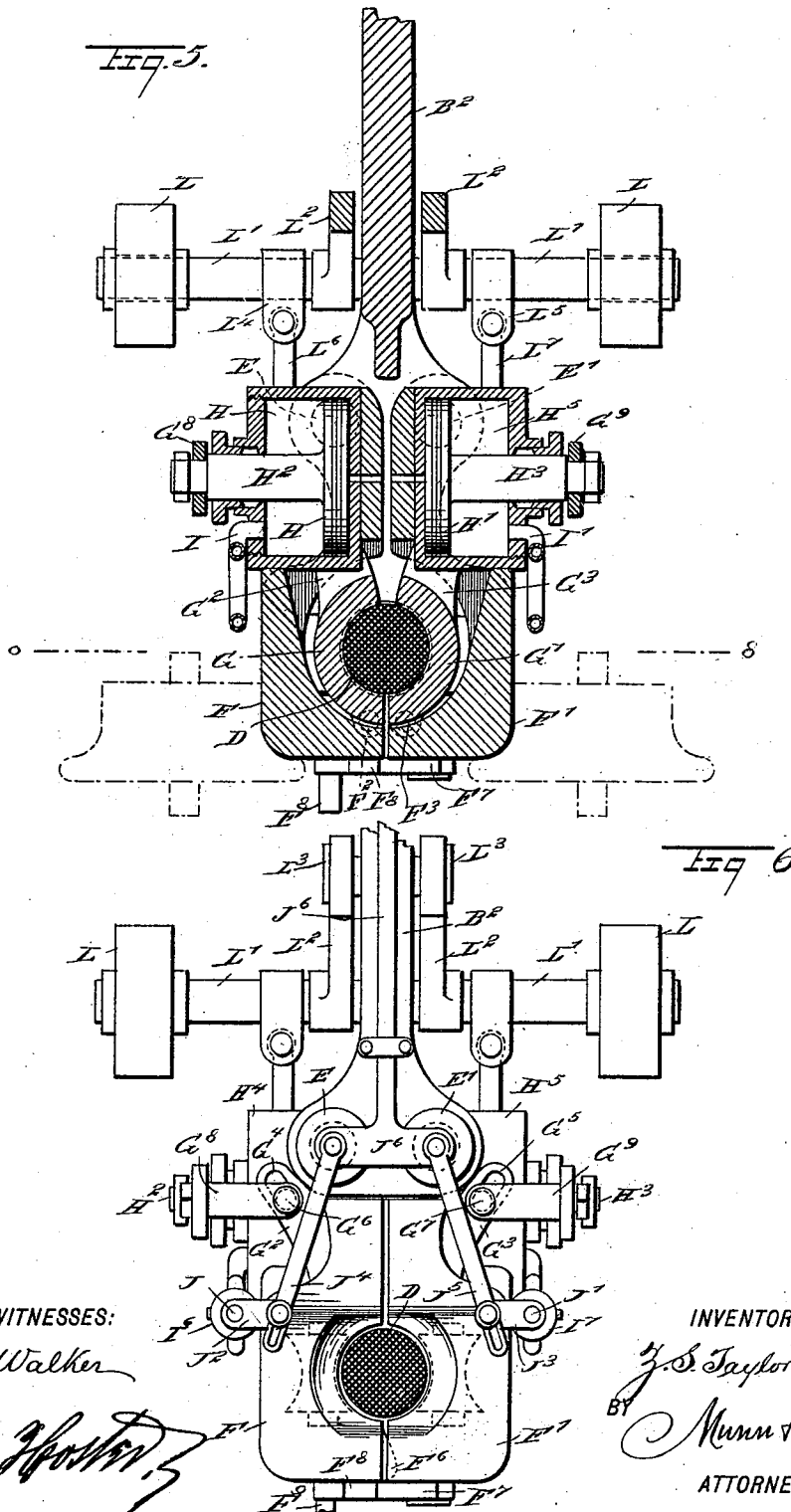
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Z. S. TAYLOR.
CABLE GRIP.

No. 549,033.

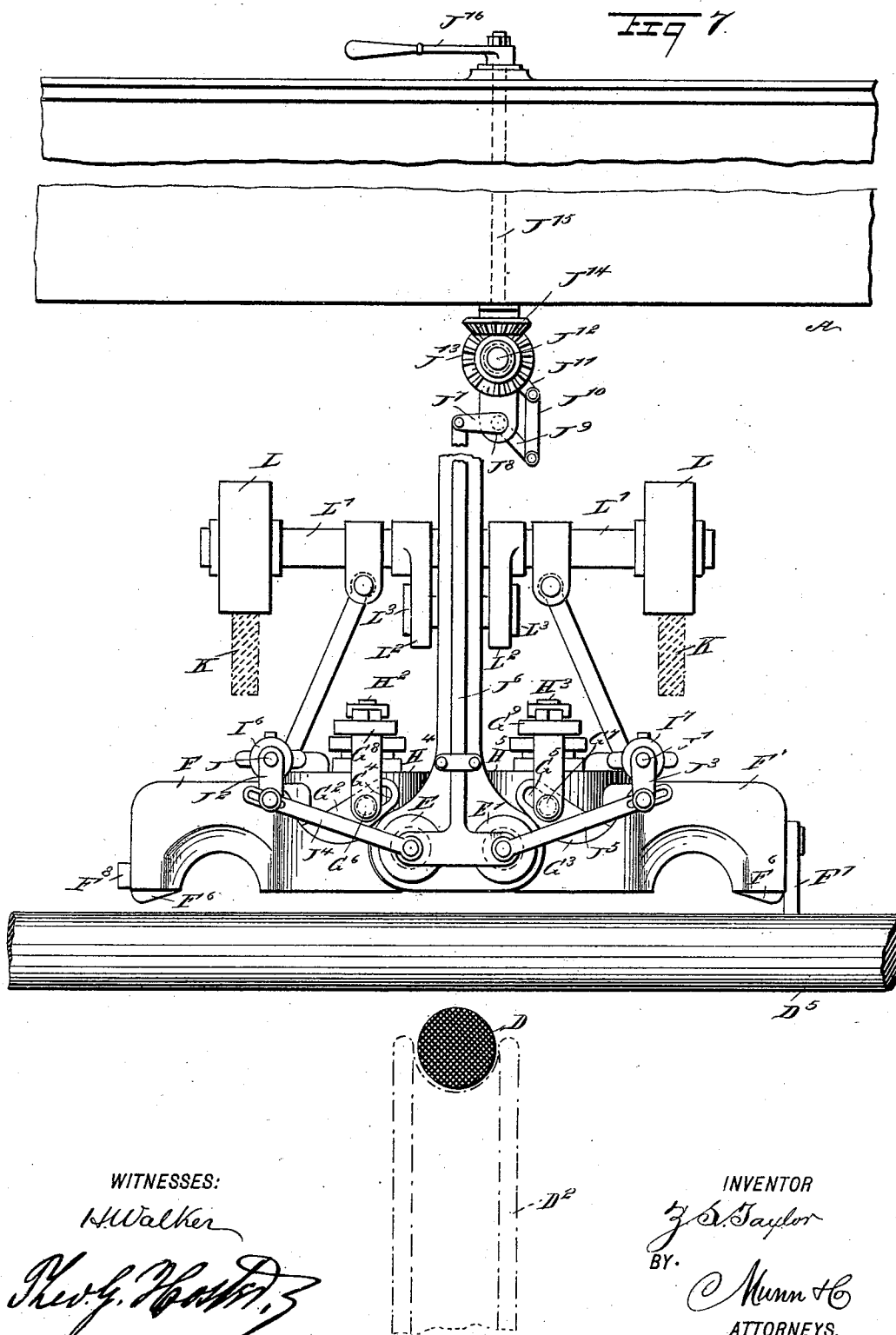
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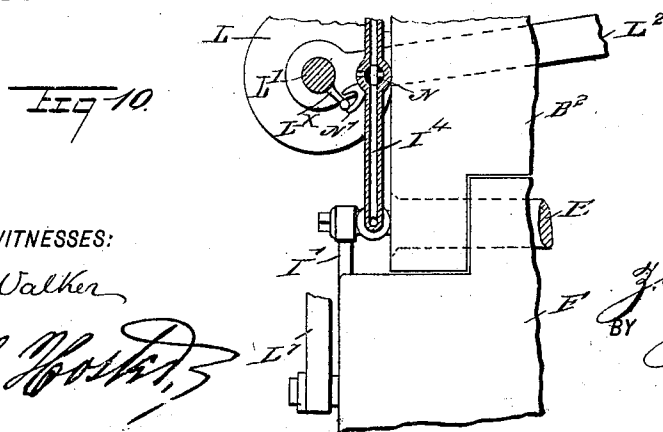
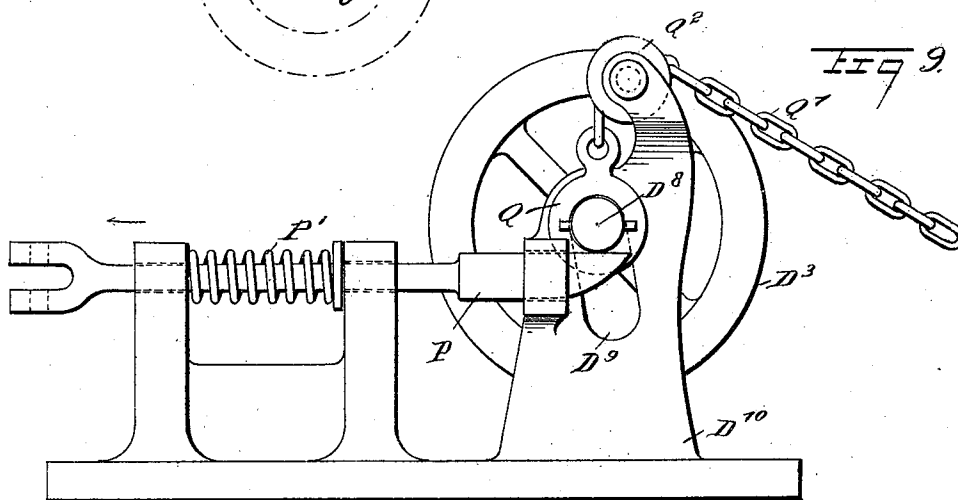
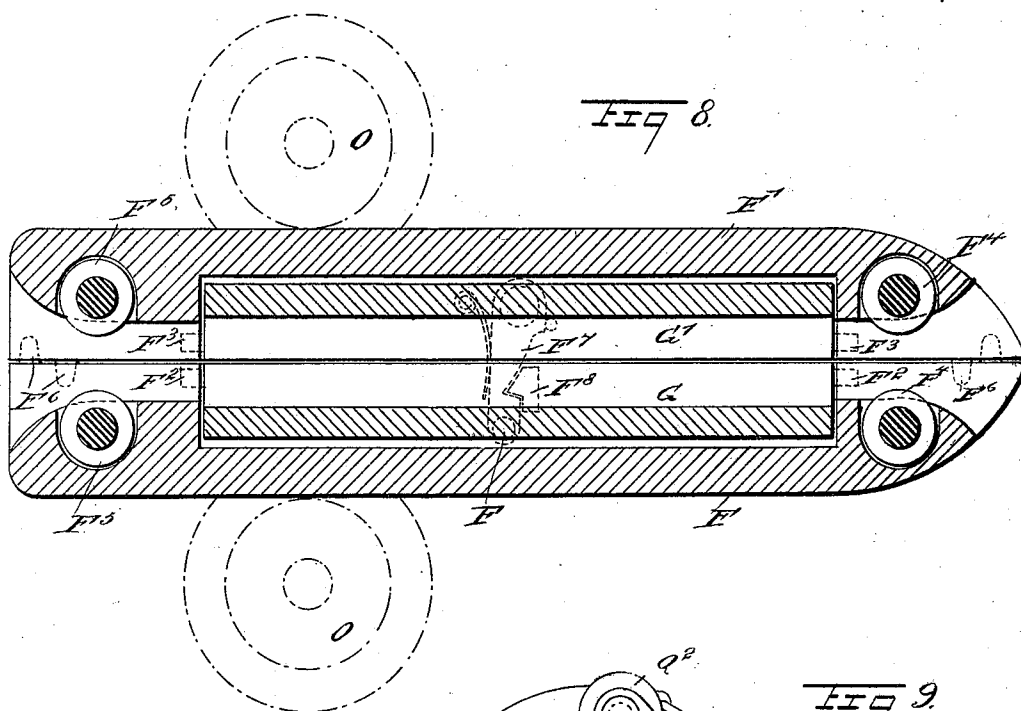
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Z. S. TAYLOR.
CABLE GRIP.

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(No Model.)

6 Sheets—Sheet 6.

Z. S. TAYLOR.
CABLE GRIP.

No. 549,033.

Patented Oct. 29, 1895.

Fig. 11.

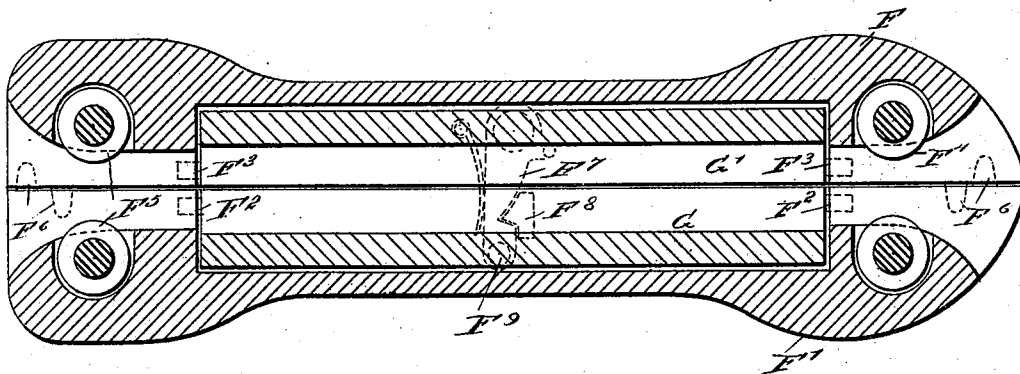
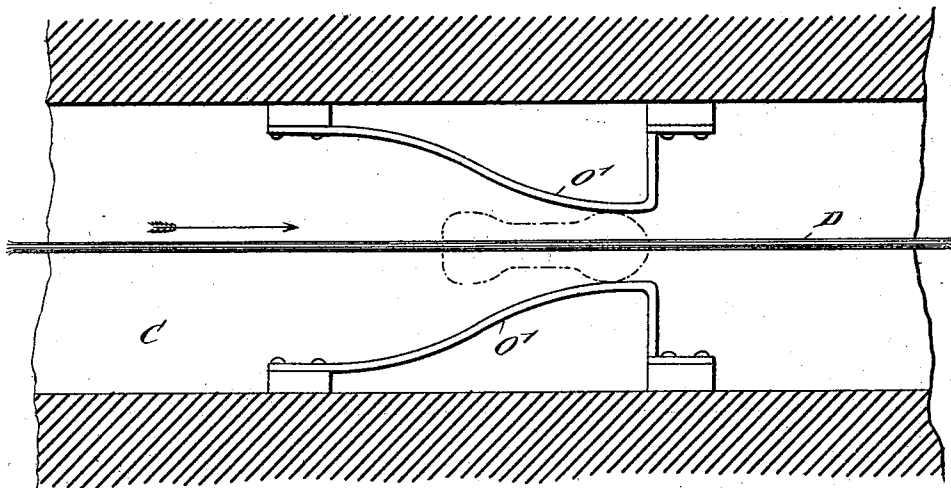


Fig. 12.



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UNITED STATES PATENT OFFICE.

ZEBULON S. TAYLOR, OF LONG BRANCH, NEW JERSEY.

CABLE-GRIP.

SPECIFICATION forming part of Letters Patent No. 549,033, dated October 29, 1895.

Application filed December 15, 1894. Serial No. 531,998. (No model.)

To all whom it may concern:

Be it known that I, ZEBULON S. TAYLOR, of Long Branch, in the county of Monmouth and State of New Jersey, have invented a new and Improved Cable-Grip, of which the following is a full, clear, and exact description:

The object of the invention is to provide a new and improved cable-grip arranged to permit the operator to readily open and close the gripping-jaws to release or engage the cable and adapted so that a part of it automatically releases the cable at a crossing and swings clear of the crossing cable, while the remaining part of the grip retains its hold on the cable-grip until the first part has again closed onto the cable, to be then moved up and clear of the crossing cable.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied and with the car and cable duct in section. Fig. 2 is a sectional plan view of the same. Fig. 3 is an enlarged side elevation of the front gripping device. Fig. 4 is a sectional plan view of the same on the line 4 4 of Fig. 3. Fig. 5 is a cross-section of the same on the line 5 5 of Fig. 3. Fig. 6 is a front elevation of the same. Fig. 7 is a similar view of the same with the casing open to pass the crossing cable. Fig. 8 is a sectional plan view of one of the gripping devices on the line 8 8 of Fig. 5. Fig. 9 is an enlarged side elevation of one of the cable-carrier pulleys and means for raising or lowering the same. Fig. 10 is an enlarged sectional side elevation of a three-way valve for an air-pipe and adjacent parts. Fig. 11 is an enlarged sectional plan view of a modified form of casing for the gripping device, and Fig. 12 is a sectional plan view of the closing device for the modified form of casing shown in Fig. 11.

The car A on which the cable-grip is applied supports on its front and rear trucks the gripping devices B and B', which are thus located near the front and rear ends of the car, the said gripping devices being provided with

frames B² and B³, respectively, connected with each other by bars B⁴, and preferably supported on the front and rear car-axes and extending through the usual slot into the duct C, through which extends the cable D. The latter normally rests, when not engaged by the gripping devices, on the usual carrier-pulleys D' D² D³ D⁴, and the said cable D is crossed on top by the crossing cable D⁵, resting on pulleys D⁶ and D⁷, located in the crossing duct C', through which the crossing cable D⁵ passes.

As both gripping devices B and B' are substantially alike in construction, it suffices to describe but one in detail.

The lower end of each frame B² or B³ carries on each side two aligned pintles E and E', of which the pintles E carry the gripping-jaw casing F and the other pintles E' carry the gripping-jaw casing F', so that both casings are adapted to swing on the pintles to open and close, as will be understood by reference to Figs. 6 and 7. The casings F and F' contain the gripping-jaws G and G', respectively, pivoted at their lower ends in the bottoms of the casings F and F' at F² and F³, as plainly illustrated in Figs. 3, 5, and 8, the said gripping-jaws having sufficient room within the casings to close and open to engage and grip or disengage the cable D.

The casings F and F' when closed form at their front and rear ends openings for the passage of the cable, and in the said front and rear ends are journaled guide-pulleys F⁴ and F⁵, engaging opposite sides of the cable D to prevent the latter from rubbing against the sides of the casings, at the same time preventing undue wear on the cable. The inner faces of the casings F and F' are provided at their lower ends and at the front and rear with sets of dowel-pins F⁶ to insure proper closing of the casings when the same are swung downward into a closed position. The casings F and F' are securely locked in position by a spring-pressed catch F⁷, fulcrumed on the under side of the casing F' and adapted to engage a fixed lug F⁸ on the under side of the casing F. (See dotted lines in Fig. 8; also Figs. 5 and 6.) From the free end of the catch F⁷ extends downwardly a pin F⁹, adapted to be engaged by an arm C² secured in the duct C near the crossing C', as illustrated in Fig.

1, so that the catch F^7 is opened to unlock the casings F and F' at the time the gripping devices B or B' arrive near the crossing duct C' .

The gripping-jaws G and G' are provided on their upper ends with arms G^2 and G^3 , respectively, extending through suitable recesses in the casings G and G' , and the upper slotted ends G^4 G^5 of the said arms G^2 and G^3 are engaged by pins G^6 and G^7 , respectively, supported on cross-heads G^8 G^9 , respectively, secured on the outer ends of piston-rods H^2 and H^3 , respectively, held on the pistons H and H' , respectively, mounted to slide transversely in cylinders H^4 and H^5 , respectively, secured on the casings F and F' . When the pistons H and H' are in their innermost positions, as illustrated in Fig. 5, then the gripping-jaws G and G' are closed on the cable D , so as to connect the respective gripping device B or B' with the cable. The pistons H and H' are normally held in this innermost position by compressed air supplied to the cylinders H^4 and H^5 by pipes I and I' , respectively, connected with an air-compressor I^2 , supported on the bars B^4 and preferably actuated from one of the car-axles to furnish the necessary supply of air to a reservoir I^3 , from which the air passes to the cylinders H^4 and H^5 , as hereinafter more fully described.

The pipes I and I' of the gripping device B connect with a pipe I^4 , leading to the reservoir I^3 , and the pipes I and I' of the gripping device B' are connected by a pipe I^5 with the said compressed-air reservoir I^3 . In the pipes I and I' for each gripping device B or B' are arranged three-way valves I^6 and I^7 , respectively, of ordinary construction and arranged to permit compressed air to pass to the cylinders, to shut off the air from the cylinders, and to connect the latter with the outer air to permit the air in the cylinders to exhaust to the outer air, as hereinafter more fully described. The valves I^6 and I^7 are provided with valve-stems J and J' , respectively, mounted to turn in suitable bearings in the casings F and F' , respectively, and the forward ends of the said stems J and J' carry crank-arms J^2 and J^3 , respectively, connected with the slotted ends of links J^4 and J^5 , respectively, pivoted on the lower end of a bar J^6 , mounted to slide vertically in suitable bearings arranged on the frame B^2 or B^3 .

The upper end of each bar J^6 is connected by a crank-arm J^7 with a longitudinally-extending shaft J^8 , journaled in suitable bearings on the under side of the car A , as plainly shown in Figs. 1 and 7. The inner ends of the two shafts J^8 for the two gripping devices B and B' are provided with crank-arms J^9 , connected by a link J^{10} with a crank-arm J^{11} , secured on a shaft J^{12} , likewise journaled in suitable bearings on the under side of the car A , the front end of the said shaft J^{12} carrying a bevel gear-wheel J^{13} in mesh with a bevel gear-wheel J^{14} , fastened on the lower end of the staff J^{15} , mounted to turn in suitable bearings on the dashboard of the car to carry at

its upper end a lever J^{16} under the control of the operator.

Now when the several parts are in the position illustrated in Figs. 3, 4, 5, and 6, then the cable D is engaged and gripped by the gripping-jaws G and G' of the two sets of gripping devices B and B' . It will be seen that the valves I^6 and I^7 in the two gripping devices B and B' are now open, so that compressed air from the reservoir I^3 can pass to the outer ends of the cylinders H^4 and H^5 of both gripping devices to hold their pistons H H' in an innermost position, so that the jaws G G' engage and grip the cable D . Now when the operator desires to stop the car he gives the lever J^{16} about a quarter-turn to rotate the staff J^{15} to impart by the gear-wheels J^{14} and J^{13} a rotary motion to the shaft J^{12} , which by the crank-arms J^{11} J^9 and link J^{10} turns the shafts J^8 so that their crank-arms J^7 pull the bars J^6 to simultaneously turn the two shafts J and J' of each gripping device B B' , so that the valves I^6 I^7 of each gripping device are simultaneously operated to cut off the supply of air and to connect the interior of the cylinders H^4 and H^5 with the outer air. Thus the pressure on the outer faces of the pistons H and H' is removed, so that the pistons H and H' move outward by atmospheric air passing into the inner ends of the cylinders through openings formed therein. (See Fig. 5.) The outward movement of the pistons H and H' of each gripping device causes the cross-heads G^8 and G^9 to move in the same direction, so that a pull is exerted on the arms G^2 and G^3 , whereby the gripping-jaws G and G' swing open within the closed casings F and F' . Thus the cable D is released simultaneously at both gripping devices B and B' , and by the operator now applying the brakes in the usual manner the car is brought to a standstill.

When it is desired to again start the car, the operator returns the lever J^{16} to its former position, so that the valves I^6 I^7 of both gripping devices B and B' are simultaneously opened to permit compressed air from the reservoir I^3 to pass to the outer ends of the cylinders H^4 H^5 , to force the pistons therein into an innermost position to again close the gripping-jaws G and G' tightly around the cable D . The latter now again draws the car forward.

When the car approaches a crossing, as illustrated in Figs. 1 and 2, then it is necessary that the casings F and F' of the gripping devices B and B' should be swung upward to clear the crossing cable D^5 , as illustrated in Fig. 7. At the same time the gripping-jaws G and G' must be automatically released from the cable to readily move with their casings into an uppermost position. In order to do this automatically and without requiring the slightest attention on the part of the operator in charge of the car, I arrange in the duct C , on which the car approaches, inclined rails K , on which are adapted to travel friction,

rollers L, mounted to rotate loosely on the outer ends of a shaft L', journaled in the free ends of levers L², extending longitudinally and fulcrumed at L³ on the front end of the frames B² or B³ of the gripping devices B and B'.

The shaft L' of each gripping device B or B' is provided with downwardly-extending lugs or arms L⁴ and L⁵, pivotally connected by links L⁶ and L⁷, respectively, with the casings F and F', respectively, at the rear ends of the latter, as plainly illustrated in the drawings. On the shaft L' of each gripping device is also held an arm L^x, (see Fig. 10,) adapted to engage the forward end of an arm N', held on the stem of a three-way valve N, arranged in the pipe I⁴ or I⁵. When the shafts L' are in their normal lowermost position, then the valves N in both pipes I⁴ and I⁵ are open to permit the passage of compressed air from the reservoir I³ to the sets of cylinders H⁴ H⁵ in the gripping devices B B', as previously explained; but when the car approaches the crossing and the casings F and F' are unlocked by the pin F⁹ striking the arm C², as previously described and the rollers L travel up the inclined rails K, then the levers L' swing upward, whereby the arm or lug L^x on the shaft L' imparts a swinging motion to the valve-stem N', so that the valve N is turned to shut off the supply of air from the reservoir I³ to the pipes I⁴. At the same time the upward swinging motion of the levers L² causes the links L⁶ and L⁷ to pull on the unlocked casings F and F', so that the latter swing open, carrying along the jaws G and G', which are now released from the cable D as the air has been cut off from the cylinders H⁴ and H⁵, it being understood that the air from the latter can pass through the open three-way valve N to the outer air. Thus when the rollers L finally pass onto the horizontal portion of the rails K, which extend into the duct C', then the casings F F' and their jaws G and G' are in an uppermost horizontal position, as illustrated in Fig. 7—that is, the gripping device B is raised above the cable D⁵ to be crossed. Now it will be seen that during this operation the rear gripping device B' is still closed and its jaws are firmly engaged with the cable, so that the car is propelled forward by the rear gripping device and while the front gripping device B is in an open position.

A second set of inclined rails K' is arranged on the other side of the duct C' in the duct C, so that the rollers L, after leaving the ends of the rails K, come in contact with the under sides of the downwardly and forwardly inclined rails K', whereby the levers L² are swung downward to gradually close the casings F and F', and also to again open the valve N at about the time when the gripping device B has passed the duct C'. In order to completely and finally close the casings F and F', I arrange in the duct C in front of the rails K a pair of rollers O, between which pass the front pointed ends of the casings F and F',

so that the said friction-rollers finally engage the sides of the casings and positively close the same by the spring-catch F⁷, engaging the lug F⁸. At this time the valve N has been completely closed by contact of rails K' with rollers L, and the compressed air passing into the cylinders H⁴ H⁵ forces the pistons H and H' inward to automatically move the gripping-jaws G and G' into gripping contact with the cable D. At this time the rear gripping device B' approaches the arm C² and the rails K and is acted on in a similar manner as the gripping device B, previously described, to first unlock the casings F and F', to swing the same into an open position and simultaneously shut off the air to release the gripping-jaws, to permit this gripping device to pass over the crossing cable D⁵. Thus it will be seen that the car A is firmly gripped on the cable D by both gripping devices B and B', as long as the car passes over an ordinary stretch of the track, and when the car passes over a crossing then the gripping devices are successively and automatically released from the cable and re engaged, so that the car is at all times attached to the cable and consequently moved forward in a positive manner and not depending on any momentum of the car to bring the latter over the crossing. It is understood that the second gripping device B' is again closed after passing the crossing cable D⁵ by the rails K' and the rollers O.

In order to hold the cable D at a proper height or on a level between the pulleys D² and D³ for the gripping devices B and B' to readily close onto the cable after passing the duct C', I place the pulley D³ at the same level with the pulley D², and in order to permit the gripping devices to clear the said pulley D³ I cause the latter to drop temporarily and shortly after the gripping device is closed on passing through the rollers O. After the gripping device has cleared the pulley D³ the latter is again raised to hold the cable in the proper position—that is, on a level between the pulleys D² and D³ for the next gripping device to properly close on the cable after passing the duct C'. Now by reference to Figs. 1, 2, and 9 it will be seen that the shaft D⁸ of the pulley D³ is journaled in an elongated slot D⁹, formed in the stand D¹⁰ for the said pulley D³, the said slot D⁹ being arranged nearly perpendicularly, as indicated in Fig. 9. The shaft D⁸ is normally held in the upper end of the slot D⁹ by bolts P, fitted to slide longitudinally in suitable bearings in the stand D¹⁰, and the said bolts P are pressed on by springs P' to normally hold the bolts under the shaft D⁸. The rear ends of the bolts P are pivotally connected by links P² with arms P³, secured on the lower ends of vertically-disposed shafts P⁴, (see Figs. 1 and 2,) journaled in suitable bearings attached to the sides of the duct C. On the upper ends of these shafts P⁴ are held arms P⁵, extending forwardly and inwardly toward the cable D, so as to be engaged by

the sides of the casings F and F' after the latter have passed the rollers O.

Now when the several parts are in the position shown in Figs. 1, 2, and 9 and the gripping device B after passing the rollers O engages the arms P⁵, then the latter are swung outwardly by coming in contact with the casings F and F'. This outward movement of the levers or arms P⁵ causes a turning of the shafts P⁴ and swinging of the arms P³, so that a pull is exerted by the links P² on the bolts P, and the latter are consequently withdrawn from under the shaft D⁸, so that the latter by its own weight drops and carries the pulley D³ downward out of the way of the now approaching gripping device B. The latter thus clears the pulley D³; but before the gripping device B' has cleared the crossing C' the said pulley D³ is again raised into its normal position by the action of the first gripping device B, and for this purpose I provide the following device: The shaft D⁸ is provided with loose collars Q, connected with chains Q', extending upwardly and passing over pulleys Q², journaled in the stand D¹⁰. The chains Q' then extend forward to connect with levers Q³, fulcrumed on the sides of the duct C, the said levers Q³ extending forwardly and inwardly toward the cable D, as plainly indicated in Fig. 2. Now after the gripping device B has cleared the pulley D³, as previously described, and the latter drops, then a pull is exerted on the chains Q' by the collars Q moving downward with the shaft D⁸, and then the levers Q³ are swung inwardly, so as to be in the path of the now approaching gripping device B. The latter by its casings F and F' pushes the levers Q³ apart, so that the chains Q' are drawn forward, and consequently the shaft D⁸ is raised past the curved ends of the bolts P to finally assume an uppermost position with the bolts P passing under the shaft D⁸ by the action of their springs P'. Thus the cable extending between the pulleys D² and D³ is held in a horizontal or a level position for the second gripping device B' to readily close on the cable D after it has crossed the duct C'. The second gripping device B' opens the levers P⁵ to permit the pulley D³ to drop in the manner previously described in reference to the gripping device B, so that the gripping device B' readily clears the pulley D³, and then by coming in contact with the levers Q³ the gripping device again raises the pulley D³ to bring the cable into proper position for the gripping devices of the next car.

As shown in Fig. 11, the form of the casings F and F' is slightly changed to permit the casings to pass easily through curved parts of the duct. It will be seen that should a car stop on a curve then the jaws can readily open, as the cable engages either set of pulleys F⁴ or F⁵, according to the form of the curve to the right or left. When the jaws are again closed, they bind the cable as usual. As shown in Fig. 12, the rollers R are dispensed with and fixed rails O' are substituted to finally close

the casings F and F' after the gripping device has passed the crossing, as previously explained.

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

1. A cable grip, provided with a gripping device comprising a pair of hinged casings, and a pair of gripping jaws hinged within the said casings and adapted to be opened and closed in the closed casings, substantially as shown and described.

2. A cable grip, comprising a gripping device provided with pivoted casings and jaws pivoted therein, and inclined rails for opening and closing the said casings and their jaws, substantially as shown and described.

3. A cable grip, comprising pivoted casings carried by the grip frame, links pivotally connected with the said casings, a shaft connected with the said links and carrying friction rollers, levers carrying the said shaft and fulcrumed on the grip frame, and inclined rails adapted to be engaged by the said rollers to open the said casings, substantially as shown and described.

4. A cable grip, comprising a pair of pivoted gripping jaws provided with arms, cross-heads connected with the said arms, pistons carrying on their piston rods the said cross-heads, and cylinders in which operate the said pistons and which are connected with a source of compressed air supply, substantially as shown and described.

5. A cable grip, comprising a pair of pivoted gripping jaws provided with arms, cross-heads connected with the said arms, pistons carrying on their piston rods the said cross-heads, cylinders in which operate the said pistons and which are connected with a source of compressed air supply, air supply pipes connected with the said cylinders and leading from an air reservoir, and valves in the said air pipes and adapted to be opened and closed by the operator in charge of the car, substantially as shown and described.

6. A cable grip, comprising a pair of pivoted gripping jaws provided with arms, cross-heads connected with the said arms, pistons carrying on their piston rods the said cross-heads, cylinders in which operate the said pistons and which are connected by pipes with a source of compressed air supply, valves in the said pipes to admit or cut off air to the said cylinders and to release air therefrom, fixed inclined rails, and means, substantially as described, for opening and closing the said valves, the said means being controlled from the said inclined rails, substantially as shown and described.

7. A cable grip, provided with hinged casings, gripping jaws pivoted in the said casings, and a catch for positively locking the said casings in a closed position, substantially as shown and described.

8. A cable grip, provided with hinged casings, gripping jaws pivoted in the said cas-

ings, a catch for positively locking the said casings in a closed position, and means fixed in the duct for unlocking the said catch previous to the arrival of the gripping device at the crossing, substantially as shown and described.

9. The combination of a support a carrier pulley for the cable, bolts for supporting the pulley in an uppermost position, and a releasing device for withdrawing the said bolts to permit the said pulley to drop, substantially as shown and described.

10. The combination of a support a carrier pulley for the cable, bolts for holding the said pulley in an uppermost position, and means, substantially as described, for drawing the said pulley in an uppermost position to permit the bolts to support the pulley, as set forth.

11. In a cable grip, the combination of a pair of hinged casings having hollows on their adjacent faces, gripping jaws pivoted in said casings and means for actuating the jaws and casings independently, substantially as set forth.

12. In a cable grip, the combination of a pair of hinged casings having rollers at their ends to guide the cable and provided with hollows between the said rollers, gripping jaws pivoted in said hollows and means for actuating the jaws and casings independently, substantially as set forth.

13. In the cable grip, the combination of a pair of hinged casings having longitudinal recesses or hollows on their adjacent faces adapted to coincide when the casings are closed together, gripping jaws pivoted in said hollows and movable therein to grip the cable independently of the movement of the casings

and means for actuating said jaws, substantially as set forth.

14. In a cable grip, the combination of a pair of hinged casings having longitudinal recesses on their adjacent sides adapted when the casings are closed together, to coincide and form a longitudinal passage for the cable, gripping jaws pivoted at their lower parts to the lower parts of the casings and adapted to be moved in the said recesses therein into and out of position to grip the cable and means to actuate the said gripping jaws, substantially as set forth.

15. The combination of a cable, a slotted frame, a pulley adapted to support the cable and having a journal engaging the slot of the frame, a bolt mounted to slide in the frame and adapted when in one position to support the journal of the pulley, and means actuated from a passing car, for moving said bolt to disengage said journal, substantially as set forth.

16. The combination of a cable, a slotted frame, a pulley adapted to support the cable and having a journal engaging the slot of the frame, a bolt mounted to slide in the frame and adapted when in one position to engage and support said journal, means actuated by a passing car to move said bolt to release said journal, a roller on the frame, a chain passing over said roller and connected to said journal and means for drawing on said chain to raise said pulley, substantially as set forth.

ZEBULON S. TAYLOR.

Witnesses:

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RACHEL E. BROWN.