

(No Model.)

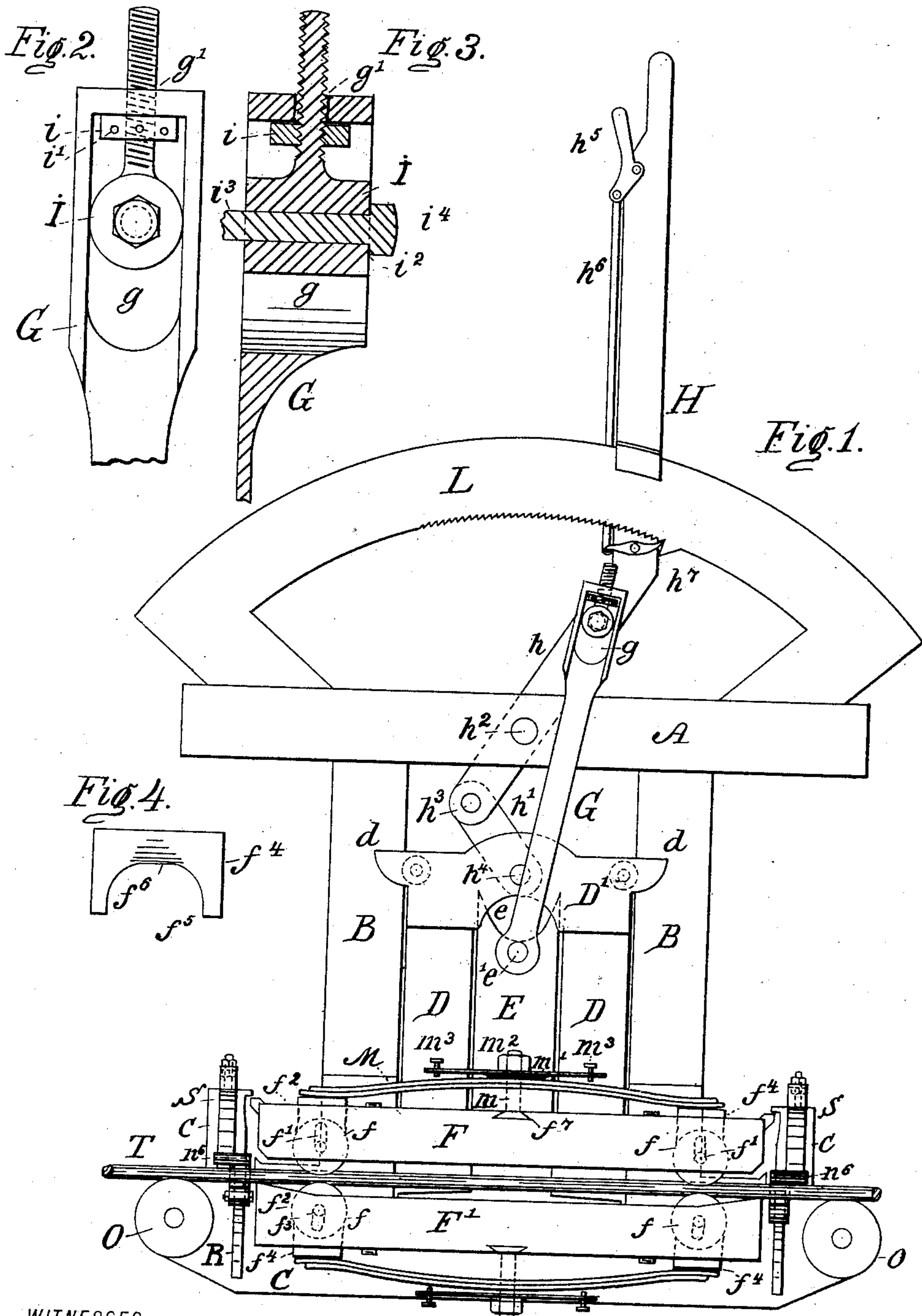
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N. ABBOTT.

GRIP APPARATUS FOR CABLE RAILWAYS.

No. 363,788.

Patented May 31, 1887.



WITNESSES:

INVENTOR.

S. L. C. Hazen
V. Springer

Noel Abbott,
BY
Rich^d. H. Manning
ATTORNEY

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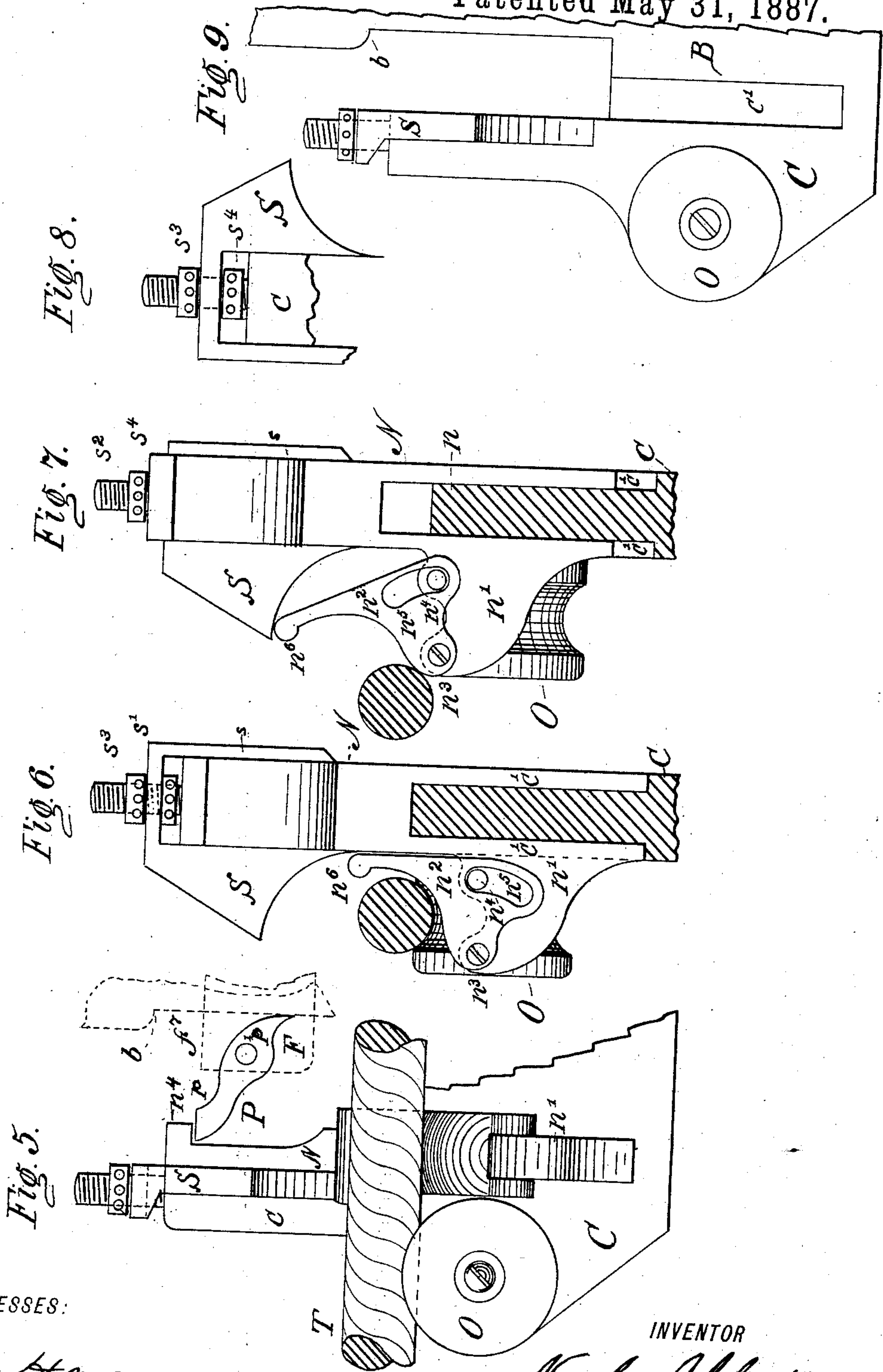
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UNITED STATES PATENT OFFICE.

NOEL ABBOTT, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO
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GRIP APPARATUS FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 363,788, dated May 31, 1887.

Application filed July 29, 1886. Serial No. 209,369. (No model.)

To all whom it may concern:

Be it known that I, NOEL ABBOTT, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Grip Apparatus for Cable Railways; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide, in a gripping apparatus for a cable, means for adjusting the grip-jaws in proportion to the wear occasioned by the friction of the cable, and also to afford a more certain means of throwing the cable out of the grip, and also for increasing the power of the spring controlling the brake-blocks; and it consists in the novel combination and arrangement of parts, hereinafter described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the grip apparatus in readiness to be attached to a car. Fig. 2 is a side view of a portion of the lever for elevating the lower grip-jaw, and showing the means for decreasing its length in connection therewith. Fig. 3 is a transverse sectional view of Fig. 2. Fig. 4 is a view of the brake-block disconnected from the grip and showing its construction. Fig. 5 is a view of a portion of the horizontal beam, showing my novel means thereon for tripping the cable. Fig. 6 is a transverse view of a portion of the tripping apparatus in its normal position, as seen in Fig. 5. Fig. 7 is a similar view to that shown in Fig. 6, and showing the position of the tripping device in the act of throwing the cable from the grip. Fig. 8 is a detail view showing a portion of the upsetting-guide and the adjusting screws and nuts. Fig. 9 is a view of a portion of the horizontal beam, showing the post and the upsetting device thereon.

In the construction of my invention I attach to the horizontal pivot-beam A, which supports the grip on the car, the upper ends of the opposite vertical fixed side plates, B B. The side plates, B B, are placed a suitable dis-

tance apart to receive between them the movable elevating and depressing plates D D E. To the lower ends of the fixed side plates, B B, is fixedly attached the lower horizontal beam, C, which, together with the upper beam, A, form the frame of the grip apparatus.

The depressing-plates D D are made of the proper width for strength, and are attached at their upper ends to a movable cross-head, D', which consists of two transverse plates, extending horizontally from one fixed side plate B to an opposite fixed side plate, and on opposite sides of the grip apparatus, the opposite ends of each plate overlapping upon the side plates, B B, and forming guides *d d*, which serve to control the vertical movements of the depressing-plates. The lower ends of the said depressing-plates D are attached to the side of the horizontal upper grip-jaw, F.

The elevating-plate E is arranged to slide between the opposite depressing-plates D D, the upper end of which plate is cut away in a transverse curved relation, as at *e*, so as to enable the said plate E to extend upwardly between the opposite plates of the cross-head D' and avoid the pivots of the levers, hereinafter described. The lower end of the said elevating-plate E is fixedly attached on its face side to the side of the horizontal lower grip-jaw, F', both of said jaws being placed upon the same relative side of the grip apparatus and in opposite gripping relations to each other.

Upon the side of the grip apparatus having the jaws F' F', and to the upper end of the elevating-plate E, I attach to pivot *e'* the lower end of a lever, G. Said pivot *e'* extends outwardly a sufficient distance from the plate E to enable the lever G to avoid frictional contact with the sides of the cross-head D'. Upon the opposite side of the grip apparatus to that having the jaws F' F', and to the horizontal supporting-beam A, I attach to said beam, by means of the pivot *h*², the depressing-lever *h*. Said lever *h* extends upwardly and rigidly unites with the operating-lever H, to which it is attached, and in relation to which it describes an obtuse angle. The lower end portion of the lever *h* extends a short distance below the horizontal beam A, and to said end I attach, by means of the pivot *h*³, one end of

the toggle-joint lever h' , the opposite end of which toggle-lever is attached by means of the pivot h^4 to the cross-head D' at a point midway the length of said cross-head. The under side of the cross-head D' is cut away transversely in a manner corresponding to that shown by the upper portion, e , of the elevating-plate E , which permits the pivotal connections of the levers G h to approach each other more closely. The upper end of lever G , which operates the elevating-plate E , is connected pivotally to the upper portion of the lever h on the opposite side of the grip apparatus. Both of said levers G h are so constructed in reference to length and so attached to the elevating-plates that the grip-jaws F F' are brought together with the full force with which the levers are permitted to work.

The constant friction of the cable upon the grip-jaws gradually wears away their gripping-surfaces, and for the purpose of enabling the adjustment of the jaws in close relation with each other and to provide for this loss I form in the upper portion of the lever G , at its pivotal point of connection with the lever h , a horizontal transverse slot, g , through the extreme upper end of lever G , and leading from the slot g , I make the vertical perforation g' . I then make a headed pin, I , with its shank screw-threaded, of a size to admit the head of the pin between the sides of the longitudinal slot g and prevent it from swiveling, and upon said shank fit a nut, i , said shank being then inserted through the vertical perforation g' in the lever G , and extending outwardly above the ends of the lever a short distance, to permit of its vertical adjustment.

The head of the pin I is made with a transverse perforation, i^2 ; and a bolt or pivot, i^3 , having a head, i^4 , is inserted through said perforation and through the upper end of the lever h . Thus it will be seen that the slight adjustment of the nut i serves to decrease the length of the lever as it becomes necessary.

Mounted upon the horizontal beam A is a segmental rack, L , and close to which the operating-lever H is made to come in the sweep of the lever. The rod h^6 , which is attached at one end to the bell-crank lever h^5 at the upper end of the operating-lever, is also attached at its lower end to a pawl, h^7 , which engages with the teeth of the segmental rack L .

To enable the cable to be seized without shock to the car, I arrange in the upper and lower grip-jaws, F F' , and at opposite ends the rollers f f' . To receive these rollers f f' , I make vertically through the ends of said grip-jaws the openings f^2 f'^2 . I then make in the opposite sides of said grip-jaws, extending a suitable distance in a vertical relation, the slot $f'f'$. The rollers being placed in the slot f^2 f'^2 , the pins f^3 are inserted through said rollers and form the journals therefor. Within the openings f^2 f'^2 , and in contact with the rollers f f' , I arrange the brake-blocks f^4 f'^4 , which are made to fit in the openings f^2 in the jaws

of the grip, and are cut away upon the under side in a curved form, as at f^5 in Fig. 4, to extend over the periphery of the rollers, and the upper portion of the curve is flattened, as seen at f^6 , so that only such portion of the brake-blocks shall come in contact with the periphery of said rollers when brought into play.

To enable the brake-blocks to yield together with the rollers under pressure, and to afford means for increasing the power of the spring, I extend from the top portion of one brake-block f^1 on the upper jaw, F , to the brake-block f^4 on the opposite end of said jaw, the strut-spring M , made in one piece and having separate layers one upon another, as the stiffness of the spring is found necessary. From the upper portion of the jaw F of the grip and midway its length is extended a vertical screw-bolt, m , the head of which is pushed within the transverse socket f^7 , dovetailed with grip-jaw of the exact portion of the head of the bolt m . A perforation is then made centrally through the spring M and the shank of the bolt inserted therethrough. I then make a straight bar, m' , shorter in length than the strut-spring M , through which I make a perforation midway its length and fit said bar over the bolt m . I then fit a nut, m^2 , upon the end of the bolt m , for adjustment, as hereinafter described. I then make a screw-threaded perforation vertically through the opposite ends of the straight bar m' and insert the thumb-screws m^3 m^3 , the ends of which rest upon the strut-springs M , the length of said bar m' being made to extend such a distance from the bolt that the point at which the highest strain is brought upon the spring may be re-enforced by means of the thumb-screws m^3 m^3 , as soon as the nut m^2 is turned down upon the straight bar m' , the resistance being obtained in the spring by said nut upwardly. The ends of the bar m' resist tension as the thumb-screws m^3 are adjusted upon the strut-spring. The strut-spring serves to retain the brake-blocks in place in the jaws of the grip in the simplest manner, and as pressure is applied the flattened portion of the brake-block is sufficient to retard the rotation of the rollers.

Upon the lower jaw, F' , the rollers and brake-blocks are arranged in the same manner as for the upper jaw, F , the brake-blocks being inserted from beneath and into the slot in said jaw and the spring being arranged beneath.

For the purpose of throwing the cable with precision from off the carrying-rollers and from out the jaws of the grip at the proper time, I form upon each end of the lower horizontal beam, C , and extending vertically above said beam between the relative position of the ends of the lower grip-jaw and the carrying-rollers, a guide-post, c . I then make a movable upright tripping-lever, N , to extend in length from the lower portion of the horizontal beam C to a point slightly above the upper jaw, F , of the grip, and to play between the guide-post c and the jaw of the grip. To en-

able this lever N to retain itself upon the horizontal beam C, I cut away between the grip-jaw and the carrying-roller a portion, c' , from the opposite sides of the said beam C, extending downwardly a sufficient distance to give a strong lateral bearing to said lever. I then make transversely through the lower end of the said lever N a groove, n , which extends upwardly a sufficient distance in said lever, and is of a proportionate size to that portion c' of the beam C cut away to receive it. The lever N is made with a bracket, n' , on the side of said lever toward the upper grip-jaw. Upon the opposite ends of the upper grip-jaw, F, and in the slot f' in said ends of jaw, and extending in a direction of the lever N and pivotally attached to the said jaws, is the pawl P, one end, p , of which engages with the lip n^4 of the lever N in the elevation of the said upper jaw, F, and the opposite end, p' , of said pawl contacts with the shoulder b , formed on the side portion of the fixed side plates, B B. (See Fig. 5.)

Upon one side of the lever N, and at the relative height of the carrying-roller O when said lever is in a normal position, and opposite said rollers, I rigidly attach to or make intact with said lever a bracket, n' , extending laterally therefrom. To the outer end of the bracket n' , I pivotally attach, by means of the pivot n^3 , one end of a movable inclined tripping-tongue, n^2 . The said tongue n^2 is a flat plate, which is constructed with a lower end portion extending in a horizontal relation from the outer extreme end of the bracket n' (to the side of which bracket it is pivotally attached by the pivot n^3) rearwardly to the side of the lever N, and the lower end rounded or curved at that point, so as to enable the said tongue to be thrown forward and avoid contact with said lever. A curved slot, n^5 , is made in the tongue n^2 , near its curved end portion, and in the side of the bracket n' , I fixedly attach a pin, n^4 , which extends outwardly through said slot and is in line horizontally with the pivot n^3 , so that as the tongue is moved outwardly the pin n^4 guides and limits the movement of said tongue.

The tongue n^2 extends upwardly a sufficient distance to exceed the height of the cable T when said cable is resting in the cable-carrying pulleys O O, and is given a curved shape on its outer edge extending from its pivotal point at n^3 upwardly and rearwardly, and terminates in a rounded end, n^6 . The portion of the tongue n^2 which rests against the lever N is made straight in a vertical relation with said lever.

Upon the fixed vertical post c , on the beam C, and upon the side of said post which is contiguous to the tongue n^2 on lever N, I attach an adjustable curved guide-plate, S. This guide-plate S is attached to the side of the adjustable cap s' , a flanged portion s of which extends downwardly along the side of said post c on the side opposite to that upon which the guide-plate S is placed.

In the top of the post c is fixed rigidly a vertical screw-bolt, s^2 , and through the cap s'

is made an opening, which permits the screw-bolt to pass freely. Upon the bolt s^2 , I fit a nut, s^4 , which is turned upon the screw-bolt s^2 , and a nut, s^3 , fitted to the bolt s^2 , which is turned down upon the cap s' . The cable-carrying pulleys O are attached to the side of the lower horizontal beam, C, at opposite ends, and upon the side carrying the jaws F F' of the grip, and receive the cable T' when the jaws have released their grip upon the cable.

In the operation of my improved gripping apparatus, the operating-lever H is thrown forward, or in such a position as to close the jaws of the grip upon the cable, in the view of the apparatus as seen in Fig. 1 to the right and in relation to the pivot h^2 of the depressing-lever h , and the elevating-lever G is afforded a shifting and also an adjustable fulcrum, the toggle-lever h' being thrown so as to approach a plane parallel with the depressing-lever h and also the lever G. This action draws up the lower and depresses the upper grip-jaws. Whenever the interior frictional surfaces of the opposite jaws which grasp the cable become worn, the jaws, it will be seen, come close together; and to retain the proper angle of the lever and the proper adjustment of the jaws I adjust the nut i on the threaded pin, which shortens the distance of the lever G between its pivotal points i' i^3 , and thus draw up the lower jaw of the grip the required degree. An adjustable fulcrum is afforded between the operating and elevating levers, which adjustment may be made upon the toggle-lever as well as upon the elevating-lever, when necessary. It will also be seen that the lever G moves as the nut is raised and the pivot remains stationary.

For the purpose of throwing the cable out of the jaw of the grip the operating-lever H is thrown in such a position as to throw the lever h G the farthest distance apart, and this action carries the jaw F' upward, and with it the lever N. The end n^6 of the tongue n^2 comes in contact with the curved guide S, and the cable T is ejected from the grip, the power thus exerted being sufficient to accomplish the result. Should the guide-plate S be required to act with a greater degree of force, the nuts s^3 s^4 are turned to adjust the said plate the proper height. The cable being ejected from the grip, the end piece, p' , of pawl P meets the projection b on the fixed side of plate F and the pawl releases its engagement with the lip n^4 of lever N, and the said lever N falls into its normal position.

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

1. The combination, with the grip-jaws, of the yielding grasping-rollers on opposite ends of said jaws and brake-blocks in contact therewith, and a strut-spring secured to said jaws and engaging opposite brake-blocks, for the purpose specified.

2. The combination, with the grip-jaws, of the yielding grasping-rollers on opposite ends of said jaws and brake-blocks in contact there-

with, and a strut-spring secured to said jaws and engaging opposite brake-blocks, and a re-enforce bar and means thereon for adjusting the tension of said spring.

5 3. The combination, with the grip-jaws, of the yielding grasping-rollers on opposite ends of said jaws and brake-blocks in contact therewith, and a strut-spring secured to said jaws and engaging opposite brake-blocks, a bolt
10 extending from said jaws through said spring, and a re-enforce bar attached to said bolt and provided with adjustable bearing-screws at the opposite ends of said bar, substantially as described.

15 4. The combination, in a grip apparatus, with the movable jaws, of an operating-lever attached to said apparatus and an elevating-lever connecting one of said jaws with said operating lever and pivoted thereto adjust-

ably, and a toggle-jointed depressing-lever at- 20 tached to an opposite jaw and rigidly attached to said operating-lever, for the purpose described.

5. The combination, in a grip apparatus having fixed side plates and a movable grip- 25 jaw and a low horizontal beam, of a tripping-lever on said beam, provided with a movable upsetting tongue and a lip on said lever, a post on said beam, having an adjustable guide in the path of said tongue, and a pawl in said 30 movable jaw in the path of said lever, and the lip on said lever, and a shoulder on said side plate in the path of said pawl, as and for the purpose specified.

NOEL ABBOTT.

Witnesses:

FRED. W. PERKINS,
WILL A. BUIS.