

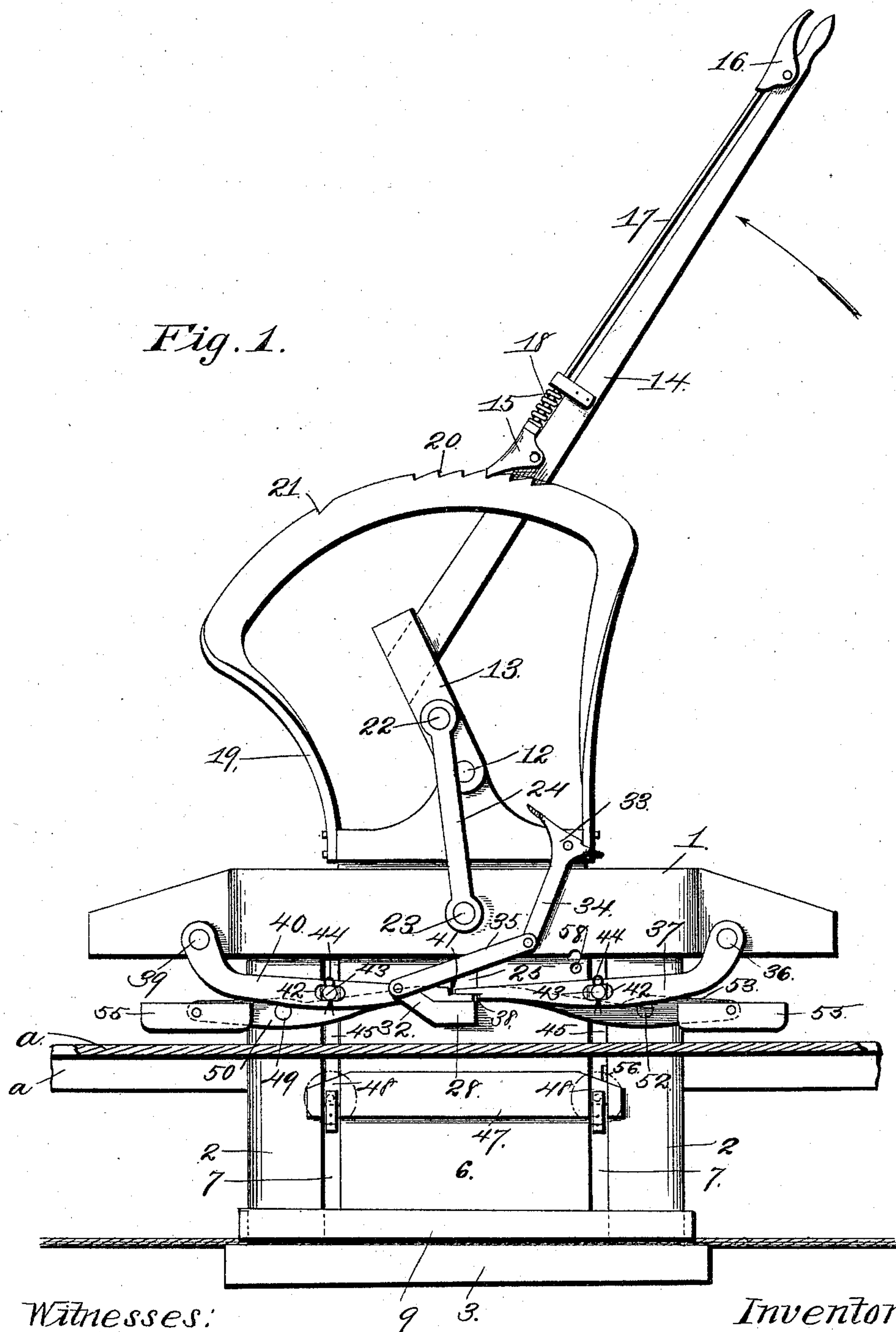
(No Model.)

2 Sheets—Sheet 1.

J. T. MARLIN.  
CABLE CAR GRIP SLOT BRAKE.

No. 526,453.

Patented Sept. 25, 1894.



Witnesses:

H. G. Fischer  
G. K. Thorpe

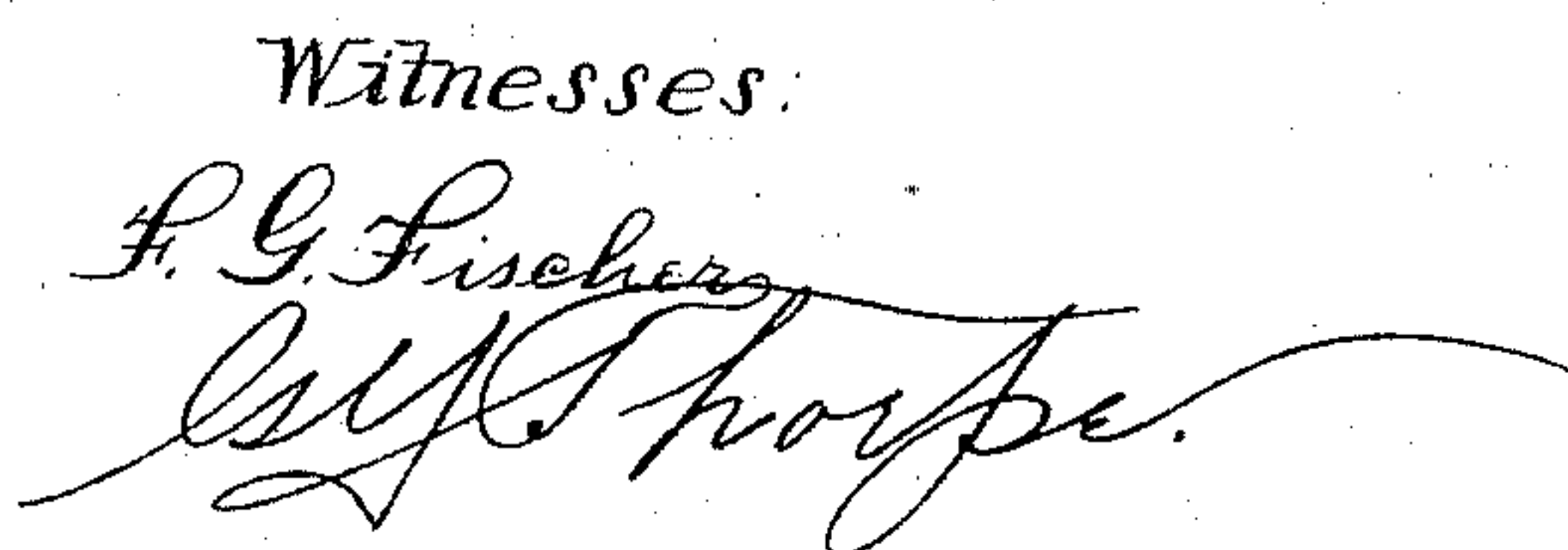
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2 Sheets—Sheet 2.

No. 526,453.

Patented Sept. 25, 1894.



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# UNITED STATES PATENT OFFICE.

JAMES T. MARLIN, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-THIRD  
TO ALFRED BLAKER, OF KANSAS CITY, KANSAS.

## CABLE-CAR-GRIP SLOT-BRAKE.

SPECIFICATION forming part of Letters Patent No. 526,453, dated September 25, 1894.

Application filed January 22, 1894. Serial No. 497,701. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES T. MARLIN, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Cable-Car-Grip Slot-Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to cable-car grip, slot-brakes, and has for its object to produce a mechanism of this character wherein one lever is employed to perform the triple function of applying the brakes, and of releasing, and gripping, the cable; so as to give the grip-man perfect and absolute control over the car.

A further object is to produce a lever-operated mechanism, which will move the brakes adjacent to the slot-rail or friction-surface, so that by the operation of the grip-lever, the cable is released and the brakes applied instantaneously; and furthermore to produce a mechanism of this character, which is simple, strong, durable, and comparatively inexpensive of construction.

With these objects in view, and others of secondary importance, as hereinafter appear, my invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described and claimed.

In order that my invention may be fully understood, reference is to be had to the accompanying drawings, in which—

Figure 1. represents a side elevation of a mechanism of the character referred to, constructed in accordance with my invention, and showing the gripping mechanism in operative position relative to the cable, and the brakes occupying their inoperative or normal position. Fig. 2. represents a side elevation with the gripping mechanism in the same position, but with the brakes arranged adjacent to the slot-rails, so that they may be applied simultaneously with the release of the cable.

Fig. 3. is a vertical sectional view, taken on the line  $x-x$  of Fig. 2. Fig. 4. is a side elevation of a portion of the grip and brake mechanism, and showing the movable grip jaw raised or elevated, and the brakes in operative position against the slot-rails. Fig. 5. is a detail perspective view of the levers, and

the lower brake carried thereby. Fig. 6. is a detail perspective view of one of the upper brake-shoes, and the levers carrying the same. Fig. 7. is a sectional view of a rotatable block which actuates directly, the brake-levers. Fig. 8. is a cross-sectional view of a pair of slot-rails of a construction different from those illustrated in Fig. 3, and showing the friction surface of the lower brake, beveled to correspond with the inclination of the inner side of the said slot-rails.

Referring to the drawings, where similar numerals refer to corresponding parts in all the figures, the grip-frame carried by the car in the usual manner, is composed of the horizontal beam 1, the standards 2, depending vertically from the beam 1, a suitable distance apart, and between the slot-rails  $a-a$ , and the lower and stationary gripping-jaw 3, which is carried horizontally at the lower end of the vertical standards 2. This gripping-jaw is provided in the usual manner with the longitudinally extending and marginal recesses 4—4 in its upper side.

The beam 1 is formed with a vertical passage 5, through which extends and operates reciprocally, the center-piece 6 of the grip, and this center-piece is in width sufficient to form a narrow vertical slot 7, between each margin and the adjacent parallel inner margins of the standards 2, and this center-piece corresponds in thickness with the said standards. The center-piece 6 above the bar 1, is laterally enlarged or thickened at 8—8, to strengthen the same, and is provided at its lower end and at each side with the longitudinally extending and horizontal strips 9—9, which, projecting beyond the side margins at 10, embrace the opposite sides of the standards 2—2, so as to afford a guide in the reciprocation of the center-piece, and these strips 9, which may be integral with the center-piece, as shown in Fig. 3, form the upper gripping-jaw, which is formed marginal and longitudinally extending with grooves 11—11, in its lower side, and these grooves are arranged vertically over the grooves 4—4 of the lower gripping-jaw.

Pivotally mounted upon the opposite ends of a pin 12, carried by the upper end of the center-piece, is the lower end of a short lever 13, and projecting upwardly from this lever



and at a suitable angle therefrom, is the gripping-lever 14. This gripping-lever forms practically a continuation of the lever 13. Pivotaly carried by the gripping-lever in the usual manner, is the pawl 15, and the hand-lever 16, connected by the rod 17; and the pawl 15, is actuated to engage the teeth of the sector-frame 19, by the spring 18, in the usual manner. This sector-frame is provided with the ordinary notches 20, and with a single notch 21 at some distance in advance thereof. The object of this notch is explained hereinafter. Pivotaly mounted at their upper and lower ends at 22, and 23, respectively, two cylindrical lugs projecting from the short lever 13, and the horizontal bar 1, are pitman-bars 24, and the pivotal point 22, of the said pitman bars, forms a movable fulcrum during the operation of the gripping-lever, to raise the movable jaw of the grip; this fulcrum point 22, moving concentrically with the axis of the pivotal point 23. By this connection the fulcrum point 22, moves away from the center of the grip, and allows the lever to exert a direct upward pull to raise the movable jaw of the grip. It will be further apparent that when the lever is moved in either direction the fulcrum point 22, moves in the same direction, and this allows the movable jaw of the grip to be raised or lowered its maximum distance with the minimum of lever movement. The center-piece 6 is formed immediately below the bar 1, and midway its width, with a vertical slot 25.

A rectangular block 26, is recessed or cut away at 27, a sufficient distance to leave intact about half the width of the block, and this forms the shoulder 28—28, at opposite sides of the recess 27. The middle-portion thus connecting the two end-portions, is diametrically, slightly narrower than the thickness of the block, so as to form guide flanges or shoulders 29, which lie in the same plane as the shoulders 28, and form therewith, a continuous or annular guide-flange at each side of the middle portions. This middle portion is rounded at two of its adjacent sides so as to partially rotate when necessary, and has its two opposite sides flattened as shown at 30 and 31; these flattened sides being adapted to limit the rotatable movement of the block to about ninety degrees or a quarter of a circle. This middle-portion of the block occupies the lower and semicircular end of the slot 25, of the center-piece, and in its normal or inoperative position, the rectangular shoulder portions 28, occupy a horizontal position; (see Fig. 1,) the recess 27, being disposed toward (what I designate) the front end of the grip-mechanism and embracing the adjacent vertical side margins of the slot 25. When in this horizontal position, an arm 32 projects forward, and at a slight angle upward, from the front end and outer margin of one of the shoulder portions 28, of the block. Pivotaly mounted at the upper end, and the

rear corner, preferably, of the center-piece 6, and at the side thereof occupied by the arm 32, is a foot lever 33, and this foot lever 33, is provided with a depending arm 34, which is pivotaly connected to the free end of the arm 32, through the medium of the link 35. It will be apparent from this construction that the operation of the foot lever will rotate the block in the slot 25, until one or the other of the flattened faces 30, or 31, of the middle-portion of the block, comes in contact with the vertical margin of the slot 25, accordingly as the block is rotated upward or downward. Pivotaly mounted upon each end of the pin 36, carried by the bar 1, a suitable distance to one side of its center, is a lever 37; there being thus one of these levers at each side of the center-piece, and these levers are formed at their free and inner ends and in their under sides with the notches 38. A pin 39, projects from the bar 1, in the same plane as the pivotal point 36, and at a distance from the opposite side of the center equal to the distance from the center to the point 36, and pivotaly mounted upon each end of the pin 39, is a lever 40; there being thus one of these levers at each side of the center-piece, and they are recessed in the upper side of their free ends at 41, to receive the overhanging portions of the notches 38 of the levers 37, and to have their projecting portions, correspondingly engaging the notches 38 of the said levers 37. The inner ends of the levers 40 rest upon the end of the shoulder portions 28 of the block 26, so that they shall be pivotaly operated when said block is rotated.

The levers 37 and 40, opposite the vertical slots 7, are formed with the longitudinal slots 42, and extending transversely through each pair of these slots is an arm or pin 43, and these arms or pins are retained in position preferably by spring-keys or counters 44. Depending centrally from each arm or pin 43, and formed integrally therewith preferably, is an arm 45, and these arms fit snugly and are adapted to reciprocate in the slots 7. These arms are thickened at their lower ends for a suitable distance, so as to form at opposite sides thereof the vertical recesses or grooves 46. (See Fig. 5.) The lower brake, composed of similar friction-plates 47, located at each side of the center-piece, are vertically grooved near each end as shown at 48, so as to fit snugly within the vertical grooves 46 of the arms 45, and at the same time to allow the outer sides of the thickened lower portion of said arms, to lie in the same vertical plane, or flush with, the outer sides of the friction-plates. The end of each friction-plate is beveled inwardly to a point from the margin of the adjacent groove. The reason for supporting the friction-plates 47, so that they lie in the same vertical plane as the thickened portion of the arms 45, and also the beveling of the ends of said friction-plates, is to afford no abrupt shoulders or



surfaces, to contact with a bolt-head or any obstruction which may project from the inner side of the slot-rails. However, this is a matter of construction only.

5 Pivotally mounted upon each end of a pin 49 projecting centrally from a standard 2 and above the slot-rails, is a pair of levers 50, there being one of these levers on each side of the center-piece, and they are notched at their free or inner ends to form the tongues or projections 51, which rest upon the shoulder portions 28 of the block 26. Pivotally mounted upon a pin 52 projecting from the center of the other standard 2, and in the same horizontal plane as the pin 49, are a pair of similar levers 53; there being one of these levers at each side of the center-piece, and they are notched at their inner ends to form tongues or projections 54, which rest upon the tongues or projections 51 of the levers 50. The levers 50 and 53 are interposed between the levers 40 and 37, and the center-piece and standards 2, and each pair of said levers carries pivotally at its outer end a brake-shoe 55.

From the foregoing, it will be seen, the block 26 occupying its normal or inoperative position, that in accordance with the rules of gravitation, the weight of the friction-plates 47, the levers 37 and 40, and the vertical connecting arms 45, cause the cross-arms 43 to bear down upon and depress the inner ends of the levers 50 and 53, so as to hold the brake-shoes 55, carried at the outer end of the said levers above and out of contact with the upper side of the slot-rails.

In the operation of the machine, the cable is gripped operatively, when the lever occupies the position shown in Figs. 1, 2 and 3. To release the cable, when desirous of crossing an opposing cable, or to take up a new cable, the lever is thrown in the direction of the arrow, Fig. 1, and the pawl 15 is allowed to engage the notch 21. This movement raises the upper gripping-jaw, to the position shown in Fig. 4, and the engagement of the pawl with the notch 21 supports it in this inoperative position. To again grip the cable, the lever is moved in the direction opposite to that indicated by the arrow, in the usual manner. If necessary to stop the car, the pawl 15 is disengaged from the notch 21, and the lever is moved, still in the direction indicated by the arrow, past the notch 21, until the upper brake-shoes come in contact with the upper side of the slot-rails, which they are caused to do by the block 26, raising their inner ends. If the friction thus obtained between the upper brake-shoes and the slot-rails, is insufficient to check the car, the movement of the lever in the same direction is continued until the friction-plates 47 come in contact with the under side of the slot-rails. The power obtained by the use of the upper brakes alone is sufficient in all ordinary cases to check the car, and for this reason the upper brakes are applied first, as the

lower brakes, when applied in conjunction with the upper brakes, might bring the car to a more sudden stop than is desirable. The lower brakes are applied, however, only an instant after the upper brakes are applied, and may, if desired, be applied to bear upon the slot-rails, simultaneously with the upper brakes.

When in the case of crowded streets, or for any other reason, it may be necessary to apply the brakes instantaneously, the grip-man, by placing his foot upon the lever 33, may pivotally operate the same and cause the block 26 to assume a vertical position. This movement of the block raises the inner end of the several series of levers, and supports the upper and lower brakes adjacent to the upper and lower sides, respectively, of the slot-rails. If necessary at any time, to avoid an accident, the lever is moved in the direction of the arrow, Fig. 1, for a distance only sufficient to release the grip upon the cable. This short throw of the lever, owing to the position of the brakes, is sufficient to apply them against the slot-rails instantaneously; the grip-man releasing the cable and applying the brakes with one movement of the lever. It is desirable, however, that the block 26 should normally occupy the position shown in Fig. 1, and that the lower brake should not be applied unless absolutely necessary to avoid an accident.

Referring to Fig. 8, the slot-rails  $a$ , are shown with the inclined sides  $a'$ , and when the lower brakes are applied to operate in connection with such slot-rails, their friction surface is beveled in a corresponding degree. In the construction of the lower brake, the friction-plates 47, are dropped into grooves 46, and to prevent their accidental displacement from the said grooves, a triangular plate 56 is pivoted in a recess formed in the outer side of one of the vertical arms 45, and the ends of this triangular plate bear upon the upper margins of the said friction-plates, below their contact surface. In case that, after applying the brakes and throwing the lever back to its original position, a defect or other fault in the slot-rails should cause the lower brake to become wedged against the slot-rails, and refuse to descend, the center-piece 6 may be reciprocated vertically, and if this is insufficient to dislodge said lower brake, the gripman, raising the center-piece, inserts a pin 57 through the opening 58 in the center-piece above the levers, and then moving the center-piece downward, the ends of the pin 57 bear upon the upper margin of the levers 37, and forces the same to pivotally operate and move the friction-plates 47 from contact with the slot-rails. The function of the pivoted plate 56, will now be apparent, as without this plate, when forcing the levers downward, through the medium of the pin 57, the friction-plates might be left wedged up against the slot-rails, and thus become disengaged from the grooves 46. If desired, to prevent any probability of



the friction-plates 47 becoming wedged thus, springs 59, secured to the bar 1, may be caused to exert a yielding pressure down upon the upper margin of the levers 37. It is thought, however, that these springs will be unnecessary.

Instead of employing a lower brake composed of friction-plates 47, as shown, which may terminate the motion of the car too suddenly, it may be found preferable to employ a brake composed of anti-friction rollers, these rollers being carried rotatably at the lower end of the arms 45, as shown in dotted lines, Fig. 1. The employment of such a brake, while exerting the same power, as the brake composed of the friction-plates, will gradually diminish the speed of movement until the car is stopped.

From the above description, it will be seen that I have produced a cable-car grip, slot-brake, which is positive and reliable in operation, and which places the car under the perfect and absolute control of the grip-man.

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

1. In a cable-car grip, slot-brake, the combination with a frame depending within the slot, and having a gripping-jaw, and a reciprocatory lever-actuated center-piece, also extending through the grip-slot, and provided with an opposing gripping-jaw, of levers carried by said framework, arms depending from said levers through the grip-slot, and friction-plates carried by said arms, so that when said center-piece is elevated a sufficient distance, said friction-plates will engage the slot-rails, substantially as set forth.

2. In a cable-car grip, slot-brake, the combination with a framework having a stationary gripping-jaw, and a movable grip jaw operating in conjunction with the stationary jaw of said framework, of levers pivotally carried by said frame-work, and provided with brake-shoes, and means to elevate said movable grip jaw to release the cable and to force said brake-shoes down upon the slot-rails, substantially as set forth.

3. In a cable-car grip, slot-brake, the combination with a frame-work having a reciprocatory grip jaw operating in conjunction with said framework upon the cable, of a series of levers pivotally carried by the framework, arms depending from said levers, and friction-plates carried by said arms below the slot-rails, and a second series of levers carried by said framework, and carrying brake-shoes at their outer ends above the slot-rails, and means to elevate the movable grip jaw so that the inner ends of each series of levers shall be raised, and the brakes applied against the upper and lower sides of the slot-rails, substantially as set forth.

4. In a cable-car grip slot-brake, the combination with a frame-work, grip jaws operating in conjunction therewith, and a series of levers pivotally carried by the framework, and interlocking at their inner ends, and brake-shoes carried at their outer ends, of a second series of levers pivotally carried by said framework, arms connecting said levers and bearing upon the first-mentioned levers inward of their pivotal points, and a lower brake supported from the last-mentioned levers below the slot-rails, substantially as set forth.

5. In a cable-car grip slot-brake, the combination with a frame, a reciprocatory center piece, having a grip jaw, and operating in conjunction with said frame, a series of levers, carried by said frame, and brakes supported by said levers, of a rotatable block carried by the reciprocating center piece and supporting the inner ends of said levers, and means to rotate said block, so that the brake levers shall be operated, substantially as set forth.

6. In a cable-car grip slot-brake, the combination with a frame, a movable grip-jaw plate operating in conjunction therewith, and levers carrying brakes, pivotally carried by the said frame, of a block rotatably carried by the movable grip-jaw plate, and having eccentrically enlarged end-portions, and means to rotate said block so that the eccentric enlargements thereon shall elevate the inner ends of the brake-levers, substantially as and for the purpose set forth.

7. In a slot-brake, the combination with a frame depending through the grip-slot, of levers carried by said frame, arms depending from said levers through the grip-slot, friction plates carried by said arms, and means to cause the same to frictionally engage the under side of the slot-rails, substantially as set forth.

8. In a slot-brake, the combination with a frame depending through the slot, and comprising a stationary section and a movable section, of levers carried by said frame and provided with break-shoes and friction plates above and below the slot respectively, and a block carried by the movable section, and means to partially rotate said block and cause the brake-shoes and friction-plates to approach the slot-rails, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES T. MARLIN.

Witnesses:

G. Y. THORPE,  
M. R. REMLEY.