

(No Model.)

3 Sheets—Sheet 1.

A. MARTINEZ.  
CABLE CAR.

No. 466,355.

Patented Jan. 5, 1892.

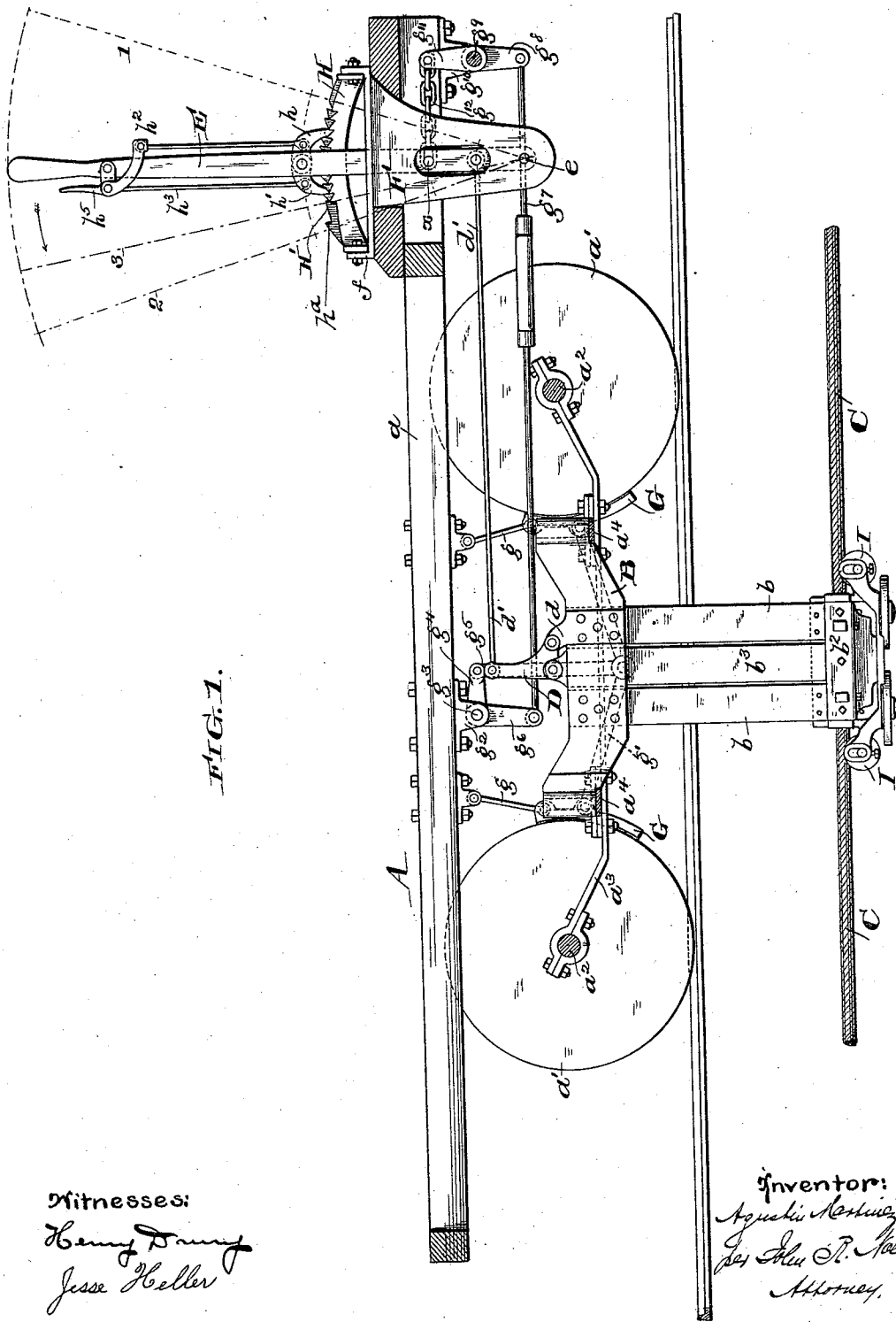


FIG. 1.

Witnesses:

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Jesse Heller

Inventor:

Agustín Martínez  
per Alex. P. Allen  
Attorney.

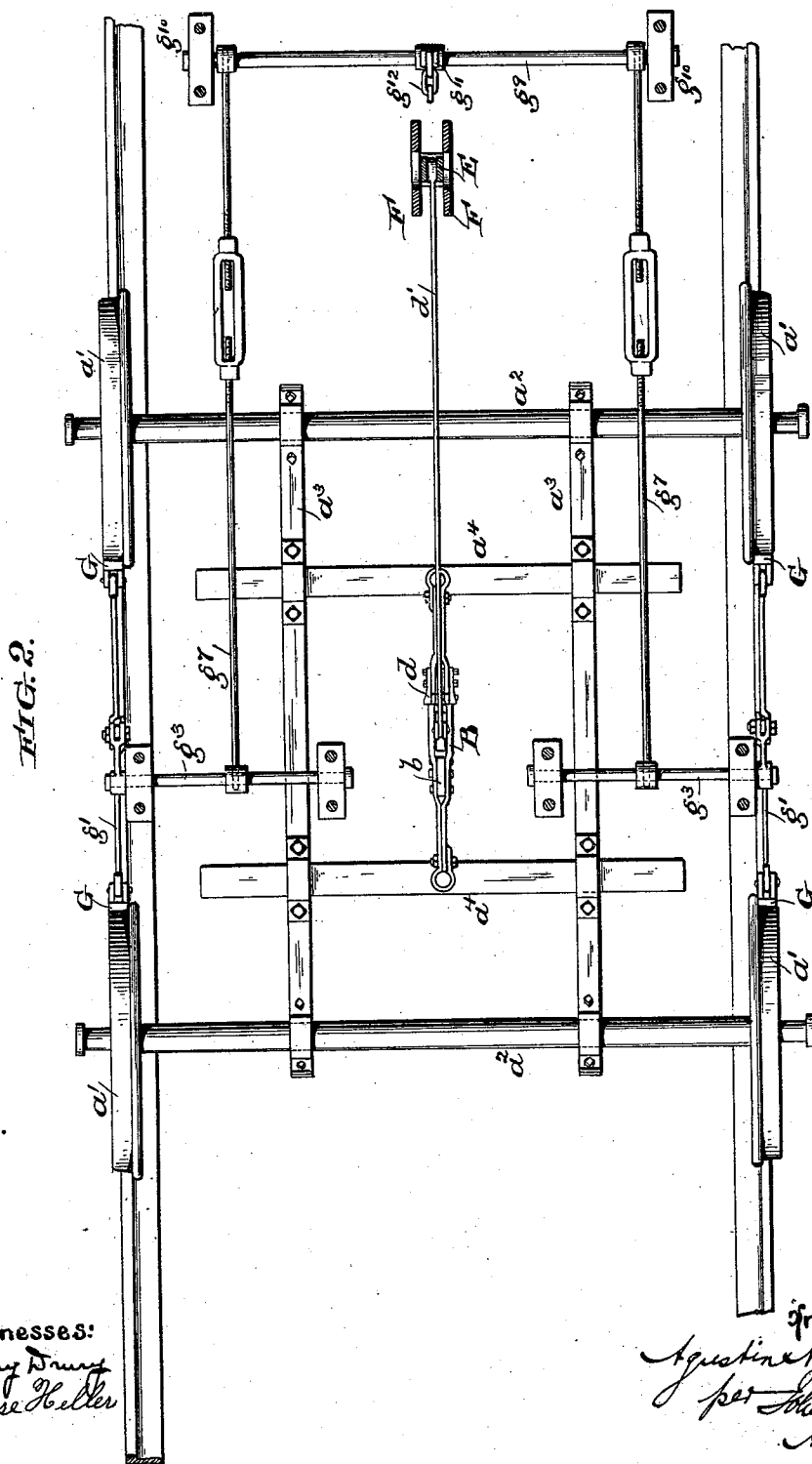
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3 Sheets—Sheet 2.

A. MARTINEZ.  
CABLE CAR.

No. 466,355.

Patented Jan. 5, 1892.



Witnesses:  
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Jesse Heller

Inventor:  
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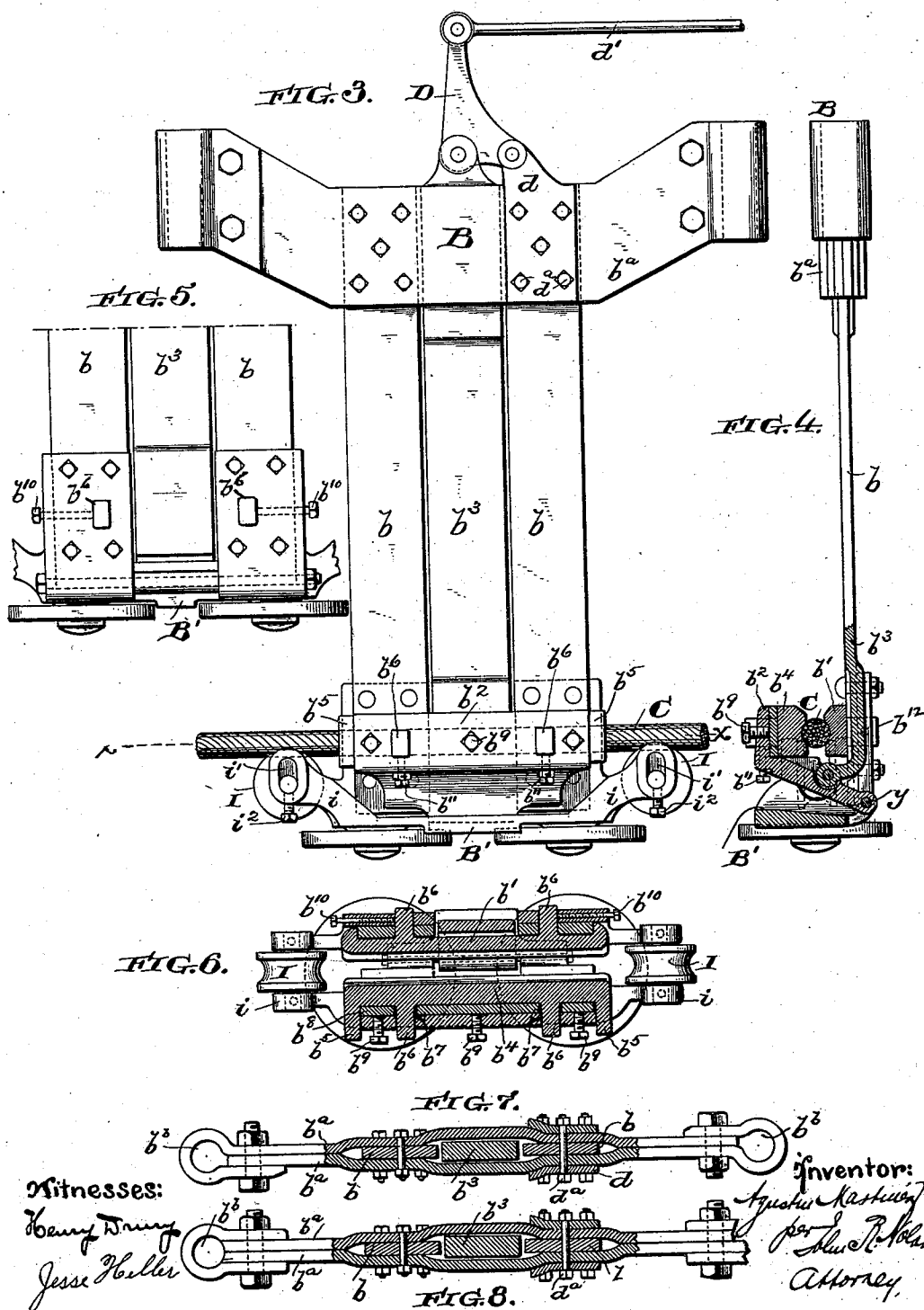
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3 Sheets—Sheet 3.

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No. 466,355.

Patented Jan. 5, 1892.



# UNITED STATES PATENT OFFICE.

AGUSTIN MARTINEZ, OF PHILADELPHIA, PENNSYLVANIA.

## CABLE CAR.

SPECIFICATION forming part of Letters Patent No. 466,355, dated January 5, 1892.

Application filed March 19, 1891. Serial No. 385,712. (No model.)

*To all whom it may concern:*

Be it known that I, AGUSTIN MARTINEZ, a citizen of the United States, residing at the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Cable Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a vertical section of a car-truck in which my invention is embodied, a car rail and cable being shown. Fig. 2 is a horizontal section taken on a line immediately below the platform or body of the truck. Fig. 3 is a side elevation, enlarged, of the gripper mechanism. Fig. 4 is a sectional end elevation thereof. Fig. 5 is a rear view of the gripping-jaws and adjuncts. Fig. 6 is a horizontal section, as on the line  $x x$ , Fig. 3, the cable being omitted. Fig. 7 is a sectional plan of my improved grip-head. Fig. 8 is a like view of a modified form of head.

This invention relates more particularly to certain improvements in the gripping and the braking mechanisms of those cars known as "cable cars," which are propelled through the medium of a power-driven cable; and the objects of the improvements are, primarily, to connect the cable-gripper and the wheel-brakes to a single or common operating device in such manner that the gripper and the brakes may be operated concertedly by or through the action of said device, and also to improve the construction of the gripper-jaws, of the gripper-head, and of the cable-supporting rollers, whereby advantages are gained, as hereinafter described. The preferred mechanism whereby I attain these objects is illustrated in the annexed drawings, to which attention will now be directed.

A represents the usual truck upon which the car is supported,  $a$  being the platform or body of the truck,  $a'$  the wheels thereof,  $a^2$  the axles,  $a^3$  the reach-bars, and  $a^4$  the cross-bars for the support of the grip-head B. Although this head may be of any desirable pattern, yet I prefer to use the particular construction represented in the drawings, which construction I shall describe in due course.

Depending from the head B are two fixed bars  $b$ , on the lower ends of which the grip-

jaws  $b'$   $b^2$  are mounted,  $b'$  being the fixed jaw and  $b^2$  the pivotal or binding jaw.  $b^3$  is the central vertically-movable bar, which is hingedly connected with the latter jaw and is guided in the grip-head, whereby this bar  $b^3$ , when it is properly operated, acts upon the movable jaw to force it against or retract it from the cable C. It will be observed that the connection of the bar  $b^3$  with the movable jaw is forward of the pivot or hinge  $y$  of the latter—that is, intermediate said pivot or hinge and the free or working end of the jaw. Consequently, to close said jaw to cause it to grip the cable it is requisite to draw or pull up the bar  $b^3$ , thereby insuring a better action of the jaw upon the cable than in those constructions wherein is required a downward push of the operating-bar to close the pivoted grip-jaw. In the "push" construction only a very limited amount of pressure may be applied to the bar; otherwise the bar will bend or twist laterally, so as to bear against the sides of the conduit-slot, whereas in the "pull" construction there may be applied an amount of power commensurate with the tensile strength of the bar. I therefore consider this latter construction one of importance. Pivoted to the upper end of the central bar  $b^3$  is a bell-crank lever D, the shorter arm of which is pivoted in and between suitable lugs  $d$  on the grip-head, while its other or longer arm is connected by means of a link or rod  $d'$  with a vertical operating-lever E, mounted at the forward end of the truck. This lever is fulcrumed at  $e$  between the depending bifurcated walls of a bracket-head F, the top or supporting plate  $f$  of which is firmly bolted to the body of the truck. Thus if the lever E be manipulated it will act through the bell-crank and link connection to actuate the jaw-working bar  $b^3$  of the grip mechanism.

G represents the brake-shoes which are suspended by means of links  $g$  from the under side of the truck-body in such respect to the wheels that there is a shoe adjacent to the periphery of each wheel. There are thus two pairs of shoes. Each pair is connected by a toggle-lever  $g'$ . Mounted in boxes  $g^2$ , depending from the under side of the body, are two lateral rock-shafts  $g^3$ , to the outer end of each of which is secured a horizontal arm  $g^4$ , which

is connected by a link  $g^5$  with the central joint of the lower toggle-lever. Hence if said shaft be properly turned the arms thereon, through the medium of their links, will act upon the toggle-levers, the latter thereupon engaging the brake-shoes with or disengaging them from the wheels. As a means whereby these shafts may be moved in concert with the gripping mechanism when the lever E is operated—that is to say, whereby the brake-shoes may be retracted from the wheels when the grip is being closed, and vice versa, or whereby both the grip and the brake may be thrown open simultaneously—I have devised the mechanism illustrated in the drawings, although I remark in this connection that I do not restrict myself to that particular mechanism, as there are obviously various equivalent ways by which the same end may be effectually accomplished. Depending from each of the shafts  $g^3$  is an arm  $g^6$ , which is connected by means of a rod  $g^7$  with a similar arm  $g^8$  on a horizontal rock-shaft  $g^9$ , that is supported in brackets  $g^{10}$ , fixed at the forward end of the truck just beyond the operating-lever. This shaft is provided with a central upwardly-projecting arm  $g^{11}$ , which is connected by a chain  $g^{12}$  or other suitable device with the operating-lever at a point (as  $x$ ) above the pivotal connection of the rod  $d'$ . By this construction it will be obvious that when the lever occupies the right inclined position indicated by the dotted line 1, Fig. 1, the grip is closed while the brake devices are open, and that if the lever be drawn to the oppositely-inclined position indicated by the line 2 the conditions of the grip and the brake devices are reversed—that is, the grip is open while the brake devices are closed or in engagement with the wheels. It will also be obvious that if the movement of the lever be checked before it reaches the extreme limit of this last position, as indicated by the dotted line 3, both the brake and the grip will be opened, and the car may thereupon be moved or drawn independently of the cable—as by horses, for example.

In order to lock the lever in its various positions of adjustment I have fixed upon the plate of the bracket F, concentric with the lever, a pair of rack-segments H H', the teeth of which are oppositely inclined, as seen, and I have provided the lever with a pair of pivoted pawls  $h$   $h'$ , so disposed as normally to engage the teeth of these racks, respectively. These pawls are connected by means of rods  $h^2$   $h^3$  with a small crank-lever  $h^5$ , pivoted near the upper end of the hand-lever, the construction and arrangement of the parts being such that if the free arm of the crank-lever be pressed inward the pawls will be disengaged from the rack-teeth, and if said lever-arm be released the parts will resume their original or locking position. It will be obvious that when the pawls are in engagement with the racks the hand-lever and its connected parts are effectually locked in those

positions before described which they may be caused to assume. The pawl  $h$  and the rack H work against the action of the brake devices, while the pawl  $h'$  and the rack H' work against the action of the gripping mechanism, as will be readily understood by one conversant with mechanics.

I prefer to make the rear tooth  $h^3$  of the rack H' somewhat larger than its fellows, so that when ordinary pressure is applied to the thumb-lever and the hand-lever is thrown into the intermediate position the pawl  $h'$  will take against this tooth and the latter will thus act as a determinate stop; but if the thumb-lever be pressed still farther, said pawl will be raised sufficiently far to clear the tooth  $h^3$ , and the hand-lever may thereupon be thrown to the extreme back position with the effect above stated.

The many advantages incident to a construction such as that above explained, in which the grip and the brake mechanism are operated from a common source of power by a single action, are too apparent to require particular mention.

It will be observed that I have so constructed the shoes of the gripping-jaws that the shoes may be adjusted inwardly from time to time to compensate for wear, or that they may be wholly removed from the jaws and others substituted therefor, as occasion may require. The shoe on the swinging jaw comprises a bar  $b^4$ , of wrought-iron or other appropriate metal, which bar is provided at its ends with lugs  $b^5$ , that embrace the ends of the jaw, and with intermediate studs or projections  $b^6$ , which extend through apertures  $b^7$  in said jaw. Interposed between the bar and the jaw is a steel plate  $b^8$ , and mounted in the jaw, so as to take against the plate, is a series of screws  $b^9$ . Thus if said screws be properly manipulated they will move the plate  $b^8$  and force the shoe toward the cable. The shoe may be fixed in the desired position by means of set-screws  $b''$ , which are so mounted in the jaw as to take against the lower sides of the studs  $b^6$ . The steel plate is employed for the purpose of insuring a uniform pressure against the iron shoe and also to resist the wearing action of the screw-points. This plate is of course provided with apertures or slots coinciding with those  $b^7$  in the gripper-jaw, in order to permit of the passage of the projections  $b^6$  on the shoe. (See Fig. 6.) The lugs and studs on the shoe act in conjunction with those portions of the jaw engaged therewith to effect accurate alignment of the shoe, and thus to make certain the gripping action on the cable.

The shoe  $b'$ , which constitutes the fixed jaw of the grip, is constructed similarly to the other shoe, before described; but, instead of its being adjusted inwardly by the action of screws, it is constructed to be set by hand and to be fixed at the point of adjustment by means of screws  $b^{10}$ , which work in the ends of the usual lower frame B' and take against

the opposed sides of the guide-studs  $b^6$ . This frame is bolted to the lower end of the fixed bars  $b$  and is practically a part thereof. It is to this frame that the movable grip-jaw is pivoted, as indicated at  $y$ , Fig. 4. Projecting from the ends of this frame are the arms  $z$ , in and between which the usual cable-supporting rollers  $I$  are mounted. I preferably make these rollers vertically adjustable, in order that they may be set to compensate for wear. I do this by fitting the studs or shafts of the rollers in elongated holes or bearings  $z'$  in the arms and providing the latter just below the bearings with set-screws  $z''$ , which act against the opposed portions of the studs or shafts. Thus by properly manipulating the set-screws nice adjustment of the rollers in respect to the cable  $C$  may be effected.

Instead of making the grip-head  $B$  of cast metal, as heretofore, I construct the same as represented in the drawings—that is to say, of two steel plates  $b^a$ , that are stamped to the requisite form, placed side by side, and bolted together, one end of each plate being extended beyond the contiguous end of the adjacent plate, bent around the latter, and bolted thereto, as illustrated most clearly in Fig. 7. Thus there are formed at each end of the head vertical eyes  $b^b$  for the passage of the bolts, which secure the head to the supporting cross-bars of the truck. The plates are suitably shaped to form a central space for the grip-bars, the fixed bars being securely bolted in place, as shown. The lugs  $d$ , to which the lever  $D$  is pivotally connected, are bolted to the sides of the plates, those bolts  $d^a$  that secure one of the fixed bars in place being used, preferably, to fasten the lugs in position.

The above-described grip-head, while simple in its construction, is obviously very strong and substantial. Should one of the plates become broken or damaged in any way, as at the eye, it may be easily removed and another or perfect one just as easily substituted therefor. On the other hand, when the cast head becomes worn or broken at the eye or eyes, or in fact at any point, it is necessary to replace it by an entirely new head.

In Fig. 8 I have represented a slight modification of my sectional grip-head. In this form the ends of the plates are not extended, as in the other construction, but, instead, U-shaped plates are bolted to said ends, so as to connect the latter, and at the same time to form the bolt-eyes.

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

1. The combination, with a wheeled supporting-frame and gripper and brake mechanisms carried thereby, of the single operating-lever operatively connected with said frame, the rock-shaft provided with the down-projecting arm and with the up-projecting arm, a connecting device between the latter arm and said lever, a connecting device be-

tween the down-projecting arm and the brake mechanism, and a link or rod connection between the said lever and the grip mechanism, the attachment of said link or rod connection with the operating-lever being intermediate the fulcrum of the latter and the point of attachment with the lever of the up-projecting-arm connection, whereby the said grip and brake mechanisms may be simultaneously operated by the action of said lever, substantially as described.

2. The combination, with a wheeled supporting-frame and gripper and brake mechanisms carried thereby, of the single operating-lever connected with said frame, the rock-shaft provided with the down-projecting arm and with the up-projecting arm, a connecting device between the latter arm and said lever, a connecting device between the down-projecting arm and the brake mechanism, and a link or rod connection between the said lever and the grip mechanism, the attachment of said link or rod connection with the operating-lever being intermediate the fulcrum of the latter and the point of attachment with the lever of the up-projecting-arm connection, together with devices for locking said lever in various positions of adjustment, substantially as described.

3. The combination, with a wheeled supporting-frame, of the gripper mechanism, the hand-lever, the rock-shaft, as  $g^b$ , provided with the down-projecting arm and with the up-projecting arm, a connecting device between the latter arm and the said lever, the brake-shoes, the connecting-toggles therefor, the rock shaft or shafts, as  $g^b$ , the arms  $g^4$   $g^6$  thereon, the links connecting said arms  $g^4$  with the toggles, the link or rod connection between the arm  $g^6$  and the down-projecting arm of the rock-shaft  $g^b$ , and the link or rod connection between the said operating-lever and the gripper mechanism, substantially as described.

4. The combination, with a wheeled supporting-frame and gripper and brake mechanisms carried thereby, of the hand-lever operatively connected with said frame, the rock-shaft provided with the down-projecting arm and with the up-projecting arm, a connecting device between the latter arm and said lever, a connecting device between the down-projecting arm and the brake mechanism, and a link or rod connection between the said lever and the grip mechanism, the attachment of said link or rod connection with the operating-lever being intermediate the fulcrum of the latter and the point of attachment with the lever of the up-projecting arm connection, together with the rack-segments, as  $H$   $H'$ , having oppositely-inclined teeth, the pawls pivoted to said lever and adapted to engage the rack-teeth, and devices on said lever for simultaneously operating said pawls, one of said segments being provided with an additional tooth, as  $h^a$ , substantially as described.

5. The combination of the bracket-head, the hand-lever fulcrumed therein, the rack-segments with their oppositely-inclined teeth, the pawls pivoted to said lever and adapted to engage the rack-teeth, and the single crank-lever pivoted on said hand-lever and operatively connected with said pawls by means of the rods  $h^2$   $h^3$ , whereby the action of said crank-lever will operate simultaneously both pawls, substantially as described.

6. The combination, with the gripper-jaw, of the shoe thereon, the interposed steel plate and the screws working in said jaw against the plate, substantially as described.

7. The combination, with the gripper-jaw provided with apertures therein, of the adjustable shoe provided with studs or projections which register with said apertures, and provided also with end lugs which embrace the ends of the jaw, and the set-screws for adjusting said shoe, substantially as described.

8. The combination, with the gripper-jaw provided with apertures therein, of the adjustable shoe provided with studs or projections which register with said apertures, and provided also with end lugs which embrace the ends of the jaw, and the set-screws for fixing said shoe in positions of adjustment, substantially as described.

9. The combination, with the gripper-jaw provided with apertures therein, of the adjustable shoe provided with studs or projections which register with said apertures, and provided also with end lugs which embrace the ends of the jaw, the set-screws for adjusting said shoe, and the set-screws for fixing it in its positions of adjustment, substantially as described.

10. The combination, with the gripper-jaw provided with apertures therein, of the adjustable shoe having studs which register with said apertures and set-screws for adjusting said shoe, together with the interposed steel plate provided with the apertures or

slots for the passage of said studs, substantially as described.

11. The grip-head constructed of two metallic plates correspondingly formed as regards shape and size, bolted together to form the sides of the head, and provided with end bolt-eyes, substantially as described.

12. The grip-head constructed of metallic plates struck up into shape, bolted together, and provided with the end bolt-eyes, substantially as described.

13. The grip-head constructed of two metallic plates struck up into shape, bolted together, and provided with end bolt-eyes formed by suitably bending the extended ends of the plate, substantially as described.

14. The combination of the grip-head, the fixed bars, the vertically-movable bar, the fixed grip-jaw, and the pivoted grip-jaw, the latter being connected with said movable bar at a point intermediate the pivot or hinge and the free or working end of the grip-jaw, whereby a pull of the movable bar is requisite to close the latter, substantially as described.

15. The combination of the grip-head, the fixed bars, the vertically-movable bar, the fixed grip-jaw, and the pivoted grip-jaw, the latter being connected with said movable bar at a point intermediate the pivot or hinge and the free or working end of the grip-jaw, whereby a pull of the movable bar is requisite to close the latter, together with the bell-crank lever operatively connected with the grip-head and the movable bar, and mechanism for operating said lever, substantially as described.

In testimony whereof I have hereunto affixed my signature this 16th day of March, A. D. 1891.

AGUSTIN MARTINEZ.

Witnesses:

JOHN R. NOLAN,  
C. W. BECK.