

No. 807,777.

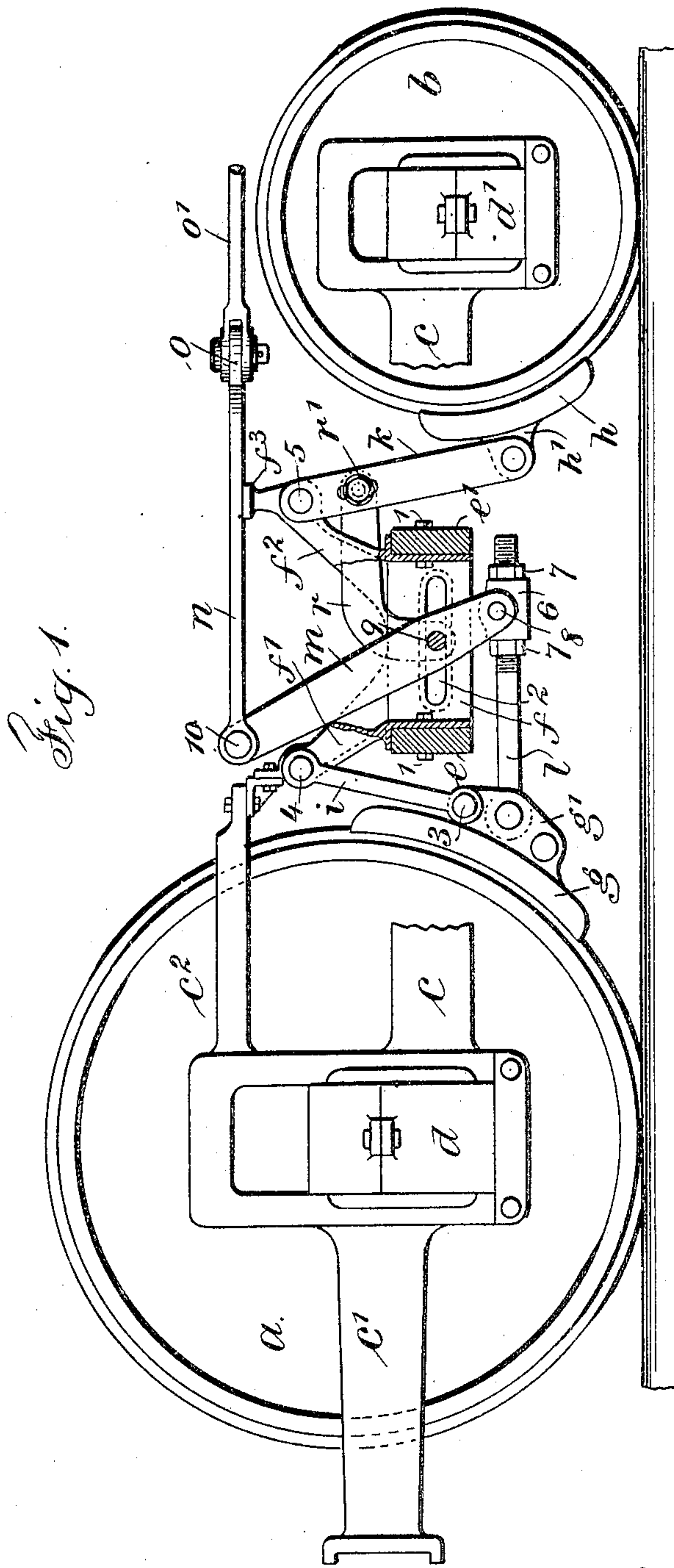
PATENTED DEC. 19, 1905.

C. REMELIUS.

CAR BRAKE.

APPLICATION FILED JUNE 10, 1905.

2 SHEETS-SHEET 1.



Witnesses

Chas H. Smith  
Leopold Herr

*Inventor*

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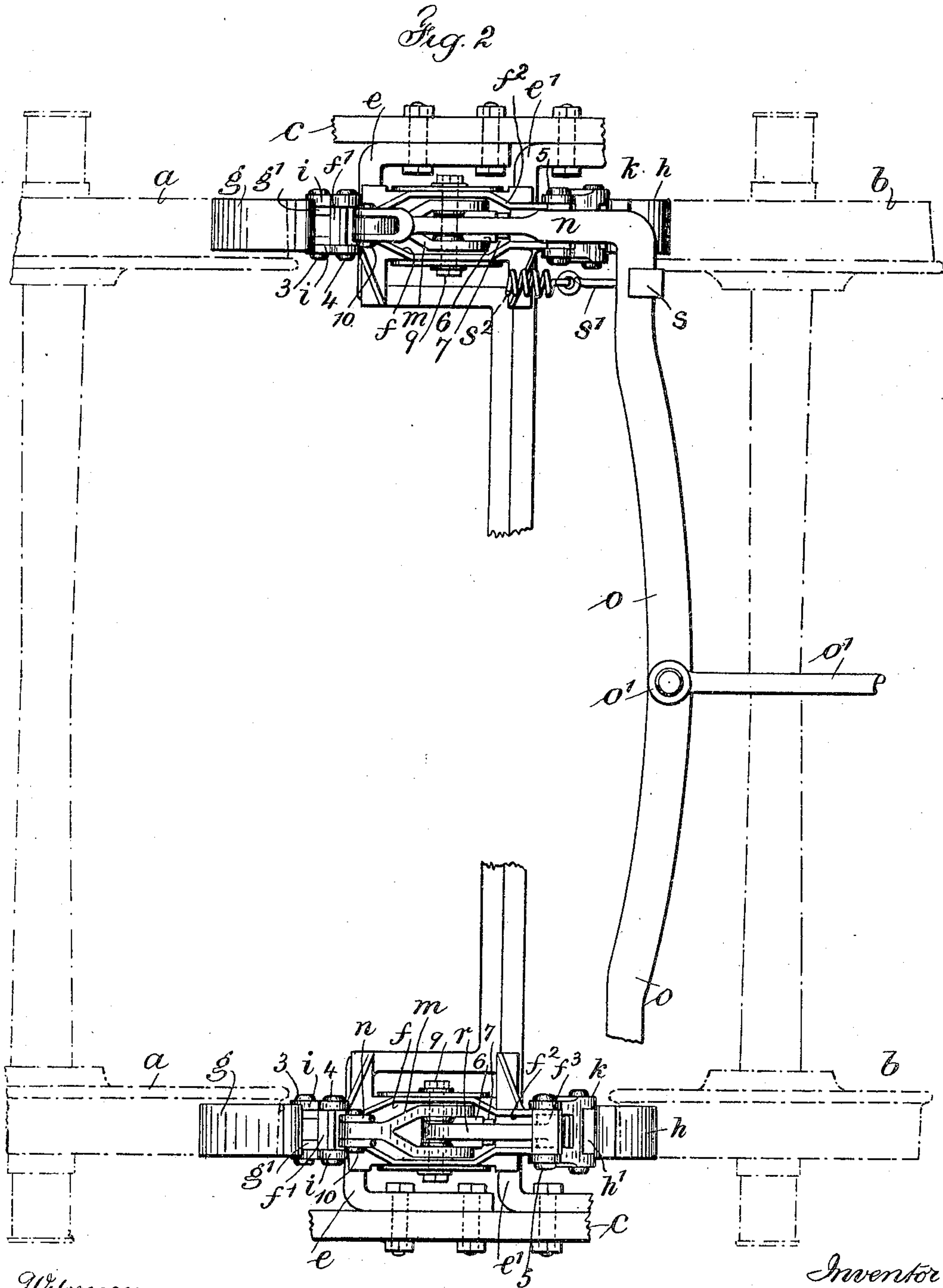
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Witnesses

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Harold Allen

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Charles Remelius.  
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att.



# UNITED STATES PATENT OFFICE.

CHARLES REMELIUS, OF NEWARK, NEW JERSEY, ASSIGNOR TO COLUMBIA MACHINE WORKS AND MALLEABLE IRON COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

## CAR-BRAKE.

No. 807,777.

Specification of Letters Patent.

Patented Dec. 19, 1905.

Application filed June 10, 1905. Serial No. 264,578.

*To all whom it may concern:*

Be it known that I, CHARLES REMELIUS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented an Improvement in Car-Brakes, of which the following is a specification.

My invention relates to improvements in car-brakes, especially of the form and class usually employed on trolley-cars with the object of overcoming difficulties which heretofore have been inherent therein. In these car-brakes as usually constructed it has been necessary to hold the brake-shoes close to the wheels, because of the amount of movement that would otherwise be required of the brake-beam and associated parts to operate the shoe. Where the brake-shoes have been away from the wheels, the extent which the motorman was obliged to move the mechanism manually actuated by him was often at variance with the quickness of stops required of the car, especially in crowded streets, in an effort to avoid accidents, and in consequence of the closeness of the brake-shoes to the wheels an increased percentage of power was required to operate and run the cars. This entailed a waste not only of energy, but revenue, because of increased wear of the parts; furthermore, the old construction was in the way of the removal of the car-wheels, which is frequently necessary to grind out flat spots.

In carrying out my invention I employ co-acting devices for simultaneously actuating oppositely-moving brake-shoes at the respective sides of the car-truck to grip the wheels of the truck in stopping the car. These parts are so arranged that the brake-shoes may normally rest at an appreciable distance from the wheels, so as not to interfere with the free movement thereof or require additional driving power for the vehicle, and the operative devices are so arranged and proportioned that only a small movement of the devices manually operated by the motorman is necessary to apply the maximum power upon the brakes, and this is quickly applied, the said parts returning immediately to an initial position as soon as released.

I employ devices by which the brake-shoes are pivotally hung from supports—a connected lever-link and push-bar combination of devices respectively and externally connected

to the said brake-shoes. These devices are alike at the respective sides of the car-truck, and similar free ends of the levers are connected to the same structures for actuation by the motorman, either one of which will operate independent of the other even if one side is out of order.

In the drawings, Figure 1 is a side elevation of a car-truck and the devices of my improvement, the main frame and auxiliary frame being broken across for clearness in showing the parts, and Fig. 2 is a plan of said parts, the devices at one side being shown complete and at the other side partly broken away for further clearness, the wheels being shown by dotted lines.

As the parts at each side of the truck are the same, the description of the parts at one side will answer as a description for the parts at both sides.

The wheels *a* are usually larger in size than the wheels *b*. The wheels *a* are the driving-wheels actuated by an electric motor, as usual, the wheels *b* being known as the "idler-wheels." *c*, *c'*, and *c''* represent the main frame and side members, and *d* *d'* the wheel-boxes serving as bearings for the ends of the axles. These parts are of usual construction in this art and do not require further description.

*e* *e'* represent parts of auxiliary frames in section in Fig. 1 and in plan in Fig. 2 which parts extend across between the side members *c* *c'* of the main frame and at opposite sides form boxes to receive structures each composed of a rectangular frame *f* and bracket-arms *f'* *f''*, which rise from the opposite ends of said frame and diverge, terminating in bearings for pivot-pins hereinafter described. Each frame *f* fits into the box formed by the auxiliary frames *e* *e'* and has a flange extending around the same or at the ends thereof to rest upon the upper surface of the boxes formed by said auxiliary frames and be supported thereby, and I prefer, as shown in Fig. 1, to connect the frames *f* with the boxes formed by the auxiliary frame by bolts 1, which pass through said parts. Opposite sides of each frame *f* are made with slots 2, adapted to receive a pivot-pin 9, and the upper end of the bracket-arm *f''* is provided with a flat horizontal surface-support block *f'''*.



$g$  and  $h$  represent the brake-shoes,  $g$  being the shoe of the wheel  $a$  and  $h$  the shoe of the wheel  $b$ , and these shoes by preference are of different size and weight and each provided with brake-heads  $g'$   $h'$ .

$i$   $i$  are hanger-rods at their lower ends connected by the pivot-pin 3 to the brake-head  $g'$  and at their upper ends by the pivot-pin 4 to the upper end of the bracket-arm  $f'$  for the swinging support of the brake-shoe  $g$ . The brake-shoe  $h$  is pivotally hung by a link-hanger  $k$ , connected by a pivot-pin to its brake-head  $h'$ , and which link-hanger is preferably made double, as seen in Fig. 2, and is pivotally connected by the pin 5 to the upper end of the brake-arm  $f''$ , which latter passes between the parts of the link-hanger  $k$ .

I employ a push-bar  $l$ , pivotally connected at one end to the brake-head  $g'$  of the brake-shoe  $g$ , with its free end exteriorly threaded. A sleeve 6 passes freely over the threaded end of this push-bar  $l$ , and I employ nuts 7 upon the threaded end of the push-bar  $l$  and coming against opposite ends of the sleeve 6 to locate and hold the same in position. A lever  $m$  in a vertical plane passes through the hollow center of the frame  $f$ . It is mounted upon the pivot-pin 9. The lower portion of this lever is forked, so that the pivot-pin 9 passes through the forked portion, and the lower ends are provided with bearings and are pivoted to the trunnions 8 of the sleeve 6.

A bent link  $r$ , placed between the forked parts of the lever  $m$ , is also connected to the pivot-pin 9, rising out of the frame  $f$  and extending toward and between the parts of the link-hanger  $k$ , being pivotally connected to said link by the pin  $r'$ . By preference the sides of the link-hanger  $k$  are slotted and the pivot-pin  $r'$ , passing through the link  $r$ , passes at its ends through the slots in said link-hanger  $k$  and is clamped thereto by end nuts on said pivot-pin  $r'$ , so that its position is adjustable to the extent of the length of said slots in establishing its relation with the said link  $k$ .

The upper end of the lever  $m$  is connected by a pivot-pin 10 to the pull-bar  $n$ , and this pull-bar extends forward, rests upon the support-block  $f^3$ , and may be connected to or by preference be formed as an integral part of the draw-bar  $o$ , which, by reference to Fig. 2, will be seen to extend across the truck. The brake-rod  $o'$ , that extends to the devices actuated by the motorman at either end of the car, is pivotally connected to the center of the draw-bar  $o$ , so that the one brake-rod actuates the brake devices of the car. I have shown and prefer to employ at each side of the car a clip  $s$ , connected to the draw-bar  $o$ , a rod  $s'$  therefrom and a spring  $s^2$  at one end connected to the rod  $s'$  and at its other end to a fixed part of the frame of the truck, said springs acting to return the braking devices to an initial position when released by the motorman.

In the operation of the devices hereinbefore described and when the motorman by manually actuating the brake-lever draws upon the brake-rod  $o'$  the draw-bar  $o$  and pull-bars  $n$  are simultaneously moved, the levers  $m$  at the opposite sides of the truck are actuated, and their tendency is to swing on the pivot-pins 9, the lower ends or short arms of said levers  $m$  moving in the opposite direction to the movement of the longer ends or long arms of said levers. This movement, through the push-bar  $l$  and the bent link  $r$ , simultaneously moves the brake-shoes in opposite directions, it being a fact that the brake-shoe of less weight has a tendency to move to the greatest extent; but the movement of the said brake-shoes is so nearly uniform that they are applied to their adjacent wheels almost simultaneously, the movement of the levers  $m$  producing the double or compound movement of the brake-shoes in opposite directions at the same time; and as the point of pivotal connection of the bent link  $r$  and the link-hanger  $k$  produces the fulcrum of said link-hanger, establishing a short arm between the same and the pivot 5 and a long arm between the same and the pivotal point of attachment of the link  $k$  with the brake-head  $h'$ , it follows that the brake-shoe  $h$  is quickly applied and forms a bearing in its application for a quick rearward movement of the push-bar  $l$  and brake-shoe  $g$ , with a very small extent of movement required by the brake-rod  $o'$  and draw-bar  $o$ —in fact, the sleeve 6, with its trunnion connection with the lever  $m$  and the nuts 7, are provided for adjustment, so that the normal distance of the shoes from the wheels may be determined and also the extent of movement of the parts required when the brakes are applied determined.

From the foregoing description it will be apparent that there is a slight movement of the pivot-pin 9 in the grooves 2 and that in view of the movement of the lever  $m$  the movement of the bent link  $r$  in one direction and the push-bar  $l$  in the opposite direction the movement of the lever  $m$  at its pivot-pin 10 is comparatively slight, and this movement is exactly the same in length as the longitudinal movement required of the brake-rod  $o'$ , as actuated by the motorman.

My improvements as illustrated and herein described provide for a quick application and release of the brake. They also provide for the movement of either side by the draw-bar  $o$  and brake-rod  $o'$  in case the similar devices at the opposite side of the truck are in any sense inoperative. They also provide for the independent equalization at one side from the other side, to the end that the slight difference in the proportions of the parts of one side over and above the parts of the other side may be compensated for by the adjustment of the sleeve 6 at the lower end of the lever  $m$ , so that the same extent of movement



of the brake-rod *o'* and draw-bar *o* may produce a like movement at the opposite sides of the truck. These devices also permit the running of the car with slack brake-shoes, it being desirable for economy in motive power that the shoes be slack; otherwise there is constant friction between the shoes and the wheels, which makes it necessary to employ more power in operating the car than would be the case if the shoes were slack. Economy is thus effected. Furthermore, this device makes necessary only a short movement of the mechanism by the motorman, and in view of frequent stops and the quick stops that are often necessary in a car to avoid accidents a short movement of the parts by the motorman is exceedingly desirable, there being no time to spare in making a long movement or in the confusion that might arise in so doing.

Another feature of advantage in this device is the fact that the braking pressure on the idler-wheels is adjustable, with the object in view of preventing said wheels skidding on the track, and thus producing flat spots. There are also in the device of my improvement no usual brake-beams employed and which, as is well known, extend across from one side of the truck to the other. Therefore the devices of the one side are substantially independent of the devices of the other side. From the foregoing description and illustration it will be noticed that these devices are entirely located between the respective pairs of wheels, so that there is therefore nothing in the way of removing either pair of wheels, and especially the driving-wheel, as has heretofore been required in these devices. The devices of my improvement require less care and less frequent adjustment than the old-style braking devices usually employed in this art.

I claim as my invention—

1. In a car-brake device and in combination with a supporting-frame, a frame adapted to fit into and be supported by said frame and bracket-arms formed with and rising from the latter frame and having bearings at their upper ends, brake-shoes, and means for pivotally hanging the same from the said bracket-arms, a brake-rod, and a series of devices operated thereby and supported by said frames for actuating the brake-shoes.

2. In a car-brake device and in combination with a supporting-frame, a frame adapted to fit into and be supported by said frame and bracket-arms formed with and rising from the latter frame and having bearings at their upper ends, brake-shoes and means for pivotally hanging the same from the said bracket-arms, a brake-rod, a series of devices operated thereby and supported by said frames for actuating the brake-shoes, and means for adjusting the relation and extent of movement imparted to said parts.

3. In a car-brake device and in combination with supporting-frames, frames adapted to fit into and be supported by said frames, and bracket-arms formed with and rising from the latter frames and having bearings at their upper ends, a pair of oppositely-movable brake-shoes at opposite sides of the car-truck pivotally hung from said bracket-arms, series of similar devices extending between the brake-shoes and connected thereto, devices connecting both of said series for simultaneous movement, and a brake-rod connected to the latter devices and extending to the end of the car to be actuated by the motorman.

4. In a car-brake device and in combination with supporting-frames, frames adapted to fit into and be supported by said frames, and bracket-arms formed with and rising from the latter frames and having bearings at their upper ends, a pair of oppositely-movable brake-shoes at opposite sides of the car-truck pivotally hung from said bracket-arms, series of similar devices extending between the brake-shoes and connected thereto, devices connecting both of said series for simultaneous movement, a brake-rod connected to the latter devices and extending to the end of the car to be actuated by the motorman, and means for adjusting the relation and extent of movement imparted to said parts.

5. In a car-brake device and in combination, a pair of oppositely-movable brake-shoes, devices for pivotally hanging and supporting the said shoes, a bar pivotally mounted with one of said shoes, a link pivotally connected to the hanger of the other shoe, a lever and connections therefrom respectively to said bar and link, and means for actuating said lever for oppositely moving the said parts and simultaneously applying both brake-shoes to the wheels.

6. In a car-brake device and in combination with a supporting-frame, a frame *f* adapted to fit into and be supported by said frame and bracket-arms formed with and rising from the said frame and having bearings at their upper ends, brake-shoes and means for pivotally hanging the same from said bracket-arms, a lever in a vertical plane passing through the latter frame, a pivotal connection for said lever in said frame, a push-bar extending from one end of the said lever to one brake-shoe, and a bent link extending from the pivotal connection of the lever in the frame to the hanger of the other brake-shoe, and means for actuating the lever.

7. In a car-brake device and in combination with a supporting-frame, a frame *f* adapted to fit into and be supported by said frame and bracket-arms formed with and rising from the said frame and having bearings at their upper ends, brake-shoes and means for pivotally hanging the same from said bracket-arms, a lever in a vertical plane passing through the latter frame, a pivotal connection for said le-



ver in said frame, a push-bar extending from one end of the said lever to one brake-shoe, a bent link extending from the pivotal connection of the lever in the frame to the hanger  
5 of the other brake-shoe, means for actuating the lever, and means for adjusting the connection and relation between the lever and the push-bar and between the link and its pivotal connection to the hanger of one brake-  
10 shoe.

8. The combination with the main frame, the driving-wheels and idler-wheels of a car-truck, of an auxiliary frame extending across between said wheels and their axles and at  
15 each side forming a box or receptacle, a frame  $f$  hollow and of rectangular form adapted to fit into said box and provided with bracket-arms  $f'$ ,  $f''$  rising therefrom and diverging, their upper ends having bearings, brake-shoes  
20 for the driving and idler wheels, hanger-rods from the bracket-arm  $f'$  to the brake-shoe of the driving-wheel, a link-hanger  $k$  from the bearings of the bracket-arm  $f''$  to the brake-shoe of the idler-wheel, a lever  $m$  in a vertical  
25 plane passing through the frame  $f$ , a pivot-pin 9 connecting the same for movement in slots 2 of said frame  $f$ , a push-bar  $l$  pivotally connected to the brake-shoe of the driver-wheel, a pivotal connection between said push-  
30 bar and the lower end of the lever  $m$ , a bent link  $r$  at one end pivotally connected to the pivot 9 of the lever  $m$  and at its other end pivotally connected to the link  $k$ , and means for actuating the lever  $m$  by the motorman.

9. The combination with the main frame, the driving-wheels and idler-wheels of a car-truck, of an auxiliary frame extending across between said wheels and their axles and at  
40 each side forming a box or receptacle, a frame  $f$  hollow and of rectangular form adapted to fit into said box and provided with bracket-arms  $f'$ ,  $f''$  rising therefrom and diverging, their upper ends having bearings, brake-shoes for  
45 the driving and idler wheels, hanger-rods from the bracket-arm  $f'$  to the brake-shoe of the driving-wheel, a link-hanger  $k$  from the bearing of the bracket-arm  $f''$  to the brake-shoe of the idler-wheel, a lever  $m$  in a vertical  
50 plane passing through the frame  $f$ , a pivot-pin 9 connecting the same for movement in slots 2 of said frame  $f$ , a push-bar  $l$  pivotally connected to the brake-shoe of the driver-wheel, a pivotal connection between said push-  
55 bar and the lower end of the lever  $m$ , a bent link  $r$  at one end pivotally connected to the pivot 9 of the lever  $m$  and at its other end pivotally connected to the link  $k$ , pull-bars  $n$ , a draw-bar  $o$  and a brake-rod  $o'$  for actuating said parts by the motorman.

10. The combination with the main frame, the driving-wheels and idler-wheels of a car-truck, of an auxiliary frame extending across between said wheels and their axles and  
65 at each side forming a box or receptacle, a frame  $f$  hollow and of rectangular form adapt-

ed to fit into said box and provided with bracket-arms  $f'$ ,  $f''$  rising therefrom and diverging, their upper ends having bearings, brake-shoes for the driving and idler wheels,  
70 hanger-rods from the bracket-arm  $f'$  to the brake-shoe of the driving-wheel, a link-hanger  $k$  from the bearings of the bracket-arm  $f''$  to the brake-shoe of the idler-wheel, a lever  $m$  in a vertical plane passing through the frame  $f$ , a pivot-pin 9 connecting the same  
75 for movement in slots 2 of said frame  $f$ , a push-bar  $l$  pivotally connected to the brake-shoe of the driver-wheel, a pivotal connection between said push-bar and the lower end of the lever  $m$ , a bent link  $r$  at one end pivot-  
80 ally connected to the pivot 9 of the lever  $m$  and at its other end pivotally connected to the link  $k$ , and means for adjusting the pivotal relation of the lever  $m$  and push-bar  $l$  and the link  $r$  and link-hanger  $k$  for changing the op-  
85 erative relation of said parts.

11. The combination with the main frame, the driving-wheels and idler-wheels of a car-truck, of an auxiliary frame extending across between said wheels and their axles and at each  
95 side forming a box or receptacle, a frame  $f$  hollow and of rectangular form adapted to fit into said box and provided with bracket-arms  $f'$ ,  $f''$  rising therefrom and diverging, their upper ends having bearings, brake-shoes for  
100 the driving and idler wheels, hanger-rods from the bracket-arm  $f'$  to the brake-shoe of the driving-wheel, a link-hanger  $k$  from the bearing of the bracket-arm  $f''$  to the brake-shoe of the idler-wheel, a lever  $m$  in a vertical plane  
105 passing through the frame  $f$ , a pivot-pin 9 connecting the same for movement in slots 2 of said frame  $f$ , a push-bar  $l$  pivotally connected to the brake-shoe of the driver-wheel, a pivotal connection between said push-bar  
110 and the lower end of the lever  $m$ , a bent link  $r$  at one end pivotally connected to the pivot 9 of the lever  $m$  and at its other end pivotally connected to the link  $k$ , a sleeve 6 on the free exteriorly-threaded end of the push-bar  $l$  and  
115 having trunnions to which the lower forked ends of the lever  $m$  are connected, and nuts 7 for fixing the position of the sleeve 6 on the push-bar  $l$ , and means for adjusting and fixing the relation of the pivot-pin  $r'$  of the link  $r$   
in slots of the link-hanger  $k$ .

12. The combination with the main frame, the driving-wheels and idler-wheels of a car-truck, of an auxiliary frame extending across between said wheels, and their axles and at  
120 each side forming a box or receptacle, a frame  $f$  hollow and of rectangular form adapted to fit into said box and provided with bracket-arms  $f'$ ,  $f''$  rising therefrom and diverging, their upper ends having bearings, brake-shoes  
125 for the driving and idler wheels, hanger-rods from the bracket-arm  $f'$  to the brake-shoe of the driving-wheel, a link-hanger  $k$  from the bearing of the bracket-arm  $f''$  to the brake-shoe of the idler-wheel, a lever  $m$  in a verti-  
130



cal plane passing through the frame  $f$ , a pivot-pin 9 connecting the same for movement in slots 2 of said frame  $f$ , a push-bar  $l$  pivotally connected to the brake-shoe of the driver-wheel, a pivotal connection between said push-bar and the lower end of the lever  $m$ , a bent link  $r$  at one end pivotally connected to the pivot 9 of the lever  $m$  and at its other end pivotally connected to the link  $k$ , a sleeve 6 on the free exteriorly-threaded end of the push-bar  $l$  and having trunnions to which the lower forked ends of the lever  $m$  are connected and nuts 7 for fixing the position of the sleeve 6 on the push-bar  $l$ , a means for adjusting and fixing the relation of the pivot-pin  $r'$  of the link  $r$  in slots of the link-hanger  $k$ , and pull-bars  $n$  pivotally connected at the upper ends of the levers  $m$ , a draw-bar  $o$  connected to the pull-bars  $n$ , and a brake-rod  $o'$  extending to devices actuated by the motorman for operating said parts.

13. In a car-brake device and in combination with a supporting-frame, a frame adapted to fit into and be supported by said frame and having slots in opposite sides, and bracket-arms formed with and rising from the latter frame and having bearings at their upper ends, brake-shoes, and means for pivotally hanging the same from the said bracket-arms, a brake-rod, a lever and pivot-pin slidable in said slots of the latter frame, a connection from said pivot-pin and lever to the pivotal support of one brake-shoe, and a connection from the short arm of said lever to the other brake-shoe.

14. In a car-brake device and in combination, a pair of oppositely - movable brake-shoes, devices for pivotally hanging and supporting said shoes, a lever device in a vertical plane and a pivotal support therefor, devices actuated by the motorman for moving said lever at one end, a connection from the lower short-arm end of said lever to one of said brake-shoes, and a connection from the pivotal support of said lever to the support of the other brake-shoe.

15. In a car-brake device, and in combination, a pair of oppositely - movable brake-shoes, devices for pivotally hanging and supporting said shoes, a lever device in a vertical plane and a pivotal support therefor, devices actuated by the motorman for moving said lever at one end, a device connected to one of said brake-shoes and having an adjustable pivotal relation with the lower or short-arm end of said lever, and a device extending from the pivotal support of said lever to the pivotal support of the other brake-shoe in such a position that said device is connected to said support nearer to its pivot than to the brake-shoe, so that the function of a lever is imparted to the pivotal support of said brake-shoe.

16. In a car-brake device, and in combination with a brake-rod, a lever in a vertical

plane, a pivotal support therefor, brake-shoes of varying size and weight for driver and idler wheels, a pivotal hanger for the brake-shoe of greater weight, an adjustable connection therefrom to one end of said lever, a link-hanger forming a pivotal support for the lighter brake-shoe, and a link device having an adjustable pivotal relation at one end with said hanger nearer to its pivotal support than to the brake-shoe and at the other end pivotally connected to the pivotal support of said lever.

17. In a car-brake device and in combination with a supporting-frame, a frame adapted to fit into and be supported by said frame and having slots in opposite sides and bracket-arms formed with and rising from the latter frame and having bearings at their upper ends, brake-shoes and means for pivotally hanging the same from the said bracket-arms, a brake-rod, a lever and pivot-pin slidable in said slots of the latter frame, a connection from said pivot-pin and lever to the pivotal support of one brake-shoe, a connection from the short arm of said lever to the other brake-shoe, and means for adjusting the relation and extent of movement imparted to said parts.

18. In a car-brake device, the combination with a brake-rod, a draw-bar connected thereto and extending across the truck, and pull-bars connected to the ends of the draw-bar, of independent frames and supports therefor at each side of the truck, brake-shoes pivotally hung from said frames, levers pivotally mounted in said frames and at one end pivoted to the pull-bars, and devices connected to said levers and actuated thereby in opposite directions for applying the brake-shoes against the wheels.

19. In a car-brake device, the combination with a brake-rod, a draw-bar connected thereto and extending across the truck and pull-bars connected to the ends of the draw-bar, of independent frames and supports therefor at each side of the truck, brake-shoes pivotally hung from said frames, levers pivoted in slots in said frames and at their long arms pivoted to the pull-bars, and devices connected to said levers and actuated thereby simultaneously in opposite directions for applying the brake-shoes against the wheels.

20. In a car-brake device, the combination with a brake-rod, a draw-bar connected thereto and extending across the truck, and pull-bars connected to the ends of the draw-bar, of independent frames and supports therefor at each side of the truck, brake-shoes pivotally hung from said frames, levers pivotally mounted in said frames and at one end pivoted to the pull-bars, devices pivoted to the short arms of said levers and extending to one brake-shoe, and other devices connected to the movable pivots of said levers and extending to the swinging supports of the other brake-shoes and actuated by said levers in



opposite directions for applying the brake-shoes against the wheels.

21. In a car-brake device, the combination with a brake-rod, a draw-bar connected thereto and extending across the truck, and pull-bars connected to the ends of the draw-bar, of independent frames and supports therefor at each side of the truck, brake-shoes pivotally hung from said frames, levers pivoted in slots in said frames and at their long arms pivoted to the pull-bars, devices pivoted to the short arms of said levers and extending to one

brake-shoe, and other devices connected to the movable pivots of said levers and extending to the swinging supports of the other brake-shoes and actuated by said levers simultaneously in opposite directions for applying the brake-shoes against the wheels.

Signed by me this 8th day of June, 1905.

C. REMELIUS.

Witnesses:

GEO. T. PINCKNEY,  
S. T. HAVILAND.