

(No Model.)

4 Sheets—Sheet 1.

C. V. ROTE.
CAR BRAKE.

No. 416,749.

Patented Dec. 10, 1889.

FIG - 2 -

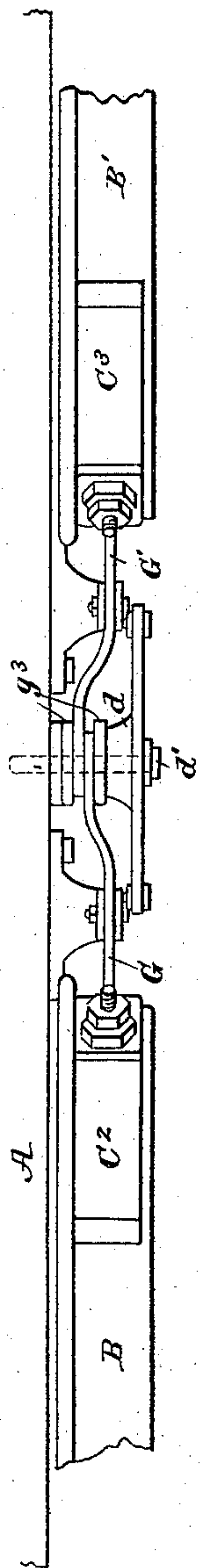


FIG - 1 -

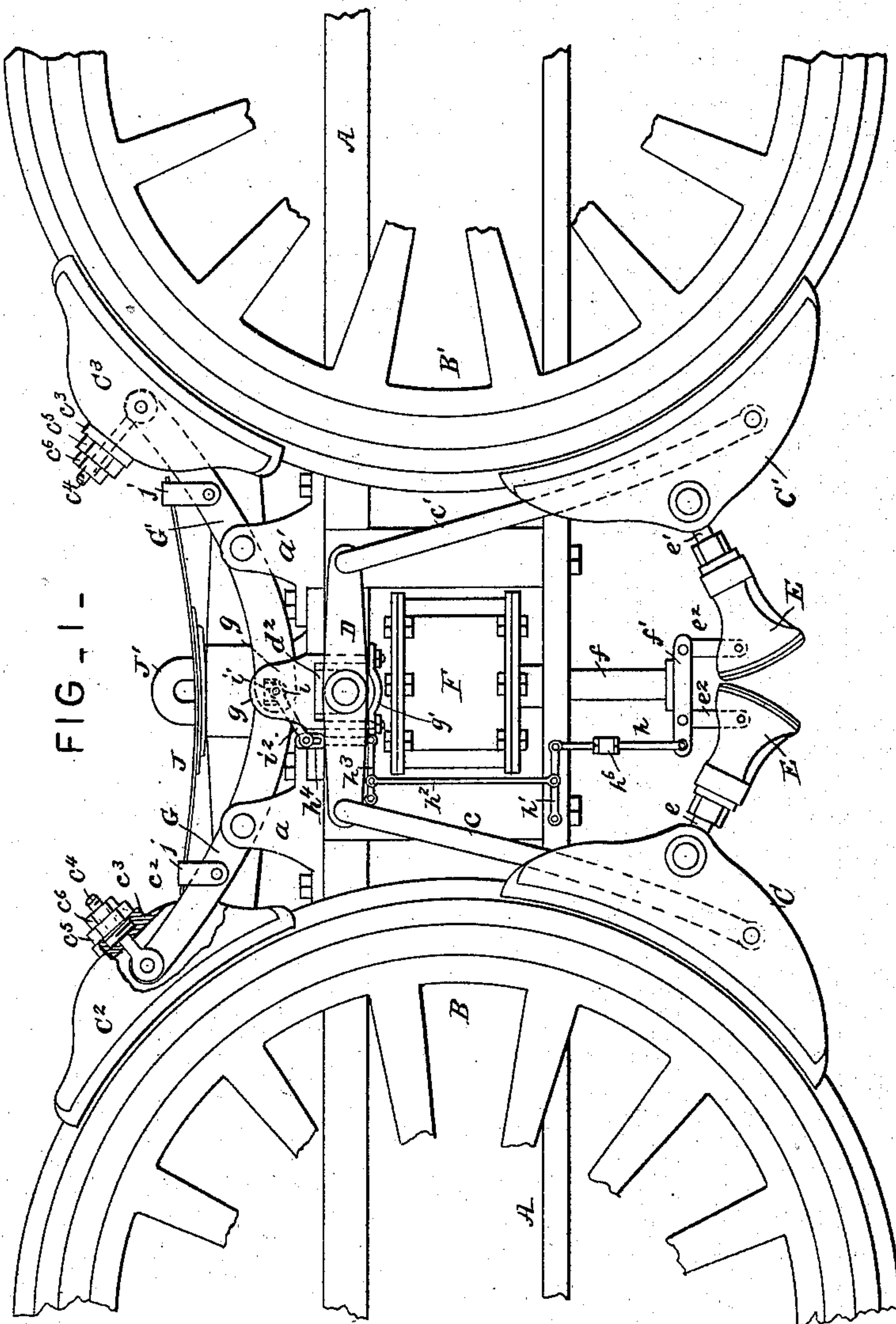
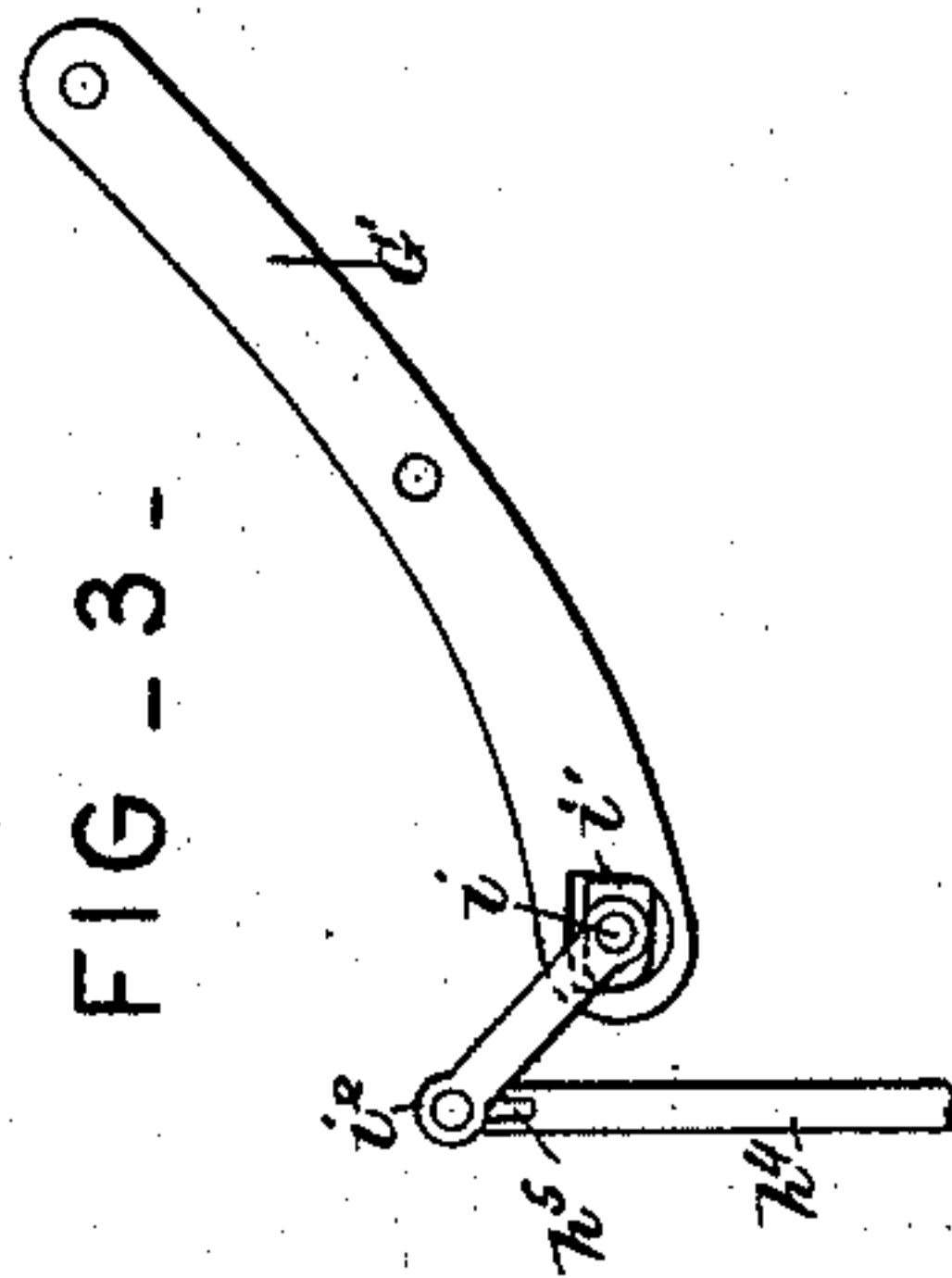


FIG - 3 -



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FIG - 5 -

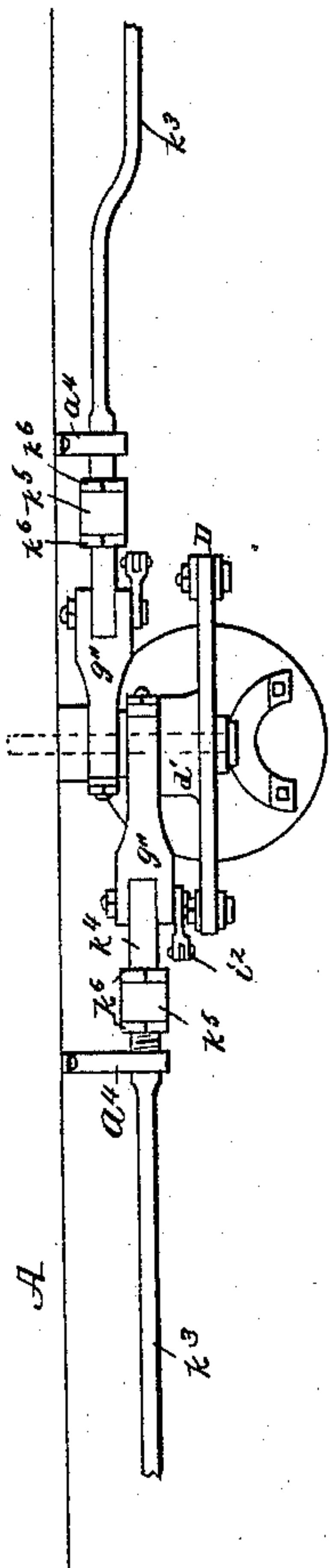


FIG - 4^a -

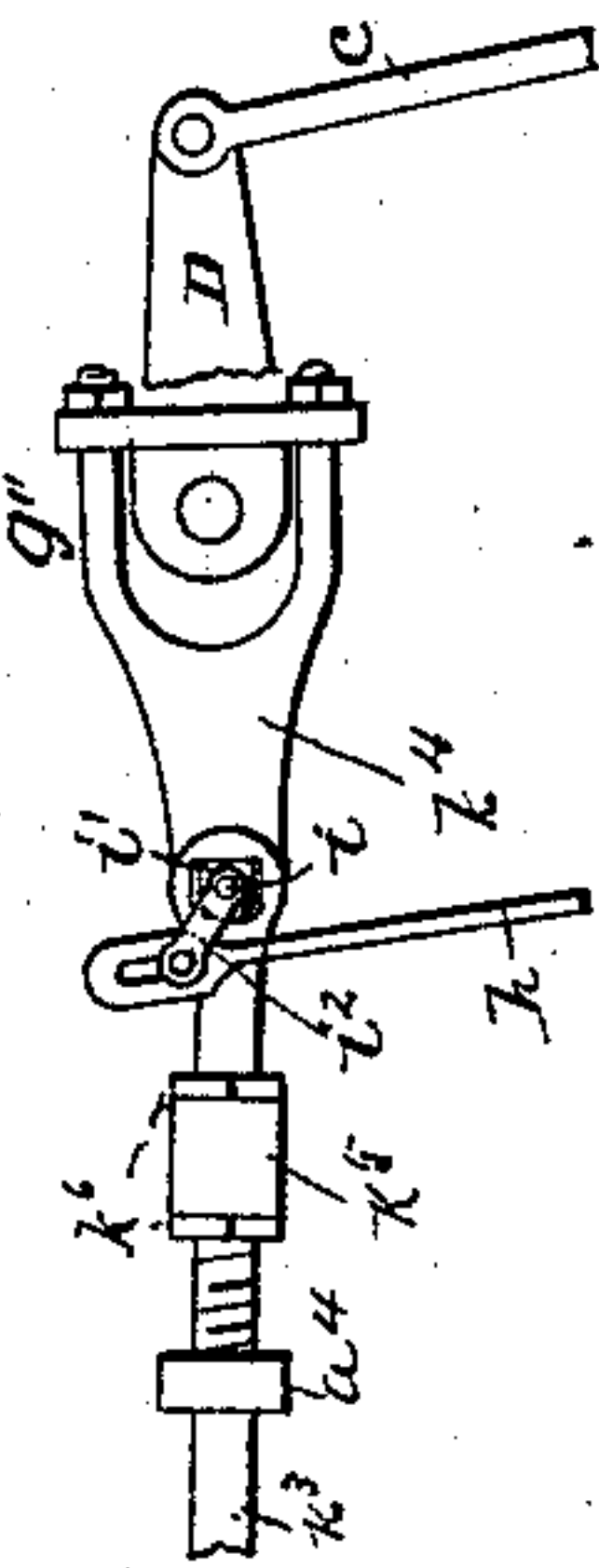
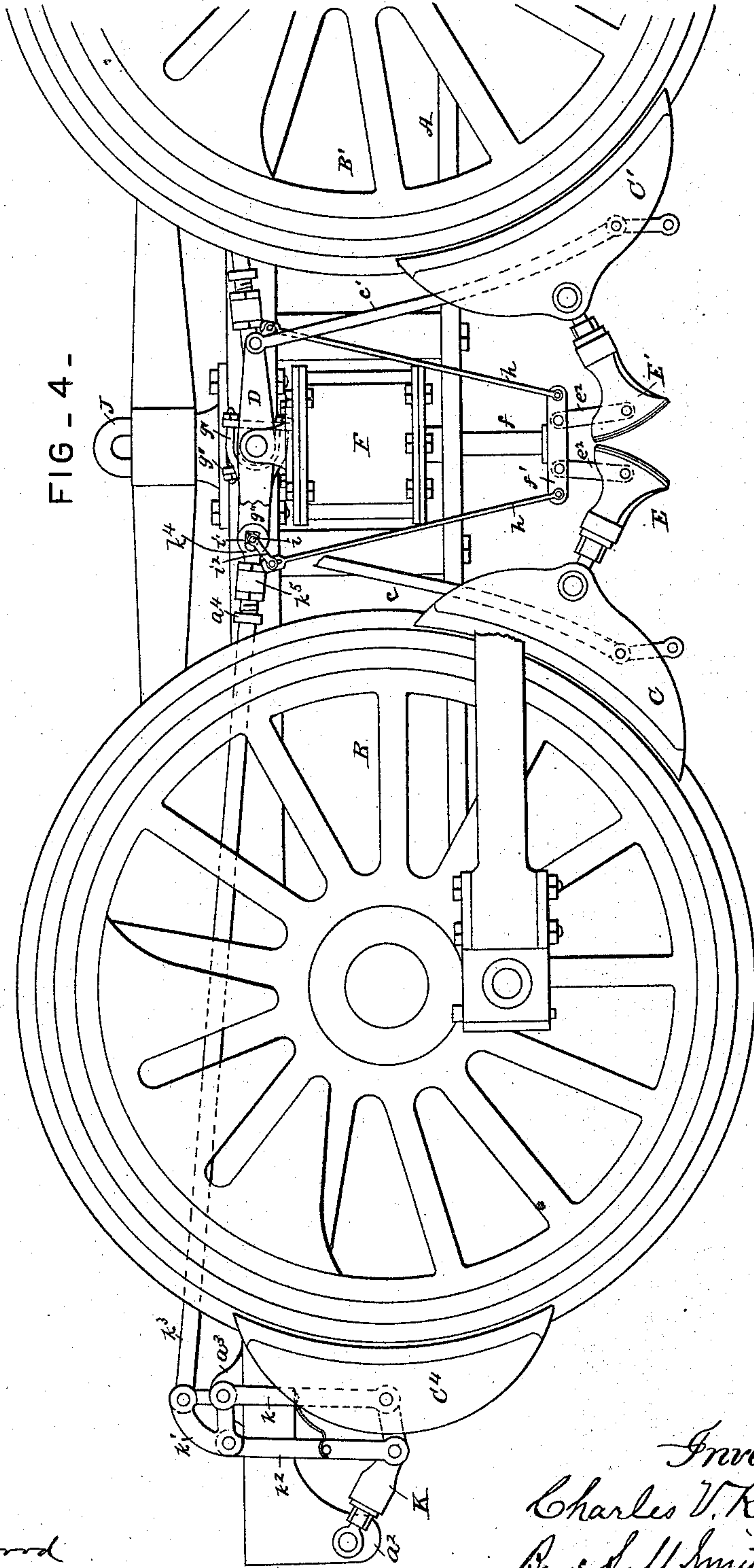


FIG - 4 -



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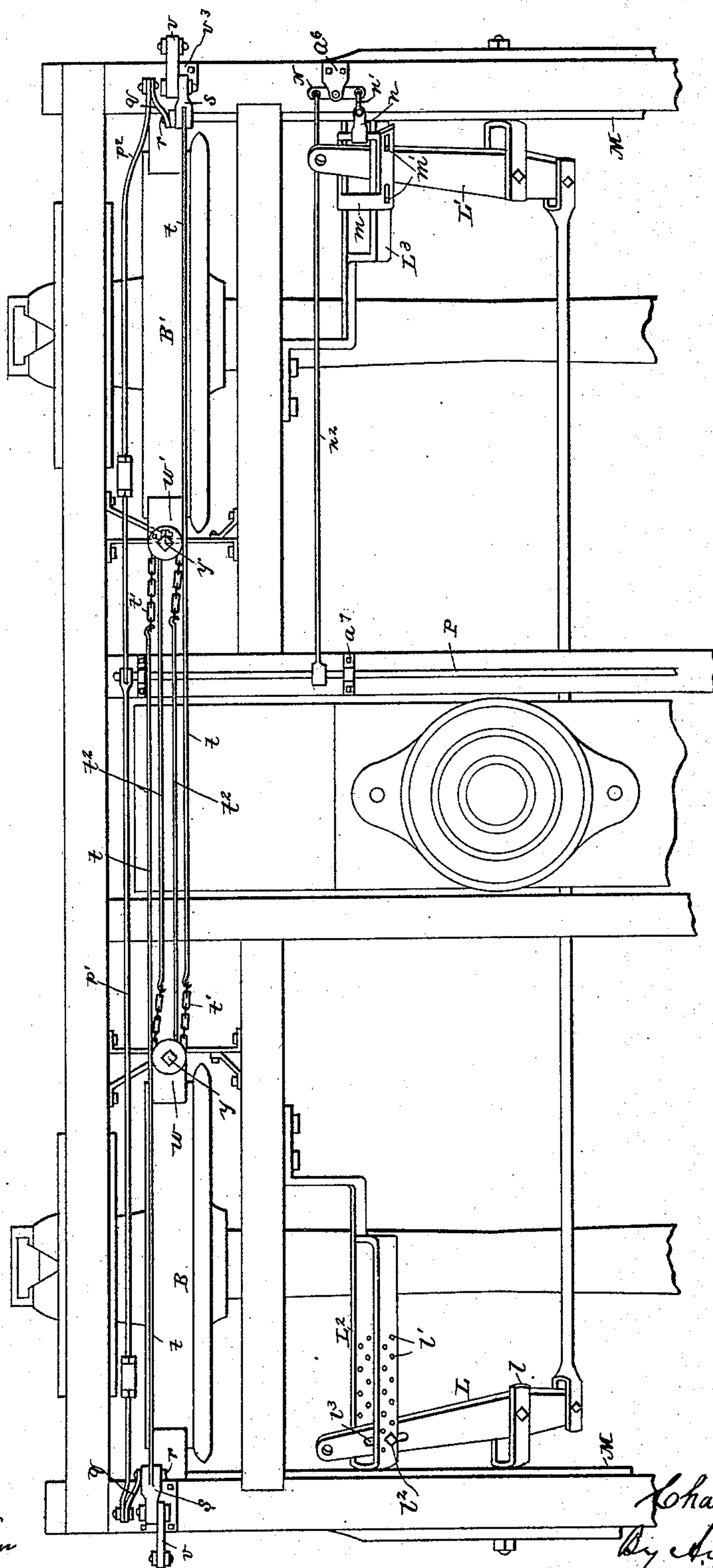
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FIG - 6 -



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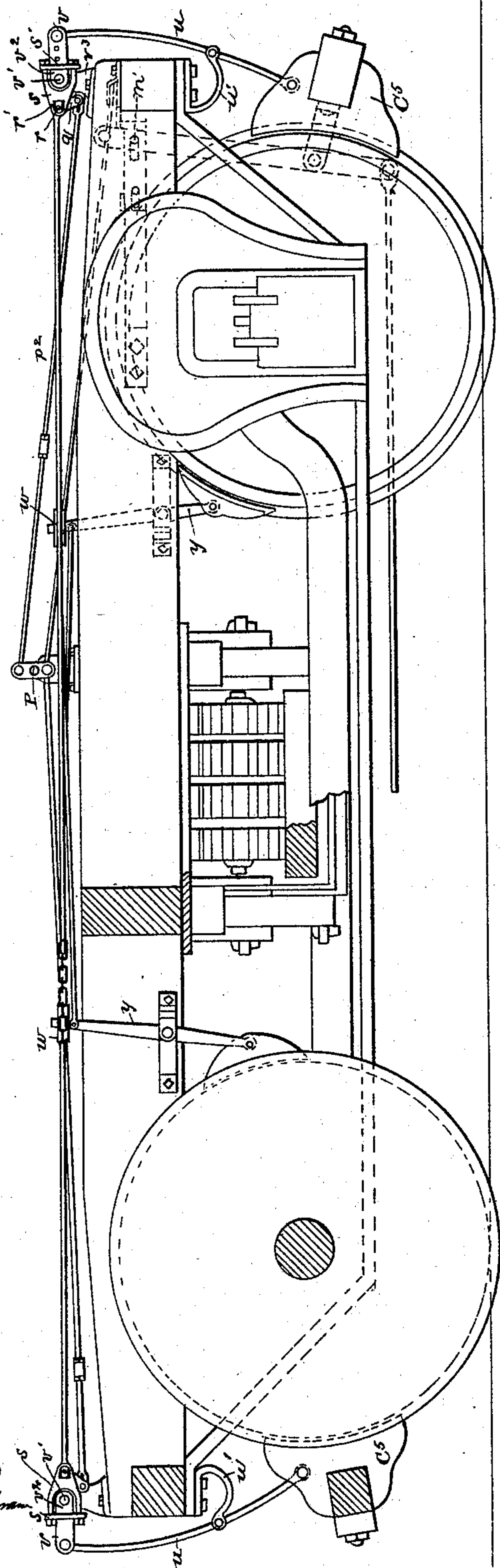
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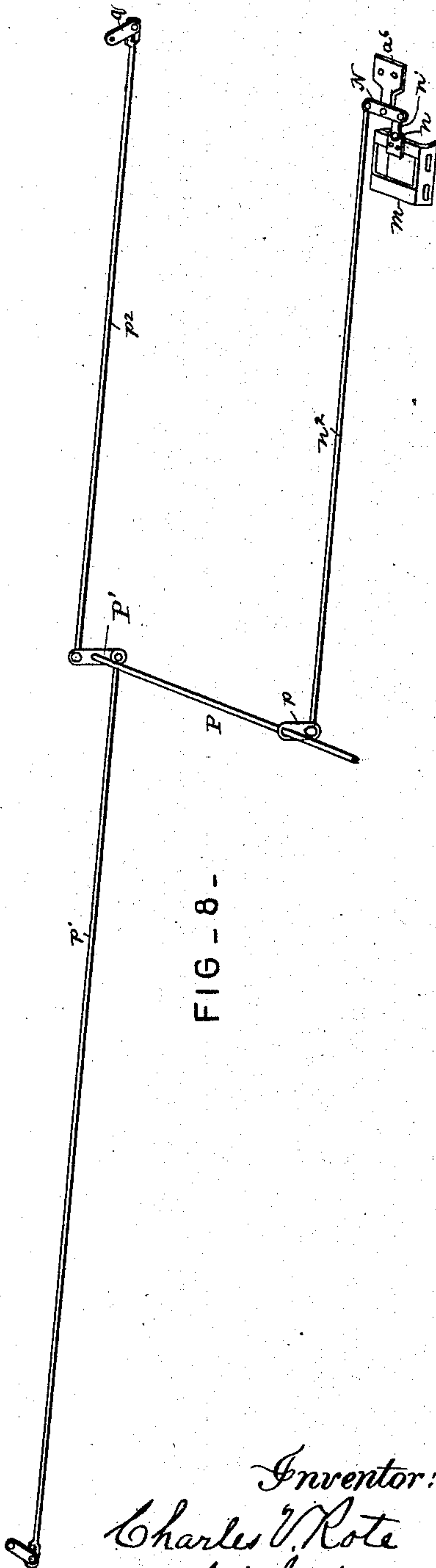
Patented Dec. 10, 1889.

FIG - 7 -



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FIG - 8 -



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UNITED STATES PATENT OFFICE.

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CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 416,749, dated December 10, 1889.

Application filed March 28, 1889. Serial No. 305,068. (No model.)

To all whom it may concern:

Be it known that I, CHARLES V. ROTE, a citizen of the United States, and a resident of Lancaster, county of Lancaster, and State of Pennsylvania, have invented a new and useful Improvement in Car-Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to the means for taking up slack in the brake rods or chains and thereby seating or bringing the brake-shoes to place preparatory to applying the braking power, and to the arrangement of levers and their connections with the brake-shoes whereby frictional action of the wheels upon said shoes is made to apply or increase the pressure of the shoes upon the wheels, as herein after described and claimed.

In the accompanying drawings, Figure 1 is a side elevation (with one of the brake-shoes partly in section) showing so much of an engine-truck as is necessary to show my improvements applied. Fig. 2 is a plan view of the upper brakes and brake-lever connections. Fig. 3 is a detail side view of one of the brake-levers and of the cam block, lever, and link for vibrating said brake-lever. Fig. 4 is a side elevation similar to Fig. 1, but showing a different arrangement of brakes and connections; Fig. 4^a, a detail side view. Fig. 5 is a plan view of some of the parts shown in Fig. 4. Fig. 6 is a plan view of one side of an ordinary car-truck, showing an arrangement of brake rods and chains in connection with my improvements for taking up slack. Fig. 7 is a side elevation of said car-truck; and Fig. 8 is a perspective view of some of the brake rods, shafts, and levers thereof, for taking up slack.

A indicates a portion of the frame, and B B' wheels, of a car-truck, which may be of any usual or preferred construction and arrangement of parts.

C and C' indicate brake-shoes, which may be connected to transverse brake-bars in any usual manner, and are suspended by means of links *c* and *c'* from the arms of a short longitudinally-arranged lever D, pivoted at

the center of its length, through a hub or sleeve *d* formed on it, on a short shaft *d'*, secured to the frame A.

E E' indicate cam-blocks pivotally connected through adjusting-rods *e e'* with the shoes C and C', and upheld in operative position by links *e² e²*, connecting them with the cross head or arm *f'* on the lower end of a piston-rod *f*, which at its upper end enters the cylinder F, where it is operated upon by compressed air, steam, or otherwise, for operating the cam-blocks and brake-shoes, in a well-known manner.

The hub or sleeve *d* has one or more semi-cylindrical or cam-shaped blocks *d²* formed on its inner end, one only being required in the construction shown in Figs. 1 and 2, where the flat side of said block is up, and astride of this block is placed a yoke *g*, the pendent arms of which are connected underneath the shaft *d'* and cam-block *d²* by a cross-bar *g'* and nuts on the screw-threaded ends of the yoke-arms. The yoke *g* has a flat inner surface extending between its pendent arms, and which rests upon the flat upper surface of the cam-block *d²*, the arrangement being such that the vibration of the lever D in either direction through the action of the brake-shoes and links *c c'* thereon serves through the cam-block *d²*, to lift the yoke *g*, for a purpose which will appear. The upper end of the yoke is bifurcated or has two parallel perforated lugs or ends *g³ g³*, in which a short transverse shaft *i* is journaled, upon which, rigid therewith, are cam-blocks *i'*, (see Fig. 3,) arranged side by side, similar in form to *d²*, above described, with their flattened sides up.

G and G' indicate levers, the inner or adjacent ends of which overlap each other, lying close together side by side and have U-shaped or semicircular perforations formed in them to receive the cam-blocks *i'*, which move therein for vibrating the levers G and G', which are pivoted at or near the centers of their length in suitable brackets *a a'* on the truck-frame, and which at their outer ends carry brake-shoes C² and C³ attached to them, as shown.

The cross-head *f'* has one (or both, see Fig. 100

4) of its arms extended, and has the lower end of a link h pivoted to it, the upper end of which connects with one end of an arm or lever h' , pivoted at its opposite end to the frame A, or any suitable support thereon, and from said lever h' a link h^2 extends up to another lever h^3 , pivoted at one end to the frame, its opposite end overhanging the cylinder F, and being connected by a link h^4 with a crank-arm i^2 , rigid on the shaft i , carrying the cam-blocks i' . The upper end of the link h^4 has a short longitudinal slot in it at h^5 , through which the crank-pin on the arm i^2 passes, and which permits a slight movement of the link h^4 relative to the crank-pin, for a purpose which will appear, and the link h by preference is a divided one, the adjacent ends of the parts thereof being provided with right and left hand screw-threads and connected by a suitable threaded elongated nut or sleeve h^6 and jam-nut, which permit the adjustment of the length of the link h for giving the desired set and throw to the crank-arm i^2 .

The shoes C^2 and C^3 have sockets formed in their sides or ends at c^2 , to receive the ends of the levers G and G', said ends underlying perforated bosses c^3 on the outer walls of the sockets or shoes, and through which eyebolts c^4 pass for connecting the shoes pivotally with the ends of the levers.

c^5 indicates a nut, and c^6 a jam-nut on the outer screw-threaded end of each bolt c^4 , for adjusting the shoes on the ends of the levers G and G', to compensate for wear or for setting the shoes nearer to or farther from the faces of the wheels.

The brake-shoes C^2 and C^3 are held normally out of frictional contact with the wheels by means of a spring J, secured to a suitable standard or support J' on the frame A, and the ends of which are connected with the levers G² and G³ through suitable loops or stirrups J J, pivoted to said levers near their outer ends.

It will of course be understood that only the parts on one side of the truck have been described above, and that said parts will be duplicated upon the other side thereof.

In operation the first part of the upward stroke of the piston-rod will of course be exerted to bring the cam-blocks E and E' into action for moving the shoes C and C' into contact with the wheels, and the same movement lifts the link h^4 the length of the slot h^5 and brings the link into position to act on the crank-arm i^2 , and so through the cams i' and levers G and G' to seat the brake-shoes C^2 and C^3 . As the shoes C and C' are brought into frictional engagement with the wheels, rotating in either direction, they act through the links c and c' on the lever D to vibrate it, and the cam-block d^2 , rigid with said lever D, acts on the yoke g to lift it and with it the inner ends of the levers G and G', thereby forcing the shoes C^2 and C^3 into frictional engagement with the wheels with a pressure

corresponding to that applied to the brake-shoes C and C'. At the same time the upward movement of the piston-rod carries with it the link h^4 and the latter continues to act, through the crank-arm i^2 and cams i' , on the levers G and G', for forcing the brake-shoes C^2 and C^3 against the wheels. When the power applied through the piston-rod is withdrawn and the latter begins to descend, it carries the link h^4 with it the length of the slot h^5 , relieving the crank i^2 , and the cam-blocks i' , being no longer locked in position to hold the brake-shoes against the wheels, are free to rock back and relieve the pressure on the brake-shoes C^2 and C^3 , and the frictional action of the wheels on the shoes C and C' being removed by the dropping away of the latter from the wheels, the lever D is allowed to rock back to its normal horizontal position, allowing the yoke g to descend, and with it the inner ends of the levers G and G', thereby permitting the spring J to lift the shoes C^2 and C^3 out of contact with the wheels.

In the construction shown in Figs. 4 and 4^a, in which the supplemental brake-shoes, one of which is indicated at C^4 , are located on the outer sides of the wheels or on opposite sides from the shoes C and C' instead of above the wheels, as in Fig. 1, said supplemental shoes are suspended from the frame by links k , and have each connected with them one end of a toggle joint or lever K, which at its opposite end is pivoted to a bracket a^2 on the truck-frame. k^2 is a link pivoted at its upper end to the horizontal arm of an elbow or bell-crank lever k' , which is pivoted at its elbow in a bracket a^3 on the frame, the lower end of said link k^2 being connected with the toggle-lever K at or near its joint, as shown. From the upper arm of the bell-crank lever k' a link or rod k^3 passes through a bearing-bracket a^4 on the frame and has its inner end screw-threaded to receive an elongated nut or screw-threaded sleeve k^5 and a jam-nut k^6 , for holding said nut at any desired adjustment. An eyebolt or extension k^4 is screwed into the opposite end of the nut or sleeve k^5 , and a second jam-nut k^6 serves to hold it also at the desired adjustment, the construction described serving to permit the adjustment of the length of the rod k^3 k^4 , as desired. The end of the extension k^4 has a semi-cylindrical perforation in it, and the cam i' on the shaft i^2 , arranged in this instance on its side to pull endwise on the rod, engages said perforated end for operating the rod k^3 , bell-crank k' , and link k^2 , and through said parts the toggle-lever and brake C^4 , for moving the latter up against the wheel. The shafts i , carrying the cams or cam-blocks i' , are in this construction journaled in the outer ends of longitudinally-arranged yokes g'' g'' , the arms of which stride horizontally-arranged and oppositely-facing cam-blocks on the sleeve of lever D, and which act on the cross-bars of the yokes to draw the rods k^3 inward, and so as to act on

the brakes C^4 , in a manner that will be readily understood without further description. In this construction also, the cranks I^2 being moved outward and away from over the cylinder F , the links $h h$ may extend directly therefrom to the cross head or arm f' , as shown.

In Figs. 6, 7, and 8 I have shown an arrangement of brake-rods, levers, and connections, applicable to an ordinary car-truck in connection with the cam or cam-blocks above described, for taking up the slack in the brake-rods and chains and seating or bringing the brake-shoes to bear on the wheels. Thus, L and L' indicate two brake-levers pivoted one at each end of the truck in a swiveling yoke or bracket l , secured to the brake-beam M . The lever L extends up through a guiding and holding loop L^2 , secured to the truck-frame and provided with a series of perforations l' and a bolt l^2 , which may be passed through any one of the perforations l' and through a slot l^3 in the lever L , for holding the latter at any desired adjustment, the slot l^3 permitting the lever to play up and down in the loop L^2 , as the brake-beam rises or falls relatively to the truck-frame. The lever L' moves in a guiding-loop L^3 , secured to the truck-frame, and its upper end will be connected to the brake-actuating mechanism in any usual manner. The operation of these parts is too well understood to require description. The guiding-loop L^3 has mounted upon it an angular saddle m , the pendent side flanges of which have longitudinal slots in them, through which pins or bolts m' pass into the sides of the loop for holding the saddle in place thereon, but which permit the endwise movement of the saddle on the loop. The upper horizontal portion of this saddle m is slotted to permit the passage of the upper arm of the lever L' through it and slight play of said arm in the slot. The outer end of this saddle m has a lug or ear n on it, and to this the inner end of a short link n' is pivoted, the outer end of said link being pivoted to one arm of a short lever N , pivoted centrally of its length in a bracket a^6 on the truck-frame. The opposite end of the lever N has a rod n^2 connected to it, said rod extending to a pendent arm p , rigid on a rock-shaft P , extending crosswise of the truck-frame about centrally of the length thereof and journaled in suitable bearing-brackets a^7 thereon. The ends of the rock-shaft P have cross arms or levers P' secured to them, from the opposite ends of which rods $p' p^2$ extend to crank-arms q on short shafts r , journaled each in the inner end of a yoke s , secured pivotally to one end of a brake-rod t . The shaft r is provided with a cam-block r' fast on it, and the perforation in the yoke s , through which the shaft r passes and in which the cam-block r' lies, is semi-cylindrical in form, the flat face of the cam being turned outward, the construction of these parts being similar to the cam-blocks and perforated link ends, above described

with reference to Fig. 4^a, and the arrangement such that as the shaft r is rocked, through its connection with the saddle m , as described, the brake-rod t is acted upon by the cam-block r' and drawn outward for taking up slack in the brake-rods and chains and moving the brake-shoes against the wheel.

The above operation is further assisted by suspending the brake-shoes C^5 on links u , attached at their upper ends to crank-arms v on short shaft v' , and upheld by suitable springs u' , attached to the truck-frame. The shafts v' are journaled in brackets v^3 on the frame, and are each provided with a cam-block v^2 , having its flat or cam face arranged to thrust outward on the cross-bars s' of the yoke s as the shaft v' is rocked by the action of the brake-shoes in being drawn downward or thrust upward by the friction of the wheel thereon.

The brake-rods t connect each with a chain t' , which passes around a pulley w or w' on the upper end of the brake-lever y or y' , and thence through a rod t^2 back to the opposing brake-lever y' or y , as the case may be, so that the action of either brake rod or chain on one lever is communicated to both levers, in a manner well understood.

The manner of applying the cam-blocks and yokes for taking up slack and assisting in applying the brakes on ordinary car-trucks will be readily understood from the foregoing description, and it will be apparent that these devices may be employed in connection with any usual or preferred arrangement of the brake rods and levers, for the purpose explained.

Having now described my invention, I claim as new—

1. The combination, with the brake-shoe, of the suspending-link, the levers to which said link is connected, the cam rigid with said lever, and the yoke operated by said cam, substantially as and for the purpose described.

2. The combination, with the brake-shoe, its suspending-link, and the lever to which said link is connected, of a cam, a yoke operated thereby, and a second brake-shoe connected to said yoke, substantially as described.

3. The combination, with the brake-shoes, their suspending-links, and the lever to which said links are connected, of the cam-block, the yoke operated thereby, and the supplemental levers and brake-shoes connected to said yoke for joint operation, substantially as described.

4. The combination, with the brake-shoes C and C' , of the suspending-links and levers operated thereby, the cam-blocks E and E' for operating said shoes, the cross-head and links connecting said cam-blocks with the piston-rod, the supplemental shoes and their actuating-levers, the cam for actuating said levers, the crank-arm rigid with said cam, and links connecting said crank-arm with the piston-rod, substantially as described.

5. The combination, with the brake-shoes, of the suspending-links, the lever, cam, cam-yoke, and the brake-connections operated thereby, and whereby the slack is taken up
5 in the brake-connections, substantially as described.

6. The combination, with a brake-lever, of the recessed cam, a shoe having the perforated boss on its outer face, the eyebolt for
10 connecting said shoe and lever, and the nut for adjusting the shoe on said lever, substantially as described.

7. The combination of the levers G and G', carrying the brake-shoes C² and C³, the sliding yoke to which said levers are pivoted, the
15 cams on the pivot connecting said yoke and levers, and the crank-arm and its connections for rocking said cams, substantially as described.

20 8. The lever connected to and operated from the brake-shoe, the cam on said lever,

and the yoke operated by said cam and connected to a second brake-shoe, substantially as described, whereby said second shoe is brought into contact with the wheel by the
25 movement of the first-named brake-shoe, substantially as specified.

9. The combination of the brake-shoes C and C', their suspending-links and lever, the cam-blocks for operating said brake-shoes,
30 the yoke operated by said lever, the levers and supplemental brake-shoes connected to said yoke, and the interposed cams and their connections for operating said levers, all substantially as described.

In testimony whereof I have hereunto set my
hand this 25th day of March, A. D. 1889.

CHARLES V. ROTE.

Witnesses:

I. C. ARNOLD,
C. REESE EABY.