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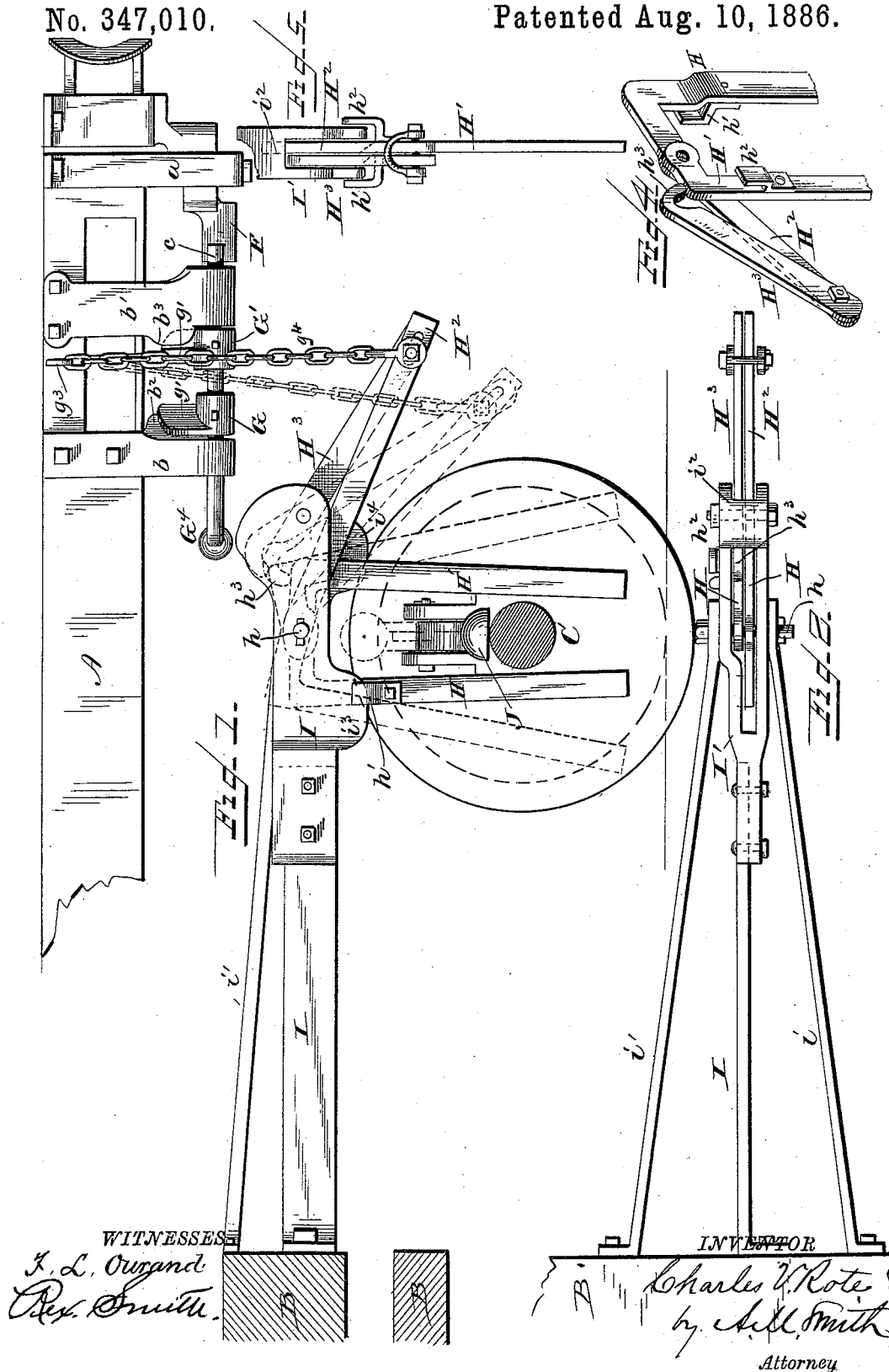
5 Sheets—Sheet 1.

C. V. ROTE.

AUTOMATIC CAR BRAKE.

No. 347,010.

Patented Aug. 10, 1886.



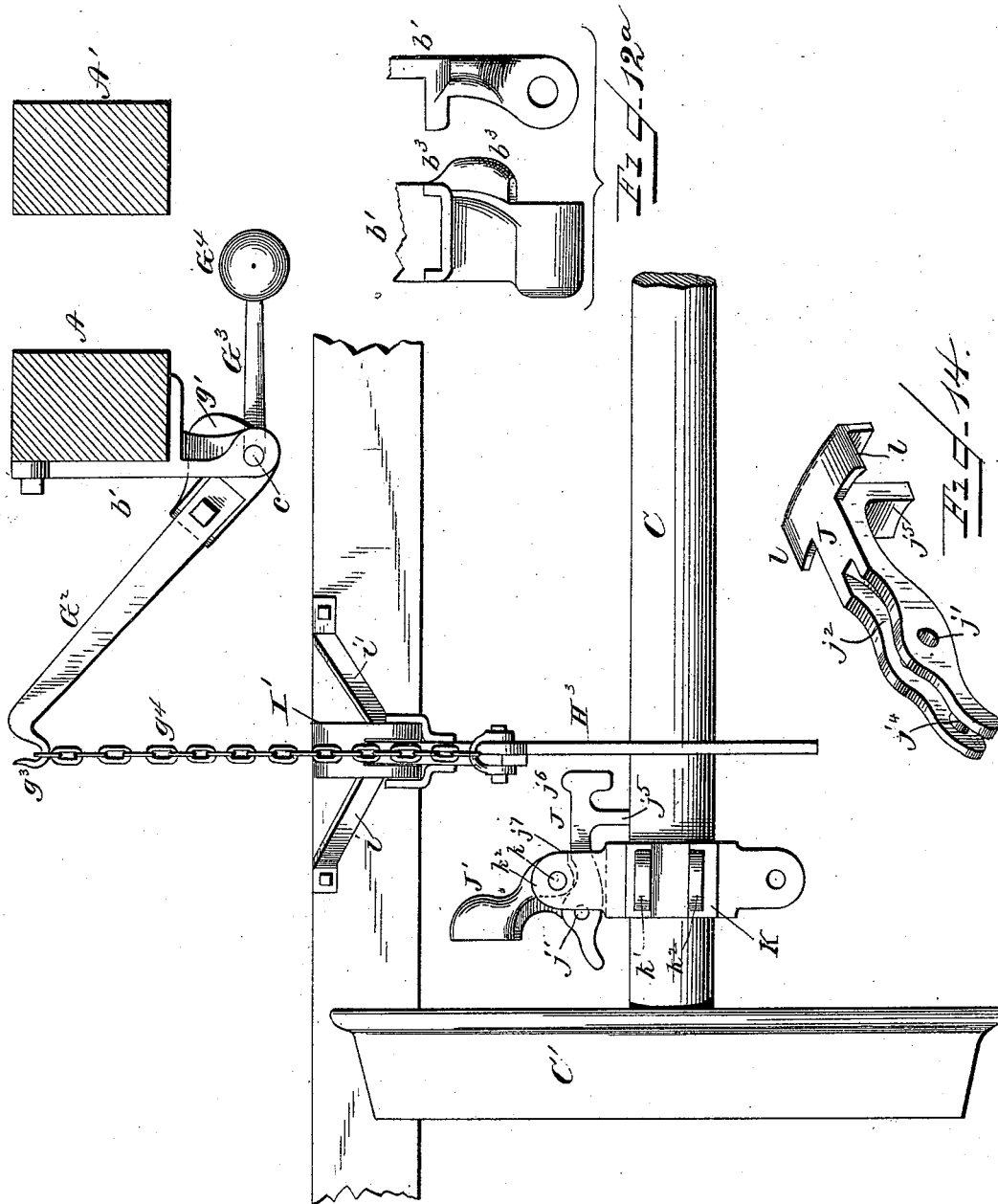
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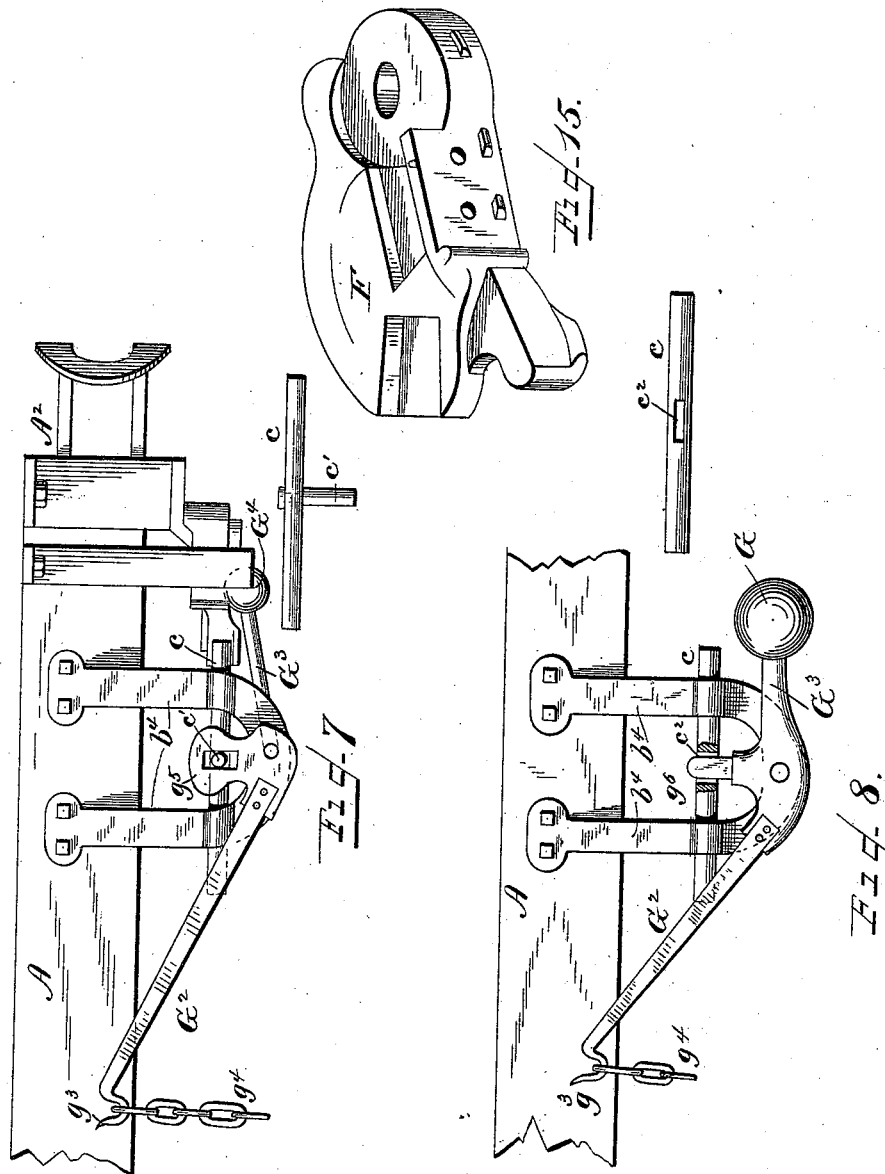
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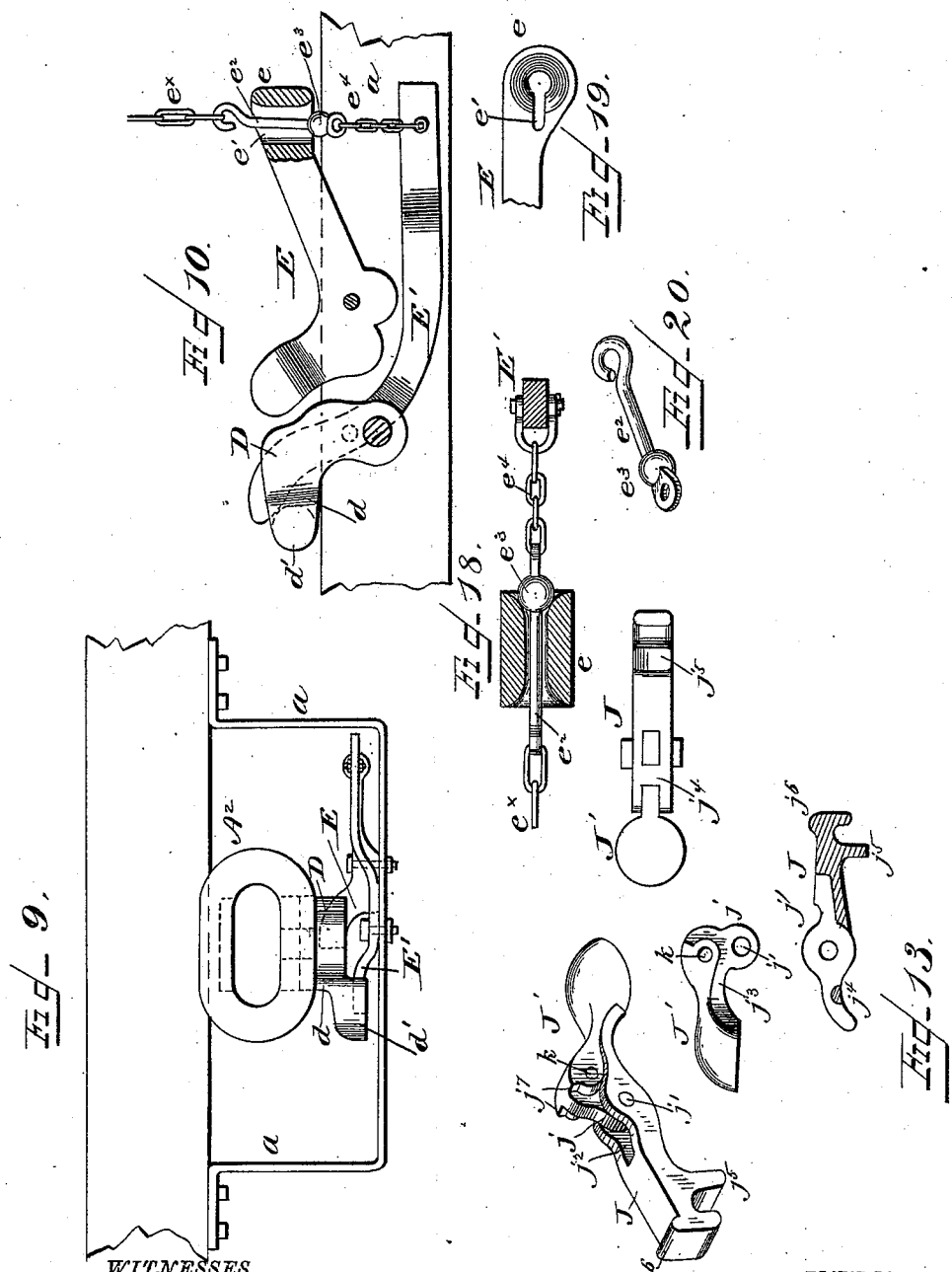
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AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 347,010, dated August 10, 1886.

Application filed March 15, 1886. Serial No. 195,318. (No model.)

To all whom it may concern:

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

My invention relates to certain improvements upon the automatic brake mechanism described in Letters Patent granted to me March 20, 1883, No. 274,389, and May 12, 1885, No. 317,954; and it consists, mainly, in simplifying and reducing the number of the parts entering into the construction and arrangement described in said patents, in particulars hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation, with the axle and part of the truck-frame in section, of so much of a car as is necessary to show my improvements. Fig. 2 is a plan view of the bracket or hanger in which the angular levers which are acted upon by the governor-arms are suspended. Fig. 3 is a plan view of a portion of the car-frame with my improvements applied. Fig. 4 is a perspective view of the pendent angular levers detached; Fig. 5 an end elevation of the same and of the end of the bracket, in which said levers are pivoted; Fig. 6, a front elevation of one of the governor-arms, the pendent levers operated upon by said governor, and of the lever connected therewith for actuating the gravity-stop or latch-pin; Figs. 7 and 8, side views showing modifications in the latch-lever and pin or latch; Fig. 9, a front elevation of the dog and of the cam and brake levers and their supporting bracket or hanger. Fig. 10 is a detail view of the brake-levers; Figs. 10^a, 11, 12, and 12^a, detail views of the weighted lever for actuating the gravity-stop pin or latch, and of the supporting-hangers connected therewith; Figs. 13 and 14, detail views showing the construction of the governor-arms and a modification therein; Figs. 15, 16, and 17, detail views showing the construction of the cam for setting and relieving the pivoted dog on the

sliding draw-bar; and Figs. 18, 19, and 20, detail views showing the connection between the brake and take-up levers.

A A' indicate the central longitudinal timbers of the car-platform frame, between which the draw-bar A² slides; B, a portion of the truck-frame; C, one of the truck-axles; and C', the wheels thereon, said parts being of the usual or any preferred construction and arrangement.

D is the dog for actuating the brake-lever, said dog being pivoted to and sliding with the draw-bar; E, the brake-lever; and F, the cam for setting the dog to act on the brake-lever, the operation of said parts being substantially the same as in my former patents referred to, with differences in construction, hereinafter described.

The brake-lever E is pivoted in a hanger, *a*, secured to the end bar of the platform-frame, (see Fig. 9,) and the horizontal portion thereof, on which said lever is pivoted, lies sufficiently below the lower face of the draw-bar and of the dog D, pivoted thereto, to allow the latter to pass freely over a second lever, E', also pivoted to the hanger *a*. The inner short arm of lever E is curved upward, as shown, to bring it within the path of the dog, and the latter is provided on its side opposite to said lever E with a laterally-projecting arm, *d*, having a pendent pin or spur, *d'*, which in the thrust of the draw-bar and dog comes in contact with the outer face of the curved heel-extension of the lever E', vibrating the latter on its pivot.

The brake-lever E is provided on its outer end with an eye or short sleeve, *e*, (see Figs. 10, 18, and 19,) having on the inner side of its perforation a slot, *e'*, of sufficient width to permit the lateral play or movement of the part *e*² of the brake rod or chain passing through said eye or perforation. The part *e*² has on its inner end a hook or eye for attaching to it with the rod or combined rod or chain *e*³, connecting it with the brakes, and on its outer end a ball or knob, *e*³, of sufficient diameter to prevent its passage through the eye *e*, thereby adapting said lever E to act through the ball *e*³ on the brake rod or chain and brakes. The

link e^2 has formed upon it, outside of the ball e^3 , an eye, from which a chain, e^4 , extends to the outer end of lever E' , which, being acted upon by the spur d' on the dog, in advance of the action of the dog on the brake-lever E , serves to take up any slack in the brake rod and chain e^4 , leaving to the brake-lever proper, E , when acted upon by the dog, only the work of applying the brakes. The ends of the perforation in the sleeve e are enlarged or countersunk, as shown, to insure the centering and prevent the catching of the ball and hook or eye on the link or part e^2 on its edges, and the latter is made of a length adapting it to slide through the eye or sleeve sufficiently to take up any slack in the brake rod or chain.

The construction of the cam F for setting the dog D to act on the brake-lever E is shown in Fig. 15 and in a modified form in Fig. 16. The long lever or arm described in my former patents referred to is dispensed with, and the cam part, pivoted at its outer end to the hanger a , has its inner swinging end adapted to be engaged by a sliding pin, c , supported in hangers b b' , secured to the outer face of frame-timber A or other suitable support. The hangers b b' are provided in their lower ends with sleeve-bearings for the pin c , and upon said sleeves, at their adjacent ends, are formed wave-cams b^2 b^3 , the purpose of which will appear. The pin c has keyed or otherwise secured to it two collars, G G' , (which may, however, be made in one piece, if desired,) the former adjacent to the hanger b , and provided with a cam-rib, g , adapted to be acted upon by the cam b^2 , and the latter, G' , adjacent to the hanger b' , and having a cam-rib, g' , adapted to be acted upon by the cam b^3 on the hanger b' . (See Figs. 10^a, 11, 12, and 12^a.) The collar G' has a socketed arm, g^2 , on its outer side, to which a lever-arm, G^2 , is secured, and upon its opposite side is formed or rigidly secured a weighted arm, G^3 , (see Fig. 6,) or this weighted arm may be formed on the inner end of the sliding pin, as shown in Fig. 1, instead of on the lever G^2 or its collar G' . The arm or lever G^2 has an eye or hook, g^3 , at its outer end, from which a chain or cord, g^4 , extends to the pendent levers, through which said lever G^2 is vibrated, as will be explained. The weight G^4 on the arm G^3 is sufficient to overbalance and raise the arm G^2 , and may be made adjustable for that purpose, if desired, and the cams b^2 b^3 and g g' on the hangers and collars are so arranged that when the arm G^2 , fast on the pin c , is raised, said pin will be thrust outward by the action of cam b^2 on the cam g , behind or outside of the inner swinging end of the cam-piece F , as indicated in Fig. 1, thereby locking the latter in position to cause the dog to act on the brake-lever, whereas when the arm G^2 is drawn downward by the action of the pendent levers, hereinafter described, the cam b^3 acts on the cam g' and crowds the pin inward out of engagement with the cam F , and the latter is free to swing outward and allow the pivoted dog on the draw-

bar to pass by it without actuating the brake-lever.

In some cases it may be necessary to set the hangers b b' and the pin c farther back than is indicated in Figs. 1 and 7, and to accommodate this or to compensate for wear of the parts the cam F may be provided with an extension, piece, f , slotted at its inner end, (see Figs. 16 and 17,) and secured in a socket in the swinging end of the latter by means of a bolt or set-screw, f' , permitting its longitudinal adjustment.

In other cases I may find it desirable to dispense with the cams for actuating the pin c and to arrange the weighted lever G^2 on a transverse pivot on a hanger, b^4 , such as is shown in Figs. 7 and 8, in which case the lever will be provided with an upright arm, g^5 , slotted to engage a laterally-projecting spur, c' , on the pin c , for actuating the latter, as shown in Fig. 7, or with a spur, g^6 , passing through a slot at c^2 in the pin c , as shown in Fig. 8.

H and H' are the angular levers through which the governor on the axle acts on the lever G^2 , said levers being pivoted through the horizontal arms at their upper ends at h in a bracket secured to one or more of the transverse bars of the truck-frame B . The bracket is composed of a strong bar or arm, I , set on edge and secured through suitable flanges or feet to the bar B , and having a forked extension, I' , secured to its outer end, and oblique braces i and i' extending from the sides of the fork I , back to and secured through suitable flanges or feet to the truck-frame, for giving the bar I a strong and rigid connection therewith. The through-bolt, which connects the outer ends of the braces i and i' with the forked extension I' , may serve also as the pivotal connection of the levers H and H' with said fork. The arms of the fork are made arching on their upper edges, at their outer ends, and are connected at said point by a web or bridge, i^2 , which serves to stiffen one from the other, and each arm of the fork is provided with a pendent lip, i^3 or i^4 , adjacent, one to the pendent arm of lever H , and the other to the pendent arm of lever H' , and serving in connection with angle-irons h' and h^2 on said arms, and engaging said lips to prevent lateral play of the pendent arms and to limit their outward throw. The horizontal arm of lever H is extended, as shown at H^2 , and the chain g^4 connects its end with the eye or hook g^3 of the lever G^2 , for adapting it to depress the latter. Said end of lever-arm H^2 has also secured to it a bar, H^3 , which extends obliquely up over the angle of lever H' , and has a hooked end, h^3 , which rests on the horizontal arm of said lever near its angle, as shown, said bar serving to cause the vibrations of the lever H' to be communicated through the arm H^2 to lever H , and vice versa, in such manner that the action of the governor on the pendent arm of either lever H or H' will be communicated to the lever-arm H^2 , and thence to the lever-arm G^2 , for vibrating the latter.

The governor consists of a series (four, more or less) of sliding bars or arms, J, and weighted elbow-levers J', (see Fig. 13,) the latter pivoted at *k* through the arms J', between ears *k'* 5 *k''* on a divided ring or collar, K, secured to the axle C. (See Fig. 6.) The arms J' of the governor are weighted at their outer swinging ends, which are adapted to be thrown outward or away from the axle, as indicated in 10 Fig. 6, by centrifugal action when the car is moving at speed, and to fall down or inward upon said axle when the latter is moving slowly or is at rest. This weighted arm is provided with a pendent arm or ear, *j*, through 15 which it is connected at *j'* to the arm J, the end of which adjacent to arm J' is slotted or forked, as shown at *j''*, to receive the ear *j*. Where the heel end of the arm J is forked or slotted it has a connecting-bar, *j'*, at the lower 20 edge of the arms, which serves as a stop to the arm J, or the shoulders formed at the sides of the ear *j* or rib *j''* may serve the same purpose, and the bar *j'* may serve merely to connect the arms of and stiffen the fork. The 25 arm J is adapted to slide longitudinally in a groove in the collar K, and has a pendent rib, *j''*, near its end which rests and slides on the axle, and on its upper face, at its extreme end, has an upright rib, *j''*, which, when the arm J 30 is moved inward to engage and act on the levers H and H', serves to prevent its withdrawal when so engaged and to prevent the said levers from accidentally slipping off the end of the arm J. The pivot *j'*, it will be seen, 35 is eccentric to and below the pivot *k*, and, as the weighted arms J' are thrown off or away from the axle by centrifugal action, they withdraw the arms J outward out of the plane of the levers H and H', as shown in Fig. 6, 40 and said levers are consequently allowed to swing in toward the axle, as indicated in full lines in Fig. 1, in which position the arm H² rises, removing all tension from the chain *g'*, connecting it with the weighted lever G², 45 and the pin *c*, connected with the latter, is acted upon by the weighted arm G³, and is thrust outward behind the cam F, locking the latter in position to cause the pivoted dog on the draw-bar to actuate the brake-lever. 50 When, however, the rotation of the axle C becomes sufficiently slow to allow the weighted arms J' to fall inward upon it, the arms J will be caused to slide inward on the axle until their ends are projected into the plane of and 55 between the pendent arms of the levers H and H', and to act thereon to crowd said arms outward away from the axle, thereby drawing the arm H³ downward, as indicated by dotted lines in Fig. 1, and therewith the arm or lever G², 60 overcoming the weight of arm G³ and causing the pin *c* to be withdrawn from behind the cam F, leaving the latter free to swing outward and permit the passage by it of the pivoted dog D without actuating the brake-lever. 65 In Fig. 14 the sliding arm J of the governor is shown provided at the end, acting on the

levers H and H', with laterally-projecting ears 70 *l l*, curved in an arc of a circle of which the axle is the center. These serve to extend the surface acting on the levers H and H' and to insure the action of one of said arms on said levers until another is brought into action, and consequently to reduce, if desired, the number of such arms required to make the action of the governor effective. The weighted arms J 75 have each a stop or shoulder at *j'*, which, when said arms are thrown out by centrifugal action, serve the double purpose of holding the sliding arms J snugly against the axle and preventing the arms J from being thrown out 80 so far as to interfere with their ready return by gravity when the centrifugal force is sufficiently reduced to permit such return movement.

The cam F has a spring, *f''*, secured to it 85 under an arrangement and acting in a similar manner to that described in Letters Patent No. 317,954, above referred to, and other parts of the mechanism not specifically hereinabove described may be constructed as described in 90 said patent.

Having now described my invention, I claim as new—

1. In an automatic brake mechanism, the combination, with the brake-lever actuated by 95 the dog on the draw-bar of a take-up lever, acting independently of said brake-lever to take up the slack in the connection between the brake-lever and brakes, substantially as described. 100

2. In a brake-actuating mechanism, a lever for taking up slack in the flexible connection between the brake-lever and the brakes, in combination with the pivoted dog on the draw-bar for actuating said take-up lever, substantially as described. 105

3. The combination, with the sliding draw-bar, and the dog secured to and moving with said draw-bar, of the brake and take-up levers actuated by said dog, substantially as described. 110

4. The combination, with the brake-lever and the pivoted dog on the sliding draw-bar for actuating said lever; of the cam for setting said dog to act on the brake-lever, and the 115 sliding latch or pin for locking said cam in position to cause the dog to act on the brake-lever, substantially as described.

5. The combination of the brake-lever, the dog on the sliding draw-bar for actuating said 120 lever, the cam for setting or relieving said dog, the sliding latch-pin for locking or releasing said cam, and the weighted lever for actuating said pin, substantially as described.

6. The combination, with the cam, the pivoted dog on the draw-bar actuated thereby, and the sliding pin for locking and releasing said cam, of the cams and weighted lever for actuating said pin, said weighted lever being 125 connected with pendent levers acted upon by the governor on the axle, and operating substantially as described. 130

7. The combination, with the weighted lever for operating the sliding pin or latch, of the levers H and H', connected with said weighted lever, and provided with straight
5 pendent arms adapted to be acted upon by the governor arms, substantially as described.

8. The bracket or hanger in which the angular levers acted upon by the governor are supported, provided with the forked extension and ears or pendent lips thereon, engaging angle-irons on the angular levers for preventing lateral play of the pendent arms of the said levers, substantially as described.

9. The governor composed of weighted elbow-levers pivoted in suitable ears on the axle, and bars or slides moving in suitable guiding ways or grooves and connected with and actuated by the weighted elbow-levers, substantially as described.

10. The combination, with the pendent arms of the levers H and H', of the governor composed of the weighted arms pivoted to the axle, and the sliding arms pivoted to said weighted arms and adapted to slide on said
25 axle, and to move into and out of engagement

with said pendent lever-arms, actuated by said weighted arm, substantially as described.

11. The governor composed of the weighted arms pivoted to the axle, and the sliding arms actuated by the weighted arms, and provided
30 on their ends each with a rib or lip adapting it to engage and retain the pendent arms of the angular levers, substantially as described.

12. The combination, with the angular levers having the pendent arms, of the sliding
35 governor-arm provided with curved ears *ll*, expanding said arms in width at the point where they act on the pendent lever-arms, substantially as described.

13. The cam for setting the dog on the sliding draw-bar to act on the brake-lever, provided with the adjustable extension-piece on its swinging end, substantially as described.

In testimony whereof I have hereunto set
45 my hand this 12th day of March, A. D. 1886.

C. V. ROTE.

Witnesses.

HUNTINGTON BROWN,
W. A. HARBESON.