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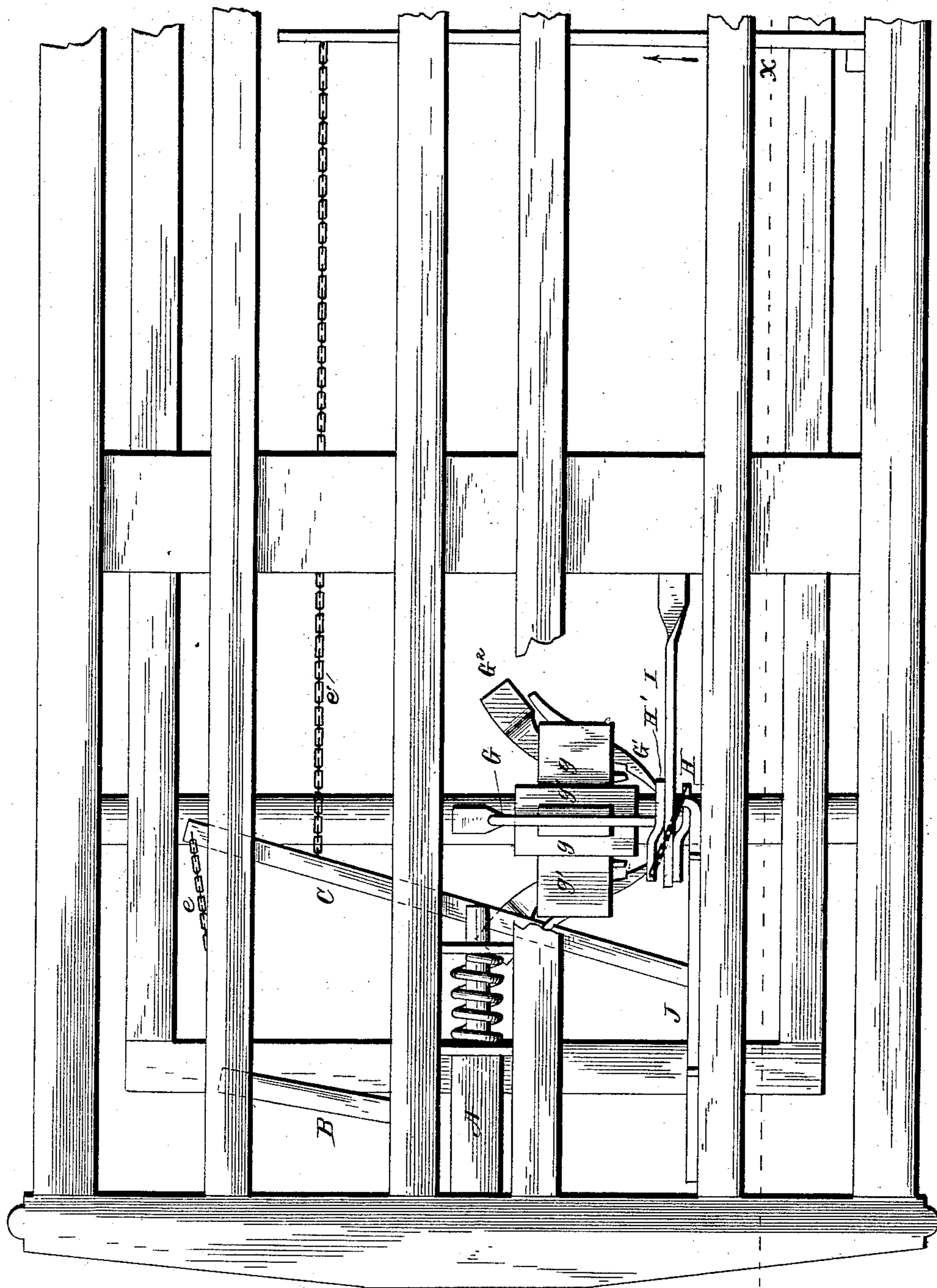
4 Sheets—Sheet 1.

F. H. AGNEW & R. R. HICE.

# AUTOMATIC CAR BRAKE.

No. 328,372.

Patented Oct. 13, 1885.



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(No Model.)

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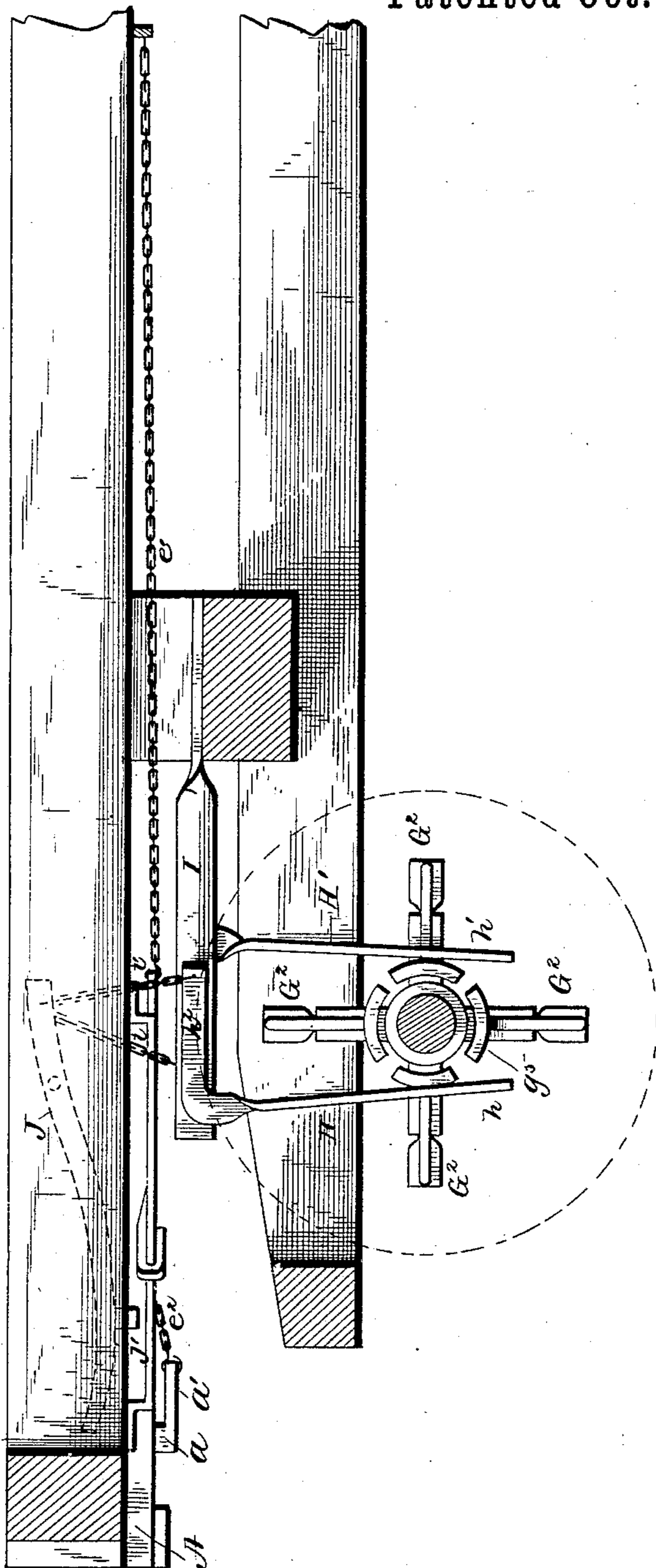
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Fig. 2.



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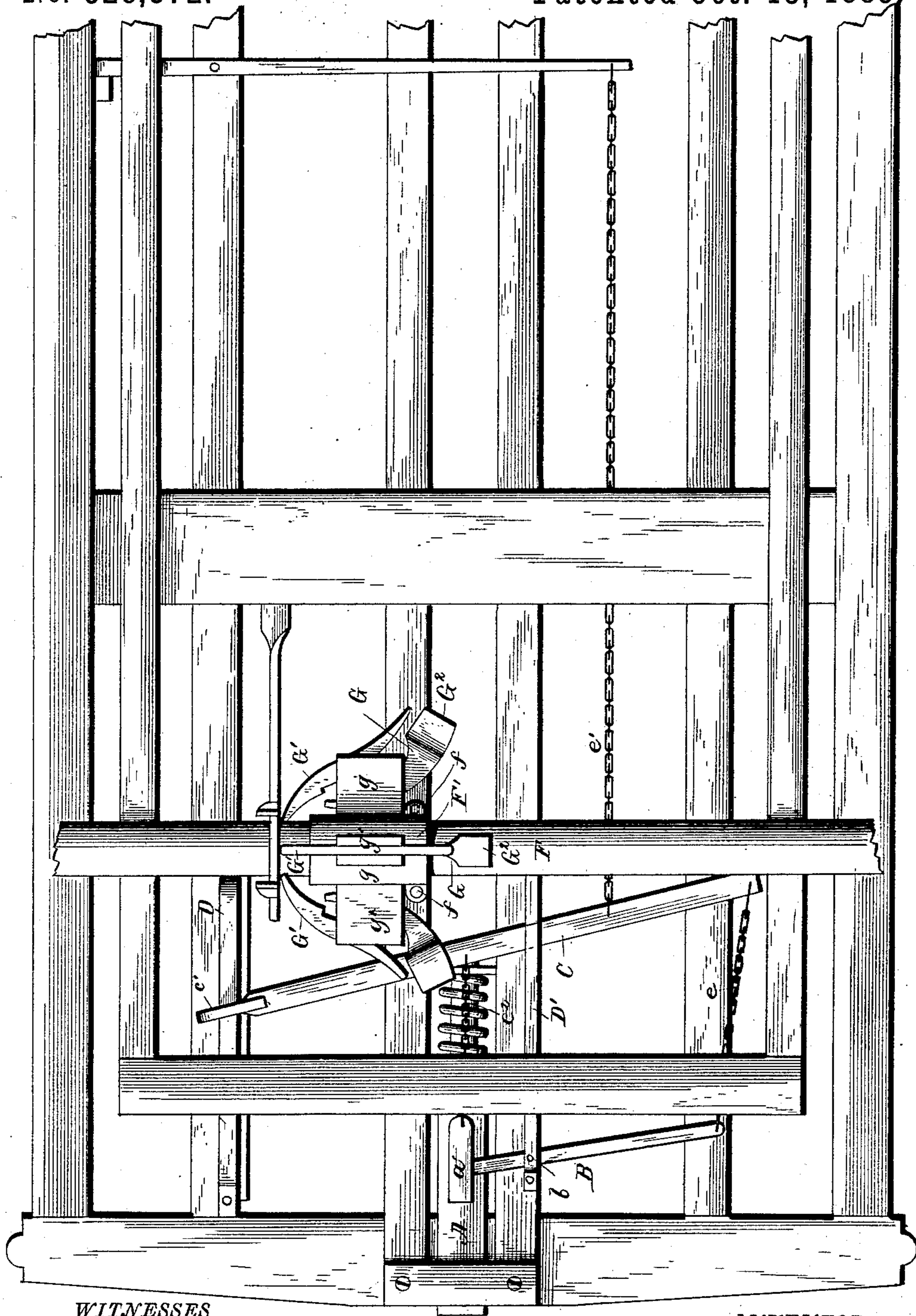
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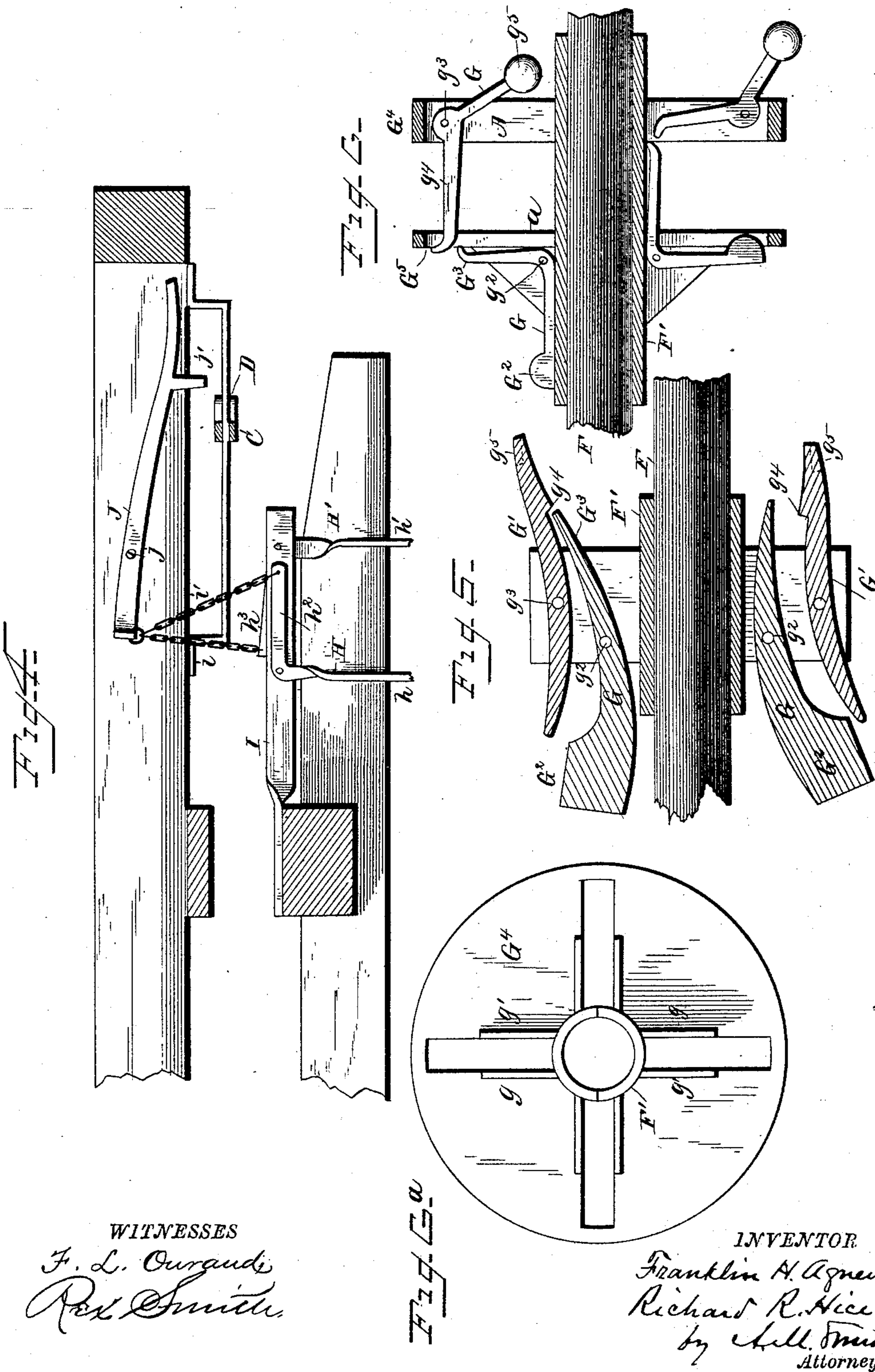
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# UNITED STATES PATENT OFFICE.

FRANKLIN H. AGNEW AND RICHARD R. HICE, OF BEAVER, PENNSYLVANIA.

## AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 328,372, dated October 13, 1885.

Application filed May 6, 1885. Serial No. 164,598. (No model.)

*To all whom it may concern:*

Be it known that we, FRANKLIN H. AGNEW and RICHARD R. HICE, both of Beaver, county of Beaver, 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 part of this specification.

Our invention is designed to do away with the use of hand-power in the application of brakes on railway-cars, and more especially on freight-cars, and has for its object the construction of a brake-actuating mechanism which will be automatic in its action, and such as will render each car of a train independent of the brake mechanisms of the other cars of the train. It is composed of two parts—viz., a brake-actuating mechanism, by means of which the brakes are applied, and a governor or regulating device for automatically controlling the brake-actuating mechanism.

The brake-actuating mechanism derives its power from the inthrust or extension of the sliding draw-bar, or from some similar arrangement, as of a sliding bumper or buffer. The power for the regulating device is derived from the motion of the axle and from gravity.

The brake-actuating mechanism consists of a stop or projection on the draw-bar, a main brake or power lever acted upon by said draw-bar, and an intermediate "floating" lever interposed between the brake-lever and the brakes, as will be explained; and the regulating device or mechanism consists of a stop or set lever, which controls the floating lever referred to by stopping it or setting it free, and thus applying the brakes or not as the case may be, interlocking levers on the axle, and interposed elbow-levers through which the interlocking axle-levers act on the stop or set lever, as will be explained.

In the accompanying drawings, Figure 1 is a plan view of so much of a car truck and frame as is necessary to show our improvements applied. Fig. 2 represents a longitudinal section taken on the line  $x x$ , Fig. 1. Fig. 3 is a bottom view of the parts shown in Fig. 1. Fig. 4 represents the stop or set lever and the elbow-levers acting thereon, in side elevation. Fig. 5 represents a vertical section through the interlocking axle-levers and the

sleeve for securing them to the axle. Fig. 6 is a section similar to Fig. 5, showing a modification in the form of the interlocking axle-levers, and Fig. 6<sup>a</sup> is a side elevation of one of the slotted flanges for supporting the axle-levers.

The frame-work of the car may be the same as in cars now in common use, and therefore need not be described.

The draw-bar A is arranged to slide in suitable ways in the platform-frame, and is provided with any usual or preferred form of buffer-spring, adapting it to resist by a yielding movement the blow or pressure upon it from a draw-bar of an adjoining car. This draw-bar has secured to or formed upon it, preferably on its lower face, a fixed stop or projection,  $a$ , shown in the present instance as provided on its lower end with a horizontal arm,  $a'$ , which extends inward parallel with the draw-bar, and forms a steady-plate for the inner end of the "power-lever" hereinafter described; but any suitable form of stop may be employed.

B is the brake or power lever pivoted at  $b$ , either to one of the frame-timbers or in a bracket secured thereto, with one end projected within the path of and on the inner side of the stop  $a$  in such manner as to be acted upon thereby whenever the draw-bar is thrust inward.

C is what we term the "intermediate" or "floating" lever, from the fact that it has no fixed position, and is adapted to be moved about bodily, except as controlled by other devices which will be described. It is shown provided at one end with a loop,  $c'$ , which surrounds and is adapted to slide freely on a longitudinal guide bar or rod, D, secured to the lower face of the platform-frame, through angular feet at its ends, as shown, and the other end of the lever C is upheld by a similar rod or bar, D', upon which it can slide freely. If preferred, chains or other suitable means may be employed for suspending this lever C, so long as it is allowed to float or move freely horizontally. The free end of this lever—that is to say, the opposite end to that upheld by the loop  $c'$ —is connected by a chain,  $e$ , with the end of the outer arm of the power-lever B, and at or near said end has attached to it the rod or chain  $e'$ , through which connection is made with any usual lever system for operat

ing the brakes. The lever C has connected to it at or near the center of its length one end of a cord or chain,  $c^2$ , which at its other end is connected to the draw-bar in such manner  
5 that as the latter is drawn out the lever will be drawn forward with it, for a purpose which will be explained.

The parts above described constitute what we have called the "brake-actuating mechanism."  
10

Upon the car-axle (indicated at F) is secured a sleeve, F', made by preference in two or more parts, each having suitable flanges or ears,  $f$ , through which they may be united and  
15 firmly clamped to the axle, and provided on its outer face with a series of radial ribs or ears,  $g g'$ , arranged in pairs, in which are pivoted the interlocking levers G G', a pair of said levers in each pair of ears  $g g'$ , as shown.  
20 One lever, G, of each pair is weighted, and when the axle is in motion, revolving rapidly, the weighted end  $G^2$  will be thrown outward, away from the axle, by centrifugal action, in a manner well understood, and the opposite  
25 end or point,  $G^3$ , projecting beyond the pivot of said lever, will be correspondingly thrown inward toward the axle. The lever G is pivoted at  $g^2$  in the ears  $g g'$ , near their base of support, (the sleeve F) and the lever G' pivoted  
30 in the same ears, near their outer ends, at  $g^3$ , outside of the lever G, as shown, and preferably, though not necessarily, in a different transverse vertical (relatively to the axle) plane. The lever G', like lever G, extends on  
35 opposite sides of its pivot, and is shown as having its end overhanging the point or end  $G^3$  of lever G notched or shouldered at  $g^4$ , to engage said point when the latter is thrown outward by the action of gravity on the weight-  
40 ed opposite end of lever G, moving said weighted end inward.

The ends  $g^4$  of the levers G' are by preference expanded in width, or provided with wings  $g^5$ , curved in an arc of a circle to give  
45 them an extended surface for acting on the lever L or elbow-levers H and H'. These levers are pivoted at their elbows in an arm or bracket, I, secured to one of the truck-frame timbers or other suitable point of support, with  
50 their vertical long arms  $h$  and  $h'$  pendent on opposite sides of the axle, and with their horizontal arms  $h^2 h^3$  turned inward toward each other and over the axle, as shown. These levers are so arranged that when the ends or  
55 wings  $g^5$  are thrown inward close to the axle, by centrifugal action on the weighted ends  $G^2$  of levers G, the pendent arms  $h$  and  $h'$  will assume a vertical or nearly vertical position, and will lie in close proximity with the ends  
60  $g^5$ ; but when the weighted ends  $G^2$  fall inward toward or upon the axle by gravity the ends  $g^3$  are crowded outward and locked by such action, and serve to crowd the arms  $h$  and  $h'$  away from the axle, and in so doing to de-  
65 press the horizontal arms of the levers H and H'. These arms  $h^2$  and  $h^3$  are connected by

cords or chains  $i i'$  with the short arm of a lever, J, pivoted at  $j$  to one of the car-frame timbers, or in a suitable bracket thereon. The lever J we term the "stop" or "set" lever,  
70 inasmuch as it serves, by its position, to set or release the floating lever C. The free end of this lever J overhangs the lever C, and is provided with a pendent spur,  $j'$ , adapted by its arrangement to drop down behind or in-  
75 side of the end  $c'$  of lever C, and to prevent the inward vibration of said end, and thereby to transfer the action of the brake-lever B on said lever C to its opposite end, and thence to the brakes in a manner that will be readily un-  
80 derstood. This action occurs whenever the axle is rotated with sufficient speed to cause the weighted ends  $G^2$  of the pairs G and G' of the interlocking axle-levers to be thrown outward by centrifugal action, while, on the con-  
85 trary, when the axle is at rest, or moving sufficiently slowly to allow said weighted ends to fall inward, and thereby to cause the ends or wings  $g^5$  to act on the elbow-levers H and H', and thence through the chain  $i$  or  $i'$  on the lever J, the stop  $j'$  will be raised out of the path  
90 of lever C, and the latter will be free to move back and forth without acting on the brakes. It will be readily understood that when the stop  $j'$  of the set-lever J is removed from the  
95 path of the end  $c'$  of the lever C said end will move freely, under the action of the brake-lever B, the lever C vibrating freely on its connection, with the brake rod or chain  $c'$  as a fulcrum, and divested of power to act on the  
100 latter; but when the stop  $j'$  is interposed in the path of lever C it becomes a fulcrum for the latter, and the end connected with the brake-lever B receives all the movement of  
105 said brake-lever and imparts it, through the rod or chain  $c'$ , to the brakes for applying the latter. The cord or chain  $c^2$  serves, when the draw-bar is drawn out, to move the lever C outward with it into position to be engaged  
110 by the set-lever J.

The pendent straight arms  $h$  and  $h'$  of the elbow-levers H and H' serve to permit the por-  
tion of the truck or frame to which they are attached to rise and fall relatively to the axle  
115 with the varying weight of the load without in anywise interfering with the action of the governor arms or levers thereon, and therein constitute an improvement upon the curved or semi-annularly-armed levers described in  
120 Letters Patent granted to C. V. Rote, March 20, 1883, No. 274,389, besides obviating the necessity for the accuracy of construction and adjustment required by the said levers.

It will be apparent that the form of the parts—such, for example, as that of the inter-  
125 locking levers on the axle, or of the other levers and stops described—may be varied. For instance, the form of the interlocking axle-levers may be varied so long as the two levers  
130 of each pair are pivoted upon different centers to their supporting arms or sleeves, and are so arranged relatively the one to the other

that one will lock the other in position for acting on the pendent arms of the elbow-levers, when said interlocking-levers are controlled by gravity, and will release the same when they are controlled by centrifugal action.

In Figs. 6 and 6<sup>a</sup> we have shown one modification in the form of the interlocking axle-levers and their sleeve-supports, in which the arm of the axle-lever, acting on the elbow and set levers, when thrown out to act thereon, is supported at both ends, thereby to a great extent obviating the strain and wear upon its pivot, due to supporting it at one end only.

Two slotted annular flanges,  $G^4$   $G^5$ , or two sets of ears in pairs, are arranged on the sleeve  $F'$ , and the levers  $G$   $G'$  are pivoted, one in the slot in flange  $G^5$ , near the sleeve, and the other in the slot in flange  $G^4$ , near its periphery, and both are weighted in such manner that when the weights are thrown out by centrifugal action they assume the position shown at the lower part of Fig. 6, while when acted upon by gravity the arms  $G$   $G'$  assume the position shown in the upper part of Fig. 6, the arm  $G^3$  of lever  $G$  standing in a position perpendicular, or nearly so, to the arm  $g^4$  of the lever  $G'$ , and with the outer free end of said arm  $g^4$  resting upon and upheld thereon during its action on the elbow-levers  $H$  and  $H'$ , and the arms  $h$  and  $h'$  of the latter will move in and out between the flanges  $G^4$  and  $G^5$ , controlled by said arms  $g^4$ .

Aside from the features hereinabove particularly described, the brake mechanism may be of any usual or preferred construction, and the brake rod or chain  $e'$  may be connected with the usual hand-wheel shaft or lever for adapting it to be operated by hand for applying the brakes in any suitable manner.

Having now described our invention, we claim as new—

1. In an automatic car-brake mechanism, the combination, with the sliding draw-bar provided with the stop or projection, of the brake or power lever adapted to be operated by said draw-bar, the brake rod or chain, and the intermediate floating lever connected to said draw-bar, power-lever, and brake-rod, substantially as and for the purpose described.

2. In an automatic car-brake mechanism, the floating lever interposed between the power or brake lever and the brake rod or chain and connected therewith, in combination with a movable stop or fulcrum, the governor on the axle, and interposed mechanism, substantially as described, for automatically

moving said stop and locking or setting and releasing said floating lever, for the purpose and substantially as described.

3. The floating lever  $C$ , interposed between the power or brake lever and brakes, and operating in connection therewith, substantially as described, in combination with a movable stop or fulcrum adapted to be moved into and out of the path of said floating lever for setting the same to act, or relieving it from acting on the brakes, substantially as described.

4. The governor-arms on the axle for controlling the brake-actuating mechanism, composed of two interlocking levers pivoted to different centers in arms on the axle, and adapted one to lock the other in position to act on the brake-actuating mechanism, substantially as described.

5. Slotted annular flanges on the axle, in combination with governor arms or levers pivoted in pairs therein upon different centers, adapting one lever of the pair to lock the other in position for acting on the brake-setting mechanism, substantially as described.

6. The combination, with the governor-arms on the axle, of the elbow-levers having the straight pendent arms, and the stop or set lever connected with said elbow-levers and operating to set and release the floating lever of the brake-actuating mechanism, substantially as described.

7. In a mechanism for automatically controlling a brake-actuating mechanism, a stop or set lever, in combination with governor-arms on the axle, and an interposed connecting-lever provided with a straight arm or portion where it is acted upon by the governor-arms, substantially as and for the purpose described.

8. The combination, in an automatic brake mechanism, of the sliding draw-bar, with its stop or projection, the brake or power lever acted upon by said draw-bar, the brake rod or chain, the intermediate floating lever, the stop or set lever for setting and releasing the floating lever, the levers connected with the set-lever, and the governor-arms on the axle for operating the last-named levers, all substantially as described.

In testimony whereof we have hereunto set our hands this 28th day of April, A. D. 1885.

FRANKLIN H. AGNEW.

RICHARD R. HICE.

Witnesses:

ALFRED R. MOORE,  
WINFIELD S. MOORE.

Correction in Letters Patent No. 328,372.

It is hereby certified that Letters Patent No. 328,372, granted October 13, 1885, upon the application of Franklin H. Agnew and Richard R. Hice, of Beaver, Pennsylvania, for an improvement in "Automatic Car-Brakes," was erroneously issued to the said Agnew and Hice; that said Letters Patent should have been issued to *The Rote Automatic Brake Company of Mansfield, Ohio*, as assignee of said Agnew and Hice; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 24th day of November, A. D. 1885.

[SEAL.]

H. L. MULDROW,  
*Acting Secretary of the Interior.*

Countersigned:

M. V. MONTGOMERY,  
*Commissioner of Patents.*