

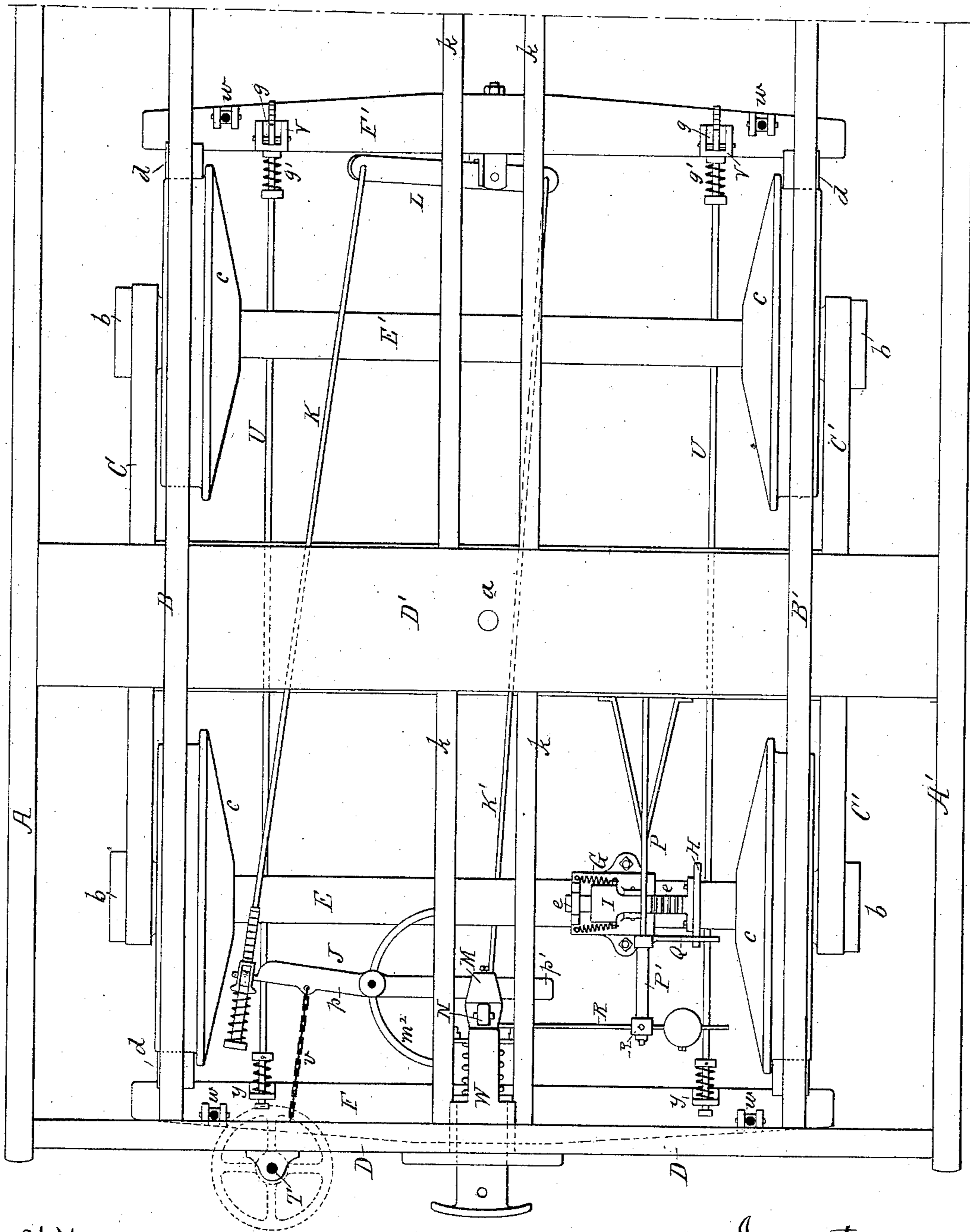
(No Model.)

4 Sheets—Sheet 1.

P. HIEN.
AUTOMATIC CAR BRAKE.

No. 313,734.

Patented Mar. 10, 1885.



Witnesses:
John M. Clayton
John C. Parker.

FIG. 1.

Inventor:
Phillip Hien
by his attorneys
Hawes & Sons

(No Model.)

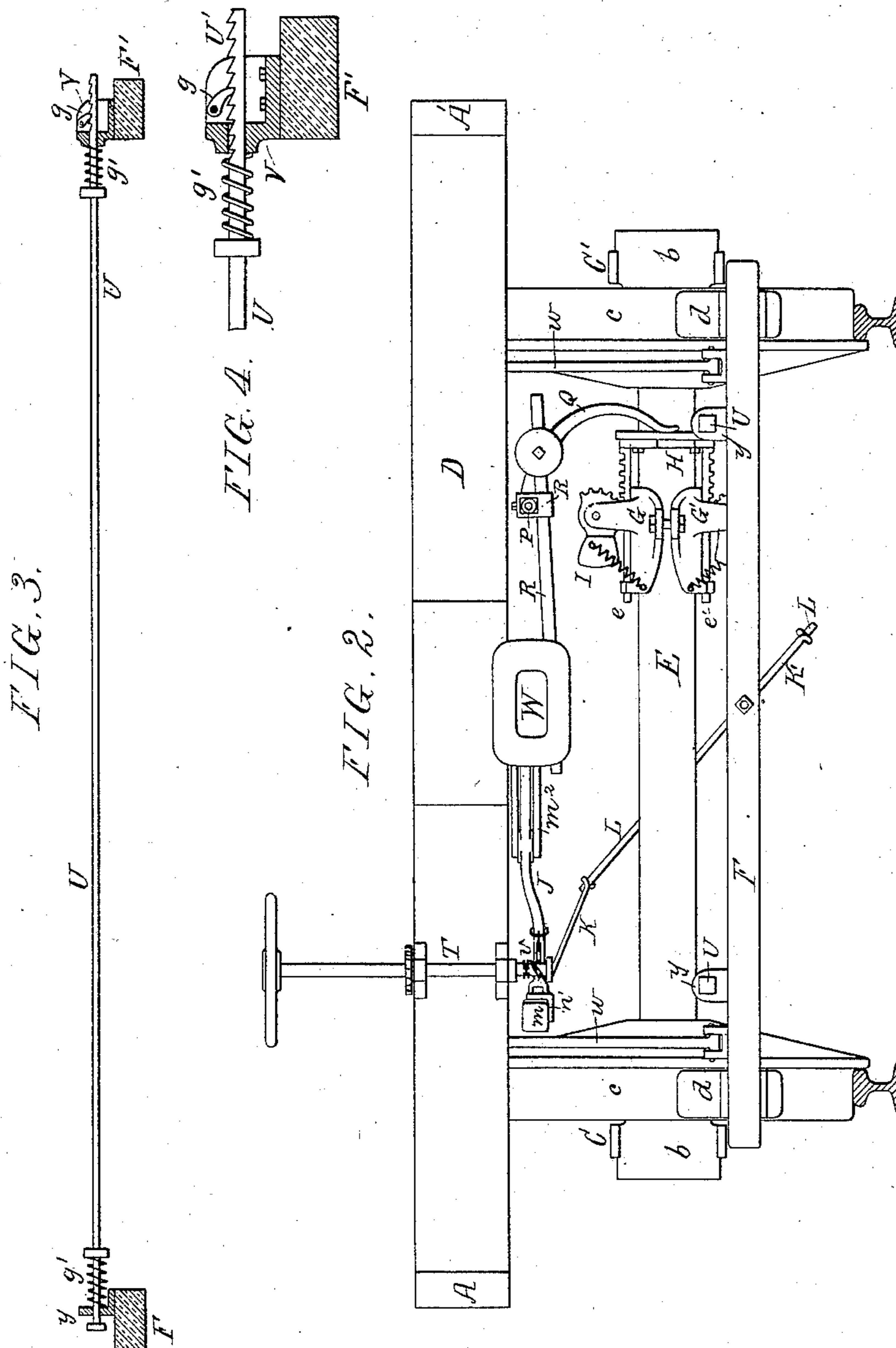
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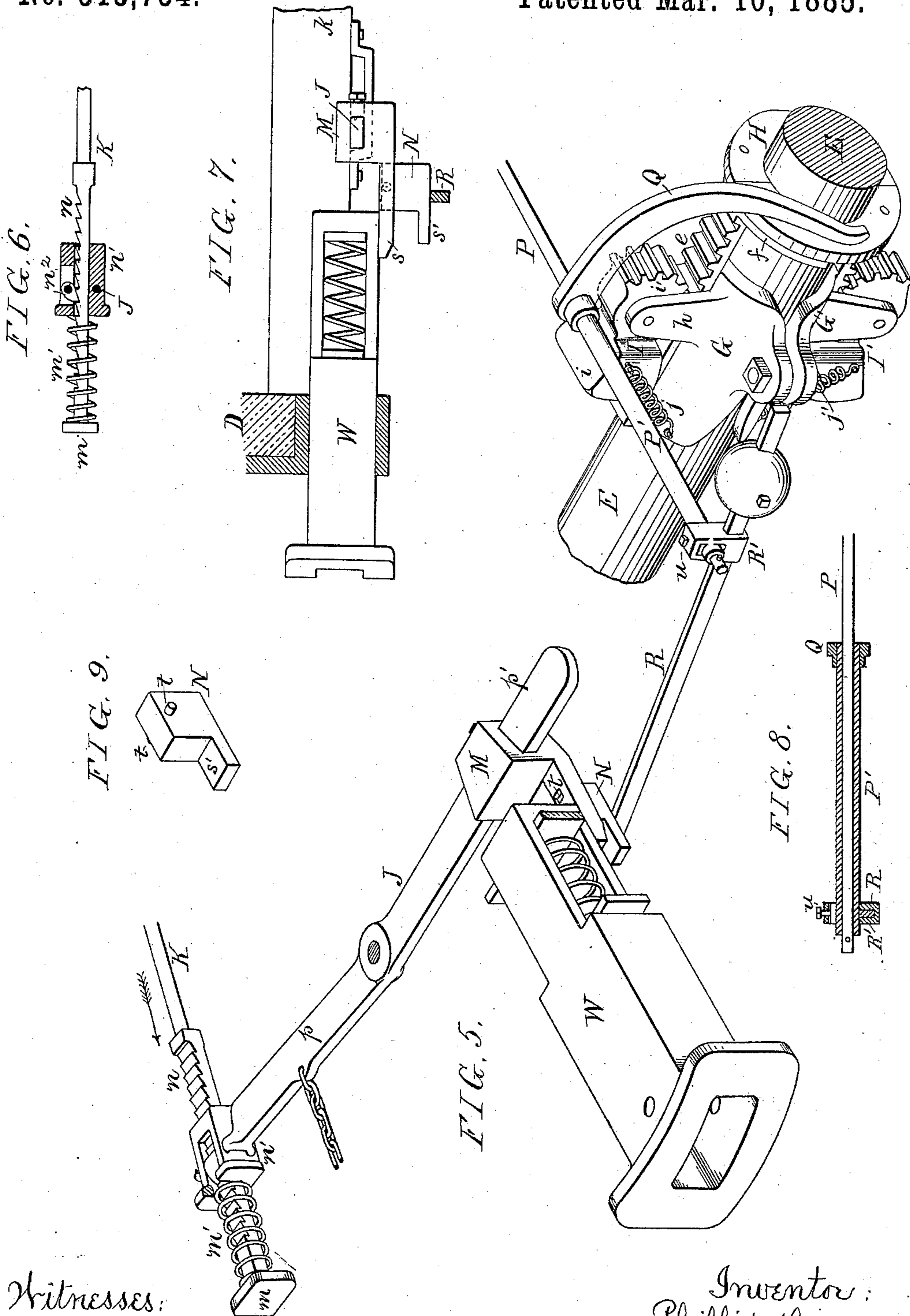
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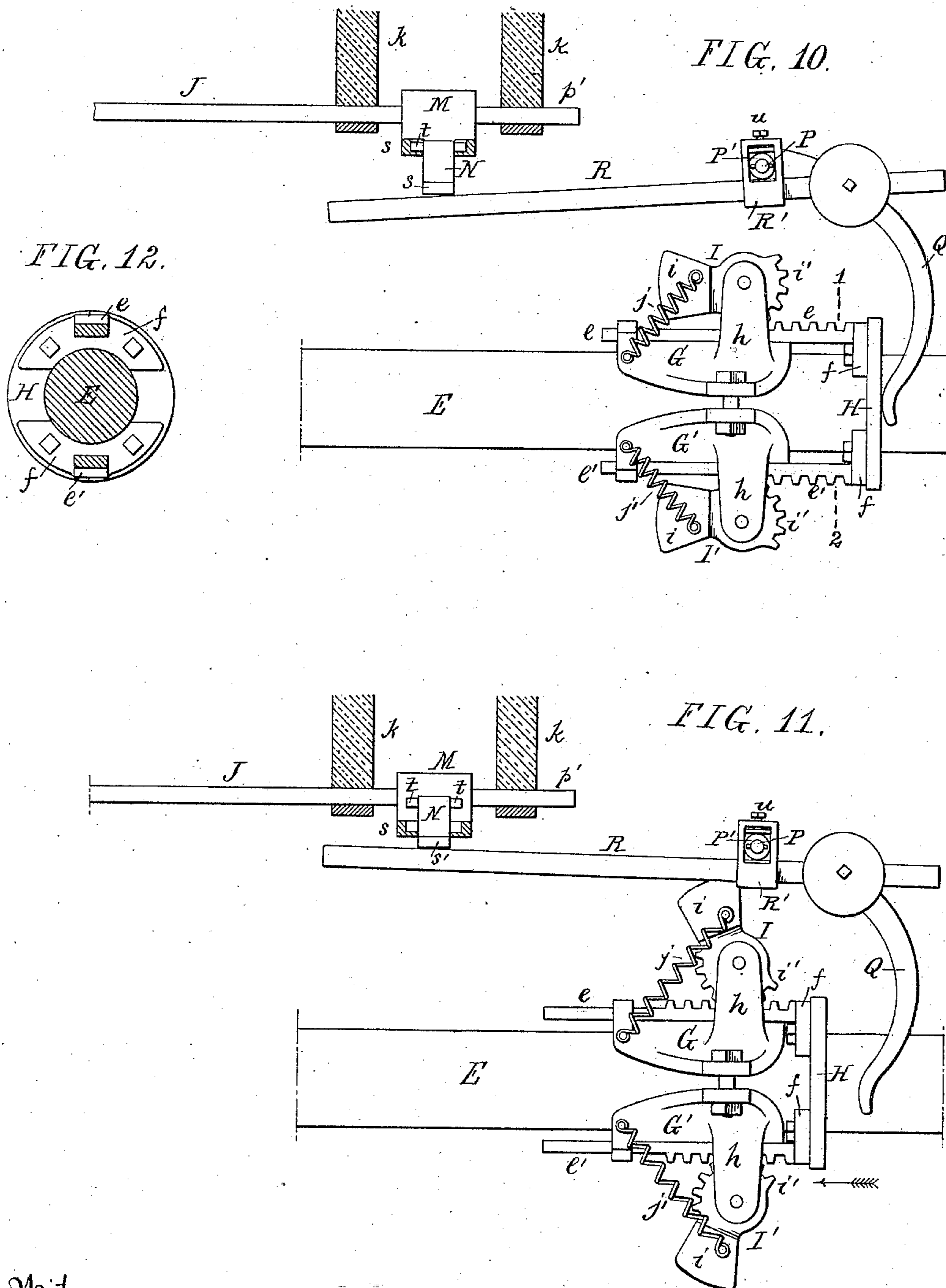
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UNITED STATES PATENT OFFICE.

PHILLIP HIEN, OF ROCK ISLAND, ILLINOIS.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 313,734, dated March 10, 1885.

Application filed September 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, PHILLIP HIEN, a citizen of the United States, residing in Rock Island, Rock Island county, Illinois, have invented certain Improvements in Automatic Car-Brakes, of which the following is a specification.

My invention consists of certain improvements in that class of braking mechanism for railroad-cars in which the draw-heads are caused to apply the brakes through the intervention of devices which are controlled by governors on the axles, my improvements being fully described and claimed and their objects set forth hereinafter.

In the accompanying drawings, Figure 1, Sheet 1, is a plan view of part of a railroad-car with my improved automatic brake. Fig. 2, Sheet 2, an end view; Figs. 3 and 4, detached views illustrating my invention; Fig. 5, Sheet 3, a perspective view of the operating mechanism; Figs. 6, 7, 8, and 9, detached views; Figs. 10 and 11, Sheet 4, views illustrating in detail portions of my invention; Fig. 12, a sectional view on the line 1 2, Fig. 10.

Referring in the first instance to Figs. 1 and 2, A A' and B B' are the longitudinal beams of the car-frame; D, the bumper-beam; D', the transverse beam, to which the truck is pivoted by the king-bolt *a*. The truck is of the usual construction, and has, therefore, not been shown in detail, the side frames, C C', of the truck, however, appearing in Fig. 1. The frame carries the usual boxes, *b*, of the axles E E', which are provided with ordinary flanged wheels, *c*.

F is the front brake-beam, and F' the rear brake-beam, each provided with ordinary shoes, *d*.

It will be well at this point to describe the governing device, which will be best explained by reference to Sheets 3 and 4.

To the axle E are clamped two castings, G G', and to guides on each clamp is adapted a rack, *e*, the two racks being connected together by a ring, H, which surrounds the axle E, but which is free from contact therewith, this ring being made in two parts and connected together by plates *f*, so that it can be readily applied and adjusted to its place.

To the projections *h* on the clamp G is

pivoted a lever, I, one arm, *i*, of which is made comparatively heavy, the other arm, *i'*, being a toothed segment gearing into the teeth of the rack *e*. The arm *i* of the lever is connected by a spring, *j*, to the clamp G. A precisely similar lever, I', is pivoted to the clamp G', and has a toothed segment gearing into the rack *e'*, and a spring, *j'*, connects the lever to the clamp G'. The spring and levers are so adjusted that they will not be disturbed by centrifugal force until the car is running at the rate of about three miles per hour, and when the car is running at about the rate of seven miles per hour the levers I I' will be moved out to their full extent, or nearly so. The levers of the governor when not in action are in the position shown in Fig. 10. When through centrifugal force the levers I I' are turned outward on their pivots and assume the position shown in Fig. 11, the two racks *e e'* and ring H will be moved in the direction of the arrow in that figure; but when the axle revolves at less than the predetermined speed the springs *j j'* will restore the levers I I' to the position shown in Fig. 10.

Turning now to the braking mechanism, it will be seen, in reference to Fig. 1, that a lever, J, is pivoted to brackets *m*², attached to the frame of the car. One arm of this lever is connected by a rod, K, to the ordinary brake-lever, L, which is pivoted to the brake-beam F' in the ordinary manner, the short arm of the said lever L being connected by a rod, K', to the brake-beam F, as usual. The lever J is connected to the rod K in the manner shown in Figs. 5 and 6. A rack, *n*, is formed on the end of the rod, and there is a block, *n'*, adapted to slide on the rack, this block being attached to the arm *p* of the lever J, and containing a pivoted pawl, *n*², the point of which is adapted to the teeth of the rack. There is a head, *m*, on the rack-bar, and between the latter and the block *n'* intervenes a spiral spring, *m'*, which tends to force the rod in the direction of the arrow, Fig. 5. A block, M, is adjustably secured to the arm *p'* of the lever J, and a projecting plate, *s*, forming part of the block, extends beneath the draw-head W, as shown in Fig. 7. In this plate *s* is an opening for receiving and guiding a gravity-block, N, (see detached view, Fig. 9,) pins *t t* on the said

block preventing it from falling from the notch, and the pins being adapted to recesses in the projecting plate *s*, so that the gravity-block may fall far enough to permit the draw-head to slide over it, a small projection, *s'*, on the block preventing the latter from being dislodged vertically from the block *M*. A rod, *P*, is permanently secured to the truck, preferably to the transverse beam of the same, Fig. 1, this rod being also shown most clearly in Figs. 5 and 8. A tube or sleeve, *P'*, is hung to this rod, and this sleeve carries an arm, *Q*, with which the ring *H* of the above-described governor will come in contact under the circumstances described hereinafter. A lever, *R*, is connected to the sleeve *P'*, preferably through the box *R'*, the lever passing through and being adjustable in the box, and the sleeve *P'* also passing through the box, and a set-screw, *u*, forcing the sleeve against the lever and the lever against the bottom of a slot in the box, thereby securing the lever to the sleeve. The long arm of the lever *R* extends beneath the gravity-block *N*, the short arm of the lever being weighted, as shown in Fig. 5. A chain, *v*, attached to the usual vertical shaft, *T*, for operating the brake by hand, is attached directly to the arm *p* of the lever *J*. Each of the brake-beams *F F'* is loosely suspended by links *w w* to the car-frame, in the usual manner, and the two brake-beams are connected together by rods *U U*, Fig. 1, one of which is also shown in Fig. 3, and part of the rod is shown on an enlarged scale in Fig. 4.

On referring to the latter figure it will be seen that a rack, *U'*, is formed on the rod, and that this rack passes through and can slide in a bracket, *V*, on the brake-beam *F'*, a spring, *g'*, intervening between a collar on the rod and the bracket *V*, to which is pivoted a spring-pawl, *g*, the latter engaging with the rack. The opposite end of the rod passes through a bracket, *y*, on the brake-beam *F*, and between a collar on the rod and this bracket intervenes a spiral spring, *g'*. The springs *g'* and *g'* tend to force the two brake-beams apart from each other, and to maintain the shoes *d* of the said brake-beams clear of the wheels; and it may be remarked here that the said springs may be dispensed with in cases where the brake-beams are so hung to the frame or provided with such appliances that their shoes will be maintained free from contact with the wheels. As long as the car is running at a given speed, the ring *H* is in contact with the arm *Q*, and the gravity-block is depressed, so as not to be in the path of the draw-head *W*; but should the car exceed this speed the levers *I I'* of the governor will fly out, the ring *H* will retreat from the arm *Q*, and the latter will fall, owing to the weighted arm of the lever *R*, and this lever will consequently raise the gravity-block until it is interposed between the end of the draw-head and the block *M*.

If the engineer should now reduce the speed

of the engine, there will be a general crowding of the cars toward the engine and a general inward movement of the draw-heads of all the cars, and the draw-head will operate the lever *J* through the medium of the block *M*, thereby applying the brakes. When, however, the speed of the engine has been reduced to the desired rate, the cars will assume their original relation to each other due to the pull of the engine, the draw-bars will be moved outward, and at the same time the lever *Q* will again come under the control of the governor, thereby permitting the gravity-block to fall beyond the range of the draw-head.

Several advantages are due to the above-described mechanism:

First. When the cars are running at the ordinary speed, the ring *H* is always so far from the lever *Q* that there can be no accidental operation of the gravity-block due to the ordinary end-play of the axle.

Second. The action of the gravity-block will always be prompt, for the reason that if a small portion only of the block rises between the draw-head and the block *M* it will serve as a medium for causing the draw-head to apply the brakes. The falling of the block is also prompt. There has always been a difficulty in automatic braking mechanism of this class in devising mechanism which will act with promptitude and certainty in causing the draw-head to apply the brakes.

Third. The governor is so constructed that it can be applied to any axle with facility.

Fourth. The mechanism through the medium of which the block is raised and permitted to fall is simple and direct, is free from joints which are liable to wear, and at the same time the mechanism admits of ready adjustment.

Fifth. In braking appliances of this class there have always been difficulties due to the wearing of the brake-shoes. As regards the rods *U*, they are self-shortening to compensate for the wear of the shoes, for when the latter are worn to a given extent each rod will slide in the bracket *V* so far that the pawl *g* will occupy a notch farther away from the end of the rod than the notch which the pawl previously occupied, and this will be substantially a shortening of the rod. (See Fig. 4.) In like manner the rod *K* is made self-shortening by its pawl-and-rack connection with the lever *J*. (See Fig. 5.)

I claim as my invention—

1. The combination of the draw-head *W* of a railroad-car, the brake-operating lever *J*, carrying the block *M*, the gravity-block *N*, arranged to rise and fall in the said block *M*, with a governor on the axle of the car, and with mechanism, substantially as described, whereby the rising and falling of the block is due to the governor, substantially as specified.

2. The combination of the draw-head, the brake-operating lever *J*, the gravity-block *N*, the rod *P*, secured to the car-frame, the tube *P'*, pivoted to the rod and carrying the lever

R, and the lever Q, secured to the said tube, with a governor for acting on the said lever Q, all substantially as set forth.

3. The combination of the rod P, tube P', and lever R with a box, R', adjustably secured to the tube and carrying the said lever R, substantially as set forth.

4. The combination of the beams F F' of the braking mechanism with a rod or rods, U U, and a rack, U', with the bracket V, secured to the said beam, and having a pawl, g, adapted to the rack, substantially as specified.

5. The combination of the axle E, castings

G G', clamped to the axle, levers I I', guided racks e e', with the pivoted lever Q, the shaft P, carrying the said lever, and the lever R, projecting beneath the gravity-block N, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PHILLIP HIEN.

Witnesses:

JOHN M. CLAYTON,
HENRY HOWSON, Jr.