

(No Model.)

2 Sheets—Sheet 1.

R. RANDOLPH.

CAR BRAKE.

No. 356,790.

Patented Feb. 1, 1887.

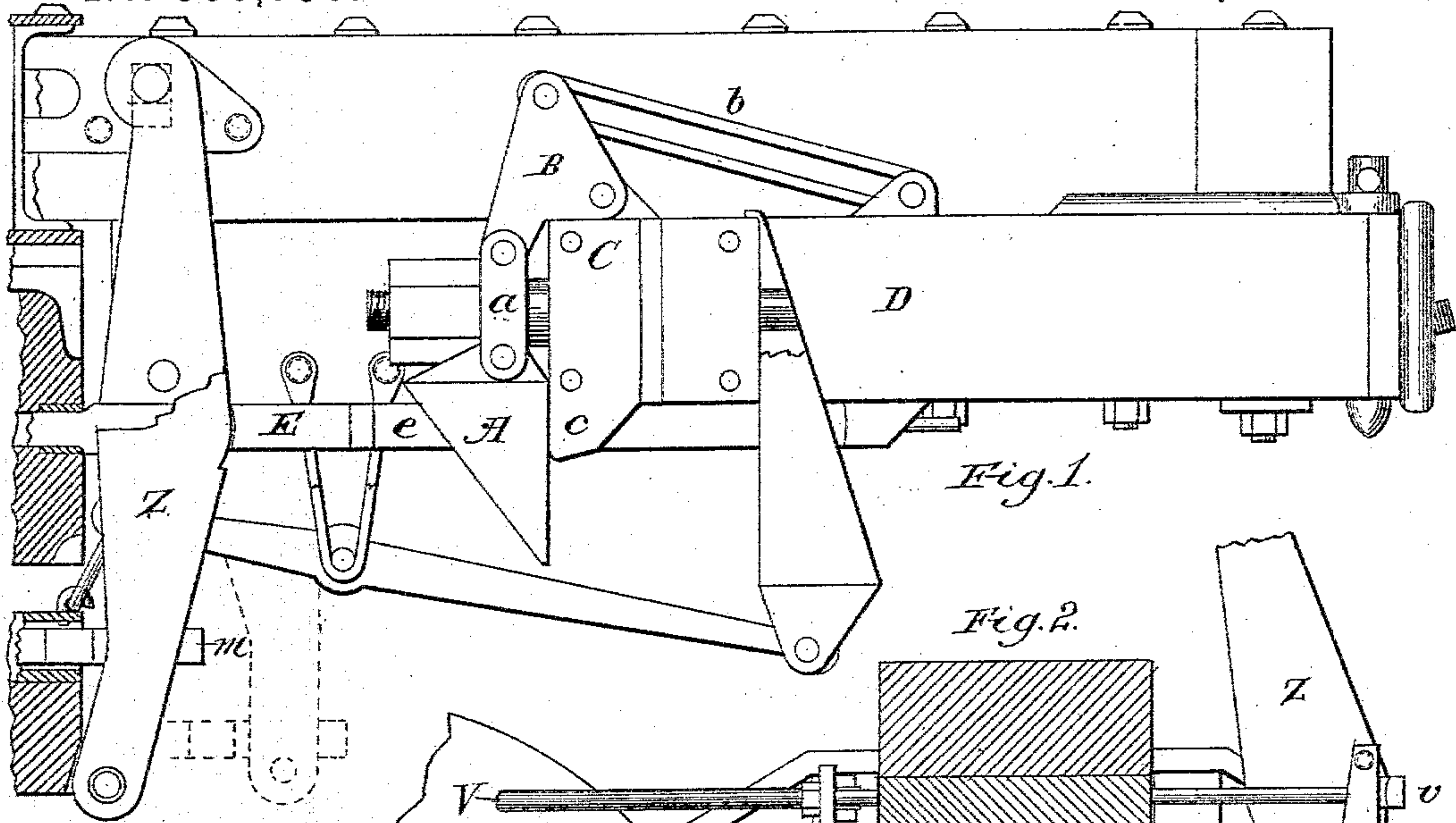


Fig. 1.

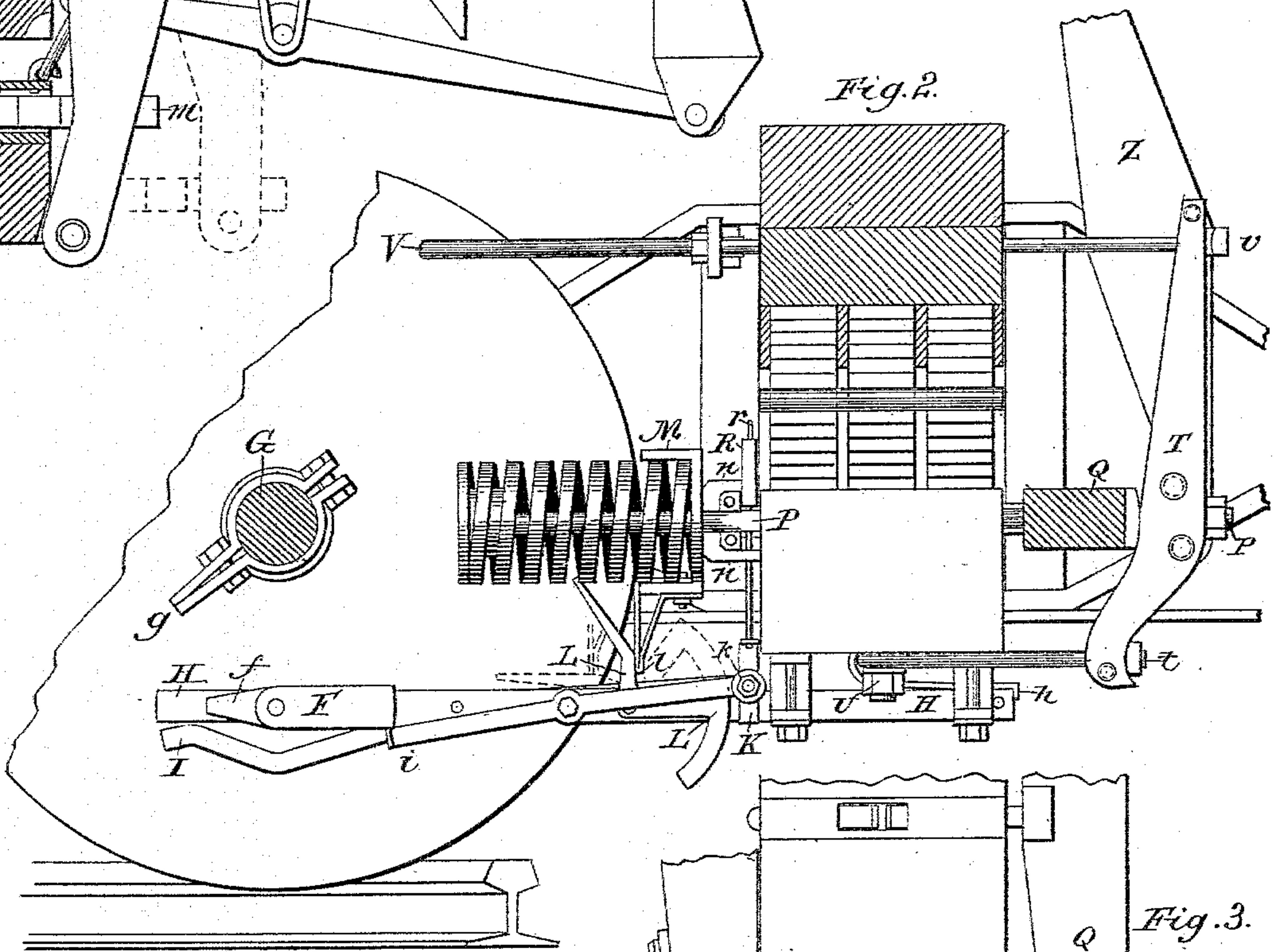


Fig. 2.

Fig. 4.

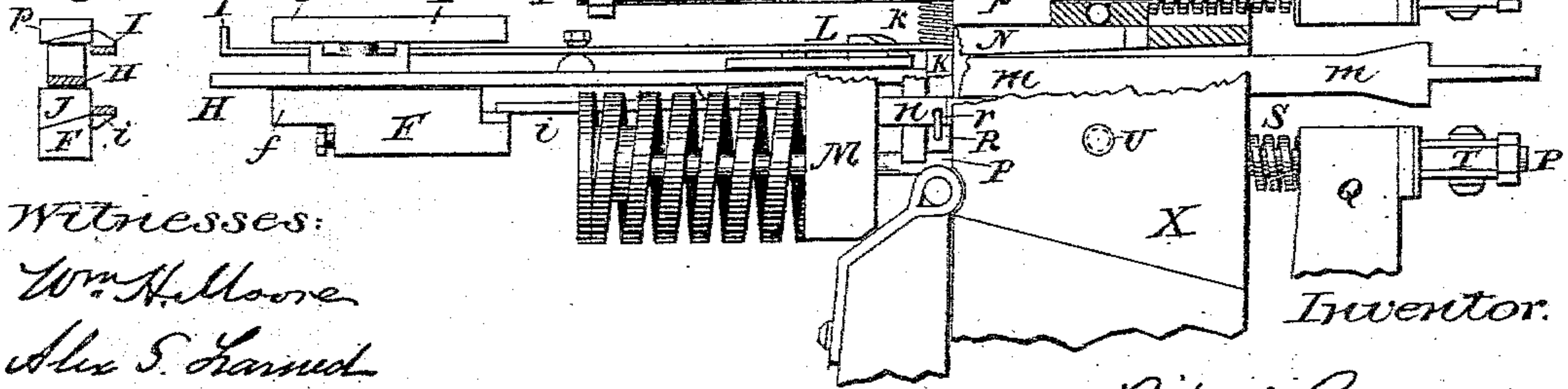


Fig. 3.

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Inventor.

Richard Randolph

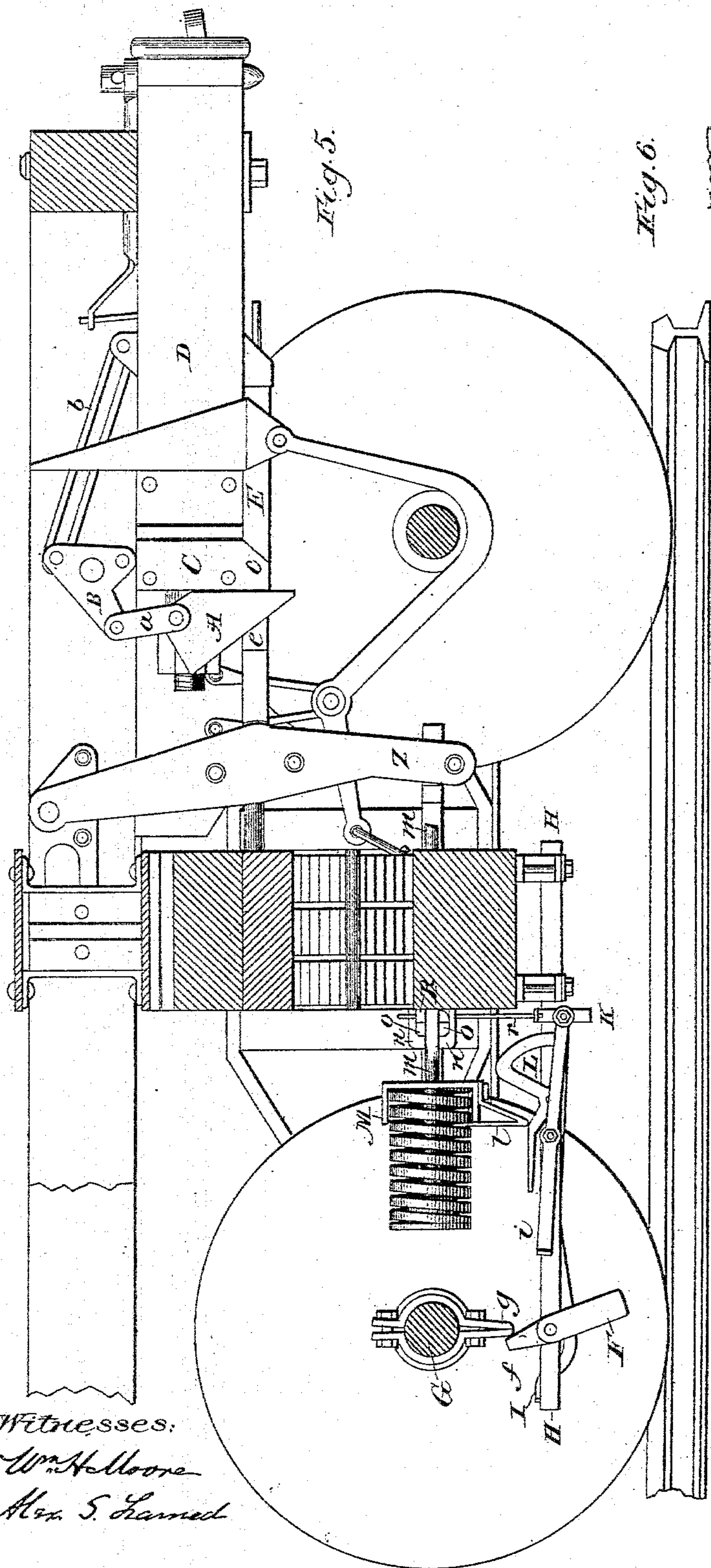
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2 Sheets—Sheet 2.

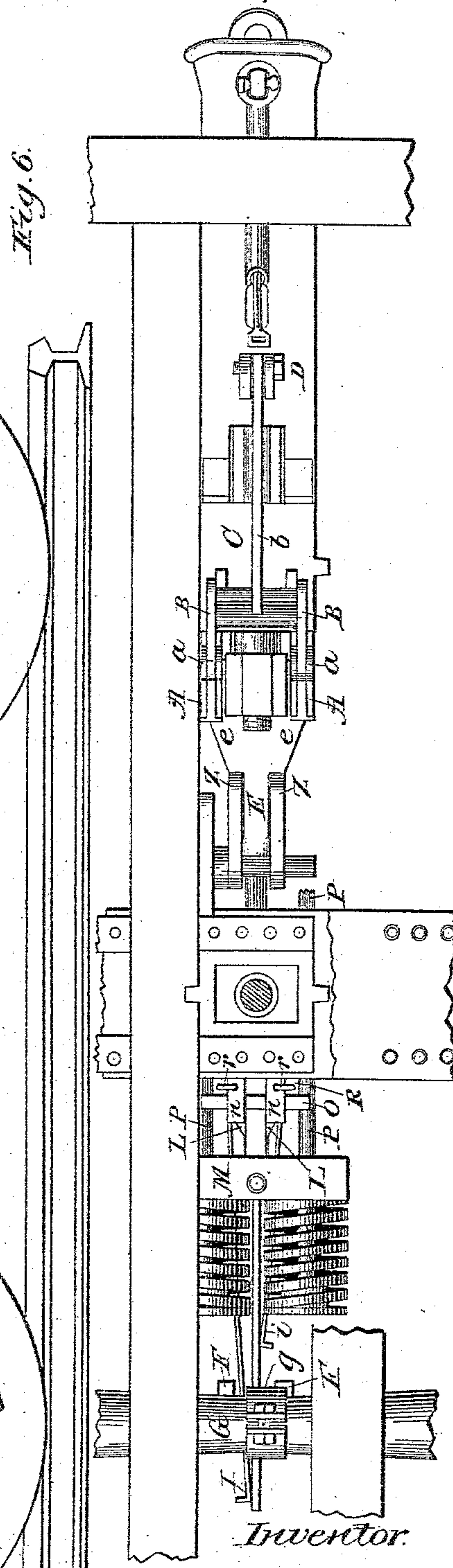
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Alex. S. Larned



Richard Randolph

UNITED STATES PATENT OFFICE.

RICHARD RANDOLPH, OF BALTIMORE, MARYLAND.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 356,790, dated February 1, 1887.

Application filed September 24, 1886. Serial No. 214,484. (No model.)

To all whom it may concern:

Be it known that I, RICHARD RANDOLPH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented new and useful Improvements in Automatic Car-Brakes, of which the following is a specification.

My invention relates to improvements in those car-brakes which are operated by the pressure between the contiguous draw-heads of two cars when a resistance is created at the head of the train; and the objects of my improvement are, first, to retain the pressure of the brakes upon the wheels after the pressure upon the draw-heads has been removed and until there is a tension upon them by the draft of the engine; second, to defer the automatic action of the brakes until the car has attained the velocity requiring it, and to keep them subject to it at all velocities afterward until there has been an action of the brakes to the full extent by the pressure of the draw-heads, either by checking the train when under speed or by a backing operation of the engine; third, to apply the force which would be wasted by the resistance of the ordinary buffer-spring to the brakes, and providing springs which act as buffer-springs, and at the same time regulate the pressure upon the brakes; and, fourth, to enable the same brakes to be operated by the hand in the usual manner at all times and entirely independent of the automatic arrangement. The last three features are simplifications and modifications of a patent already issued to me, No. 332,944, December 22, 1885, and I make no claim where the examiner determines them to be equivalents. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the apparatus which retains the pressure produced by the contact of the draw-heads of two cars after they have separated. Fig. 2 is a side view of the apparatus which establishes the automatic action of the brakes, and also of the arrangement for operating them by hand. Fig. 3 is a partial top view of Fig. 2. Fig. 4 is the end view of the pendulum resting upon the shorter lever. Fig. 5 is a side view in elevation of the whole device, the intervening car-wheels and floor-sills being removed, and represents the truck, &c., of an unloaded car and mini-

mum action of the draw-head, and with the pressure intercepted from the brake-levers. Fig. 6 is a plan or top view of Fig. 5.

Referring to Fig. 1, a pair of wedges, A, are suspended by the links *a* from a pair of bell-cranks, B. These cranks deflect about a pin, which passes through lugs formed upon the top of the cast-iron dead-block C and are between the cranks. At the top of the cranks a pin passes through them and through the link *b* between them, which link extends to and between similar lugs formed on the top of the draw-head D, where a pin passes through both, so that when the draw-head is pushed back the wedges A descend of their own weight, and when it moves forward they are lifted. In rising and falling these wedges play between the lugs *c* formed on each side of the dead-block at the bottom and the sloping shoulders *e* formed on the push-bar E, which passes between the wedges and the lugs *c*. One face of the wedge is vertical and coincides with the end of the dead-block and the lug. The other face coincides with the slope of the shoulder on the push-bar. This angle is calculated to be such that will not give a resulting vertical force to the wedges under any horizontal pressure sufficient to overcome the friction, yet it will be near enough to that point to require but a moderate strain upon the links when the draw-head is pulled forward to raise them, and thus release the push-bar and the brakes from all pressure. The push-bar is retained in a horizontal position, for it plays through an opening in the bolster of the truck, slotted horizontally, and the lever which it actuates can play vertically, as may be required by its deflection by its upper end working in a slot.

In Fig. 2 a pendulum, F, is suspended from a supporting-bar, H, which is fastened to the under side of the lowest sill of the truck, and is placed under the middle of the axle G of the inner pair of wheels. This pendulum has a projection, *f*, extending above the axis, upon which it swings and engages with the projection *g*, fastened to the axle of the wheel above it, which, if the velocity of rotation of the wheel is sufficient, will cause the pendulum to rise above the levers which establish automatic action and actuates them by the imposition of its weight.

The pendulum is composed of two parts

rigidly connected with the same axial bolt, and swing as one. This bolt or pin passes through the bar H, which supports the whole, and the parts of the pendulum swing on either side of it. On each side of the bar, parallel to and equidistant from it, are the two setting-levers I and i, deflecting both horizontally and vertically from fulcrums attached to the bar at the same proportional distances. The ends of these levers next to the truck-sill are connected with the loop K, inclosing the bar. On each side of this loop is a pin passing through each lever, and between each and the head of the pin is a slight spiral spring encircling the pin. These springs are intended to restore the levers to their position parallel to the bar after they have been deflected horizontally. The other end of the levers terminate with a rectangular crook, forming a projection away from the bar with a perpendicular edge, which slopes from the bottom upward, so as to afford a catch upon which the pendulum may rest. At this point (J, Fig. 4,) the pendulum slopes at its side to a corresponding degree, so as to deflect the lever horizontally toward the bar as it passes upward, but which will resume its position by the action of the spring k before it descends, thus presenting the catch under it and receiving its weight upon one of the levers, according to the direction of the rotation of the car-wheel. This causes the united ends of the levers to rise, carrying with it the loop K and the pair of small rods r, which play vertically in perforations through the bars N and their hooked heads n, and which carry on each side of the pair the stop-pieces R, which determine the automatic action.

On each side of push-bar m is a retaining-bar, N, having at one end a head, by which it is fastened to the interior of the casting X, let into and flush with the truck-sill, for the attachment and guiding of all the rods and bars. At the other end is a head in the form of a double hook, one above and the other below, under which hooks the cross-pieces O extend across and beyond both bars on both sides, affording between them just room enough for the longitudinal play of the rods P, which actuate the brake-levers. These rods are provided with shoulders p on the side next to the retaining-bars. Normally these shoulders are retained even with the face of the casting X, and in the space between them and the cross-pieces O the stop-pieces R play vertically by the action of the setting-levers I and i. When these are raised, the space is clear and the rods P are free to move forward as far as is required by the utmost action of the brakes. When they are down, the space is filled and the pressure is received by the retaining-bars N, instead of the brake-levers Q.

On each side of the supporting-bar H, and attached to it by the same pin, are angular pieces or cranks L. The ends projecting above the bar are deflected downward by the bracket l, attached to the cross-head M. When this is

pushed forward by the push-bar m, the bracket acts upon the crank at that distance from its axis which insures its complete action at a certain degree of movement of the cross-head, and the upper arm of the crank is bent at that angle from this point, which prevents any further action by the continued movement of the cross-head and bracket. In its normal position the other arm of the crank is horizontal, and is radial to a curved wedge formed at its end, the base of the wedge being below the arm, where its thickness is sufficient to force the levers I and i away from the bar to the extent that will bring them in contact with it at their other ends, which catch the pendulum. This action disengages the pendulum from the levers, allowing the stop-pieces R to resume their position of obstruction afterward, and is accomplished by a complete action of the crank L, and therefore by the automatic action of the brakes or by a backing of the engine.

The shoulder p is retained in its position by the spring S, reacting against the interior of the casting X and the retaining-bar N, by the contact of its head against the casting at the same point in the interior, thus securing free play for the stop-pieces R when there is no pressure upon the cross-head M.

The supporting-bar H is provided with a strong spring, h, between it and the truck-sill, which will allow it to deflect vertically sufficiently to avoid injury in case of the coincidence of the projection from the wheel-axle and that from the pendulum, end for end, and causing a depression of the latter.

On each side of the suspended lever Z are the vertical levers T, which, at the lower end, are attached to the rods t, fastened to the under side of the truck-sill. This attachment is formed by the two ends of the same rod curving around the two bolts U, which pass through the casting X and the sill. The levers are fulcrumed against the brake-levers Q, and the rods P pass through both and actuate both when in automatic action; but they do not interfere with the action of the vertical ones when operated by hand-power, for which they are intended. At their upper ends a rod, v, passes through each and through the bolster of the truck, where they connect on the other side with a single rod, V, which extends to the middle of the car, where it is attached to one arm of a crank. A similar rod, coming from the other truck, is attached to the opposite arm of the same crank, which crank is operated by hand-power from one end of the car, in the usual manner.

The spiral springs which encircle the rods P in front of the cross-head M, and which are compressed by its advance, are proportioned to apply to the brakes a determined amount of pressure, according to the loading of the car and consequent advance of the cross-head. When this pressure is intercepted by the stops R, confining the rods P, the cross-head is still free to advance, and then the springs act as a

buffer to the impact of the draw-heads of two cars.

The features of this mechanism which I claim as my invention, and for which I apply for Letters Patent, are—

1. The combination of the draw-head D, the wedges A, the lugs *c* on the cast-iron dead-block C, the shoulders *e* on the push-bar E, and the bell-crank B, attached to the dead-block and having one arm attached to the wedge A by the link *a* and the other arm attached to the draw-head by the link *b* in such a manner that the wedges will descend by the backward movement of the draw-head and fill the space between the lugs *c* on the dead-block and the shoulders on the push-bar, and in such a manner that the wedges shall be lifted clear of this space to the extent necessary to allow the push-bar to resume its normal position when the draw-head is pulled forward by the draft of the engine, for the purpose of enabling the engineer to regulate the duration of the pressure on the brakes.

2. The combination of a pendulum suspended below the axle of the car-wheel and having a projection above the axis upon which it swings, the projection from the wheel-axle engaging with the one from the pendulum, the two levers I and *i*, attached, one on each side, to the supporting-bar of the pendulum and deflecting both vertically and horizontally, the sloping catches at one end of the levers and at the end of the pendulum, the springs *k* at the other end of the levers, the stop-pieces R, playing vertically by the vertical deflection of the levers, the cross-pieces O, held by the retaining-bars N, the shoulders *p* on the brake-lever rods P, and the springs S, restoring the shoulders to their normal position, all so arranged

that at a certain velocity of the swing of the pendulum it will rise above the levers and be caught upon one of them, according to the direction of rotation of the car-wheel, and by its superior weight lift the stop-pieces R at the other end of the levers out of the way of the shoulders *p* on the brake-lever rods, for the purpose of allowing the brakes to be applied by the pressure between the draw-heads of two cars after they have attained a certain velocity.

3. The combination of the cranks L, bearing a curved wedge playing between the levers I and *i* and the supporting-bar, and the bracket *l*, attached to the cross-head M, behind the upper arm of the crank, so arranged as to deflect this arm downward by the forward movement of the bracket and to raise the wedges high enough to force the levers to a contact with the bar between them at the ends next to the pendulum, for the purpose of freeing either lever from the pendulum and thus allowing the stop-pieces R to descend.

4. The combination of one or more springs, spiral or of other suitable form, and the levers which apply the brakes directly to the car-wheels, so connected and arranged that the force produced by the pressure between the draw-heads of two cars when communicated to these levers shall be through these springs, and when intercepted from the levers shall be received and absorbed by the springs, for the purpose, in the first case, of regulating the pressure, and in the second for acting as a buffer to the impact of the cars.

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Witnesses:

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