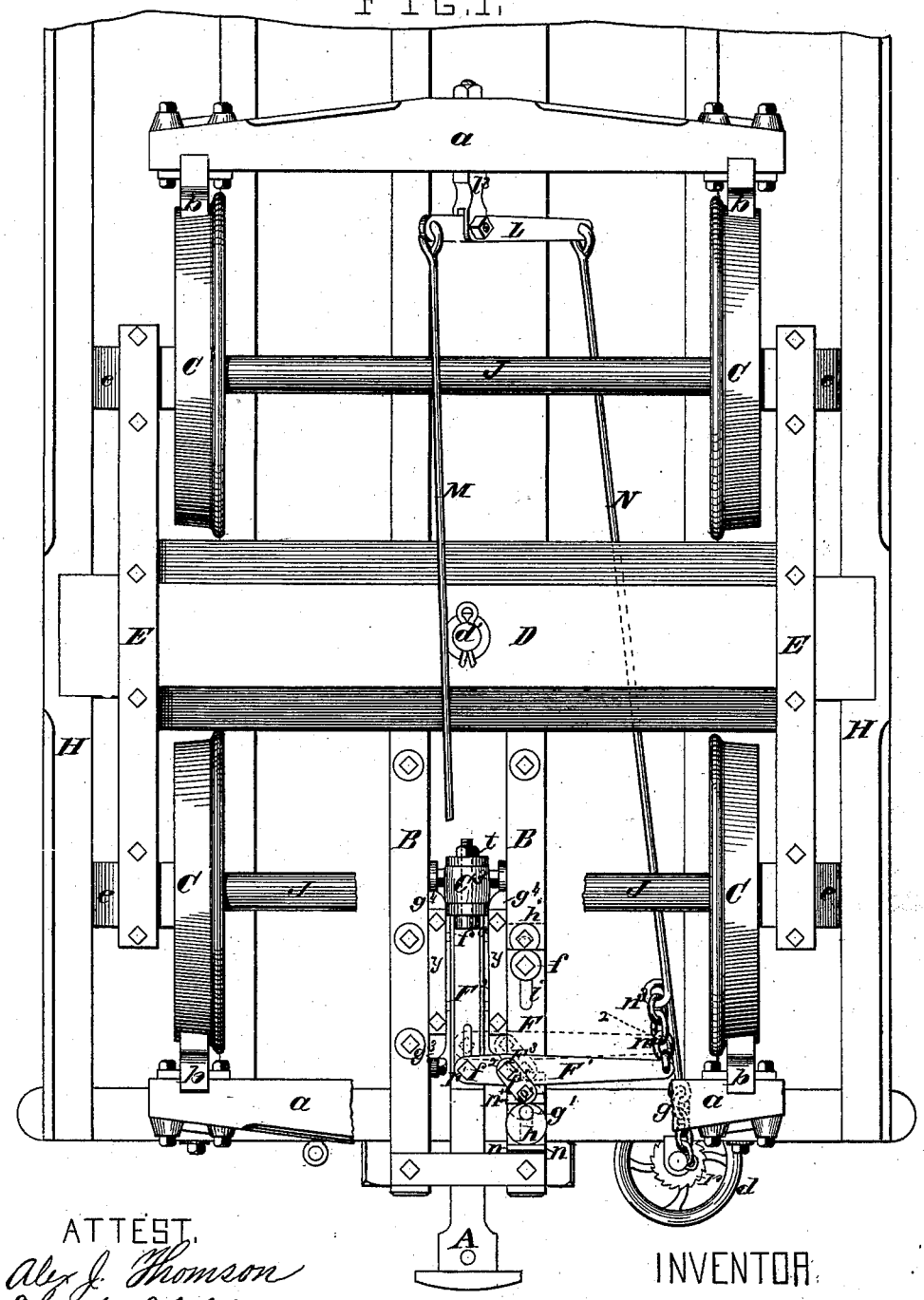
2 Sheets—Sheet 1.

# W. L. CARD.

## Automatic Railway Brake.

No. 201,594. Patented March 26, 1878.

FIG. 1.

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## Automatic Railway Brake.

No. 201,594. Patented March 26, 1878.

FIG. 2.

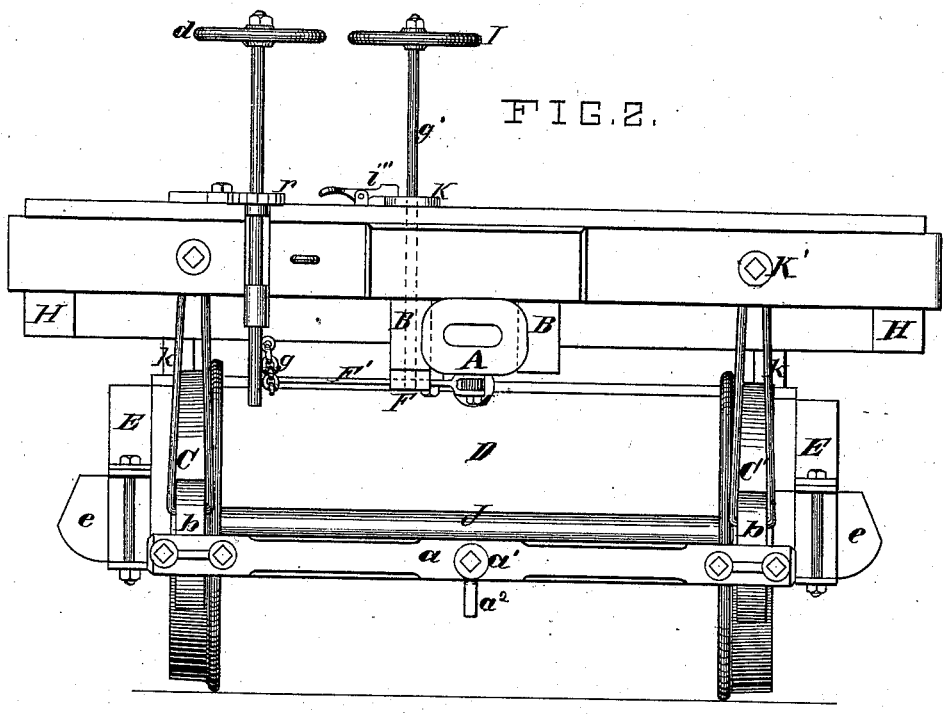



FIG. 3.

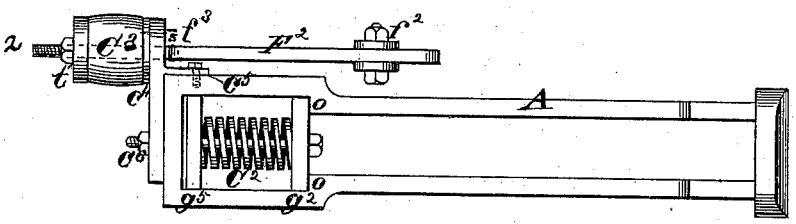



FIG. 4.

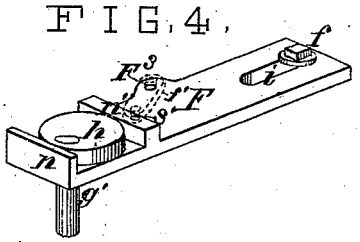
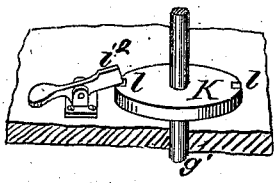



FIG. 5.

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# UNITED STATES PATENT OFFICE.

WILLIAM L. CARD, OF MOBERLY, MISSOURI.

## IMPROVEMENT IN AUTOMATIC RAILWAY-BRAKES.

Specification forming part of Letters Patent No. **201,594**, dated March 26, 1878; application filed October 15, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM L. CARD, of Moberly, in the county of Randolph and State of Missouri, have invented certain new and useful Improvements in Automatic Railway-Brakes; and I do hereby declare that the following is a full, clear, and exact description of my invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In the accompanying drawings, Figure 1 is a plan view of the under side of a car with my improved brake mechanism applied thereto. Fig. 2 represents an end elevation of the same. Fig. 3 shows the draw-bar with a portion of my improvement connected therewith. Fig. 4 represents, in perspective, the fulcrum-plate, with its operating-cam; and Fig. 5 shows a device for locking the said cam and fulcrum-plate in position.

Referring by letters to the several figures, H H represent the car-sills, and D E the truck-frame, upon which the car-platform is mounted in the usual way. C C represent the wheels; J, the axles thereof, and *e* the ordinary oil-boxes. The brake-beams *a* are furnished with shoes *b*, and are suspended by the hangers *k*, which are connected with the platform through the medium of bolts K′, or in any other suitable manner.

M N represent the brake-rods, both of which are connected with the rear brake-beam by means of a pivoted lever-bar, L, and a suitable connection, $l^3$. The rod M also connects with the forward brake-beam, through an ordinary eyebolt, which passes through the beam and through an elastic cushion or spring, $a^1$, a tension-nut, $a^2$, being fitted upon the projecting end of the bolt, so as to take up the slack of the brake rods and links; otherwise, the mechanism hereinafter described for setting the brakes would be ineffective.

It may also be here observed that these nuts should be set so as to allow the wheels, under set brakes, to revolve sufficiently to prevent any local flattening.

The other brake-rod, N, connects at its forward end with the vertical rod of an ordinary brake-wheel, *d*, through the medium of the chain-link *g*; and it also connects with a lever-bar, $F^1$, the functions of which will be presently described, by means of a chain, $n^2$, linked at one of its ends into an eye, $n^3$, on the rod.

As thus far described, the brakes are adapted to be set by turning the wheel *d*, which is provided with the usual vertical rod, and with the ratchet-wheel *r*, in connection with an ordinary engaging pawl or stop.

My improved mechanism for operating lever $F^1$ so as to automatically set the brakes when the speed of the engine of a train is slacked from any cause whatever, and the opposed resistance to the train consequently transmitted to the sliding spring draw-bars, is substantially as follows: The draw-bar A slides between the straps *y y*, which are bolted at their ends upon stops $g^4$ and $g^3$. The follower-plates $g^2 g^5$ project beyond the sides of the draw-bar, so as to work in suitable ways or guides under the straps, the movements of the said follower-plates being limited by the stops $g^3$ $g^4$.

$C^2$ represents the draw-spring between the two follower-plates $g^5$ $g^2$, and *o o* represent shoulders, against which the plate $g^2$ abuts by reason of the pressure of the spring.

Upon the rear end of the draw-bar I secure an angle-plate, $C^4$, by means of bolts and nuts $C^5$ $C^6$. This angle-plate has an upwardly-projecting flange, $f^3$, as shown in Fig. 3, and which I shall designate as the "stop-plate."

$F^2$ represents a bar, which has one of its ends slotted and pivoted to the lever-bar $F^1$.

A portion of the other end of bar $F^2$ is somewhat reduced in size, from a stop-shoulder, *s*, to its end 2, and said smaller portion passes through an opening in the stop-plate $f^3$, and also through the take-up spring $C^3$, which is secured therein between the stop-plate and its end 2 by a nut, *t*, which may be adjusted upon a screw-threaded portion of the bar, as occasion demands.

From this construction and arrangement it will be seen that when the draw-bar A is forced back the pressure of the stop-plate $f^3$ against the elastic cushion or take-up spring $C^3$ will also throw back the bar $F^2$ sufficiently to operate lever $F^1$, and thereby set the brakes,

when the fulcrum of the lever-bar is in proper position for automatic braking, as presently described.

The compression of the spring $C^3$ will be proportionate to the extent to which the draw-bar is driven back. In case of severe concussion, it is evident that the interposition of this take-up spring between the above-described operative parts will prevent the same from being injured; also, when the pressure upon the draw-bar is removed, the said spring, if considerably compressed, will necessarily operate to a certain extent in conjunction with the ordinary draw-spring.

The lever-bar $F^1$, which, as before stated, is connected at one end with the bar $F^2$, and at its other with the rod N by the links $n^2$, has its fulcral point upon a sliding fulcrum-plate, F, its bearing being formed by a pin, $F^3$, and strap $f^1$. This fulcrum-plate F (see Fig. 4) is formed with a slot, *i*, near one end, and through this slot a bolt, *f*, passes, which secures the plate upon one of the draft-timbers B. This admits of the forward or backward movement of the fulcrum-plate upon the draft-timber, and hence the consequent change of the fulcral point of the lever F. To effect this movement, I form the plate F with ribs or abutments $n$ $n^1$, between which I locate a cam-eccentric, *h*, adapted to operate in its rotation against either abutment, thereby throwing the fulcrum-plate forward or backward.

The cam-eccentric *h* is secured upon a rod, $g^1$, which passes through bar $F^1$, timber B, and also the car-platform, above which it has an operating-wheel, I.

In order to maintain the plate F in position after it has been forced backward by the cam so as to slack up chain $n^2$, and thereby put the brakes under control of the ordinary brake-wheel alone, or forced forward so as to take up the slack and place the fulcrum of the lever-bar in such position that the brakes will be automatically set by the movement of the draw-bar, I secure upon rod $g^1$ a disk, K, with notches *l l* therein, and arrange a spring-catch, $i^2$, so as to engage with the same, and thereby lock the cam-eccentric in position.

For yard-work or switching (the tension-nuts having been properly adjusted) the fulcrum-plate with its lever is thrown back by the cam and locked, as above described.

For automatic braking upon the road, the spring-catch is released from disk K, the fulcrum-plate and lever thrown forward, and again locked by the spring-catch $i^2$. If, for any reason, the speed of the engine is slacked, the opposed resistance will force in the draw-bars, and consequently automatically set the brakes. In proceeding on a down-grade, if the engineer shuts off steam and the draw-bars are thereby released from strain, the draw-springs, which have heretofore been somewhat contracted, will expand sufficiently to admit of a light setting of the brakes.

I do not wish to be understood as claiming, broadly, the principle of automatic self-braking in railroad-trains; but

I do claim and desire to secure by Letters Patent—

1. In an automatic car-brake, the combination, with the draw-bar A, of the connecting-bar $F^2$, provided with a shoulder, *s*, and the take-up spring $C^3$, with tension-nut *t*, said devices being connected with the draw-bar through the medium of an angle-plate, $C^4$, substantially as shown, and for the purposes described.

2. In combination with the connecting-bar $F^2$, the brake-lever $F^1$, pivoted thereto, and the fulcrum-plate F, attached to lever $F^1$ by the strap $f^1$ and center-pin $F^3$, substantially as shown and described.

3. In combination with the brake-lever $F^1$ and a mechanism for automatically operating the same when the draw-bar is forced backward, the connecting-links $n^2$ and loop or eye $n^3$ upon the said rod, which also connects with the rod of an ordinary hand-brake wheel, substantially as shown and described.

4. The movable fulcrum-plate F, secured upon one of the draft-timbers B by the guide pin or bolt *f* through slot *i*, and carrying the brake-lever $F^1$, in combination with the cam-eccentric *h* between abutments $n$ $n^1$, adapted to be operated by the rotation of its rod or spindle *r*, substantially as shown and set forth.

5. The rods M and N, connected with the brake-lever, in combination with an elastic cushion, $a^1$, and tension-nut upon the forward end of rod M, and with an ordinary hand-braking mechanism and an automatic braking apparatus, composed essentially of bar $F^2$, connected with the draw-bar through the medium of an angle-plate and spring, and a lever-bar, $F^1$, connected with rod N, all constructed and adapted for adjustment substantially in the manner as herein shown and described, and for the purposes set forth.

6. The connecting-bar $F^2$, provided with check-shoulder *s*, in combination with the angle-plate $C^4$, with its stop-plate $f^3$, substantially as shown and specified.

7. The take-up spring $C^3$ and connecting-bar $F^2$, in combination with the bar F, with a joint at the slotted portion of bar $F^2$, through which the bolt $f^2$ is passed and adapted to have a limited movement, substantially as herein shown and specified.

8. The locking-disk K, with spring-catch, in combination with cam *h* and fulcrum-plate F, substantially as shown and set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

WILLIAM L. CARD.

Witnesses:
S. S. BISSELL,
JOS. E. WARE.