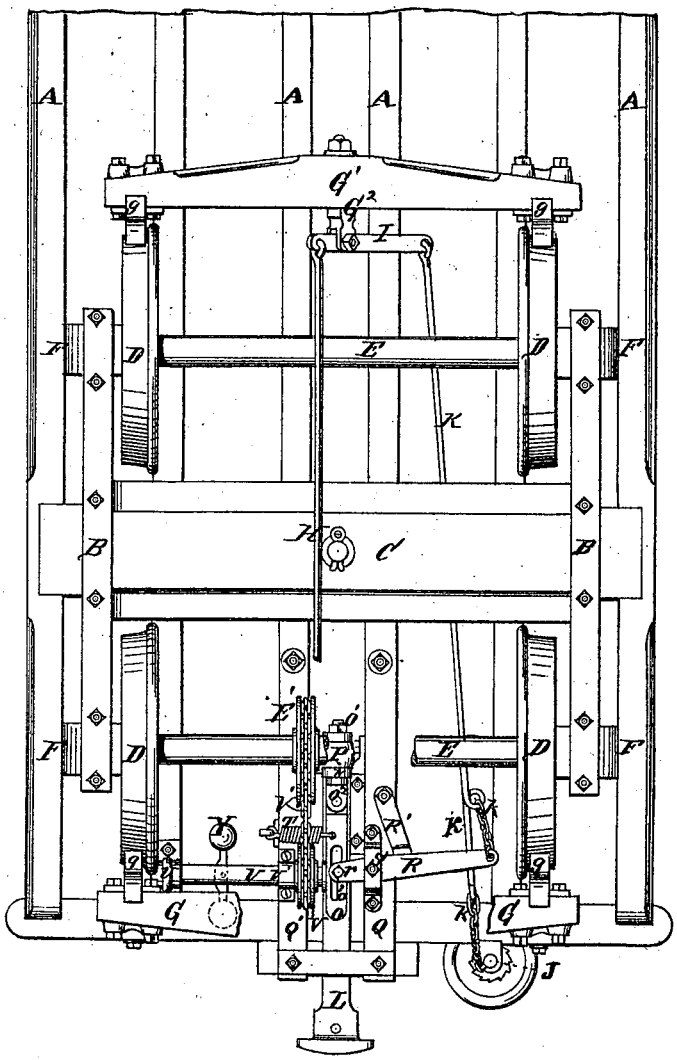
2 Sheets—Sheet 1.

W. L. CARD.

Automatic Car-Brake.

No. 207,501. **Patented Aug. 27, 1878.**

FIG. 1.



ATTEST:

Walter Allen
Geo. D. Smallwood Jr.

INVENTOR:

William L. Card
By Knights Bros
Attys

2 Sheets—Sheet 2.

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FIG. 2.

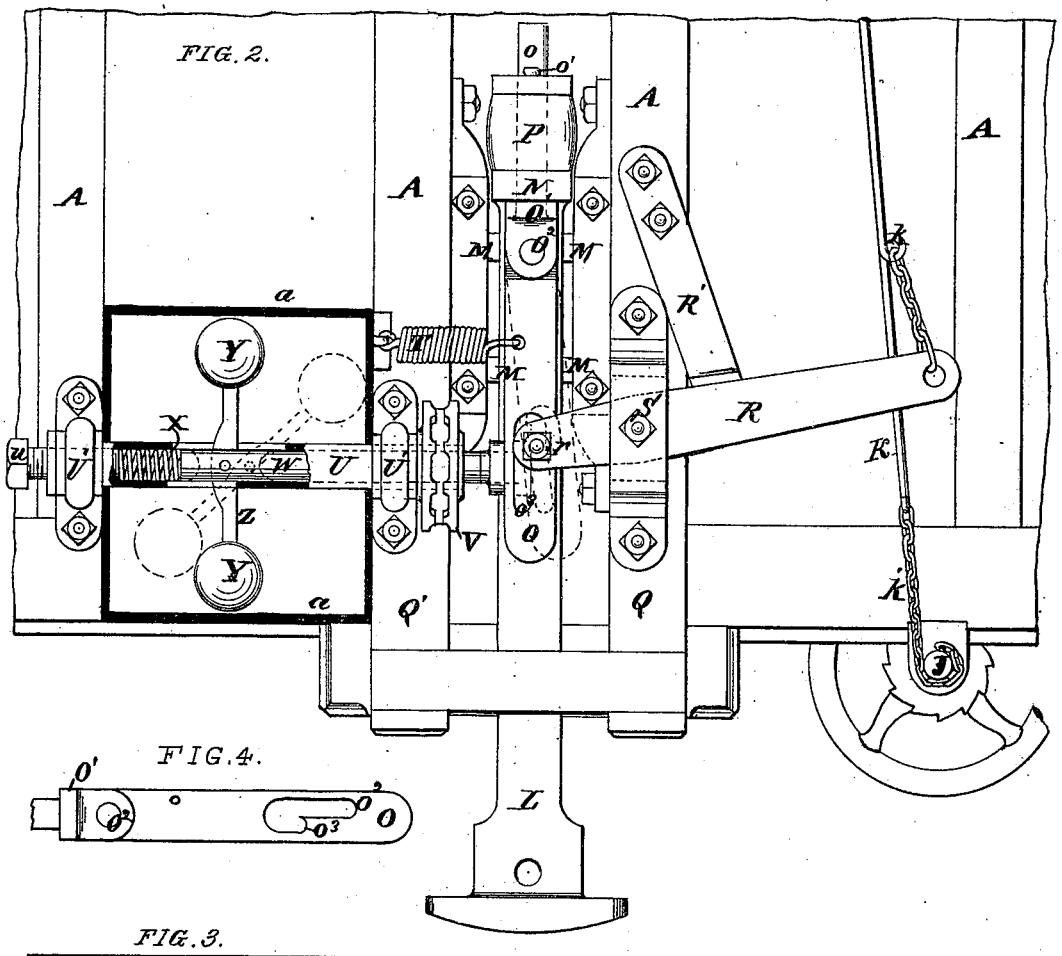
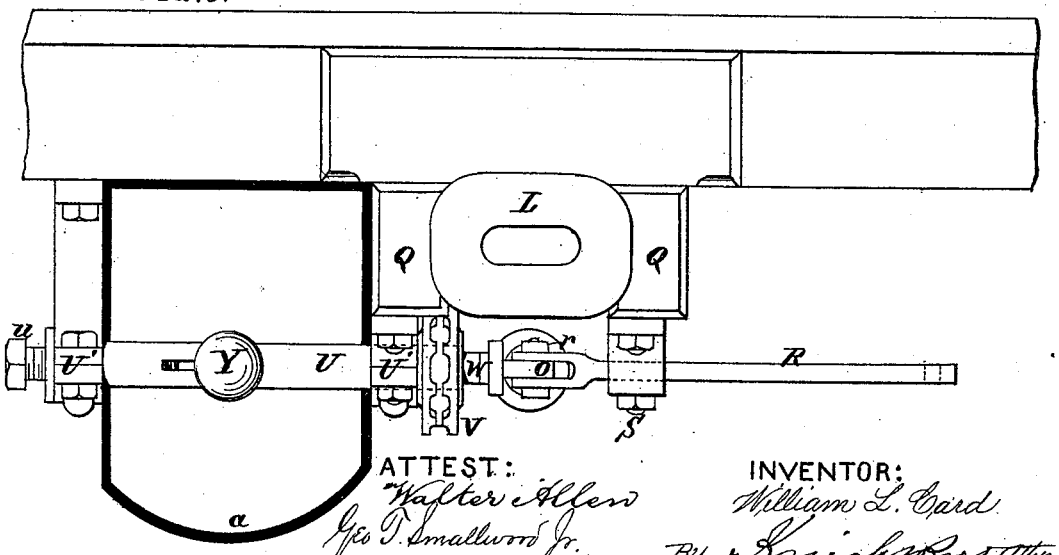


FIG. 4.

FIG. 3.



ATTEST:
Walter Allen
Geo. T. Smallwood Jr.

INVENTOR:
William L. Card
By Knight Bros Attys.

UNITED STATES PATENT OFFICE.

WILLIAM L. CARD, OF MOBERLY, MISSOURI.

IMPROVEMENT IN AUTOMATIC CAR-BRAKES.

Specification forming part of Letters Patent No. **207,501**, dated August 27, 1878; application filed July 24, 1878.

To all whom it may concern:

Be it known that I, WILLIAM L. CARD, of Moberly, Randolph county, and State of Missouri, 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, forming part of this specification.

This is an improvement on the invention described in Letters Patent of the United States numbered 200,602 and 201,594, granted to me, and dated, respectively, February 26 and March 26, 1878.

In the aforesaid inventions the parts had to be manipulated by the brakemen to put them in position to be automatically operated by the movement of the draw-head, and to be thrown out of such position.

In my present invention the parts are made automatic in every respect and at all times, the parts being always in position to set the brakes, on the slacking up upon the draw-heads, when the cars are in motion, and to remove the brakes by draft upon a draw-head when the cars are not in motion. The parts are thrown into the position for the setting of the brakes by the centrifugal power of balls upon the ends of a cross-bar pivoted to an axial rod in a shaft rotated by connection with the axle of the car, as fully set forth hereinafter, the other parts being made to conduce to the above result, as set forth.

In the drawings, Figure 1 is an under view of one end of a car, showing one four-wheeled truck. Fig. 2 is a similar view of a portion of same on an enlarged scale, part in section. Fig. 3 is a detail in end elevation, showing part in section. Fig. 4 is a top view of the slotted bar which actuates the brakes.

I will first briefly describe the parts which are similar to those of my Patent No. 201,594, and then particularly describe the points differing from those in said patent.

The car-sills are shown at A, and the truck-timbers at B C, the wheels at D, the axles at E, and the ordinary grease-boxes at F. G G^1 are the brake-bars, having shoes *g*, suspended on hanger-links in the usual manner. H is a rod, attached at one end to one of the brake-bars, G, and the other end connected to the shorter end of a lever, I.

The lever I is connected to the other brake-bar, G^1, by a fulcrum-bolt, G^2. The longer and upper end of the lever I is connected to hand-shaft J of the brake by a rod, K, and chain *k'*, in the usual manner.

I claim no invention in any of the parts above described by letter, and consequently will not make any detailed description of them.

L is a draw-head, of any suitable or ordinary construction. M M are the follower-plates, between which is the usual draw-spring, all being of the ordinary construction.

Upon the inner end of the draw-head is a lug or bracket, N, for the attachment of the bar O, such attachment being made by means of a reduced portion or bolt, *o*, which passes through the lug N and axially through a spring, P, and carries at the end a washer and nut or pin, *o'*, so that the spring is confined between the washer and the lug N. I term this spring the "take-up spring." It allows the draw-head to be forced back beyond a certain point without carrying with it the bar O.

O^1 is a shoulder or collar on bar O, resting against the lug N, except when the take-up spring is compressed.

The bar O has in it a joint, O^2, allowing an oscillatory movement to its outer end in a horizontal plane.

O^3 is a longitudinal slot in the bar O, through which passes the pin *r* at the end of the brake-lever R, which bar is connected to one of the draw-timbers Q by a fixed fulcrum, S. The outer end of the lever R is connected to the eye *k* on the rod K, so that the movement of the lever R by the backward movement of the draw-head may be made to set the brakes.

R' is a stop, to limit the backward movement of the longer end of lever R.

The slot O^3 has upon one side a hooked shoulder, o^3, to engage the pin *r* of the lever R on the backward movement of the draw-head when the bar O is in the position shown in the drawings. It will be observed that the portion of the slot O^3 to the rear of the shoulder o^3 is wider than the other portion of the slot. T is a spring, connected at one end to a fixed part of the car, and at the other end to the bar O, and whose tendency is to hold the bar O in the position shown, and when the car is in motion the bar O is always held in this

position by the spring T, so that the backward movement of the draw-bar will cause the setting of the brakes.

I will now describe the chief novelty of my invention, which consists in the mechanism for preventing the setting of the brakes by the backward movement of the draw-head when the cars are at rest. U is a tubular shaft, turning in bearings U′. It has upon it a chain gear-wheel, V, connected by a gear-chain, V′, with a chain gear-wheel, E′, upon one of the axles E, so that when the car is in motion the shaft U has continuous rotation.

W is a rod placed axially in the shaft U, and having endwise movement therein, being thrust outward by the spiral spring X bearing against its end, and drawn inward when in rotation by the centrifugal force of the ball Y upon the ends of the cross-bar Z, the cross-bar passing through slots in the rod W and shaft U, and being pivoted to the former by a pin, *z*.

The rotation of the shaft U causes the bar Z to take a position at right angles with a shaft, as shown; and as the bar in such a position bears against the end *u* of the slot in the sleeve the rod W is held back in the position shown, and the spring T holds the bar O in the position seen in Figs. 1 and 2, so that the shoulder o^3 will engage the pin *r* on the backward movement of the draw-head. On the other hand, when the car is not in motion the spring X forces the end of the rod W against the bar O, carrying it into the position shown in dotted lines, Fig. 2, and then the shoulder o^3 is out of the line of the pin *r*, and the draw-head may move backward and forward without any action upon the brakes.

It will be understood that the spring X has sufficient strength to overpower the spring T, and hold the bar O in the position shown by dotted lines when the shaft U is not rotating. The tension of the spring X is adjusted by a set-screw, *w*, screwing into the end of the shaft, and against which the outer end of spring X bears.

To keep the parts U V W X Y Z free from dust, I prefer to inclose them in a case, *a*. The tubular shaft U may be perforated to allow the escape of any dust that might enter it.

The operation has been explained; but something more may be said as to its bearing upon the running of the trains. When a train is running the draw-heads are pulled outward, and the shoulder o^3 is held out of contact with the pin *r*; but on the cars running together the draw-heads are retracted by the draw-springs, and the shoulder o^3 comes in contact with pin *r*, and, that end of the lever being carried backward, the brakes are set on. When the ends of the draw-heads come in contact the brakes are still harder pressed against the wheels. In this case the take-up spring P is compressed and relieves the brake mechanism from extreme strain. When the train stops the hook-formed shoulder o^3 remains in engagement with the pin *r*, and the brakes are still set; but as the balls Y cease to compress the spring X just as soon as the draw-heads are drawn outward by the stretching out of the train, the bar O is thrown toward the draw-timber Q, and the shoulder o^3 is disengaged from the pin *r* and the brakes are thrown off.

The take-up spring P is made of a proper strength, so that when the ends of the draw-heads are in hard contact the brakes will not be applied with sufficient force to slip the wheels, and thus much loss is avoided.

It will be observed that on a down-grade, or in any other position when the cars may be running toward each other, the brakes will immediately be set, and on the train stretching out again the brakes will be released, and thus injury and loss will be avoided, from the cars crushing each other in case of an accident.

In case the engineer might have carried his train a little past the stopping-place and desires to back up, all he has to do is to just stretch out the train, which will release the brakes, and then the train may be backed, as the spring-rod W X will push each bar O to the position shown in dotted lines, Fig. 2, as soon as the hook-formed shoulder o^3 has been disengaged from the pin *r* by the forward movement of the draw-head.

I now mention briefly some practical advantages of this automatic brake. As each car contains a complete brake mechanism, no brake-coupling is required from car to car; and as it is worked by a common draw-head, cars with my brake can be placed anywhere among ordinary cars in a train, and the brake will act in the same manner as if it formed one of a train of similar cars, so that no radical or general change will be required to be made in the rolling-stock; but the cars may have the automatic brake mechanism applied to a few at a time, and the business of the road have no hinderance.

The mechanism is fitted for application to the ordinary hand-brake mechanism without any change being made in it, and does not in any way interfere with the use of the ordinary hand-brake mechanism.

The automatic brake mechanism may be put on cars at so small a cost that it would be applied to freight-cars, and thus much loss of property avoided. It can be made and put on by any ordinary mechanic.

On the breaking of a link the brakes will be set on all the cars behind the point of separation, whether running up or down hill or on a level.

No special action of the engine-driver is required to set the brakes; but the ordinary working of the engine accomplishes their setting and release, so that no forgetfulness or carelessness of the engine-driver will endanger the destruction of life or property from this cause.

I claim herein as new and of my invention—

1. The combination, with the automatic brake-lever R, of the slotted bar O, having at

the side of the slot a shoulder or catch, o^3, to engage the lever in certain position of the bar O, for the purpose set forth.

2. The combination, with the lever R and bar O, of the spring T, substantially as set forth.

3. The combination, with the draw-head L, slotted bar O, and lever R, of the spring-rod W X and revolving shaft U, for the purpose set forth.

4. The combination of axle E, chain or other gear E′ V V′, shaft U, centrifugal automatic device Y Z, spring push-rod W X, bar O, and brake-lever R, substantially as and for the purpose set forth.

5. The combination, with an ordinary hand-brake mechanism of a railway-car, of the described automatic brake mechanism, consisting of lever R, slotted bar O, spring T, spring-rod W X, and shaft U, carrying pivoted bar or lever Z, with weights Y, all substantially as set forth.

WILLIAM L. CARD.

In presence of—
SAML. KNIGHT,
E. E. CHASE.