2 Sheets--Sheet 1.

S. P. LITTLEFIELD.

Car-Brakes.

No. 165,008. Patented June 29, 1875.

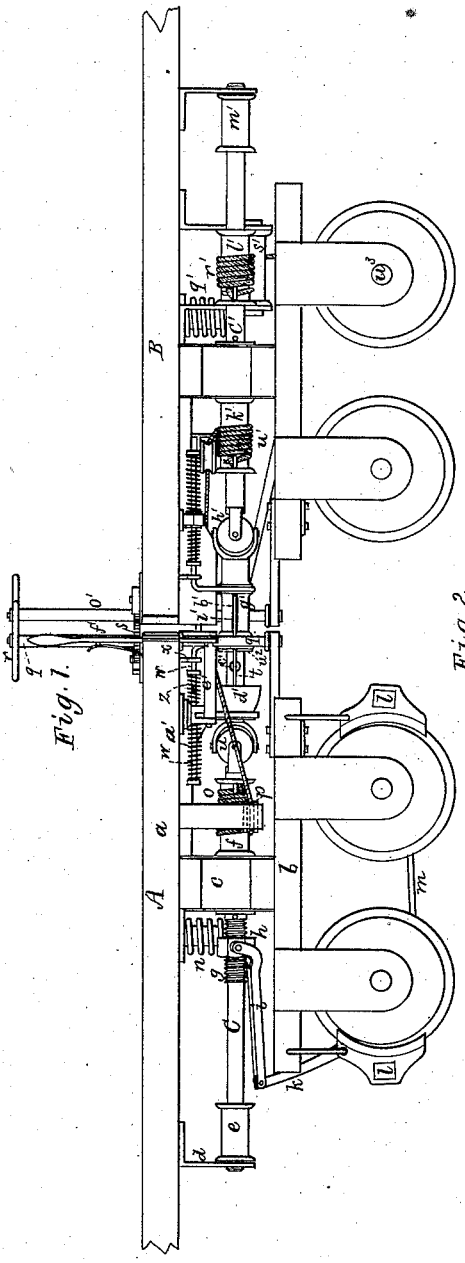

Fig. 1.

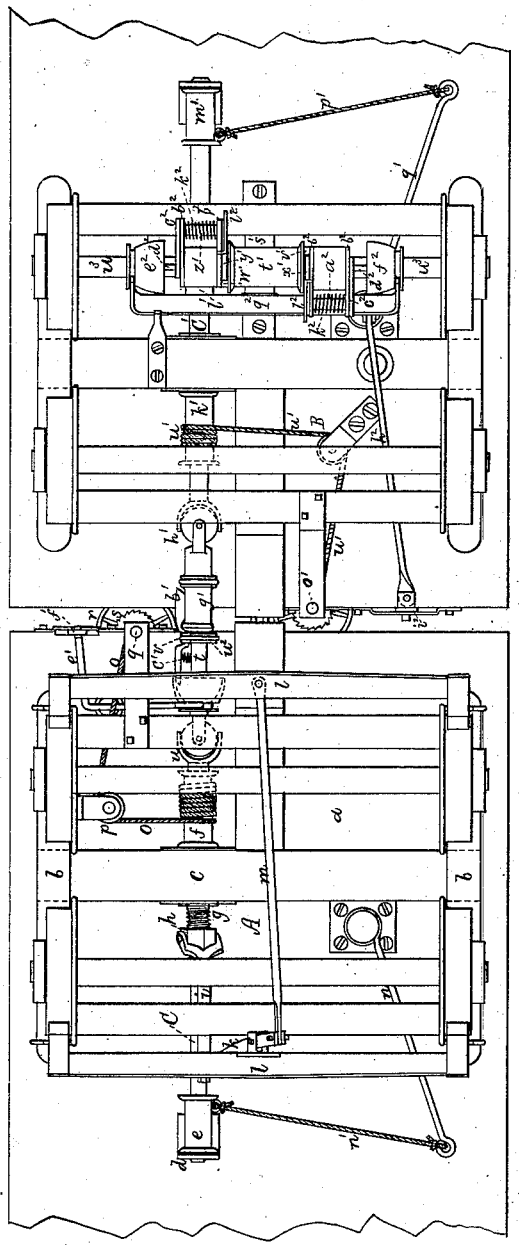

Fig. 2.

Witnesses.
S. W. Pyper
L. N. Fowler

Silas P. Littlefield
by his attorney.
R. H. Eddy

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2 Sheets--Sheet 2.

S. P. LITTLEFIELD.

Car-Brakes.

No. 165,008. Patented June 29, 1875.

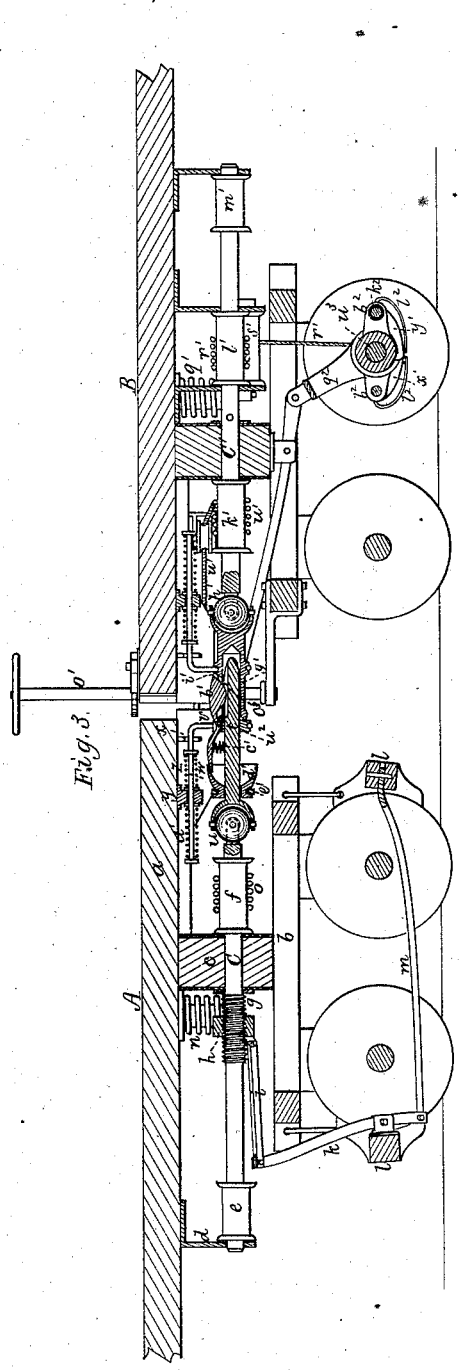

Fig. 3.

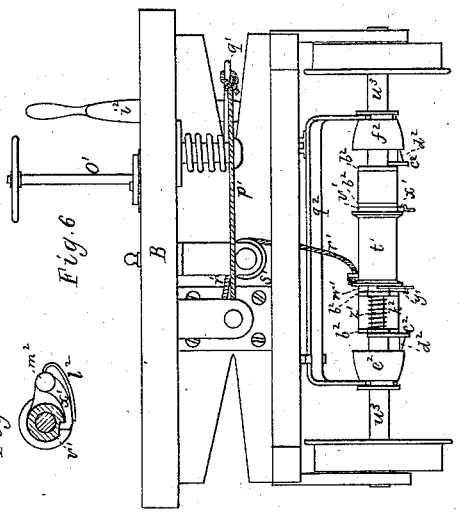

Fig. 6

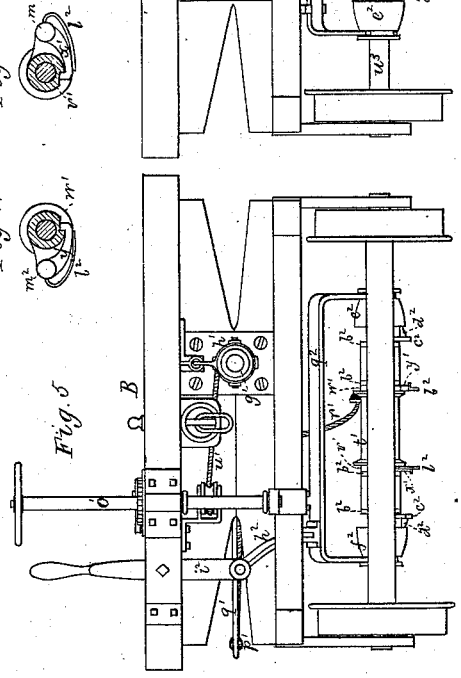

Fig. 5

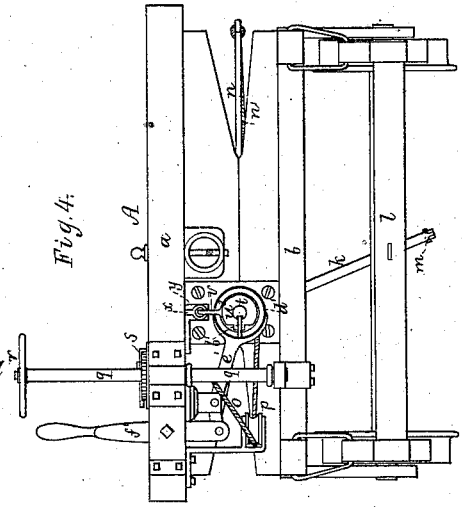

Fig. 4

Fig. 8

Fig. 7

Witnesses.
S. N. Pipes
L. N. Bottles

Silas P. Littlefield
by his attorney
R. H. Eddy

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UNITED STATES PATENT OFFICE.

SILAS P. LITTLEFIELD, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **165,008**, dated June 29, 1875; application filed May 22, 1875.

To all whom it may concern:

Be it known that I, SILAS P. LITTLEFIELD, of Lynn, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Brake Mechanism for Railway-Carriages; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, Fig. 2 an under-side view, Fig. 3 a longitudinal section, and Figs. 4 and 5 inner end elevations, of two railway-cars provided with my invention.

My invention has for its object the setting up simultaneously of all the brakes of the carriages of a train; also, to prevent any car or cars of the train, on becoming accidentally detached from the rest of it, from running backward down a grade.

In the drawings, A denotes one carriage, and B the other, they being supposed to be provided with ordinary couplings for connecting them together end to end. Extending longitudinally of the car A, and between its platform *a* and truck-frame *b*, is a shaft, C, duly supported in bearings *c d*, and provided with two barrels, *e f*, and a male screw, *g*, all being arranged as shown. On the screw is a nut, *h*, jointed to a bifurcated arm, *i*, which at its rear end is jointed to the upper end of a lever, *k*, pivoted to one of the brake-bars *l l*, and connected to the other by a rod, *m*, all being as shown. By revolving the shaft C one way the brakes will be set up to the wheels, and by turning it the opposite way they will be moved away from the wheels, the back revolution of the shaft being effected by a spring, *n*, connected with the barrel *e* by a rope or chain, *n'*. Another rope or chain, *o*, fixed to the barrel *f* and wound around such, extends therefrom around a guide-wheel, *p*, and thence to and is fixed to an upright shaft, *q*, provided with a hand-wheel, *r*, and a ratchet-wheel, *s*. On revolving the shaft *q*, the shaft C will be turned so as to cause the brakes to be set up to the wheels. To the front end of the shaft C a pointed spindle, *t*, is connected by a universal joint, *u*, the said spindle having a grooved disk, u^2, fixed on it. The spindle is held up by a stirrup, *v*, which encompasses the disk. The stirrup projects downward from a horizontal rod, *w*, that goes loosely through supports or eyes *x y*, and two springs, *z* a^1, arranged on it, and with said supports, as shown. The said means of supporting the spindle—viz., by the disk, the stirrup, the rod, and its springs—enable it to move laterally or up or down, or accommodate itself to the lateral or vertical movements of the cars. There is jointed to the disk u^2 and arranged with it, as shown, a catch-lever, b^1, between whose rear arm and the spindle is a spring, c^1, that operates to press upward the rear arm of the lever, in order to force the front arm thereof into a socket or groove, c^2, made lengthwise in the upper part of the spindle. In rear of the lever b^1, and applied to the spindle, so as to slide on it, is a cup, d^1, provided with a system of levers, e^1 f^1, to move it on the spindle. While being moved forward or toward the point of the spindle, the cup so acts on the rear arm of the catch-lever b^1 as to depress it, and consequently force upward the front arm of said lever. The said spindle is to co-operate with a tubular spindle, *g'*, connected by a universal joint, h^1, with a shaft, C', arranged with the next car, and applied thereto as the shaft C is to its car. The tubular spindle is slotted lengthwise, as shown at i^1, the slot being to receive the latch of the first-named spindle when the two spindles are in conjunction. The spindle g^1 is upheld by means like those by which the fellow spindle is supported. The shaft c^1 is provided with three barrels, k^1 l^1 m^1, the first of which has a rope or chain, w^1, fixed to, wound around it, and led around a guide-wheel to a hand-wheel shaft, o^1. The barrel m^1 has a rope or chain, *p'*, connecting it with a spring, q^1, which serves to effect back revolution of the shaft C'.

Fig. 6 is an outer end elevation of the car.

To the middle barrel l^1 a rope or chain, *r'*, is fixed, it being wound around the barrel, and thence led over a guide-roller, *s'*, and down to a barrel, *t'*, arranged upon the rear axle w^3 of the truck of the car B. The barrel *t'* turns freely on the axle, and it has at each of its ends a ratchet or catch wheel, *v'* or *w'*. To operate with these ratchets are two catch-pawls, *x' y'*, Figs. 7 and 8 representing sections of such pawls and ratchets.

Each pawl is pivoted to one of two short

shafts, z' a^2, supported in arms b^2 b^2, projecting from the axle. There is on each of such shafts an arm, c^2, arranged as shown, and provided with a wedge-shaped tooth, d^2, extended into one of two tapering cups, e^2 f^2, arranged as represented and to slide on the axle.

A furcated slide, q^2, projected into grooves in the cups, and arranged as shown, has a system of levers, h^2 i^2, applied to it and the truck-frame, to enable it to be moved so as to carry either of the cups up the wedge-teeth of the pawl next to it.

Fixed to each of the short shafts z' a^2, and to one of the next contiguous arms, is a spring, k^2, whose purpose is to throw the pawl out of action upon the ratchet-wheel.

Each pawl turns freely on its shaft, but is pressed toward the ratchet by an auxiliary spring, l^2, fixed to the shaft or to a head, m^2, attached thereto.

When the cars come together for being coupled, the spindles interlock, so as to couple the two shafts C C′ in such manner that when one is turned, both will revolve simultaneously. Now, if to each shaft and the brakes of its car, there be a screw, g, a nut, h, a furcated arm, i, a lever, k, a barrel, e, and spring n, the two latter being connected by a chain or rope, n', all as hereinbefore explained with reference to the car A, in setting up the brakes of one car, those of all the others of the train will be simultaneously and in like manner moved up to their wheels. On the cars being uncoupled and drawn apart, the spindles readily separate from each other.

The object of the slide-cup d^1 and its levers e^1 f^1 is to move the catch-lever b^1 outward, and so hold it as to enable the shaft c to revolve independently of the shaft c^1, in order for the brakes of one car to be "let off" while those of the other are up to their wheel or off the same, as the case may be.

In case of the rear car, or any car of the train, becoming accidentally uncoupled from that one next in advance, and running back down a grade, the wheels having their motion reversed, the rear axle will be revolved in a direction contrary to what it does when the car moves forward, in which case the axle will cause one of the pawls to so act on its ratchet as to revolve the barrel at the middle of the axle, in a manner to wind the rope or chain thereon, and thereby cause the shaft c^1 to be revolved in a way to effect the setting of the brakes up to the wheels, and thus stop the carriage from running down the grade. The other pawl and ratchet are to enable such effect to take place in case the car is being drawn in an opposite direction. The brakeman, by means of the lever i^2, moves the slide q^2, so as to set one or the other of the cups e^2 f^2 up to its pawl-arm, as may be required.

I claim—

1. In combination with the shafts c c^1 and their coupling-spindles t g', provided with a catch-lever, and constructed substantially as described, the spring c^1, the slide-cup d^1, and the system of levers e^1 f^1, applied to the spindle t and the truck, as set forth.

2. The spring n and its chain or cord n', in combination with the shaft c, provided with mechanism, as described, for setting the brakes up to the wheels, such mechanism consisting of the rod m, lever k, furcated arm i, nut h, screw g, barrel e, chain or rope o, barrel f, and the hand-wheel shaft q.

3. In combination with the shaft C′ and the car-wheel axle, the mechanism applied thereto for revolving the shaft c^1, to effect stopping the car on a descending grade, such mechanism consisting of the barrel t', its ratchets v' w', the pawls x' y', and the mechanism, as described, for throwing either pawl into or out of action with its ratchet, this latter mechanism being the shafts z' a^2, arms c^2, teeth d^2, cups e^2 f^2, slide q^2, levers h^2 i^2, and springs k^2 l^2, all being arranged and applied substantially as specified.

SILAS P. LITTLEFIELD.

Witnesses:
R. H. EDDY,
J. R. SNOW.