

(No Model.)

3 Sheets—Sheet 1.

R. C. SAYER.
RAILWAY CAR BRAKE.

No. 471,849.

Patented Mar. 29, 1892.

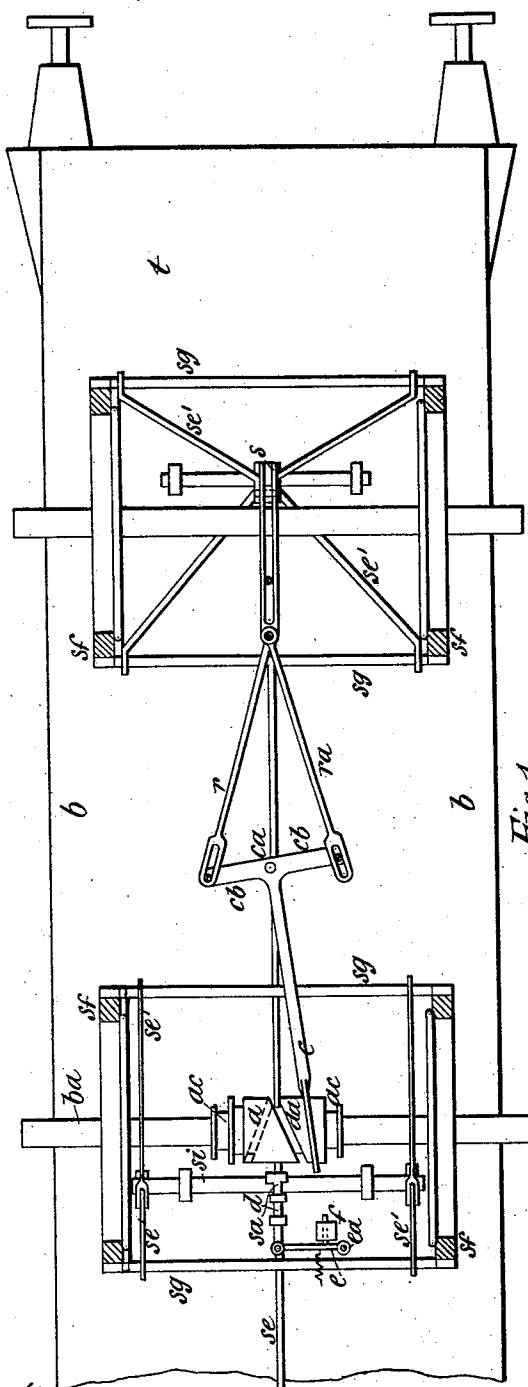


Fig. 1.

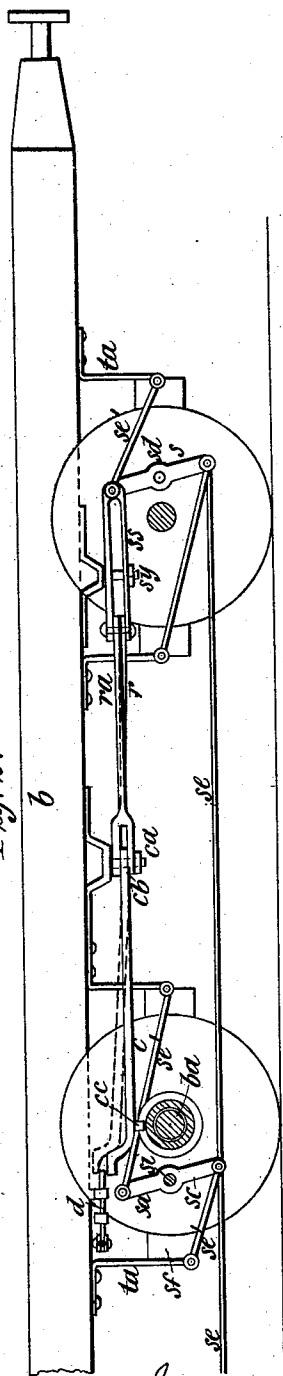


Fig. 2.

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by *Herbert W. Jenner* Attorney.

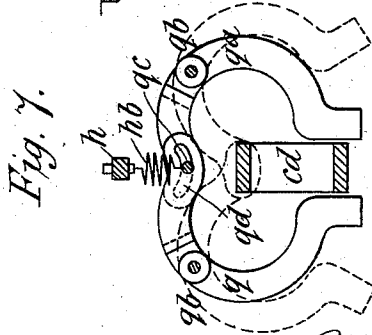
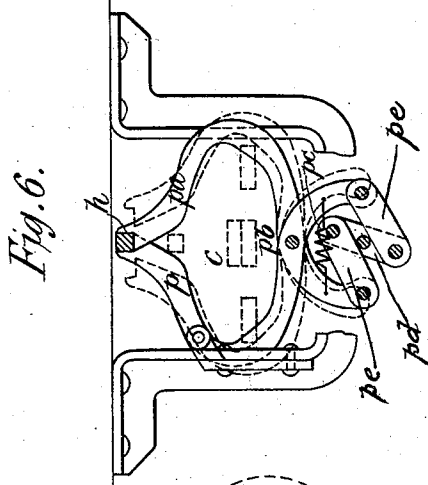
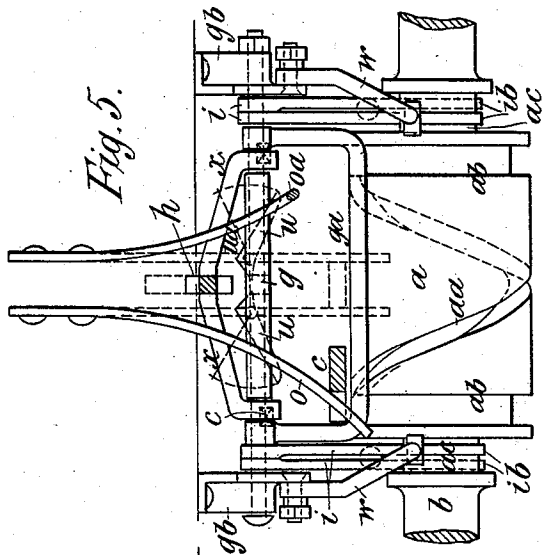
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3 Sheets—Sheet 3.

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Witnesses:
 C. D. Swett
 John Lullum

15
1906
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UNITED STATES PATENT OFFICE.

ROBERT COOKE SAYER, OF BRISTOL, ENGLAND.

RAILWAY-CAR BRAKE.

SPECIFICATION forming part of Letters Patent No. 471,849, dated March 29, 1892.

Application filed September 1, 1891. Serial No. 404,421. (No model.)

To all whom it may concern:

Be it known that I, ROBERT COOKE SAYER, a subject of the Queen of Great Britain and Ireland, residing at Redland, Bristol, in the county of Bristol, England, have invented certain new and useful Improvements in Brakes for Railway-Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention for improvements in brakes for railway-vehicles has for its object to utilize the momentum of the vehicles for applying and taking off the brakes when required; and it consists, essentially, in operating a brake-lever by means of a spiral groove in or a spiral feather on a drum mounted on or driven from one of the axles of the vehicle, the said spiral groove or feather terminating at the ends of the drum in plain grooves or feathers, so as to retain the brake-lever in this position until released when once there. The brake-lever is held over the drum by means of an electro-magnet, and when the current to the said magnet is stopped the lever drops onto the drum and is operated. To take off the brakes, a counterweighted or spring-released lever, prevented from acting by stops, is removed by the brake-lever as it reaches the end of its traverse and also by the electro-magnet. On again stopping, the current to the magnet falls and raises from off the drum the brake-lever which is forced along inclines to its normal position by springs, the counterweight or spring-released lever being again raised by the motion of the carriage ready to act again.

In the accompanying three sheets of illustrative drawings, Figure 1 is a plan of the under side of a railway-carriage, showing the arrangement of mechanism for applying and taking off the brakes; and Fig. 2 is a sectional side elevation of the same. Fig. 3 is a longitudinal vertical section of the operating mechanism. Fig. 4 is a plan view, and Fig. 5 is a vertical cross-section, of the same. Figs. 6 and 7 are detail views.

The drum *a*, provided with end grooves *a b*, united by the spiral groove *a a*, is fixed upon or forms part of an axle *b a* of the vehicle *b* and rotates with it. The T-shaped brake-le-

ver *c*, fulcrumed in the center *c a* of its head *c b* and carrying the stud *c c* for engaging with the groove *a a* of the drum *a*, is supported over the drum by the slide *d*, passing under its free end and connected to the lever *e*, fulcrumed at *e a* and forming the armature of an electro-magnet *f*. When no current is passing through the magnet *f*, a spring *e b* draws the lever *e* away from the magnet, and thus draws the slide *d* from under the end of the lever *c*, which falls onto the drum *a*, and its stud *c c* engages with the groove *a a* and causes the lever *c* to be moved to one end or the other of the drum, according to the direction of its rotation, to apply the brakes. This motion of the brake-lever *c* is resisted by one or the other of the plate-springs *o o* or *o a*, which forces the lever to take a central position over the drum *a* when the stud *c c* is raised out of the groove *a b*. A weighted release-lever *h*, fulcrumed at *h a*, is normally supported at its weighted end by a weighted lever *l*, fulcrumed at *l a*, and whose weight *l b* forms the armature of a second electro-magnet *m* in the same circuit as the magnet *f*, and also by the upper ends or stops of the curved levers *p p a*, fulcrumed at *p b* and connected at their lower ends by a spring *p c* and by links *p e* to the opposite ends of a lever *p d*. The brake-lever *c* passes between the levers *p p a*, and when forced to either end of the drum it acts on them to open their upper ends against the closing action of the spring *p c*, so that the release-lever *h* is freed from them. If now the current through the magnet *m* be stopped, the weight *l b* is released and the weighted end of the lever *h* falls, forcing down also the other end of the lever *l* and raising the weight *l b*, the horn or projection *h c* on the release-lever *h* preventing the weight from again falling. The other or free end of the lever *h* is thus raised and raises the saddle *x*, and also the cross-bar *g a* and bent rod *g a* attached to it. The rod *g a* in rising forces the stud *c c* of the lever *c* out of the groove *a b*, and the spring *o o* or *o a* then forces it up on one of the hinged inclines *u* and over the end onto the slide *d*, thus taking off the brakes and allowing the upper ends of the levers *p p a* to be closed by the spring *p c*. The rod *g* is guided by the vertical guides *g b*. It will also be seen that when the current is stopped

for putting on the brakes the release-lever *h* cannot fall, as it is supported by the levers *p p a*, and the current is again turned on before the brake-lever arrives at the end of the drum, and so holds it when the levers are withdrawn. The rod *g* also carries at each end two pawls *i*, provided with hooks *i b*, and forced apart by a spring *i a*. The hooks *i b* are situated on opposite sides of the drum *a* and in close proximity to the end grooves *a c*, each of which is provided with a tooth or projection *a d*. As the rod *g* is raised when taking off the brakes, the pawls *i* are also raised and are forced inward by the fixed stops *w*, so as to come, after the stud *c c* has cleared the groove *a a*, in the path of the teeth or projections *a d*, which lower the pawls *i*, and thus the rod *g* and free end of the release-lever *h*, raising the weighted end of the lever *h*, which forces apart in its passage (against the spring *p c*) the upper ends of the levers *p p a*, which again close and support it, and the weight *l b* then falls and causes the lever *l* to again pass under the end of the lever *h* and also support it, the weight *l b* being again held by the magnet *m*.

Instead of the end of the release-lever *h* being weighted, it may be attached, as shown, to one end of a spring *h b*, attached at its other end to a pin *q c*, working in curved slots *q d* in the upper ends of levers *q q a*, fulcrumed at *q b q b*. A loop *c d* on the under side of the brake-lever *c* passes between the lower ends of the levers *q q a*, and when the brake-lever *c* is operated acts on one of these ends to lower the upper ends and pin *q c* and extend the spring *h b*, so that it can pull down the end of the release-lever *h* when released from the lever *l*. The extremities of the head *c b* of the lever *c* are connected to the slotted link *s s* by means of the slotted links *r r a*, one of which, according to which end of the drum the lever *c* is forced, operates in tension and the other is idle. The slotted link *s s* is pivoted to the rocking levers, fulcrumed at *s d*, and connected to a similar rocking lever *s c* by the longitudinal rod *s e*. The rocking levers *s s c* are connected by the tension-links *s e'*, and the rocking lever *s c* by the axis *s i*, and levers *s a* and links *s e'* to the transverse brake-rods *s g*, and thus to the brake-blocks, which are suspended from the vehicle-frame by the plate-springs *t a* that assist in taking off the brakes.

What I claim is—

1. The combination, with the drum revolved by the motion of the vehicle and provided with two circumferential guides and a spiral guide connecting the two said guides, of a horizontally-vibrating lever adapted to engage with the said guides and to actuate the brake mechanism, substantially as set forth.

2. The combination, with the spirally-grooved drum revolved by the motion of the vehicle, of a horizontally-vibrating lever adapted to be operated by the said drum and to actuate the brake mechanism, and a re-

tractible slide normally supporting the said lever above the said drum, substantially as set forth.

3. The combination, with the spirally-grooved drum revolved by the motion of the vehicle, of a horizontally-vibrating lever adapted to be operated by the said drum and to actuate the brake mechanism, an automatically-retractible slide, and an electro-magnet adapted to hold the said slide under the said lever and thereby cause the slide to support the said lever over the drum, substantially as and for the purpose set forth.

4. The combination, with the spirally-grooved actuating-drum and the horizontally-vibrating lever engaging therewith and adapted to operate the brake mechanism, of springs for restoring the said lever to its central position, the retractible slide for supporting the said lever clear of the drum, the inclined guides for guiding the end of the lever onto the said slide, and a pivoted lever provided with a yoke at one end and adapted to raise the aforesaid lever automatically, substantially as and for the purpose set forth.

5. The combination, with the spirally-grooved actuating-drum and the horizontally-vibrating lever *c* engaging therewith and adapted to operate the brake mechanism, of a pivoted lever *h*, provided at one end with a yoke passing under the lever *c* and adapted to raise it automatically out of engagement with the said drum, the pivoted levers arranged in the path of the lever *c* and adapted to support the lever *h*, and the electrically-controlled lever *l*, also adapted to support the said lever *h*, substantially as and for the purpose set forth.

6. The combination, with the spirally-grooved actuating-drum and the horizontally-vibrating lever *c*, provided with a loop, of a pivoted lever *h*, provided at one end with a yoke passing under the lever *c* and adapted to raise it out of engagement with the drum, the pivoted levers arranged in the path of the lever *c* and adapted to support the lever *h*, the electrically-controlled lever *l*, also adapted to support the said lever *h*, the two pivoted levers provided with curved slots and adapted to be operated by the said loop, a pin engaging with the said curved slots, and a spring connected to the said pin and to the other end of the lever *h*, whereby the said lever *h* is caused to raise the said yoke when released, substantially as and for the purpose set forth.

7. The combination, with the lever *c* for operating the brake mechanism, the grooved operating-drum, and the pivoted lever *h*, provided with a yoke for automatically disengaging the lever *c* from the said drum, of two crossed levers arranged in the path of the lever *c* and adapted to support the lever *h*, a spring coupling the lower ends of the said crossed levers, a centrally-pivoted lever, and two links pivoted to the lower ends of the said crossed levers and to the opposite ends

of the last said lever, whereby the crossed levers are operated simultaneously, substantially as set forth.

5 8. The combination, with the lever *c* for operating the brake mechanism, the grooved operating-drum provided with projecting teeth at its ends, and the pivoted lever *h*, provided with a yoke for automatically disengaging the lever *c* from the said drum, of the
10 spring-distended hooks connected to one end of the lever *h* and arranged in the path of

the said teeth, and fixed stops adapted to cause the said hooks to engage the said teeth, whereby the said yoke is lowered and the lever *h* is restored to its original position, substantially as and for the purpose set forth. 15

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT COOKE SAYER.

Witnesses:

WM. SEFTON CLARKE,
LIONEL A. WILSON.