J. W. RICE.

Car Brake.

No. 64,036. Patented Apr. 23, 1867.

Fig. 3.

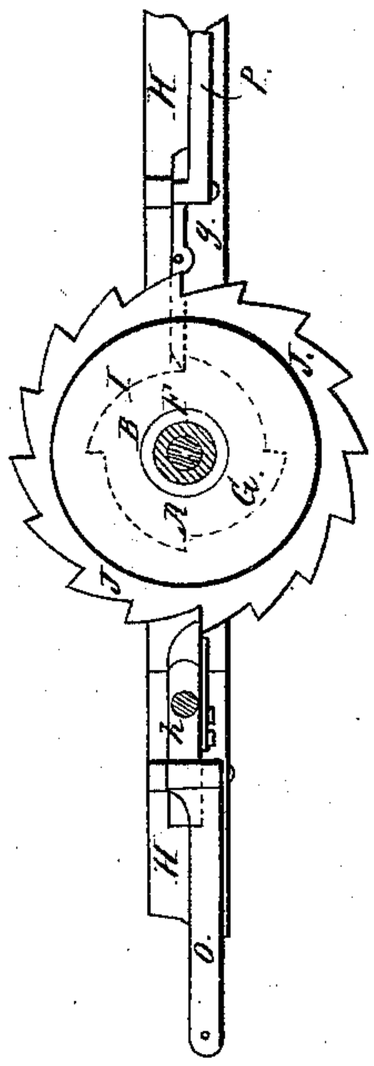


Fig. 4.

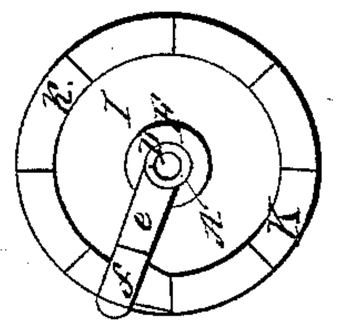


Fig. 1.

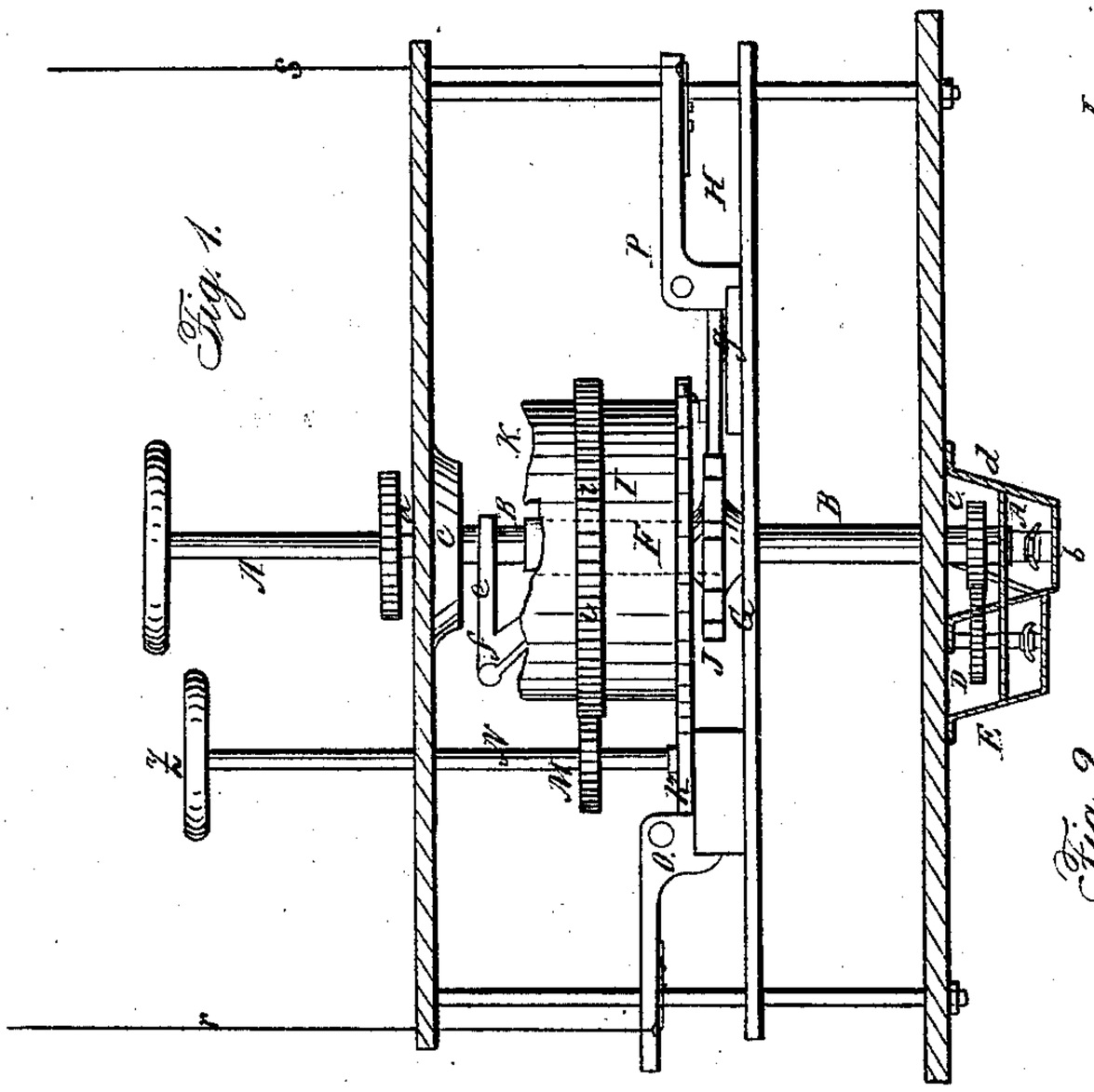
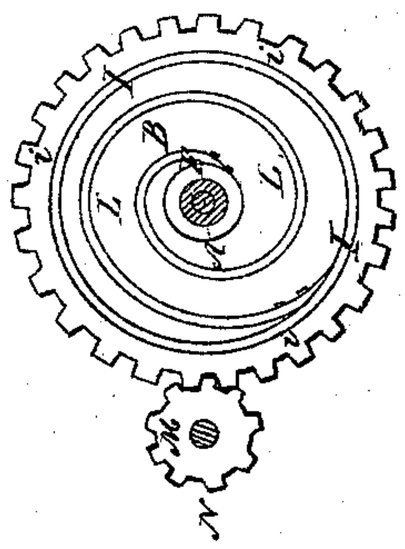


Fig. 2.



Witnesses:

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J. W. RICE, OF SPRINGFIELD, MASSACHUSETTS.

Letters Patent No. 64,036, *dated April* 23, 1867.

IMPROVED CAR-BRAKE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. W. RICE, of Springfield, Hampden county, Commonwealth of Massachusetts, have invented certain new and useful improvements in Car-Brakes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon. In these drawings—

Figure 1 is an end view of the car frame having my brake.

Figures 2 and 3, detailed views of the improvements.

Figure 4 is a plan view of the trucks of a car having part of my improvements; and

Figure 5 is a detailed view of a portion of my invention.

This invention relates to that class of car-brakes known as self-acting, in which reserve power is suddenly applied to the brakes in cases of emergency.

In order to simplify the description and purpose of my invention, I will mention at first three points and qualifications: In the first place, it does not interfere at all with the ordinary hand-brake, that being free to be moved at all times, as in ordinary cases; secondly, after being set the engineer can at any moment apply the brakes to the whole train, and can then release them from pressure on the wheels without moving from his engine; thirdly, all the friction used can be applied equally and at the same moment to the wheels of the entire train.

To accomplish these important advantages I construct my device as I will now describe.

In plate 1 of the drawings, A is the shaft of the hand-brake, which has its bearings at *a* and *b*. Around this shaft I place a sleeve, B, entirely disconnected from the shaft A otherwise. This is confined between the points *c* and *d* by means of shoulders on the sleeve. At the lower portion of this sleeve is a gear-wheel, C, meshing with another wheel, D, the latter upon a shaft, E, to which is attached the chain connecting with the levers beneath the car. Upon the upper part of the sleeve B is attached a horizontal arm, *e*, having a pawl, *f*. Over the sleeve B is placed another sleeve, F, shown in fig. 1 by dotted lines. This has attached to its lower end a ratchet-wheel, G, operated upon by a pawl, *g*, attached to the cross-bar H. The sleeve F passes up through a drum, I, which has at its lower part a ratchet-wheel, J, operated upon by a pawl, *h*, and at its top edge is a ratchet, K, operated upon by the pawl *f*, before mentioned. Inside of this drum I is arranged a coil-spring, L, which is attached at one end to the sleeve F, and at the other to the inside of the drum. This is shown in fig. 2. Around the circumference of the drum is a circle of cogs, *i i i*, which mesh in with the cog-wheel M, which is set upon a shaft, N, by which the device is wound up. O and P are two dogs, which, when pulled up by the cords *k* and *l*, allow the pawls *h* and *g* to release their ratchets. The cords *k* and *l* pass up to the top of the car and communicate with the engineer, as will be hereafter described.

In order for this device to be subject to the control of the engineer it is necessary that it should first be set, the operation of which I will now describe.

The pawls *h* and *g* being set and held by the dogs O and P, the shaft N is turned by hand, revolving the drum I, the pawl *h*, being a jointed one, allows the teeth of the ratchet J to slip by as the drum is turned, but prevents it from slipping back. The sleeve F is held stationary by means of the ratchet G and pawl *g*, so that in turning the drum around it the spring L is wound up. In turning the drum in this direction, the pawl *f*, connected with the sleeve B, slips over the teeth of the ratchet *k* upon the drum, so that the sleeve B is not moved. When the drum is thus turned sufficiently to wind up the spring within it, the whole is ready for use and can be sprung at any moment, operating as follows: The dog O being lifted the pawl *h* is loosed, allowing the drum I to whirl back to its former position, moved by the force of the spring L. In this instance the pawl *f* catches in the teeth of the ratchet K, and the sleeve B turns with the drum, winding up the chain upon the shaft E by means of the gearing already described, all the friction that can be obtained by the power of the spring being brought to bear against the wheels of the car. Now, by lifting the dog P, the pawl *g* is allowed to turn on its pivot, and the whole gearing connected with the sleeve B is loosed, and the pressure upon the wheels of the car removed.

In the operation of this process of braking up the train, and then releasing the pressure, I use two cords, which pass through the entire train to the engine. One of these operates all the dogs O, which apply the

power of the springs to the brakes, and the other operates the dogs P, releasing the same. With these two horizontal cords are connected the vertical cords *r* and *s*, which are attached directly to the dogs. The arrangement of these connections is shown in the diagram upon plate 1, in which *t* and *u* are the main cords, and *r* and *s* the branch cords, connecting the ones *t* and *u* to the dogs. These, as is seen, pass over the pulleys *v v v* so as to draw the cords *r* and *s* vertically if the cords *t* and *u* be drawn in either direction, or from either end of the train. The connection of the cords *r* and *s* with the dogs O and P is made in the following manner: The cords are formed with loops *w w* at their lower ends. These loops slip over the ends of the dogs, and rest in notches *x x*. Cut in the lower sides of the dogs at these points springs *y y* are fastened so that they pass over the lower opening of these notches, preventing the end loops from slipping off until the dogs are drawn up to a sufficient angle to allow the loops to pass between the springs and the sides of the dogs and slip off the latter. If it should be desired, both dogs O and P may be placed upon one side of the drum, in which case the connecting-cords may be arranged upon the same side of the car. In fig. 1 it is shown that the shaft A of the hand-brake has a chain attached to its lower end, and that the shaft E, operated by the gear-wheels *d* and *c*, has a separate one. These chains both connect with the centre chain beneath the car, so that if either be tightened it operates the brakes, allowing the other to hang loose. The gear-wheels *c* and *d* may be made of different relative sizes, so that a greater leverage and more retarded action or the reverse may be obtained. In plate 2 of the drawings is shown my method of applying the friction of the shoes equally and at the same time to all the wheels of the car. This is done by means of equalizers, constructed as follows: In fig. 5 it is shown that the chains Q Q′, which are operated by the windlass at either end of the car, connect with levers R R′. These levers work upon a pivot, *z*, in the centre, around which is a box, S, having pulleys, 1 2 3 4, between its top and bottom sides. A centre chain, T, is passed around these pulleys and through the box S diagonally, so that if the chains Q Q′ be gathered in turning the box S on the pivot, the centre chain T, which is attached to levers U U at each end, is gathered in at the centre, operating the levers U U equally and at the same time. These levers are themselves attached to equalizers, constructed on the same principle as the one described, one of which is shown in fig. 6, plate 2. In these the chain V is attached at each end to the brake-bar having the shoes upon it, and, as in the former case, the chain passing over pulleys 5 and 6 brings the strain equally and simultaneously upon each end of it. In this manner it will be seen that the windlass at either end of the car being operated divides its force equally upon all the wheels of the car at the same time. In the box S, following the diagonal course of the chain, are cut slots 7, into which works a pin, 8. This pin is put through the centre link of the chain T, and should either portion of the same break when in operation the pin 8 is brought up against the other ends of the slots 7 and prevents the chain from slipping out, allowing it to still operate the lever to which it is attached.

The great advantages I obtain by this arrangement are the instantaneous control that the engineer has over the brakes upon the whole train, so that at any moment, by pulling one cord, he can stop up the whole train, and then, if the necessity for the same should cease, he can, by pulling another cord, release all pressure upon the wheels of the cars, and pass on without more loss of time. Besides this, is the perfect action of the equalizers in braking up all the trains at once, thereby much lessening the danger of braking them, and stopping up the train much more suddenly.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a brake for cars, the combination of the drum I, having the spring L, ratchets K and J, and the sleeve F, having the spring L attached to it, and the ratchet G, with the sleeve B, having the pawl *f*, the whole arranged substantially in the manner and for the purpose set forth herein.

2. In combination with the above arrangement, the pawls *g* and *h*, and dogs O and P to operate the pawls, the same constructed and operating substantially as described.

3. In combination with the drum I the device for turning the same, consisting of the shaft *h*, cog M, and crank *z*, substantially as shown and specified.

4. In combination with the sleeve B, provided with cog-wheel C, I claim the wheel D, and shaft forming a windlass for the brake chain.

5. The equalizers for brakes herein shown, in which the chain passes around two or more pulleys, 1 2 3 4, arranged in a frame, S, having slots 7 in it, into which works a pin, 8, substantially as shown and described.

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Witnesses:

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