R. JACOBI.

CAR-BRAKE.

No. 185,930. Patented Jan. 2, 1877.

fig: 1.

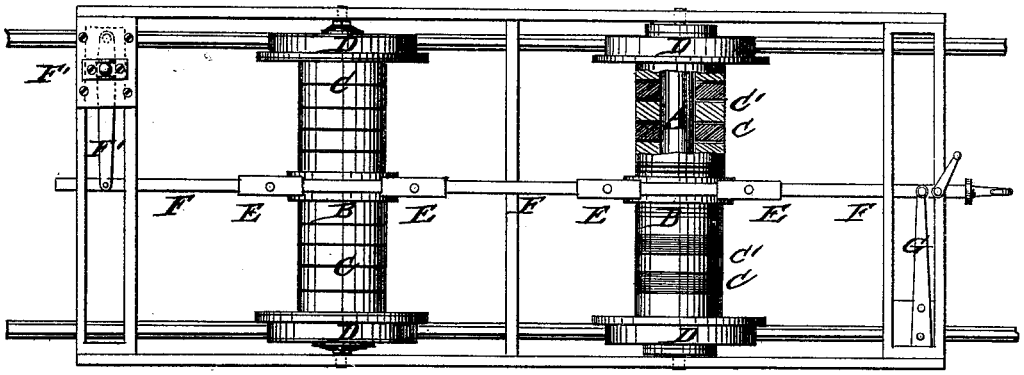


fig: 4.

fig: 5.

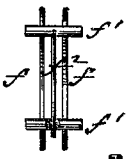


fig: 2.

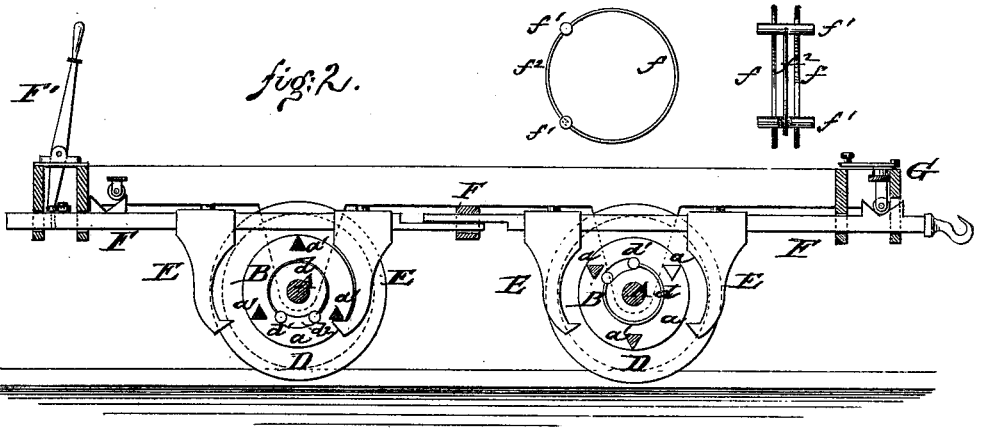


fig: 3.

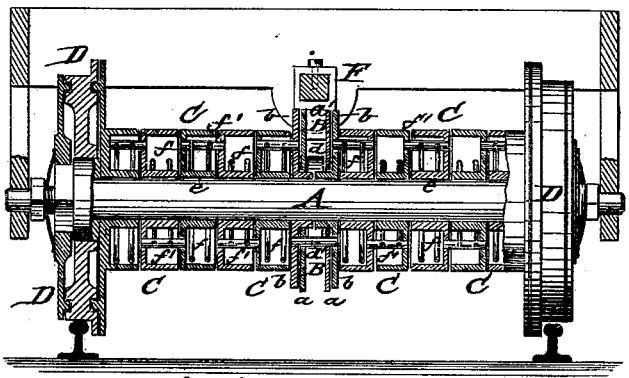


fig: 6.

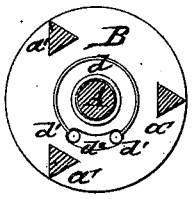


fig: 7.

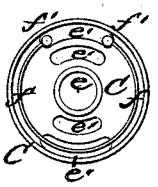


fig: 8.

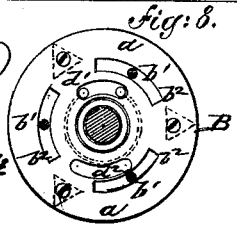
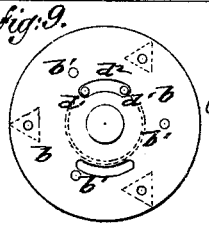


fig: 9.



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UNITED STATES PATENT OFFICE.

RODOLFO JACOBI, OF PUEBLA, MEXICO.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **185,930**, dated January 2, 1877; application filed October 26, 1876.

To all whom it may concern:

Be it known that I, RODOLFO JACOBI, of Puebla, in the Republic of Mexico, have invented a new and Improved Car-Brake, of which the following is a specification:

The object of this invention is to provide an improved safety-brake for railroad and street cars of all kinds, by which the car or train may be rapidly stopped in an effective manner either by the slacking of speed of the locomotive, or by a hand-lever mechanism from each car, so that the whole train, as well as each car, be speedily brought within full control of the engineer or conductor, and thereby the dangerous consequences of accidents arising from any cause to any part of the train be in a great measure avoided, and thereby a greater degree of safety to passengers produced.

The invention consists, essentially, of the arrangement on the axles of the truck-wheels of the cars of a series of springs that are placed symmetrically to a central spring-acted disk, and connected thereto, so as to be thrown, when engaged in either direction by hook-arms of sliding longitudinal rods, successively into action, producing, by the accumulated power of the springs of each car, and by the connection of the actuating-rods, the stopping of the entire train. The brake-action of the springs is interrupted and the hook-arms withdrawn by suitable springs, which are arranged in connection with the actuating-rods, and thrown into action on releasing the lever or the pressure on the same.

In the accompanying drawing that illustrates my invention, Figure 1 represents a plan view of a car-truck, with my improved brake attached. Figs. 2 and 3 are, respectively, vertical, longitudinal, and transverse sections. Figs. 4 and 5 are detail side and end views of the springs; Fig. 6, a vertical central section of the stop-disk; Fig. 7, an end view of a spring-casing, and Figs. 8 and 9 are detail side views of the stop-disk and its inclosing-plate.

Similar letters of reference indicate corresponding parts.

Referring to the drawing, A A represent the axles of the car-trucks, to which my improved safety-brake arrangement is applied. It consists of a central loosely-turning stop-disk, B, and a series of symmetrically-arranged spring-casings, C, that are placed on the sections of the axle A between the stop-disk B and wheels D. The stop-disk B is made of two plates, *a*, that are laterally connected near the circumference by two or more stop-pins, *a'*, of triangular, round, or other shape. The stop-disk B is inclosed by outer plates *b*, which turn, by center sleeves, on the axle, the plates of the stop-disk turning again in the sleeves of the same. The inclosing-plates *b* are laterally connected by pins b^1, which pass through segmental slots b^2 of the stop-plates *a*, as shown clearly in Fig. 8. A suitable band-spring, *d*, extends around the sleeves of the inclosing-disks, and is seated by transverse end pins d^1 in segmental slots d^2 of the stop-plates *a* and of the inclosing-plates *b*, giving thereby the stop-disk an axial play within the outer plates equal to the length of the slots d^2.

The spring-casings C are open at one side, and fitted by a center-sleeve on the axle A. They are provided with one or more slots, *e'*, arranged concentrically and symmetrically to the sleeve *e*, as shown in Fig. 7. The end pins f^1 of band or other springs *f* are seated in the slots e^1 in analogous manner to the spring of the stop-disk. The end pins f^1 are wider than the casing, so as to extend slightly at the open side, and enter thereby the corresponding slots of the adjoining casing C, or of the inclosing-plates *b*, the end pin of one casing entering, however, the diametrically-opposite slots of the adjoining casing, as shown in Fig. 3. The entire series of spring-casings is in this manner connected by the end-pins of the springs at alternately-opposite sides, so that the springs may be called consecutively into action from the center stop-disk to the wheels.

The springs used may be common band-springs, or constructed of spring-rods applied to the end pins, as shown in Figs. 4 and 5, in which case the joint reliable action of the spring-rods is secured by a curved guide-rod, f^2, extending from one end pin, f^1, and passing through a central perforation of the other end pin.

The outermost spring-casings may be cast

in one piece with the wheels D, or attached in any other manner thereto, or, preferably, connected thereto by pins in the same manner as in the casings, so that the accumulated power of the springs may be finally exerted on the wheels.

Wheels of any approved construction may be used, but I prefer to employ, in connection with the brake, a frictional safety-wheel, D, shown in Fig. 3, which is composed of entering web-plates keyed tightly to the axle, and an intermediate tire, that slides loosely on the axle, and is guided by the outer plates. The friction between the web-plates and tire increases the resistance of the springs, and produces, finally, the turning of the tire-section on the axle after the car has arrived at the point of rest.

As this construction of the safety-wheel is applicable to vehicles, fly-wheels, and for other purposes, I have filed a separate application for Letters Patent on the same.

The joint power of the springs and wheels for the quick stoppage of a car or train is called into action by hook-arms E, which are secured symmetrically at both sides of the axles to actuating-rods F, that are guided, in suitable manner, in longitudinal direction on the supporting-frame of the car.

The actuating-rods F may be operated either by the slackening of speed of the locomotive, in which case the rods extend in one piece below the cars, and are pushed back by the concussions of the same, so that the hook-arms are thrown back to engage the stop-disks; or the train may be stopped from the last car in forward direction by throwing the hook-arms into the stop-disk by a suitable lever-connection, F′, with the actuating-rods F.

The action of the springs on the axles retards the motion of the car, and throws, by the coupling of the actuating-rods of the front cars, successively the hook-arms of each car into the stop-disks, so as to bring all the brakes into play. By applying the brakes of any intermediate car, the brakes of the cars back of the same are actuated by the momentum of the same, while the brakes of the front cars are applied by the strain transmitted from one actuating-rod to the other. When the hook-arm at either side of the brake engages one of the pins of the stop-disk, the spring of the same is first thrown into action, then by the inclosing-plates successively the springs in the casings, and finally, the friction-wheels, so that the motion of the car is retarded in quick and powerful manner, but without sudden shocks, by the compound action of the springs, and, finally, the train stopped. The actuating-rods F are carried back into normal positions, with the hook-arms clearing the stop-disks either when the train is set in motion by the locomotive, or in case the brakes are applied from the rear part of the train, and the train is stopped, by suitable band or other springs G, which act by friction-rollers on raised inclines of the rods, as shown in Fig. 2. I prefer to apply the brakes from the last car of the train, which is placed, by suitable signaling devices, into communication with the locomotive, as thereby not only a more perfect control of the train is obtained, and especially any accidental uncoupling of one or more of the cars on ascending gradients of the road prevented, but also a perfectly reliable and constantly-applied means furnished of bringing such cars to a stop before any accidents may occur. The actuating-rods in these cases are made in two sections, as shown in Fig. 2.

Whenever a cheaper construction of the brake mechanism is desired, as for street, freight, and other cars, I employ, as a substitute for the springs and casings, rubber rings that are placed alternately with wooden or cast-metal sections C′ on the shaft, and tightly screwed together thereon, as shown in Fig. 1. A number of frictional plates, at both sides of the stop-disk, take up the pressure of the rubber rings, and impart a forward brake-action as soon as the hook-arms engage the spring-acted stop-disk. In these cases the frictional safety-wheels may be also dispensed with, and thereby a reliable yet cheap and gradually-acting brake mechanism obtained.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a car-axle and wheels, of a series of springs that are arranged symmetrically to and thrown successively in operation by a central stop-disk and interlocking hook-arms of longitudinally-sliding rods of the car-frame, substantially in the manner described, and for the purpose specified.

2. The combination of longitudinally-sliding actuating rod or rods F, having rigid hook-arms E, with a compound spring-acted stop-disk, B, of the axle, substantially as specified.

3. The combination of the hook-arms E, stop plates and pins *a a′*, slotted inclosing-plates *b*, and spring-acted interlocking-pins f^1 of spring-casing C, substantially as herein specified.

4. The spring-casing C, having symmetrical and concentric slots *e′*, with springs *f*, and end pins f^1 seated and guided therein, substantially as herein shown and described.

5. The spring-casings of the car-brake, connected alternately at diametrically opposite points by the projecting and interlocking end pins, substantially as and for the purpose specified.

RODOLFO JACOBI.

Witnesses:
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