H. F., J. M. & W. B. RICE.

Car-Brake.

No. 161,549. Patented March 30, 1875.

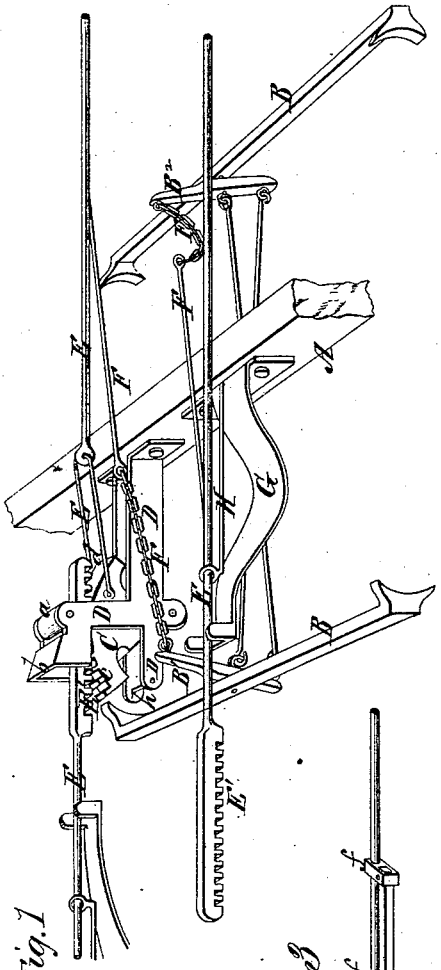

Fig. 1

Fig. 3

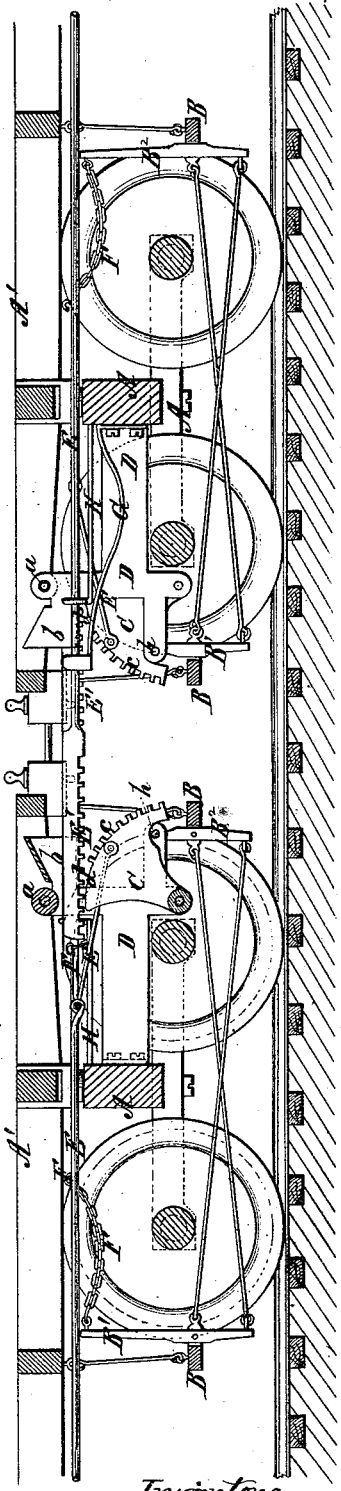

Fig. 2

Witnesses.
James Martin Jr.
J. N. Campbell.

Inventors.
Henry F. Rice
James M. Rice by
Wm B. Rice
Munn Pennie & Co Attorneys

UNITED STATES PATENT OFFICE.

HENRY F. RICE, JAMES M. RICE, AND WILLIAM B. RICE, OF DUBUQUE, IOWA.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **161,549**, dated March 30, 1875; application filed March 18, 1875.

To all whom it may concern:

Be it known that we, HENRY F. RICE, JAMES M. RICE, and WILLIAM B. RICE, of the city and county of Dubuque, and State of Iowa, have invented new and Improved Mechanism for Operating Railroad-Brakes; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of the improved mechanism for operating the brake, the brake-blocks being shown thrown on the wheels. Fig. 2 is a vertical longitudinal section of the same. This view shows the brake-blocks thrown off the car-wheels. Fig. 3 is a modification of the toothed rod for connecting the toothed sectors, showing a mode of sliding back the toothed portion of the rods out of the way whenever necessary.

The brake mechanism herein shown is intended particularly to be connected with the machinery of the locomotive or engine, so as to be worked by and under the control of the engineer, but it may be operated in any other proper and convenient manner.

The nature of our invention consists in vibrating toothed sectors applied on a car-truck, in combination with longitudinally-moving rods having rack-teeth on their free ends, and the car-brake mechanism connected to them, as will be hereinafter fully described. It also consists in certain details of construction.

By this combination, which is very simple, a longitudinal movement of the rods in one direction will cause the sectors to turn and draw the brake-blocks against the car-wheels, and a movement of said rods in an opposite direction will cause the sectors to move to their original positions, and thereby release the brake-blocks, and allow them to be moved away from the wheels by the ordinary springs employed for this purpose.

A A′ represent two car-trucks; B B, brakes of ordinary construction, applied to the trucks in the usual manner. These car-trucks are to be furnished with the usual bumpers or draw-heads and couplings. C C are sectors, hung on pivots in guides D D of the frame, said guides having a friction-roller stop, *a*, at their top, for toothed connecting-rods to bear against in an upward direction, and a funnel-shaped mouth or guide portion *b*, extending out from them at a point above the highest part of the sector, for guiding said rods over the sectors, as shown. These sectors are constructed with a perimeter, which is partly toothed, as at *c*, and partly plain, as at *d*, and they vibrate in vertical planes. E E are connecting-rods, having one of their ends forked, and connected, by these forked ends and pivots, to the sectors, as shown, and extending from the sector along the full length of one car-truck, and to and a little beyond the sector on another car-truck, as illustrated in the drawings. On the under side of the flattened and enlarged free ends of these rods cog-teeth E′ are formed, and these teeth match the teeth of the sectors C C, and gear with the same, as represented in Fig. 1. F F are chains and rods for connecting the levers B^1 B^2 of the brake to the rods E, as shown. The rods may be constructed of two parts, and the parts coupled together by straps *f f*, so that the toothed part may slide in and out on the other part, as shown in Fig. 3.

By making the sectors with a portion of their perimeters plain the toothed portion of the rods can be supported by and ride upon the same without moving the sectors.

The rods are guided and supported by spring-brackets G G, and by the flaring guiding-pieces *b* of the sector-guides. They are also connected to light springs H H, which permit them to vibrate laterally if strained to any great extent, and return them to their proper positions again. The spring-brackets G G allow them to vibrate vertically when necessary. The rods themselves may be flexible to a slight degree, if found desirable.

In applying the described mechanism so that it shall be operated by steam, the rod E, which passes under the tender will have a reciprocating piston on its end, and this piston will be fitted in a small steam-cylinder, which is in connection with the steam-chest of the main cylinder or other chamber containing steam, and under the control of the engineer.

The brakes usually have springs (not shown in the drawings,) by which they are suddenly thrown away from the wheels of the car.

In operating the brakes of trains of cars with our mechanism connected to the same, the power is applied to the foremost rod, and this causes the rack-teeth of the rods to operate all the sectors C so as to cause them to draw the brackets up against the back and forward pairs of wheels which are at each end of an eight-wheel truck. A reverse application of the power releases all the brake-blocks and allows the springs to throw them away from the wheels. The sectors, when not in action upon the brake-blocks, occupy the position shown in Fig. 2, and in this position their gravity is sustained by pins or cross-bars *h* of the guiding-brackets G G, and when the sectors are acting against the brakes and causing them to bear upon the wheels of the car, they occupy the position shown in Fig. 2. The gravity of the sectors assists them in falling back to their starting position as soon as they are out of gear with the teeth of the rods, in which position they remain until they are again drawn upon by the toothed rods connected to them, and the toothed rods which are to become geared with them when the brakes are to be applied, have freedom to ride over these plain surfaces of the sectors without moving them or the brakes, when the sectors are readjusted to their starting position.

We contemplate arranging our mechanism in different positions upon car-trucks, and in some cases for the single sectors may be substituted compound sectors, (with partly plain and partly toothed perimeters,) placed horizontally and centrally upon the car-beds of the trucks, under which construction the toothed portion of one rod would gear into teeth on one side of the center, and another rod into teeth on the opposite side of the center of the compound sector. The other ends of the rods would of course be pivoted to the compound sector, same as in the case of the single sectors.

What we claim is—

1. Vibrating sectors, made with a partly toothed and partly plain perimeter, in combination with rods having teeth on their free ends and brakes, substantially as and for the purpose set forth.

2. The pendulous spring-brackets G and the springs H, in combination with the rods E, substantially as and for the purpose set forth.

3. The guiding-brackets D, having a friction-roller stop, *a*, and a funnel-shaped mouth, *b*, in combination with the sectors and toothed rods, substantially as set forth.

4. The combination of the vertically-vibrating partly toothed sectors with toothed rods and a car-brake, the sectors being pivoted so as to fall by their own weight to their original position when released, substantially as and for the purpose set forth.

Witness our hands in the matter of our application for a patent for an improved rail-road-car brake.

HENRY F. RICE.
JAMES MERRIT RICE.
WILLIAM B. RICE.

Witnesses:
J. C. LONGUEVILLE,
MAURICE FLYNN.

Witnesses for WILLIAM B. RICE:
JAMES N. CAMPBELL,
JAMES MARTIN, Jr.