

(No Model.)

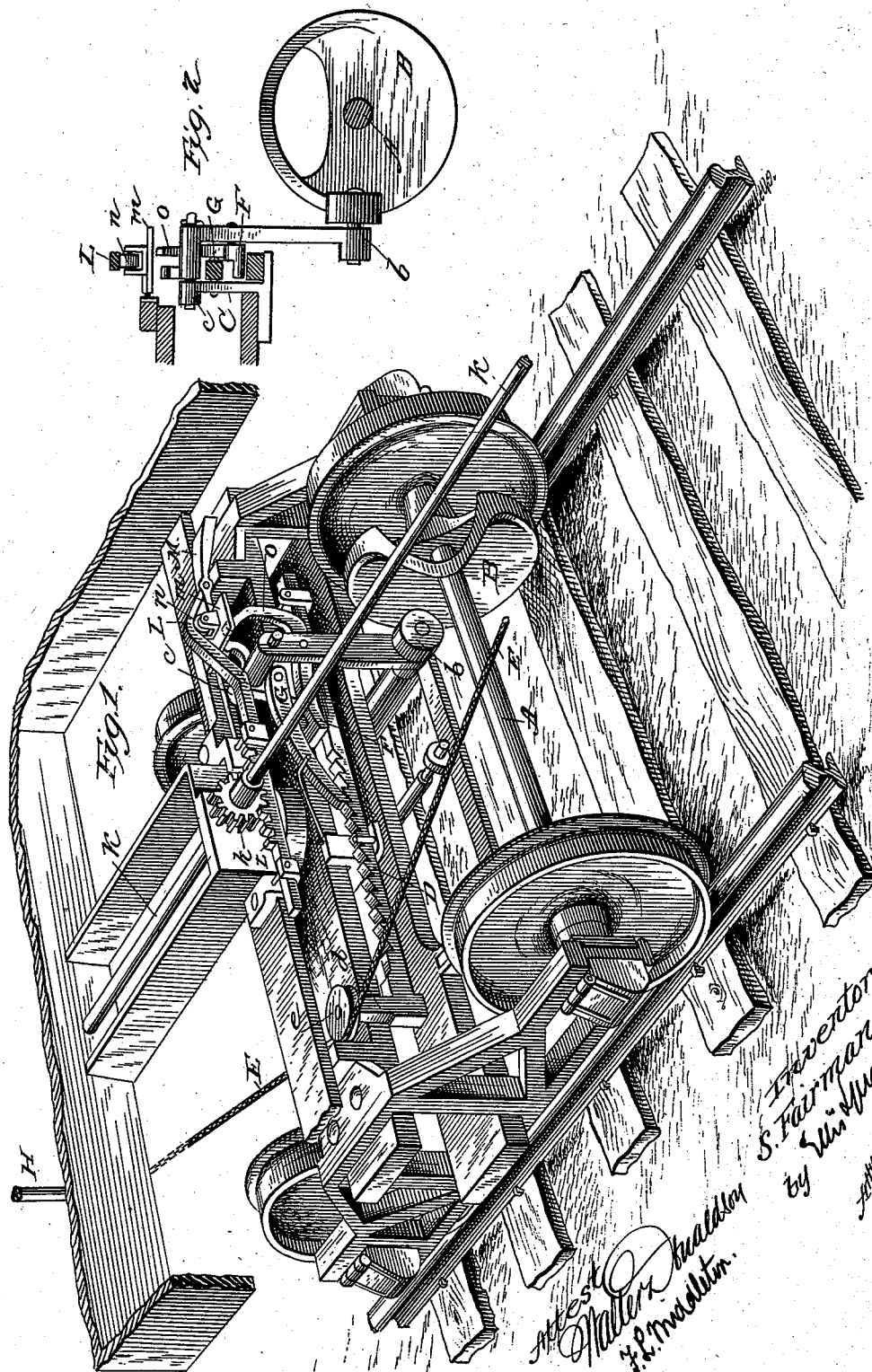
2 Sheets—Sheet 1.

S. FAIRMAN.

CAR BRAKE.

No. 381,353.

Patented Apr. 17, 1888.



(No Model.)

2 Sheets—Sheet 2.

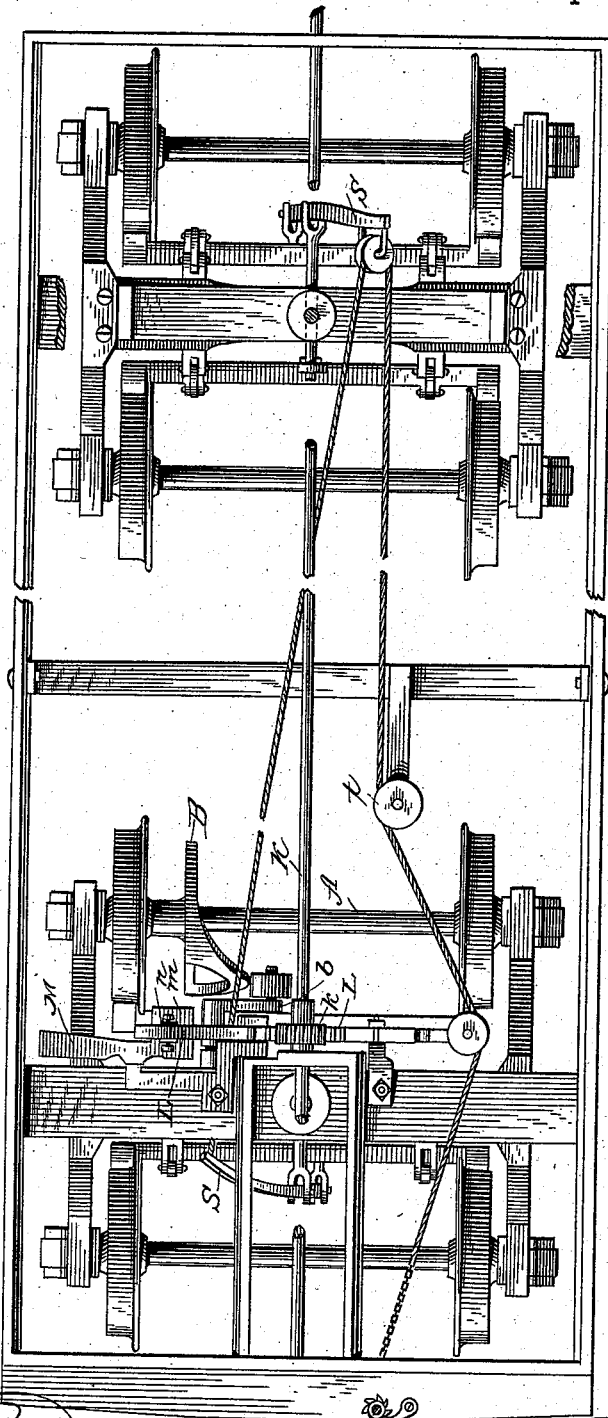
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Fig. 3



Attest:

Wm. L. Madsen
W. L. Madsen.

Inventor:
Simon Fairman
by *Ellis Spear*
Atty.

UNITED STATES PATENT OFFICE.

SIMON FAIRMAN, OF BALTIMORE, MARYLAND, ASSIGNOR TO BENJAMIN G. HARRIS, OF SAME PLACE.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 381,353, dated April 17, 1888.

Application filed November 23, 1887. Serial No. 256,008. (No model.)

To all whom it may concern:

Be it known that I, SIMON FAIRMAN, of Baltimore, in the State of Maryland, have invented a new and useful Improvement in Car-Brakes; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention is an improved car-brake for railway-cars. It is designed on the principle of utilizing the momentum of the car in the application of the brakes and to cause the momentum of each car to apply its own brake. Further, in connection with the mechanism for applying the momentum of the car to the putting on the brakes of the car, the plan also includes a controlling mechanism extending throughout the train for throwing off the brakes and throwing out the brake-operating mechanism, so that the brakes may be released and held off on the whole train, or on any particular car when disconnected from the train.

I have sought to provide a brake mechanism which will operate in whichever direction the car may be moving, in which the movements are all positive and require no springs in any part of the structure, and in which the mechanism may be applied to the existing forms of trucks and brakes without any material change in either.

In the accompanying drawings, Figure 1 is a perspective view of one of the car-trucks with my improved locking mechanism attached. Fig. 2 is a detail view showing the operating-cam in side elevation and the devices in operative engagement therewith. Fig. 3 is a plan view of the two car-trucks. Fig. 4 is a detail view.

In Fig. 1 of the drawings I have represented only one end of the car-body and only one truck, my mechanism for applying the brake being such that only one is required upon each car.

On one of the axles A of the truck is fixed a cam-wheel, B, having lateral faces and a double incline, the incline being symmetrical, so that the cam will operate equally in either direction. This cam apparatus operates weighted lever b, pivoted to oscillate across the line of movement of the truck. Its lower or free end carries a friction-wheel, which bears laterally

against the face of the cam-wheel, so that each revolution of the wheel pushes the free end of the lever laterally, and this movement is made to operate upon intermediate mechanism at each revolution of the car-wheel and to push laterally a pawl or some equivalent device which impinges against the brake-chain and puts it under strain, thereby putting on the brakes.

In the form shown in the drawings the details of construction include devices by means of which my apparatus may be applied to existing cars, and in this the oscillating weighted lever is pivoted at its upper end to a projection, c, on a frame, C, which is bolted to the truck-beam. On the same frame, held by suitable guides, is a sliding rack-bar, D, on the end of which is a stud, d. The sliding rack-bar is arranged to be moved laterally by the pawl through intermediate mechanism and to push against the brake-chain E. To avoid friction and wear of the chain, a small pulley, e, is placed on the stud d. The oscillating weighted lever carries a working-pawl, F, pivoted thereon, and the end of the pawl engages with the teeth on the upper face of the rack, and when the lever is moved laterally it carries the bar with it by the engagement of the pawl with the teeth of the said bar. The bar is held by a holding-pawl, G, both pawls being made to engage with the rack-bar by gravity, though, manifestly, springs may be used; but I prefer to have them made sufficiently heavy to operate by gravity. The teeth upon the rack-bar are extended sufficiently to allow the pawl to operate the rack-bar far enough to give the movement necessary to put on the brakes. That part of the rack-bar extending toward the oscillating lever is made smooth, so that when the working-pawl has operated the rack-bar a sufficient distance it rides upon the plain part of the bar and then ceases to operate, so that there is no danger of undue or destructive strain upon the brake mechanism. It is assumed that the brake-chain E is connected with brakes of any sort adapted to be applied by drawing upon the chain. The mechanism already described is sufficient for the application of the brakes, and it is manifest that it may be applied to any kind of a brake mechanism in which the chain runs longitudinally of

the car. At the same time it does not interfere with the working of the brake by the ordinary hand-wheel. The shaft of this is represented at H, to the shaft of which the chain E is attached and by which it may be wound up to put on the brakes independently of the automatic mechanism; but, while I have illustrated what I deem the best and simplest of pushing mechanism interposed between the oscillating lever and the stud which pushes aside the brake-chain, I do not desire to limit myself thereto, as it may be very easily and greatly varied from the form shown. The oscillating lever is made to swing freely and is weighted at its lower end, and gravity will return it to a vertical position, bearing on the low part of the cam-wheel after it has been pushed aside by the high part.

The mechanism described is designed only to put on the brake and requires some mechanism for removing the brakes for the more convenient operation of the whole apparatus in the railway-train. In the mechanism shown for this purpose is a longitudinal shaft, K, arranged centrally of the car-body and having suitable bearings therein. It may be made of rod, or, better, three-fourths-inch gas-pipe. Upon it is fixed a pinion, k, which meshes with a second rack-bar, L, which slides laterally in guides attached to the truck-beam of the car-body. One end of this second rack-bar has an arm bent to form a double incline, which extends over a bearing-plate, m, on a weighted lever, M, pivoted to have vertical movement in a plane transverse to the car-body. The arm with a double incline bears directly upon the friction-wheel n, journaled in a stud on the plate. The weighted end of the lever tends to keep the plate normally raised. The plate overlies an extended rear arm, o, of the working-pawl and also over an inclined arm on the upper end of the oscillating lever above its pivot, so that when the plate is depressed it throws the working-pawl out of engagement with the lever, and this pawl is also at the same time made to lift the holding-pawl, so as to leave the rack-bar free. As this releasing mechanism is on the car-body and the brake-applying mechanism is on the truck, the plate must be made large enough to remain over the arms of the working-pawl and oscillating lever whatever may be the position of the truck, as in turning curves. The double incline on the end of the second rack-bar allows the rotation of the shaft in either direction to throw off the brake, and the rack on the second rack-bar is made short, so that when the pinion has been turned sufficiently to throw the pawls out of engagement the teeth of the pinion are past the teeth of the rack-bar, and any rotation of the pinion will simply hold the second rack-bar in position, and thus hold the brake-applying mechanism out of gear, while the shaft may be operated further upon another car subsequently attached without releasing the brake mechanism

upon the first car. The operating-rod is provided at each end with a pinion, p, by means of which it may be operated by any suitable lever and pawl by the operator standing on the car to which the mechanism is applied. The connections between this operating rod and the brake-applying mechanism may of course be varied. It is essential that there be releasing devices connecting the shaft with the brake-applying devices.

My invention includes the releasing of the brakes throughout the whole train by an attendant upon any car. This requires that there should be connections between the operating-rods on all the cars of the train. In order to provide this connection, which must be flexible laterally and vertically while rigid against torsion, I attach to the ends of each rod a shell, Q, in the shape of a hemisphere with a cylindrical extension, with a longitudinal slot, q, on one side. The shell is arranged to bring this slot on the upper side on one car and on the under side on the contiguous end of the next car. Into these shells fit the balls of the dumb-bell coupling R. Each ball has a pin, r, adapted to the slot in the shell, one above and the other below, and when the cars are brought together this coupling is held so as to enter the shells with the pins in the slots. The pins communicate rotary motion from one shaft to another, but allow free vertical movement, and the balls fitting in the shells allow also free lateral movement. The balls may be provided with slots, as in Fig. 4, which provide a spring action and hold the parts together.

In all the mechanism, as described, no springs are required and the movements are all positive. The releasing-lever is held by its weight normally out of contact with the brake-applying pawls, which are normally in gear by their own weight, and the oscillating lever which carries the working-pawls is normally against the face of its cam through its own weight. A brake-chain runs from the brake-levers S to the hand-lever shaft without being interfered with other than in the manner described by the automatic mechanism. The amount of tension applied by the automatic mechanism will depend upon the amount of chain taken up by the hand-wheel, and therefore the chain can be regulated by the hand-wheel in order to give a greater or less amount of pressure by the automatic mechanism according to the load of the car.

In order to facilitate the strain upon the brake-chain by the application of the automatic mechanism, I have provided a pulley, t, on the car-body, so as to hold a part of the chain in line. Another may be placed upon the other side of the truck, if desired.

I am aware that ball-and-socket joints have heretofore been used between the operating-rods on different cars in a railway-car brake, and I do not broadly claim such connection. My invention is designed to provide more effectually for differences in vertical height,

as well as in lateral movement, and to this end it is confined particularly to the dumb-bell coupling in connection with the socket.

I am aware that it is not new to connect the shafts of a railway-car brake by means of a shell inclosing balls fixed on the adjacent ends, and I do not broadly claim this mode of connection.

I claim as my invention—

1. In combination with car-brakes and the operating-chain therefor, a cam-wheel fixed upon the axle, having double-inclined faces, a lever operated by the cam-wheel, a bar arranged to bear against the brake-chain, and connections between the bar and the oscillating lever, whereby the oscillations of the lever push the bar against the chain, substantially as described.

2. In combination with the brakes and chain of a car, a cam having double-incline lateral faces, a lever operated by the cam, and a laterally-sliding rack-bar operated by a pawl on the lever and arranged to bear against the chain of the brake, substantially as described.

3. In combination with the brakes and chain of a car, the sliding rack-bar arranged to bear against the chain, the holding and the working pawls, the latter carried upon a lever, the said lever, and the cam-wheel on the axle, substantially as described.

4. In combination with the brakes and chain of a car, the sliding rack-bar arranged to bear against the chain, the holding and the working pawls, the latter carried upon a weighted lever, the said lever, and the cam-wheel having double-inclined faces, substantially as described.

5. In combination with the brakes and chain of a car, laterally-sliding rack-bar, working-pawl carried upon an oscillating lever and worked by a cam on the axle, an arm on said pawl, a plate arranged to operate said arm, and connections between the plate and the working-shaft, substantially as described.

6. In combination, a cam-wheel on the axle, having double-inclined faces, a weighted oscillating lever carrying a working-pawl, a sliding rack-bar worked by the pawl, a holding-pawl, and a stud on the rack-bar arranged to operate against the chain of the brake, with mechanism for releasing the brake, substantially as described.

7. In combination with a brake-applying apparatus having pawls by which it is oper-

ated and held, a sliding rack, a shaft carrying a pinion engaging with the rack, and connections between them and the pawls, whereby the turning of the shaft is communicated to the pawls to release the brakes, all substantially as described.

8. The operating-rod carrying a pinion engaging with a sliding rack-bar which releases the working and holding pawls of the brake-applying mechanism, the rack on said bar being arranged in relation to its pinion to cease action when the brakes are released and to allow the pinion to continue to turn, substantially as described.

9. In combination, the operating-shaft carrying a pinion, the sliding rack-bar engaging therewith, an inclined extension of the rack-bar, a weighted lever operated by the inclined extension, and an arm on the working-pawl of the brake-applying apparatus operated by the weighted lever to release the brake mechanism, all substantially as described.

10. In combination with the brakes of a car and with the chain and hand-wheel shaft thereof, a laterally-moving bar carrying a friction-pulley arranged to press the chain aside and apply the brake, all substantially as described.

11. In combination, the cam-wheel, the weighted lever carrying a pawl with an arm thereon, and having also an arm on its upper end above the pawls, and a weighted lever carrying a plate arranged to press down the arms and to throw the weighted lever and the pawl out of connection with their working parts, substantially as described.

12. In combination with the operating-rod of a railway-car brake, a shell, Q, on the end of each rod, hemispherical in shape, with a cylindrical extension provided with a slot, g, the slots being arranged on opposite sides, as explained, in combination with a dumb-bell coupling having a pin, r, fitted to the slots, the pin on one ball of the dumb-bell being on the upper side and on the other ball on the lower side, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON FAIRMAN.

Witnesses:

JNO. T. MADDOX,
HENRY ROTH.