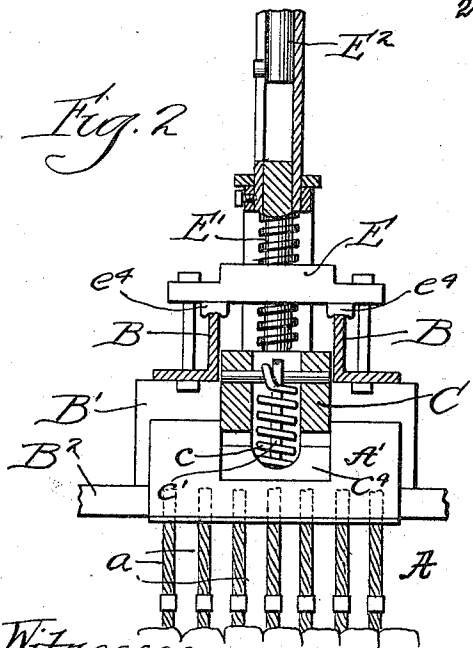
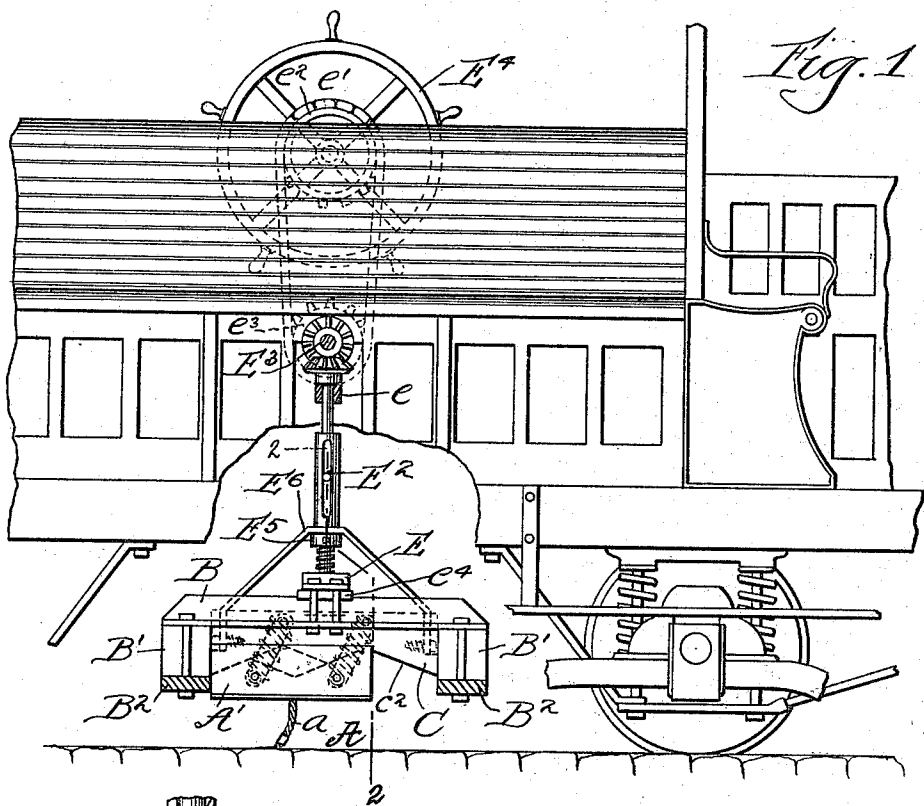


(No Model.)

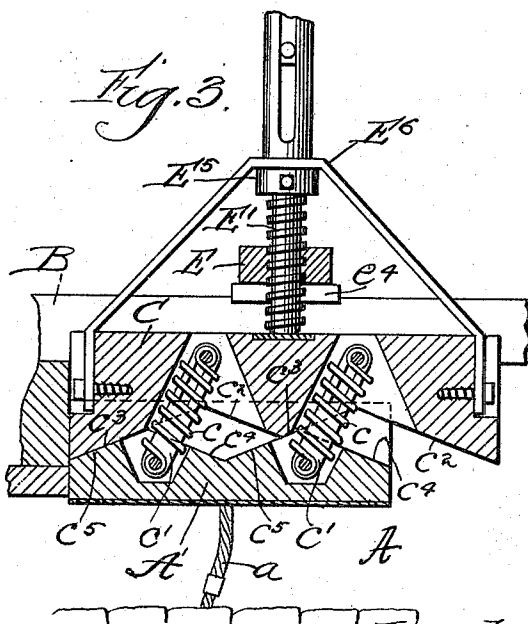
C. B. FAIRCHILD.
VEHICLE BRAKE.

No. 572,939.

Patented Dec. 8, 1896.



Witnesses
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Inventor
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By Geo. L. Waldo. Atty.

UNITED STATES PATENT OFFICE.

CHARLES B. FAIRCHILD, OF NEW YORK, N. Y., ASSIGNOR OF ONE-EIGHTH
TO DANIEL W. BOSLEY, OF CHICAGO, ILLINOIS.

VEHICLE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 572,939, dated December 8, 1896.

Original application filed December 3, 1895, Serial No. 570,948. Divided and this application filed February 18, 1896. Serial No. 579,717. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. FAIRCHILD, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented an Improved Vehicle-Brake, of which the following is a specification.

This invention relates to improvements in vehicle-brakes, and relates particularly to what may be termed "pavement-brakes," of the general type comprising, broadly, a brush supported upon the vehicle and adapted to be lowered and raised to depress the free ends of the brush-teeth into and to raise them out of contact with the road-bed.

The object of the present invention is to provide a brake of this type of such construction that when the teeth of the brake-brush are lowered into contact with the road-bed or pavement said brake will be applied with desired force automatically and quickly.

A brake embodying my invention comprises a brake-brush consisting of a rigid back in which are secured a plurality of resilient brush-teeth, a block or support in contact with which said brush is supported, said block or support being movable toward and from the road-bed; cam-surfaces formed on said block or support and said brush, respectively, such that movement of said brush longitudinally of said support will operate to advance or retract said brush relatively to said support; stops to maintain said block or support in permanent longitudinal adjustment upon said vehicle; stops to limit the longitudinal movement of said brush relatively to said block or support; means to maintain said brush normally at the limit of its retraction, and means to lower and raise the block or support to depress the free ends of the brush-teeth into or to raise them out of contact with the road-bed or pavement.

The invention also consists in the various other features, combinations of features, and details of construction hereinafter described and then pointed out in the claims.

In the accompanying drawing a brake embodying my invention is fully illustrated.

Figure 1 is a side view of a brake embodying my invention, said brake being shown as

applied to the grip-car of a cable street-railway. Fig. 2 is a transverse vertical section thereof on the line 2 2 of Fig. 1, and Fig. 3 is a longitudinal vertical section through the middle thereof.

Referring now to the drawings, A designates, as a whole, a brake-brush which is substantially identical in construction with the brake-brush heretofore fully described in an application for Letters Patent filed by me on the 3d day of December, 1895, and numbered serially 570,948, and which comprises, essentially, a rigid back A', in which are secured a plurality of brush-teeth *a*.

In the preferable form of the brake-brush A the brush-teeth *a* are resilient and are made from strands of wire cable drawn to a mild spring-temper. My invention, however, contemplates the use of rigid teeth, either alone or together with resilient teeth, and also contemplates the use of other forms of resilient teeth, all as fully disclosed in said application for Letters Patent of the United States so filed by me in the Patent Office on the 3d day of December, 1895, Serial No. 570,948.

In the drawings I have shown my improved brake as applied to the grip-car of a cable street-railroad. As shown, said brake is supported at one side of the cable-grip, so as to engage the road-bed between the slot of the cable-conduit and the rail.

The brake-frame consists of longitudinally-disposed angle-bars B, firmly secured to the tops of block B', which are in turn secured to the upper sides of the transverse slide-bars B² of the grip-car.

The brake-brush A is supported in contact with the under surface of a block or support C, so as to be movable relatively to said block or support C. As shown, coiled tension-springs *c* are used to so hold said brake-brush in contact with said block or support C, the ends of said springs being connected to said block or support C and to said brake-brush A, respectively.

The movement of the brush A relatively to the block or support C is limited by links *c'*, pivotally connected at one end to said brush and slots, in the other ends of which engage

pivot-pins, secured in said block or support. As shown, the ends of the springs *c* are attached to the pivot-pins of the links *c'* and embrace said links as guides.

5 The block or support C, which carries the brake-brush A, is bodily movable toward and from the road-bed or pavement between the slide-bars B² of the grip-car and the blocks B' as guides, so as to lower and raise the
10 brake-brush A to depress the free ends of the brush-teeth *a* into and to raise them out of contact with the road-bed or pavement.

Formed on the contacting surfaces of the block or support C and the brake-brush A are
15 cam-surfaces, such that movement of said brake-brush longitudinally of said block or support will operate to advance said brush toward and to retract it from the road-bed relatively to said block or support. As shown,
20 duplicate sets of regularly-inclined surfaces *c*² *c*³ are formed on said block C, corresponding oppositely-inclined surfaces *c*⁴ *c*⁵ being formed on the brake-brush A, the pitch of said surfaces being about one inch vertically
25 to three inches longitudinally. In the preferable construction shown also the block or support C is fitted to a channel formed in the upper surface of the brake-brush A, the cam-surfaces on said brake-brush being formed at
30 the bottom of said channel. Said block or support C will thus operate in an obvious manner to maintain said brush A from lateral displacement. In order to provide for longitudinal movement of the brake-brush A relative
35 to said block or support C, said brush is made shorter than said block or support, the difference in length being such that the brush, being at the middle of the block lengthwise, may move in either direction a sufficient distance
40 to depress said brush about two inches. With inclined surfaces having a pitch of one inch in three said brush will be about twelve inches shorter than the inclined surfaces on the said block or support, and the
45 length of the respective inclined surfaces is from two to three inches more than the maximum travel of said brush from its middle position on said block or support longitudinally thereof. It therefore follows, from the use
50 of duplicate cam-surfaces constructed as described, that said brush will always be supported at both ends when moving in either direction.

It is obvious that the springs *c* will operate
55 to maintain the brake-brush A normally at the middle of the block or support C and at the middle of its travel, thus providing for movement of said brush in either direction. Said springs will also operate to maintain said
60 brush normally at the limit of its retraction relatively to the block or support C.

When the block or support C, carrying the brake-brush A, is depressed sufficiently to bring the free ends of the brush-teeth *a* into
65 contact with the road-bed or pavement, the resistance offered to the passage of said brush over said road-bed or pavement will operate

automatically to impart longitudinal movement to said brake-brush relatively to said block or support, whereby said brake-brush
70 will be further depressed so as to engage the road-bed with desired force.

Movement of the brake-brush A longitudinally of the block or support C is limited
75 by means of suitable stops, which also operate to take the end thrust due to the application of the brake. As shown, these stops are formed by the slide-bars B² of the truck-frame of the car, which extend below the block or support C at all times and into the path of
80 said brush A.

The means for lowering and raising the block or support C to bring the free ends of the brush-teeth *a* into contact with the road-bed or pavement and to raise them out of contact
85 therewith are as follows: Threaded through a nut E, rigidly secured to the frame-bars B, is a screw E', the end of which bears upon the top of the block or support C at the middle thereof. The upper end of the screw
90 E' is tubular, and fitted to and splined therein is a shaft E², the upper end of which is supported in a suitable bearing formed in a bracket *e*, secured to the body of the car. A beveled gear secured to the shaft E² meshes
95 with a beveled gear secured to a horizontal shaft E³, mounted in suitable stationary bearings on the body of the car. Pivotally supported upon the body of the car, in position to be accessible to the gripman, is a hand-
100 wheel E⁴, rotation of which is imparted to the shaft E³ by means of a chain belt *e'*, adjusted to sprocket-wheels *e*² *e*³, rigidly secured to the hub of said hand-wheel E⁴ and to said shaft E³, respectively.
105

Rigidly secured to the screw E' above the nut E is a collar E⁵, which, as the screw is raised, comes into contact with a bar or rod E⁶, which embraces said screw E' above said
110 collar E⁵, and the ends of which are connected to the opposite ends of the block or support C. In order to allow the brake-brush A to adjust itself to inclined road-beds or pavements, the bar or rod E⁶, in the preferable
115 construction shown, is pivotally connected to said block or support C.

In order to prevent binding of the screw E' in the nut E, rubber cushions *e*⁴ are placed under the ends of said nut E and between it and the frame-bars B.
120

The operation of my improved brake is as follows: The block or support C and the brush A being both fully retracted and it being desired to apply the brake, the gripman turns
125 the hand-wheel E⁴ to lower the screw and thus depress the block or support C and the brush A carried thereon until the free ends of the brush-teeth *a* come into contact with the road-bed or pavement. The resistance offered to the passage of the said brake-brush along the
130 road-bed or pavement operates automatically to impart longitudinal movement to said brake-brush relatively to said block or support C, whereby said brush will be further de-

pressed into forcible engagement with the pavement and the car stopped.

When it is desired to release the brake, the hand-wheel E⁴ is turned in the opposite direction, whereby the screw E' is raised, and the collar E⁵ thereon, coming into contact with the rod or bar E⁶, operates to raise said block or support C, and with it the brush A, until the free ends of the brush-teeth *a* are clear of the pavement. The springs *c* then operate to further retract said brake-brush and to return it to its normal position at the middle of the block or support C.

This application is filed as a division of an application for Letters Patent filed by me in the Patent Office on the 3d day of December, 1895, numbered serially 570,948, in which a brake embodying my present invention is shown and described but not claimed.

I claim—

1. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in which are secured a plurality of brush-teeth, said brush being maintained in contact with a suitable support, which is movable toward and from the road-bed or pavement, cam-surfaces formed on said brush-back and on said block or support, respectively, such, that movement of said brush, longitudinally of said support, will operate to advance or retract said brush, relatively to said support, stops to maintain said support in permanent longitudinal adjustment, relatively to the car, stops to limit the longitudinal movement of said brush relatively to said support, means to maintain said brush, normally, at the limit of its retraction, relatively to said support, and means to lower and raise said support, to depress the free end of the brush-teeth into and to raise them out of contact with the road-bed or pavement, substantially as described.

2. In a vehicle-brake, the combination of a brake-brush consisting of a rigid back in which are secured a plurality of resilient brush-teeth, said brush being maintained in contact with a suitable support, which is movable toward and from the road-bed or pavement, cam-surfaces formed on said brush-back and on said block or support, respectively, such, that movement of said brush, longitudinally of said support, will operate to advance or retract said brush, relatively to said support, stops to maintain said support in permanent longitudinal adjustment, relatively to the car, stops to limit the longitudinal movement of said brush, relatively to said support, means to maintain said brush, normally, at the limit of its retraction, relatively to said support, and means to lower and raise said support, to depress the free ends of the brush-teeth into and to raise them out of contact with the road-bed or pavement, substantially as described.

3. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in which are secured a plurality of brush-teeth,

said brush being maintained in contact with a suitable support, which is movable toward and from the road-bed or pavement, duplicate cam-surfaces formed on said brush-back and on said block or support, respectively, one set at each end thereof, said cam-surfaces being such that movement of said brush, longitudinally of said support, will operate to advance or retract said brush, relatively to said support, stops to maintain said support in permanent longitudinal adjustment upon the car, stops to limit the longitudinal movement of said brush, relatively to said support, means to maintain said brush, normally, at the limit of its retraction, relatively to said block or support, and means to lower and raise said block or support to depress the free ends of the brush-teeth into and to raise them out of contact with the road-bed or pavement, substantially as described.

4. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in which are secured a plurality of brush-teeth, a channel formed longitudinally in the back of said brake-brush, a block or support, movable, bodily, toward and from the road-bed or pavement in suitable rigid guides, which operate to maintain said block in permanent longitudinal adjustment upon the car, said block or support being fitted to the channel in the brush-back, duplicate cam-surfaces formed on the contacting sides of said brake-brush and block or support, one at each end thereof, said cam-surfaces being such that movement of said brush, longitudinally of said block or support, will operate to advance or retract said brush, relatively to said support, stops to limit the longitudinal movement of said brush, relatively to said block or support, tension-springs connecting said block or support and brush, whereby said brush will be maintained, normally, retracted, relatively to said block or support, a nut rigidly supported above the middle of said block or support, a screw threaded through said nut and adapted to impinge on said block or support, a lifting-bar attached to said block or support, which embraces said screw above a collar secured to said screw and means to rotate said screw, substantially as described.

5. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in which are secured a plurality of brush-teeth, a channel formed longitudinally in the back of said brake-brush, a block or support movable, bodily, toward and from the road-bed or pavement in suitable rigid guides, which operate to maintain said block in permanent longitudinal adjustment upon the car, said block or support being fitted to the channel in the brush-back, duplicate cam-surfaces formed on the contacting sides of said brake-brush and block or support, one at each end thereof, said cam-surfaces being such that movement of said brush, longitudinally of said block or support, will operate to advance or retract said brush, relatively to said sup-

port, stops to limit the longitudinal movement of said brush, relatively to said block or support, tension-springs connecting said block or support and brush, whereby said
 5 brush will be maintained, normally, retracted, relatively to said block or support, a nut rigidly supported above the middle of said block or support, elastic cushions or washers inserted under the ends of said nut, a screw
 10 threaded through said nut and adapted to impinge on said block or support, a lifting-bar attached to said block or support, which embraces said screw above a collar secured to said screw and means to rotate said screw,
 15 substantially as described.

6. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in which are secured a plurality of brush-teeth, a channel formed longitudinally in the back
 20 of said brake-brush, a block or support, movable, bodily, toward and from the road-bed or pavement in suitable rigid guides, which operate to maintain said block in permanent longitudinal adjustment upon the car, said
 25 block or support being fitted to the channel in the brush-back, duplicate cam-surfaces formed on the contacting sides of said brake-brush and block or support, one at each end thereof, said cam-surfaces being such that
 30 movement of said brush longitudinally of said block or support, will operate to advance and retract said brush, relatively to said support, stops to limit the longitudinal movement of said brush, relatively to said block or support,
 35 tension-springs connecting said block or support and brush, whereby said brush will be maintained, normally, retracted, relatively to said block or support, a nut rigidly supported above the middle of said block or support,
 40 port, elastic cushions or washers inserted under the ends of said nut, a screw threaded through said nut and adapted to impinge on said block or support, a lifting-bar attached to said block or support, which embraces said
 45 screw above a collar secured to said screw, the upper end of said screw being tubular and a shaft being fitted thereto and splined there-

in, a bevel-gear thereon, which meshes with a bevel-gear secured to a horizontal shaft, a hand-wheel pivoted on the car, sprocket-
 50 wheels on said hand-wheel and said horizontal shaft, and a chain belt adjusted to said sprocket-wheels, substantially as described.

7. In a vehicle-brake, the combination of a brake-brush, consisting of a rigid back in
 55 which are secured a plurality of resilient brush-teeth, a channel formed longitudinally in the back of said brake-brush, a block or support, movable, bodily, toward and from the road-bed or pavement in suitable rigid
 60 guides, which operate to maintain said block in permanent longitudinal adjustment upon the car, said block or support being fitted to the channel in the brush-back, duplicate cam-surfaces formed on the contacting sides of
 65 said brake-brush and block or support, one at each end thereof, said cam-surfaces being such that movement of said brush longitudinally of said block or support, will operate to advance and retract said brush, relatively
 70 to said support, stops to limit the longitudinal movement of said brush, relatively to said block or support, tension-springs connecting said block or support and brush, whereby said brush will be maintained, nor-
 75 mally, retracted, relatively to said block or support, a nut rigidly supported above the middle of said block or support, elastic cushions or washers inserted under the ends of said nut; a screw threaded through said nut
 80 and adapted to impinge on said block or support, a lifting-bar pivoted to said block or support, which embraces said screw above a collar rigidly secured to said screw and means to rotate said screw, substantially as
 85 described.

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 8th day of February, 1896.

CHARLES B. FAIRCHILD.

Witnesses:

F. C. CRITTENDEN,
 GRACE FERN.