(No Model.)

E. PROUTY.

EMERGENCY RAIL BRAKE.

No. 539,444. Patented May 21, 1895.

FIG. 1

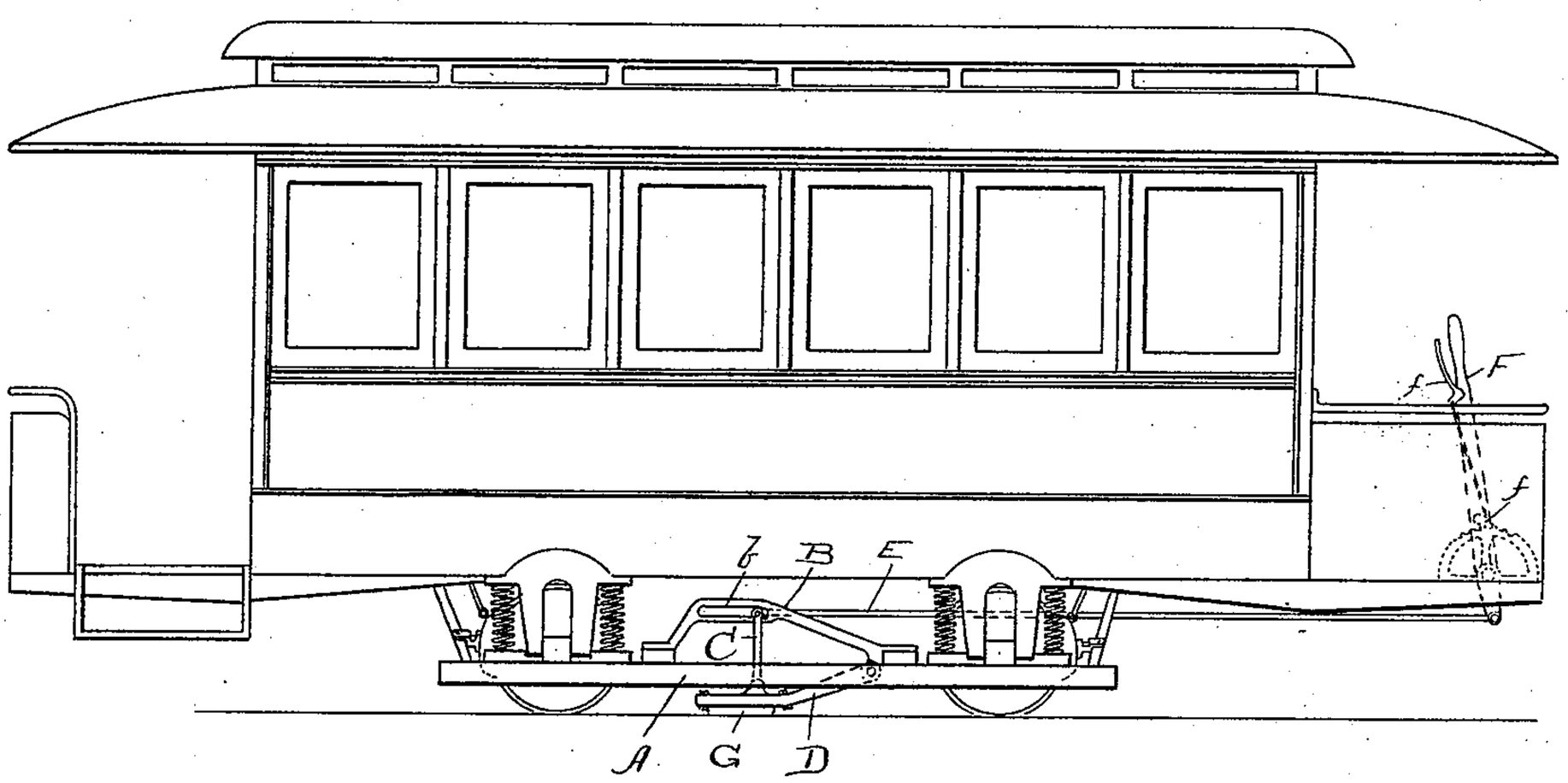

FIG. 2

FIG. 3.

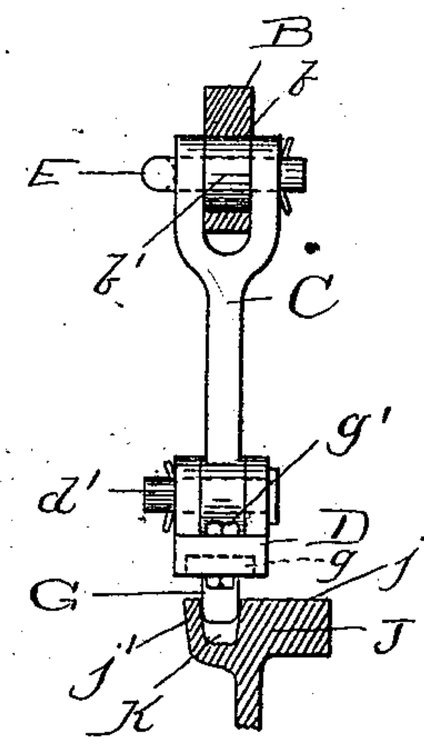

FIG. 4.

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EMERGENCY RAIL-BRAKE.

SPECIFICATION forming part of Letters Patent No. 539,444, dated May 21, 1895.

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To all whom it may concern:

Be it known that I, ENOCH PROUTY, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Emergency Track-Brakes for Street-Railway Cars, of which the following is a specification.

This invention relates to an improvement in emergency track brakes for street railway cars, more especially adapted for use on inclines.

It has been customary where an incline occurs and danger of or from derailment is great to use rails having an inner guard flange so that the flange of the car wheel runs in a groove thus formed between the rail proper and the rail guard flange. I have found that the inner walls of this groove, which are nearly but not quite vertical and parallel to each other may be used with remarkable facility and success as the place of contact for a track brake of great power and smoothness of operation. The shoe or blade of the brake for use in this groove I make of a size and shape in cross section which shall permit it to enter the groove for part only of the depth of said groove so that a downward pressure of the shoe will give a wedging action between it and the sides of the groove, and so that when the heat of the friction engendered by the movement of the shoe through the groove expands the shoe laterally, the pressure shall be increased thereby, against the sides of the groove without any tendency to lift the shoe out of the groove. This shoe is substantially of the same thickness from the first point of impingement upward for a distance sufficient to prevent the forming of a shoulder by wear to ride on the top of the flanges of the rail, which would materially tend to prevent the impingement of the shoe against the inner walls of the rail groove. If the shoe were permitted to reach the bottom of the rail groove the unusual and effective resistance to be obtained by impingement on the sides of the rail groove would cease. It is a settled fact in the laws of mechanics that the resistance in rigid parallel surfaces is not increased by varied forms and shapes, and, therefore, it is the object in this invention to maintain an impingement by unequal parallel surfaces between the shoe and rail groove. I mount the blade or shoe rigidly on an arm, one end of which is pivoted to the car, so that the blade will enter the groove one end slightly in advance of the other thus producing a gradually increasing impingement to avoid a sudden shock in applying the brake. A link having a friction roll at its upper end playing in a horizontal slot in a framework attached to the car supports the brake arm, and this link being connected to a brake lever a simple but highly effective toggle action, having only three joints, not likely to wear, and not likely to swing out of place, is thus produced.

The nature of my improvement will be fully understood from the subjoined more detailed description and claims, and the accompanying drawings.

In said drawings, Figure 1 is a side elevation of a street-car, showing the improved brake. Fig. 2, upon a larger scale, is a side view of the brake mechanism detached. Fig. 3 is a section on line 3 3 of Fig. 2, and Fig. 4 is a bottom view of the brake-shoe and its carrying-arm.

Like letters of reference in the several figures indicate like parts wherever used.

Referring to the drawings A denotes the timbers of the usual truck frame of the car.

B is a metal frame piece bolted to and extending up from the timbers of the truck, and constituting the brake support. At its upper portion is the horizontal slide way or slot *b* to receive a friction roller *b'* on the link C, which link is pivotally connected to and supports the brake shoe arm.

D is the brake shoe arm which is pivotally connected to the car on the brake support at *d*, and at *d'* to the link C.

E is a connecting rod which at one end is connected to the link C, as for example, as shown in the drawings by bending its end at right angles to form the journal for the friction roller *b'*. The other end of this connecting rod is shown as being connected to a common hand lever F on the platform of the car, and having a detent *f* for holding it in position.

G is a brake shoe or blade made preferably of comparatively soft cast steel. It should preferably be softer than the material of the track rails, so that whatever wear takes place between the blade and the rail shall be mostly

on the blade. A convenient method of attaching this blade to the arm D is that indicated in the drawings, which shows a base plate *g* cast integral with the blade; which base plate sets into a cavity in the under face of the arm and is removably secured by two bolts *g' g'*. This blade as shown has its lower corners rounded slightly which is not for the purpose of causing it to fit in the bottom groove, as might possibly be supposed, because it is not intended or expected that the bottom of the blade shall ever actually reach the bottom of the groove in use. This rounding of the corners is for a different purpose, namely, to insure that the blade when the brake is applied shall enter the groove notwithstanding the lateral lurching and vibration when the car is under rapid motion. For the same reason that end of the blade which is nearest the pivot *d* is chamfered or beveled away on both sides, as at *h*. By reason of the blade being rigidly attached to the pivoted arm, it will be understood that this end of the blade enters the groove slightly in advance of the remaining portions; and so too on account of this chamfering of the end first to enter, and the rounding of the corners above mentioned the friction is more gradually produced when the brake is applied.

The upper portion of the rail is shown in cross section at J Fig. 5, and consists of the main bearing portion or head *j*, upon which the tread of the wheel rides, and the guard flange *j'*, forming between these two parts a groove K, the walls of which are nearly parallel and vertical, presenting however a slight divergence sufficient to produce a wedging action as the brake shoe blade is forced down between them. It is this wedging action between the rail and the brake which gives to this apparatus its remarkable smoothness and efficiency of operation, and is one of the things which distinguishes it from that class of track brakes which rely upon mere downward pressure or contact for their power and which consequently depend for their efficiency or amount of retarding influence upon the weight of the car itself; and of course, as is well understood, such brakes relying upon mere downward contact are never absolutely positive and certain to stop the car under all circumstances. If a car in rapid motion loses its weight on the track to considerable extent owing to the laws of inertia, this loss is immediately felt on the efficiency of the track brake no matter what the weight of the car, and just at the time it is most needed.

In my improved brake the friction of the wedging action is not dependent merely upon the weight of the car but is positive and may be increased to any degree, and moreover the heat generated by the frictional contact instead of being an indifferent matter becomes a factor to increase the efficiency of the brake by expanding the blade, while the track, which is being moved over, is not heated to the same extent and consequently not expanded in like degree.

I claim—

1. In a track brake, the combination of the pivoted arm D, means for raising and lowering the same, and the blade G adapted to wedge with the rail and carried rigidly upon the rear end of said arm, substantially as specified.

2. In a track brake, the blade G and means for raising and lowering said blade into contact with the track, one end of the blade G coming into contact with the track slightly in advance of the other end, substantially as specified.

3. In a track brake, in combination with means for raising and lowering it, the blade G, one end of which is tapered and the lower edges of which blade are rounded, in combination with the pivoted arm D extending forwardly of the same substantially as specified.

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