(No Model.)

P. WARDMAN.

RAIL CLEANING ATTACHMENT FOR CARS.

No. 476,909. Patented June 14, 1892.

FIG. 3.

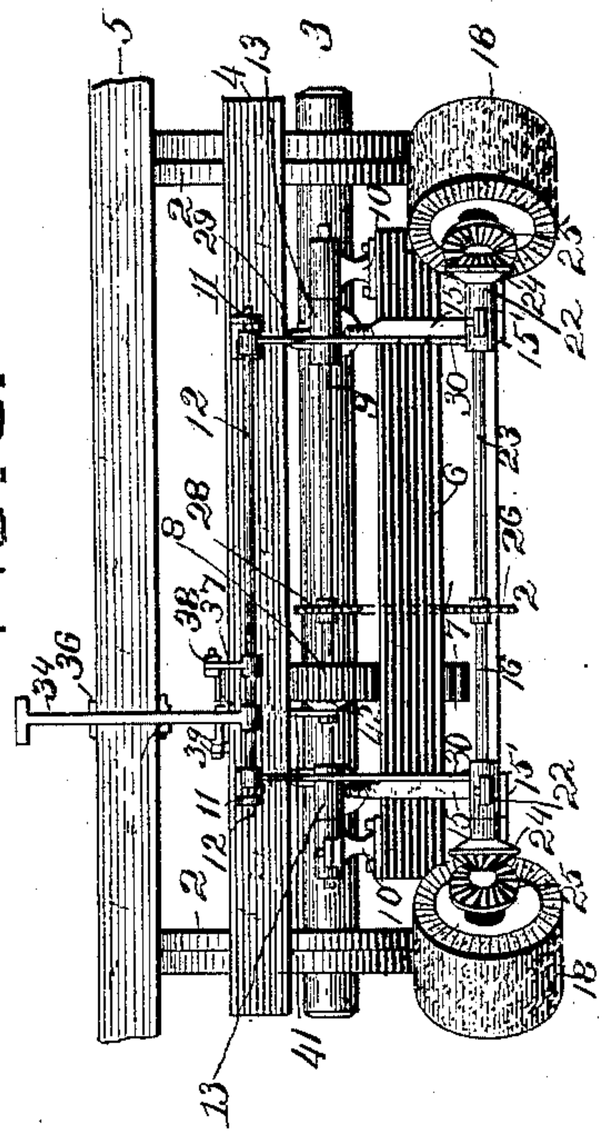

FIG. 2.

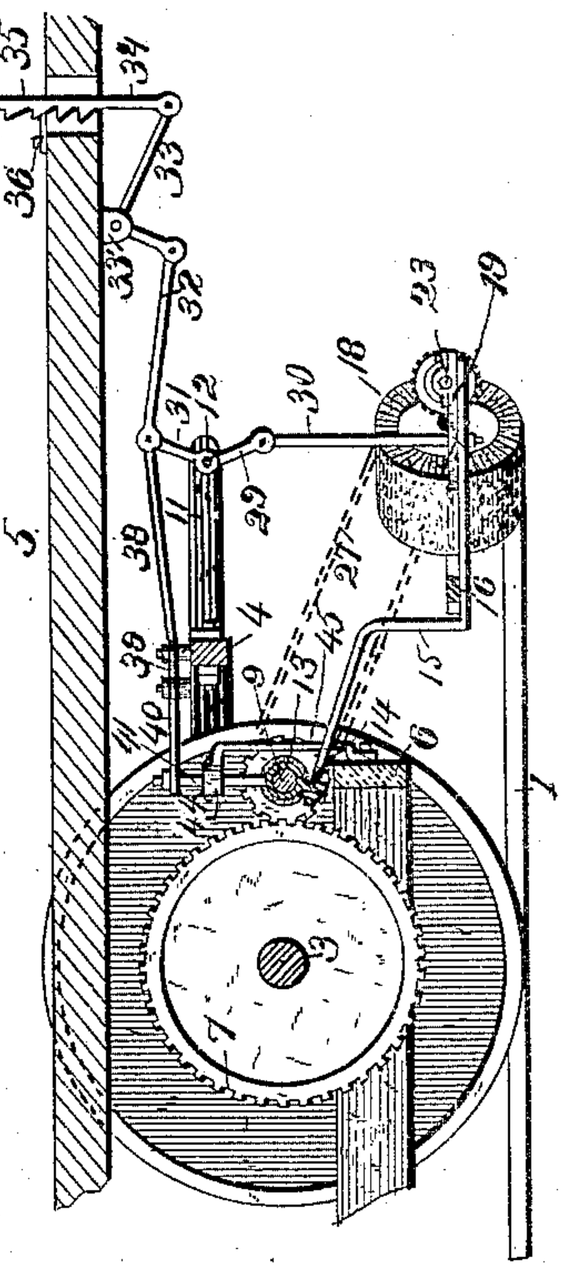

FIG. 1.

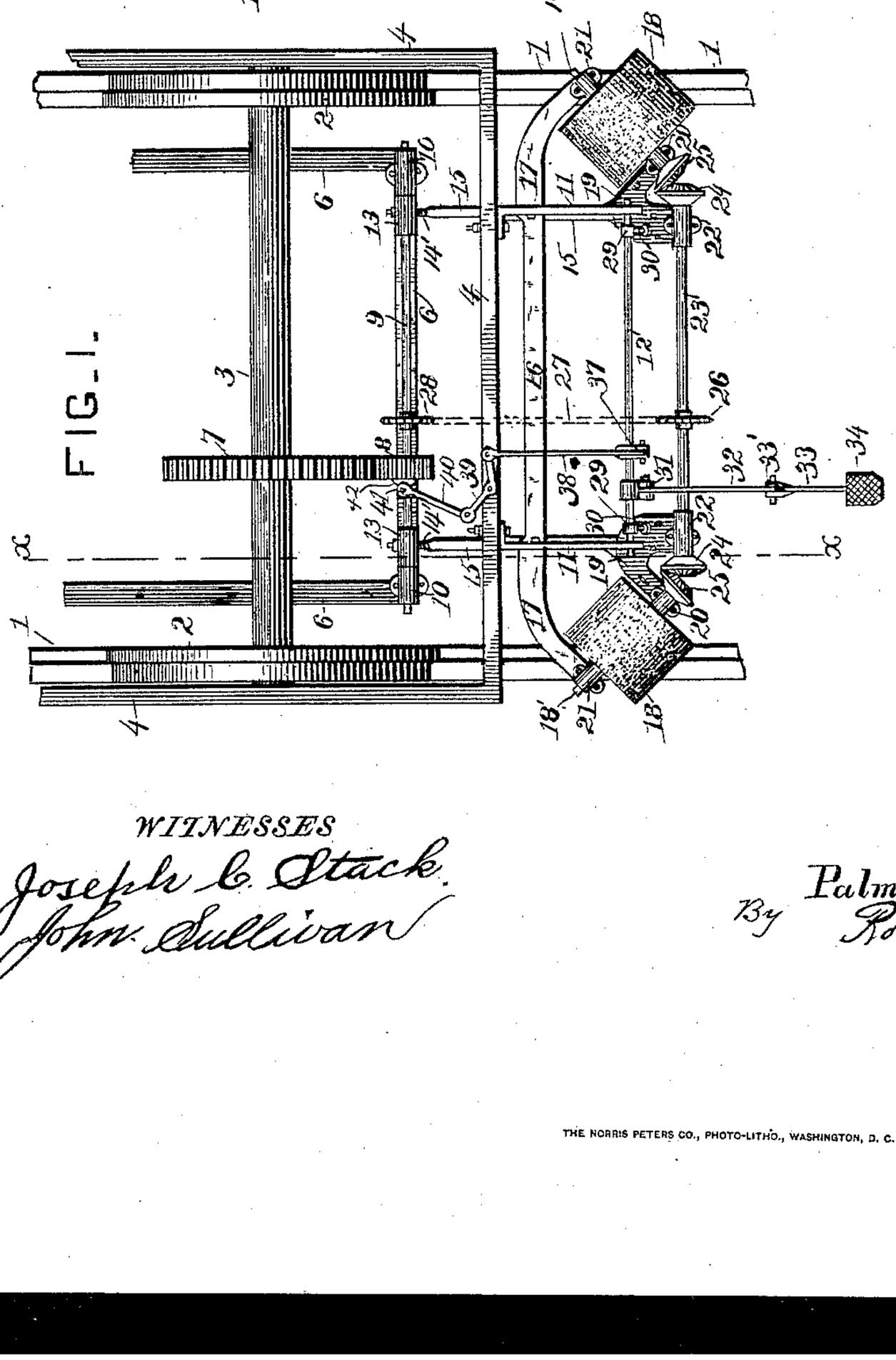

FIG. 4.

WITNESSES

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RAIL-CLEANING ATTACHMENT FOR CARS.

SPECIFICATION forming part of Letters Patent No. 476,909, dated June 14, 1892.

Application filed January 12, 1892. Serial No. 417,792. (No model.)

To all whom it may concern:

Be it known that I, PALMER WARDMAN, a citizen of the United States, residing at East Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Rail-Cleaning Attachments for Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates generally to railway-track sweepers or cleaners and particularly to improvements in that class thereof in which the cleaning attachments are employed in connection with street-cars propelled by electromotors, in which the car-wheel axles and intermediate connections impart rotation to the rail-cleaning brushes when lowered, in which said brushes can be lowered to and raised from the rails by connections leading to the platforms of cars, and in which when so lowered they are automatically caused to revolve by the connections intermediate thereof and the car-wheel axles; and my invention consists in the peculiarities of construction and arrangement or combination of parts hereinafter fully disclosed in the description, claims, and drawings.

The objects of my invention are, first, to provide an improved rail-cleaning attachment for railway-cars generally, but which is especially intended and adapted for employment in connection with electrically-propelled street-cars, for which it is especially necessary that the rails be kept clear of ice, snow, and dirt, which prevent the wheels from making firm contact with the rails or from effecting the friction thereon that is necessary for utilizing the entire power of the electromotor for propelling the cars; second, to provide improved connecting mechanism intermediate of the wheel-axle and the brushes, whereby when the latter are raised from the rails said mechanism is automatically thrown and held out of gear with said wheel-axle and whereby when said connecting mechanism is released from its elevated position the brushes will descend by gravity and be automatically geared with said wheel-axle and revolved upon the rails, and, third, to provide improved combinations of devices which are accessorial to the obtainment of these ends and tend to overcome the objections to the construction and operation of existing attachments of this character. These objects are accomplished by the mechanism illustrated in the accompanying drawings, forming part of this specification, in which the same reference-numerals indicate the same or correponding parts and features, and in which—

Figure 1 represents a broken top plan view of the lower portion of a street-car provided with my improved rail-cleaning attachment, the bottom and platform being omitted for clearness of illustration of the parts beneath; Fig. 2, a longitudinal vertical section of the same, the section being taken on the dotted line *x x* of Fig. 1 and along the bottom and platform of the car; Fig. 3, a front end elevation of the same, and Fig. 4 a detail (partly broken and sectional) view of parts hereinafter fully described.

In the drawings, the numeral 1 indicates the track-rails, 2 the car-wheels, 3 their axle, 4 the lower portion of the car-supporting frame, 5 the bottom and platform of the car, and 6 the frame for supporting the electromotor and its belongings, all being of any ordinary or suitable construction and arrangement.

The gear-wheel 7 is rigidly secured to the wheel-axle 3 and arranged to mesh with the normally-loose pinion 8 on the transverse shaft 9, which is journaled at its ends in the raised boxes or bearings 10 upon the upper surface of the electromotor-frame 6. To the front end of the car-supporting frame 4 are bolted or otherwise suitably secured the forwardly-projecting arms 11, in the front ends of which is journaled the transversely-arranged rock-shaft 12.

Near the ends of the transverse shaft 9 are loosely mounted the collars or sleeves 13, having the lugs or flanges 14 on their under sides, through which pass the screw-threaded and nutted inner ends 14′ of the angularly-shaped and forwardly-extending arms 15, which are flared or forked, as at 15′, at their front ends and provided upon their upper sides, about midway of their length, with the transverse bar 16, having the forwardly-curved ends 17. These parts constitute the main portions of the pivoted supporting-frame; but it is further provided with the brushes 18, their short

shafts 18′, and the following additional devices which support said brushes and shafts and directly impart thereto the rotary motion which is transmitted from the wheel-axle 3 through the connections hereinafter described: Upon the flared or forked front ends of the arms 15 of this pivoted supporting-frame are secured the correspondingly-shaped bearing-plates 19, to which are attached the adjustable journal-boxes 20 and and 22; also, the forwardly-curved ends 17 of the transverse bar 16 are provided with the journal-boxes 21, which may or may not be adjustable. The obliquely-arranged shafts 18′ of the brushes are journaled at their outer ends in the boxes 21 and at their inner ends in the adjustable boxes 20. In the adjustable journal-boxes 22 the transverse shaft 23 is mounted and provided at its ends with the bevel-gears 24, which mesh with the corresponding gears 25 on the inner ends of said brush-shafts. The object of making these boxes adjustable is to secure the necessary arrangement of said transverse shaft and brush-shafts for effecting proper engagement between said bevel-gears. The brushes 18 are revolved in a direction opposite to that of the car-wheels 2 and receive their motion from these bevel-gears, their shafts, and the sprocket-wheel 26 on the transverse shaft 23, which is operated by the belt or chain 27, the sprocket-wheel 28 on the transverse shaft 9, the pinion 8, and the gear-wheel 7 on the wheel-axle 3. These brushes are cylindrical in shape and are preferably formed of wire, so that they will last longer than ordinary bristle brushes; also, they and their shafts 18′ are mounted at the sides of the front portion of their pivoted supporting-frame and arranged diagonally or obliquely thereon, so as to deliver all obstructions outside and clear of the track-rails.

For lowering and raising the pivoted supporting-frame and the parts with which it is provided the following mechanism is employed: In the front ends of the forwardly-projecting arms 11 of the car-supporting frame 4 is journaled the rock-shaft 12, as above stated. From the lower side of this shaft near its ends project the short arms 29, to the lower ends of which are pivoted the upper ends of the vertical rods 30, which pass down through and are firmly secured at their lower ends to the flared or forked bearing-plates 19 and the correspondingly-shaped front ends of the forwardly extending and pivoted arms 15. From the upper side of this rock-shaft near its left end projects the arm 31, which is pivoted at its upper end to the slightly-inclined rod 32, which extends forwardly and is pivoted at its front end to the rear or inner arm of the vertical bell-crank lever 33, which is attached by a lug 33′ to the under side of the platform of the car, as shown in Fig. 2. The front or outer arm of this bell-crank lever is pivotally connected to the lower end of the vertically-arranged treadle-bar 34, which projects up through the opening 35 in the platform 5 and is formed with a ratcheted or toothed edge for engaging the fixed pawl or stop 36. These two parts when engaged serve, together with the intermediate connections just described, to hold the brushes raised or above the rails; also, when disengaged they permit said brushes to descend upon the rails by their own gravity and that of their pivoted supporting-frame. Owing to the descent of the brushes and the supporting-frame by their own weight, they will turn the rock-shaft 12 forwardly by means of the short arms 29 and the rods 30, and thus cause the short arm 37 on the upper side of said shaft to be also moved in the same direction, and thus draw or pull with it the rod 38, which is pivotally connected to its upper end. This rod is also pivoted at its rear end to the inner arm of the horizontally-arranged bell-crank lever 39, which is fulcrumed upon the car-frame 4, as shown in Figs. 1 and 2, and pivotally attached by its outer arm to the front end of the short rod 40, which extends rearwardly and is removably secured to the upper end of the vertical lever 41, which is secured by a collar or strap at its lower end to the clutch 42 on the transverse shaft 9. This clutch is movable endwise or laterally upon said shaft by an ordinary spline-and-groove connection and is formed with a ratchet-toothed inner surface for engaging a corresponding surface formed on the normally-loose pinion 8 and for positively revolving the same and said shaft periodically or when the brushes are in their lowered position. The shifting of this clutch is directly effected by the movement of the rod 40 and the vertical lever 41, the latter being fulcrumed upon the pin 43, which passes through the same and the loose collar or sleeve 44, which is formed upon the upper end of the vertical bracket 45, which is secured at its lower end to the motor-frame 6, as shown in Fig. 4 These devices hold said vertical lever in place and still permit it to move the clutch 42 into and out of engagement with the pinion 8. When this clutch and pinion are thrown into engagement through the connections just described, they are positively revolved by the gear-wheel 7 simultaneously with the descent of the brushes upon the rails and also are the intermediate source from which their revolution is effected. When the track-rails are clear of obstructions and it is desired to raise the pivoted supporting-frame and brushes out of operative position, the treadle-bar 34 is pushed downwardly. This moves the arms of the vertical bell-crank lever 33, the rod 32, the short arm 37 on the rock-shaft 12, and the rod 38 rearwardly. This movement of the rod 38 causes the horizontal bell-crank lever 39, the short rod 40, and the vertical lever 41 to disengage the clutch 42 from the pinion 8, which results in stopping the motion of the shaft 9, the sprocket-wheels 26 and 28, the chain 27, the shaft 23, and the bevel-gears 24 and 25 and in discontinuing the revolution of the brushes. During the time

this result is being effected, or while the rock-shaft 12 is being turned rearwardly, the short arms 29 on the lower side thereof and the vertical rods 30 will raise the pivoted supporting-frame and the parts with which it is provided, after which these parts can be held in their inoperative position by engaging the vertical toothed treadle-bar 34 with the fixed pawl or stop 36.

While I have shown and described my improved rail-cleaning attachment as applied to only one end of a car, it is obvious that it is capable of duplication and employment at both ends thereof. In this latter event, however, when the car is moving in one direction the attachment at the rear end thereof should ordinarily be raised and the brushes held out of contact with the rails; but, if found necessary, both attachments could be in operation simultaneously. In either event, or whichever way the car travels, the brushes should, as above stated, be revolved in a direction opposite to that of the wheels of the car.

Having thus fully described the construction and arrangement or combination of the several parts and features of my invention, its advantages and operation, what I claim as new is—

1. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, and with gears secured to their inner ends, of means for simultaneously lowering said supporting-frame and revolving said shafts and brushes, substantially as described.

2. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, with bevel-gears secured to their inner ends, and with a transverse shaft having at its ends corresponding and intermeshing bevel-gears, of means for simultaneously lowering said supporting-frame and revolving said brushes and shafts, substantially as described.

3. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with angularly-shaped and forwardly-extending arms, with a bar arranged transversely and near the middle of said arms, with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, and with gears secured to their inner ends, of means for simultaneously lowering said supporting-frame and revolving said shafts and brushes, substantially as described.

4. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with angularly-shaped and forwardly-extending arms, with a bar arranged transversely and near the middle of said arms, with a transverse shaft journaled upon the front ends of said arms and having gears at its ends, and with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, and with gears secured to their inner ends, of means for simultaneously lowering said supporting-frame and revolving said shafts and brushes, substantially as described.

5. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with angularly-shaped and forwardly-extending arms having forked outer ends, with correspondingly-shaped bearing-plates secured to said forked ends, with the adjustable journal-boxes secured to said forked ends, and plates with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, and with gears secured to their inner ends, of means for simultaneously lowering said supporting-frame and revolving said shafts and brushes, substantially as described.

6. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with angularly-shaped and forwardly-extending arms having forked outer ends, with correspondingly-shaped bearing-plates secured to said forked ends, with the adjustable journal-boxes secured to said forked ends and plates, with a transverse shaft journaled in said boxes and having bevel-gears at its ends, and with obliquely-arranged brushes and shafts, the latter being adjustably journaled and having bevel-gears at their inner ends, of means for simultaneously lowering said pivoted supporting-frame and revolving said shafts and brushes, substantially as described.

7. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with forwardly-extending arms and with revoluble and obliquely-arranged brushes and shafts at the sides of its front portion, of means for lowering and raising said pivoted supporting-frame, its shafts and brushes, said means including a rock-shaft provided with short arms on its lower side near its ends, and the vertical rods which are pivoted at their upper ends to said short arms and secured at their lower ends to the front ends of said forwardly-extending arms, substantially as described.

8. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with forwardly-extending arms and with revoluble and obliquely-arranged brushes and shafts at the sides of its front portion, of means for lowering and raising said pivoted supporting-frame, its shafts and brushes, said means including a rock-shaft provided with short arms on its lower side

near its ends, the vertical rods, and connections for operating said rock-shaft from the platform of a car, substantially as described.

9. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with forwardly-extending arms and with revoluble and obliquely-arranged brushes and shafts at the sides of its front portion, of means for lowering and raising said pivoted supporting-frame, its shafts and brushes, said means including a rock-shaft provided with short arms on its lower side near its ends, the vertical rods, and connections for operating said rock-shaft from the platform of a car, consisting of a short arm on the upper side of said rock-shaft, a slightly-inclined rod pivoted at its rear end to said arm, a vertically-arranged bell-crank lever pivoted to the front end of said rod, and a vertical treadle-bar pivoted at its lower end to said lever and projected up through an opening formed in said platform, substantially as described.

10. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with forwardly-extending arms and with revoluble and obliquely-arranged brushes and shafts at the sides of its front portion, of means for lowering and raising said pivoted supporting-frame, its shafts and brushes, said means including a rock-shaft provided with short arms on its lower side near its ends, the vertical rods, and connections for operating said rock-shaft from the platform of a car, consisting of a short arm on the upper side of said rock-shaft, a slightly-inclined rod pivoted at its rear end to said arm, a vertically-arranged bell-crank lever pivoted to the front end of said rod, a vertical treadle-bar pivoted at its lower end to said lever and formed with a ratcheted or toothed edge, and a fixed pawl or stop for engaging the same, substantially as described.

11. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged brushes and shafts located at the sides of its front portion, with journal-boxes for both ends of said shafts, and with gears at the inner ends thereof, and mechanism for lowering and raising said supporting-frame and the parts mounted thereon, of a geared wheel-axle and connections intermediate of the same and said brushes and shaft for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, substantially as described.

12. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with brushes and shafts, the latter having bevel-gears at their inner ends, and with a transverse shaft having corresponding gears meshing therewith, and mechanism for lowering and raising said supporting-frame and the parts mounted thereon, of a geared wheel-axle and connections intermediate of the same and said brushes and shafts for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, said connections, including a transverse shaft provided with a normally-loose pinion, a laterally-movable clutch therefor, and a sprocket-wheel, a sprocket-wheel secured to said transverse shaft at the front portion of said frame, and a belt or chain passing over said sprocket-wheels, substantially as described.

13. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged, revoluble, and adjustable brushes and shafts and mechanism for lowering and raising the same, of a geared wheel-axle, connections intermediate of the same and said brushes and shafts for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, and devices for throwing said connections into and out of operative relation from the platform of the car, substantially as described.

14. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged, revoluble, and adjustable brushes and shafts and mechanism for lowering and raising the same, of a geared wheel-axle, connections intermediate of the same and said brushes and shafts for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, and devices for throwing said connections into and out of operative relation from the platform of the car, said devices including a transverse shaft provided with a normally-loose pinion, a laterally-movable clutch therefor, a vertical lever attached at its lower end to said clutch, and means connected with the upper end of said lever for moving said clutch into and out of engagement with said pinion, substantially as described.

15. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged revoluble and adjustable brushes and shafts and mechanism for lowering and raising the same, of a geared wheel-axle, connections intermediate of the same and said brushes and shafts for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, and devices for throwing said connections into and out of operative relation from the platform of the car, said devices including a transverse shaft provided with a normally-loose pinion, a laterally-movable clutch therefor, a vertical lever attached at its lower end to said clutch, and means connected with the upper end of said lever for moving said clutch into and out of engagement with said pinion, said means comprehending a short rod, a horizontally-arranged bell-crank lever pivoted to the front end thereof, a rock-shaft having a short arm on

its upper side, and a rod pivotally connected to said bell-crank lever and arm, substantially as described.

16. In a rail-cleaning attachment for cars, the combination, with a pivoted supporting-frame provided with obliquely-arranged revoluble and adjustable brushes and shafts and mechanism for lowering and raising the same, of a geared wheel-axle, connections intermediate of the same and said brushes and shafts for starting and stopping the rotation thereof simultaneously with the lowering and raising of said supporting-frame, and devices for throwing said connections into and out of operative relation from the platform of the car, said devices including a transverse shaft provided with a normally-loose pinion, a laterally-movable clutch therefor, a vertical lever attached at its lower end to said clutch, and means connected with the upper end of said lever for moving said clutch into and out of engagement with said pinion, said means comprehending a short rod, a horizontally-arranged bell-crank lever pivoted to the front end thereof, a rock-shaft having a short arm on its upper side, a rod pivotally connected to said bell-crank lever and arm, another short arm on the upper side of said rock-shaft, an inclined rod pivoted at its rear end thereto, a vertically-arranged bell-crank lever pivoted to the front end of said rod, a vertical treadle-bar pivoted at its lower end to said lever and formed with a ratchet or toothed edge, and a fixed pawl or stop for engaging the same, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PALMER WARDMAN.

Witnesses:
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