(No Model.) 2 Sheets—Sheet 1.

C. MAHON.

DEVICE FOR REMOVING OBSTRUCTIONS OR PREVENTING ACCIDENTS ON STREET RAILWAYS.

No. 381,881. Patented Apr. 24, 1888.

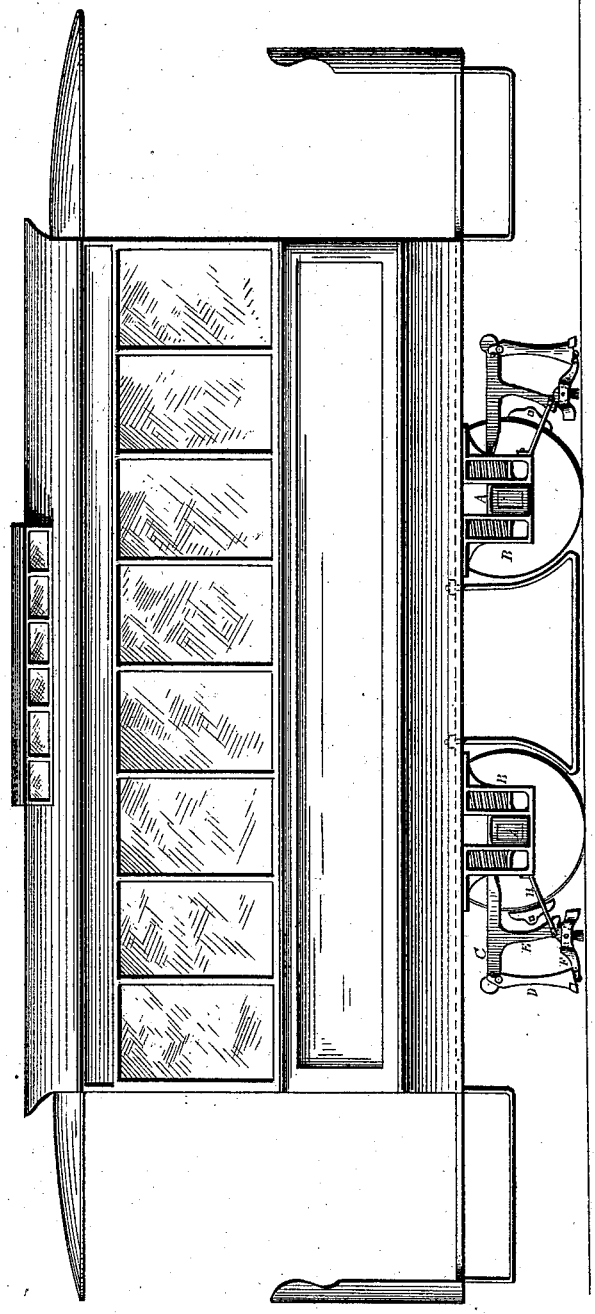

Fig. 1.

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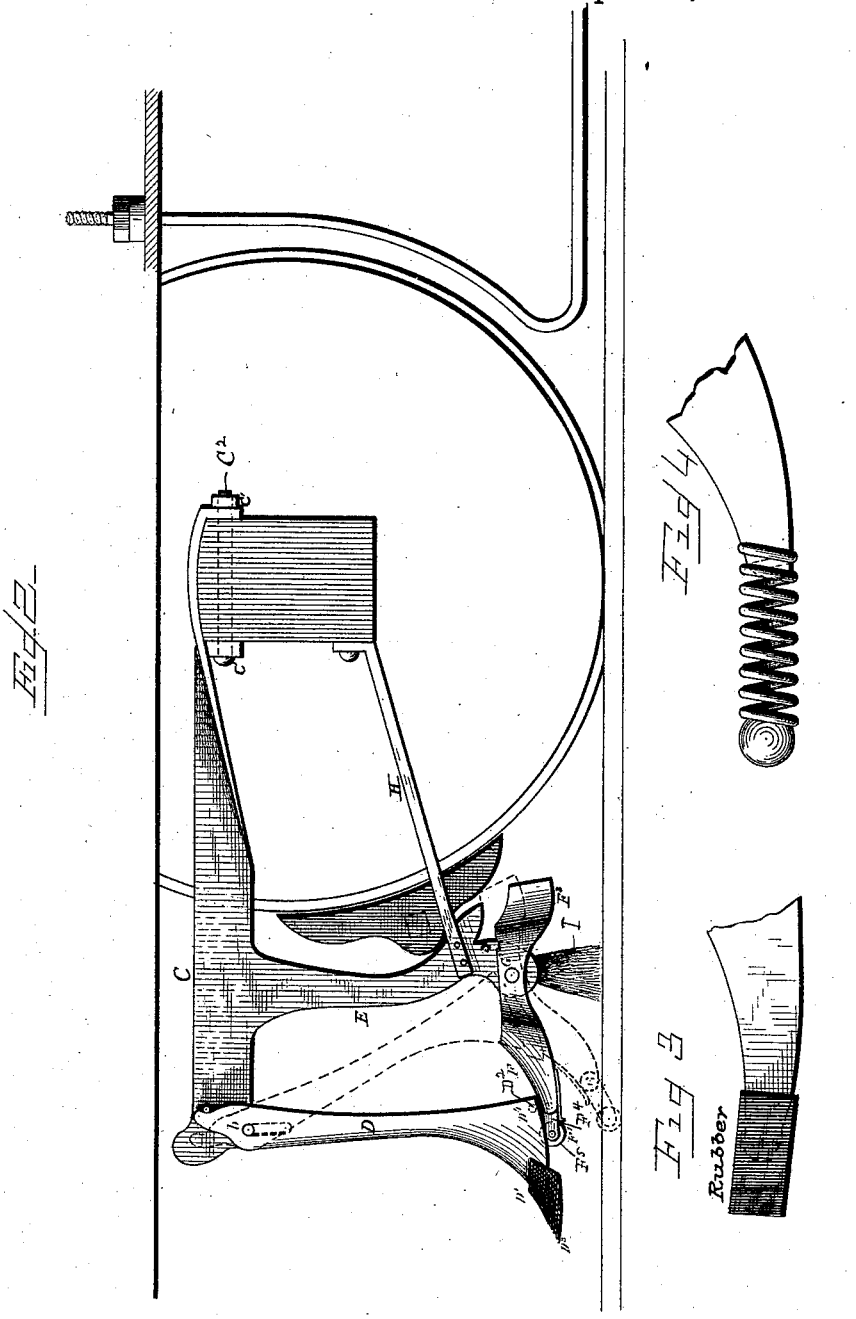

Fig 2

Fig 4

Fig 3

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UNITED STATES PATENT OFFICE.

CHARLES MAHON, OF WASHINGTON, DISTRICT OF COLUMBIA.

DEVICE FOR REMOVING OBSTRUCTIONS OR PREVENTING ACCIDENTS ON STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 381,881, dated April 24, 1888.

Application filed February 8, 1886. Renewed March 31, 1887. Serial No. 233,202. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MAHON, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Devices for Removing Obstructions or Preventing Accidents on Street-Railways, of which the following is a full and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that class of apparatus which is applied to tram-cars for removing obstructions accidentally thrown or dropped upon the track, or to prevent accident by running over human bodies or portions thereof. These devices as heretofore constructed or arranged, on account of the necessity of bringing the same in close proximity to the rail in attempting to accomplish the end, have either been made rigid or placed so far in advance of the wheel as to render them liable to breakage in coming in contact with fixed paving-stones in the yielding motion of the car in traveling over rough portions of the track, or wedging between it and the rail, or projecting out so far in turning curves as to strike similar fixed obstructions, or, where they have been made flexible or yielding, have not been sufficiently rigid when brought into operation to remove the obstacle.

The object of my invention is to overcome the difficulties heretofore experienced, and to provide means whereby the parts are adapted to yield sufficiently to prevent breakage, and at the same time to provide a firm and rigid device when brought into action, and to place the same in such close proximity with the tread of the wheel as to prevent the same projecting out beyond the rail in turning curves, while preventing the same from interfering with the action of the brake-shoes; and my invention consists in mounting in front of the wheels in a suitable frame or support a pivoted swinging arm arranged at such height from the rail as to be engaged by any object sufficiently large to need removal therefrom, and which will swing said arm backward into engagement with a pivoted shoe or point and act automatically to throw the same downward under the object to be removed and into near contact with that portion of the rail traversed by the flange of the wheel, and said parts being automatically locked at the proper point to form a rigid brace, serving both as a "pick-up" and "shove-off," as hereinafter explained and claimed.

It further consists in providing the pivoted shoe with a flexible yielding-point to permit the same, when thrown downward below the tread or riding-surface of the rail, to readily ride over projecting spike-heads or raised portions of the rail, as hereinafter claimed.

It further consists in providing the lower portion of the shoe-supporting arm with a brush formed of wires or twigs to remove small obstructions or to remove the hands or feet of children too small to engage the swinging arm or lever, and in certain details in the construction and arrangement of parts, all as hereinafter explained and claimed.

In the accompanying drawings, Figure 1 is a side view of a "double-ender" tram-car with my improvement applied. Fig. 2 is an enlarged view of the front portion of the frame of a car, showing the improved device when in its normal position, and in dotted lines the position the same assumes when removing an object from the track; and Figs. 3 and 4 show side views of modifications of the toe.

In the drawings a tram-car is shown provided with the most approved form of axle-box A, connected and moving in guideways B in the usual manner. To this box, upon its upper side and between the wheel and guideway, is secured a bar or brace, C, by means of suitable lugs or ears, C′, extending therefrom upon each side of the axle-box and being secured thereto by means of a through-bolt, C^2, extending through the axle-box, or by short bolts, as shall be found most desirable.

The bar or brace C extends forward and curving around the wheel to a point about an inch inside of the tread thereof, at which point it extends forward in the same plane with the flange or inner face of the wheel for a short distance in advance of the brake-shoes, at which point it is provided with a suitable perforation, *b*, hereinafter referred to. From this forward end is suspended an arm or pendulum, D, pivoted at *b*, made, by preference, in arching or **U** shape in cross section, beginning below its pivotal connection, expanding or widen-

ing toward its lower end, and curving forward to form a toe-piece, D′. The forward edge of this toe is provided with a further extension both forward and downward by the addition of a rubber-cloth collar, D^3, and the heel immediately in rear is provided with a horizontal cross-bar, journal, or roller, D^2, (extending between the inner walls thereof,) as may appear most advantageous. This pendulum arm is loosely pivoted to the brace C by means of a vertical slot in its upper end, in which the brace fits, and a bolt passing through perforations in the end of said arm and the perforation *b* in the brace C supports it. Midway between the swinging arm D and the brake-shoe a firmly-attached pendent arm, E, to the brace C curves downward in the same vertical plane in close proximity to and below the lowest part of the brake-shoe, as shown, to the lower end of which is secured a shoe, which will now be explained. This shoe F is formed with a curved forward face both transversely and longitudinally, having an enlarged central portion and having its forward portion extending to a point or toe, F′, hereinafter referred to. From the rear of the enlarged portion the shoe is contracted or flattened to form vertical side faces, said portion being slotted to receive the lower end of the pendent arm E, and to which it is pivoted by means of a bolt, G′, passing through the same and through a perforation in the lower end of the pendent arm. The end of this shoe in rear of the flattened portion is enlarged, as shown at F^3, to make the shoe of greater weight behind the pivot to throw the toe of the shoe upward, for a purpose hereinafter explained.

The forward or toe end of the shoe is slotted and has pivoted thereto a point, F^4, having a suitable vertical roller, F^5, mounted therein, said portions being connected together by a suitable knuckle-joint, or in any preferred way, being free to turn upward upon its pivot, but held from downward movement below its normal position by means of the inclined rear walls of the slot formed therein being engaged by the rear inclined wall of the point which moves therein. The motion of this toe in an upward direction is controlled by a flat spring extending from above or below the main body of the shoe, returning it to its normal position after leaping the head of a spike or end of a rail at a joint should either happen to be present at the moment of the removal of an object.

Fig. 4 represents a flexible toe composed of a metallic spring with a round or egg-shaped metal knob fastened into the forward end, preventing breakage against spike-heads, ends of rails, or when turning curves at the moment of removing an obstacle. Fig. 3 represents a toe tipped with rubber for preventing breakage under the same circumstances.

When the parts are in proper position, the swinging arm D will hang perpendicularly and the point or toe portion of the shoe F will rest out of sight in the lower end thereof against the small cross-bar D^2, being held in contact therewith by means of the rear weighted end and at right angles thereto.

The lower end of the rigid pendent arm E is braced by means of a bar, H, connected near its lower end and extending backward therefrom and connected to the lower inner corner of the axle-box.

The pendulum-arm D is prevented from swinging too far forward by means of a lug or projection formed or attached to the brace C coming in contact with the rear face thereof or engaging a notch formed at a suitable point near its upper end. The shoe is also prevented from being thrown too far downward by means of a similar device formed on the lower rear edge of the pendent arm E engaging a notch formed in the shoe in rear of the pivot.

The lower collar-rim of the pendent arm D hangs at such height from the rail as to prevent its being accidentally struck by any permanent portion of the track or street, but in such position as to be engaged by any object that would need removal from the track, and operates in the following manner:

When an object sufficiently large to need removal is on the track, it comes first in contact with the rubber collar of the pendent arm, and as the same is swung backward it throws the toe F′ of the shoe F downward by means of the bar D^2 riding over the forward curved face of the shoe, the relation of the parts being such and the curved face of the shoe being at such an inclination that the toe of the shoe will be thrown below the top surface of the rail before reaching the object, at which moment the cross-bar D^2 will have reached the upper edge of the curvature of the shoe, and while compelling the shoe to retain this position it will continue its course in a "dead-movement" until it comes in perfect contact with the instep of the shoe, as shown by the dotted lines, Fig. 2, when the two pieces will conjointly form a powerful lifting and shoving device for the purposes herein set forth. After the lever D and the shoe F combinedly have thrown the object from the track the former will quickly swing forward by the action of gravity to its normal position, and the latter will do likewise, but with less alacrity, to allow the former to clear the way. This is accomplished by the slight preponderance of the rear end of the shoe F in weight.

From the above description it will be readily seen that, while the parts are permitted to hang in place and are raised sufficiently above the rail to prevent them from being accidentally broken, at the same time, when brought into action, they form a rigid brace extending entirely down to and into engagement with the bed of the rail, preventing the wheel coming in contact with or running over any object accidentally dropped or dropping thereon.

To prevent accident or to remove small obstructions which would not engage the swinging arm nor sufficiently large to need the use of the same, I enlarge the lower end of the

rigid pendent arm and provide the same with suitable projecting flexible points, forming a brush, as shown at I, which points extend down in close proximity to the rail, and which, while yielding to any permanent or fixed point in the track, will brush off or remove small obstructions, or the hands or feet of a small child, in an effective manner.

By connecting the braces with the axle box it will be seen that the arm and shoe will always maintain their proper relation to the rails independent of the movements of the car-body.

While the form of the shoe and arm and the form of the pivoted point of the shoe herein described are thought to be the best, they may, however, be changed, as shall be found desirable or necessary, and the means for throwing the shoe up or down may be accomplished in a different manner; but such changes and modifications may be made without in any manner departing from the spirit or intent of my invention.

In the drawings, rods are seen suspended between the front and hind wheels in the planes of the flanges, curving near the wheels, and running parallel with the rails within two (2) or (3) inches, for the purpose of protection against the inside of the wheels. Objects falling between the wheels going in either direction fall thereon and are prevented from being run over. These rods, in combination with the parts already described, are necessary to make a perfect whole to accomplish the object of the invention.

What I claim as new is—

1. The combination, with a tram-car, of a pendent swinging arm and a pivoted shoe disconnected from each other and arranged in such relation to each other as to operate conjointly to remove obstruction from the track, as set forth.

2. In a tram-car, the combination of the forwardly-extending brace secured to the axle box, the pendent swinging arm, and a pivoted shoe secured to said brace, whereby said parts are held at a fixed relation to the track, as set forth.

3. In a tram-car, the pendent swinging arm, in combination with a pivoted weighted shoe, F, arranged in such relation to the arm as to be depressed thereby in the backward movement of the same, and to automatically return to its normal position by gravity when released from engagement with the arm, substantially as described.

4. The combination, with the pendent swinging arm having the bar arranged at its rear lower end, of the pivoted shoe having a curved forward face, adapted to be engaged by the bar to throw the same downward into engagement with the track, substantially as and for the purpose described.

5. In a tram-car, the combination of the brace extending forward from axle-box, having the swinging pendent arm connected thereto, the pendent rigid arm secured to said brace, and a pivoted shoe connected to the lower end of the rigid arm, substantially as described.

6. In a tram-car, the combination of the pivoted shoe having a flexible toe or point, with the pendent swinging arm operating in connection therewith, substantially as and for the purpose set forth.

7. In a tram-car, the combination of the forwardly-extending brace, the pendent swinging arm, the pivoted shoe, the rigid pendent arm, and the flexible points, secured to the lower end of the rigid pendent arm, substantially as and for the purpose set forth.

8. In a tram-car, the combination of the forwardly-extending brace, the pendent swinging arm, and the stop secured to the brace, for engaging the rear face of said arm, substantially as and for the purpose described.

9. In a tram-car, the combination of the forwardly-extending brace having the rigid pendent arm secured thereto, the pendent swinging arm, the pivoted shoe secured to the pendent arm, and the stop connected to the rigid pendent arm for limiting the downward movement of the shoe, and the backward movement of the pendent swinging arm, substantially as described.

10. In a tram-car, the combination of the forwardly-extending brace, the rigid pendent arm, the swinging arm, the pivoted shoe, and the rearwardly-extending brace secured to the lower end of the rigid arm and to the axle-box, substantially as and for the purpose set forth.

11. In a tram-car, the combination of the forwardly-extending brace having the rigid arm secured thereto, and the pendent swinging arm having the flexible or yielding collar, substantially as described.

12. In a tram-car, the combination of the forwardly-extending brace, the rigid pendent arm, and the pivoted shoe, with the rods suspended between the wheels, as and for the purpose set forth.

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Witnesses:
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