

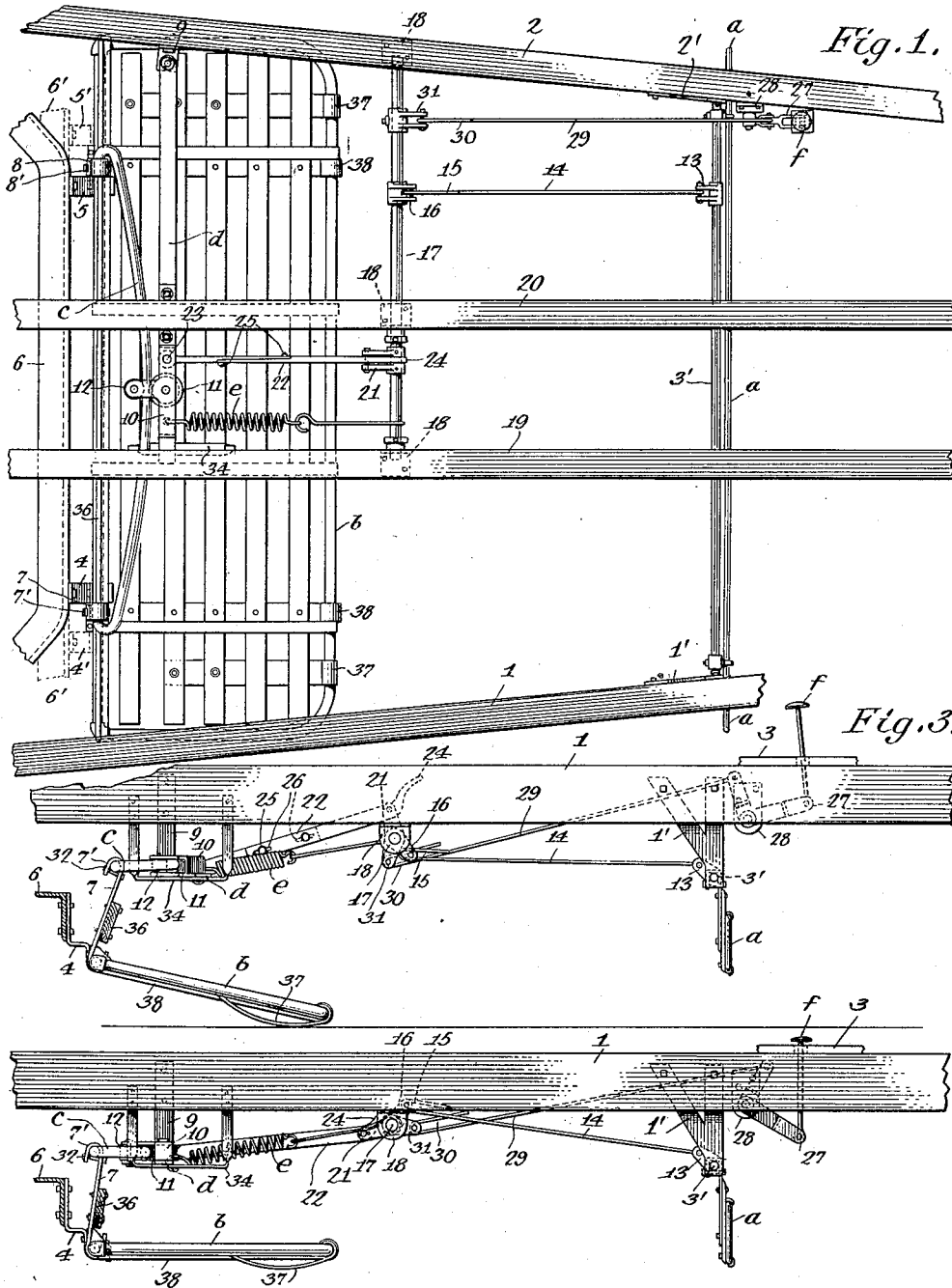
C. E. GIERDING.
AUTOMATIC WHEEL GUARD.

APPLICATION FILED MAY 12, 1910, RENEWED FEB. 2, 1912.

1,036,521.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.



Witnesses:
James S. Allen
Wm. Lamb

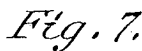
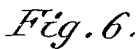
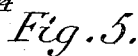
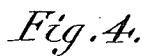
Fig. 2.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC WHEEL-GUARD.

1,036,521.

Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed May 12, 1910, Serial No. 560,926. Renewed February 2, 1912. Serial No. 675,095.

To all whom it may concern:

Be it known that I, CHARLES E. GIERDING, a citizen of the United States of America, and a resident of Belleville, in the State of New Jersey, have invented a new and useful Improvement in Automatic Wheel-Guards, of which the following is a specification.

This invention relates to those street-car fenders known as automatic wheel guards of the "trip and drop-scoop" type, and particularly to those in which the cradle or scoop is attached to the truck, where there is the minimum of oscillation, adapting the scoop to be carried as close to the track as the condition of the pavement will permit.

It relates especially to the adaptation of such wheelguards to cars having swiveled trucks, and to those cars in which it is impracticable to employ centrally located connections between the tripping gate and the drop scoop, owing to the obstruction of the space beneath the car platform by swinging draw bars and the like.

The present invention consists in certain novel combinations of parts, and in an improved automatic wheel guard embodying such combinations or any of them, all as hereinafter particularly described and claimed.

In previous specifications, forming part of United States Letters Patent No. 935,491 dated September 28, 1909, and an application for Patent filed February 6, 1909, Serial No. 476,475, I have set forth automatic wheelguards for swivel-truck street cars, having, as elements of each wheelguard, a curved bar hinged to arms carried by the scoop, and a central longitudinal locking bar, connected with said curved bar, normally locked against endwise movement and tripped by the gate to drop the scoop.

The leading objects of the present invention are to render it practicable to dispense with such central longitudinal locking bar, and, at the same time, to provide for normally supporting the scoop in its raised position and for instantaneously dropping the scoop when the gate is swung on its hinges; the supporting and tripping means being adapted for accommodation beneath the sills of cars on which it would be impracticable

to employ such central longitudinal connections.

Other objects will be set forth in the general description which follows.

Two sheets of drawings accompany this specification as part thereof.

Figure 1 is a top view of one species of the improved wheel-guard, and of adjoining portions of the sills and of one truck of a swiveled-truck street car, illustrating its attachment thereto; Fig. 2 is a side elevation projected from Fig. 1, showing the scoop up; Fig. 3 is a side elevation of the same parts, showing the scoop dropped; Fig. 4 is a partial side view on a larger scale, showing the movable parts in full lines, as in Fig. 2, and in dotted lines as in Fig. 3; Fig. 5 is a partial side view on the same scale as Fig. 4 showing a second species of the improved wheel-guard; Fig. 6 is a fragmentary view further illustrating said second species (Fig. 5); and Fig. 7 is a fragmentary top view mainly projected from Fig. 6.

Like reference characters refer to like parts in all the figures.

The principal parts of the improved wheel-guard are a tripping gate, *a*, hinged at its upper edge or top to the outermost car sills, 1 and 2, beneath the platform, 3, of the car body, by a pair of hinge-brackets, 1' and 2', interacting with a horizontal rock shaft, 3'; a cradle or drop scoop, *b* or *b*², hinged at its rear edge or back by a pair of hinge brackets, 4 and 5, to the frame, 6, of the adjoining car truck, the truck being of a swinging or swiveled type, and said scoop being provided with a pair of upwardly projecting lever arms, 7 and 8, near the respective sides of the truck; a curved bar, *c* or *c*², of round bar iron, known to some as a "radial bar," attached to or connected with the upper ends of said lever arms 7 and 8, the curve of said bar being an arc of a circle the center of which is the axis around which the truck turns on curves; and a horizontally swinging bar, *d* or *d*², known also as a "rocking lever," transverse with reference to the longitudinal axis of the car, which bar is loosely pivoted to a depending bracket, 9, bolted to said sill 2 at one side of the car, and carries or includes a bracket or yoke,

10, within which a pair of grooved wheels, 11 and 12, turn on vertical pins, to interact with said curved bar at midlength, as a frictionless push-and-pull connection, or
 5 anti-friction means effecting a sliding connection between said swinging bar and said curved bar.

The gate *a* is or may be of the construction set forth in said previous specification forming part of Letters Patent No. 935491,
 10 except that instead of a central tappet on the rock-shaft 3', the latter is provided at a convenient point with a short lever arm, 13, which projects upward at a suitable angle.
 15 From said lever-arm 13, a connecting rod, 14, having a lost-motion device in the form of an open loop, 15, extends to a lever-arm, 16, on a rock-shaft, 17, arranged parallel with
 20 said rock-shaft 3' of the gate *a*, and mounted in hangers, 18, bolted to said side sill 2 and to two middle sills, 19 and 20. See Fig. 1. Between said middle sills 19 and 20, said
 25 rockshaft 17 carries, at approximately right angles to said lever-arm 16, a lever-arm, 21, which interacts with one end of a toggle-strut, 22, the other end of which is connected by a loose pin-joint, 23, Fig. 1, to said
 30 swinging bar *d* or *d*². Normally the toggle formed by said strut 22 and arm 21 is self-locked, as shown in Fig. 2, in full lines in Fig. 4, and in Fig. 5; the upwardly bent
 35 front end, 24, of the strut, interacting with the rockshaft 17 as a stop or locking device; and, by the interaction of said strut 21—22, the swinging bar *d* or *d*², the curved bar *c* or *c*², and the arm 7 and 8 of the scoop *b* or *b*², the scoop is held in its normal or raised position as shown in Fig. 2, in full lines in said Fig. 4 and in Fig. 5.

40 When the gate *a* swings inward from the normal position in which the gate is shown both in Fig. 2 and Fig. 3, the rockshaft 3' with its lever-arm 13, the connecting rod 14—15, lever-arm 16, and rockshaft 17,
 45 transmit motion to the toggle arm 21 and strut 22, breaking the toggle upward by upwardly moving the pivot which connects the toggle members 21 and 22, until this pivot passes its locking position or plane, and per-
 50 mitting the scoop *b* or *b*² to drop, as represented in Fig. 3 and by dotted lines in Fig. 4. This final movement is effected by the gravity of the scoop supplemented by the tension of the spring *e*. To provide for vary-
 55 ing the height of the front edge of the scoop in its said normal or raised position, at will, to meet the requirements of different pavements, the toggle strut 22 is conveniently made in two parts united by a lap
 60 joint, with tap bolts, 25, Figs. 1 and 3, each of which passes through a longitudinal slot, 26, in one of the parts, into a tapped hole in the other part of the strut.

To overcome the inertia of the tripped
 65 scoop *b* or *b*² and to hold the free edge of

the scoop down in its dropped position (Fig. 3 and dotted lines in Fig. 4), a tensile spring, *e*, (Figs. 1—5) preferably of coiled rod steel, is stretched from the swinging bar *d* or *d*² to the rockshaft 17.

For raising the dropped scoop *b* or *b*²
 70 from the car platform, to reset the wheel-guard, suitable means operable by a man on the platform, preferably in the form of a foot plunger, *f*, Figs. 1, 2 and 3, at one side
 75 of the platform 3, is connected beneath the platform to one arm of a bell-crank lever, 27, which is conveniently pivoted to a bracket, 28, bolted to said side sill 2, and connected by a connecting rod, 29, having a
 80 lost-motion device, 30, preferably in the form of an open loop, to a lever-arm, 31, on the rockshaft 17. This lever-arm 31 projects downward when the scoop is dropped, as shown in Fig. 3 and in dotted lines in Fig. 4,
 85 and, when pulled by the depression of the treadle *f*, transmits resetting motion through said rockshaft 17, the toggle arm 21 and strut 22, and the swinging bar *d* or *d*² and curved bar *c* or *c*², to the lever arms 7 and 8
 90 of the scoop *b* or *b*², turning the scoop on its hinges at 4 and 5, and stretching the spring *e* until the toggle 21—22 is straightened, and its locking end 24 again interacts with the rockshaft 17, as in full lines in Fig. 4.

In the species represented by Figs. 1 to 4, inclusive, the curved bar *c* is connected with said lever-arms 7 and 8 of the scoop *b*, as in said previous specifications, by hinges, 7' and 8', having a horizontal axis; such
 100 hinges being preferably formed by providing the curved bar *c* with straight ends, and providing said lever-arms 7 and 8 with hook-shaped upper ends adapted to embrace
 105 said straight ends of the curved bar, and with bolts (32, Fig. 4) by which the accidental separation of the parts is prevented. The swinging bar *d*, correspondingly, is extended beneath both of the middle sills
 110 19—20; and its free end works in a bracket, 34, Figs. 1—2 and 4, bolted to said sill 19, to sustain the weight of said free end of the swinging bar *d* and its load, including that of the curved bar *c*, and to maintain the bar *c* in a horizontal plane as in Fig. 4.

In the species represented by Figs. 5 to 7, inclusive, said hinges 7' and 8' are omitted, and the curved bar *c*² is rigidly bolted to the upper ends of the lever arms 7 and 8 of the scoop *b*², being constructed with downturned
 120 and flattened ends (35, Fig. 5) for this purpose; and said bracket 34 (Fig. 4) is omitted so as to permit the free end of the swinging bar *d*² to accommodate itself to the angular movement of the rigid curved bar
 125 as shown by full and dotted lines in Fig. 6.

In both species, the scoop *b* or *b*² is adapted to be hinged directly to the frame 6 of the car truck by said hinge brackets 4 and 5; the customary pilot board 36 being bolted
 130

to said lever arms 7 and 8, so as to utilize to the utmost the length between the truck frame and the extremity of the car platform, or the space beneath the sills otherwise available, for the accommodation of the wheel-guard devices. Otherwise the scoop b or b^2 , in both species, is preferably and conveniently of the construction set forth in said previous specifications, except that it is preferably provided with runners, 37, distinct from the brace extensions or feet, 38, of the lever arms 7 and 8, and which are relatively light and resilient.

The dotted lines at 4', 5' and 6', Fig. 1, illustrate the attachment of the hinge brackets 4 and 5 to the end of a square-ended truck. The hinge brackets (4—5 or 4'—5') are in all cases bolted to the truck as wide apart as may be convenient, so as to render the scoop as steady as practicable in its raised position.

For the purposes of the present invention both the gate a and the scoop b or b^2 may be of any known or improved construction adapted to the mode of operation hereinbefore specified; and other like modifications will suggest themselves to those skilled in the art.

Having thus described said improvement, I claim as my invention and desire to patent under this specification:

1. The combination with a car body and swiveled truck frame, of a scoop pivotally supported by the truck frame, a curved bar connected with the scoop, a rocking lever pivotally supported from the car body, anti-friction means carried by the rocking lever and engaging said curved bar, means for normally holding said lever in position to hold the scoop elevated; and tripping means.

2. The combination with a car body and swiveled truck frame, of a scoop pivotally carried by the truck frame, and having upwardly extending arms, a curved bar carried by said arms, a lever pivotally supported from the car body, means effecting a sliding connection between said lever and said curved bar, a longitudinally movable locking bar connected at its rear end to said lever, means normally locking said movable bar against movement, and tripping means.

3. The combination with a car body and swiveled truck frame, of a scoop pivotally connected to the truck frame, a curved bar carried by the scoop, a lever pivotally supported from the car body and having a part engaging said curved bar with a sliding engagement, a longitudinally movable bar disposed at one side of the center of the car and connected at its rear end with said pivoted lever, locking means for holding said longitudinally movable bar against movement, tripping means for releasing said bar, a pivoted resetting lever carried by the car body, a device operable by a man on the car

platform and connections between said device and the resetting lever, said connections being also disposed at one side of the center of the car body.

4. In combination with a car body and its swiveled truck frame, a scoop pivotally supported from the truck frame and having upwardly extending arms at its rear edge, a curved bar connected with said arms, a lever pivotally connected to the car platform, a bracket carried by said lever, approximately centrally of the car body, and having a wheel acting on said curved bar, a longitudinally movable locking bar disposed at one side of the center of the car body and connected at its rear end to said lever, means for locking said bar normally against movement, a tripping means for tripping said bar, a resetting lever pivotally supported from the car body and having one end operably connected to said first named lever, a device operable by a man on the car platform, and connections between said device and the opposite end of the tripping lever.

5. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means interacting with said swinging bar and adapted to support the scoop in its raised position, and tripping means interacting with said locking means to drop the scoop.

6. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, and tripping means interacting with said strut to drop the scoop.

7. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, 130

a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, a tensile spring stretched from said swinging bar on the same side as said strut, and tripping means interacting with said strut to drop the scoop.

8. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar transverse with reference to the longitudinal axis of the car pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, a tensile spring stretched from said swinging bar on the same side as said strut, and tripping means including a rock shaft having a lever arm arranged to interact with said strut and another lever arm at right angles thereto, said strut being constructed with a locking end arranged to interact with said rock shaft.

9. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, a tensile spring stretched from said swinging bar on the same side as said strut, a rock shaft having a lever arm arranged to interact with said strut to trip the scoop and an oppositely projecting lever arm, and resetting means interacting with the lever arm last named.

10. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard compris-

ing a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, a tensile spring stretched from said swinging bar on the same side as said strut, a rock shaft having a lever arm arranged to interact with said strut to trip the scoop and an oppositely projecting lever arm, and resetting means interacting with the lever arm last named, said resetting means including a treadle on the car platform, a bell crank lever pivoted beneath the platform and operated by said treadle, and a connecting rod extending rearward from said bell crank lever and having a lost motion connection with said last named lever arm.

11. The combination with the sills of a street car and a swiveled truck beneath the same, of an automatic wheel guard comprising a drop scoop hinged to the truck and constructed with upwardly projecting arms, a bar connected to said arms and curved to an arc of a circle the center of which is the axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, pivoted beneath one of the side sills and constructed and arranged to interact with said curved bar at midlength, locking means including a toggle strut interacting with said swinging bar and adapted to support the scoop in its raised position, a tensile spring stretched from said swinging bar on the same side as said strut, a rock shaft having a lever arm arranged to interact with said strut and a tripping arm substantially at right angles thereto, said strut being constructed with a locking end arranged to interact with said rock shaft, and tripping means consisting of a swinging gate having as one of its hinge members a horizontal rock shaft provided with a lever arm projecting upward at a suitable angle and a connecting rod hinged to the last named lever arm and having a lost motion connection with said tripping arm of the rock shaft first named.

12. The combination, in an automatic wheel guard for swiveled car-trucks, of a drop scoop adapted to be hinged to the truck and constructed with upwardly projecting lever arms, a bar of round iron rigidly attached to said arms and curved to an arc of a circle, the center of which is the

axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, and provided with grooved wheels arranged
5 to interact with said curved bar at mid-length, means for loosely pivoting said swinging bar at one end beneath one of the outermost car sills, the other end of said swinging bar being free to rise and fall
10 with said curved bar, locking means interacting with said swinging bar and adapted to support the scoop in its raised position, and tripping means interacting with said locking means to drop the scoop.
15 13. The combination, in an automatic wheel guard for swiveled car-trucks, of a drop scoop adapted to be hinged to the truck and constructed with upwardly projecting lever arms, a bar of round iron
20 rigidly attached to said arms and curved to an arc of a circle the center of which is the

axis around which the truck turns, a horizontally swinging bar, transverse with reference to the longitudinal axis of the car, and provided with grooved wheels arranged
25 to interact with said curved bar at mid-length, means for loosely pivoting said swinging bar at one end beneath one of the outermost car sills, the other end of said swinging bar being free to rise and fall
30 with said curved bar, locking means interacting with said swinging bar and adapted to support the scoop in its raised position, tripping means interacting with said locking means to drop the scoop, and means in-
35 teracting with said swinging bar to reset the wheel guard, substantially as hereinbefore specified.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."