

No. 728,637.

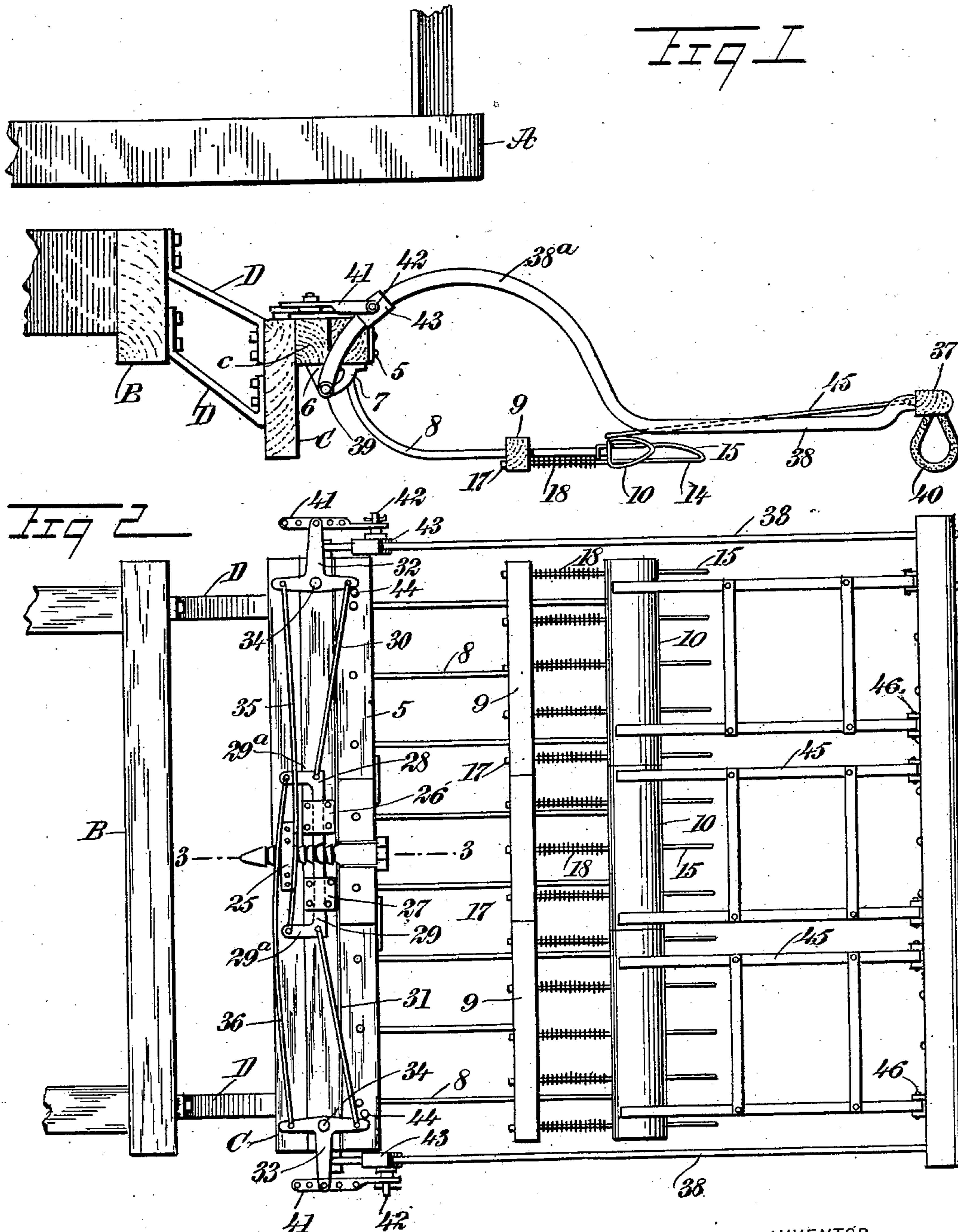
PATENTED MAY 19, 1903.

W. T. WATSON.  
AUTOMATIC WHEEL GUARD FOR TRAM CARS.

APPLICATION FILED DEC. 12, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

*W. Walker*  
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INVENTOR

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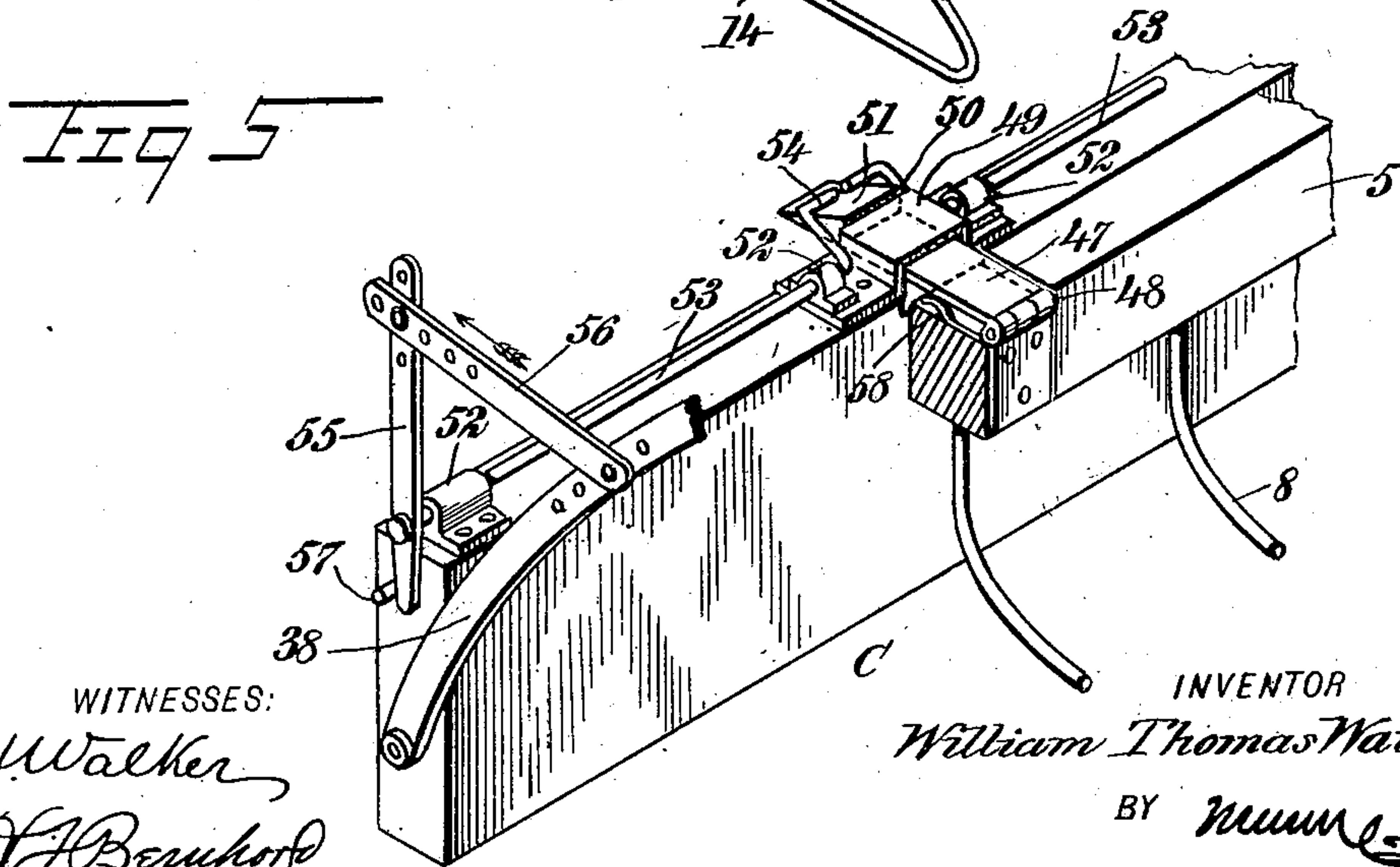
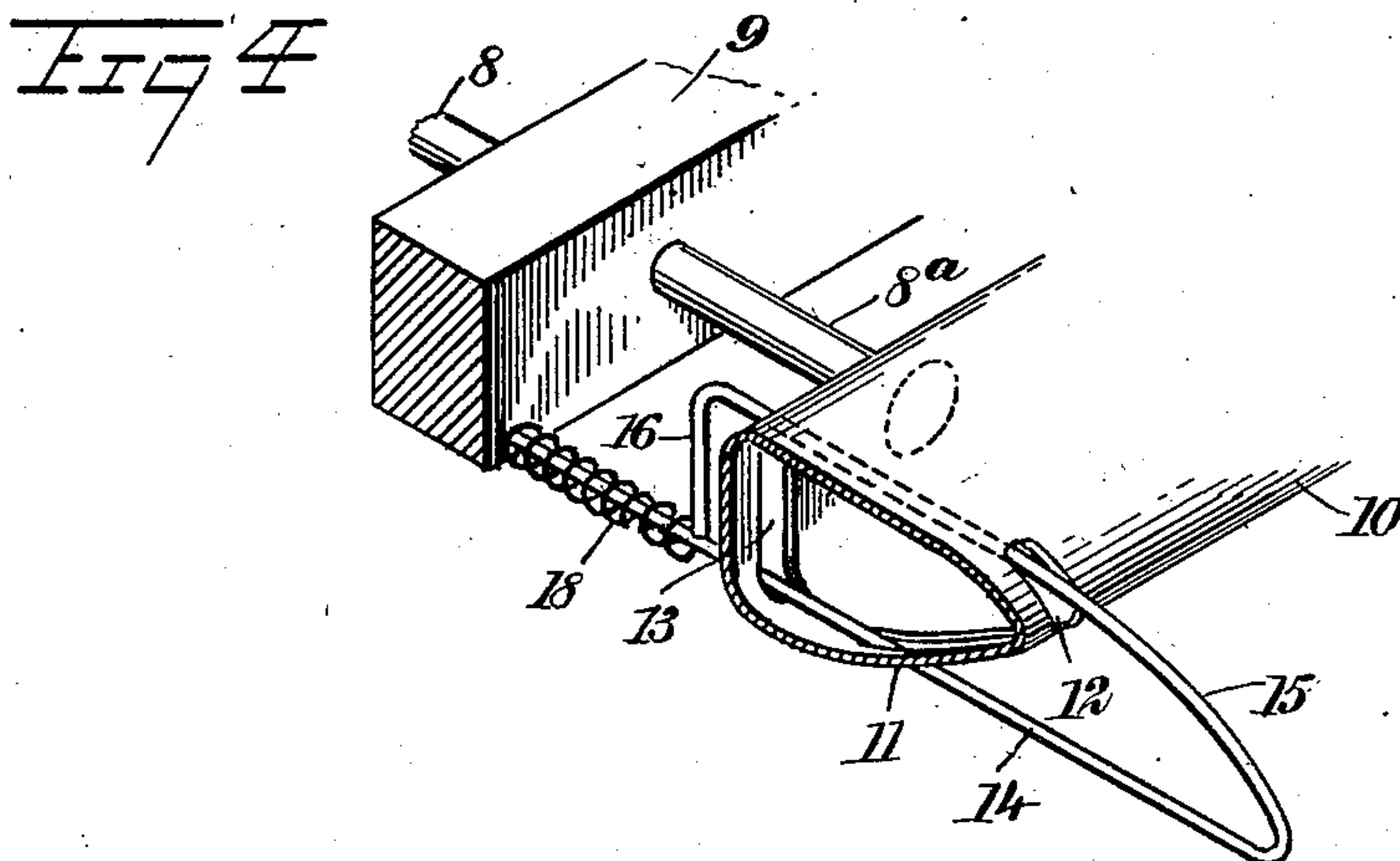
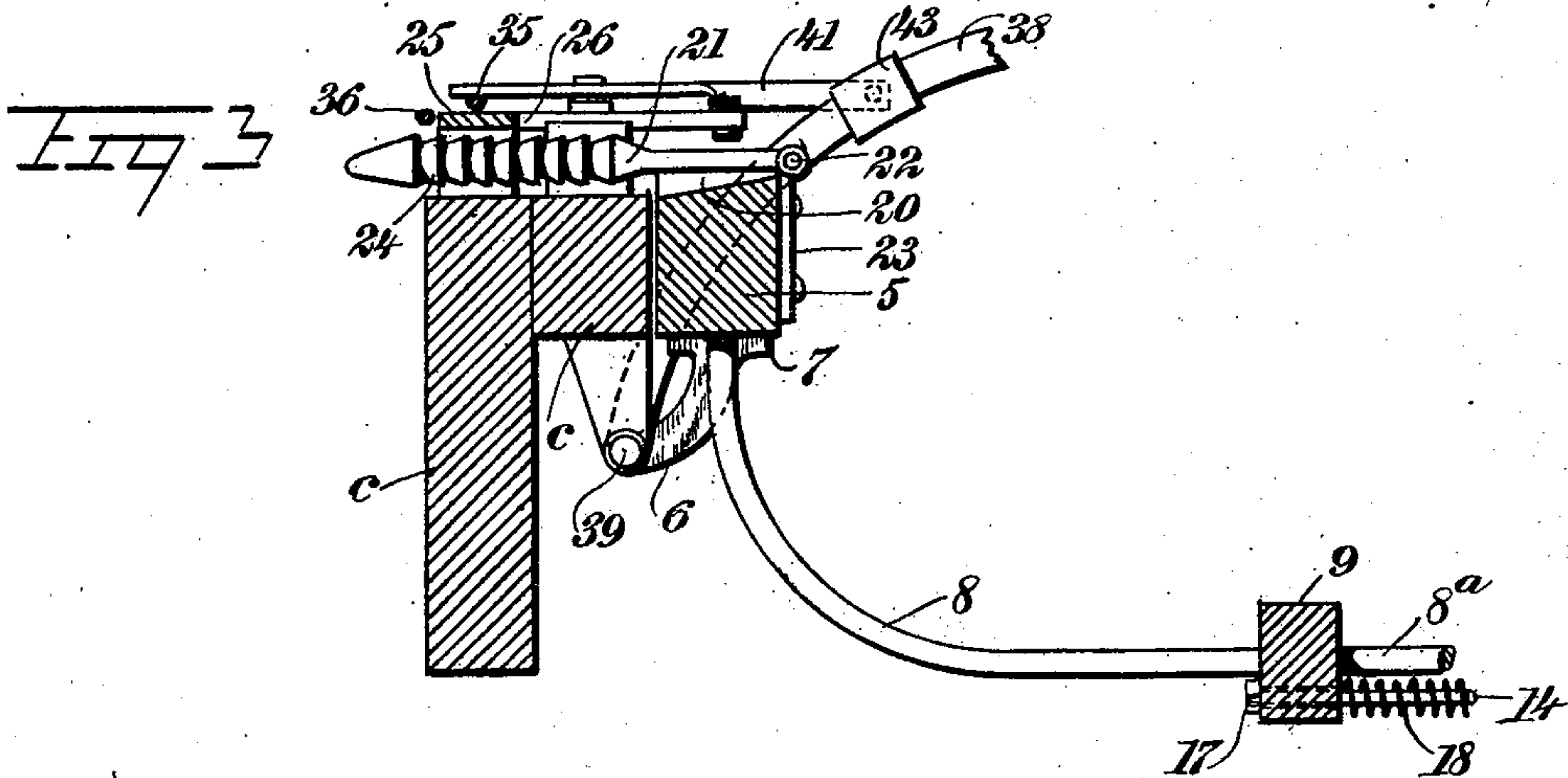
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BY *Wm. J. ...*  
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## UNITED STATES PATENT OFFICE.

WILLIAM THOMAS WATSON, OF VICTORIA, CANADA.

## AUTOMATIC WHEEL-GUARD FOR TRAM-CARS.

SPECIFICATION forming part of Letters Patent No. 728,637, dated May 19, 1903.

Application filed December 12, 1902. Serial No. 134,939. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM THOMAS WATSON, a subject of the King of Great Britain, and a resident of Victoria, in the Province of British Columbia and Dominion of Canada, have invented a new and Improved Automatic Wheel-Guard for Tram-Cars, of which the following is a full, clear, and exact description.

10 My invention relates to improvements in wheel-guards for tram-cars, such as cable railway and electric cars.

In this invention I aim to provide a wheel-guard which may be fitted to the pilot-board of any standard make of truck independently of the car-sill, which may be supported at any desired height from the track-rails, and which will turn with the car around a curve in the track, so as to lie at all times directly over the track-rails. I also seek to provide means for automatically tripping and dropping the wheel-guard when it meets with an obstruction in the path of a car, such tripping means being so constructed and arranged as to operate without interference by snow on the track.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

35 Figure 1 is a side elevation of an automatic wheel-guard constructed in accordance with my invention and showing a part of an ordinary tram-car. Fig. 2 is a plan view of the parts shown by Fig. 1. Fig. 3 is a longitudinal section taken in the plane of the dotted line 3 3 of Fig. 2. Fig. 4 is a detail perspective view showing a part of the guard removed from the car; and Fig. 5 is a perspective view, partly broken away and in section, of another embodiment of locking device for the guard.

45 A designates a part of a car-platform, B a part of a truck, and C is a pilot-board which is disposed in front of the truck and below the horizontal plane of the truck-beams, said pilot-board being rigidly fastened to one of the truck-beams by an intermediate bracket

or brackets D. These parts may be of any usual or preferred construction.

The automatic guard, the locking devices therefor, and the tripping mechanism associated with said guard are all supported or carried on the pilot-board, so that no part of my invention is connected with the car proper. The pilot-board is provided at its upper front side with a cross-beam c, which is secured 60 firmly to said board, and in front of this beam is disposed a horizontal carrying-bar 5, the same forming one part of the guard. This horizontal carrier-beam is connected with a part of the pilot-board in a way to drop or lower itself when released from the restraint of certain locking devices, and I prefer to hingedly connect said beam to depending brackets 6 by means of suitable arms 7. The brackets 6 are fastened to the under side of the beam c, 70 forming a part of the pilot-board, while the arms 7 are pivotally attached to said brackets in a way to allow the guard to drop or fall below the plane of the beam c. The carrier-beam 5 is provided with a series of downwardly and forwardly curved arms or rods 8, the front ends of which are fastened rigidly to a divided bar 9, said bar being shown by Fig. 2 as consisting of three members arranged in alinement with each other. The bar 9 is arranged in a horizontal position and in a plane 80 below the beam 5, and through said bar is extended the front ends of the arms or rods 8, as shown at 8<sup>a</sup> in the drawings. The extended ends of the arms or rods support a buffer 10, which preferably consists of a series of members disposed in alinement with each other, the said buffer being disposed in a horizontal plane and in front of the bar 9.

The buffer is shown by Fig. 4 as of hollow 90 construction and made by folding or doubling a piece of sheet metal upon itself to produce a rounded under side 11; but the detailed construction of the buffer is not material, because it may be made of wood instead of metal. This buffer is provided with slots 12 13 in its front and rear walls, and through the buffer passes a series of fingers. Each finger consists of a rod 14, having its front end doubled and curved to form the curved 100 guard portion 15, the rear end of this curved guard portion being carried downwardly at



16 and joined to the rod 14. The parts 14 15 of each finger are loosely received in the slots 12 13 of the hollow buffer; but the rod 14 is extended loosely through a suitable opening 5 provided in the bar 9, the rear end of said rod being screw-threaded and adapted to receive a nut 17. The rod of the finger is thus slidably mounted in the bar 9; but the finger is pressed forward to a projected normal 10 position by a coiled spring 18, the latter being fitted loosely on the rod 14 to have one end bear against the bar 9, while its other end bears against the vertical member 16 of the finger. It will be understood that a series of these fingers is employed in connection with the bar 9 and the buffer 10, said fingers being spaced a suitable distance apart and lying in the same horizontal plane with respect to the bar 9 and the buffer 10. The 20 fingers are yieldable endwise on encountering an obstruction in the path thereof, and they are free to slide through the slotted buffer and the perforations of the bar 9. The fingers are yieldable individually, and when one of said fingers encounters a rock or other small obstruction it will be pressed backwardly until the guard passes the obstruction; but if the series of fingers encounter the body of a person lying on the track the energy of the 30 series of springs is sufficient to prevent the backward movement of the series of fingers, whereby the guard is adapted to pick up a person. The buffer 10 serves to stay the slidable fingers against lateral displacement, and it also acts as a shelf in sustaining the weight 35 of the person picked up by the guard.

In connection with the guard which is arranged to drop by gravity I employ a suitable form of locking mechanism to sustain the 40 guard in a raised position, and in the drawings two forms of locking devices are disclosed. I will first describe the construction of locking device shown by Figs. 1, 2, and 3, in which the carrier-beam 5 is provided in 45 its upper side with a notch or recess 20. A locking-rod 21 is arranged to pass through this recess of the beam at the middle portion thereof, the front end of said rod being pivoted at 22 to a hinge-plate 23, which is secured firmly to the front edge of the beam 5. 50 This locking-rod is provided with a plurality of transverse grooves forming a series of annular ratchet-teeth 24, and said rod extends rearwardly from the hinge-plate 23 across the beam *c* and the pilot-board *C*. The rear portion of the locking-rod is loosely confined in a keeper 25, which is secured to the upper edge of the pilot-board.

The beam *c* is provided on opposite sides 60 of the keeper 25 with the guide-plates 26 27, and in these guide-plates are fitted the slidable dogs 28 29, respectively, said dogs being adapted to engage with the teeth 24 on opposite sides of the locking-rod 21. Each dog is 65 provided with a laterally-extended arm 29<sup>a</sup>, and to the dogs are pivoted the inner ends of the pull-rods 30 31, respectively. The outer

ends of these pull-rods are pivoted to the T-shaped levers 32 33, which are fulcrumed at 34 on the beam *c* near opposite ends thereof. 70 The lever 32, which is connected by the rod 30 to the dog 28, is also connected to the other dog 29 by a push-rod 35, and in like manner the lever 33, which is connected by the pull-rod 31 to the dog 29, has connection 75 through a push-rod 36 with the other dog 28, whereby each lever is connected by pull and push rods with the pair of locking-dogs 28 29.

The locking mechanism just described is 80 adapted to be released by trip devices which include a horizontal trip-bar 37. This bar is arranged in horizontal position a suitable distance in front of the guard-fingers, and near the end portions of the bar are secured 85 the front ends of the carrying-rods 38, said rods extending horizontally for a suitable distance and being curved or bowed upwardly, as at 38<sup>a</sup>. The rear end portions of these carrying-bars 38 extend across the end 90 portions of the beams *c* 5, and they are pivoted to the hanger-bracket 6 at 39. The trip-bar 37 is provided with a series of depending cushion-loops 40, the same being made of steel rods and covered with rubber 95 or other suitable material—leather, rubber, or any other material—and adapted to strike a person with a cushioned blow. The loops 40 of the series are spaced apart in order that they may pass easily through snow lying on 100 the car-track.

The carrying-bars 38 of the trip-bar 37 are connected with the levers 32 33 by the links 41, said links being pivotally and adjustably 105 connected to the outwardly-extending arms of the T-shaped levers. The links have their front ends fitted loosely on pivotal pins 42, which are carried by sleeves 43, that embrace the bowed portions 38<sup>a</sup> of the carrying-bars, said sleeves being clamped firmly and adjustably to said carrying-bars. The weight 110 of the trip-bar and the carrying-bars serves to normally hold the levers 32 33 in positions to maintain the locking-dogs 28 29 in engagement with the teeth of the locking-bar, thus dispensing with the use of springs to hold the 115 dogs in engagement with the bar; but the weight of the trip-bar and the carrying-rods is not imposed on the series of rods 30 31 35 36, because the levers 32 33 engage with stop pins or studs 44, which are secured to the beam 5 in the path of certain arms of said levers. 120

When the bar 37 or its loops 40 strike a person and pass over the body, the said bar 125 and its arms 38 are raised on the pivots 39. The levers 32 33 are turned by the links 41 to make the rods 30 31 pull the dogs 28 29 from engagement with the locking-bar; but if the trip-bar is twisted by striking at one 130 end against a person the push-rods 35 36 are operated by the levers to withdraw the dogs, thus promoting the efficiency of the trip devices. When the dogs are free from the lock-



ing-bar, the weight of the guard causes it to drop, said guard swinging on the pivot afforded by the hinged connection between the arms 7 and the hanger-bracket 6. The bar 5 9, the buffer 10, and the series of fingers are thus lowered into close relation to the track, and a person will thus be picked up by the guard, so as to overcome any possibility of the wheels passing over the body. The improved guard may be used in connection with a fender of any pattern, and it is adapted to be supported on the pilot-board of any style of truck.

The trip-bar 37 supports a series of slatted frames 45, which are hinged or pivoted thereto, as at 46, while the rear ends of said frames rest on the buffer 10, as shown by Figs. 1 and 2. These frames serve to prevent a person from rolling off the guard when picked up thereby, and they are free to yield or give in an upward direction to permit the person to pass onto the guard. The trip-bar 37 does not touch the ground at any time, and it is always in readiness for resetting. The fingers of the guard are tapered, so that the guard has a downward pressure in taking up a person. The parts are simple in construction and are readily interchangeable. The curved portions 38 of the carrying-bar for the trip are adapted to clear snow on the track.

The locking device shown by Fig. 5 contemplates the employment of a locking member 47, which has a hinged connection at 48 to the guard-beam 5, and this locking-plate is loosely confined in a keeper 49, that is secured rigidly to the upper edge of the pilot-board C. The rear part of the locking member or bar 47 is enlarged to form a ledge or shoulder 50 and an inclined face 51. The pilot-board is provided at its top edge with shaft-bearings 52, in which are journaled horizontal rock-shafts 53, which are provided at their inner ends with cranks 54, arranged to bear on the inclined face of the locking member. The rock-shafts are provided at their outer ends with levers 55, which are connected by links 56 with the carrying-arms 38 of the trip-bar, and the lower ends of these levers 55 are adapted to engage with stop-pins or studs 57, which are fixed to the pilot-board in the path of said levers to take up the weight or strain of the trip-bar and its arms 38. The locking member 47 is normally held in a raised position by a spring 58, that lies on the beam 5 and engages with the under side of the member 47 to hold the latter in a raised position, wherein its shoulder 50 will engage with the keeper 49 to prevent the bar 5 and the guard from dropping. On the elevation of the trip-bar 37 the arms 38 will be raised and the links 56 will actuate the levers 55 to rock the shafts 53, whereby the cranks 54 will depress the locking member 47 to a position where its shoulder 50 will clear the keeper 49, thus allowing the bar 5 and the guard to drop, while the locking member will be drawn through the keeper.

After the guard shall have been dropped the parts may be readily reset by raising the bar 5 and adjusting the locking member 47 70 or 21 into position for engagement by the trip-actuated devices.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a device of the class described, the combination with a pilot-board, of a guard, a locking device therefor, a horizontal trip-bar disposed in advance of the guard and having rearwardly and upwardly curved arms pivoted to the pilot-board, and connections between said pivoted arms and the locking device to release the latter and allow the guard to drop by gravity.

2. In a device of the class described, the combination with a guard, of a trip-bar disposed in front of the guard and above the horizontal plane of the same, and a series of buffer-loops depending from the trip-bar and lying in the plane of the guard, a locking device for said guard, and connections between said trip-bar and said locking device to release the latter.

3. In a device of the class described, the combination with a pilot-board, of a bar hinged to the pilot-board, a gravity-guard carried by said hinged bar, a keeper on the pilot-board, a locking member pivoted to the hinged bar and fitted slidably on the keeper, other locking members to engage with said slidable member, and trip devices to withdraw the second-named locking members from engagement with the slidable locking member.

4. The combination with a pilot-board, of a guard having a member hinged to said pilot-board, a locking device for said guard, a trip having arms hinged to said pilot-board, and connections between said arms of the trip and the locking device.

5. In a device of the class described, the combination with a pilot-board, of a carrying-bar hinged to said pilot-board, another bar fastened to the carrying-bar, and a series of yieldable fingers attached to the last-mentioned bar.

6. In a device of the class described, the combination with a carrying-bar, of a series of tapering fingers fitted slidably to said bar, means to hold said fingers in a projected position, and a buffer-bar loosely fitted on said fingers and holding them in spaced relation.

7. In a device of the class described, a guard having a carrying-bar, a series of fingers yieldably connected therewith, and a buffer-bar loosely fitted on said fingers and arranged in advance of the carrying-bar.

8. In a device of the class described, a guard having a bar, a series of tapering fingers slidably connected to said bar, a buffer through which the fingers are free to slide, and springs to hold the fingers in projected positions.

9. In a device of the class described, a



guard consisting of a bar, a slotted buffer disposed in advance of the bar, a series of tapering fingers fitted loosely in the buffer and the bar, and springs to normally project the fingers to their operative positions.

10. In a device of the class described, the combination with a pilot-board, of a carrying-bar hinged thereto, a guard attached to the carrying-bar, a locking member attached to the carrying-bar, a trip-bar having rods hinged to the pilot-board, and connections between said arms of the trip-bar and the locking-bar.

11. In a device of the class described, the combination with a pilot-board, of a carrying-bar hinged thereto, a guard attached to the carrying-bar, a locking member attached to

the carrying-bar and engaging with a part on the pilot-board, a trip-bar having arms hinged to the pilot-board, and devices actuated by said arms to release the locking-bar.

12. In a device of the class described, the combination of a guard, and a trip-bar, of slatted frames movably connected to the trip-bar and arranged to rest on a part of said guard.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM THOMAS WATSON.

Witnesses:

BENJ. A. HUNTER,  
W. BOWNASS.