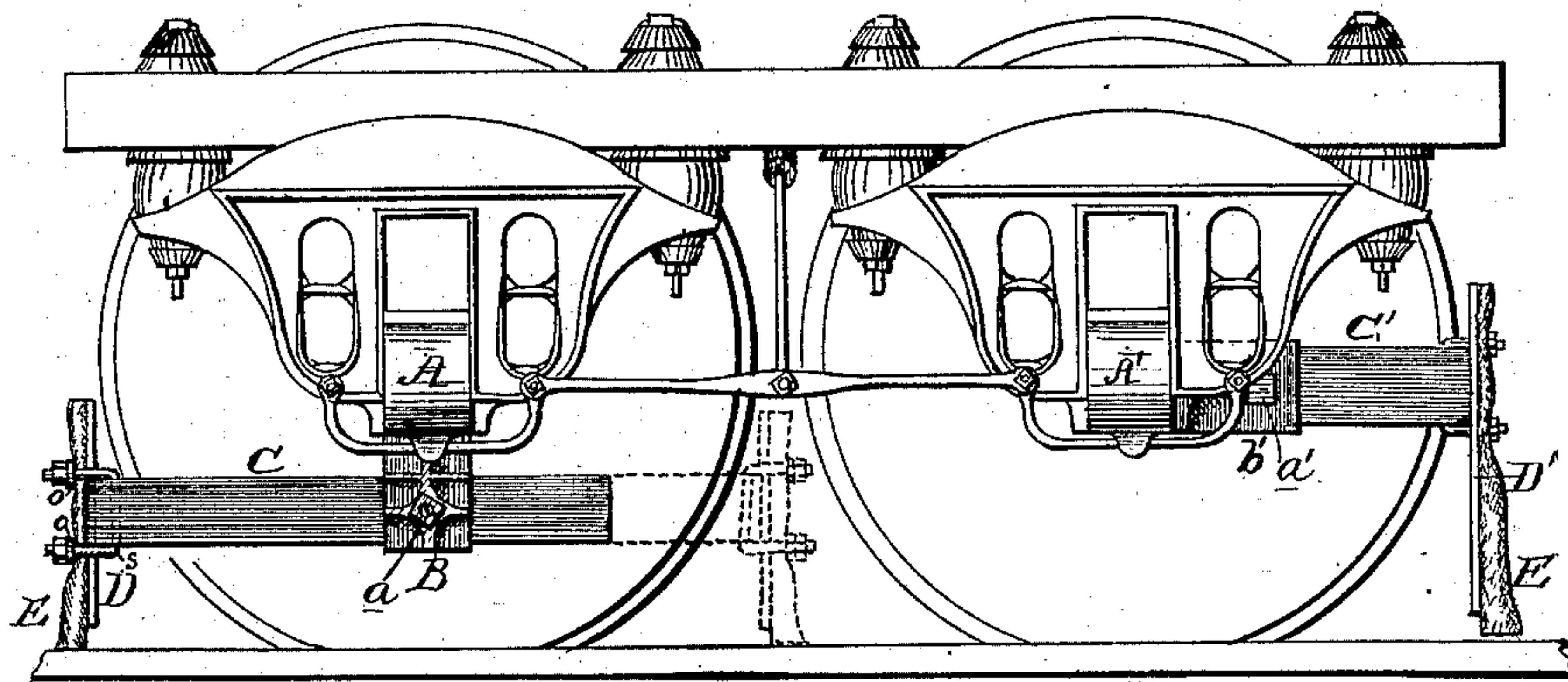
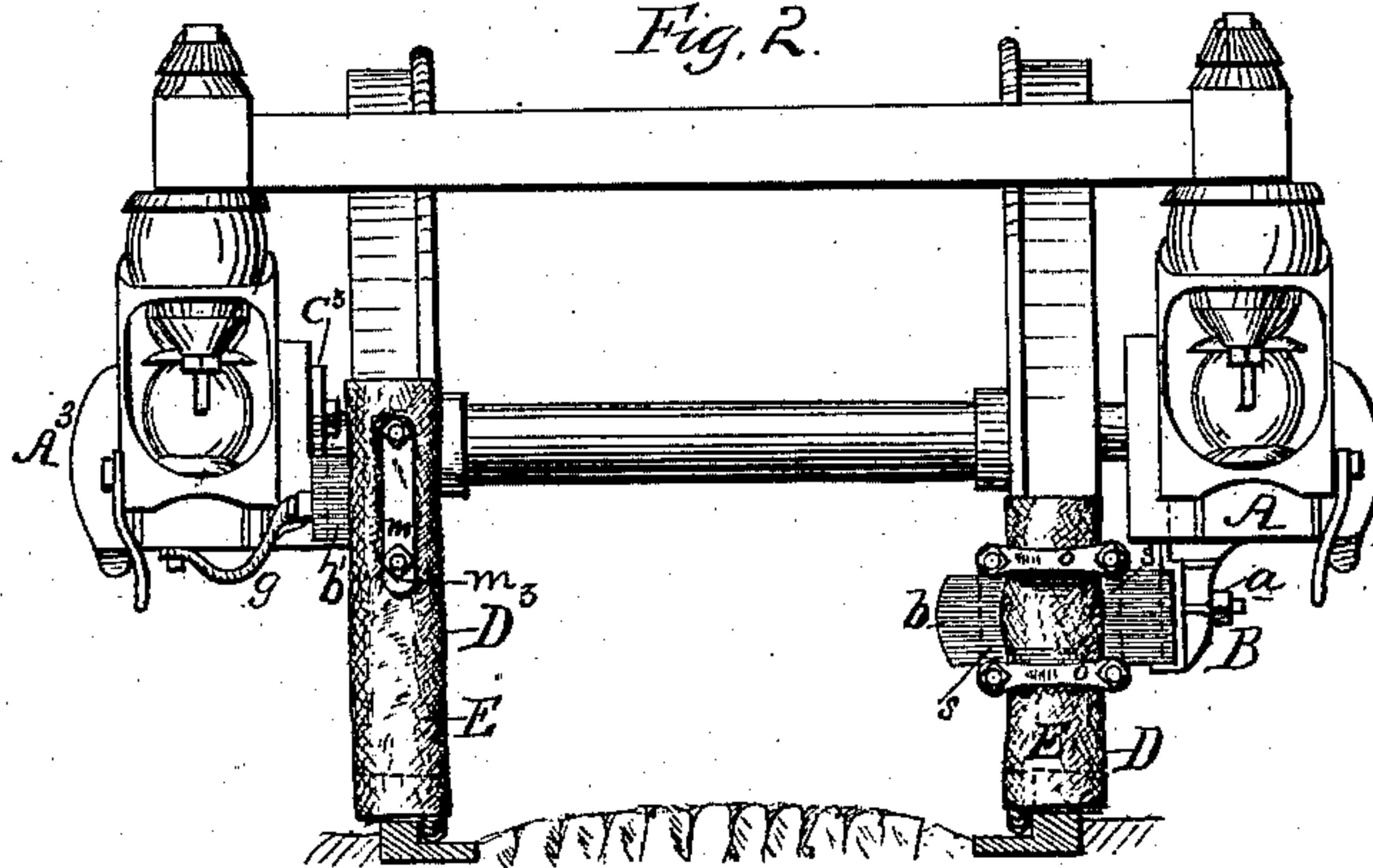


J. STEPHENSON.  
Life Guard or Wheel Guard for Street Cars.  
No. 238,258.                      Patented March 1, 1881.

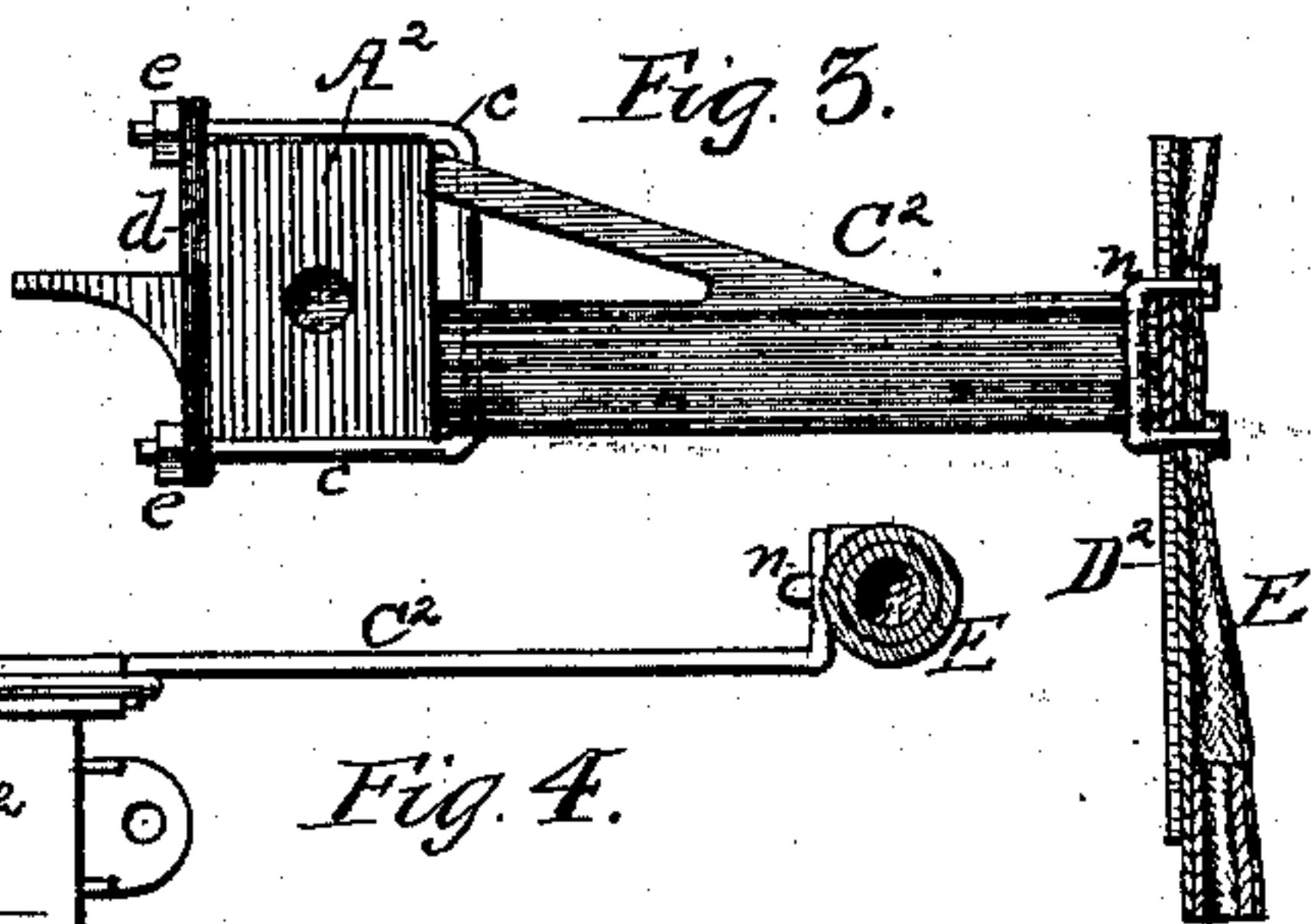
*Fig. 1.*



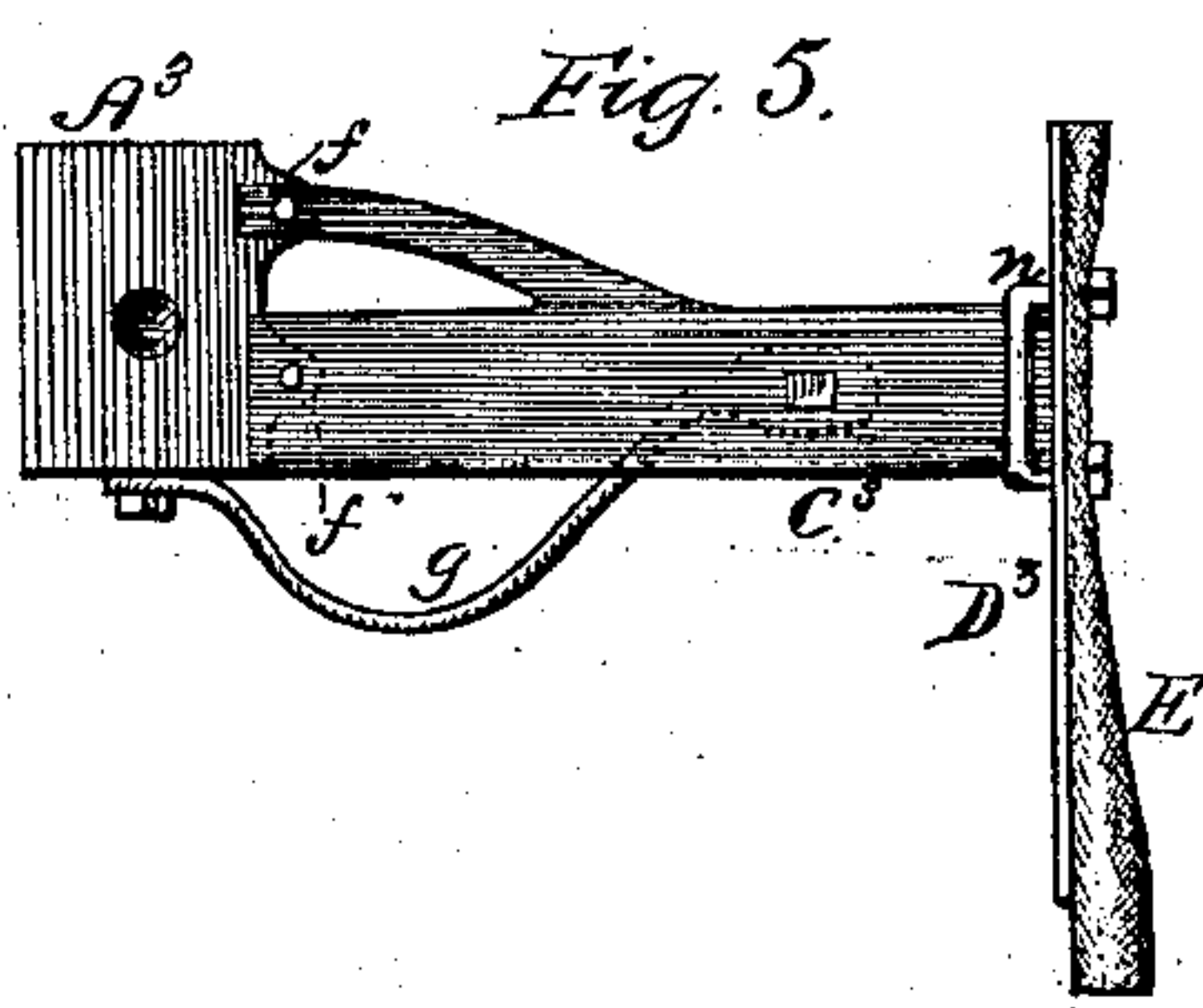
*Fig. 2.*



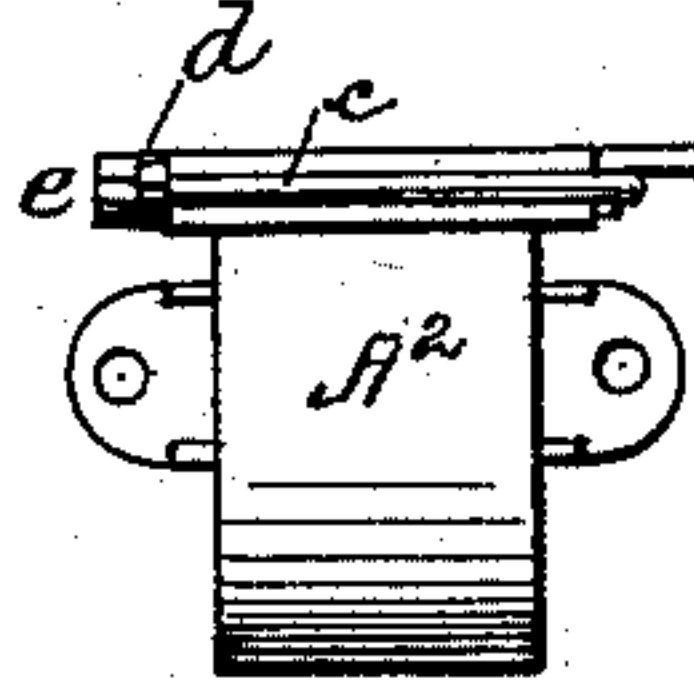
*Fig. 3.*



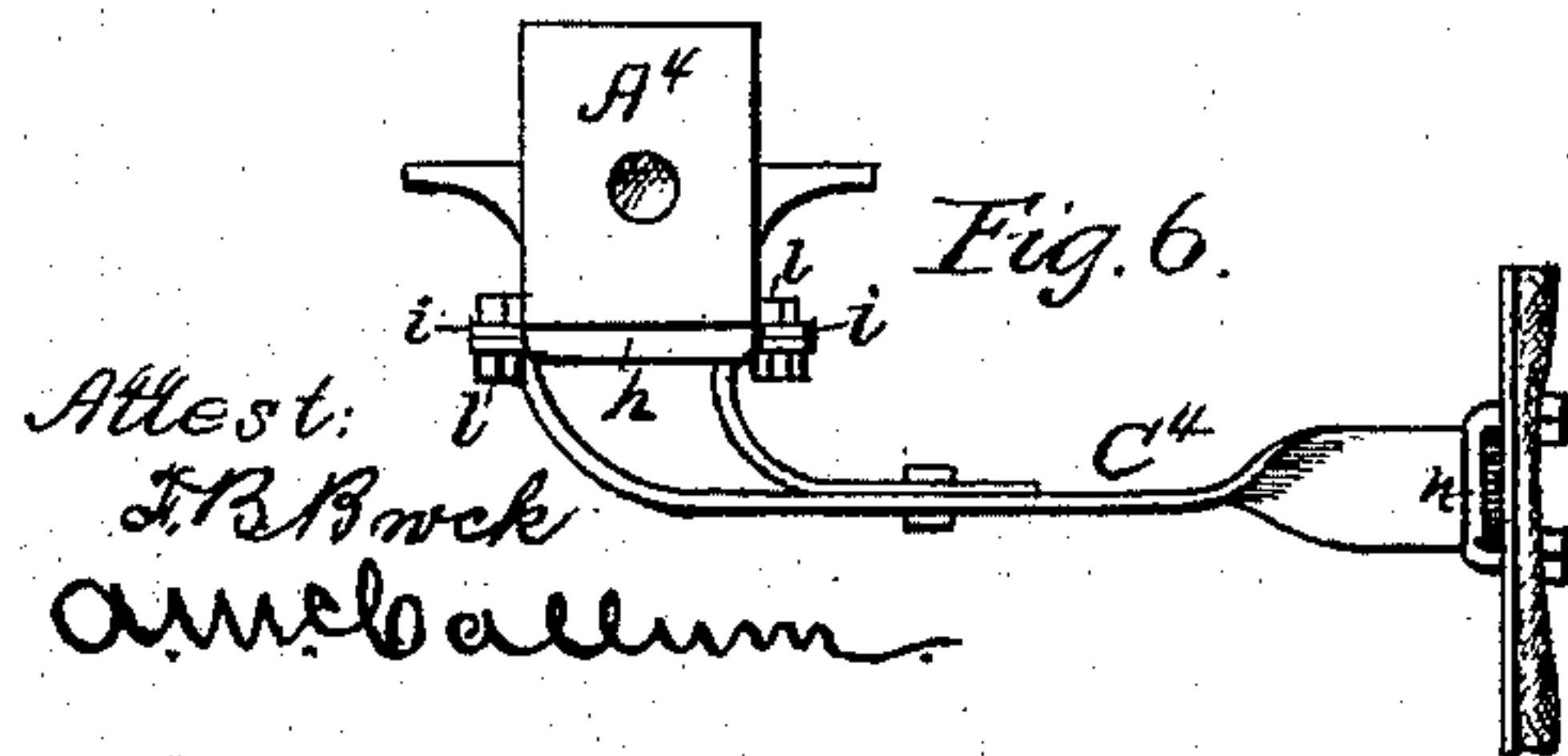
*Fig. 5.*



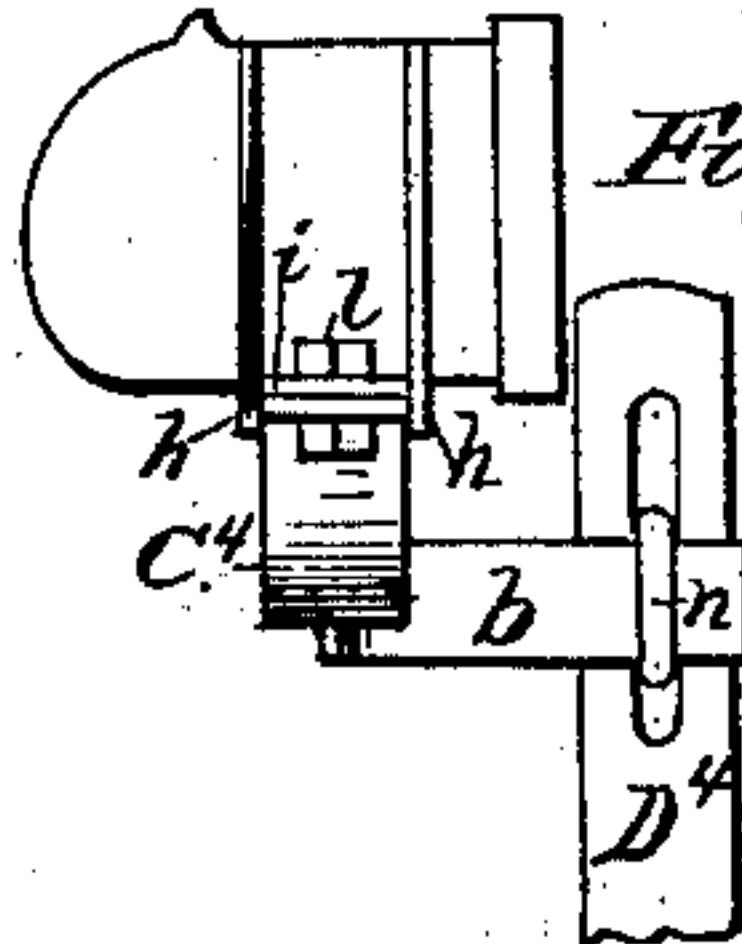
*Fig. 4.*



*Fig. 6.*



*Fig. 7.*



Inventor:

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# UNITED STATES PATENT OFFICE.

JOHN STEPHENSON, OF NEW YORK, N. Y.

## LIFE-GUARD OR WHEEL-GUARD FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 238,258, dated March 1, 1881.

Application filed November 15, 1879.

*To all whom it may concern:*

Be it known that I, JOHN STEPHENSON, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Life-Guards or Wheel-Guards, &c., for Street-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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 represents a side elevation of the running-gear and sill of a car to which my improvements have been applied, and Fig. 2 an end elevation of the same. Figs. 3 and 4 represent detail views of another form of my improvement, being a side elevation of the axle-box and arm from the side next the wheel, and a bottom view of the same. Fig. 5 represents a similar side elevation, taken from the same side, of another mode of attaching the arm to the axle-box. Fig. 6 represents a similar view of another form, and Fig. 7 an end view of the same.

The large and increasing use of coupé-cars gives a special importance to devices insuring greater personal safety.

The use of my life-guard, for which an application for Letters Patent has heretofore been filed and is now pending, has demonstrated its great utility and suggested my present improvements.

The construction of the car and the running-gear may be of the usual form.

The guard before the wheel has heretofore been held in position by an arm attached to the axle-box; but it has been found difficult to secure the arm firmly and with sufficient stiffness to positively hold the guard before the face of the wheel. Another practical difficulty arises from the destruction and derangement of the guard caused by the depression of the rails, elevation of pavements, and projection of switches, curves, and other parts of the tramway-plant.

The object of my invention is to remedy these difficulties; and it consists, first, in a certain new and improved mode of securing the

arm which supports the guards to the axle-box, and, secondly, in a new and improved mode of constructing and applying the life-guard in front of the wheels.

To enable others skilled in the art to make, construct, and use my invention, I will now proceed to describe it in detail, omitting such parts of the running-gear of a car as are old and common to the art.

In the drawings, Fig. 1, are represented two different styles of securing the arm and life-guard to the axle-box. In the form shown at left-hand side the axle-box A is provided with a pendant, B, formed on its under side. The inner face of this pendant is provided with a recess, into which is fitted the arm C, which supports the life-guard D. The arm C is secured to the pendant B by means of a screw-bolt, *a*. The outer end of arm C is bent so as to project over the front or face of the wheel, and it is to this bent portion *b* that the life-guard D is secured. The recess formed in the pendant B gives great vertical rigidity and stiffness to the supporting-arm C and to the life-guard. Guard D, at its lower end, should not exceed in width the face of the wheel, because the paving-stones, cross-walks, and other obstructions would otherwise break, derange, and destroy any unyielding device which projected beyond the face of the wheel.

Where it is deemed desirable to protect the rear face of the wheel, the arm C may be made of a length sufficient to bend around and project in front of the rear face of the wheel, and a life-guard applied thereto in the same manner as the guard in front.

The peculiar construction and mode of applying and securing the life-guard D to the arm C will be more particularly referred to and described hereinafter.

On the right-hand side, Fig. 1, the arm C' is represented as being rigidly secured to the axle-box by means of a lateral arm or projection, *b'*, formed on said box, arm C' for this purpose fitting into a recess formed in said arm *b'*, the two being then secured and fastened together by a screw-bolt, *a'*. The arm C' is bent around in front of the face of the wheel and carries a life-guard, D', in a manner similar to the guard D, just described.

In Figs. 3 and 4 the arm C<sup>2</sup>, which carries



the guard  $D^2$ , is rigidly secured to the axle-box  $A^2$  by having its end bent squarely round and then clamped to the box by means of a clip,  $c$ , having screw-threads formed on each end, over which is placed a connecting-bar,  $d$ , and the whole then firmly clamped to the axle-box by screw-nuts  $e$ .

In Fig. 5 the axle-box  $A^3$  is provided with a lateral projection or projections,  $f$ , to which the arm  $C^3$ , which supports the guard  $D^3$ , is secured by screw-bolts or other suitable device. In this figure is shown a side brace,  $g$ , one end of which is secured to the under side of the axle-box and the other to the forward end of arm  $C^3$ , in order to give lateral rigidity to the same. This brace may be applied for the same purpose to each of the other arms, heretofore described, for the support of the life-guard.

In Figs. 6 and 7 the arm  $C^4$  is represented as being secured to the under side of the axle-box. For this purpose the under side of the axle-box is formed with a lug or projection,  $i$ , at each side, and with two flanges,  $h$ , which form a recess for the reception and lateral support of the arm  $C^4$ . The arm  $C^4$ , at its rear end, is formed of two parts secured or bolted together at or near the outer end of the upper part. The ends of these parts are bent around in opposite directions, and through these bent parts are passed the screw-bolts  $l$ , which secure them, through the lugs  $i$ , to the axle-box. The forward end of arm  $C^4$  is given a quarter-turn, and is then bent squarely round in front of the face of the wheel, and to this bent end is secured, in a manner similar to the others, a life-guard,  $D^4$ .

In making all of these arms  $C^1$ ,  $C^2$ ,  $C^3$ , and  $C^4$ , I prefer to make them of steel, so that in case of the life-guards being brought in contact with some heavy or immovable obstruction, they may be made to yield and pass without breaking.

The life-guard consists of a plate of metal, preferably of steel, of a width at its lower end not greater than the width of the face of the wheel. It may be secured to the arm  $C$  in any suitable way; but I prefer to secure it so that I may have both vertical and lateral adjustment. For this purpose a slot is cut in the upper end of the guard  $D$ , through which a clip,  $n$ , is passed, and the guard adjusted to the position required upon the arm  $C$ , as well laterally as vertically, after which a connecting-bar,  $m$ , having openings in each end, is placed over the ends of the clip  $n$ , and the whole then screwed up tightly together by means of nuts on the screw-threaded ends of said clip  $n$ . (See Fig. 2.)

In practice I prefer to face the life-guard with a substance having sufficient flexibility, as stiff rubber—fire-hose answers well—which will wriggle out of position when brought, as in the case of cars running off the track, in contact with the pavement, rails, &c., but which, when released, will recover. For this purpose I prefer to keep the metallic guard  $D$  from two

to three inches above the rail, the rubber facing  $E$  projecting below. This auxiliary guard or facing  $E$  has further value, in forming a pad or cushion less hurtful when brought in contact with a fallen person. The same clip,  $n$ , which secures the life-guard  $D$  to the arm  $C$  also secures the facing  $E$  to guard  $D$ .

Another mode of securing the life-guard  $D$  to the arm  $C$  is shown in Figs. 1 and 2, where, in two clips,  $s$ , are used, one on each side of the guard  $D$ , the ends of which are connected by cross-bars  $o$ , passing over the rubber facing  $E$ , the whole being then secured together by nuts on the threaded ends of the clips  $s$ . By this mode, as in the other, of securing the life-guard to the bent end of the arm which carries it, the guard may be adjusted both vertically and laterally upon the arm. The object of having lateral adjustment of the guards is to adapt it to the variation in the gage of different tracks, so that the guards may stand directly over the rails.

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

1. A car-axle box provided with a flanged seat at its under side, for receiving and holding in position a guard-arm, substantially as described.

2. A car-axle-box shell having a socket portion projecting from its walls for holding a guard-arm, the socket extending four inches (more or less) from the shell, and with a flange at each side of the socket, for receiving an arm with similar conformation, to prevent its slipping or swerving, as and for the purpose described.

3. A tram-car with a life-guard before the wheel, the guard being carried by an arm attached to the under side of the axle-box and located between two flanges or ridges, substantially as described.

4. A tram-car with an adjustable guard before the wheel, the guard being carried by an arm in an angular socket or recess of the axle-box, which holds the guard-arm in a fixed relation thereto, as and for the purposes set forth.

5. A tram-car having a life-guard before the wheel, carried by an arm supported by a pendant from the axle-box, the arm being retained in position by a flange at each edge of the arm, and secured as and for the purposes described.

6. A tram-car having before the wheel a vertical guard carried by an arm supported by a limb of the axle-box, the guard being capable of lateral or vertical adjustment.

7. A tram-car with a guard before the wheel, held by an arm supported by the axle-box, the guard being padded in front with rubber or any other compressible material, and both guard and pad being capable of vertical and lateral adjustment, as and for the purpose described.

8. A tram-car having an arm attached to the axle-box and carrying before the wheel a



vertical guard, from which arm or guard extends a stay or brace secured to the axle-box, substantially as described.

9. A tram-car with a pendant to the axle-box, holding a guard-arm extending both ways from the axle-box, and holding a guard before and after the wheel.

10. A car-axle-box shell having projecting from its walls a limb, (four inches, more or less,) said limb having an angular socket or recess,

to receive and hold in fixed relation thereto a guard-arm, as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of November, 1879.

JOHN STEPHENSON.

Witnesses:

LEANDER M. DE LA MATER,  
AUGUST RIPPERGER.