

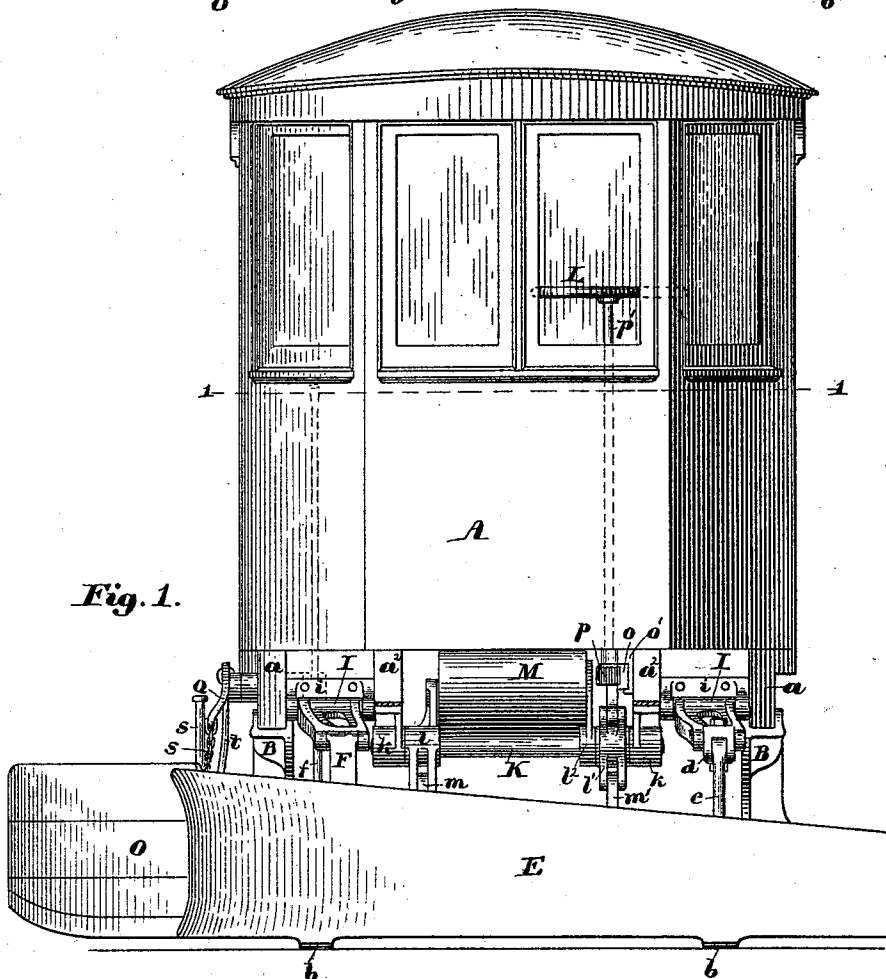
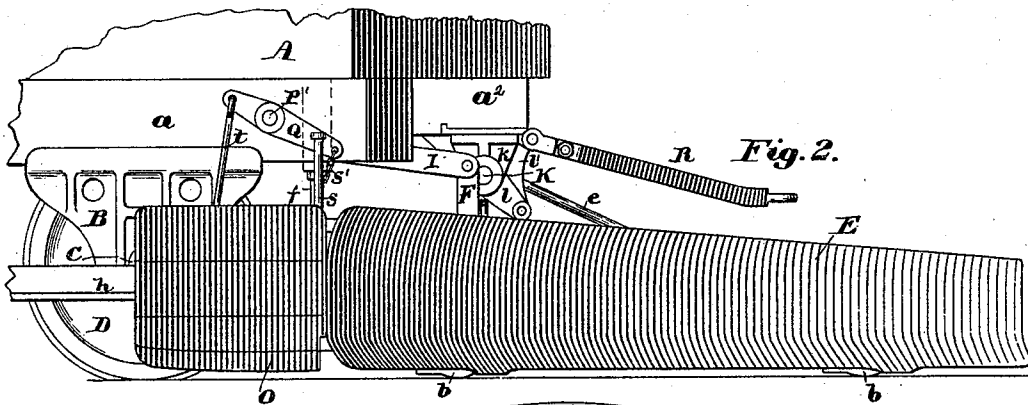
(No Model.)

4 Sheets—Sheet 1.

F. W. DEAN & W. E. MATHEWS.
SNOW PLOW FOR STREET RAILWAYS.

No. 536,328.

Patented Mar. 26, 1895.



Witnesses:
Walter E. Lombard
H. Theodore Fletcher

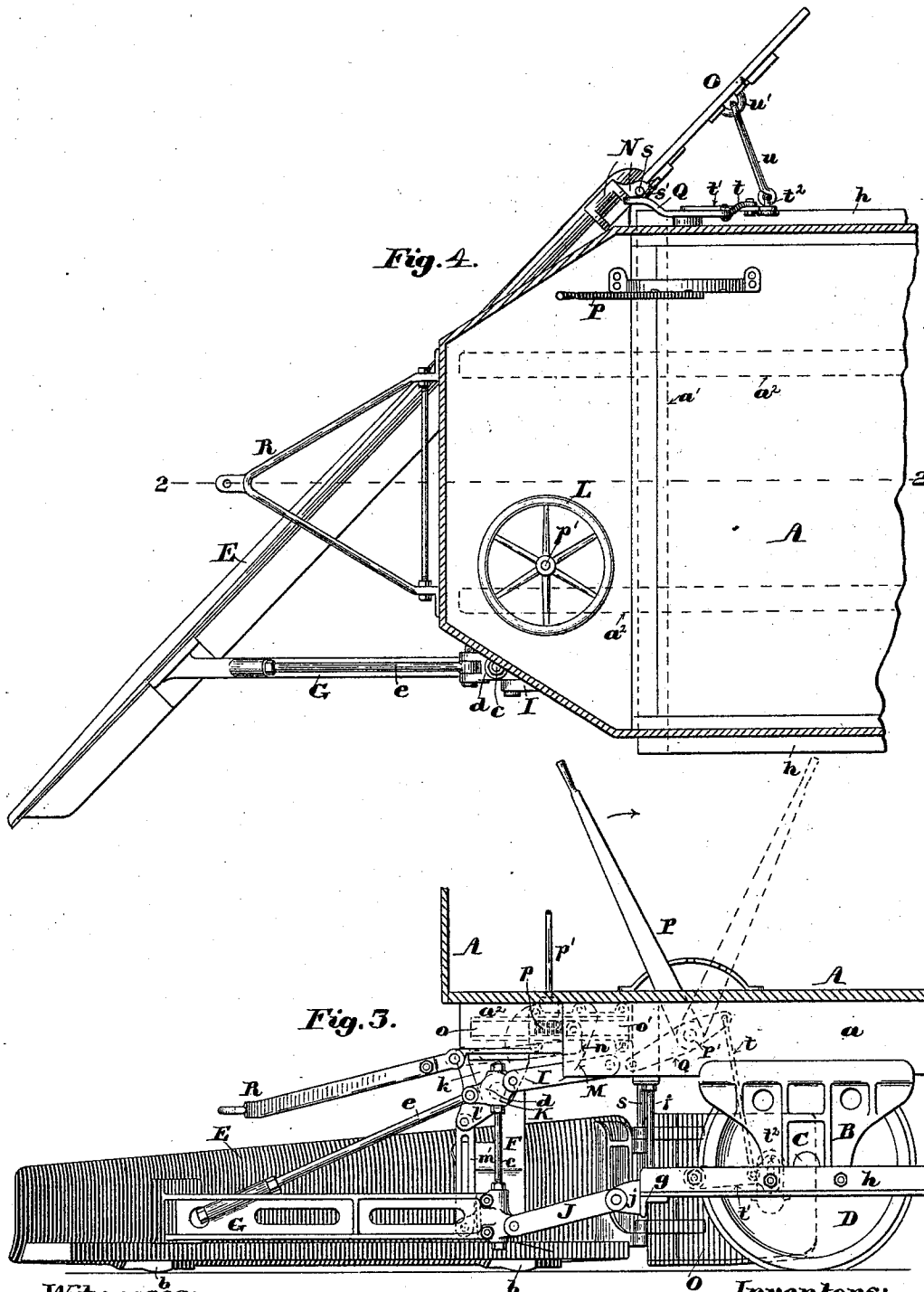
Inventors:
Francis Winthrop Dean,
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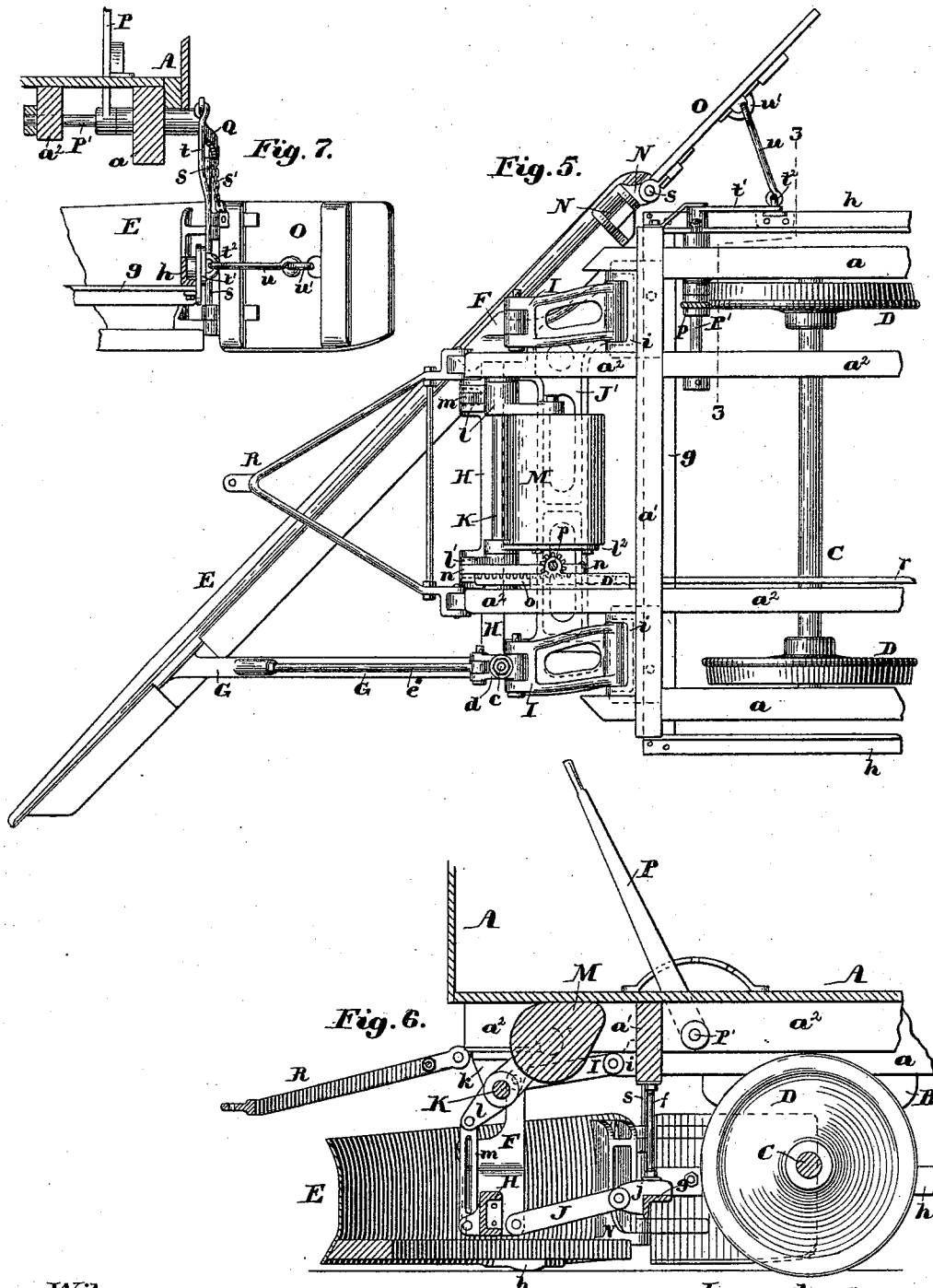
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4 Sheets—Sheet 4.

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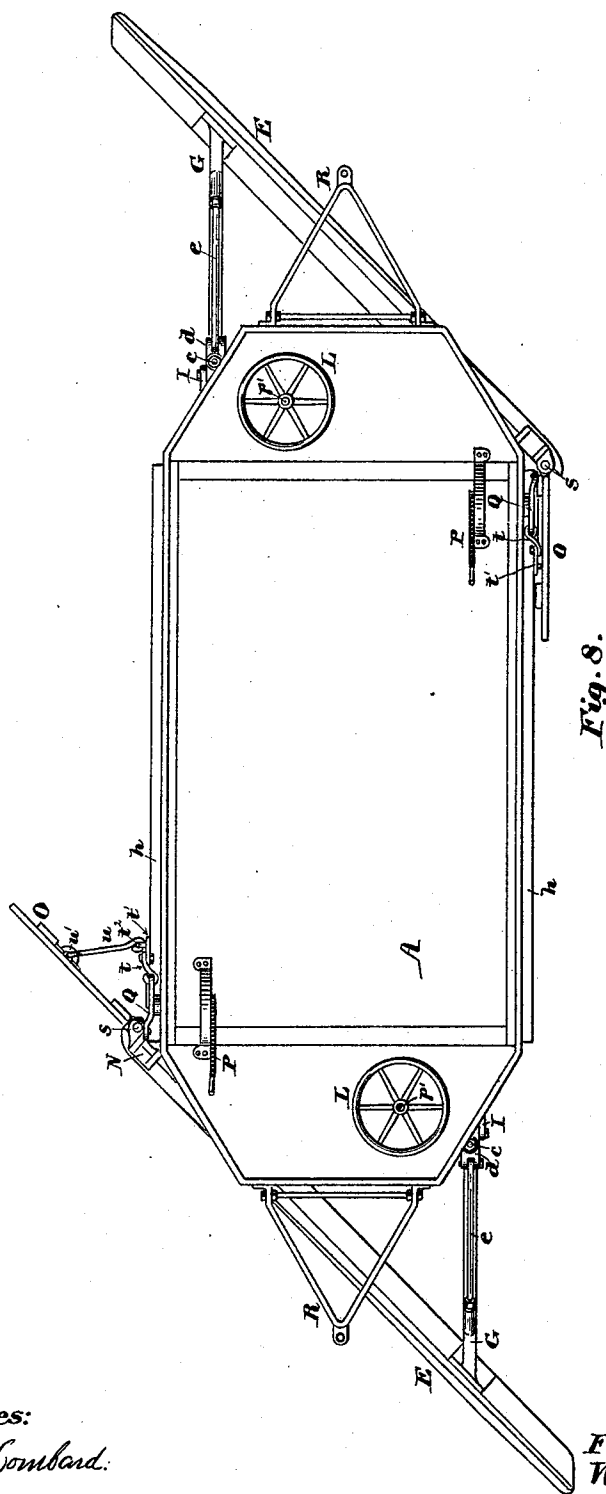


Fig. 8.

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UNITED STATES PATENT OFFICE.

FRANCIS W. DEAN, OF CAMBRIDGE, AND WILLIAM E. MATHEWS, OF BOSTON,
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OF TAUNTON, MASSACHUSETTS.

SNOW-PLOW FOR STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 536,328, dated March 26, 1895.

Application filed February 1, 1895. Serial No. 536,940. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS W. DEAN, of Cambridge, in the county of Middlesex, and WILLIAM E. MATHEWS, of Boston, in the county of Suffolk, in the State of Massachusetts, have invented certain new and useful Improvements in Snow-Plows for Street-Railways, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to snow-plows for street railways, and is an improvement upon the invention described in the Letters Patent No. 527,523, granted to us October 16, 1894, and is especially designed for use on double tracked roads, and it consists in certain novel features of construction, arrangement and combination of parts which will be readily understood by reference to the description of the accompanying drawings, and to the claims hereto appended, and in which our invention is clearly pointed out.

Figure 1 of the drawings is an end elevation of a snow plow embodying our invention. Fig. 2 is a partial side elevation of about one half of the plow and the lower portion of its car. Fig. 3 is a similar side elevation of the other half of the plow viewed from the same standpoint. Fig. 4 is a sectional plan of about one half of the length of the plow and its car the cutting plane being on line 1, 1, on Fig. 1. Fig. 5 is a plan of the plow share, its operating mechanism and the sills of the car body the superstructure of the car body and its floor being removed. Fig. 6 is a longitudinal vertical section on line 2, 2, on Fig. 4. Fig. 7 is a transverse vertical section of a portion of the car body on line 3, 3, on Fig. 5, and showing a portion of the plow-share and its adjustable wing in elevation, and Fig. 8 is a sectional plan of a car with a plow share at each end, drawn to a reduced scale.

In the drawings A is the car body having secured to its sills *a a* suitable housings B in bearings in which are mounted the axles C, C, having secured thereon the wheels D, D, all constructed substantially as shown and described in our before cited prior patent.

E E are two plow-shares arranged obliquely to the axes of the car axles and outside of,

or in advance or at the rear of all of the wheels of the car as shown.

The plow-shares E, E, are each provided with two shoes *b, b*, to rest upon the track rails when said plow-share is depressed as shown in Figs. 1, 2, and 3, and has firmly secured thereto the stand F and the beam G which stand F and the rear or inner end of the beam G are connected by the tie beam H as shown in Figs. 5 and 6.

The beam G has set in its inner end the standard *c* upon the upper end of which is mounted the block *d* to one side of which is connected one end of the oblique brace rod *e* the other end of which is secured to said beam G near its connection to the plow-share E as shown in Figs. 3, 4 and 5.

A transverse sill *a'* extends across the car near each end from which depend a plurality of suspension rods *ff* supporting at their lower ends the angle iron beam *g* directly beneath the transverse sill *a'* and secured at its ends to the longitudinal angle irons *h, h*, which are bolted to the lower portions of the housings B B one upon each side of the car, as shown in Figs. 3 and 5.

The sill *a'* has firmly secured thereto two stands *i i* to which are pivoted the links or radius arms I, I, the opposite ends of which are pivoted, one to the upper end of the stand F, and the other to the block *d*, and the beam *g* has firmly secured thereto the two stands *j, j*, to which are pivoted the links or radius arms J, J, connected together by the tie bar *J'*, preferably cast in one piece therewith to form a rigid frame, the outer or movable ends of said links J, J, being pivoted one to the lower end of the stand F and the other to the inner end of the beam G as shown in Figs. 3, 5 and 6.

The links I, I, are preferably made somewhat shorter than the links J, J, so that when the plow-share is raised its nose or forward end will be raised to a greater height than its heel or rear end, but said links may be all made of equal length so that the plow-share will be lifted bodily and maintain a uniform parallelism with the track as described in our before cited prior patent.

Between the sills *a, a*, are two other sills *a'*

a^2 parallel therewith but of greater length and extending to a greater distance beyond the transverse sill a' at each end of the car and have secured thereto the stands $k k$ in bearings in which is mounted the rocker shaft K upon which are secured the levers $l l'$ and l^2 as shown in Figs. 1, 3, 5 and 6. The lever l has pivoted to one arm thereof the upper end of a link m the lower end of which is pivoted to ears projecting from the outer side of the tie beam H and one of the arms of the lever l' has pivoted thereto the upper end of the link m' which is also connected at its lower end to ears on the outer side of the tie beam H while the other arm of the lever l' has connected thereto one end of the connecting rod n the opposite end of which is connected to the reciprocating rack o , mounted in a bearing in the stand o' secured upon the inner side of one of the sills a^2 , as shown in Fig. 5, and in dotted lines in Fig. 3.

The rack o is engaged by the pinion p secured upon the lower end of the shaft p' which has secured upon its upper end the hand wheel L by rotating which the plow-share may be raised or depressed at the will of the operator substantially as described in our prior patent.

M is a counterbalance weight supported by the upper or inner arm of the lever l and the lever l^2 , and serves to nearly counterbalance the plow-share, the beam G, tie beam H, stand F and links m and m' , thereby reducing the power required to manipulate the plow. This counterbalance weight is a very essential feature if only one plow-share is carried by the car, but when a plow-share is carried at each end of the car so that the car may be run either end forward the weight M may be dispensed with and one plow-share and its supporting frame may be made to counterbalance the other plow-share and its supporting frame by connecting the rack o at each end of the car with a lever on the rocker shaft d at the opposite end of the car by means of a connecting rod r shown in Fig. 5 substantially as in our prior patent.

The heel or rear end of the plow-share E has secured to its back or inner side the stand N to which is pivoted, by means of the rod s the extension wing O in such a manner that it may be moved about the axis of said rod s and vertically thereon by means of the hand lever P mounted upon the rocker-shaft P' having mounted on its outer end the lever Q one end of which is connected by the chain s' to the wing O for raising it, and the other end is connected by the link t to a radius arm t' pivoted to the angle iron h and provided at its movable end with the eye t^2 with which one end of the link u engages, its opposite end in like manner engaging with the eye u' secured to the back or inner side of the wing O as shown in Figs. 4, 5, and 7. By a movement of the hand lever P from the position shown in full lines to the position shown in dotted lines in Fig. 3 the wing O will be raised

and at the same time be swung inward to a position parallel or nearly so to the side of the car substantially as described in our prior patent before cited.

R is a draw bar by which the plow-car may be connected to another car when desired.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with a car or vehicle fitted to, and adapted to be propelled upon the tracks of a street railway, a plow-share arranged obliquely across both rails of the track and in front of the wheels; a supporting frame comprising a longitudinal trussed beam and a transverse tie beam both firmly secured to said plow-share and to each other; two pairs of radius arms connected at their movable ends to said frame and plow-share and means having provision for moving said radius arms about their axes of motion and raising or lowering said plow-share and frame bodily.

2. In combination with a car or vehicle fitted to and adapted to be propelled upon the tracks of a street railway, a plow-share arranged in front of all the wheels of the car or vehicle and extending in a straight line obliquely across both rails of the track and having its front or operating face curved from top to bottom; a triangular frame carrying said plow-share; a system of radius arms or links connecting said frame and plow share to the car or vehicle body; and means having provision for raising or depressing said frame and plow-share bodily.

3. In combination with a car or vehicle fitted to and movable upon the tracks of a street railway, a plow-share extending in a straight line obliquely across both rails of the track; a triangular frame secured to the back of, and serving as a support for said plow-share; a system of radius arms or links connecting said frame and plow-share to the body of the car or vehicle; a pair of levers; a rocker shaft carrying said levers; a pair of links connecting said levers upon one side of said shaft to said triangular frame; a counter weight connected to and carried by said levers upon the other side of said shaft; and means for oscillating said rocker-shaft to raise or lower said frame and plow-share.

4. In combination with a car or vehicle fitted to and movable upon the tracks of a street railway; two plow-shares arranged one at each end of the car or vehicle body and each extending in a straight line obliquely across both rails of the track in advance or outside of all of the wheels of said car or vehicle; a triangular frame secured to the inner face of each of said plow-shares; a system of radius arms or links connecting each of said frames and plow-shares to the car or vehicle; and means having provision for raising and lowering said frames and plow shares substantially as described.

5. In combination with a car or vehicle fitted to and movable upon the tracks of a street railway, a plow-share extending in a straight line

obliquely across both rails of the track in advance of all of the wheels of the car or vehicle and having a greater height at its heel or rear end than at its forward end and its front face 5 concaved; a triangular frame rigidly connected to and carrying said plow-share; a system of radius arms and links connecting said frame to the car or vehicle; and means for raising and depressing said frame and plow- 10 share.

6. In combination with a car or vehicle fitted to and movable upon the tracks of a street railway; a plow-share extending in a straight line obliquely across both rails of the track in advance of all the wheels of the car or vehicle; 15 a triangular frame rigidly connected to and carrying said plow-share; two pairs of radius arms connected at their movable ends to said frame, the upper pair of said radius arms having a length somewhat less than the lower pair of said radius arms whereby when said plow-share is raised its nose or forward end will be lifted a greater distance than its heel or rear end; and means for raising and depressing 20 said frame and plow-share by moving said radius arms about their pivotal connections to the car or vehicle.

7. The combination of a car or vehicle fitted to and movable upon the tracks of a street railway; the plow share E located in front of the 30

wheels of the car or vehicle and extending in a straight line obliquely across both rails of the track; the beams G and H and stand F, all secured to said plow share; the standard c; block d; the brace rod e; the two pairs of 35 radius arms I and J; the levers l and l'; the links m m' and n; the rack o; the pinion p; shaft p'; and the hand wheel L.

8. In combination with a car or vehicle fitted to and movable upon the tracks of a street railway; a plow-share arranged entirely in front 40 of all of the wheels of the car; a system of links or radius arms connecting said plow-share to said car; a rocker shaft; a pair of levers on said rocker shaft; links connecting said levers 45 to said plow share on one side of said rocker shaft a counter weight carried by said levers on the other side of said shaft, and means for oscillating said shaft to raise and lower said plow share. 50

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 28th day of January, A. D. 1895.

FRANCIS W. DEAN.
WILLIAM E. MATHEWS.

Witnesses:

N. C. LOMBARD,
FRED B. COLE.