

July 2, 1929.

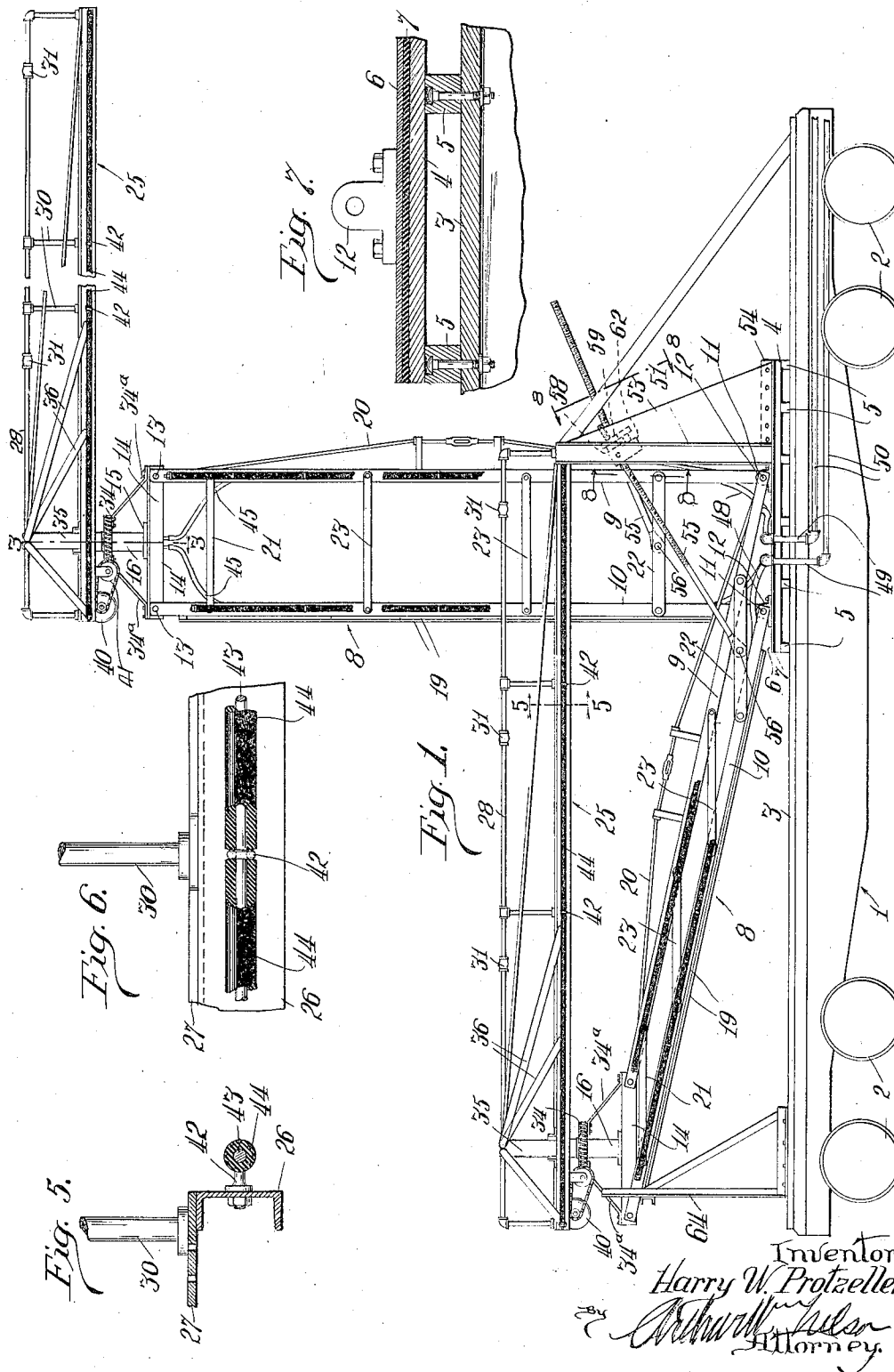
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TOWER CAR

Filed June 10, 1927

3 Sheets-Sheet 1



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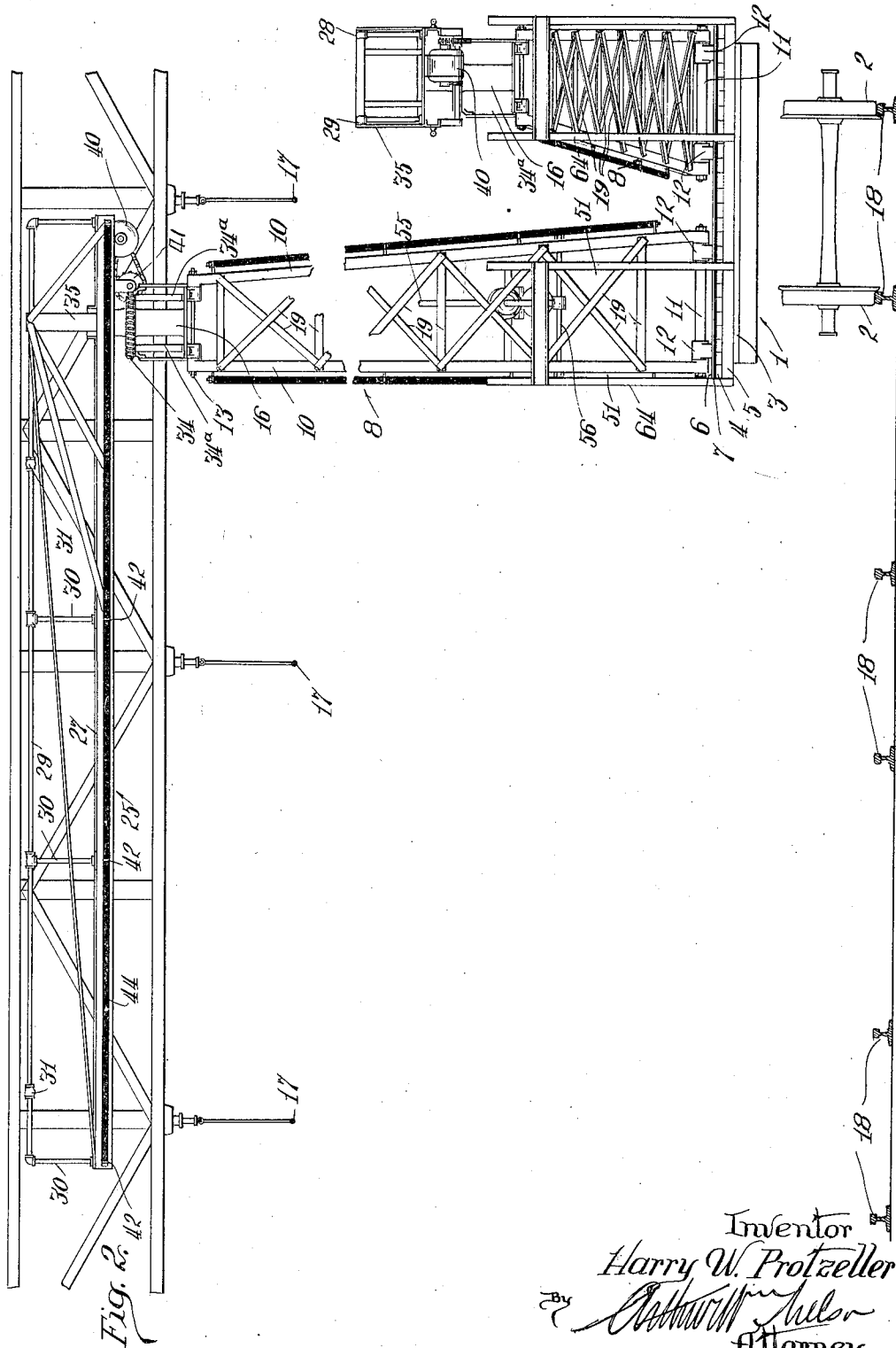
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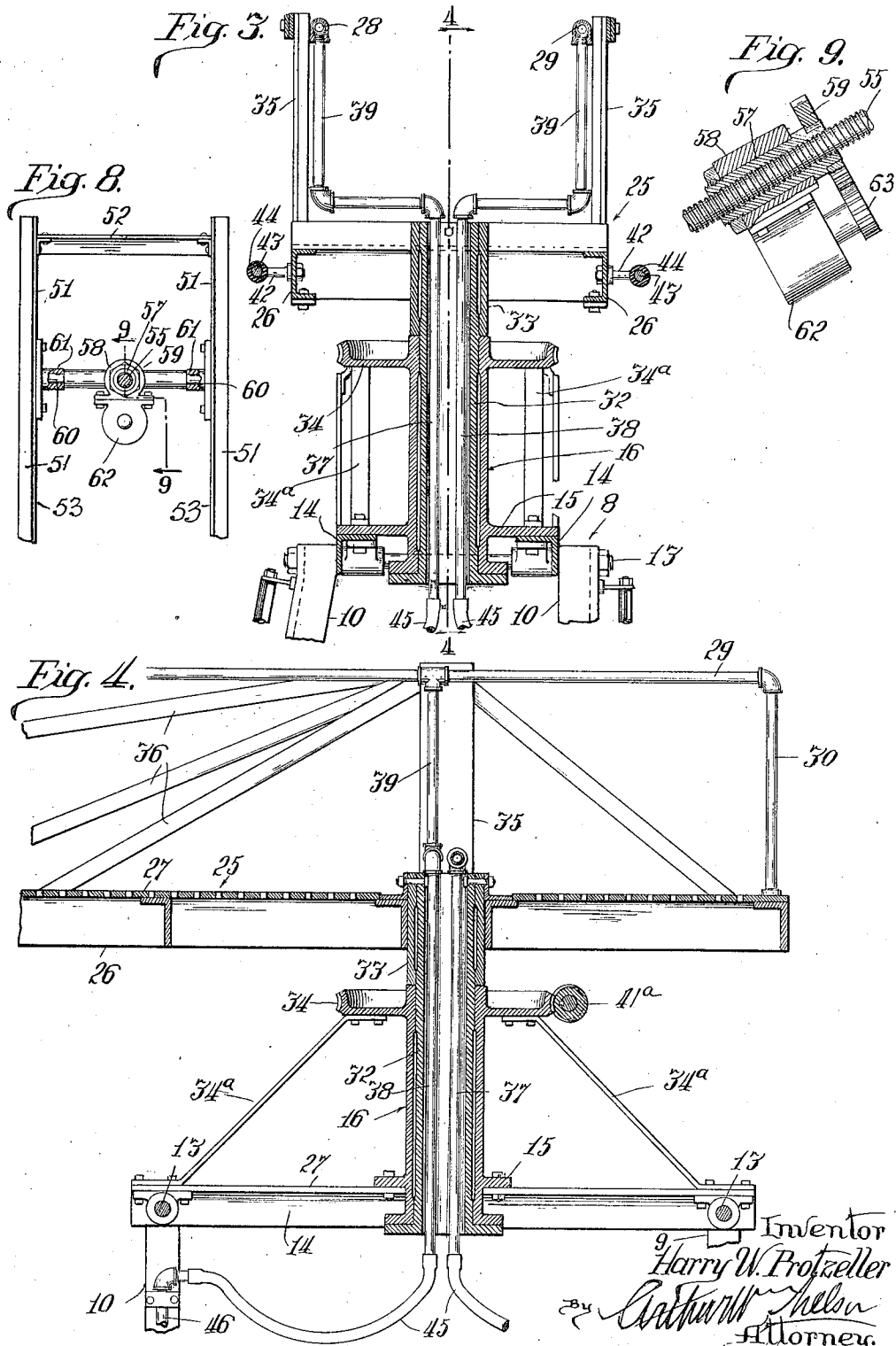
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TOWER CAR

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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TOWER CAR.

Application filed June 10, 1927. Serial No. 197,785.

This invention relates to improvements in tower cars and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

5 The electrification of railroads has presented a new problem as to the maintenance and repair of the overhead structure. It is imperative that this structure be periodically painted to prevent rusting and as is apparent, when considerable traffic is handled, the use of ladders to reach this structure is not only slow but is otherwise objectionable.

10 The primary object of the present invention is to provide a car which I have termed "a tower car" whereby the maintenance and repair of the overhead structure of electrified railroads is greatly facilitated.

15 Another object of the invention is to provide such a car which includes at least one tower adapted to be swung from a substantially horizontal to an upright position and which carries an off center mounted platform always maintained horizontally but capable of being swung into different angular positions, with respect to the car body, so that different portions of the overhead structure may be easily reached.

20 A further object of the invention is to construct the platform with novel hand rails which provide conduits for paint and air and which may be tapped for connection with suitable spraying hose.

25 Still another object of the invention is to provide a novel insulator construction for the tower and platform to prevent the passage of a current through the structure thereof, should said tower or platform come into contact with a high tension line such as is found upon the right of way of electrified railroads.

30 The above mentioned objects together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawings:

35 Fig. 1 is a view in side elevation of a tower car embodying one form of my invention.

40 Fig. 2 is a view in end elevation of the car with one tower and platform in folded position on the car as when in transport, and with the other in its upright position with its platform swung transversely of the car and above and across the trolley wires of adjacent tracks.

45 Fig. 3 is a transverse vertical section through the associated ends of a tower and

platform on an enlarged scale as taken on the line 3—3 of Fig. 1.

Fig. 4 is a longitudinal vertical section through the parts shown in Fig. 3 on the line 4—4 thereof.

Fig. 5 is a detail section on an enlarged scale, through the part of the platform as taken on line 5—5 of Fig. 1.

Fig. 6 is a view in side elevation of the parts shown in Fig. 5.

Fig. 7 is a detail vertical sectional view through a portion of a car deck and fixed platform thereon and which will be more fully referred to later.

Fig. 8 is a detail transverse vertical sectional view on an enlarged scale, as taken on the line 8—8 of Fig. 1.

Fig. 9 is a detail sectional view as taken on the line 9—9 of Fig. 8.

In general my invention contemplates the provision of a car or other vehicle body in the form of an ordinary "flat" car upon the deck of which, toward one end is a platform extending the full width of the deck and suitably insulated from the car framing. Upon this platform there is arranged one on each side of the longitudinal median plane of the car body, a suitable, skeletonized tower or mast of a parallelogram post construction. The posts of this tower or mast are so pivotally connected at one end to the platform as to be folded down toward the rear end of the car when the same is to be moved in transit to freely pass under overhead structures or to be unfolded into an erect position, to bring the other ends of the posts into a considerable distance above the deck of the car so as to extend above the trolley wires of electrified railroads. On said other end of the towers is a top plate or support always maintained horizontal and pivoted thereon is a cantilever like platform, to be swung into a position most convenient for the work to be done, such as painting or otherwise maintaining the overhead supports for the trolley wires or cross overs and bridges. This platform has tubular guard or hand rails along each side which are employed as pressure conduits for compressed air and paint respectively and each rail is provided in its length with suitable valves permitting the attachment of the usual hose of paint spraying devices. The posts and platform beams or stringers are provided

with suitable insulating bars so arranged as to prevent direct circuiting contact with such high tension wires as is met with in operations for which the car is most especially adapted.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings: 1 indicates as a whole a vehicle in the form of a flat car of ordinary construction having the usual pairs of front and rear truck wheels 2—2 and a flat deck 3. On said deck, forwardly of the middle thereof is a low fixed platform 4 extending the full width of the deck and spaced above the same by transverse stringers 5—5. On said platform is a metallic plate 6, spaced therefrom by a sheet of insulation 7 as shown in detail in Fig. 7.

Mounted on the fixed platform 4 is a pair of skeletonized towers 8—8 each made up of suitable steel structural members, arranged in the manner of a folding parallelogram, there being one of said towers located on each side of the median line of the car deck 3. As the construction of both towers is the same, a detailed description of one will suffice for both. Each tower includes four corner posts arranged in inner and outer pairs of front and rear posts 9 and 10 respectively. The bottom ends of the front posts 9 and the like ends of the rear posts 10, are fixed to the front and rear shafts 11—11, each journaled in a pair of laterally spaced bearing ears 12—12 fixed on the platform plate 6 toward the rear thereof. The top ends of the outermost and innermost front and rear posts are pivotally connected as at 13 to the ends of angle bar members 14—14, which angle bar members are cross connected together by the bottom horizontal flange 15 of an upright tubular, non rotative sleeve or tubular standard 16 disposed with its axis centrally of the pivotal connections 13 for the four corner posts of the tower. Each post is made of a channel beam, with the flanges of the front posts facing inwardly toward each other and with the flanges of the rear posts arranged in a like manner. The posts are so arranged that when the tower is in its erect or upright position, the outer front and rear posts are truly vertical while the inner front and rear posts taper inward toward the top as best shown in Fig. 2. This arrangement provides more clearance for the top end of the tower with respect to the trolley wire 17 associated with the track 18 upon which the car as a whole is located as best shown in Fig. 2.

The rear posts are connected by crossed members 19 which provide a suitable means for ascending the tower when erect, while the front posts are each rigidified by tension rods 20. The outer front and rear posts and the inner front and rear posts are each connected together by associated top, bottom

and intermediate links 21—22 and 23 respectively, the links of course having a pivotal connection with the respective posts.

Associated with the top end of each tower is a platform indicated as a whole as at 25 arranged in the manner of a cantilever as best shown in Fig. 1. Said platform is preferably of a width and length approximating that of the tower and includes a pair of parallel, horizontally disposed channels 26—26, arranged with their flanges facing each other and suitably connected together. Said channels support an open mesh flooring 27 and associated with the side channels are hand or guard rails 28 and 29 respectively. Each hand rail is in the form of a pipe supported by end and intermediate uprights 30 from the top flange of the associated channel 26 and in each rail is a plurality of valves 31—31 for a purpose to appear later.

The platform 25 is pivotally mounted near one end upon the tubular standard 16 so as to be swung horizontally about the axis of said standard into any desired position. Preferably said platform has fixed to it at a point near one end, an inner sleeve 32 bearing in the standard 16 and an outer sleeve 33 bearing on the top end of the standard 16. Just below said top end of the standard is a fixed worm gear 34 of substantially large diameter. Braces 34^a connect the under side of the gear with the angle bar members 14. Rising from the side channels of the platform in the plane of the axis of the sleeves 32—33 are uprights 35 which terminate in the planes of the hand rails. Fixed to the top end of said uprights is a plurality of strut like tension bars 36 connecting the top ends of said uprights with different longitudinal points along the associated channel, to provide a bracing suitable for the cantilever like mounting of the platform when upon the tower.

Within the sleeve 32 are two pipes 37—38, each connected at its top end by a lateral and upright branch 39—39 with the associated pipe or tube 28—29 forming the hand rails for the platform. One of these pipes (37) is a compressed air pipe and the other (38) is a paint supply pipe. Upon the under side of the shorter end of the platform 25 is mounted a reversible motor 40 of suitable kind, either electric or pneumatic. When pneumatic it will be suitably connected to the pipe 37 and when electric will carry suitable conductors for attachment to a source of current supply. This motor will, through suitable reduction gearing, 41, drive a worm 41^a journaled on the under side of the rear end of the platform 25 which worm meshes with a large fixed worm gear 34 on the part 16. Thus when the motor 40 is in operation, the worm 41 will travel around the gear 34 and impart a swinging or turning movement to the platform so that it may be brought into any desired angular position with respect to

the car deck, either longitudinally or transversely of the same as is desired, as well as positions between the same.

To guard against accidental engagement of said platform with high tension and other wires among which the platform is disposed when used upon electrified railroads I provide on each channel the following construction: Extending laterally from the web of each channel 26—26 at suitable intervals are eyed bolts 42 to support a rod 43 and surrounding each rod between said bolts are tubular sleeves of insulation 44. A similar rod and sleeve structure is provided on each post of the tower and these sleeves protect the channels of the platform and tower against direct engagement with current conductors which direct engagement with current conductors will be dangerous for those persons working upon the platform.

The bottom ends of the pipes 37—38 in the tubular standard are each connected by a section of hose 45—45 with the top end of a pipe 46 connected within the channel of each outer post 9 and 10. The bottom ends of these pipes are connected by hoses 48 to short upright pipes 49 at the associated side of the car, which are in turn connected to a pair of forwardly extending pipes 50 each leading off from a source of air and paint supply respectively. Attending the car thus described is another car (not shown) which carries the supply of paint and oil and which furnishes the motive power for moving the car from one place of operation to another.

Means is provided in connection with each tower for raising and lowering the same and such means is as follows. On the fixed platform 4, forward of each tower is a pair of laterally spaced uprights 51—51 connected together at their top ends by a cross bar 52 and each upright is braced by an upright gusset plate 53 the bottom end of which extends toward the front end of the platform 4, and is fixed to an angle bar 54 in turn fixed to said platform. A long screw threaded rod 55 is pivotally connected at one end to a cross rod 56, connecting the bottom links 22 of the tower together. The other end of this rod has threaded engagement in a sleeve or nut 57 rotative but held against endwise movement in a cradle block 58, one end of said sleeve being formed to provide a gear 59 thereon. The cradle block has laterally extending trunnions 60 between its ends and these trunnions have bearing in sleeves 61 projecting inwardly from each upright member 51. Thus the cradle block may pivot upon said trunnions as is apparent. On the under side of the cradle block 58 which is made flat, is fixed a motor 62 either pneumatic or electric, having a forwardly extending shaft upon which is fixed a pinion 63 which meshes with the gear 59 on the sleeve 57. This motor which is reversible when

actuated will drive the gear 59 in either direction and when driven in one direction will exert a pull on the threaded rod 56 to swing the tower from its folded position to its upright position. When said gear is driven in the other direction, a push is exerted on said rod which will swing the tower from its upright to its folded position as is apparent. By reason of this threaded rod and sleeve construction, the movement of the tower from one position to the other and vice versa is such as to be under control at all times and the tower may be held in any intermediate position without the danger of folding under its own weight. Thus the desired height of the platform 25 with reference to the car deck may be readily maintained.

When the car is in transit the both towers are folded toward the rear of the car and stand in a position slightly inclined from the horizontal. When in this position the top or platform supporting ends of both towers are supported in cradles 64 provided for that purpose on the rear end of the car deck while the free ends of the platforms 25 which are there arranged above the associated tower, rests upon the cross bar 52 of the associated uprights 51, and are held against any swinging as when the car is taking a curve. When the towers are in this position they provide ample clearance at the sides of the car and are within the standard clearance heights so as not to interfere with trolley wires or cross overs or bridges or tunnels. In Fig. 1, one of the towers and its platform is shown in its folded position as when the car is in transit while the other tower and its platform are shown erect, in the operative position.

In Fig. 2 the parts are shown in a similar position with the platform of the erect tower swung into a position transversely of the car and overhanging adjacent tracks above associated trolley wires and parallel with and in a position convenient to the supporting overhead structure for such trolleys. Thus in multiple trackwork, several of the tracks may be maintained open for traffic without in any manner interfering with the operations it is desired to carry on, such as painting or repairing such structure.

My improved tower car has many advantages as will be apparent from the foregoing. It provides a balanced structure which gives a wide lateral reach from the track which it occupies. It permits the use of a number of men at the one time for painting overhead structures which may be rapidly carried out. By using the hand rails of the platform as paint and air conduits, no long length of spray hose is necessary to dangle into dangerous positions unknown to the workmen.

While in describing my invention, I have referred in detail to the form and arrangement of the parts thereof, the same is to be considered as by way of illustration only and

not by way of limitation except as may be pointed out in the appended claims.

I claim as my invention:

1. A vehicle embodying therein a flat deck,
5 a folding parallelogram tower structure connected at one end to said deck, near one end thereof, and a horizontal platform operatively connected near one end to the other end of
10 said tower structure so as to be swung about a vertical axis thereon, means on said deck for supporting the last mentioned end of the tower, means also on said deck for supporting the other end of said platform when said tower is folded, a power actuated device
15 mounted on said last mentioned means, and means connecting said device and tower structure for raising and lowering the same.
2. A vehicle embodying therein a flat deck, a folding parallelogram tower structure connected at one end to said deck, near one end
20 thereof, and a horizontal platform operatively connected near one end to the other end of said tower structure so as to be swung about a vertical axis thereon, means on said deck for supporting the last mentioned end of the tower,
25 means also on said deck for supporting the other end of said platform when said tower is folded, a power driven nut pivotally mounted on said last mentioned means and a screw
30 threaded rod operatively connected at one end to a part of said tower and engaged in said nut for raising and lowering said tower.
3. A vehicle embodying therein a flat deck, a folding parallelogram tower structure pivotally connected at one end to said deck, means
35 including a vertical bearing sleeve operatively connected to the other end of said tower, a platform pivotally connected near one end in said sleeve for a swinging movement in a horizontal plane, a non-rotative gear on said
40 sleeve and means carried by said platform and including a worm meshing with said gear for turning the platform in either direction in said horizontal plane.
4. A vehicle embodying therein a flat deck,
45 a fixed plate supported above but insulated from said deck, a parallelogram tower structure including corner posts, pivoted at one end to said plate, means connecting the other
50 end of said posts, a horizontal platform including side members pivoted near one end to said last mentioned means, and insulating

members on the outer surface of said posts and platform side members.

5. A vehicle embodying therein a flat deck, 55
a fixed plate supported above but insulated from said deck, a parallelogram tower structure including corner parts, pivoted at one end to said plate, means connecting the other
60 ends of said post, a platform including side members pivoted near one end with said last mentioned means, laterally extending eye bolts in the outer surfaces of said posts and side members, a rod arranged in the eyes of
65 said bolts and tubular insulating members enclosing said rods.

6. A flat car embodying therein a deck, a pair of parallelogram tower structures one positioned on each side of the median line of
70 said deck, means providing a pivotal connection for one end of said tower structure with said deck, a horizontal platform operatively connected near one end with the other end of the tower structure for a swinging
75 movement about a vertical axis, means on said deck for supporting the last mentioned end of said tower when folded, and means also on said deck for supporting the free end of said platform and for holding it against swinging
80 movement when said last mentioned end of the tower is engaged with its associated supporting means.

7. A flat car embodying therein a deck, a fixed platform forward of the middle thereof, and including a metallic plate insulated
85 from said deck, a pair of parallelogram tower structures one on each side of the median line of said deck, and pivotally connected to said plate to swing toward and away from the rear end of said deck, means on said rear end
90 of the deck for supporting the other end of said tower structure when swung toward said deck, a horizontal platform pivoted to the last mentioned end of each tower for a swinging movement in a horizontal plane, and an
95 upright structure on said plate forwardly of said first mentioned end of the tower for supporting the other end of said platform, when said last mentioned end of the tower is engaged with its supporting means. 100

In testimony whereof, I have hereunto set my hand, this 31st day of May, 1927.

HARRY W. PROTZELLER.