

June 30, 1925.

F. L. MONTGOMERY

1,544,263

UNA-RAIL SYSTEM

Original Filed Feb. 9, 1921

8 Sheets-Sheet 1

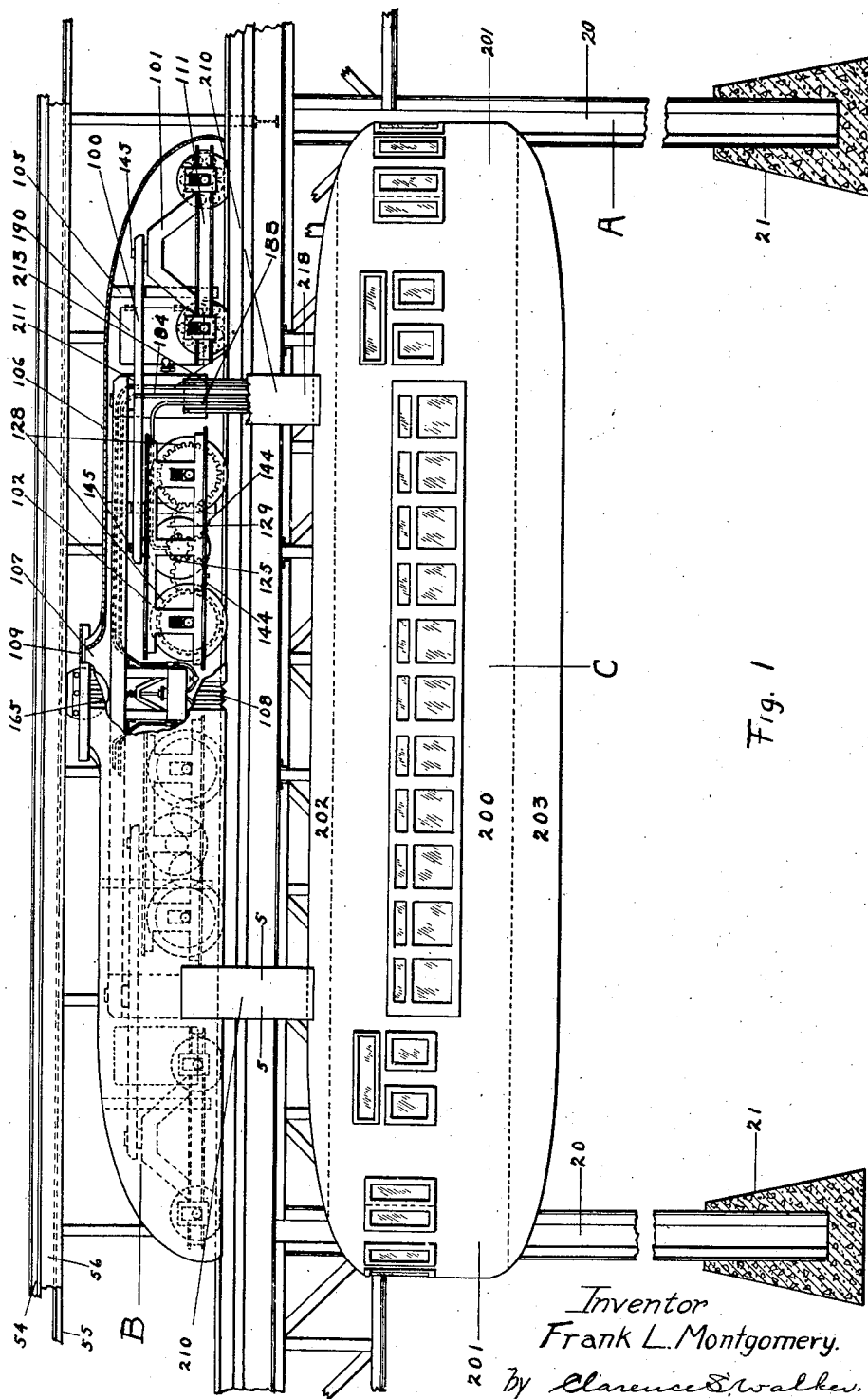


Fig. 1

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June 30, 1925.

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8 Sheets-Sheet 2

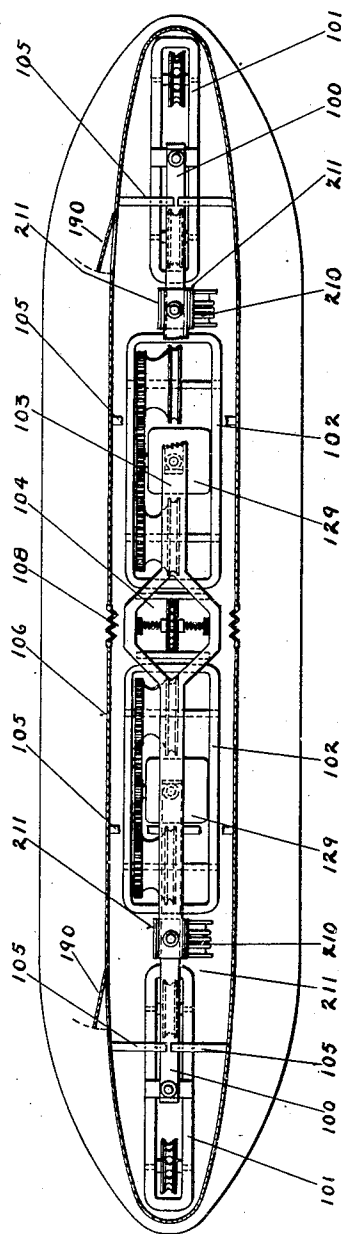


Fig. 2

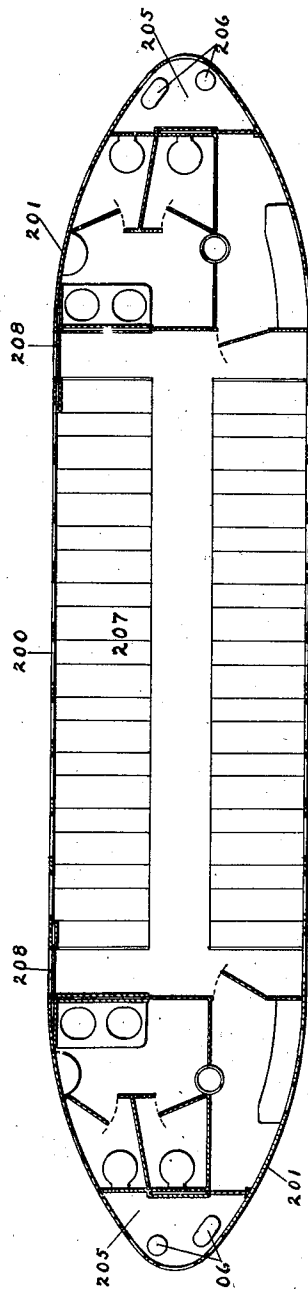


Fig. 3

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8 Sheets-Sheet 3

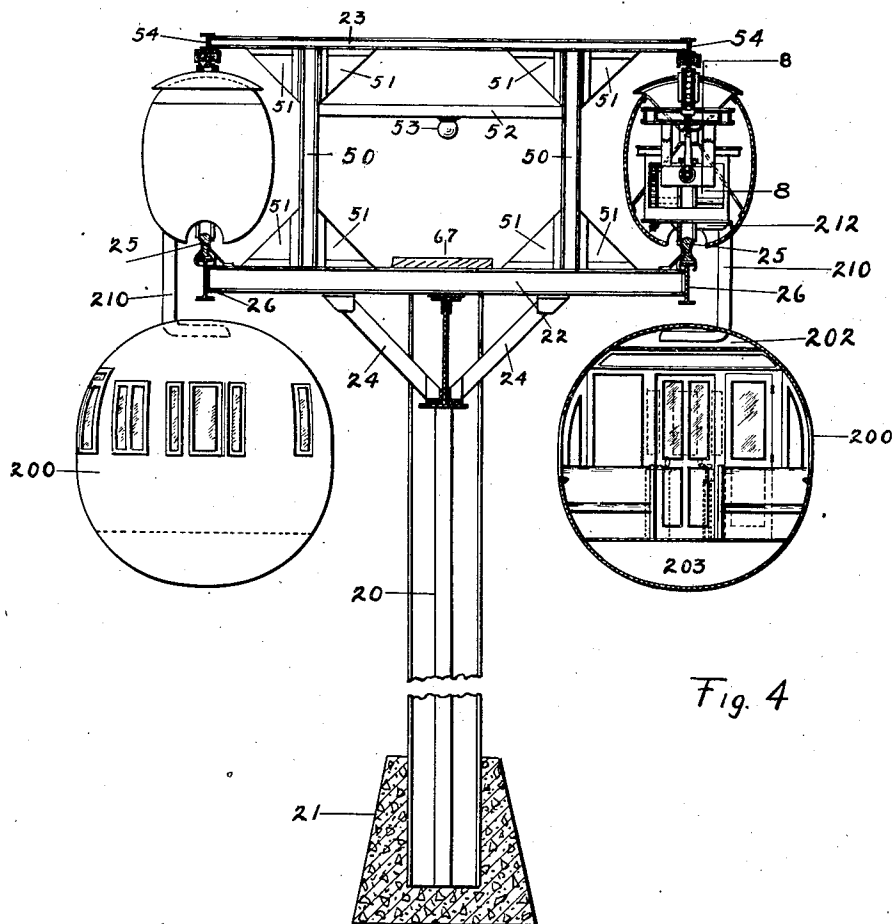


Fig. 4

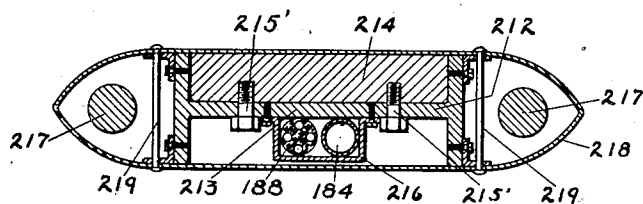


Fig. 5

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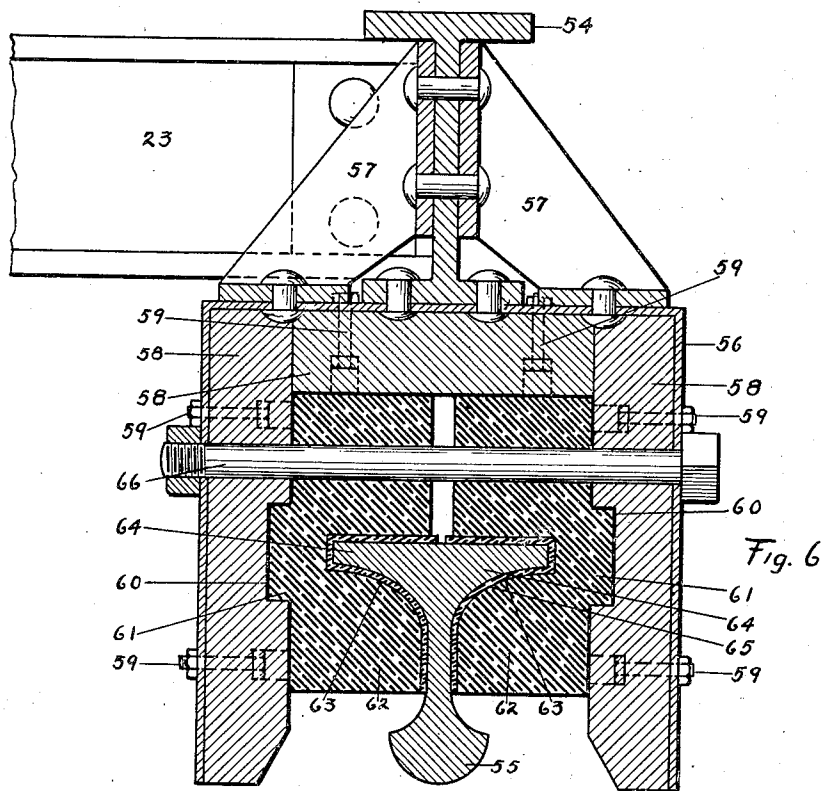


Fig. 6

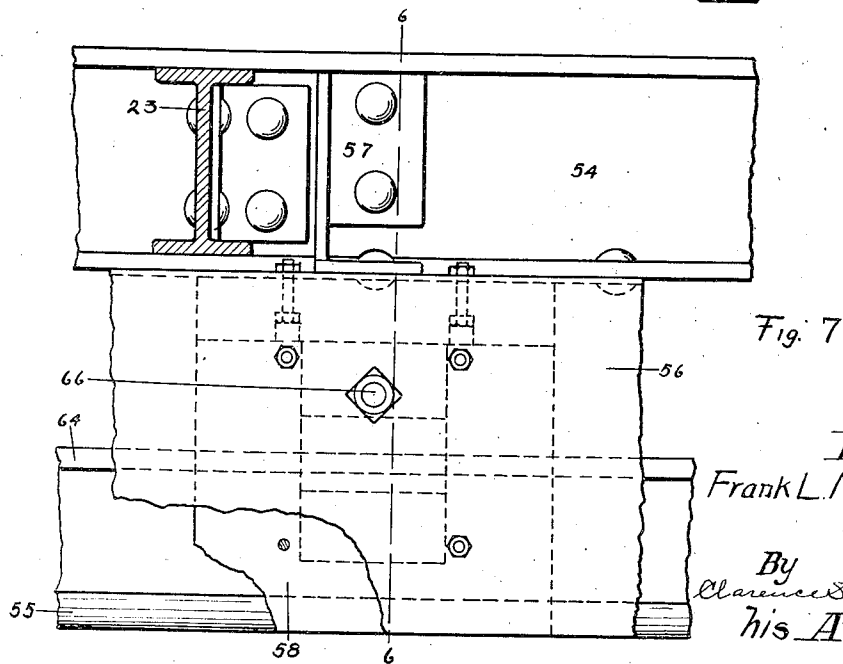


Fig. 7

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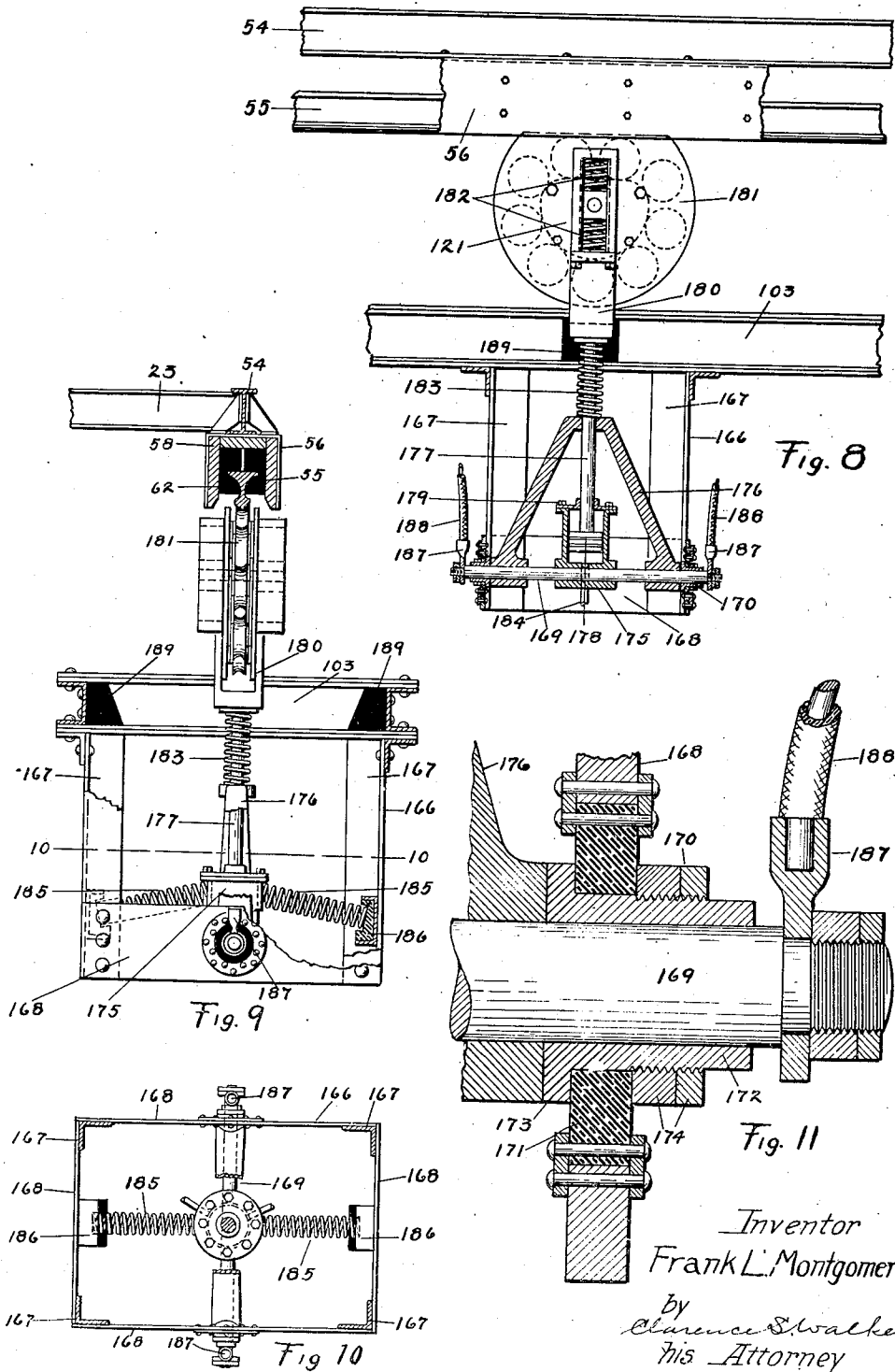
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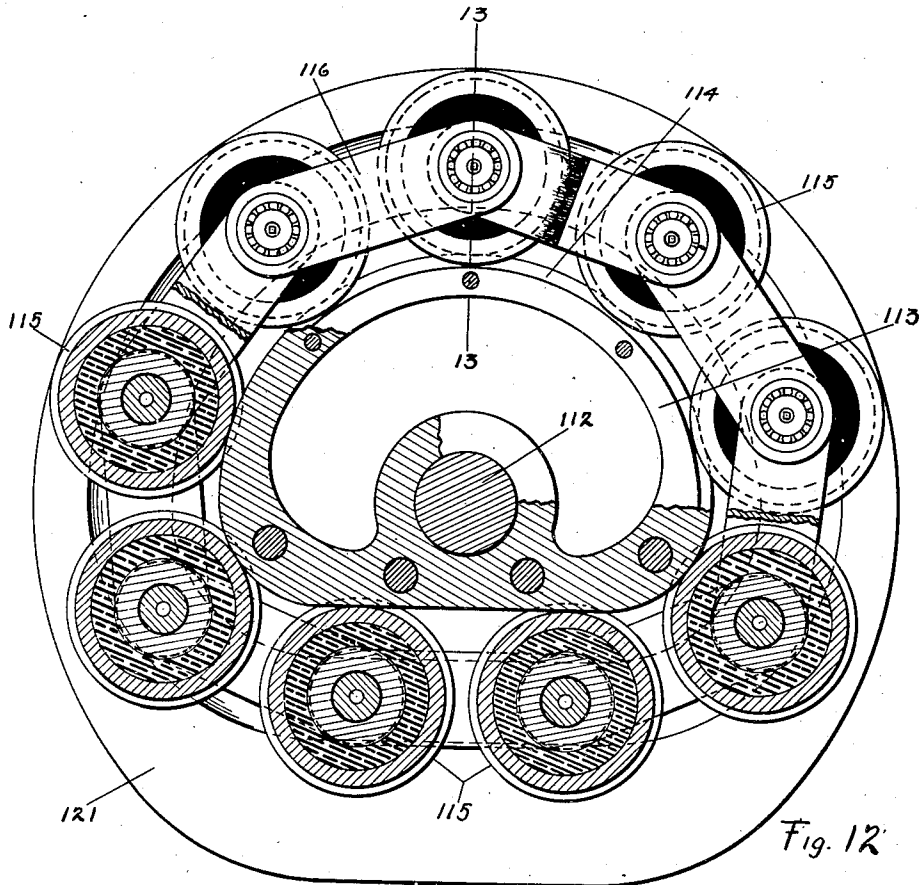


Fig. 12

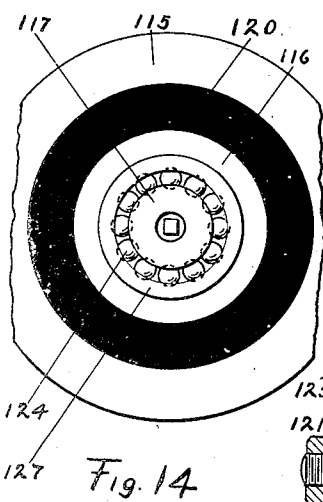


Fig. 14

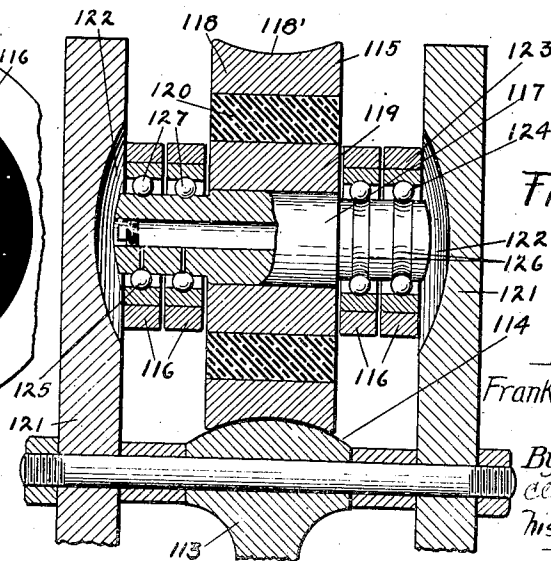


Fig. 13

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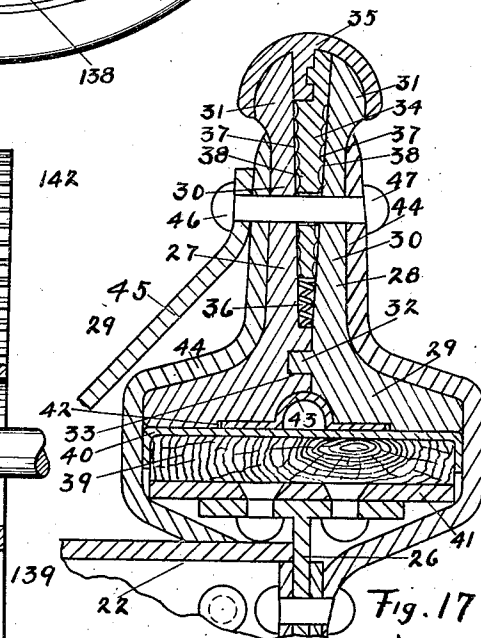
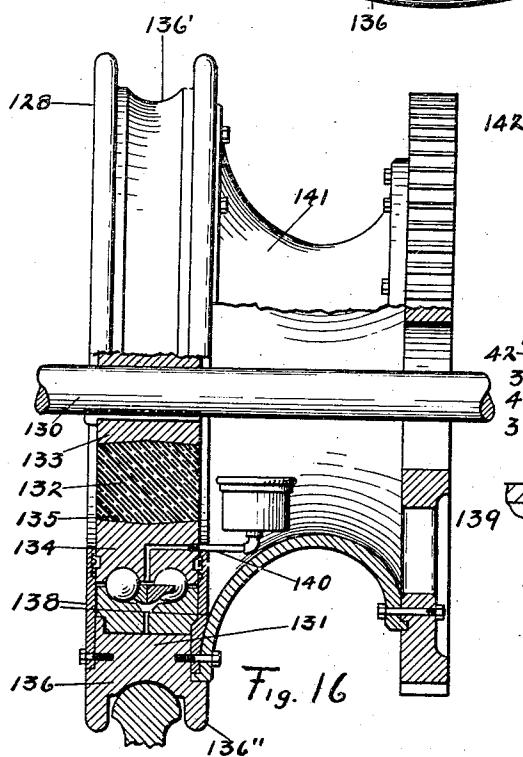
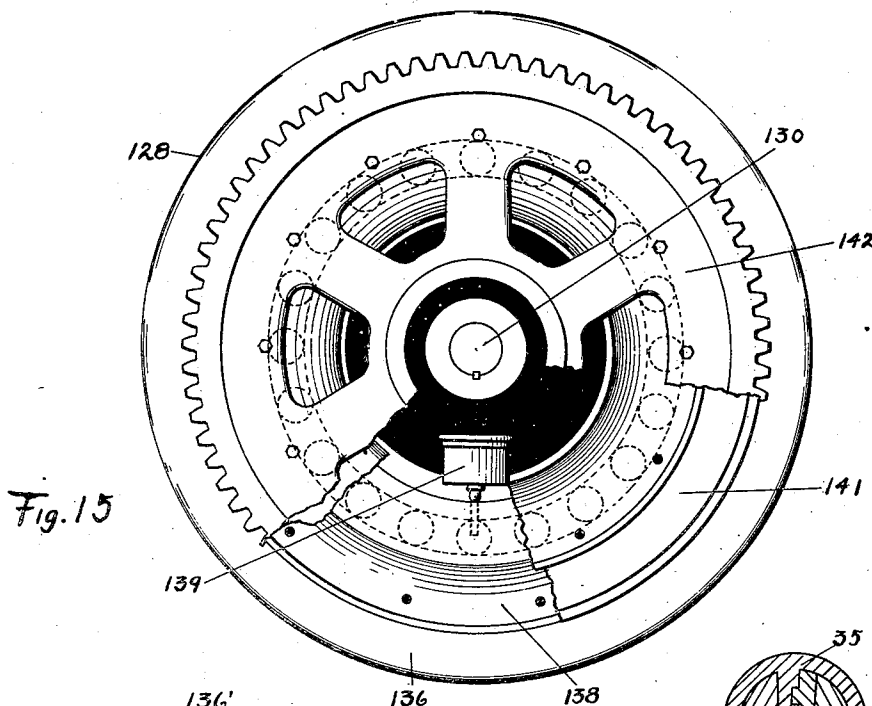
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UNA-RAIL SYSTEM

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8 Sheets-Sheet 7



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8 Sheets-Sheet 8

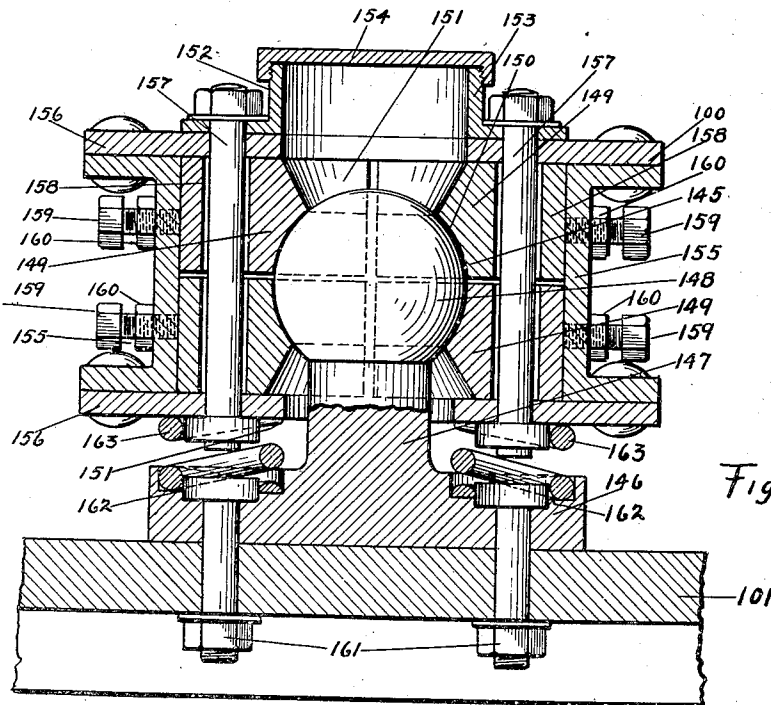


Fig. 18

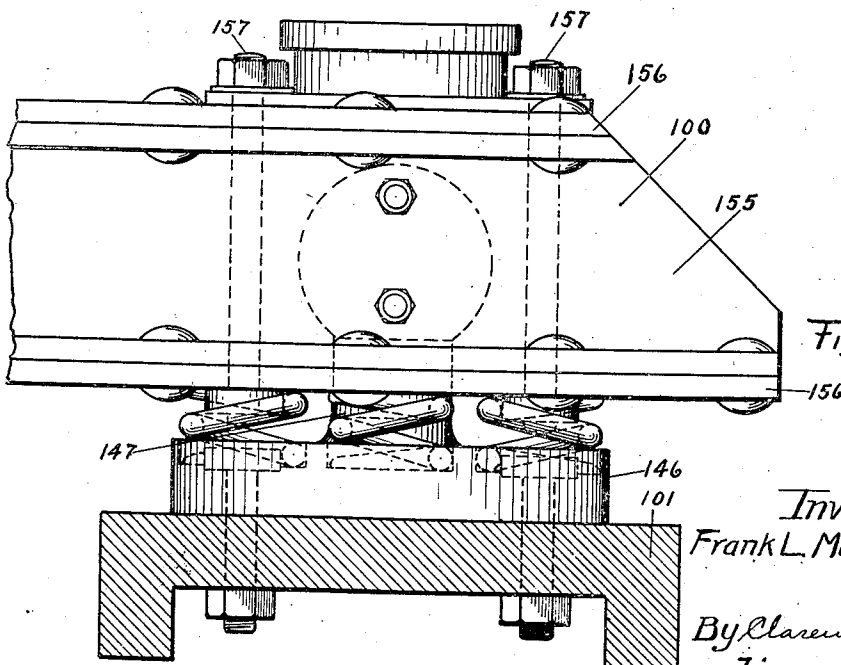


Fig. 19

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Patented June 30, 1925.

1,544,263

UNITED STATES PATENT OFFICE.

FRANK L. MONTGOMERY, OF BUFFALO, NEW YORK.

UNA-RAIL SYSTEM.

Application filed February 9, 1921, Serial No. 443,699. Renewed November 28, 1924.

To all whom it may concern:

Be it known that I, FRANK L. MONTGOMERY, a citizen of the United States, and resident of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Una-Rail Systems, of which the following is a specification.

This invention relates to an improvement in a una-rail system in which the passenger car is supported and propelled by driving apparatus resting on a single line of traction rails and receiving its power through a single line of current rails above and parallel to the traction rails.

One object of the invention is to mount the current rails of such a system above and parallel to the traction rails so that they are protected from moisture and the elements and are available at all times.

Another object of the invention is to provide the traction rail of such a system with shock absorbing supports including resilient means and a wooden stringer to reduce noise and vibration and thus increase the comfort of travel.

A further object of the invention is to provide a wheel truck assembly pivoted as a unit to turn in a horizontal plane, and having wheel trucks oscillatably mounted in the assembly.

A still further object of the invention is to provide wheels comprising a stationary center, a tire ring mounted to rotate on said center and gear means for driving said ring.

Another object of the invention is to provide wheels comprising a stationary cam-like center plate and a series of rollers linked together around said plate.

Another object of the invention is to provide a housing for the driving apparatus employed in such system which completely encloses such apparatus and protects it from the elements, and which has a flexible central section, a center top opening thru which trolley mechanism extends and an overhanging cap for said opening carried by said trolley mechanism.

Another object of the invention is to provide a una-rail system with trolley mechanism mounted to oscillate laterally of the driving apparatus and car and held yieldingly by suitable means in positive contact with the current rail under all conditions of operation.

Other objects of the invention will appear from a consideration of the specification and of the drawings which form a part thereof and in which

Fig. 1 is a side elevation partly in section of one embodiment of my invention;

Fig. 2 is a top view of the driving apparatus and car, the housing of the apparatus being shown in section;

Fig. 3 is a sectional plan view of the passenger-car;

Fig. 4 is a view of this invention showing the supports adapted to carry two cars, one of the cars and the driving apparatus connected therewith being shown in section;

Fig. 5 is a cross section taken on the line 5-5 of Fig. 1 of one of the hangers by which the car is supported;

Fig. 6 is an enlarged section taken on the line 6-6 of Fig. 7 of the current rail and its supports;

Fig. 7 is a side elevation of the same mechanism;

Fig. 8 is a side elevation of the trolley mechanism, partly in section taken on the line 8-8 of Fig. 4;

Fig. 9 is an end view of the trolley mechanism shown in Fig. 8;

Fig. 10 is a sectional plan view of the part of the trolley mechanism taken on the line 10-10 of Fig. 9;

Fig. 11 is an enlarged detail view of a part of the trolley mechanism showing the way in which the current is transmitted therefrom to the motor;

Fig. 12 is a sectional view of one of the pilot wheels;

Fig. 13 is a section taken on the line 13-13 of Fig. 12 showing one of the rollers;

Fig. 14 is an enlarged side elevation of a roller;

Fig. 15 is a side elevation partly in section of one of the driving wheels;

Fig. 16 is a front view of one of the driving wheels partly in section;

Fig. 17 is a sectional view of the traction rail;

Fig. 18 is a sectional view of the king bolt; and

Fig. 19 is a side elevation of the king bolt.

Referring to the drawings, the reference character A designates the structure on which the driving apparatus and car are supported; the reference character B repre-

sents the driving apparatus and the reference character C designates the car.

The supporting structure.

5 The supporting structure A comprises up-
rights 20 suitably embedded in concrete or
other rigid holding means as at 21, on which
uprights are mounted cross girders 22 and
23 here shown in the form of I-beams. The
10 cross girders 22 are braced on the uprights
20 by the bars 24 and carry the traction
rails 25 on I-beams 26.

These traction rails are substantially of
the form shown in my application, Serial
15 No. 234,983 filed May 16, 1918 matured
January 4, 1921 into Patent No. 1,364,204
and are composed of two members 27 and
28 each having a base flange 29, a web 30,
and a rounded head 31. On the member 27
20 is provided a projection 32 which fits into
a depression 33 in the member 28 so that
the members act as a unit. Between the
webs 30, 30 and the heads 31, 31 is a space
in which is mounted a tongue 34 carrying
25 a head plate 35 and resting upon a resilient
member 36. The head plate extends over
the heads 31, 31 and is made substantially
circular in cross section for a reason to be
described later.

30 The tongue 34 is tapered and on each
side is a series of longitudinal depressions
37. The portions 38 of the tongue, which
separate the depressions, have line contacts
with the sides of the members 27, 28. When
35 the traction rail is assembled lubricant is
forced into the space between the members
and thus fills the longitudinal depressions.
Since the tongue 34 is tapered and has line
contacts only with the members 27, 28 and
40 since the depressions 37 are filled with lubri-
cant the plate 35 and tongue 34 will nor-
mally be raised by the resilient member 36
and under the weight of the load will be de-
pressed. Thus much of the shock normally
45 transmitted to the rail structure will be
absorbed together with a large part of the
noise and vibration.

As shown particularly in Fig. 17 the rail
25 rests upon a wood stringer 39, which is
50 protected from the weather by a metal sheet
40, completely covering its top and partly
covering its sides, and which in turn rests
upon a longitudinal beam 41 rigidly secured
to the I-beam 26. The bottom of the mem-
55 bers 27 and 28 is cut away as at 42 to re-
ceive a spring plate or other resilient means
43. The resilient means 43 and the wood
stringer 39 cooperate with the member 36
not only to absorb shocks and vibration but
60 also to eliminate the noise that is proven
most objectionable in the operation of any
railroad. The location of the member 36
below the tongue 34 adapts it to absorb a
blow on the side of the head as well as on
65 the ball. The wood tie 39, while protected

against the weather, is not entirely enclosed
so that it can be compressed vertically to
take up any blow.

In addition to the rail plates 44 by which
the I-beam is strengthened and the rail is
70 fixed to the structure there is a plate 45 fixed
to each girder 22 and secured by bolts 46
to the rail, which bolts act to hold the parts
of the rail in the assembled position. This
plate braces the rail against any side strains
75 that may arise due to the swaying of the car
in a wind or to the swinging of the driving
apparatus while going around a curve.
Vertical slots 47, which permit contraction
and expansion of the rails, are provided in
80 the tongue 34 through which the bolts 46
pass. The reciprocation of the tongue 34 de-
scribed above is thus not absolutely prevent-
ed by the bolts 46 but the length of its
movement is limited. 85

Erected on the girders 22 are uprights 50,
two sets being shown in the drawing, which
carry the upper cross girders 23, suitable
braces 51 being provided to join rigidly the
uprights and the girders. The cross beam
90 52 which extends between and stiffens the
uprights 50 is also adapted to support cables
or wires and the lighting means 53, thus
eliminating the need for the unsightly poles
required by surface railroads operated by
95 overhead transmission means.

Carried at each end of the girders 23 are
I-beams 54 from which are suspended the
current rails 55. Referring to Fig. 6 it will
be noted that the current rail 55, like the
100 traction rail 25, has a rounded head. The
rail 55 is preferably supported in a steel
housing 56 rigidly secured along the I-beam
54, braces 57 being provided in the form of
angle irons to rigidly hold the steel housing
105 in place. Within the steel housing, at sui-
table intervals, are wood linings 58 fixed in
place by bolts 59, the heads of which are
embedded in the lining. The side lining
plates are recessed at 60 to receive the pro-
110 jections 61 on the blocks 62 of porcelain or
other insulating material. These blocks are
suitably cut away at 63 to receive the flanges
64 of the current rail 55. In addition to the
blocks 62 insulating means 65 may also be
115 provided between the flanges and the blocks.
While this last is not essential it will be
found desirable in order to increase the bar-
rier against the leakage of current from the
rail 55. The linings and insulating blocks
120 are rigidly clamped in position by means of
a bolt 66 which extends completely through
the housing, linings and blocks.

It will be noted that the current rail is
mounted above the traction rail so that it is
125 engaged from below instead of at the side
as in the third rail system usually employed
in surface and elevated railroads. This
method permits the use of an encasing hous-
ing which completely protects the rail from
130

the weather so that its operation is not affected by rain, snow or ice. The part of the girders 22 between the uprights 50 may be used to support a footway 67 which may be used by employees for inspection and repair purposes.

Driving apparatus.

The driving apparatus B comprises two bolster bars 100, each of which is supported by a pilot truck 101 and a drive truck 102. The pilot trucks are located ahead of and behind the drive trucks which are arranged adjacent each other so that the driving force is applied approximately above the center of the car regardless of its direction of travel. This has proven to be the most efficient way since the greatest load is there located under normal conditions. The bolster bars 100 are pivoted intermediate their ends to a top plate 103 which extends substantially from one end to the other of the driving apparatus. At the center of the top plate is provided an opening 104 (see Fig. 2) through which the trolley mechanism carried by the top plate, operates as will be pointed out later.

Rigidly carried by the bolster bars 100 through braces 105, or other suitable means, is the housing 106 which completely encloses the driving apparatus except for the opening 107 above the opening 104, through which the trolley mechanism extends. The housing has at its center an accordion pleated section 108 which permits relative movement of the ends of the housing so that the bolster bars, by which the housing is carried, can pivot on the top plate independently of one another and in order that the wheel assemblies can follow the line of the traction rail. This accordion pleated section 108 is at either side of the trolley mechanism and is located between the two driving wheel trucks 102.

On the trolley mechanism, above the opening 107, is a cap 109 which overhangs the opening and prevents entry of moisture at any time. This cap is carried by the trolley mechanism which is supported by the top plate 103 and has no direct contact with the housing 106, so that the bending of the housing, permitted by the accordion pleated section, does not effect the function of the cap 109. The roar which the noise of the driving apparatus would set up in a closed bell-shaped housing is eliminated by the provisions of the opening 107 and the cap which covers without engaging it.

The pilot trucks 101 comprise the frame work 110 on which is rigidly supported the pilot wheels 111. These wheels, two in number, bear at all times upon the traction rail and are shown in detail in Figs. 12, 13 and 14. Rigidly fixed on the axle 112 is a cam-like plate 113, the outer edge 114 of which

is cylindrical and similar to the head of the rail 25 and which acts as a track for a purpose to be described below. Around the cam-like plate 113 is provided a series of rollers 115 joined by links 116 and so held that each roller bears against the edge 114 of the plate at all times. The individual rollers are rigidly carried upon a shaft 117 and as shown in Fig. 13 are made up in three parts, the outer collar or tire 118, preferably of steel, the inner collar 119, also preferably of steel which is secured to the shaft 117, and, between the collars 118 and 119 a fibre collar 120. The chief function of this collar 120 is to deaden the noise and to absorb shocks that might otherwise be transmitted to the shaft and bearings. The collar 120 as indicated in the drawings also has insulating properties to protect the shaft bearings, if it should prove advisable to use the traction rails to complete the electric circuit. Bolted to the plate 113 are side plates 121 having annular grooves 122 into which, as shown in Fig. 13, project the ends of the shafts 117. The lower side of the cam-like plate 113 is flat, as shown in Fig. 12, so that there are two rollers 115 in contact at all times with the traction rail, thus providing a firmer support for the truck and insuring more adhesion to the rail than would be possible if only a single wheel or roller were used.

The rail contacting surface 118' of the steel tire 118 is curved to conform exactly with the round head of the rail 25 and the edge 114. Thus the tire bears on the rail in the same manner when the apparatus tips in going around a curve as when it is upright. By reason of this construction the same speed can be maintained whether the apparatus is on a curved or on a straight track.

The rotative movement necessarily given to the rollers as the apparatus moves along the rail obviously causes them to move along the edge 114 of the plate 113 so that one roller after another is presented to the track 25. The links 116 have at their ends openings 123 through which the shafts 117 project and in these openings are provided anti-friction devices 124 which support the ends of the shafts. As shown in Fig. 13 these devices comprise ball bearings 125 which run in grooves 126 in the ends of the shafts and in similar grooves in the collars 127 mounted in the openings 123 of the links. The drawings show an uneven number of rollers 115 and it is obviously necessary, therefore, that the links of one set should be bent so that they form the outer links on one roller and the inner links on the adjacent roller. The load is transmitted to the shafts 117 through the springs 127' which also act to allow for any unevenness which may occur.

Each drive truck 102 carries in addition to the drive wheels 128, a motor 129 which is mounted between the drive wheels and is suitably geared thereto. The drive wheels 5 128 are mounted on shafts 130 and each comprises an annular rim 131 which gyrates about a ring 132 keyed or otherwise rigidly secured to the shaft. The ring 132 comprises the steel collar 133 which is fixed to 10 the shaft, a steel collar 134 and an intermediate fibre collar 135, which has the same functions as the collar 120 set forth above. The rim 131 has a steel face or tire 136 which engages the traction rail 25 and with- 15 in which is mounted a race cooperating with a race provided in the collar 134 for the ball bearings 137. The rail contacting surface 136' of the steel tire 136 is curved to conform with the round head of the traction 20 rail 25 as is the corresponding surface 118' of the tire 118 and functions therefore in the same way. Flanges 136² for the tire do not normally touch the traction rail but in case of accident they prevent derailing 25 of the car and since they project at each side of the rail they will break up any ice or snow lying across the rail. Flange rings 138, pinned to the tire, project beyond and protect the ball race which may be lubricated by any suitable means. In Fig. 16 30 this lubricating means comprises a grease cup 139 from which lubricant is fed through a pipe 140 to the race. Rigidly secured to the side of the tire 136 is one end of a ring 141 at the other end of which is carried a 35 gear wheel 142. The gear wheels 142 are driven from a gear wheel 143 on the motor 129 through intermediate idle gears 144 as shown in Fig. 1.

40 Each of the pilot and drive trucks is suspended from the bolster bar 100 by means of king bolts 145, shown in detail in Figs. 18 and 19. Firmly secured to the frame work of the trucks is a plate 146 from which 45 projects a boss 147 terminating in a spherical head 148. Mounted within the bolster bar 100 are blocks 149, four in number, so formed that when properly assembled they provide a socket 150 for the spherical head 50 148 and leading from the top and bottom of the socket are diametrically opposed conical openings 151 through the lower of which the boss 147 of the plate 146 extends.

Rigidly secured to the bolster bar 100 55 around the upper conical opening 151 is a flanged ring 152, the flange 153 of which is covered by a threaded cap 154 which can be easily removed to permit lubrication of the moving parts of the bolt.

60 As shown in Fig. 18 the bolster bar 100 is made up of channeled bars 155 to which are riveted or otherwise rigidly secured, top and bottom plates 156. The upper and lower 65 blocks 149 of each set are fixed in position by vertical bolts 157 connecting the top and

bottom plates 156 and passing through vertical holes 158 in the blocks. These bolts also clamp the flanged ring 153 in place on the top plate. The holes 158 are larger 70 than the bolts 157 so that the blocks 149 can be adjusted laterally, should the occasion arise, by the pins 159 which are threaded through the bars 155 and to bear against the blocks. Lock nuts 160 are provided to 75 hold the pins in the desired position.

The plate 146 is held on the truck frame by bolts 161, the heads of which are located in recesses 162 of the plate below and in line with the bolts 157. The springs 163 80 which seat in these recesses and which surround the heads of the bolts 157 and 161, while tending to hold the trucks normally parallel to the bolster bars 100, allow them to oscillate in any direction relative thereto. 85 The trucks are therefore so pivoted relatively to the bolster that when on a grade or on a curve they always bear directly upon the track and the drive wheels are always in position to transmit their full power. Inas- 90 much as the head of the traction rail is round and the contact of the wheels with it is always along a curved line the loss of power is reduced to a minimum in any relation of the trucks to the track.

The trolley mechanism 165 is mounted in 95 a frame work 166 which is secured to and depends from the plate 103 at the opening 104 mentioned above. As shown in Figs. 8, 9 and 10 this frame work 166 is made up of four angle plates 167 which are riveted 100 to the plate 103, and to the lower ends of which are fixed side plates 168 which completely enclose the lower ends of the frame. Mounted in the two transverse plates 168 105 is an axle 169 on which the trolley mechanism is carried. The axle extends through opposed circular apertures 170 in the plates 168 one of which is shown in Fig. 11. Fixed in each of the apertures 170 is a ring 110 171 made of insulating material and carrying a flanged sleeve 172 through which the axle 169 extends. The sleeve 172 is clamped against the ring 171 by the flange 173 and nuts 174. Fixed at the middle of the axle 169 is a dash pot 175 and at the ends of the 115 axle inside the frame work is fixed the support 176 through which extends a rod 177. The enlarged lower end 178 of the rod 177 is provided with packing rings and forms the piston for the dash pot. A suitable 120 cover plate 179 through which the rod 177 passes is bolted to the dash pot 175 to hold the rod 177 in place. At the upper end of the rod 177 is mounted the forked support 180 for the trolley wheel 181. This trolley 125 wheel is similar in construction to the pilot wheel 115 which has been described above and the same reference characters will therefore be applied to the parts of the trolley wheel. Instead, however, of the single 130

spring 127' used with the pilot wheels there are in the journal boxes a plurality of springs 182, above and below the axle, so that the latter is normally held in the mid-way position shown in Fig. 8. Moreover, the flat portion of the plates 121, which is adjacent and parallel to the rail engaged is, of course, at the top and projects within the housing 56.

A spring 183 surrounding the rod 177 and bearing against the top of the support 172 and against the bottom of the support 180 tends to hold the trolley wheel at all times in contact with the current rail 55. Into the dash pot 175 compressed air is forced through the pipe 184 which is controlled from the passenger car. It will thus be noted that while under ordinary conditions the trolley wheel is held against the current rail by air pressure, the spring 183 will act to hold the wheel in place if the air pressure should not be available at any time. By providing two rollers 115 in contact at all times with the current rail, it is obvious that the danger of arcing will be reduced to a minimum.

The axle 169 being mounted to turn freely in its support, the trolley mechanism can, of course, swing from side to side so that any inaccuracies that may be present in the line of the current rail are taken up and also so that the trolley contacts with the current rail on a curve as well as while on a straight track. The trolley mechanism is normally held in the upright position shown in Fig. 9 by springs 185 provided at opposite sides of the dash pot 175, the outer end of such springs bearing against suitable blocks 186 which are fixed to the center of the side plates 168. The springs 185 counteract each other and normally hold the trolley mechanism upright. But, however, since these springs are directly opposed the trolley mechanism is kept in contact with the current rail regardless of its relation to the driving apparatus. In connection with this function attention is called to the fact that the trolley mechanism is constantly under tension either of compressed air thru the dash pot 175 or of the spring 183 so that the distance of the current rail from the apparatus has no effect upon the wheel contact.

The current from the rail 55 is transmitted through the rollers 115, the plate 113 and the shaft 112 to the forked support 180 and thence through the supports 176 to the axle 169. At each end of the axle 169 which is insulated from the frame work by the rings 171 are fixed plugs 187 carrying the cables 188 by which the current is transmitted to the motor 129 and the control mechanism in the car. In order to prevent any short circuit that might result if the trolley mechanism, while swinging with

the axle 169, should touch the plate 103, blocks of insulation 189 are provided at the sides of the opening 104.

The current rail 55 has, like the traction rail 25, a rounded head with which the rollers 115 exactly conform so that they have the same contact when the trolley mechanism is tilted as when it is upright.

Doors 190 are provided in the housing 106 by which the mechanism may be inspected or repaired should the occasion arise at any time.

The car.

The car 200 preferably used in this system, is, as shown in the drawings, cylindrical in form having tapered ends 201. It has been found that a car of this contour offers the least resistance to movement through the air and at the same time affords the maximum capacity for passengers. In the upper part of the car is provided an air compartment 202 for compressed air tanks and thru this compartment the control wires and air tubes pass. In the bottom of the car is a compartment 203 in which are provided water and wastage tanks and also tanks for compressed air by which the water is supplied to and the wastage removed from the lavatory sections. At the front and rear of the car are the operating compartments 205 which are provided with suitable control mechanism 206 by which the driving apparatus is controlled. Since this mechanism forms no part of the present invention it is not shown and will not be described in detail. At the center of the car are provided seats 207 and sliding doors 208. The drawings show only two such doors both on the inner side of the car with the idea that island platforms only are to be used. Obviously, however, doors may be provided at both sides and in fact the entire arrangement of the interior of the car may be changed if preferred.

The car 200 is supported from the driving apparatus by means of hangers 210 which are rigidly fixed at each end of the top plates 103. The hanger 210 comprises plates 211 which are fastened at each side of the plate 103, sufficient space being allowed between the plates so that the bolster bars can move relatively to the plate 103, and which extends down between the pilot trucks 101 and the drive trucks, 102. To the lower ends of each pair of plates 211 is secured one end of a U shaped bar 212 shown in section in Fig. 5. The bar 212 consists of an I-beam 213 strengthened on one side between the flanges by a plate 214 held in place by bolts 215'. On the other side is bolted a channeled plate 216 which protects the electric cable 188 and the compressed air pipe 184. In addition to the I-beam 213 and its stiffening bar 214 there is also

provided bars, chains or cables 217 at each end of the beam. A housing 218 tapered at each end encloses these parts, being suitably held in place by bolts or other means 219. The lower ends of the hangers 211 are rigidly fixed in the compartment 202 by any suitable means (not shown) above each end of the center compartment. Not only, as pointed out above, are the drive trucks 10 between the hangers but also the greatest part of the load to be carried is so located.

Since the car 200 is thus rigidly secured to the top plate 103 and since both the trucks and the trolley mechanism are mounted to 15 have a tilting movement independent of the plate, it will follow that the car will remain practically upright while making curves and moreover since the driving apparatus is housed the tendency of a high 20 wind to sway the car laterally will be counteracted by the force of the wind against the housing. In order to reduce air resistance as much as possible the housing for the driving apparatus and for the 25 hanger are tapered or stream lined like the car body.

While one embodiment only of this invention has been shown and described it is obvious that others can be made without departing from the spirit and scope of my invention as set forth in the following claims.

Having thus set forth my invention that which I claim is new and for which I desire the protection of Letters Patent of the 35 United States is the following:

1. In a una-rail system, a supporting structure, a traction rail carried thereby, a current rail suspended from said structure above and parallel to said traction rail, driving apparatus supported on said traction 40 rail below said current rail, said apparatus comprising a truck carrying plurality of driving wheels, a truck carrying a plurality of pilot wheels, a bolster bar to which said trucks are pivoted, a trolley yieldingly held 45 against said current rail, and a motor carried upon said driving wheel truck connected to said trolley, and a car suspended from said apparatus below said traction rails.

2. In a una-rail system, a supporting structure, a traction rail carried thereby, a current rail suspended from said structure above and parallel to said traction rail, driving apparatus supported on said traction 55 rail below said current rail, said apparatus comprising a truck carrying plurality of driving wheels, a truck carrying a plurality of pilot wheels, a bolster bar to which said trucks are pivoted, a trolley

yieldingly held against said current rail, 60 and a motor carried upon said driving wheel truck connected to said trolley, hangers fixed to said driving apparatus, a car carried by said hangers below said traction rail, motor control mechanism in said car, and connections 65 between said control mechanism and said motor passing through one of said hangers.

3. In a una-rail system, a supporting structure, a traction rail carried thereby, a 70 current rail suspended from said structure, above and parallel to said traction rail, driving apparatus supported on said traction rail, said apparatus comprising a top plate, bolster bars pivoted to said top plate, 75 driving trucks and pilot trucks pivotally mounted in said bolster bars to support said bars and plate, a trolley suspended from said plate and engaging said current rail and motors mounted upon said drive trucks, 80 and a car suspended from said top plate below said traction rail.

4. In a una-rail system, a supporting structure, a traction rail carried thereby, a current rail suspended from said structure, 85 above and parallel to said traction rail, driving apparatus supported on said traction rail, said apparatus comprising a top plate, bolster bars pivoted to said top plate, driving trucks and pilot trucks pivotally 90 mounted in said bolster bars to support said bars and plate, a trolley suspended from said plate and engaging said current rail and motors mounted upon said drive trucks, hangers rigidly secured to said top plate, 95 and a car rigidly fixed to said hangers and suspended thereby below said traction rail.

5. In a una-rail system, a supporting structure, a traction rail carried thereby, a 100 current rail suspended from said structure, above and parallel to said traction rail, driving apparatus supported on said traction rail, said apparatus comprising a top plate, bolster bars pivoted to said top plate, driving trucks and pilot trucks pivotally mount- 105 ed in said bolster bars to support said bars and plate, a trolley suspended from said plate and engaging said current rail and motors mounted upon said drive trucks, hangers rigidly secured to said top plate, a 110 car rigidly fixed to said hangers and suspended thereby below said traction rail motor control mechanism in said car and connections between said motor and said control mechanism passing through one of 115 said hangers.

In witness whereof, I affix my signature.
FRANK L. MONTGOMERY.