Feb. 1, 1938. J. L. BONANNO 2,106,698

ARTICULATED TOY TRAIN

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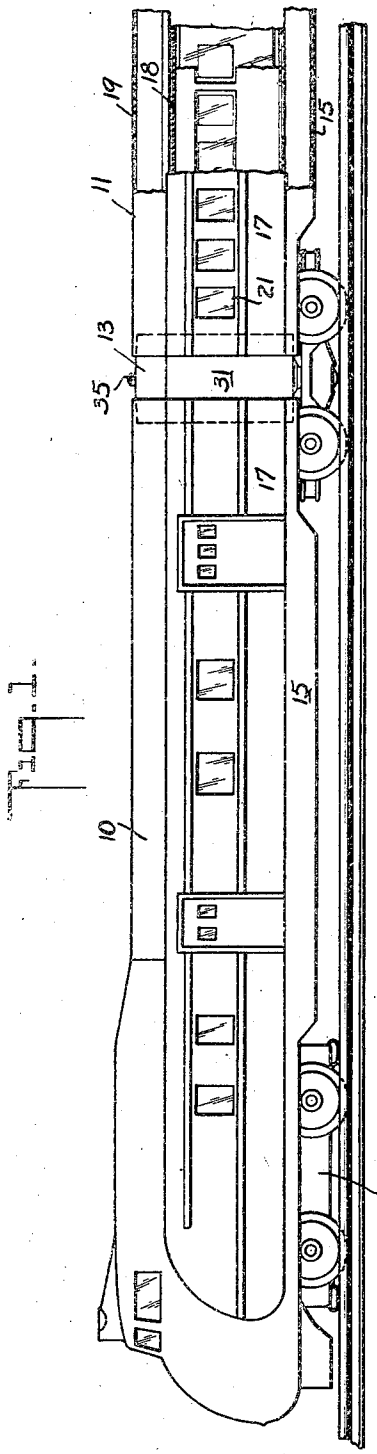


Fig. 1.

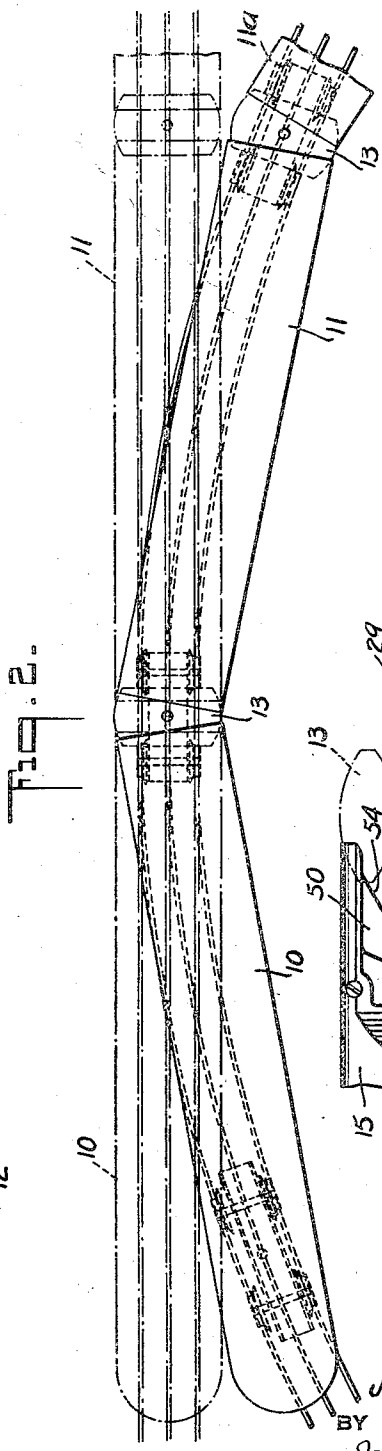


Fig. 2.

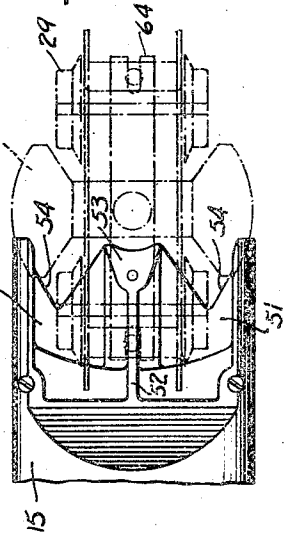


Fig. 3.

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Fig. 3.

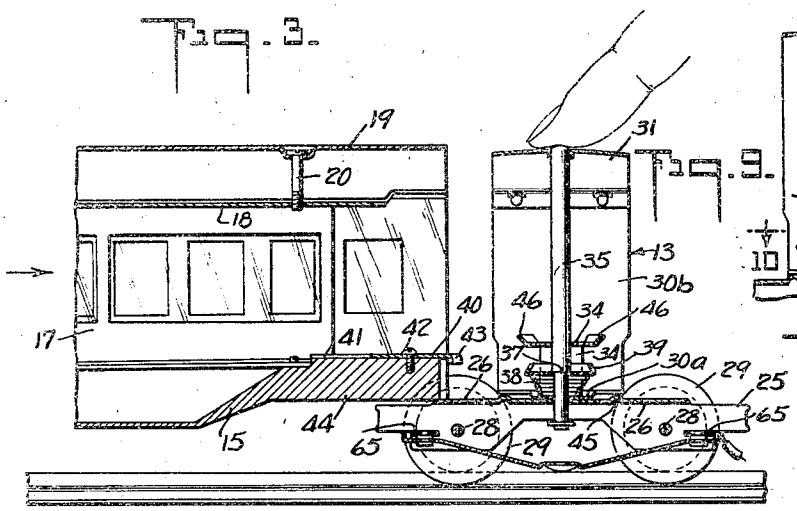


Fig. 9.

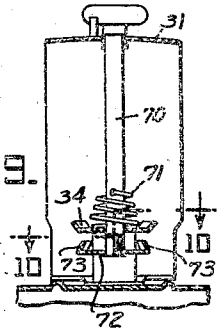


Fig. 10.

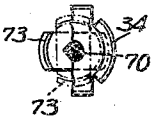


Fig. 4.

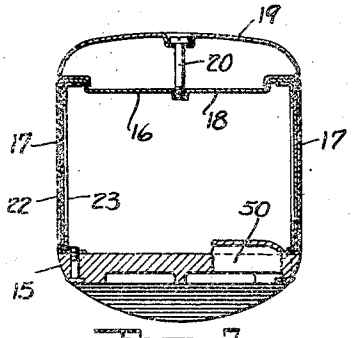


Fig. 7.

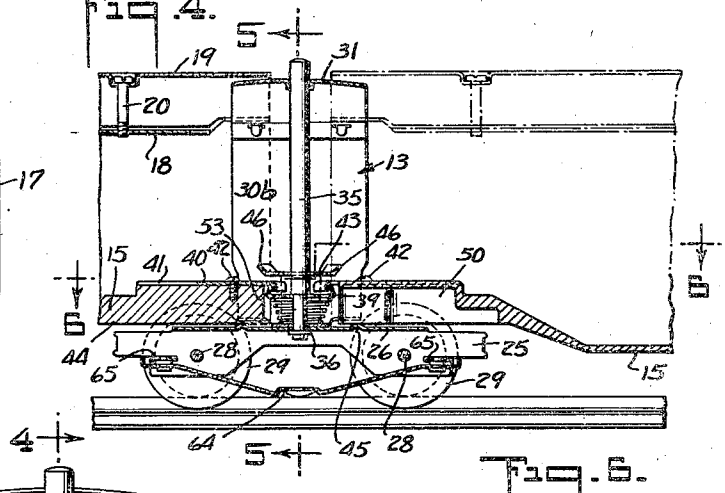


Fig. 5.

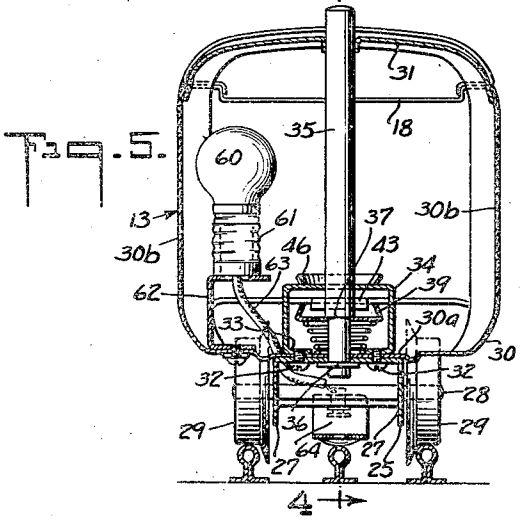
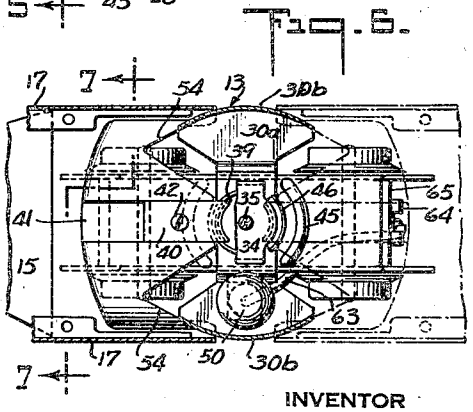


Fig. 6.



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Fig. 11.

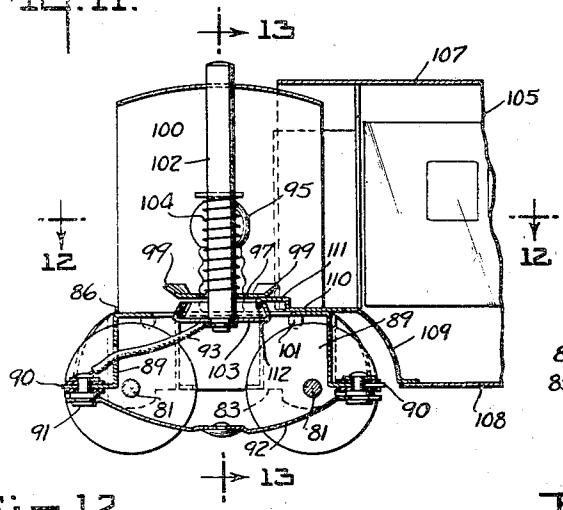


Fig. 13.

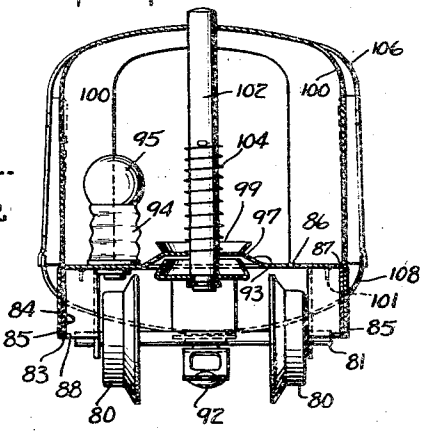


Fig. 12.

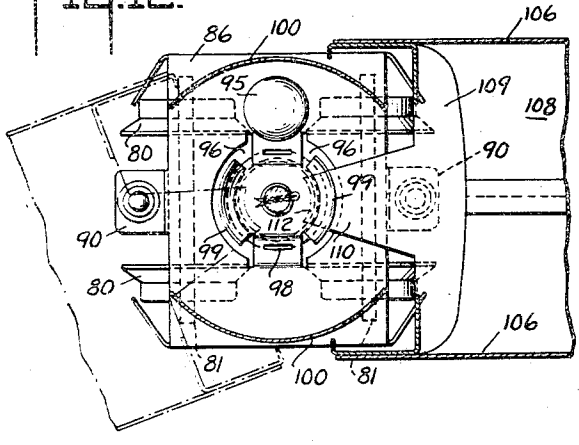


Fig. 14.

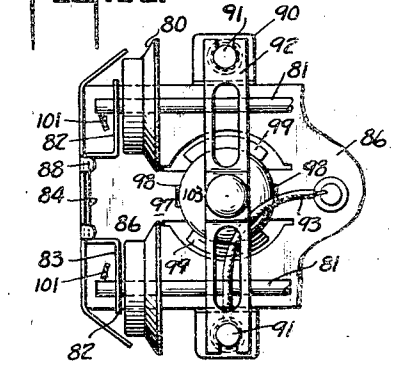
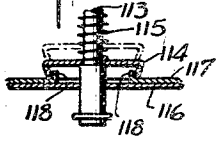


Fig. 14a.



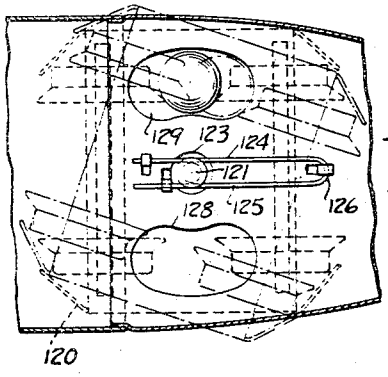


Fig. 16.

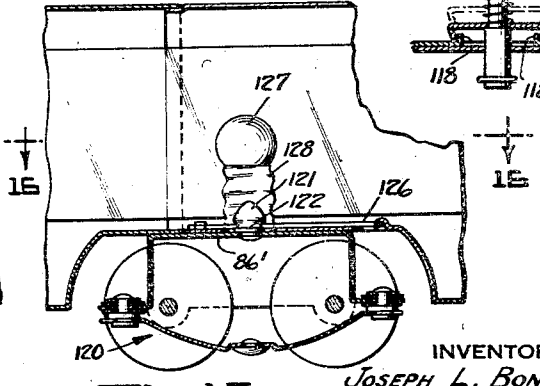


Fig. 15.

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Patented Feb. 1, 1938 2,106,698

UNITED STATES PATENT OFFICE

2,106,698

ARTICULATED TOY TRAIN

Joseph L. Bonanno, Forest Hills, N. Y., assignor to The Lionel Corporation, New York, N. Y., a corporation of New York

Application July 27, 1935, Serial No. 33,435

33 Claims. (Cl. 105—4)

The present invention relates to articulated toy trains and is more particularly directed toward the provision of improved means whereby two adjacent cars may be coupled to and supported from a truck section.

The present invention contemplates the securing of the two adjacent cars to a coupling section in the form of a truck in such a way that the truck may ride along the track and carry the car bodies in the position which car bodies should assume in regular trains of similar appearance.

According to the present invention, the car bodies extend on to the truck section and are supported from it, and have draft elements which enter in between fixed and movable members carried by the truck section. The draft elements and fixed and movable members are arranged to facilitate coupling the parts together and to insure against accidental disconnection of the parts.

The invention also contemplates the provision of the truck unit with an electric lamp and current collector so that it will be unnecessary to carry electric wiring into the car bodies, the light from the lamp being allowed to enter each body and illuminate it from the end.

A further object of the present invention is to provide a form of construction for car bodies which has a low center of gravity and great rigidity. Other and further objects will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, several embodiments in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Fig. 1 is a side elevational view of two cars of an articulated toy train, parts being shown in section.

Fig. 2 is a top plan view showing three cars of an articulated toy train on curved track, and indicating the position of the same parts on straight track by dot and dash lines.

Fig. 3 is a longitudinal sectional view through a coupling unit and car showing the car slightly spaced from the coupling unit and the coupling elements out of normal position to facilitate the coupling operation.

Fig. 4 is a longitudinal sectional view through two cars of a toy train with interposed coupling unit showing the parts in normal operating position, this view being taken on the line 4—4 of Figure 5.

Fig. 5 is a transverse sectional view on the line 5—5 of Figure 4.

Fig. 6 is a plan view of the lower part of one car and of the coupling unit, with parts in section, on the line 6—6 of Figure 4, the car on the right being indicated in dot and dash lines.

Fig. 7 is a section taken on the broken line 7—7 of Figure 6 showing the construction of the car.

Fig. 8 is an inverted plan view of the end of the car body illustrating the position of the truck or coupling unit in dot and dash lines.

Fig. 9 is a fragmentary vertical section similar to Figure 3 illustrating a modified form of coupling mechanism.

Fig. 10 is a fragmentary sectional view on the line 10—10 of Figure 9.

Figure 11 is a longitudinal sectional view through a modified form of coupling unit and car construction.

Fig. 12 is a horizontal sectional view on the line 12—12 of Figure 11.

Fig. 13 is a transverse vertical sectional view on the line 13—13 of Figure 11.

Fig. 14 is an inverted plan view of the coupling section.

Fig. 14*a* is a vertical sectional view of a modified form of construction.

Fig. 15 is a longitudinal sectional view illustrating a detachable truck for supporting car bodies.

Fig. 16 is a horizontal sectional view on the line 16—16 of Figure 15.

In the form of construction shown in Figs. 1 to 8, a stream line toy electric locomotive for an articulated train is indicated generally at 10, a car at 11 and a second car at 11*a* (Fig. 2).

The rear end of the car 10 carrying the locomotive or power plant and the ends of all intermediate cars, as well as the front end of the rear car of the train, may be made alike, and are preferably so made. The car 10 has a truck indicated at 12 which supports the front end of the locomotive, and the adjacent ends of two cars or the locomotive and car are coupled together and supported by a coupling section indicated generally at 13.

Each car is provided with a comparatively heavy die-cast bottom member 15 to which is secured a channel-shaped stamping 16 having side walls 17, 17 and a top wall 18. A roof-forming stamping 19 is secured to the top portion 18 by screws indicated at 20. The side walls may be formed to simulate the side walls of a train and provided with window openings 21 which

may be covered by a sheet of translucent material **22**, held in place by a skeletonized stamping **23**.

The coupling section or unit **13** has a body stamping **25** having a substantially flat upper platform **26** and downwardly flanged side members **27** which carry the axles **28** for the wheels **29**.

A U-shaped sheet metal stamping **30** having a bottom portion **30***a* and side walls **30***b* is mounted on the upper face of the stamping **25**. This stamping **30** supports a top member **31** and these parts are shaped to simulate the vestibule of a train. They enter under the roof portion **19** and inside the side walls **17**, **17** of the cars, as will be apparent from the drawings. The stamping **30** is secured in place by screws indicated at **32** which pass into feet **33** carried by a bridging member **34**.

A plunger **35** extends down through the cover member **31** of the vestibule-simulating element through the bridging member **34**, and the bottom of the stamping **30**, as well as the upper portion of the stamping **25**. Its lower end is provided with a washer **36** which limits its upward movement. The plunger is provided with a shoulder **37** against which a coiled spring **38** holds a movable member **39**. This member may be in the form of a small annular sheet metal stamping and is preferably provided with conical side walls as indicated. The spring presses this member upwardly toward the fixed bridging member **34**, as will be obvious.

The cars are provided with draft elements or draw bars which extend beyond the ends of the cars. A suitable form of construction for use with the die-cast car bottom is indicated at **40**. It is in the form of a short steel stamping fitting a groove **41** in the casting and held in place by a screw **42**. It has an annular depending flange **43** adapted to enter between the fixed bridging member **34** and the movable member **39** when the latter is depressed, and to engage with the member **39** when the plunger is released, so that the spring moves it up as shown in Fig. 4. In order to take the weight of the car off the spring, the parts are so designed that the lower surface **44** of the bottom casting **15** rides on an annular bead **45** formed in the stamping **25**.

To secure the truck unit and a car together, it is merely necessary to bring the parts into the position indicated in Fig. 3, press down on the plunger **35** and then move the car toward the coupling section. In doing this, the draw bar element passes into position, the cams **46** carried by the bridging member **34** facilitating the operation. Release of the pressure on the plunger will complete the coupling of the parts, and when it is desired to couple the second car in position, it is merely necessary to repeat the operation. The truck supports the first car in position so that the first car and coupling member do not separate when the second car is moved toward the coupler. Release of the cars is accomplished by reversing these operations.

In the form shown in Figs. 1 to 8, the ends of the casting **15** are provided with downwardly opening recesses **50**, **51** on the opposite sides of the central web **52**. These recesses accommodate the wheels on the truck. The central web **52** reinforces the structure and provides a surface to engage the upper face of the stamping **25** to limit the fore and aft tilting of the coupling section relative to the car body. The front end of this central web is enlarged and made arcuate, as indicated at **53** (Fig. 8) to engage the outer surface of the movable coupling element **39** and limit the amount that the car may approach the plunger.

To accommodate the vestibule-simulating stamping **30**, the bottom wall of the car is provided with V-shaped notches **54**.

Where it is desirable to have electrically lighted articulated toy trains, the coupling sections are preferably provided with an electric lamp so that light can shine into the car bodies and illuminate them. In the construction shown in Figs. 1 to 8, such an electric lamp bulb is indicated at **60**. It is carried in a lamp socket **61** supported by a bracket **62** fastened to the vestibule-simulating member. The insulated contact of the lamp socket is connected by a wire **63** with a collector shoe **64**. This collector shoe is supported on insulating cross members **65** carried by the frame **25**.

Figs. 9 and 10 fragmentarily illustrate a coupling device which may, in general, be like that shown in Figs. 1 to 8. Instead, however, of employing a vertically movable plunger to effect the release of the draft element from the fixed and movable members, the construction here illustrated employs a vertical rod **70** secured between the bridging member **34** and the top **31** of the car. This rod is turned in one direction by a coiled spring **71** so as to normally hold the movable member **72** in such a position that the upwardly extending flanges **73** are in position to engage the hook-shaped ends of the draft members **43**. When the shaft **70** is turned through 90°, the arcuate segments **73** are turned to the dot and dash line position of Fig. 10 so as to release the coupling elements.

In the construction shown in Figs. 11 to 14 inclusive, the wheels **80** are carried on axles **81** which extend through the ends **82** of stampings **83**. These stampings have an intermediate portion **84** which is offset from the end portions **82**, as indicated more clearly in Fig. 14. These stampings **83** are secured to depending flanges **85**, **85** of a body stamping **86**, these two stampings being interlocked by means of an upwardly extending lug **87** carried by the stamping **83** and passing through a hole in the platform portion of stamping **86** and by inwardly bent lugs **88** carried at the lower edge of the flanges **85**. The stamping **86** has downwardly bent elements **89** with outwardly bent feet **90**. These feet carry insulated members **91** adapted to support the collector shoe indicated at **92**. A wire **93** extends up from one of these insulated supports to the socket **94** which supports a lamp bulb **95**. The stamping **86** is provided with two arcuate slots **96** and the material between these slots forms a bridging member **97**. The bridging member is slotted as indicated at **98** to permit the elevation of the bridging member without unduly stretching the material. The bridging member is also provided with curved cam surfaces **99** similar to the cams **46** shown in Figs. 3–5.

A vestibule-simulating stamping **100** is provided with downwardly extending lugs **101** which pass through suitable slots in the body stamping **86** so that these two stampings may be secured together. A plunger **102** passes through aligned openings in the stamping **100** and the bridging member **97**, and the lower end of this plunger carries a movable member **103** which corresponds with the movable member **39**. A coiled spring **104** holds the plunger in elevated position.

A car body **105** may have side walls **106**, roof **107** and bottom wall **108**. Where the bottom is

below the upper level of the truck, the car body is provided with a curved stamping 109 which accommodates the swinging truck. The stamping 109 has an extension 110 which rests on the upper surface of the stamping 86 and it is provided with a draft element 111 having a hooked extension 112, adapted to enter between the fixed bridging member 97 and the movable member 103.

The structure shown in Figs. 11–14 inclusive functions substantially the same as that previously described.

In the form shown in Fig. 14*a*, the plunger 113 carries a downwardly flanged disk 114 and is pressed downwardly by a spring 115. The plunger extends upwardly and may be lifted to raise the disk to the dot and dash line position in any suitable way. The truck body is indicated at 116 and draft elements at 117 have hooks 118 extending upwardly to enter inside the flange of the disk 114. It will be understood that draft elements with upwardly extending hooks may be employed with an angularly movable downwardly flanged member similar to that shown in Figure 9, but inverted.

To support the rear end of the last car of the train, a truck such as illustrated in Figs. 15 and 16 may be employed. This truck is designated generally by the reference number 120. Instead of providing the central part of the truck stamping 86' with the coupling devices shown in Figs. 11–14, this portion of the stamping 86' is provided with an upwardly extending conical member 121 having an under-cut shoulder indicated at 122. This button-like member passes through an opening 123 in the bottom of the car body and passes between the arms 124, 125 of a spring 126. The spring is carried by the car body and grips the button sufficiently tight to hold these parts together and not permit the truck to swing relative to the car body.

To provide for the illumination of the interior of the car body a lamp bulb 127 is carried in a lamp socket 128 mounted on the truck stamping 86'. To accommodate the socket and lamp bulb, the bottom of the car is provided with slots indicated at 128 and 129. The lamp is connected to the collector shoe in the same manner as shown previously. To remove the truck from the car for re-lamping, it is only necessary to grasp the truck and pull downwardly with sufficient force to spread the spring 126.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims, and I wish it to be understood that the particular forms shown are but a few of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. In an articulated toy train, in combination, a coupling section comprising a truck having wheels and axles, a truck-carried member, a spring normally holding the truck-carried member in one position, the member being freely manually movable to another predetermined position, a fixed truck-supported element, a movable element carried by the movable member and normally held thereby in a predetermined position opposite the fixed element, and car bodies each having draft elements extending between the fixed and movable elements and having a configuration to interlock with one of said elements to prevent separation of the corresponding car body from the coupling section when the movable member is in normal position and to transmit pull from one draft element to the other without changing the load on the spring, the draft elements being unlocked when said member is manually moved to the other position.

2. An articulated toy train such as claimed in claim 1, wherein the movable member is in the form of a vertically extending plunger.

3. In an articulated toy train, car bodies, a toy truck located between the adjacent ends of two car bodies, the car bodies having hooked draw bars extending toward one another, a vertically movable, spring-pressed plunger carried by the truck and disposed between the ends of the draw bars and carrying an element to receive the hooked ends of the draw bars whereby the cars may be coupled together, the truck carrying a fixed member toward which the spring urges the hook receiving member to prevent the separation of the ends of the draw bars therefrom.

4. In an articulated toy train, car bodies, a toy truck located between the adjacent ends of two car bodies, the car bodies having hooked draw bars extending toward one another, a vertically movable, spring-pressed plunger carried by the truck and disposed between the ends of the draw bars and carrying an element to receive the hooked ends of the draw bars whereby the cars may be coupled together, the truck carrying a fixed member above the hook receiving member and toward which the spring urges the hook-receiving member to prevent the separation of the ends of the draw bars therefrom.

5. An articulated toy train as claimed in claim 4, wherein the truck has a support for the car bodies to relieve the spring from the load of the car bodies.

6. In an articulated toy train, in combination, a coupling section comprising a truck having a truck body, wheels and axles, and two toy cars having supporting extensions resting on the truck body and draft elements extending toward one another, the truck body carrying a fixed member under which the draft elements extend to prevent lifting the car bodies, the truck carrying a movable member disposed below the fixed member and having a normal position in which it interlocks with the draft elements to prevent separation of the car bodies and a second unlocking position.

7. In an articulated toy train, in combination, a coupling section comprising a truck having a truck body, wheels and axles, two toy cars having supporting extensions resting on the truck body and draft elements extending toward one another, the truck body carrying a fixed member under which the draft elements extend to prevent lifting the car bodies, the truck carrying a movable member disposed below the fixed member and having a normal position in which it interlocks with the draft elements to prevent separation of the car bodies and a second unlocking position, and a vestibule simulating element carried by the truck body and having side and top walls and open ends, and having a plunger extending through the top wall for actuating the movable member.

8. An articulated toy train as claimed in claim 7 having an electric lamp mounted inside the vestibule simulating element for illuminating the car bodies through the open ends of the vestibule-simulating element and a current collector carried by the truck and connected to the lamp.

9. In an articulated toy train, in combination, a coupling section comprising a truck having a

truck body, wheels and axles, and two toy cars having supporting extensions resting on the truck body and draft elements extending toward one another, the truck body carrying a fixed member under which the draft elements extend to prevent lifting the car bodies, the truck carrying a movable member disposed below the fixed member and having a normal position in which it interlocks with the draft elements to prevent separation of the car bodies and a second unlocking position, the car bodies extending about the upper part of the wheels and being cut away to accommodate the swinging of the coupling section.

10. A coupling section for articulated toy trains comprising a truck body having axles and wheels, a vertically extending manually movable rod disposed centrally of the truck body and extending vertically upwardly so as to be accessible for manual manipulation above the truck body, a fixed member carried by the truck body, a movable member carried by the rod and disposed opposite the fixed member and movable with the rod to receive draft elements of a car between it and the fixed member, and a spring opposing such movement and normally placing the rod and movable member in a predetermined position in which the draft element is held against removal, the spring being yieldable when the rod is manually moved.

11. A coupling section as claimed in claim 10, wherein the rod is axially movable and one of said members has a flange extending toward the other.

12. A coupling section as claimed in claim 10, wherein the rod is axially movable and the movable member has a flange extending toward the fixed member carried by the truck body.

13. A coupling section as claimed in claim 10, wherein the fixed member has slanting cams to guide the draft elements into place.

14. A coupling section as claimed in claim 10, having a vestibule simulating element open at its ends and closed at the top through which the rod extends.

15. A coupling section as claimed in claim 10, wherein said rod is angularly movable about its longitudinal axis and the member carried thereby has discontinuous flange elements extending toward the fixed member carried by the truck body.

16. A coupling section as claimed in claim 10, wherein the truck body includes a stamping in which is formed the fixed member and axle supports carried by said stamping.

17. A coupling device for articulated toy trains having cars with draft elements extending toward one another, comprising a truck having a vertically upwardly extending movable rod accessible from above the truck for manual manipulation, a fixed truck-carried member above the lower end of the rod, a member carried by the rod below the fixed member, the draft elements extending between the fixed and movable members and having a configuration to interlock with one of said members to prevent separation of the corresponding car when the movable member is in one position, a spring acting on the rod to place the rod and member carried thereby in said position, the rod and movable member being movable out of said position to unlock the draft elements, the spring deforming sufficiently to permit such movement.

18. A coupling section for articulated toy trains, comprising a truck body having a platform portion and axle-carrying flanges, a U-shaped stamping secured to the platform portion and extending upwardly to simulate the side walls of a vestibule, an upper stamping attached to the side walls to form a roof element, a fixed member spaced from the bottom of the U-shaped stamping, a rod extending through the fixed member and the upper stamping, a movable member carried by the rod below the fixed member to receive the draft elements of toy cars between it and the fixed member, and a spring pushing the rod and movable member upwardly.

19. In an articulated toy train, a car body having a bottom wall, top and side walls, a centrally disposed draft element carried by the bottom wall, and a coupling section having a truck body provided with wheels and axles, a vestibule-simulating element supported by the truck body and having top and side walls received within the end of the car body and a coupling device cooperable with the draft element to couple the car body to the coupling section for articulation about a vertical axis, the bottom wall of the car body being cut away to accommodate the lower side walls of the vestibule-simulating element.

20. In a wheel carried coupling unit for articulated toy trains, an upwardly urged, spring pressed, manually movable plunger carrying hook seats, and a fixed abutment against which the hook seats are urged by the spring.

21. In a wheel carried coupling unit for articulated toy trains, a body stamping, a bridging member carried by the body stamping, a plunger passing through apertures in the stamping and bridging member, a member carried by the plunger, and a spring urging the member toward the bridging member, one of said members having arcuate seats adapted to receive the draft elements of cars to be coupled to the unit.

22. In an articulated toy train, toy cars having draft elements, and a wheel supported coupling unit having an upper face provided with two slots separated by an integral bridging strap elevated to permit inserting the draft elements under the strap, a vertical rod extending through the bridging strap and carrying a coupling member below the strap, a spring urging the rod and coupling member to a position to prevent removal of the draft elements, the rod being movable to unlock said draft elements.

23. An articulated toy train as claimed in claim 22, wherein the rod is vertically movable and the spring urges the rod and coupling member upwardly.

24. An articulated toy train as claimed in claim 22, having a vestibule-simulating element with side walls, and a roof through which the rod extends.

25. An articulated toy train as claimed in claim 22, having a collector shoe connected to a lamp bulb, and a vestibule-simulating element about the bulb, the vestibule-simulating element having side walls, and a top wall through which the rod extends.

26. In an articulated toy train, two car bodies having open ends, a supporting truck common to both cars, a vestibule-simulating element carried by the truck and having open ends extending into the adjacent car ends, an insulated current collector carried by the truck, and a lamp bulb connected to the current collector and carried within the vestibule-simulating element so that both car bodies may be illuminated therefrom.

27. In an articulated toy train, two car bodies having open ends, a supporting truck common to

both cars, a vestibule-simulating element carried by the truck and having open ends extending into the adjacent car ends, and a lamp bulb carried within the vestibule-simulating element so that both car bodies may be illuminated therefrom.

28. In an articulated toy train, in combination, a coupling section comprising a truck having wheels and axles, a truck-carried member normally held in one position and freely manually movable to another predetermined position, a fixed truck-supported element, a movable element carried by the movable member and normally held thereby in a predetermined position opposite the fixed element, and car bodies each having draft elements extending between the fixed and movable elements, the movable element having arcuate surfaces to co-operate with arcuate surfaces on the draft elements, the surfaces having a configuration to interlock and prevent separation of the corresponding car body from the coupling section when the movable member is in normal position, the draft elements being unlocked when said member is manually moved to the other position.

29. An articulated toy train such as claimed in claim 28, wherein the truck-carried member is in the form of a vertically extending plunger, the arcuate surfaces being concentric with its axis when the draft elements are in coupled position.

30. An articulated toy train as claimed in claim 28, wherein the car bodies are tubular and have open ends, and characterized by a vestibule simulating portion mounted on the truck and through which the movable member extends, the vestibule simulating portion having open ends extending into the ends of the car bodies to conceal the coupling mechanism, and an electric lamp carried within the vestibule simulating portion for illuminating the car bodies.

31. In an articulated toy train, in combination, a coupling section comprising a truck having wheels and axles, a truck-carried member normally held in one position and freely manually movable to another predetermined position, a fixed truck-supported element, a movable element carried by the movable member and normally held thereby in a predetermined position opposite the fixed element, and car bodies each having draft elements extending between the fixed and movable elements and having a configuration to interlock with one of said elements to prevent separation of the corresponding car body from the coupling section when the movable member is in normal position, and to be unlocked when said member is manually moved to the other position, the fixed element having cam surfaces to guide the draft elements into coupling position.

32. In an articulated toy train, in combination, a coupling section comprising a truck having wheels and axles, a truck-carried member normally held in one position and freely manually movable to another predetermined position, a fixed truck-supported element, a movable element carried by the movable member below the fixed element and normally held thereby in a predetermined position opposite the fixed element, and car bodies each having draft elements extending between the fixed and movable elements, the car bodies being supported from the truck to relieve the movable element of the load, the draft elements having a configuration to interlock with one of said elements to prevent separation of the corresponding car body from the coupling section when the movable member is in normal position, and to be unlocked when said member is manually moved to the other position.

33. In an articulated toy train, a truck having a truck body and wheels extending above the truck body, a tubular car body having substantially co-extensive bottom, sides and top, and a coupling element extending beyond the body, and a co-operative coupling element carried by the truck, the bottom of the car body being provided with downwardly opening recesses, into which the wheels extend, and a centrally disposed downwardly extending web separating the recesses and bearing on the truck body to support the car body.

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