Feb. 1, 1938. J. L. BONANNO 2,107,024

COUPLING DEVICE FOR TOY TRAINS

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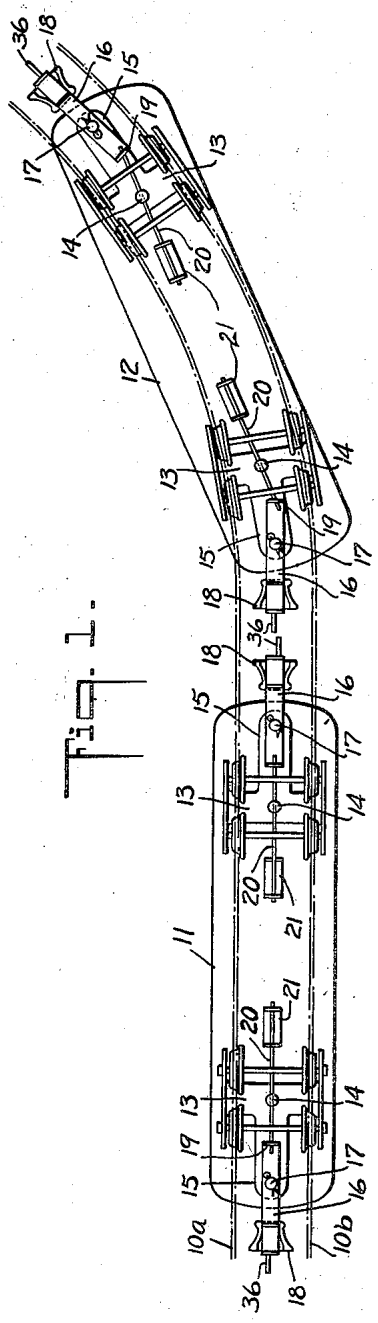

Fig. 1.

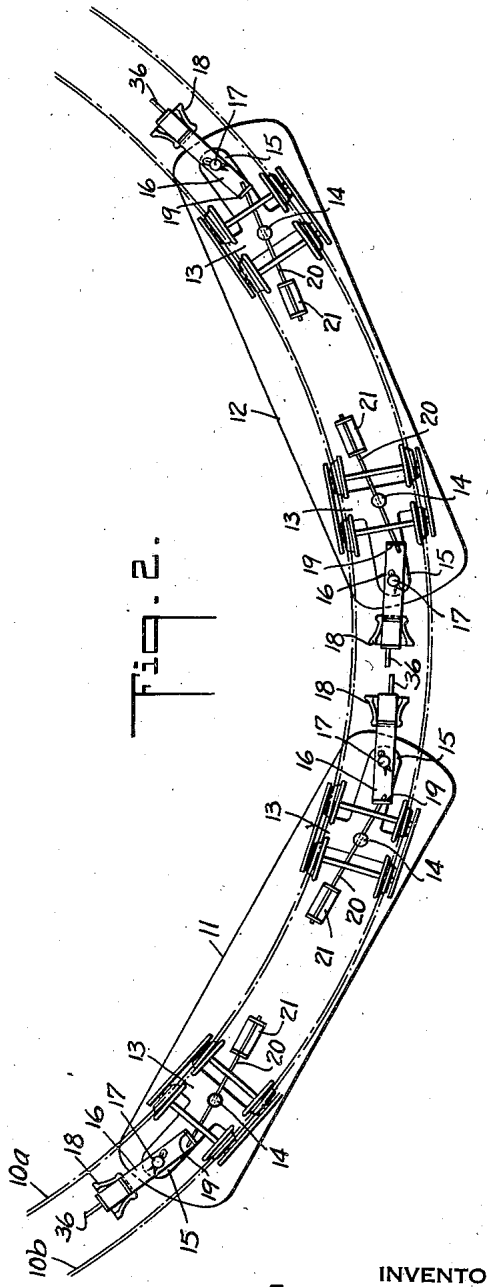

Fig. 2.

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COUPLING DEVICE FOR TOY TRAINS

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Fig. 3.

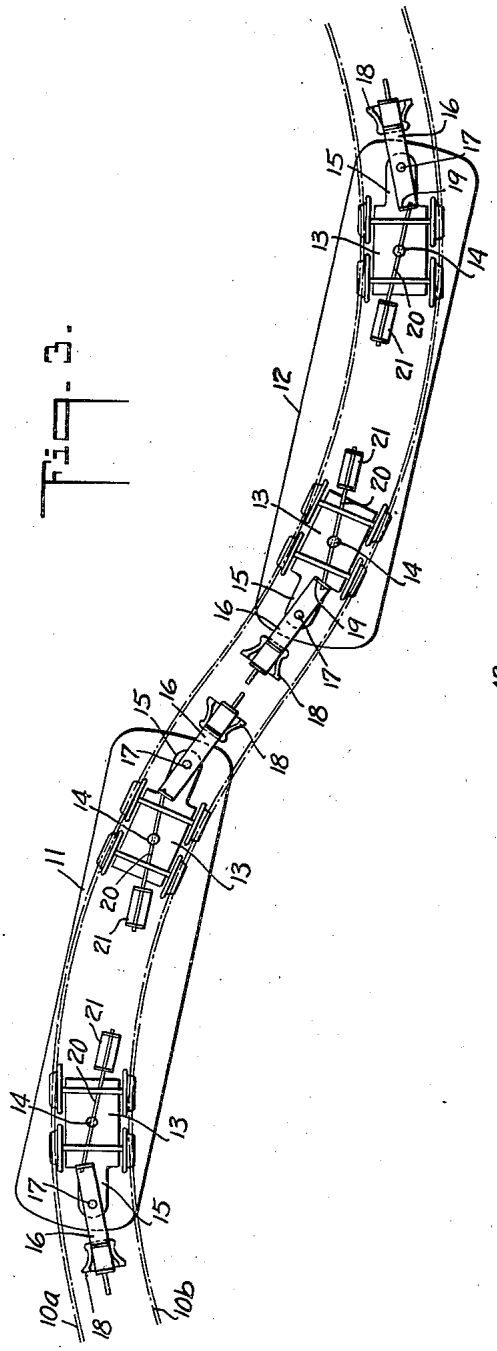
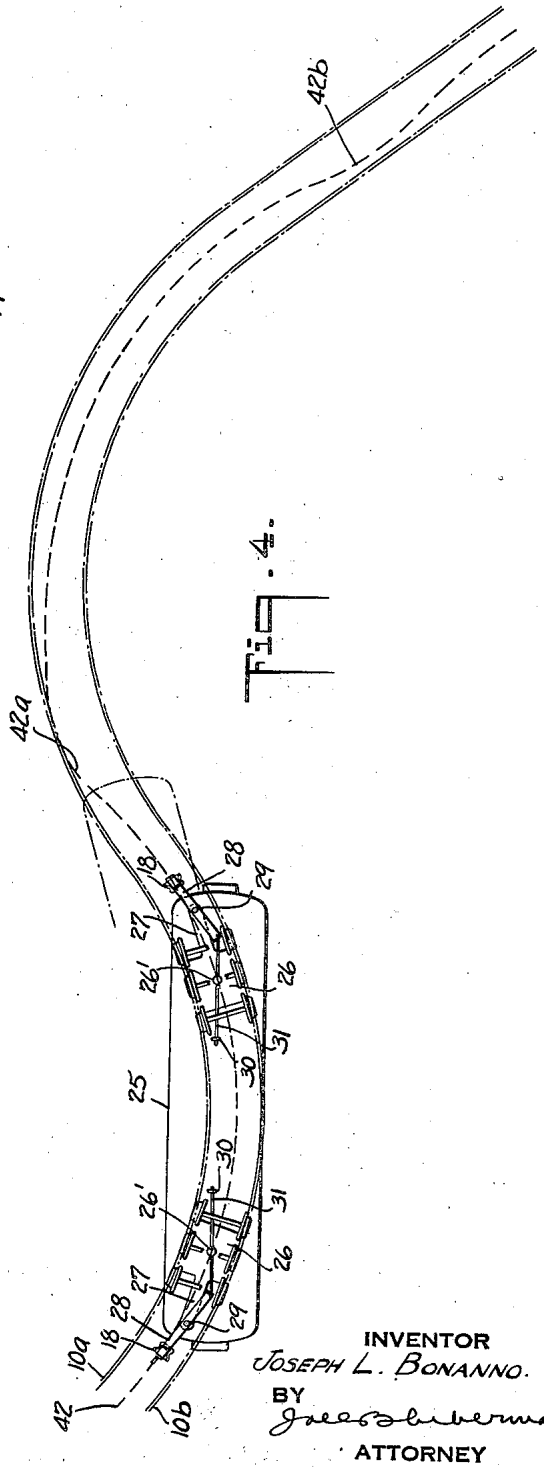


Fig. 4.



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COUPLING DEVICE FOR TOY TRAINS

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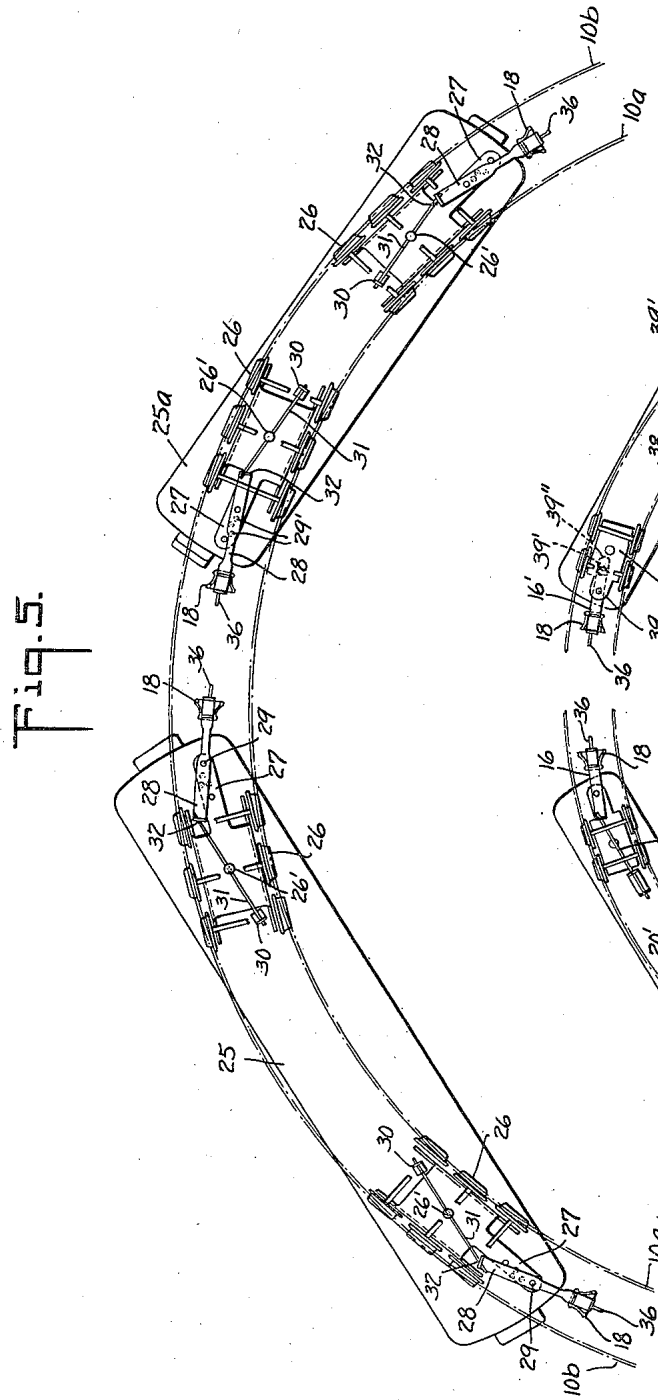

Fig. 5.

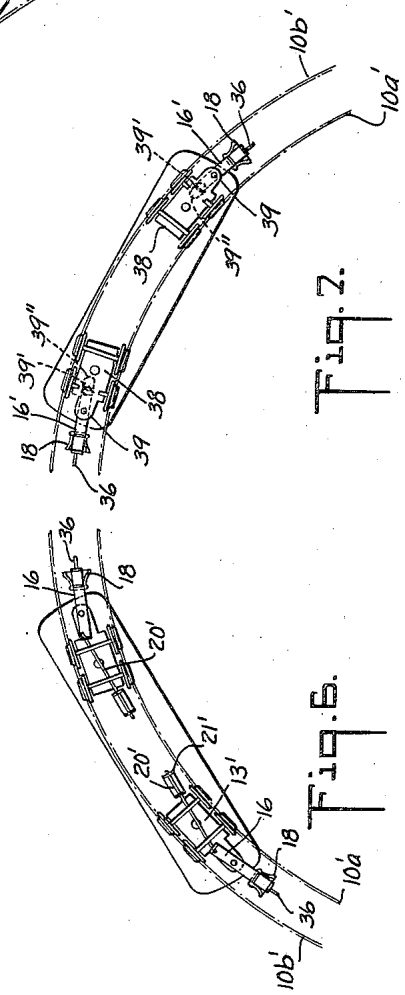

Fig. 7.

Fig. 6.

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COUPLING DEVICE FOR TOY TRAINS

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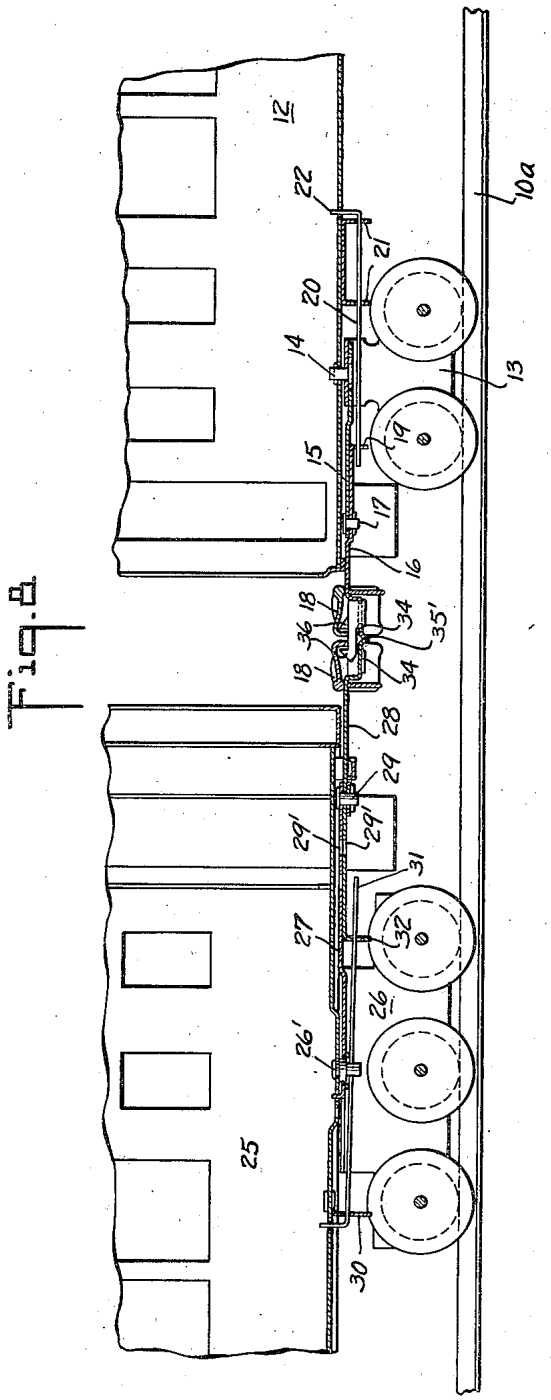

Fig. 8.

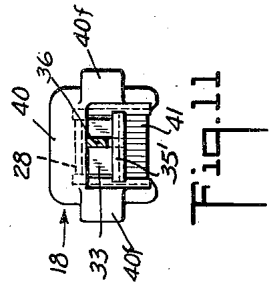

Fig. 11.

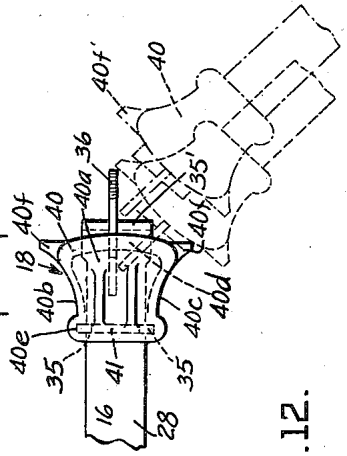

Fig. 10.

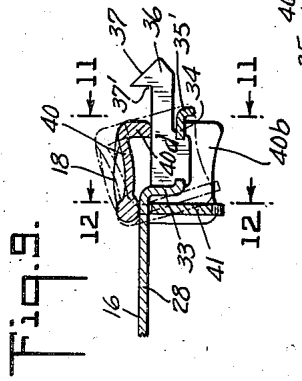

Fig. 9.

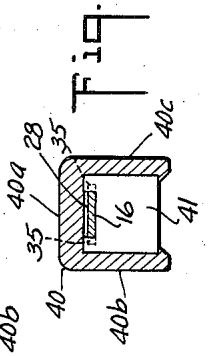

Fig. 12.

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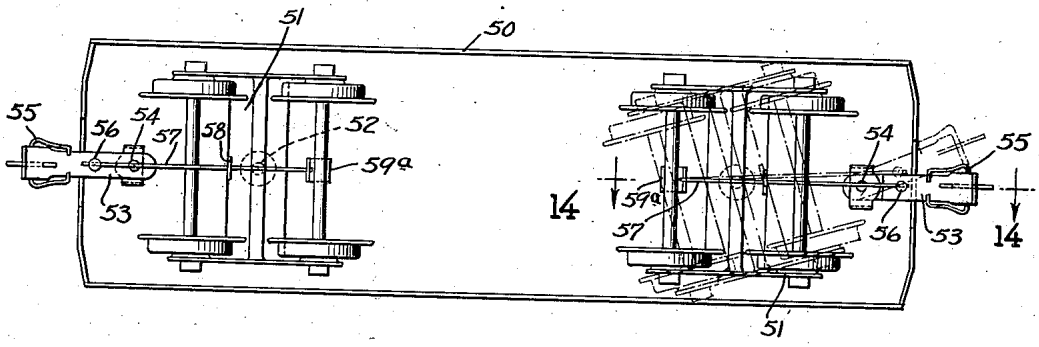
Fig. 13.



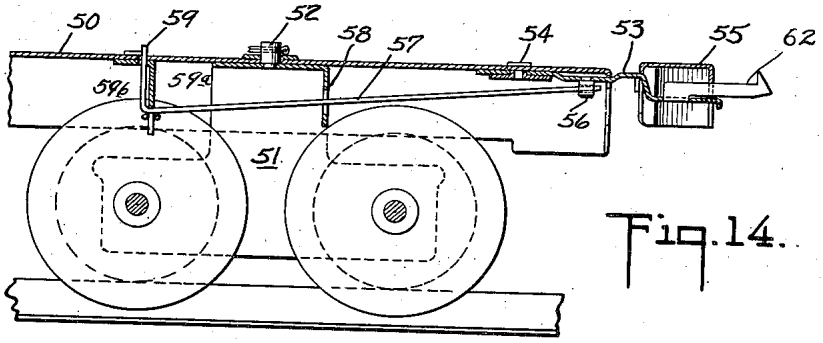


Fig. 14.

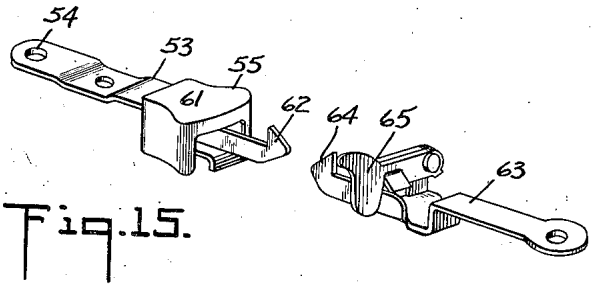


Fig. 15.

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COUPLING DEVICE FOR TOY TRAINS

Filed May 31, 1935 7 Sheets-Sheet 6

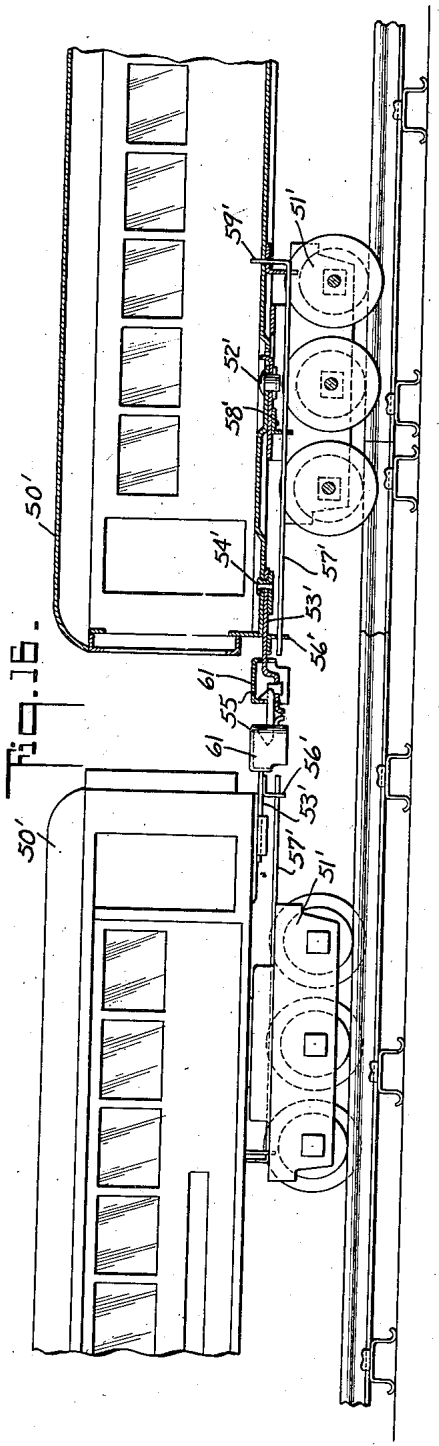

Fig. 16.

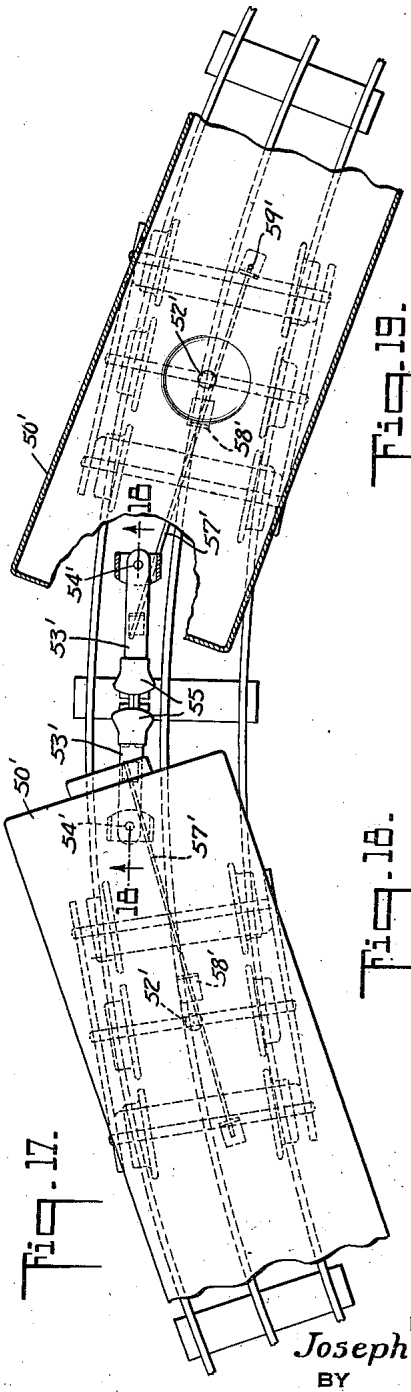

Fig. 17.

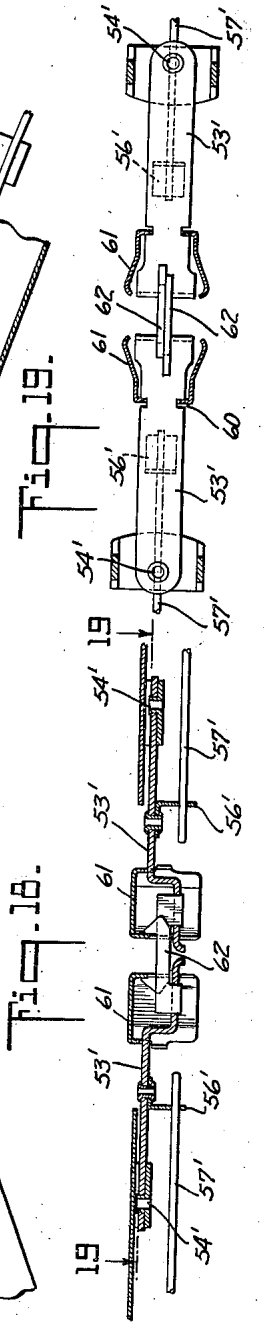

Fig. 18.

Fig. 19.

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COUPLING DEVICE FOR TOY TRAINS

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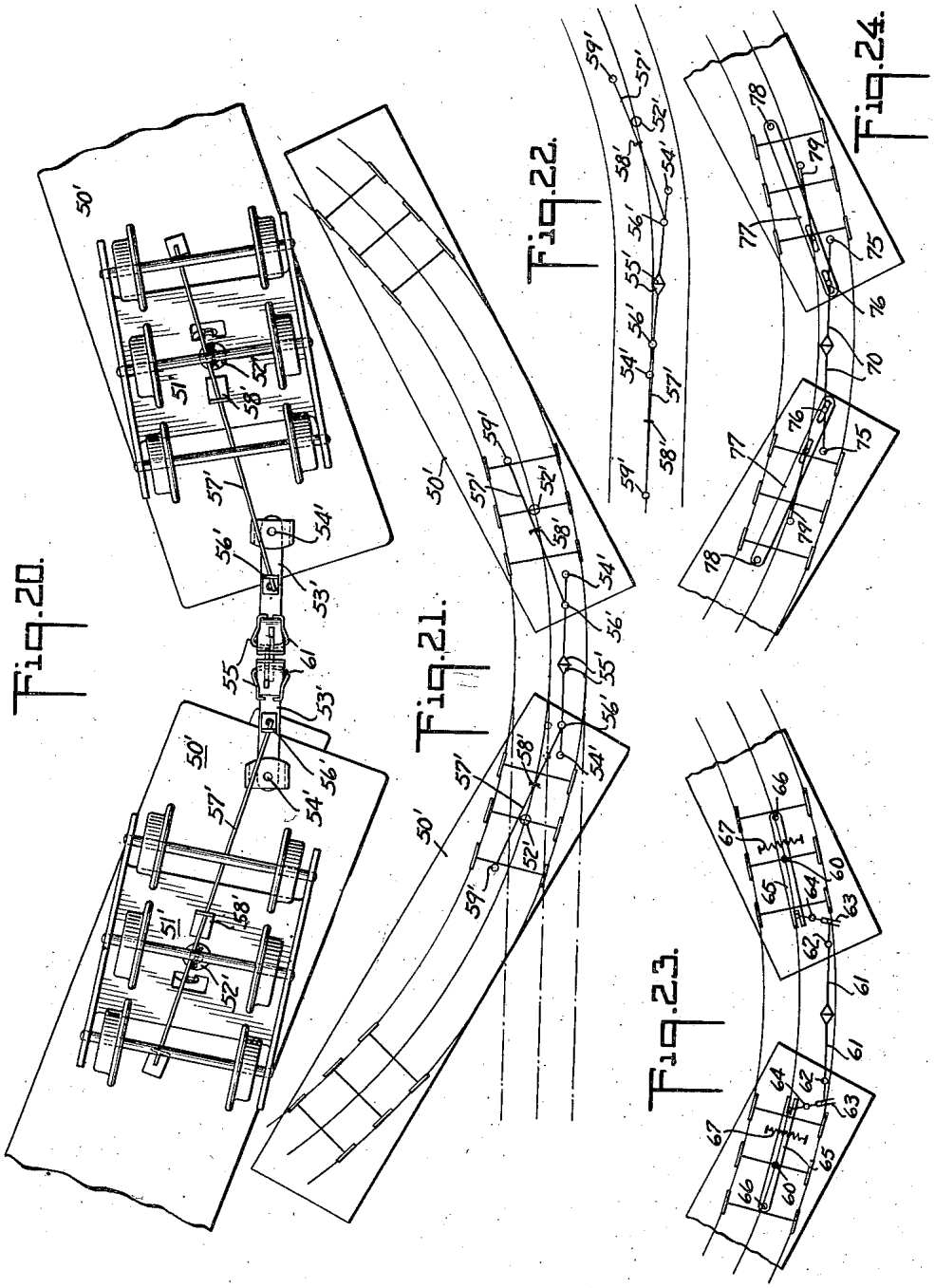

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Patented Feb. 1, 1938 2,107,024

UNITED STATES PATENT OFFICE

2,107,024

COUPLING DEVICE FOR TOY TRAINS

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Application May 31, 1935, Serial No. 24,406

11 Claims. (Cl. 213—74)

The present invention relates to coupling devices for toy cars and is more particularly directed toward coupling devices having means for automatically positioning them so that coupling can automatically take place on either straight or curved track.

The coupling devices in common use on toy cars are pivoted to the car body and must be manually aligned before the car bodies could be moved toward one another to effect a coupling operation. This has made it impossible to couple cars or cars and locomotives by merely pushing them together.

According to the present invention, the coupling devices are so arranged that when the car traverses either straight or curved track the coupling devices are automatically positioned so as to meet a similar coupling device carried by another car.

The present invention also contemplates that the mechanism for effecting the positioning of the coupler shall include a laterally flexible or yieldable spring member, preferably made out of wire, which will bend whenever it is necessary to have the coupler move from the position in which it would normally be placed by reason of the alignment of the track on which the car is resting. These displacements may take place when the cars are passing from straight to curved track or when they are passing about S-shaped track. The provision of the flexible connection makes it possible for the coupler heads to shift laterally from their normal position without imposing substantial side forces on the trucks, and therefore the trucks are not derailed even though the coupling devices are shifted from the normal position.

Toy trains are ordinarily constructed to operate on either wide gage track or narrow gage track and in each case the cars employed are of varying length. The spacing between the trucks on a car and the spacing between adjacent trucks on two cars are therefore variable, and for satisfactory coupling the parts should be dimensioned and centers located so that the truck swinging relative to the car body will be effective to place the coupling mechanism in the same position relative to the rails for all cars intended to be capable of automatic coupling. In all cases it is preferable to have the coupler heads at the standard height of other toy railroad cars of the same gage, and to design them so as to accept other forms of couplers so that the cars equipped with the new form of coupler may be employed in trains having cars not so equipped.

Other and further objects of the invention 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 an inverted plan view illustrating a form of automatic coupler swingably mounted on the car truck, the cars here shown having four wheel trucks, one car being on straight track, and the other car on curved track forming part of the same track layout;

Fig. 2 is a view similar to Figure 1 illustrating two similar cars both on curved track;

Fig. 3 is a view similar to Figure 1 illustrating two similar cars on S-shaped track;

Fig. 4 is a view illustrating a car with six wheel trucks disposed on S-shaped track, and diagrammatically illustrates the path of the coupler head as the car proceeds along such track;

Fig. 5 is an inverted plan view illustrating different length cars with six wheel trucks travelling on curved track;

Fig. 6 is a view similar to Figure 1 showing a comparatively long car on narrow gage track;

Fig. 7 is a view similar to Figure 6 showing a coupler arrangement suitable for short cars on narrow gage track;

Fig. 8 is a longitudinal sectional view through two cars showing coupling devices designed for four wheel and six wheel cars joined or coupled together;

Fig. 9 is an enlarged sectional view showing a detail of the coupler head of Figure 8;

Fig. 10 is a top plan view of the coupler head;

Figs. 11 and 12 are sectional views taken on the lines 11—11 and 12—12 respectively of Figure 9;

Fig. 13 is an inverted plan view showing a car having four wheel trucks and provided with dirigible couplers pivoted to the car body;

Fig. 14 is an enlarged sectional view on the line 14—14 of Figure 13;

Fig. 15 is a perspective view illustrating the coupler head shown in Figure 13 alongside a coupler in common use with which the present automatic couplers are adapted to cooperate;

Fig. 16 is an elevational view, with parts in longitudinal section, showing the coupling together of two cars by means of couplers such as shown in Figures 13 to 15;

Fig. 17 is a top plan view of the structure shown

in Figure 16, parts being broken away, the cars being placed on curved track;

Fig. 18 is a vertical sectional view taken on the line 18—18 of Figure 17;

Fig. 19 is a horizontal sectional view taken on the line 19—19 of Figure 18;

Fig. 20 is an inverted plan view of the coupler and car construction shown in Figure 16;

Fig. 21 is a diagrammatic illustration of the couplers shown in Figures 14 to 18; and

Figs. 22 to 24 are diagrammatic illustrations of further modifications of coupler construction.

In Figures 1 to 3, two wheel bearing rails of a toy railroad track are indicated at 10*a* and 10*b*. For clearness the third or power rail is omitted. These rails may be straight or curved in one direction or curved in two directions as indicated in the drawings and will ordinarily form parts of interchangeable straight and curved track units such as ordinarily used in toy railroads. The radius of curvature of the curved sections is usually a constant.

In each of these three figures two cars designated 11 and 12 are illustrated. These cars have four wheel trucks indicated at 13 (and shown more in detail on the right of Figure 8). They are pivoted as indicated at 14 to the bottom of the car body. The trucks are able to swing relative to the car body in the usual manner and the relative positions of the trucks and car bodies on various shapes of track will appear from inspection of the figures of the drawings. The trucks have extensions 15 extending toward the adjacent end of the car body, but preferably not quite reaching to the end of the car body, and it will be apparent that these extensions swing bodily with the respective trucks an amount which depends on their radius, the spacing of the truck centers and the curvature of the tracks on which the two trucks bear.

Coupler bars indicated at 16 are pivoted to the truck extensions as indicated at 17. These bars extend beyond the ends of the car bodies and are provided with coupler heads indicated at 18, and shown in detail in Figures 8–12. The opposite or inner ends of these coupler bars 16 are bent downwardly as indicated more clearly at 19 (Figure 8), and apertured to receive a longitudinally extending member 20. This member is preferably made of steel wire so as to be flexible and is anchored in apertured clips 21 carried on the car bottom. To keep the wire member in place, it is preferably bent upwardly as indicated at 22 (Figure 8), and passed through a hole in the bottom of the car body.

In the arrangement shown in Figures 4 and 5 and at the left of Figure 8, a design suitable for longer car bodies 25 and 25*a* is illustrated. These car bodies are generally provided with six wheel trucks 26 pivoted as indicated at 26'. The trucks have extensions 27 corresponding with the extensions 15, and coupler bars 28 are pivoted at 29 on these extensions. The extensions and coupler bars may be provided with a series of holes 29' as indicated so as to permit selection of the pivot point of these two parts in accordance with the length of the car and the spacing of the trucks from one another. This is illustrated in Figure 5, where a different pivot point is used for car 25 than for car 25*a*. The parts, however, are the same so that manufacturing costs may be kept low.

The car bodies are provided with anchorages 30 adjacent the trucks and longitudinally extending wire members 31 pass through the anchorages 30, the pivot posts 26' for the trucks, and through apertured eyes 32 carried by the rear ends of the coupler bars 28. The free ends of the coupler bars 28 are provided with coupler heads 18.

The arrangement shown in Figure 6 is designed for narrow gage tracks. It employs the same coupler bars 16 and coupler heads 18 which are used in the wide gage cars of Figures 1–3. These coupler heads are pivoted on trucks 13' similar to the trucks 13 and are controlled by wire members 20' fastened by anchorages 21' in substantially the same way as shown in Figure 1.

The arrangement shown in Figure 7 is designed for short narrow gage cars and here it is unnecessary to provide the yieldable spring for shifting the coupler heads. The coupler bars 16', similar to bars 16, are adjacent the car bottom and are pivoted directly to the trucks 38 as indicated at 39. They have an extension 39' which cooperates with an elongated slot 39'' on the car bottom.

The coupler heads 18 are shown more clearly in Figures 8 to 12 inclusive. The coupler bar 16 (or 28) is bent downwardly as indicated at 33 to provide a depressed portion 34. It is notched as indicated at 35, and bent down at the end as indicated at 35'. The depressed portion 34 is slotted to receive a coupler hook 36. This coupler hook has an outer cam 37 and an upwardly and rearwardly opening notch 37'.

A latch member 40 has a top wall 40*a* and side walls 40*b* and 40*c* to receive the outer end of the coupler bar and has a front wall 40*d* to drop into the notch 37'. It is slotted as indicated at 40*e* to receive a back member 41. This member enters the notches 35 in the coupler bar and prevents the latch from sliding lengthwise of the coupler bar. There is, however, sufficient clearance between the parts to permit the latch to swing as indicated in the dot and dash lines of Figure 9. The lifting of the latch is accomplished by the cam surface 37 of another coupler hook, or it may be done manually. When the cars are pushed, the projecting ends 35' act as pushers, without any tendency to lift the coupler heads. These ends also allow sufficient motion of the coupler head when the two cars are brought tightly together to enable the operator to lift the head with a slight upward pressure of the finger.

When cars such as above described are on straight track the parts are symmetrical on the longitudinal axis of the car and the coupler heads are disposed over the center of the track, the hooks 36 being slightly offset so as not to abut end to end. When the cars are on curved track the parts assume the position shown in Figures 1, 2, and 3, and the coupler heads are over the center of the track, so that with the structures shown in Figures 1 to 3 inclusive, the cars may be brought toward one another and the coupler heads will automatically be placed in alignment so as to effect automatic coupling. On the longer cars such as shown in Figures 4 and 5 the same relation prevails and automatic coupling takes place on straight track or on uniformly curved track.

With a track layout such as shown in Figure 4 having an S curve and then a straight length of track (as shown at the right of this figure), the coupler head 18 on long cars does not follow the center line of the track. The path of this coupler head is indicated by the heavy dash line 42. When the car passes through the reverse curve at

the left, the locus of the path of the coupler head 18 departs from the center of the track as indicated at 42a, and then gradually returns to it when both trucks come on to uniformly curving track. When the leading truck comes on to the straight track at the right of this figure the path of the coupler head again departs from the ideal as indicated at 42b.

The ability of the spring members 20 and 31 to flex makes it possible for the coupler bar to swing out of the normal position and accommodate itself to any departures from this normal position without imposing on the truck a substantial force. In this way it is possible for the coupler bars to be shifted or swung as the cars proceed around the tracks through switches, reverse curves and the like without derailing the trucks.

The latches 40 of the coupler heads are provided with laterally extending ears 40f which prevent false coupling. This is illustrated in Figure 10. The dot and dash lines indicate a coupler approaching at an improper angle. The point of the hook member 36 thereon engages the side wall of the hook member shown in full lines, and the coupler at the right then moves to the left hand dotted line position. Here the ear 40f' on the approaching coupler engages the end of the latch member 36 and the pusher extensions 35' (or the adjacent ears of the coupler heads) come into contact and limit the amount the hook member can enter below the latch. The parts are so proportioned that the hook does not pass under the front wall 40d of the latch. The cars may push one another when the parts are in this position, but cannot pull one another. Should the pushing be continued until the couplers are sufficiently aligned, the hooks will be brought in front of the openings and the latches lifted as usual. The prevention of false coupling makes it certain that the couplers cannot be connected so as to be incapable of straightening out, which would be the case if they were to couple when aligned as in Figure 10.

In the form of construction shown in Figures 13 to 24 inclusive the coupler bars are pivoted to the car body instead of carried by the truck as shown in Figures 1 to 12 inclusive.

In Figures 13 and 14 a car body is indicated at 50 and two wheel trucks at 51. The trucks are pivoted to the floor of the car as indicated at 52. Coupler bars 53 are pivoted to the ends of the car body as indicated at 54. These coupler bars have coupling heads 55 generally similar to the coupling heads 18 shown in Figures 9 to 12. An apertured member 56 is carried by the coupler bars at a point intermediate the pivoted point and the coupler head. These members may conveniently be in the form of swinging eyes.

A flexible wire member 57 has its free end passing through the eye 56. The flexible wire 57 passes through an apertured depending element 58 carried by the truck. It extends into the car body as indicated at 59 and may be held in a slotted ear 59a by a wire loop 59b.

In the constructions shown in Figures 16, 17 and 20, designed more particularly for longer cars having six wheel trucks, the parts are arranged substantially the same as in Figures 13 and 14 and corresponding reference characters with a prime added are applied to corresponding parts.

Figure 21 diagrammatically illustrates the operation of the couplers shown in Figures 13 to 20. The distance "X" is the amount to be absorbed by the spring elements and the looseness of the parts when one car is on straight track and the other on curved track. This is diagrammatically illustrated in Figure 22 by the curving of the wires 57'.

In Figure 23 trucks are pivoted at 60 and the coupler bars 61 are pivoted at 62. The rear ends of the coupler bars 61 are connected to forked levers 63 pivoted at 64 to the car body and these levers are connected to the front ends of forked arms 65 pivoted at 66 to the car body. The arms 65 are yieldably held in mid-position by coiled springs 67.

In Figure 24 the coupler bars 70 are pivoted at 75 and have pin and slot connections 76 with arms 77 pivoted at 78. The arms are yieldably held in mid-position by long wire springs 79.

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 a toy car, a car body, a car truck pivoted to the body to swing about a vertical axis spaced from the end of the car body, a coupler bar pivotally supported from one of said car parts to swing in a horizontal plane, and means responsive to the swinging of the car body relative to the car truck for swinging the coupler bar in the same direction, said means including a longitudinally extending laterally yieldable member having one end secured to the car body, the other end being yieldable to permit lateral displacement of the coupler bar from the position normally determined by the angular relation of the car truck and car body.

2. A toy car such as claimed in claim 1, wherein the yieldable member is in the form of a spring whose front end is slidably engaged by the coupler bar.

3. A toy car such as claimed in claim 1, wherein the yieldable member is in the form of a spring which extends across the truck and has its front end slidably engaged by the coupler bar.

4. A toy car such as claimed in claim 1, characterized in that the coupler bar is pivoted to the truck, and in that the yieldable member is in the form of a spring having a free end slidably engaging the coupler bar.

5. A toy car such as claimed in claim 1, characterized in that the coupler bar is pivoted to the truck, and in that the yieldable member is in the form of a spring which is secured to the car body at two points behind the truck and has a free end extending across the truck and slidably engaging the coupler bar.

6. A toy car such as claimed in claim 1, characterized in that the coupler bar is pivoted to the truck and has a downwardly extending apertured lug, and in that the yieldable member is in the form of a spring having a free end slidably engaging the apertured lug.

7. A toy car such as claimed in claim 1, wherein the coupler bar is pivoted to the car body, the yieldable member has an end slidably engaged with the coupler bar beyond the pivot support thereof, and wherein the intermediate portion of the yieldable member is coupled to the truck to be swung thereby.

8. A toy car such as claimed in claim 1, characterized in that the yieldable member is in the

form of a spring and the coupler bar is pivoted to the car body and is connected to the front end of the spring at a point beyond the pivotal support thereof, and wherein the truck has an eye to receive the intermediate portion of the spring, and the anchorage of the spring is to the car body to the rear of the truck.

9. In a track supported toy car, a body and a truck pivoted to the body to swing about a vertical axis spaced from the ends of the car body and adapted to traverse the track, a dirigible coupler bar pivoted to said truck between the axis of the said truck and the adjacent end of the car body, the bar extending forwardly beyond the end of the car body and carrying a coupling device and rearwardly toward the truck axis, and a longitudinally extending flexible member anchored to the car body at one end and slidably secured to the coupler bar to control the position of the rear end of the coupler bar whereby the coupler bar is positioned according to the curvature of the track on which the truck bears, the flexible member being bendable when the coupling device is forced laterally out of normal position.

10. In a toy car, in combination, a truck, a body to which the truck is pivoted, the truck having an extension toward the end of the car body, a coupler bar pivoted to the extension and extending forwardly beyond the car body and rearwardly toward the truck axis, and a laterally yieldable spring secured to the car body and having a free end secured to the rear end of the coupler bar to swing the coupler bar relative to the truck when the truck is swung relative to the car body and to permit lateral displacement of the forward end of the coupler bar.

11. In combination, a car body having a pivoted truck, a coupler bar pivoted to the car body and having a coupler head projecting beyond the car body, an eye carried by the coupler bar between the pivot and coupler head, a flexible wire anchored to the car body behind the truck and extending across the truck to enter the eye, and a connection between the truck and an intermediate portion of the wire to swing the wire when the truck swings whereby the coupler is swung in the same direction.

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