Aug. 6, 1940. H. J. FERRI 2,210,752

TOY VEHICLE

Filed Oct. 21, 1938 2 Sheets-Sheet 1

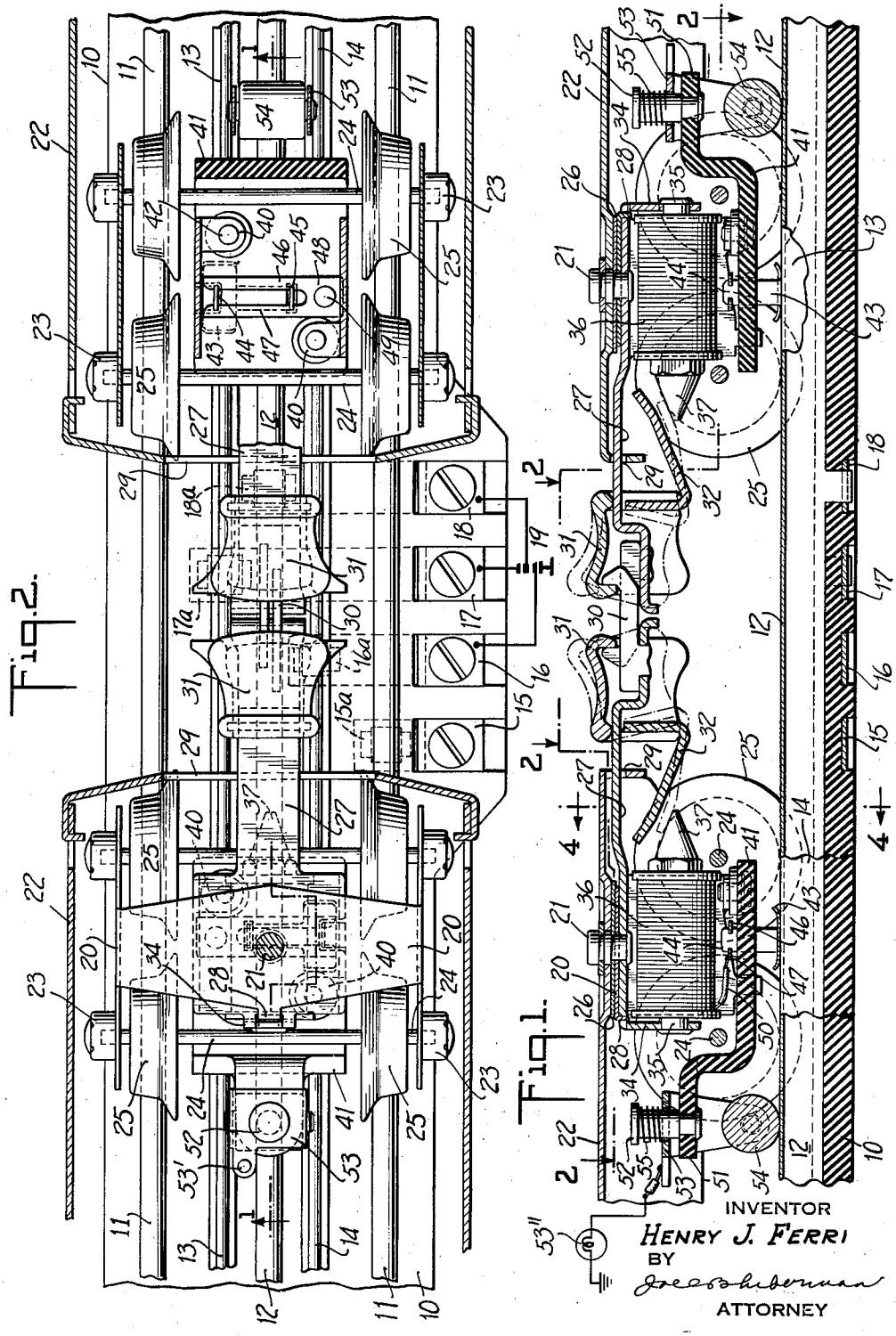


Fig. 2.

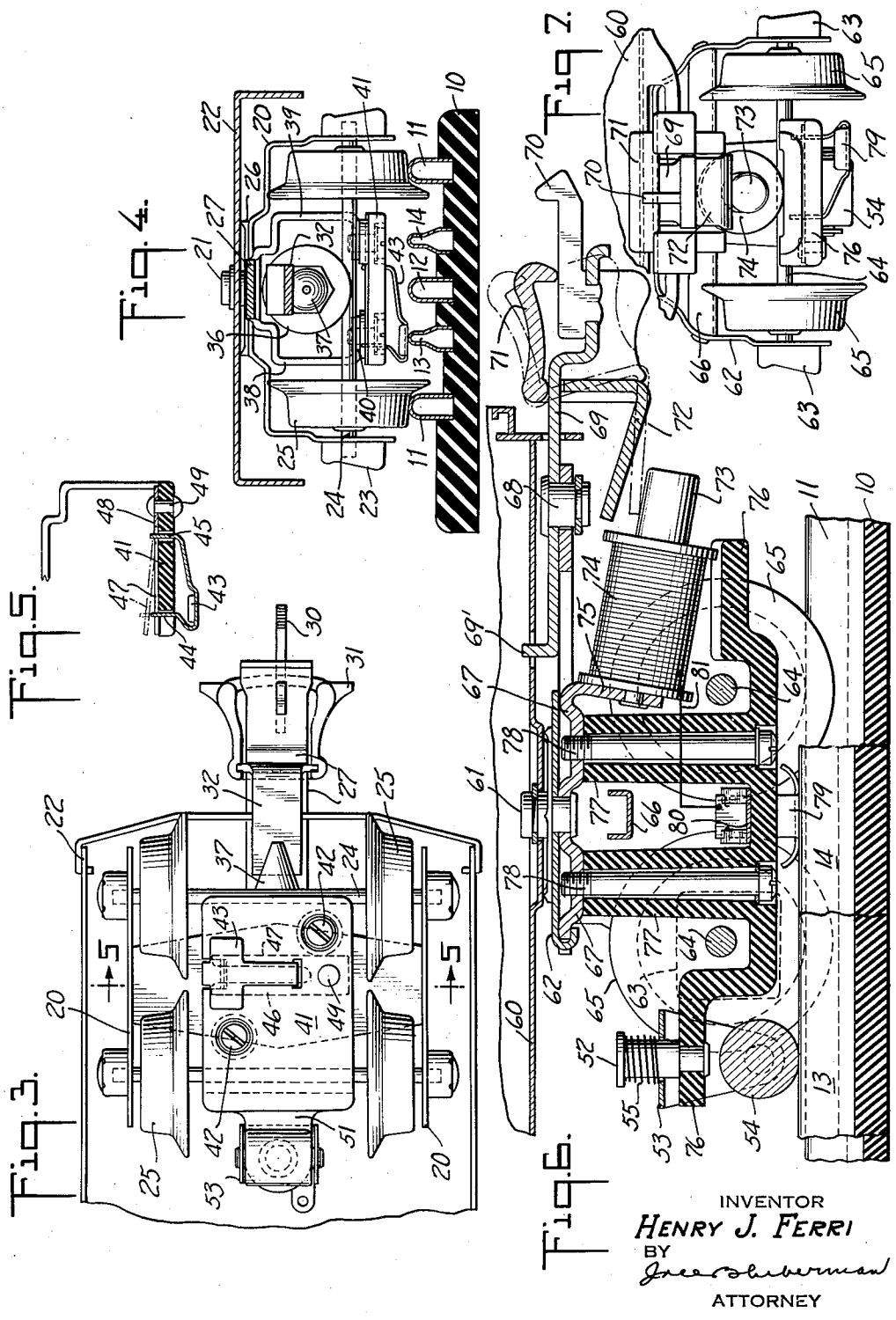
Fig. 1.

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TOY VEHICLE

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10 Claims. (Cl. 213—212)

The present invention relates to toy vehicles, and is more particularly directed toward automatic coupling and uncoupling devices for use with such toy vehicles of the type ordinarily used on toy electric railroad track and having automatically operable uncoupling devices so that the vehicles can be uncoupled, when desired, by remote control.

According to the present invention the locomotive and each of the trucks of the car of the train will be provided with a truck carried electromagnet arranged to operate an armature also carried by the truck (or locomotive) and associated with the coupler head in such a way that when the electromagnetic devices of two adjacent couplers are energized simultaneously, both couplers can be released so that the vehicles can be separated.

According to the present invention each truck is provided with a bar extending generally longitudinally of the vehicle and centrally disposed with respect to the wheels. This bar is coupled to the truck so as to swing with the truck and it carries a coupler hook and coupler head for cooperation with hooks and heads of other couplers and an armature which can be attracted by a truck carried electromagnet, whereby the coupler heads may be shifted to releasing position.

The accompanying drawings show, for purposes of illustrating the present invention two of the many 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:

Figure 1 is a longitudinal sectional view taken on the line 1—1 of Figure 2 through the center of two toy vehicles with attached coupling and uncoupling devices, and shows the disposition of the vehicles on the track;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is an inverted plan view of one truck with associated mechanism;

Figure 4 is a section taken on the line 4—4 of Figure 1;

Figure 5 is a fragmentary section taken on the line 5—5 of Figure 3;

Figure 6 is a vertical longitudinal sectional view through a coupler of slightly modified construction; and

Figure 7 is an end view of the coupler mechanism of Figure 6.

The couplers shown herein are intended for use on ordinary three-rail toy electric railroad track which is provided with an inserted five-rail section at points where it is desired to uncouple the cars. A portion of such a five-rail track is illustrated in Figures 1, 2 and 4.

The base of insulating material is indicated at 10. It has two wheel-bearing rails 11, 11, a power, or third, rail 12, and control rails, indicated at 13 and 14, disposed between the power rail and each of the wheel-bearing rails. The insulating base 10 carries four straps 15, 16, 17 and 18 provided with binding post screws, as indicated. These straps extend under the base and are connected to the respective rails 11, 14, 13, and 12, as indicated at 15a, 16a, 17a and 18a, so that when the switch 19 is closed both rails 13 and 14 may be connected to the power rail.

The truck frames are indicated at 20. These are formed of sheet metal, as shown, and are provided with pivot studs 21, whereby they are secured to the car bodies 22. The truck frames are provided with the usual journals 23 for the axles 24 and wheels 25. The lower end of the stud 21 is reduced and passes through a grounding washer 26, the top of the truck stamping 20, and through a coupler carrying bar 27, and its lower end is upset as indicated. The truck stamping and the bar are interlocked by a hook-shaped element, indicated at 28. One end of the coupler bar 27 extends out through a slot 29 in the body 22 of the car, and is provided at the end with a coupler hook 30. The coupler bar 27 also pivotally supports a coupler head 31. The coupler head and coupler hook per se are of the same construction as in common use on toy trains, so that cars having the automatic uncoupler may be coupled with cars not so equipped. The coupler head 31 is secured to an armature 32 which extends back underneath the car as indicated. The coupler head is heavier than the armature so that the parts are normally in the full line position of Figure 1.

The rear end of the coupler bar is bent downwardly, as at 34, and carries a core member 35 which is disposed horizontally and carried between the wheels. This core carries a coil 36, one end of which is grounded to the support. The end 37 of the core is located just below the armature 32.

The bar 27 also has two laterally disposed downwardly extending members 38 and 39 (Figures 4 and 5), each provided with inwardly bent feet 40. An insulating plate 41 is secured to these feet by screws, indicated at 42. This insulating plate is disposed below the axles, as will

be apparent from the drawings, and carries a collector shoe 43 formed out of a strip of sheet material to have the shape shown in the drawings. This sheet has two upwardly extending portions 44 and 45 which pass through openings in the insulating plate 40, and each of these is notched, as indicated in Figure 2, to receive the two arms 46 and 47 of a leaf spring 48 secured to the insulating base by a rivet indicated at 49. This spring normally rests on top of the plate and holds the collector shoe 43 down, but yields when the collector shoe bears on the corresponding fixed rail. The collector shoe is connected to the coil 36 of the electromagnet by a wire 50 which is soldered to the rivet 49. The insulating plate 41 has an extension 51, as shown at the left, and this extension carries a stud 52 on which is secured a bracket 53. This bracket has a soldering lug 53' for a wire for a lamp or the like diagrammatically indicated at 53''. It straddles the extension 51 and carries a contact roller 54 adapted to be held against the third rail by coiled spring 55 carried by the stud 52.

When two cars are on straight or curved track, the cars may be automatically coupled by the couplers as shown herein. When it is desired to automatically uncouple the cars they are placed so that the adjacent trucks stand on the section of five-rail track, the train stopped, or not, as desired, and the switch 19 operated and both coils energized. While the switch is thus closed either car may be moved to separate the couplers.

In the form of construction shown in Figures 6 and 7, car bodies are indicated at 60 and the pivot stud at 61. The truck frame 62 carries the journals 63, axles 64 and wheels 65, as usual, and may be provided with a cross-brace indicated at 66. The lower end of the stud 61 is employed to secure a coupler carrying bar 67 in place. The outer end of this bar is provided with a pivot stud 68 to which is secured a coupler bar 69 having the coupling hook 70 and coupling head 71 of the same construction as above referred to. The rear end of the coupler bar 69 has a lost motion pin-and-slot connection with the car body, as indicated at 69'. The coupler head 71 carries an armature 72 which extends near the pivot stud 68 and is normally above the exposed core 73 on electromagnet 74. The other end of the core is secured to a downwardly bent lug 75 formed out of the bar 67.

The insulating plate is indicated at 76. It is disposed below the axles 64 and has upwardly extending tubular spacers 77 through which screws 78 pass by which the insulating member can be secured to the bar 67. The insulating member carries a collector shoe 79 and spring 80, the same as that shown in the preceding figures. It is connected to the core by a wire 81. The insulating member 76 also carries a contact roller 54 adapted to be held against the third rail by coiled spring 55 carried by the stud 52.

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. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet carried by the truck frame and having an operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, and an insulated collector shoe connected to the coil to energize the same.

2. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to the bar and having an operating coil and a core adjacent the armature to attract the armature and lift the couper head to releasing position, and an insulated collector shoe connected to the coil to energize the same.

3. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to the bar and having an operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, an insulating plate secured to the bar and disposed below the axles, and a collector shoe carried by the plate and connected to the coil to energize the same.

4. A toy vehicle having a trunk frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to a downwardly extending lug carried by the bar and having a substantially horizontal operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, and an insulated collector shoe connected to the coil to energize the same.

5. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to a downwardly extending lug carried by the bar and having a substantially horizontal operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, an insulating plate secured to the bar and disposed below the axles, and a

collector shoe carried by the plate and connected to the coil to energize the same.

6. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to a downwardly extending lug carried by the bar and having a substantially horizontal operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, laterally disposed, downwardly extending feet carried by the bar, an insulating plate carried by the feet, and a collector shoe connected to the coil to energize the same.

7. A toy vehicle having a truck frame adapted to be pivoted to a vehicle body and provided with axles which carry wheels adapted to travel on the rails of toy railroad track, a coupler carrying bar secured to the truck to swing therewith, a coupler including a coupler hook and a gravity operated, movable coupler head adapted to engage a similar hook of another vehicle to couple the vehicles together, an armature carried by the coupler head, an electromagnet fixedly secured to a downwardly bent prong carried by the bar and having an operating coil and a core adjacent the armature to attract the armature and lift the coupler head to releasing position, an insulating plate disposed below the axles, spacer tubes between the plate and the bar, screws extending through the tubes to secure the plate and bar together.

8. A sub-assembly for toy railroad trucks comprising a bar, a coupler carried by the bar and having a fixed coupling hook and a movable coupling head, an armature carried by the coupler head and disposed below the bar, and an electromagnet carried by the bar and having a core adjacent the armature.

9. A toy vehicle having a car body, a truck pivoted to the car body, a bar carried by the truck and extending toward the end of the car body, a truck carried electromagnet having a core disposed below the bar, a coupler pivoted to the bar above the end of the core and having a lost motion connection with the bar body so that the angular swing of the coupler about its pivot is greater than the angular swing of the truck relative to the car body, and an armature carried by the coupler and extending close to the coupler pivot so as to be over the core in all positions of the truck.

10. A toy vehicle having a swingable truck having the usual wheels and axles, an electromagnet carried by the truck, a contact shoe connected to the coil of the magnet, a coupler bar carried by the truck to be swung when the truck swings and carrying a coupler hook and a pivoted coupler head adapted to be raised by the coupler hook of another coupler and to lower by gravity, and an armature secured to the coupler head and disposed near the magnet to be attracted thereby to release the said hook.

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