June 25, 1940. W. C. FLANNERY 2,205,830

CAR COUPLER

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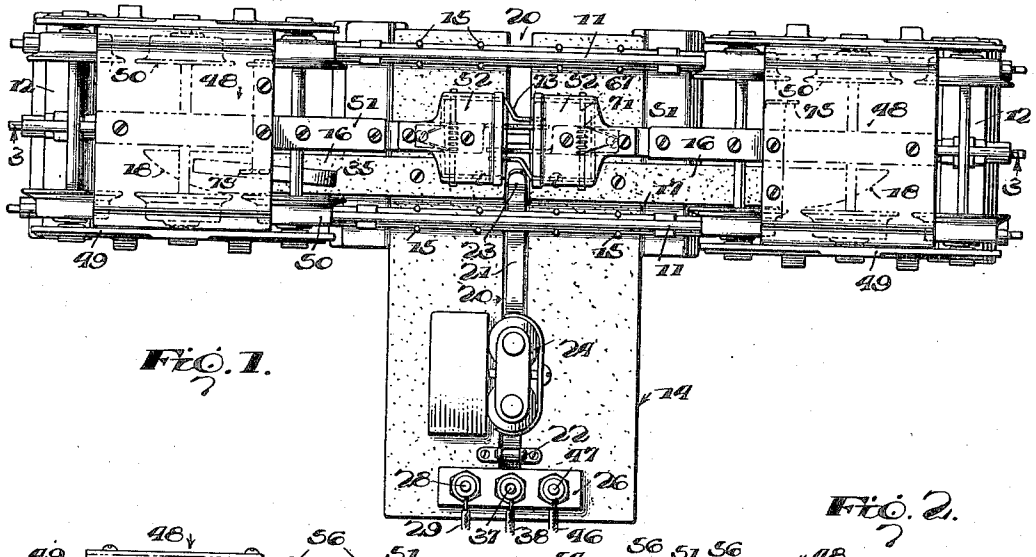


Fig. 1.

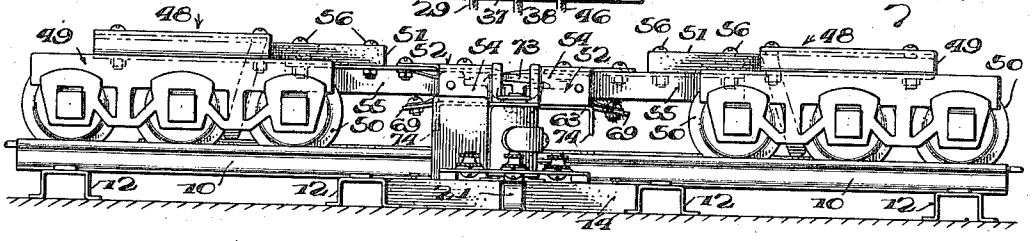


Fig. 2.

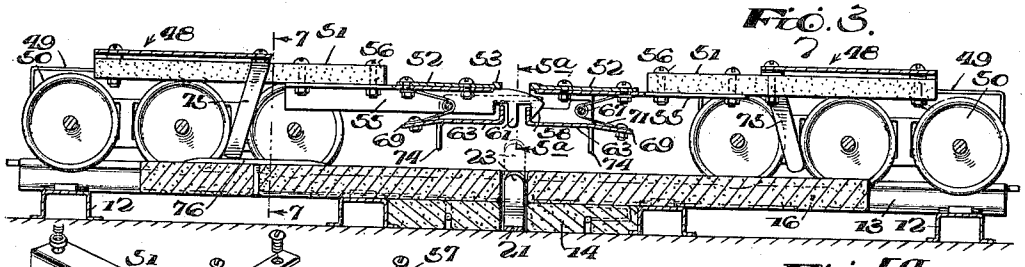


Fig. 3.

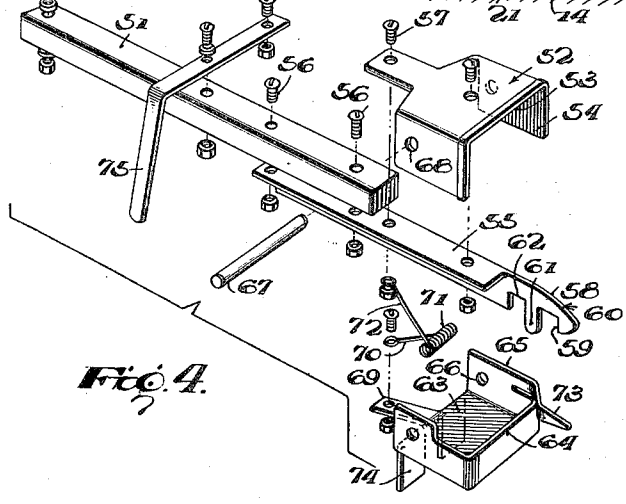


Fig. 4.

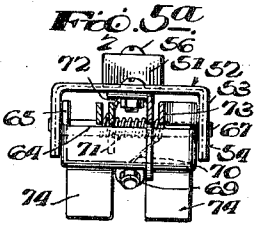


Fig. 5a.

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Fig. 5.

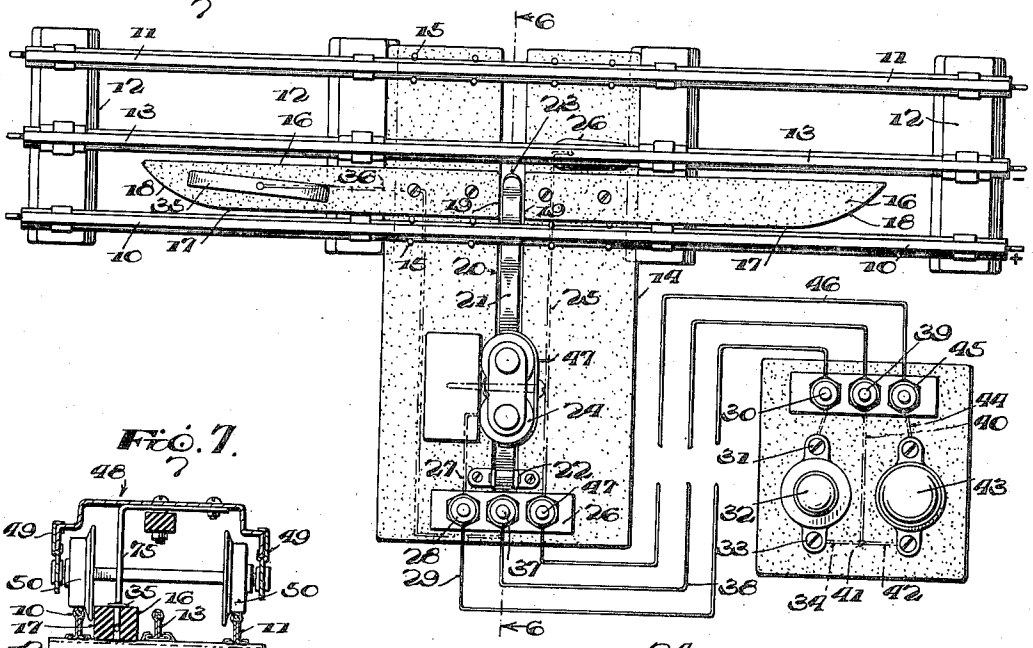


Fig. 7.

Fig. 6.

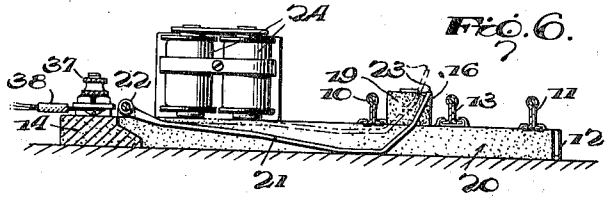


Fig. 8.

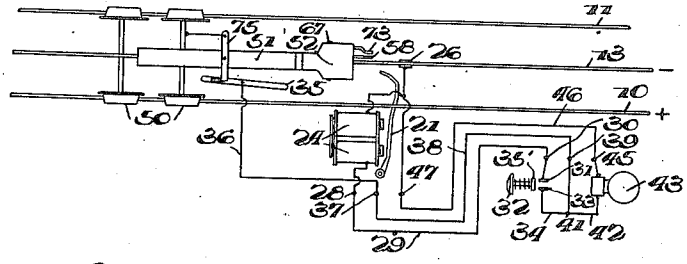
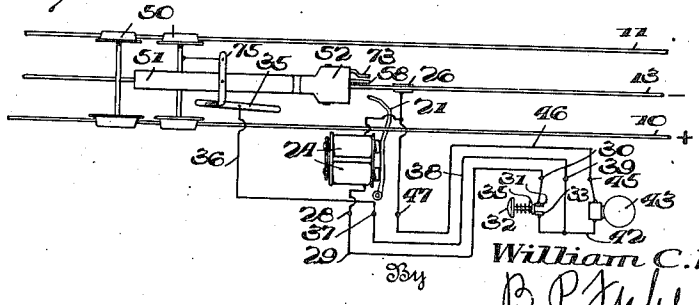


Fig. 9.



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2,205,830

CAR COUPLER

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Application March 24, 1938, Serial No. 197,948

18 Claims. (Cl. 213—200)

My invention relates to car coupling devices, well adapted for use upon toy trains, but not necessarily restricted to this use.

An important object of the invention is to provide means for retaining the coupler heads centered with respect to the trucks of the cars, so that the couplers will couple and uncouple on curves.

A further object of the invention is to provide remote control for uncoupling companion couplers.

A further object of the invention is to provide means for causing the keepers of both couplings to be operated, for uncoupling, when one keeper is operated.

A further object of the invention is to provide means to move a track device into the path of travel of a portion of the keeper of the trailing coupling when the corresponding portion of the keeper of the leading coupling has cleared the device.

A further object of the invention is to provide a signal which is automatically operated as each car passes the uncoupling point.

A further object of the invention is to provide means which is both automatically controlled by the track contact and manually controlled, to project the track trip element, when the companion couplers have reached the selected uncoupling position.

A further object of the invention is to provide a coupler of the above mentioned character which is simple, cheap to manufacture, strong and durable.

A further object of the invention is to provide couplers which are inter-changeable so that companion couplers will couple and uncouple if cars are reversed.

A further object of the invention is to provide track means to actuate a coupler in the pair of companion couplers, to uncouple, with the traffic in one direction, regardless of whether the individual cars are reversed.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of companion couplers and associated elements embodying my invention,

Figure 2 is a side elevation of the same,

Figure 3 is a longitudinal section taken on line 3—3 of Figure 1,

Figure 4 is an exploded perspective view of one of the couplers,

Figure 5a is a transverse section taken on line 5a—5a of Figure 3,

Figure 5 is a plan view of the track trip and contact and associated elements,

Figure 6 is a transverse section taken on line 6—6 of Figure 5,

Figure 7 is a transverse section taken on line 7—7 of Figure 3,

Figure 8 is a diagrammatic view of the track trip, signal, and associated circuits and elements, showing the signal active and the trip inactive, and,

Figure 9 is a similar view showing both the signal and the trip active.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numerals 10 and 11 designate rails for a toy train, mounted upon cross ties 12. The rail 10 is connected with the positive side of the source of current while a third rail 13 is connected with the negative side of the source of current and is mounted upon the cross ties 12 and insulated therefrom. The track is formed in sections, as is customary.

The uncoupling of cars preferably occurs at the center of a track section, and for this purpose a base 14 is provided, which may be formed of insulating material and which is secured to the rails 10 and 11 by pins 15 or the like. Rigidly secured upon the base 14 are guard rails 16, having outer edges 17 spaced a given distance from the head of the rail 10. These guard rails also have inclined or curved ends 18, and inner ends 19, which are spaced. Extending between these inner ends is a passage 20, arranged longitudinally of the base 14.

Extending longitudinally within the passage 20 is a track trip 21, formed of magnetic material, such as iron, and pivotally supported at its outer end by a pivotal joint 22, mounted upon the base 14. The track trip 21 is adapted to swing vertically and it has an upwardly projecting free end portion 23, the extremity of which is preferably rounded, as shown. The trip element 21 has no electrical contact or connection with any of the rails 10, 11 or 13. The track trip 21 constitutes the armature of an electro-magnet 24, rigidly supported above it, upon the base 14. When this electro-magnet is energized, the track trip 21 is raised. The electro-magnet may have a winding or windings and is shown as embodying two windings connected in series. Connected with the end of one winding is a wire 25, electrically connected with a contact plate 26, engaging the rail 13. Connected with the end of

the other winding is a wire 27, leading to a binding post 28. This binding post has connection with a wire 29 and this wire is connected with a binding post 30, connected with one terminal 31 of a switch 32. The numeral 33 is a coacting terminal and this terminal is connected with a wire 34. A bridge contact element 35' serves to connect the contacts 32 and 33 when the button is pressed, as is obvious. Mounted upon one insulating guard rail 16 is a track contact 35, which is stationary and has connection with a wire 36 and this wire is connected with a binding post 37, to which is connected a wire 38, connected with a binding post 39, having connection with a wire 40, in turn connected with the wire 34, at 41. A branch wire 42 is also connected with the wire 40 and with one terminal of a visual signal 43, such as an electric bulb, the other terminal of which is connected with a wire 44, connected with a binding post 45. An audible signal may be substituted for the visual signal if desired. A wire 46 is connected with the binding post 45 and this wire 46 is connected to the wire 25, as shown at 47.

The numeral 48 designates end trucks of two adjacent cars. Each truck comprises a truck body 49 mounted upon wheels 50. Rigidly mounted upon the truck body 49 are horizontal draw bars 51, formed of rigid insulating material. These draw bars extend longitudinally of the trucks and have their central longitudinal axes coinciding with the central longitudinal axes of the trucks. The purpose of rigidly mounting the draw bars upon the trucks, in the manner stated, is to retain the couplers centered with respect to the trucks, so that the companion couplers will properly couple and uncouple upon curves.

Mounted upon each draw bar 51 is a coupler head 52, the free edge 53 of which is preferably slightly rounded. This head had depending sides 54. The numeral 55 designates a draw bar rail, rigidly clamped to the draw bar 51, by screws 56 or the like, and the head 52 is mounted upon the draw bar rail and clamped thereto by screws 57. The draw bar rail carries a hook 58 having a down turned bill 59 provided with a cam face 60. The hook also carries a depending spacing bar 61, having an opening or notch 62 at its rear. The hook 58 is arranged at one longitudinal edge of the draw bar rail 55, as shown. Arranged between the sides 54 of the coupler head is a vertically swinging keeper 63, having an upwardly projecting flange or lip 64, having interlocking engagement with the hook of the companion coupler. The keeper 63 has sides 65, provided with openings 66, to receive a pivot element or pin 67 also passing through openings 68 in the depending sides 54. The keeper is provided with a longitudinally extending tail 69, connected with one arm 70 of a torsional coil spring 71, mounted upon the pin 67, and having its opposite arm 72 attached to the draw bar rail 55. The function of the spring is to swing the keeper 63 upwardly and normally to retain it in the upper horizontal position, which is limited by the lip 64 engaging with the top wall of the notch 66. Preferably formed integral with one side 65 of the keeper is a keeper operating finger or extension 73, arranged upon the outer side of the hook 58. The finger 73 is preferably tapered and serves to enter the companion coupler and engage the lip 64 of the keeper of the companion coupler. Each keeper has a depending trip extension 74 rigidly secured thereto.

The numeral 75 designates a truck contact, rigidly mounted upon the truck body 49 and in electrical connection therewith. This truck contact is arranged to engage with the track contact 35. The trucks and the couplers carried thereby are identical, and when the trucks are both faced in the same direction, as to the right, the hooks 58, fingers 73 and truck contacts 75 would all assume the same relative position. When two trucks face in opposite directions, as shown in Figure 1, the hook 58 and finger 73 of one coupling head is arranged upon the opposite side of the draw bar rail 55 with respect to the hook 58 and finger 73 of the companion coupling head, while the truck contact 75 will be arranged to contact with the track contact 35, but the truck contact 75 of the companion truck would be out of alignment with this track contact and could not engage therewith. This is important, as the traffic is regarded as being in one direction only, namely from left to right, Figure 1.

The operation of the apparatus is as follows:

When two cars are brought together, for the purpose of coupling, since the coupler heads are rigidly mounted upon the trucks, such coupler heads will remain centered with respect to their trucks, and hence will be brought into coupling relation, if the trucks are on a straight or curved section of track. The cam face 60 of each coupler engages the upstanding lip 64 of the keeper 63 of the companion coupler, depressing it, so that the depending bill will then engage within and behind the lip 60, which is instantly shifted upwardly by the spring 71. The keeper operating finger 73 of each coupler enters the coupler head of the companion coupler and is arranged near and above the lip 64. It is thus seen that when the trip extension 74 of one keeper 63 is swung in a trailing direction with respect to the travel of the coupler, that its keeper 63 is depressed, and the finger 73 will depress the keeper of the companion coupler, whereby the two couplers will be uncoupled.

Assuming that a train embodies an engine and five cars, and it is desired to uncouple the last car at the point occupied by the track trip 21, then as the first car (the engine not being equipped with the truck contact 75, although it could be so equipped if desired) reaches the track contact 35, the truck contact 75 will engage with the contact 35, and a circuit will be closed to automatically cause visual signal or bulb 43 to glow, while the truck contact passes over the track contact in engagement therewith. In this closed circuit current will flow from the positive side of the source of current, through the rail 10, the truck of the car, truck contact 75, track contact 35, wire 36, binding post 37, wire 38, binding post 39, wire 40, wire 42, bulb 43, wire 44, wire 46, point 47, wire 25, contact 26, and rail 13 back to the negative side of the source of current. It is thus seen that the visual signal or bulb 43 will flash as each successive car passes over the track contact 35. Since there are five cars, and after four flashes have been counted and it is known that the fifth car is approaching the track contact 35, the button 32 is pressed and contact element 35' bridges contacts 31 and 33, closing a circuit at that point. When the fifth car reaches the track contact 35 and its truck contact 75 contacts with contact 35, the same circuit will be automatically closed to operate the signal 43, but another circuit will also be closed to energize the electro-magnet and raise the track trip 21. In this electro-magnet circuit current will now pass from the positive rail 10,

through the truck of the car, truck contact 75, track contact 35, wire 36, binding post 37, wire 38, binding post 39, wire 40, wire 34, contact 33, contact 35, contact 31, binding post 30, wire 29, electro-magnet 24, wire 25, contact 26 and back to the negative rail 13. The contact rail 35 is so positioned with respect to the track trip 21 and couplers that the depending trip extension 74 of the leading coupler will have passed over and slightly beyond the track trip, before truck contact 75 engages track contact 35. As soon as this engagement is effected, the free end 23 of the track trip is projected upwardly and is arranged in the path of travel of the depending trip extension 74 of the trailing coupler. The track contact 35 is of sufficient length to retain the electro-magnet energized and the track trip 21 raised, until and slightly after engagement between the track trip and the trailing trip extension 74. This engagement, with the travel of the train to the right will swing the keeper 63 of the trailing coupler downwardly and this keeper will swing the keeper of the leading coupler downwardly, thereby uncoupling both couplers. If the train is backed over the trip contact, for the purpose of uncoupling, when again moving forward the button will not be depressed upon backing until the visual signal is had, thus giving the then leading trip extension 74 time to pass over and beyond the track trip before it is raised.

Should the button be inadvertently pressed, the trip extension 74 would ride over the raised trip 21, without derailing the car, due to the vertical play between the truck body and the wheels and the rounded end of the track trip.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:

1. In coupling and uncoupling apparatus, companion couplers, each coupler comprising a support, a self-closing keeper mounted upon the support, a hook carried by the support for interlocking engagement with the keeper of the companion coupler, a finger carried by the keeper to engage the keeper of the companion coupling to shift such keeper to the open position, and means to move one keeper to the open position.

2. In coupling and uncoupling apparatus, comprising companion couplers, each coupler comprising a support, a self-closing movable keeper mounted upon the support and having a trip part, a hook mounted upon the support and adapted for inter-locking engagement with the keeper of the companion coupling, means operated upon the movement of the movable keeper to shift the keeper of the companion coupling to the open position, and a track trip movable into the path of travel of the trip part.

3. In coupling and uncoupling apparatus of the character described, cars having trucks, companion couplers including heads fixedly mounted upon the trucks to remain centered with relation to the trucks, means for coupling each head to the other head, means actuated by the uncoupling action of one coupler to effect an uncoupling action of the other coupler, means including a track trip to effect an uncoupling action of one coupler, a track circuit including a track contact, a contact mounted upon one truck to engage with the track contact and close the track circuit at one point, manually operated means to close the track circuit at a second point and means energized when the track circuit is closed at both points to project the track trip.

4. In coupling and uncoupling apparatus, companion couplers, each coupler comprising a pivoted spring pressed self-closing keeper having a depending trip extension, a hook connected with each coupler to detachably inter-lock with the keeper of the other coupler, means operated by the movement of the keeper of one coupler to swing the keeper of the other coupler downwardly, a track circuit comprising an electro-magnetic device, a track trip to be projected into the path of travel of the trip extensions by the electro-magnetic device, a contact traveling with the truck, a track contact connected with the track circuit and so spaced from the track trip that the traveling contact will engage with the track contact after the leading trip extension has passed over and beyond the track trip, the traveling contact and track contact closing the track circuit at one point, and manually operated means to close the track circuit at another point.

5. In coupling and uncoupling apparatus, companion couplers, each coupler comprising a pivoted spring pressed self-closing keeper having a depending trip extension, a hook connected with each coupler to detachably inter-lock with the keeper of the other coupler, means operated by the movement of the keeper of one coupling to swing the keeper of the other coupling downwardly, a track circuit comprising an electro-magnetic device, a track trip to be projected into the path of travel of the trip extensions by the electro-magnetic device, a contact traveling with the truck, a track contact connected with the track circuit and so spaced from the track trip that the traveling contact will engage with the track contact after the leading trip extension has passed over and beyond the track trip, the traveling contact and track contact closing the track circuit at one point, manually operated means to close the track circuit at another point, and a signal circuit automatically closed when the traveling contact engages the track contact.

6. In coupling and uncoupling apparatus, companion couplers having tripping parts, a track trip, electrically operated means including a circuit to project the track trip into the path of travel of the tripping parts, and means to close the circuit at one point after one trip part has passed over and beyond the track trip including a vehicle carried contact and a coacting track contact, and manually operated means to close the circuit at a second point.

7. In coupling and uncoupling apparatus; a coupler comprising a coupler head, a self-closing movable keeper secured to the coupler head, a finger operated by the movable keeper and adapted to engage the keeper of a companion coupler for shifting the companion coupler keeper to the open position, and a hook connected with the coupler head for interlocking engagement with the companion coupler keeper.

8. In coupling and uncoupling apparatus; a coupler comprising a supporting member, a movable self-closing keeper connected with the supporting member, an element connected with the supporting member for detachable interlocking engagement with a companion coupler keeper, means operated by the movable keeper and adapted for shifting the companion coupler

keeper to the open position; and means to move one keeper to the open position.

9. In coupling and uncoupling apparatus; companion couplers, each coupler comprising a support, a movable self-closing keeper carried by the support, a finger carried by the movable keeper to engage the companion coupler keeper to shift the same to the open position, a hook carried by the support for detachable interlocking engagement with the companion coupler keeper, an extension secured to the keeper; and a trip movable into the path of travel of the selected extension.

10. In coupling and uncoupling apparatus; companion couplers to be connected with cars, each coupler comprising a movable keeper having a trip part, a hook connected with the coupler for detachable interlocking engagement with the companion coupler keeper, means operated by the opening movement of the keeper to shift the companion coupler keeper to the open position; a track trip; and means to project the track trip into the path of travel of the trip part of the trailing coupler after the leading coupler has passed over and beyond the track trip.

11. In coupling and uncoupling apparatus for cars or the like, companion coupling parts mounted upon the cars and movable with relation to the cars to releasing positions and having tripping parts, means operated by the movement of each coupling part to the releasing position to shift the companion coupling part to the releasing position, other coupling parts carried by the cars, each of the second named coupling parts carried by one car being arranged for detachable interlocking engagement with the first named coupling part carried by the companion car, a track trip, and means to move the track trip into the path of travel of the tripping parts only after one tripping part has passed over and beyond the track trip.

12. In coupling and uncoupling apparatus for cars or the like, coupling parts mounted upon the cars and movable with relation to the cars to releasing positions and having trip parts, means operated by the movement of each coupler part to the releasing position to shift the other coupling part to the releasing position, a second set of coupling parts carried by the cars, each of the coupling parts in the second set carried by one car being arranged for detachable interlocking engagement with the first named coupling part carried by the companion car, a track trip, and means to move the track trip into the path of travel of one tripping part.

13. In coupling and uncoupling apparatus for cars or the like, coupling parts mounted upon the cars and movable with relation to the cars to releasing positions and having tripping parts, means operated by the movement of each coupling part to the releasing position to shift the companion coupling part to the releasing position, a second set of coupling parts carried by the cars, each of the coupling parts of the second set carried by one car being arranged for detachable interlocking engagement with the first named coupling part carried by the companion car, a track trip to be projected into the path of travel of the tripping parts, a track circuit comprising an electro-magnetic device to move the track trip, a contact traveling with the truck, a track contact connected with the track circuit and so spaced from the track trip that the traveling contact will engage with the track contact after the leading tripping part has passed over and beyond the track trip, the traveling contact and track contact closing the track circuit at one point, manually operated means to close the circuit at another point, and a signal circuit automatically closed when the traveling contact engages the track contact.

14. In coupling and uncoupling apparatus for cars, a movable self-closing keeper mounted upon one car, a hook mounted upon the companion car for detachable interlocking engagement with the keeper, means mounted upon said companion car and having engagement with the keeper to shift it to the open position, the means separating from the keeper when the cars are uncoupled and separated, and means to operate the first named means.

15. In coupling and uncoupling apparatus for cars, self-closing keepers mounted upon the cars, means to cause one keeper to open the other keeper when one keeper is opened, and a hook mounted upon each car and arranged to engage with the keeper upon the companion car when such keeper is closed.

16. A track, vehicles to travel upon the track, couplers for connecting the vehicles, a circuit including a signal element, vehicle controlled means to close the circuit when the couplers approach a selected uncoupling position, and manually actuated electrically operated means for uncoupling the couplers when they reach the uncoupling position, the action of the manually actuated means being controlled by the vehicle controlled circuit closing means.

17. In a diminutive railway, a track, a plurality of vehicles to travel upon the track, coupling devices for connecting the vehicles for producing a train, a circuit including a signal element, means controlled by the movement of each vehicle to close the circuit when each vehicle nears a selected uncoupling position whereby signals are produced in succession as the vehicles reach the selected point, and manually operated means to actuate each coupling device when the coupling device reaches the selected uncoupling position to disconnect the adjacent vehicles, the produced signal affording sufficient time for the operator to actuate the manually operated means.

18. A track, a plurality of vehicles to travel on the track, coupling devices to connect the vehicles for producing a train, a circuit including a signal element, means controlled by each vehicle to close the circuit when each vehicle reaches a selected position so that signals are produced in succession as the vehicles reach the selected position, electrical means adapted to operate each coupling device for disconnecting the adjacent vehicles and including a second circuit, the second circuit being closed at one point when the first circuit is closed, and a manually actuated device to close the second circuit at another point.

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