Nov. 25, 1941. J. N. TYLER 2,263,959

CAR COUPLING AND UNCOUPLING MECHANISM

Filed Dec. 9, 1939

Fig. 1.

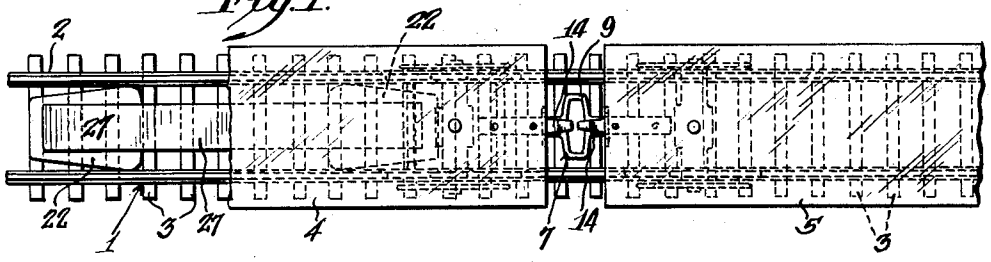


Fig. 2.

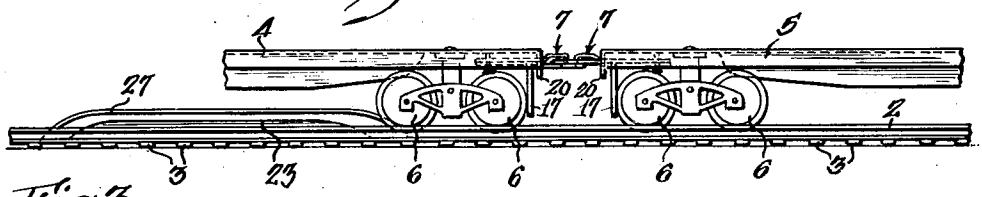


Fig. 3.

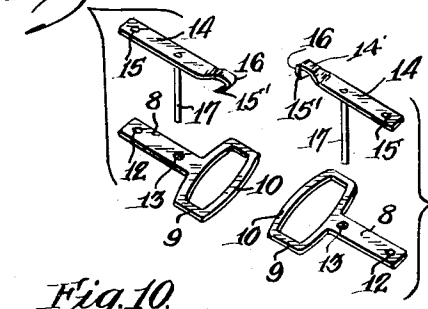


Fig. 4.

Fig. 5.

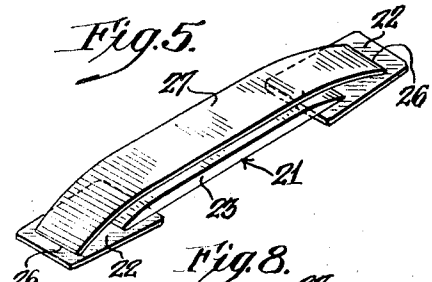


Fig. 8.

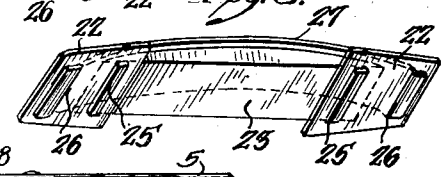


Fig. 10.

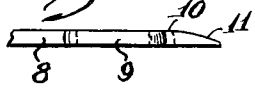


Fig. 6.

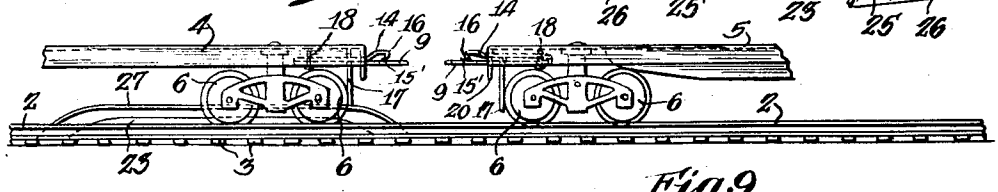


Fig. 7.

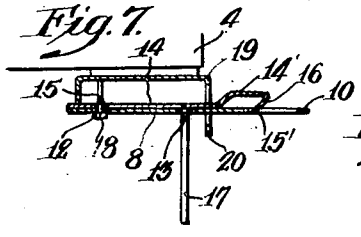


Fig. 9.

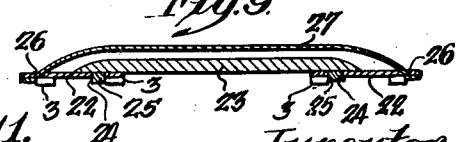
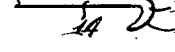


Fig. 11.



Inventor.
John N. Tyler
by Watson E. Coleman
Attorney.

Patented Nov. 25, 1941 2,263,959

UNITED STATES PATENT OFFICE

2,263,959

CAR COUPLING AND UNCOUPLING MECHANISM

John N. Tyler, Woodbury Heights, N. J.

Application December 9, 1939, Serial No. 308,472

8 Claims. (Cl. 213—82)

This invention relates to the class of coupling and uncoupling devices for railway cars and pertains particularly to improvements in such devices which are designed for use in connection with miniature railroads.

The primary object of the present invention is to provide a novel car coupling and uncoupler which are so designed that the operator of the miniature railroad in association with which the invention is used will be able to couple and uncouple any car at any place in the track line without having to touch the coupling between the cars, the coupling or uncoupling being effected by moving the cars in a prescribed manner over a unit placed on the track between the rails.

Another object of the invention is to provide a novel coupling and uncoupling means for the cars of a miniature railroad wherein there is employed a ramp unit over which the car is passed and which operates to shift an element of the coupling mechanism between the cars whereby after one of the cars has been located over such ramp and the said one element of the coupling mechanism has been shifted, the desired uncoupling action may be accomplished merely by slightly backing up an adjacent car to the one which is over the ramp.

Another object of the invention is to provide a novel coupling mechanism for toy cars wherein the coupling of the cars together may be accomplished automatically merely by running the cars into coupling position and wherein the coupling mechanism is so designed that after the coupling of the cars has been accomplished, they cannot be accidentally uncoupled even though the cars may be brought closer together and then pulled apart as in the operation of backing up and then moving forward.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not to be confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Fig. 1 is a view in plan of a portion of a miniature railway track showing thereon portions of cars equipped with the coupling mechanism embodying the present invention and showing in plan on the track the ramp unit employed for uncoupling the cars.

Fig. 2 is a view in side elevation of the structure shown in Fig. 1, illustrating the couplings between adjacent ends of a pair of cars in connected relation.

Fig. 3 illustrates in perspective the two elements making up a coupling unit of one car, the elements being separated from their working positions.

Fig. 4 illustrates the two elements making up the coupling unit of a car, the elements being in separated relation and the elements of this figure being in working relation with the elements of Fig. 3.

Fig. 5 is a view in perspective of the uncoupling ramp.

Fig. 6 is a view in side elevation of adjacent ends of a pair of cars showing one car over the ramp and the manner in which the ramp operates to lift an element of the coupler.

Fig. 7 is a view in longitudinal section through an assembled coupler together with adjacent supporting means therefor.

Fig. 8 is a view in perspective of the under portion of the ramp.

Fig. 9 is a view in longitudinal section of a portion of the track and of the ramp thereon illustrating the manner in which the ramp is maintained in position on the track ties.

Fig. 10 is a view in side elevation of the yoke end of the coupling tongue.

Fig. 11 is a view in side elevation of the hook end of the bar.

Referring now more particularly to the drawing, the numeral 1 designates a portion of a miniature track which is made up of the rails 2 and the cross ties 3. On this track are shown portions of two cars which are indicated by the numerals 4 and 5. These cars may be of the flat car type or of any of the other numerous types employed in railway systems and they are supported upon the track rails by the usual flanged wheels 6.

The coupler of the present invention is employed upon each end of each of the cars of the miniature railroad system so that when any two cars are brought into end to end relation, such cars may be automatically joined or coupled together. The numeral 7 generally designates the coupler structure embodying the present invention and this structure is shown in detail in Fig. 7. Figs. 3 and 4 show the two main elements of each coupler in perspective and in separated relation so that the exact relationship of these

parts and their detailed construction is clearly brought out. As will be seen upon reference to these Figs. 3, 4 and 7, the coupler consists of a main tongue 8 which at its outer or forward end carries or is enlarged to provide a yoke 9 which is horizontally disposed when the coupler is in operative position on a car. This yoke is elongated transversely of the tongue 8 and has a convex or arcuate forward bar 10 as shown, the edge of which is beveled or rounded, as indicated at 11 in the enlarged detail of Fig. 10. This bevel 11 of the bar of each yoke is provided to facilitate the sliding of one yoke onto or over the other when two couplers are brought together so that the yokes of the couplers upon adjacent ends of two cars may be brought into superposed relation with their openings alined in the manner shown in Fig. 1.

The rear end portion of each tongue 8 has an aperture 12 therethrough and a second aperture is formed through the tongue adjacent the forward end and just behind the yoke 9, as indicated at 13.

Disposed over each tongue 8 is a hook bar 14 which has an aperture 15 at one end which is alined with the aperture 12 of the tongue and at its other end is provided with the upwardly offset portion 14' and terminates in the downwardly and rearwardly directed hook 15'. The forward or front part of this hook curves downwardly and rearwardly forming a camming face 16 which functions to ride the hook over the beveled edge 11 of the yoke of a tongue of an adjacent coupler when the two couplers are brought into opposing relation. Due to the offset 14' the tip of the hook 15' is maintained substantially in the plane of the top of the tongue 8.

The hook bar 14 carries an actuating pin 17 which extends downwardly through the aperture 13 of the adjacent tongue, the latter aperture being of sufficient size to permit the hook bar to rise and fall with respect to the tongue without binding of the actuating pin against the edge of the aperture through which it passes.

As previously stated, the apertures 12 and 15 of the associated tongue 8 and bar 14 of a coupling unit are in alined relation and these alined apertures receive a retaining pin or other suitable member 18 which is carried by a plate 19 attached to the underside of the bottom or floor of the supporting car. At the end edge of the car beyond which the hooked end of the bar 14 and the yoke of the adjacent tongue 8 project, there is provided a vertical frame 20 forming an integral part of the plate 19, through which the tongue and bar extend. The securing element 18 loosely couples the bar and tongue together so that these are permitted relative vertical movement and the frame 20 limits the vertical movement of these elements.

The hook bar actuating pin or rod 17 extends downwardly toward the track tie but terminates a substantial distance above the same and is designed to ride over the surface of a ramp unit which is shown in perspective in Fig. 5, and is generally indicated by the numeral 21. This ramp unit 21 consists of two end plates 22 which are of a width to permit them to be snugly disposed between the two track rails. These plates are joined together by a broad flat bar 23, the ends of which overlie the adjacent end portions of the plates. Each of the plates is provided with a slot 24 extending transversely thereof and a tongue 25 formed integrally with the adjacent end of the bar 23 extends from the bar 23 through the slot and projects below the underface of the plate 22. These tongues 25 serve the double purpose of coupling the bar 23 with the plates 22 and of providing a means which when engaged against a side of a tie 3 on which the plate 22 rests, prevents the ramp from being shifted lengthwise of the track.

Each of the ramp plates 22 has a second slot 26 formed therethrough and transversely thereof adjacent the end remote from the bar 23 and these slots 26 each receives an end of a relatively broad strip of resilient material 27 which is maintained in slightly spaced relation with the top of the bar 23. This strip constitutes the actual ramp on which the lower end of a hook bar actuating pin 17 rides, the strip being bowed longitudinally of the ramp structure as illustrated so that the ends thereof which extend through the slots 26 will be lower than the lower ends of the pins 17 but the major portion of the strip between these ends will be above the lower ends of these pins so that when a car runs over a ramp, the pin will ride onto the ramp and will be shifted upwardly slightly so as to raise the hook bar to which it is attached, up from the underlying tongue.

In the operation of the coupler, the ends of the cars 4 and 5 are brought together in the usual manner and when the arcuate bars 10 of the two adjacent coupler yokes come into abutting relation, one will ride up over the beveled edge 11 of the other until the two yokes come into vertically alined relation. In moving into this relation, the uppermost one of the yokes will have the beveled edge 11 of the arcuate bar portion 10 thereof brought against the rounded nose 16 of the hook of the other coupler and will cause the hook to ride up over the forward bar of the yoke so that the point of the hook will then drop into the yoke. When the cars are then pulled apart the hook of the one coupler which has ridden over the bar portion 10 of the yoke of the other coupler will engage this bar and thus couple the cars together so that one may pull the other. It will be apparent that with the parts of the coupling units in this relation, the cars may be backed or pulled forwardly without danger of the couplings becoming disconnected.

When it is desired to uncouple the cars, the uncoupling ramp may be paced in any desired position in the track line upon the ties 3, being secured against longitudinal movement in the manner described by means of the holding tongues 25. One of the cars is then run into position over the ramp where the releasing pin 17 of the coupling unit nearest the car which is to be dropped, rides onto the resilient strip 27 of the ramp. This will cause the hook bar attached to this pin to be raised away from the tongue with which it is associated but in being so raised, it will also lift the yoke of the tongue of the coupler of the other car due to the fact that the pulling of the one car on the other will keep the yoke bar 10 in the narrow portion of the hook with which it is connected. The cars are then stopped with the coupler parts in the positions stated and are backed up slightly to a position where the yoke of the one car which is attached to the hook of the other car is moved back from the point of the hook whereupon the yoke will drop away from the hook which is still held in raised position by the lifting pin 17 which is resting upon the underlying ramp. The cars may then be moved apart and the coupling units will be dis-

connected or free so that complete separation of the cars can be effected.

The same uncoupling action will be accomplished if both cars are moved to a position where the hook bar actuating pins of the joined coupling units move onto the top of the ramp as it will be apparent that the lifting of both pins and of the hook bars connected therewith will not alter the action of the parts when the cars are backed up, because such backing up action will free one of the yokes of one coupler from the hook of the other coupler and let it drop away from such hook and then when the cars are moved forwardly again, they will become completely separated.

It is preferred in the construction of the parts of the ramp that the plates **22** be made of fibre or similar material which is non-conductive of electricity so that when the coupler and uncoupler mechanism is used in connection with toy trains which are electrically operated, these parts will not cause short circuiting of current between the rails.

By the provision of the resilient strip **21** onto which the hook bar actuating or releasing pins **17** ride, allowance is made for the passage over the ramp of locomotives or other pieces of rolling stock having low parts as these parts when coming into contact with the resilient strip of the ramp will depress the strip and permit the cars to pass over the ramp without danger of derailment. The resiliency of the strip is great enough, however, to effectively lift the hook bars of the coupler so that the operation of the uncoupling ramp will be positive and effective at all times.

The ramp is also made of the proper length that it may be placed in curved portions of a track as well as in the straight parts thereof.

What is claimed is:

1. A car coupler and uncoupler mechanism, comprising a pair of superposed members supported at the end of a car to project beyond said end and to have independent vertical movement while maintaining a more or less parallel relation, the uppermost one of said members terminating in a downturned hook bill which is turned back under the member and the lowermost one of the members terminating in a yoke which is adapted to receive and be engaged at one side between the bill and the upper member of the hook of a corresponding coupler, the hook member being supported horizontally on the yoke member, an actuating element rigidly connected with and depending from the hook carrying member, and means adapted to be positioned beneath a car carrying the coupling and over which the car passes, which is so constructed and arranged as to engage said actuating element and lift the hook carrying member and the yoke with which it is engaged when the car moves to position over said means to effect the disconnection of the hook carrying member from the yoke engaged thereby when the cars are stopped and backed up while the element is in engagement with said means.

2. A coupling and uncoupling mechanism for wheel supported bodies, comprising a pair of elongated superposed members, means supporting said members in parallel relation and resting one upon the other and connecting the members to the under side of the body, the members having independent up and down movement, the members at one end extending beyond an adjacent end of the body, a downwardly directed hook on the said other end of the upper one of said members and turned back under the upper member, a horizontally disposed yoke forming a part of the said other end of the lower one of said members and having a substantial width extending transversely of the length of the members, the point of said hook being disposed over the yoke at and upon the side thereof nearest the body, the side of the yoke remote from the body being outwardly bowed and beveled to present a relatively thin outer edge whereby said yoke may ride over and register with the yoke of another corresponding coupling carried upon another body, said hook being shaped at its under side to form a cam surface facilitating the riding of the hook over the beveled outer part of the yoke of the said other coupling, the said outer part of the yoke of the other coupling engaging between the turned back hook and the adjacent upper member, an actuator element connected with the member carrying said hook and extending downwardly therefrom, and a ramp constructed and arranged to have the wheeled body pass thereover whereby said actuator may ride up on the ramp to lift the hook carrying member and the yoke of the other coupling engaged by the hook, to effect disconnection of the hook from the yoke of the said other coupling by relatively moving the wheeled bodies while the actuator is in engagement with the ramp.

3. A coupling and uncoupling mechanism for wheel supported bodies, comprising a pair of elongated superposed members, means connecting said members at one end to the under side of the body whereby the members have vertical relative movement, the other ends of said members extending beyond an adjacent end of the body, a downwardly directed and rearwardly curved hook on the said other end of the upper one of said members, a horizontally disposed yoke forming a part of the said other end of the lower one of said members and having the bill of said hook disposed thereover adjacent the side thereof nearest the body, the side of the yoke remote from the body being outwardly bowed and beveled to present a relatively thin outer edge whereby said yoke may ride over and register with the yoke of a coupling carried upon another body, said hook being shaped at its underside to form a cam surface facilitating the riding of the hook over the beveled outer part of a yoke of the said other ocupling, a pin member secured at one end to the hook carrying member and extending downwardly through an aperture in the yoke carrying member, and an elongated ramp body having downwardly sloping ends and a portion intermediate the ends having an elevation higher than the elevation of the lower end of said pin, the ramp being of a width facilitating the running of the wheeled body longitudinally thereover whereby said pin may be made to ride upwardly on the ramp and lift the hook carrying member and the yoke engaged by the lifted hook to facilitate disconnection of the hook from the yoke of the said other coupling when said bodies are stopped and backed while the pin engages the ramp.

4. A coupling and uncoupling mechanism for cars adapted to run upon a pair of tracks, comprising a yoke member and a downwardly and rearwardly curved hook member attached to the under side of the car in superposed relation, the hook member being above the yoke member and the attaching means for the members facilitating the independent vertical movement of the members, said hook member being arranged to

engage and curve under a portion of the yoke member of another coupling when the yoke members of a pair of couplings are brought into superposed relation, an actuator for the hook member, comprising a pin rigidly fixed thereto and extending downwardly therefrom, and ramp means facilitating vertical shifting of the hook member and the yoke of another coupling with which it may be connected through the medium of said pin for effecting the disconnection of the hook from the said yoke of the other coupling by relatively moving the cars while the pin is supported on top of the ramp, said ramp comprising a pair of spaced supports adapted to be located between said rails and a strip of material connecting said supports and having a relatively long portion between its ends in a horizontal plane for the engagement and lifting of said pin and having its ends sloping downwardly.

5. A coupling and uncoupling mechanism for cars adapted to run upon a pair of tracks, comprising a yoke member and a downwardly and rearwardly curved hook member attached to the under side of the car in superposed relation, the hook member being above the yoke member and the attaching means for the members facilitating the independent vertical movement of the members, said hook member being arranged to engage and curve under a portion of the yoke member of another coupling when the yoke members of a pair of couplings are brought into superposed relation, an actuator for the hook member, comprising a pin rigidly fixed thereto and extending downwardly therefrom, ramp means facilitating vertical shifting of the hook member and the yoke of another coupling with which it may be connected through the medium of said pin for effecting the disconnection of the hook from the said yoke of the other coupling by relatively moving the cars while the pin is supported on top of the ramp, said ramp comprising a pair of spaced supports adapted to be located between said rails and a strip of material connecting said supports and having a relatively long portion between its ends in a horizontal plane for the engagement and lifting of said pin and having its ends sloping downwardly, and means upon the under side of each of said supports adapted for engagement against an underlying part of the track to prevent said plate from shifting longitudinally of the track.

6. A coupling and uncoupling mechanism for cars adapted to run upon a pair of tracks, comprising a yoke member and a hook member attached to the under side of the car in superposed relation, the hook member being above the yoke member and the attaching means for the members facilitating the vertical relative movement of the members, said hook member being arranged for connection with the yoke member of another coupling when the yoke members of a pair of couplings are brought into superposed relation, an actuator for the hook member, comprising a pin rigidly fixed thereto and extending downwardly therefrom, ramp means facilitating vertical shifting of the hook member through the medium of said pin for facilitating disconnection of the hook from the yoke of another coupling, comprising a pair of plate members adapted to be positioned between said track rails upon the supporting ties therefor, a bar connecting said plate members and having downwardly sloping end surfaces, and an elongated strip of flexible material extending longitudinally of and over and in spaced relation with said bar and having downwardly sloping end portions, the end portions of said strip being joined to said plates and said strip forming a resilient lifting means for absorbing shock incidental to the rapid riding of the pin onto a sloping end portion.

7. A coupling and uncoupling mechanism for cars adapted to run upon a pair of tracks, comprising a yoke member and a hook member attached to the under side of the car in superposed relation, the hook member being above the yoke member and the attaching means for the members facilitating the vertical relative movement of the members, said hook member being arranged for connection with the yoke member of another coupling when the yoke members of a pair of couplings are brought into superposed relation, an actuator for the hook member, comprising a pin rigidly fixed thereto and extending downwardly therefrom, ramp means facilitating vertical shifting of the hook member through the medium of said pin for facilitating disconnection of the hook from the yoke of another coupling, comprising a pair of plate members adapted to be positioned between said track rails upon the supporting ties therefor, a bar connecting said plate members and having downwardly sloping end surfaces, an elongated strip of flexible material extending longitudinally of and over and in spaced relation with said bar and having downwardly sloping end portions, the end portions of said strip being joined to said plates and said strip forming a resilient lifting means for absorbing shock incidental to the rapid riding of the pin onto a sloping end portion, and a tongue member formed upon the under side of each plate for engagement against one of the rail supporting ties to prevent longitudinal movement of the ramp along the track.

8. A coupling and uncoupling mechanism for track supported cars, comprising a tongue, a bar disposed over and longitudinally of said tongue, means coupling said bar and tongue at one end to the under side of a car, the coupling means facilitating relative vertical movement of the tongue and bar, said tongue and bar at their other ends extending beyond an end of the car, a yoke formed across the other end of said tongue and horizontally disposed, a downturned hook formed upon the other end of said bar and disposed in a plane above the open portion of the yoke, the hook having a downwardly and inwardly curving nose, a frame supported from the car body and supporting the said other ends of the bar and tongue, a pin member connected at one end with said bar and extending downwardly through an aperture in the tongue, and an elongated ramp adapted to be positioned longitudinally of and between said rails and having downwardly curving end portions, the part of said ramp between the end portions being at an elevation for engagement by the lower end of said pin whereby the pin will be raised by the ramp to lift said bar and hook from the tongue.

JOHN N. TYLER.