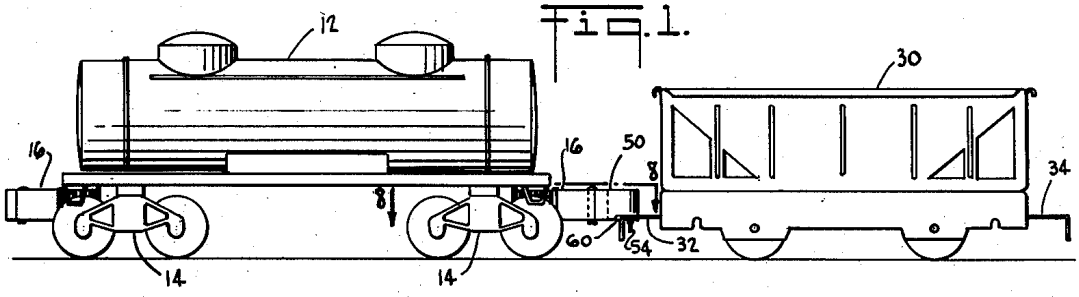
Sept. 25, 1951 W. E. REXFORD ET AL 2,569,071

COUPLER FOR TOY RAILWAY TRAINS

Filed Sept. 19, 1950

Fig. 1.



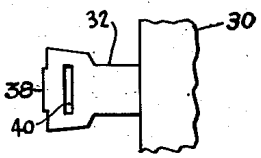


Fig. 2.

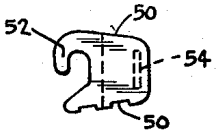


Fig. 3.

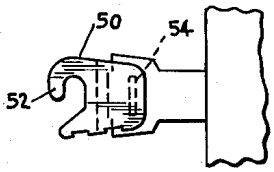


Fig. 4.

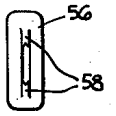


Fig. 5.

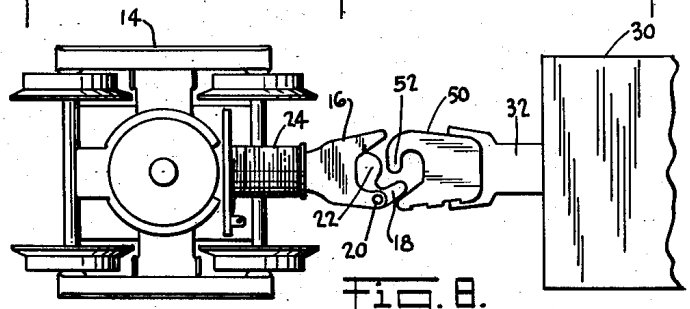


Fig. 8.

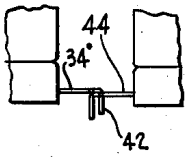


Fig. 11.

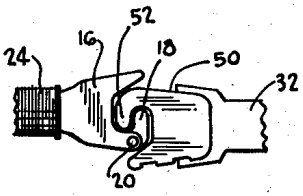


Fig. 9.

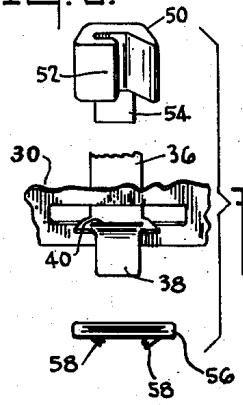


Fig. 6.

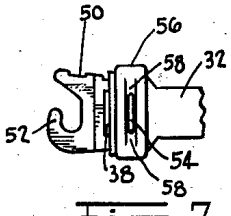


Fig. 7.

Fig. 12.

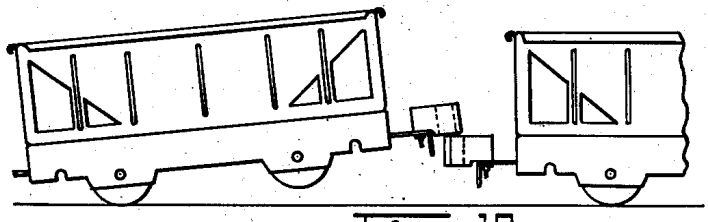


Fig. 10.

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COUPLER FOR TOY RAILWAY TRAINS

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Application September 19, 1950, Serial No. 185,536

12 Claims. (Cl. 213—112)

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This invention relates to toy railway cars, and more particularly to coupling means therefor.

Heretofore toy trains have been made with a number of kinds of coupler. A common and popular coupler employed on inexpensive trains is a sheet metal coupler extending horizontally and having its end bent downward to form the male element of the coupler, and having cut through the horizontal part near the male element a slot dimensioned to receive the male element of a like coupler. To couple these inexpensive cars it is necessary to manually lift one of the couplers until its male element can be dropped downward through the slot of the other coupler, thus anchoring the two cars together.

Somewhat more elaborate toys have been made with automatic couplers. Such couplers include a conpling hook having a movable part which may be moved between an open position and a closed position, the arrangement being such that when two cars are run together the engagement of the couplers itself causes closing of the hooks, and automatic latching thereof in closed position. Such couplers are automatically engaged, but must be disengaged by external means, such as a lever mounted on or near the coupler and carried by the car.

A still more elaborate coupling system is arranged for remote control. Such a coupling system employs automatic couplers which are engaged by running two cars together, as described, but which may be unlocked by electrical means operated under remote control. A common and popular arrangement for the purpose employs a solenoid mounted on or near the coupler bar and energized under remote control through a special track section and pick-up shoe. The solenoid when energized retracts a detent and so frees the hook to move to open position. For purposes of the present description the first form of coupler will be referred to generally as a "non-automatic coupler," while the second and third forms of coupler will be referred to generally as an "automatic coupler." In other words, for simplicity and convenience the term "automatic coupler" is here applied to any coupler which may be engaged and locked by running the cars together, whether or not the disengagement or unlocking is by local means or by remote control means.

Heretofore it has not been possible to couple together cars having non-automatic couplers and cars having automatic couplers. A child having a train system with non-automatic couplers would have to continue with that system, and

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would not be able to employ either a locomotive or cars having an automatic coupler. Conversely, a child having a system with automatic couplers would not be able to introduce into his system any of the cars provided with non-automatic couplers. The primary object of the present invention is to overcome this difficulty, and to make it possible to interchangeably employ and couple together rolling stock having automatic and non-automatic couplers. A still further object of the invention is to retain much of the benefit of the automatic coupler, and in the case of remote control equipment, to retain much of the benefit of the remote control.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the couplers and coupling adapter elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by a drawing, in which:

Fig. 1 is a side elevation showing rolling stock with automatic and non-automatic couplers coupled together;

Fig. 2 is a plan view of the non-automatic coupler;

Fig. 3 is a plan view of an adapter forming an important part of the present invention;

Fig. 4 is a plan view showing the adapter applied to the coupler;

Fig. 5 is a plan view of a friction nut or retainer forming a part of the adapter;

Fig. 6 is an exploded view showing how the adapter is applied to a sheet metal non-automatic coupler;

Fig. 7 is a bottom plan view of the coupler with the adapter mounted thereon;

Fig. 8 is a plan view showing how automatic engagement may be obtained between an automatic coupler and a non-automatic coupler having the adapter;

Fig. 9 is a fragmentary plan view showing the relation of the parts after engagement of the couplers;

Fig. 10 is a side elevation showing non-automatic engagement of non-automatic couplers having adapters;

Fig. 11 shows the relation between sheet metal non-automatic couplers when engaged; and

Fig. 12 is a fragmentary plan view showing the inter-engagement of non-automatic couplers with adapters.

Referring to the drawing, and more particularly to Fig. 1, the tank car 12 is of a relatively

expensive type mounted on four wheel trucks 14 each having an automatic coupler 16. Fig. 8 shows one of the trucks with the chassis of the tank car removed. The coupler 16 includes a movable hook portion 18 pivoted at 20 and having a connected part 22. This part 22 is so exposed when the hook 18 is in the open position shown that when two couplers are run together the parts 22 are forced inward and turn the hooks 18 to cause engagement of the couplers. The engagement is locked by means of a detent which is not shown but which takes effect when the hook 18 is moved from the open position shown in Fig. 8 to the closed position shown in Fig. 9.

The particular coupler here shown is not only automatic, but also remotely controlled. The remote control is obtained by means of a solenoid 24 which when energized draws into itself a ferrous plunger, the outer end of which constitutes the detent for holding the coupler locked. The truck 14 is provided with a contact shoe adapted to engage a fourth rail located between the usual wheel bearing rail and the central third rail, so that when energy is supplied to the fourth rail under remote control the solenoid 24 of the truck which is on that particular track section is energized.

Reverting to Fig. 1, the car 30 is an inexpensive car having only two axles and four wheels. The car is provided at one end with a sheet metal coupler 32, and at the other end with a sheet metal coupler 34. Referring to Fig. 6, these couplers are of the type comprising a generally horizontal coupler bar 36 with its endmost portion 38 bent downwardly to form a tenon-like male element. The coupler bar is provided with a transverse slot 40 through the horizontal coupler part near the tenon 38. The slot 40 is dimensioned to receive the male element of another like coupler.

The manner in which two such sheet metal couplers are engaged is illustrated in Fig. 11 where it will be seen that the coupler 34 has its tenon 42 dropped through the transverse slot of the coupler 44. Such engagement must, of course, be performed manually. In some cases the coupler may itself be lifted far enough to permit the desired engagement, and in other cases it may be necessary to lift one end of one of the cars relative to the other when interlocking the couplers.

It will be seen from examination of the non-automatic sheet metal coupler shown in Figs. 2, 6 and 11 that it would not be possible to couple such a coupler to the automatic coupler shown in Figs. 1, 8 and 9. In accordance with the present invention, however, we provide an adapter which makes such coupling readily possible.

Referring to Figs. 3 through 6 of the drawing, the adapter 50 has a part 52 forming a coupler hook dimensioned to mate with the coupler hook of the automatic coupler. It also has another part 54 dimensioned to mate with and be received by the non-automatic coupler. It further comprises a retainer means 56 which holds the adapter assembled with the non-automatic coupler. The combined adapter and non-automatic coupler then constitutes a modified or different non-automatic coupler which is so shaped and dimensioned, and located at such height, as to be useable with the automatic coupler.

Considered in greater detail, the adapter comprises a solid block 50 of material shaped to form a coupler hook 52 dimensioned to mate with the coupler hook 18 of the automatic coupler. The adapter further comprises a flat, tenon-like male portion 54 dimensioned to pass downward through the coupler slot 40 of the sheet metal coupler. In preferred form the retainer means 56 is a spring friction nut, best shown in Figs. 5, 6 and 7. The nut is made of thin resilient sheet metal, and is slotted to receive the tenon 54. Some of the material of the slot is struck downwardly to form sloping or biased arms indicated at 58. With the construction shown the nut can be slid upwardly on the tenon 54, as shown in Figs. 7 and 10, but then resists attempted downward movement, and so holds the block 50 rigidly on the sheet metal coupler.

The adapter block is preferably molded, because in that way its somewhat complex configuration is obtained very inexpensively. It may be die cast, or it may be molded out of a suitable moldable plastic. The nut is preferably stamped out of a thin resilient sheet metal, such as phosphor bronze. Thus the adapter assembly may be made by quantity production methods at very low cost.

Reverting now to Fig. 1, it will be seen that the non-automatic couplers 32 and 34 here shown are at a somewhat lower level than the automatic coupler 16. Thus the addition of the adapter 50 helps bring the non-automatic coupler to the desired height to mate with the automatic coupler. The height is not critical because of the large vertical dimension of the couplers. Moreover, the configuration can be varied to suit each particular problem. For example, in the present case the block 50 is recessed somewhat at 60 where it overlies the coupler 32. If the sheet metal coupler 32 were higher, this recessing could be carried to greater height. The recessing here shown is slight because the coupler 32 is lower than the coupler 16 by substantially the entire height of the coupling block.

From inspection of Figs. 3, 4 and 6 it will be seen that the adapter provides a fixed hook. Nevertheless substantially all of the benefit of automatic and remote control coupling is retained, and this may be explained with reference to Figs. 8 and 9 of the drawing. In Fig. 8 it will be seen that a car having the adapter 50 with its fixed hook may nevertheless be run against an open automatic coupler 16, and by reference to Fig. 9 it will be seen that the fixed hook is well able to close the open hook of the automatic coupler. Thus automatic engagement is obtained by simply running the two cars together, much as though both couplers were automatic couplers.

Conversely, to release or disengage the couplers it is sufficient to open one of the hooks, specifically the hook 18 of the automatic coupler 16. Thus, if under either local or remote control, the detent of coupler 16 is freed, any separating traction of the cars will cause a separation of the couplers as indicated in Fig. 8.

The extent to which the adapter is employed in a mixed train system will depend, of course, on the degree of interchangeability desired. Specifically, if a child has a number of cars with automatic couplers, and a number of cars with non-automatic couplers, he may content himself with using a single adapter, this being mounted on one of the non-automatic couplers. In such case the other non-automatic couplers must be kept together, being engaged as shown in Fig. 11, and the

automatic couplers must be kept together, the transition between the two coupled sets of cars taking place at the particular non-automatic coupler having the adapter.

If, however, the child wishes to be able to connect any car to any other car, then a sufficient number of adapters may be employed, one being added to each of the non-automatic couplers. In such case a non-automatic coupler may be engaged to another non-automatic coupler in the manner shown in Fig. 10. This engagement is strictly manual and requires lifting of one of the couplers, or the entire car, to a height sufficient to permit the hook of one adapter to be dropped into engagement with the hook of the other adapter. Fig. 10 shows two such cars in process of engagement, and Fig. 12 shows how the two fixed hooks interlock when once engaged. Thus the coupling of two non-automatic couplers is still manual, as before, yet each of the non-automatic couplers is adapted for automatic engagement with any of the automatic couplers.

By arranging the cars in alternation, every other car having automatic couplers, and the intermediate cars having non-automatic couplers, the entire train may be handled in much the same manner as though all of the cars were provided with automatic couplers, the train being separated at any desired point, and the cars being shuttled and rearranged, all by remote control.

The adapter is readily added, without requiring the use of tools. It is merely necessary to insert the tenon of the adapter through the slot of the coupler, and to then push the spring retainer upwardly on the tenon as far as the coupler.

It is believed that the construction and method of use of our improved coupler adapter system for toy railway trains, as well as the many advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while we have shown and described our invention in a preferred form, changes may be made in the structure disclosed without departing from the scope of the invention, as sought to be defined in the following claims.

We claim:

1. For use in a toy railway, an adapter for adapting a non-automatic sheet metal coupler for use with an automatic coupler, said sheet metal coupler having a slot to receive a flat tenon-like male portion of another coupler, said adapter comprising a block of material shaped to form a coupler hook dimensioned to mate with the coupler hook of the automatic coupler, and having a flat tenon-like male portion dimensioned to pass through the coupler slot of the sheet metal coupler, and a retainer on said tenon to hold the block assembled with said sheet metal coupler.

2. For use in a toy railway, an adapter for adapting a non-automatic sheet metal coupler for use with an automatic coupler, said sheet metal coupler having a slot to receive a flat tenon-like male portion of another coupler, said adapter comprising a block of material shaped to form a coupler hook dimensioned to mate with the coupler hook of the automatic coupler, and having a flat tenon-like male portion dimensioned to pass through the coupler slot of the sheet metal coupler, and a retainer dimensioned to slip over said tenon and to hold the block assembled with said sheet metal coupler, the tenon of said adapter being disposed vertically and the hook of said adapter lying in a horizontal plane.

3. For use in a toy railway, an adapter for adapting a non-automatic sheet metal coupler

for use with an automatic coupler, said sheet metal coupler extending horizontally and having its end bent downward to form the male element of a coupler and having a transverse slot through the horizontal part acting as the female element of the coupler, said adapter comprising a block of material shaped to form a coupler hook dimensioned to mate with the coupler hook of the automatic coupler, and having a flat tenon-like male portion dimensioned to pass through the coupler slot of the sheet metal coupler, and a retainer to hold the block assembled with said sheet metal coupler.

4. For use in a toy railway, an adapter for adapting a non-automatic sheet metal coupler for use with an automatic coupler, said sheet metal coupler extending horizontally and having its end bent downward to form the male element of a coupler and having a transverse slot through the horizontal part acting as the female element of the coupler, said adapter comprising a block of material shaped to form a coupler hook dimensioned to mate with the coupler hook of the automatic coupler, and having a flat tenon-like male portion dimensioned to pass through the coupler slot of the sheet metal coupler, and a spring friction nut dimensioned to slip over said tenon and to hold the block assembled with said sheet metal coupler, the tenon of said adapter being disposed vertically and the hook of said adapter lying in the horizontal plane.

5. In a toy railway, in combination, a non-automatic sheet metal coupler having a slot to receive the male element of a coupler, and an adapter mounted on said sheet metal non-automatic coupler for use with an automatic coupler, said adapter comprising a block of material with a projecting tenon passing through the aforesaid slot of the non-automatic coupler, and means on said tenon to hold the adapter on the non-automatic coupler, the block being shaped to form a hook dimensioned to cooperate with an automatic coupler having a hook.

6. In a toy railway, in combination, a non-automatic sheet metal coupler comprising a coupler bar having a transverse slot to receive the male element of a coupler, and an adapter mounted on said sheet metal non-automatic coupler for use with an automatic coupler, said adapter comprising a block of material with a downwardly projecting tenon passing through the aforesaid slot of the non-automatic coupler, and a retainer on said tenon to hold the adapter on the non-automatic coupler, the block being shaped to form a hook dimensioned to cooperate with an automatic coupler having a movable hook.

7. In a toy railway, in combination, a non-automatic sheet metal coupler comprising a generally horizontal coupler bar having its endmost portion bent downwardly to form the male element of the coupler and having a transverse slot through the horizontal coupler part near the male element dimensioned to receive the male element of a like coupler, and an adapter mounted on said sheet metal non-automatic coupler for use with an automatic coupler, said adapter comprising a block of material with a downwardly projecting tenon passing through the aforesaid slot of the non-automatic coupler, and retainer means to hold the adapter on the non-automatic coupler, the projecting portion of the block being shaped to form a hook lying in a horizontal plane and dimensioned to cooperate with an au-

tomatic coupler also having a hook movable in a horizontal plane.

8. In a toy railway, in combination, a non-automatic sheet metal coupler comprising a generally horizontal coupler bar having its endmost portion bent downwardly to form the male element of the coupler and having a transverse slot through the horizontal coupler part near the male element dimensioned to receive the male element of a like coupler, and an adapter mounted on said sheet metal non-automatic coupler for use with an automatic coupler, said adapter comprising a block of material with a downwardly projecting tenon passing through the aforesaid slot of the non-automatic coupler, and a spring friction sheet metal nut slid upwardly on said tenon to hold the adapter on the non-automatic coupler, the projecting portion of the block being shaped to form a hook lying in a horizontal plane and dimensioned to cooperate with an automatic coupler also having a hook movable in a horizontal plane.

9. In a toy railway system, one or more vehicles having automatic couplers with block-like ends carrying hooks pivoted for movement, one or more vehicles having non-automatic sheet metal couplers, each of said latter couplers having a slot to receive the male part of a coupler, and one or more adapters mounted on one or more of the non-automatic couplers to make possible coupling between the vehicles having automatic couplers and the vehicles having non-automatic couplers, each of said adapters comprising a block of material having a flat tenon passing through the slot in a non-automatic coupler, and a retainer means on the tenon to hold the adapter on the sheet metal coupler, said block being shaped to provide a hook dimensioned to mate with the automatic couplers.

10. In a toy railway system, one or more vehicles having automatic couplers with block-like ends carrying hooks pivoted for movement, one or more vehicles having non-automatic sheet metal couplers, each of said couplers having a slot to receive the male part of a coupler, and one or more adapters mounted on one or more of the non-automatic couplers to make possible coupling between the vehicles having automatic couplers and the vehicles having non-automatic couplers, each of said adapters comprising a block of material having a depending flat tenon passing through the slot in a non-automatic coupler, and a spring friction sheet metal nut slid over the tenon to hold the adapter on the sheet metal coupler, said block being shaped to provide a hook dimensioned to mate with the automatic couplers.

11. In a toy railway system, one or more vehicles having automatic couplers with block-like ends carrying hooks pivoted for movement in a horizontal plane, one or more vehicles having non-automatic sheet metal couplers, each of said couplers having its end bent downward to form a flat tenon-like male part and having a transverse slot in the horizontal coupler bar near the male part to receive the male part of a like coupler, and one or more adapters mounted on one or more of the non-automatic couplers to make possible coupling between the vehicles having automatic couplers and the vehicles having non-automatic couplers, each of said adapters comprising a block of material having a depending flat tenon passing through the slot in a non-automatic coupler and retainer means to hold the adapter on the sheet metal coupler, said block being shaped to provide a hook disposed horizontally and dimensioned to mate with the automatic couplers.

12. In a toy railway system, one or more vehicles having automatic couplers with block-like ends carrying hooks pivoted for movement in a horizontal plane, one or more vehicles having non-automatic sheet metal couplers, each of said couplers having its end bent downward to form a flat tenon-like male part and having a transverse slot in the horizontal coupler bar near the male part to receive the male part of a like coupler, and one or more adapters mounted on one or more of the non-automatic couplers to make possible coupling between the vehicles having automatic couplers and the vehicles having non-automatic couplers, each of said adapters comprising a block of material having a depending flat tenon passing through the slot in a non-automatic coupler, and a spring friction sheet metal nut slid over the tenon to hold the adapter on the sheet metal coupler, said block being shaped to provide a hook disposed horizontally and dimensioned to mate with the automatic couplers.

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