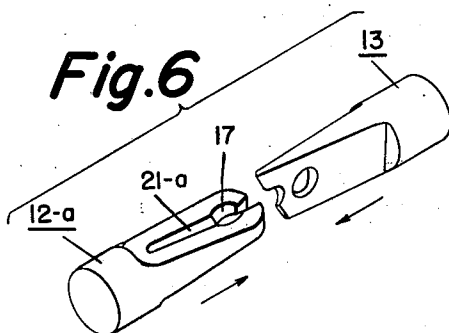
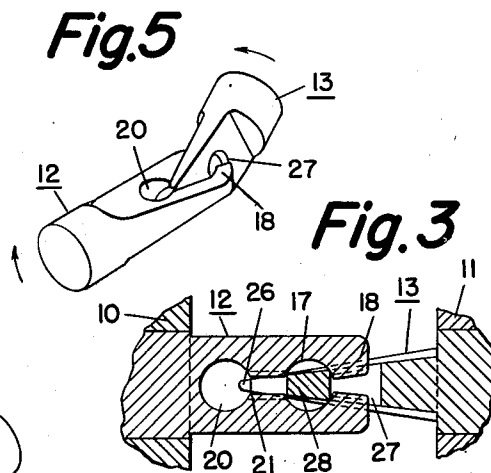
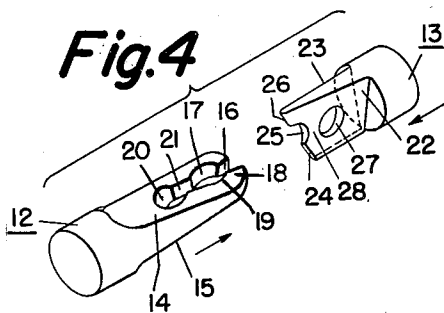
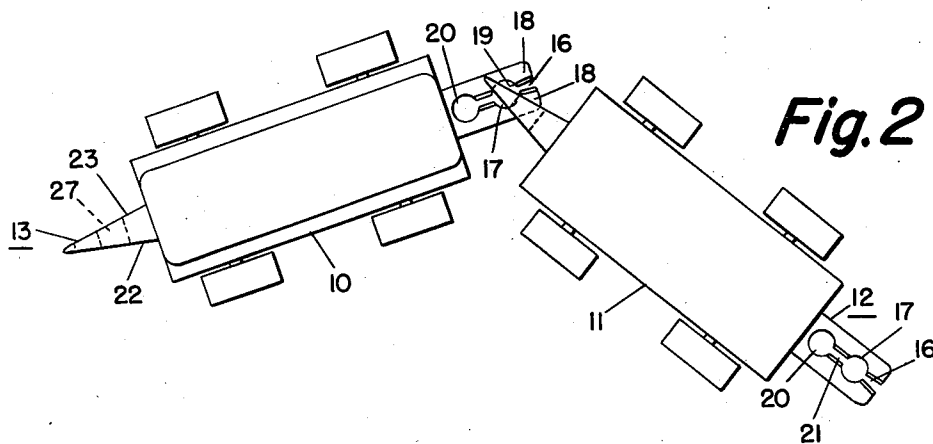
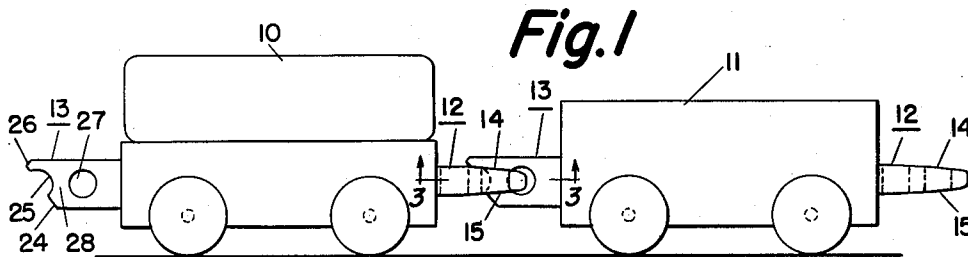


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M. CUTLER
RELEASABLE COUPLING
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2,701,152



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1

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RELEASABLE COUPLING

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5 Claims. (Cl. 287—92)

The present invention relates to detachable couplings for toy trains and the like.

An object of the present invention is to provide a new and improved construction for a detachable coupling to connect two separate parts, for example the individual cars of a toy train or the like. Another object of the present invention is to provide a novel detachable coupling which is simple and inexpensive to manufacture, sturdy and durable, easy to engage and disengage, and which affords a positive and secure locking action proof against accidental disengagement.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

Generally speaking, the novel detachable coupling of the present invention comprises a bifurcated female member and a wedge-shaped male member capable of being moved into locking pivotal engagement with the female member and capable of being tilted to spread the bifurcated female member and thereby permit disengaging withdrawal of the male member.

For the purpose of illustrating the invention, there are shown in the accompanying drawings forms thereof which have been found in practice to give satisfactory results and which are presently preferred; it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, and that the several parts and elements can be variously arranged and organized without departing from the spirit or essential attributes of this invention.

Referring to the accompanying drawings, in which like reference characters indicate like parts throughout;

Figure 1 is a side elevational view of two coupled toy train cars equipped with the novel coupling elements of the present invention.

Figure 2 is a top plan view of the embodiment of Fig. 1, but showing the cars in pivoted, rather than aligned, relationship.

Figure 3 is a horizontal cross-sectional view, generally along the line 3—3 of Fig. 1.

Figure 4 is a perspective view of the coupling elements of Figs. 1—3, as they appear when disengaged.

Figure 5 is a perspective view of the coupling elements of Figs. 1—4, as they appear when engaged but vertically tilted during a stage of the disengaging operation.

Figure 6 is a perspective view, like that of Fig. 4, but showing modified coupling elements, constituting another embodiment of the present invention.

In Figs. 1—5, I have shown a pair of toy train cars 10 and 11, each having an elongated female coupler element 12 at one end and an elongated male coupler element 13 at the other end; the female element 12 of the first car 10 being shown engaged with the male element 13 of the second car 11.

The female coupler element 12, which may be formed from a length of dowel stock or in any other suitable way, has a bifurcated end portion of reduced thickness disposed generally in a horizontal plane, and slightly outwardly and longitudinally tapered, with generally flat, slightly outwardly and longitudinally converging top and bottom surfaces 14 and 15, respectively. A slot 16 extends inwardly from the outer end of the element 12 the walls defining the slot being slightly inwardly and longitudinally tapered. The inner end of the slot 16 communicates with an enlarged, generally circular sharp-edged hole 17 extending transversely intermediate the surfaces 14 and 15 and form opposed gripping jaws 18

2

having sharp inner edges and shoulders 19. A second, generally circular hole 20 is disposed inward of the hole 17, with a slot 21 extending longitudinally between the holes 17 and 19.

The male coupler element 13, which may also be formed from a length of dowel stock or in any other suitable way, has one end outwardly and longitudinally tapered, and optionally also slightly downwardly and transversely tapered, with generally flat side surfaces 22 and 23, which converge outwardly and longitudinally and, optionally, also converge slightly downwardly and transversely. The forward or outer edge 24 of the element 13 is inclined downwardly and inwardly like a ship's prow, an arcuate notch 25 being formed therein below the outermost and uppermost portion 26, which, as will be described hereinafter, constitutes a camming finger for use in disengaging the coupler elements. A sharp-edged circular hole 27 extends transversely through the element, intermediate the surfaces 22 and 23, the hole 27 being spaced somewhat inward from the notch 25, with the intervening portion 28 having a horizontal and longitudinal dimension slightly less than the diameter of the hole 17 and with the diameter of the hole 27 slightly greater than the length of the slot 16.

As is apparent from Figs. 1 and 4, the slot 16 of the female coupler element 12 is in horizontal alignment with the notch 25, so that, when the two elements are brought together (in the direction of the arrows in Fig. 4), the slot 16 and notch 25 come into registration. Upon application of further force in the direction of the arrows in Fig. 4, the portion 28 of the male coupler element 13 enters and distends the slot 16, so as to spread the somewhat resilient gripping jaws 18 of the female element 12 and to permit the portion 28 to pass through the slot 16 and into the hole 17, whereupon the jaws 18 spring together (to their original spaced relationship) within the hole 27, the shoulders 19 bearing against the wall of the hole 27 and preventing opposite relative movement of the elements 12 and 13, so that the elements are securely locked together, as indicated in Figs. 1 and 3.

In this last-described engaged position of the elements 12 and 13, the camming finger 26 overlies the inner slot 21. The slot 21 is slightly smaller in transverse dimension or width than the camming finger, and may, optionally, be slightly downwardly tapered.

The engaged coupler elements permit relative horizontal pivoting of the cars 10 and 11, as indicated in Fig. 2; the portion 28 pivoting within the hole 17 and the jaws 18 moving in and out of the hole 27, so as to provide adequate articulation for a string of engaged cars or any other connected elements.

In order to disengage the coupler elements 12 and 13, they are tilted vertically in the directions of the arrows in Fig. 5 (it being possible to tilt only one of the elements, while maintaining the other stationary), so as to cause the camming finger 26 to enter and distend the slot 21 and thereby to spread the gripping jaws 18 (the inner hole 20 providing the necessary resilience) and to enable them to be displaced from the hole 27, so that the elements can be pulled apart to disengage them.

Thus, it is apparent that engagement of the complementary coupler elements is effected automatically by simply rolling two cars together, while disengagement is effected by manually tilting one or both of the cars upward, in the manner described above. It requires a relatively strong push to effect disengagement of the coupler elements, so that a slight upward force, such as might occur when the train is being pulled or played with, will not result in accidental disengagement of the cars.

When engaged, the coupler elements will resist any pull, however strong, and any overturning or jostling or bumping or the like, so that the cars will remain securely connected, as distinguished from hook-and-eye and other conventional connecting means, which usually come apart when the cars overturn or are otherwise jostled during play.

In place of wood dowel stock, it is possible to construct the coupler elements of metal or synthetic resin or other suitable material, by appropriate stamping, machining and/or molding operations. Where dowel stock is used, the coupler elements are secured to the cars by

3

simply gluing them into appropriate sockets formed in the bodies of the cars. In the case of metal, they can be welded or riveted or otherwise suitably connected to the cars.

It is apparent that each coupler element is rigidly secured to the car, with no movable parts, so as to provide a construction of great strength and simplicity, which is easy and inexpensive to manufacture, and which affords a positive automatic locking action and an unlocking action which can be grasped by children of tender years.

In Fig. 6, there is shown another embodiment of the present invention employing a modified female coupler element 12-a, which resembles the element 12 described above, except that the inner circular hole 20 is omitted, and, in place of the relatively short connecting slot 21, there is provided an appreciably longer slot 21-a, which extends inwardly from the circular hole 17 (and which may, optionally, be tapered inwardly and/or downwardly).

The engaging action of the coupler elements 12-a and 13 is the same as described above, that is the two elements are moved together in the direction of the arrows.

The disengaging action is also like that described hereinabove; that is, one or both of the elements are tilted upward to cause the camming finger 26 to enter and distend the slot 21-a and thereby to spread the gripping jaws 18 sufficiently to permit them to be shifted out of the hole 27, whereupon the elements can be pulled apart.

Elimination of the inner circular hole 20 in this embodiment cuts down the cost of manufacture; the greater length of the slot 21-a compensating for the reduction in resilience resulting from elimination of the hole 20.

The present invention may be embodied in other specific forms and, accordingly, the above-described embodiments are to be regarded merely as illustrative, and not restrictive, reference being made to the appended claims, rather than to the foregoing specification, as indicating the scope of this invention.

Having thus described my invention, I claim as new and desire to protect by Letters Patent:

1. A detachable coupling comprising a male coupler element having a tapered end defined by outwardly and longitudinally converging surfaces merging into a thin transversely extending forward edge, said tapered end having a sharp-edged hole extending transversely intermediate said converging surfaces and spaced slightly longitudinally inward of said forward edge; and a female coupler element having a tapered bifurcated end defined by outwardly and longitudinally converging surfaces, said

4

bifurcated end having a sharp-edged hole extending transversely intermediate said converging surfaces longitudinally inward of the forward edge thereof a distance less than the longitudinal dimension of said male element hole and providing opposed gripping jaws having sharp inner edges, each jaw and its supporting bifurcation end being of such size as to slide freely in said male element hole in coupled position, said bifurcated end also being slotted longitudinally inward of said hole to impart resilience to said gripping jaws; said coupler elements being attachable by bringing their forward edges together in 90 degree axially rotated position so that the gripping jaws of the female coupler element straddle the forward edge of the male coupler element and by thereafter pushing them together longitudinally until the jaws snap into the male element hole.

2. A construction according to claim 1 wherein a protruding camming finger is formed at the forward edge of the male coupler element for entering into the slot of the female element by relative tilting movement of the two coupler elements for forcing the gripping jaws apart to releasing position.

3. A construction according to claim 1 wherein the longitudinally converging surfaces of the male coupler element also converge transversely and wherein the forward edge is inclined inwardly along the line of convergence with the outermost thicker end of the inclined forward edge forming a protruding camming finger adapted to enter the slot of the female coupler element upon relative tilting movement of the two coupled elements and to force the gripping jaws apart to releasing position.

4. A construction according to claim 1 wherein the forward edge of the male coupler element is provided with an aligning guide notch intermediate its ends and in parallel alignment with the hole, adapted to register with the gripping jaws of the female coupler element to assure their entry into the hole of the male coupler element.

5. A construction according to claim 1 wherein a second hole is provided in the female coupler element at the inner end of said slot so as to impart increased resilience to the gripping jaws.

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