United States Patent [19]

Martin

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[54] **MODEL VEHICLE RACE TRACK**

[75] Inventor: **Donald E. Martin,** Smithtown, N.Y.

[73] Assignee: **Aurora Products Corp.,** West Hempstead, N.Y.

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[52] **U.S. Cl.** ..... **238/10 F**

[51] **Int. Cl.** **A63h 19/30**

[58] **Field of Search** ..... 46/1 K; 238/10 F, 10 E; 104/60, 53

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Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—Richard A. Bertsch
Attorney, Agent, or Firm—Amster & Rothstein

[57] **ABSTRACT**

A track section contains grooves and electrical contacts for model vehicles. The track section includes provision for rapid and positive mechanical and electrical aligned linear connection with adjacent track sections by registration of mating parts and simple relative lateral movement between the two sections. The connection is accomplished by the use of a single hook and a single corresponding opening on each end of the track section for engagement with mating elements of a like track section. There are corresponding detent means and corresponding tongue and mouth elements on each track section which serve to normally restrain lateral movement between adjacent track sections once they are connected. Electrical contact between adjacent track sections is maintained by conductor strip tabs which are arranged to permit positive electric assembly and snag-free disassembly of like adjacent track sections.

6 Claims, 10 Drawing Figures

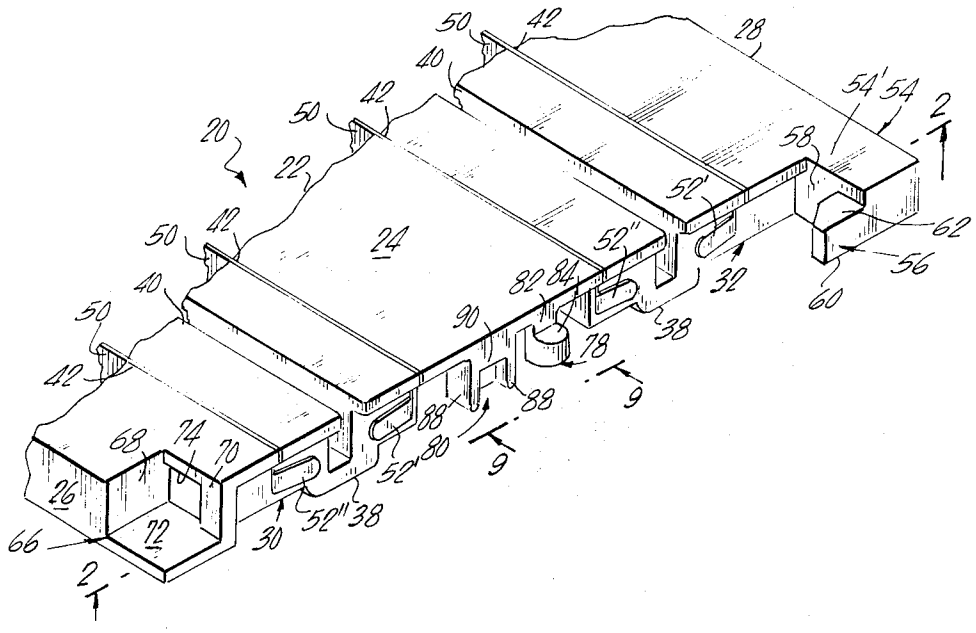


FIG. 1

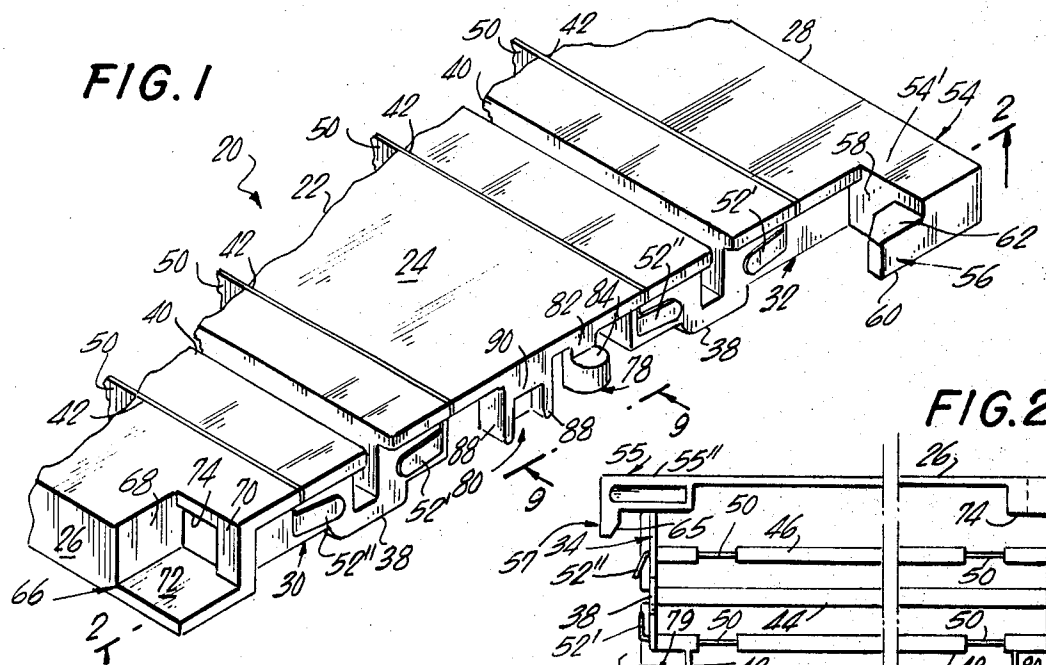
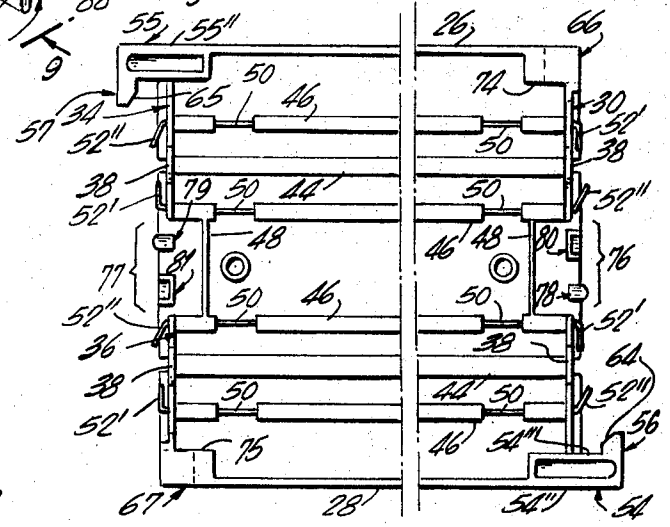


FIG. 2



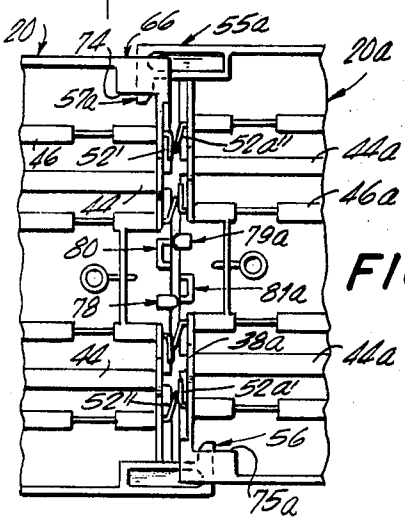


FIG. 3

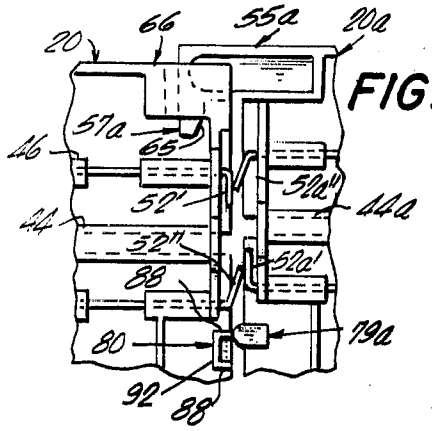


FIG. 4

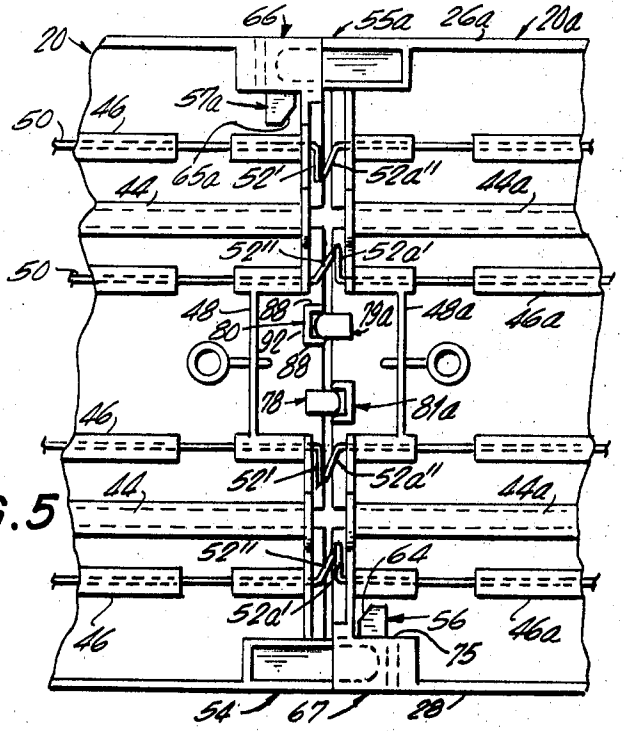


FIG. 5

FIG. 6

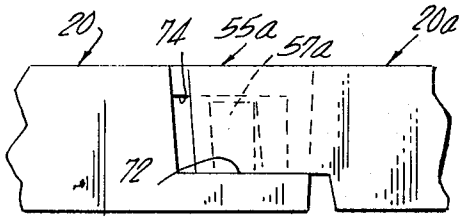
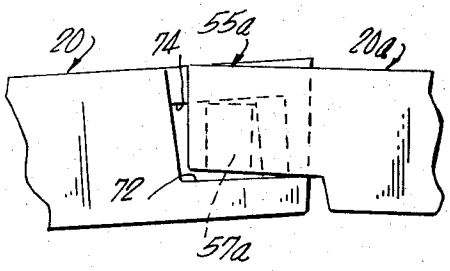


FIG. 7



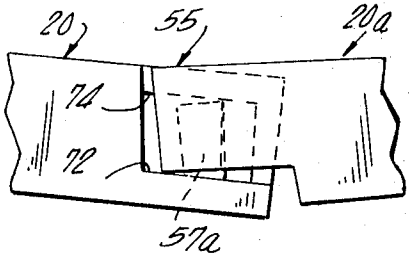


FIG. 8

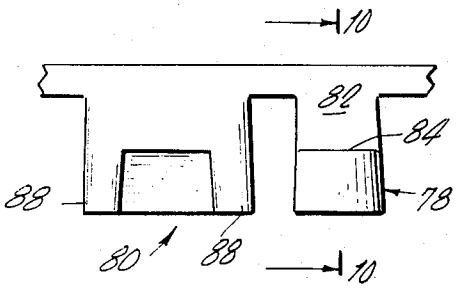


FIG. 9

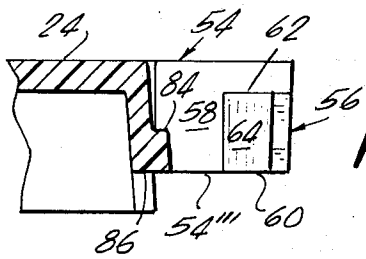


FIG. 10

MODEL VEHICLE RACE TRACK

The present invention relates generally to model racing vehicles, and in particular to track sections for use therewith.

In recent times there has been an increasing interest in toy vehicle systems in which miniature versions of automobiles, trucks, buses and other vehicles travel automatically on replicas of streets and highways under remote control. The power is supplied to the vehicles by means of conductors in the surface of the track which are contacted by brushes or conductors on the individual cars. The roadbed for model vehicle systems generally attempts to conceal the guiding means and the necessary electrical contacts for the vehicles in an attempt at providing a realistic, controlled replica of a street or highway. Among the variations of this basic idea which have appeared are models of automobile race courses which might vary in configuration from a simple oval to a tortuous series of twists and turns.

The majority of the purchasers of miniature toy vehicle race courses lack the space to permit a track setup to remain in position for an extended length of time. Also, is a particular track configuration were available only as an assembled unit, storage and handling of the unit would be difficult for the manufacturer, the retailer and the consumer. Consequently, it is desirable to provide track sections of various shapes which may be assembled and disassembled by the purchaser to form the roadbed configuration desired.

A variety of miniature vehicle track sections have appeared wherein the sections are designed for rapid edge-to-edge assembly with a continuous roadbed surface and continuous electrical contact. The vehicles propelled on the roadbed thus can remain in motion on the track system under control of the operator. While the interconnectable track sections of the prior art served to provide operative systems which generally met the requirements of continuity noted, often the connections between adjacent track elements were difficult to make, resulted in track misalignment which interfered with the model vehicle's progress or required track sections which were expensive to produce.

It is therefore an object of the present invention to provide an improved model vehicle track section which is capable of easy interconnection with like track sections resulting in a continuous electrically and mechanically interconnected roadbed.

Considerable relative lateral movement between connected track sections can normally be prevented by the use of mating, substantial, lateral detent means on like track sections with a catch being designed for operation in overcoming this substantial lateral detent during assembly thus permitting relatively easy erection and dismantling of adjacent track sections.

Accordingly, it is a more particular object of the present invention to provide a track section for model vehicles which is easily interconnected with and disconnected from like track sections and which remains normally interconnected in use.

It is another object of the present invention to provide a model vehicle track construction which is extremely simple in structure and use, reliable and durable throughout it life and which can be economically produced for sale at a reasonable price.

In an illustrative embodiment demonstrating certain aspects of the invention, a track section for model vehicles for aligned linear interconnection with like adjacent track sections is formed of insulating material. An elongated body of the track section has two ends and a substantially flat top wall with upstanding side walls depending therefrom which support the top wall. A projection appears at each end of the track section with a laterally extending hook being fixed to each of said projections. The hooks face in laterally opposite directions on each end of the track section. A recess appears in each end of the track section which is constructed and arranged to receive a corresponding projection of a like adjacent track section. A hook retaining means appears at each end of the track section, spaced from the end thereof, for releasably engaging a corresponding laterally extending hook of a like adjacent track section. A detent means is located on each end of the track section for reacting with corresponding detent means of an interconnected like adjacent track section for normally maintaining the aligned linear relationship of the two like adjacent track sections. The corresponding hooks and hook-retaining means are constructed and arranged to override coacting corresponding detent means of like adjacent track sections and engage the like adjacent track sections in response to the application of oppositely directed lateral forces thereto.

As a feature of the invention, the hook retaining means within each end of each track section for receiving a laterally extending hook of a like track section may coact with a corresponding hook in a mnner to aid in overcoming the restraining force of the detent means during assembly of adjacent track sections.

The above brief description as well as further objects, features and advantages of the present invention will be more fully understood by reference to the following detailed description of the presently preferred but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an enlarged fragmentary perspective view of one end of a representative form of the present invention;

FIG. 2 is a fragmentary bottom plan view of the track section of FIG. 1 showing both ends thereof taken substantially along the line 2—2 of FIG. 1 and looking in the direction of the arrows;

FIG. 3 is a fragmentary bottom plan view showing an adjacent pair of track section end portions in an intermediate stage of connection;

FIG. 4 is an enlarged fragmentary bottom detail view of the track sections of FIG. 3 showing the relationship between a hook and corresponding opening and the relative alignment of detent means.

FIG. 5 is an enlarged fragmentary bottom plan view showing an adjacent pair of track section end portions connected together in end-to-end relationship;

FIG. 6 is an enlarged fragmentary side elevational view of a pair of connected track section end portions in coplanar alignment;

FIG. 7 is an enlarged fragmentary side elevational view of the track sections of FIG. 6 shown at their limit of convex downward misalignment;

FIG. 8 is an enlarged fragmentary side elevational view of the track sections of FIG. 6 shown at their limit of concave upward misalignment;

FIG. 9 is an enlarged fragmentary end elevational view of the track section of FIG. 1, taken generally

along the line 9—9 of FIG. 1 and looking in the direction of the arrows, showing the detent means of the present invention; and

FIG. 10 is an enlarged partial sectional view of the end of the track section of FIG. 9 taken substantially along the line 10—10 and looking in the direction of the arrows.

Referring now specifically to the drawing and first to FIGS. 1–5, there is shown an illustrative track section embodying features of the present invention, generally designated by the reference numeral 20, which includes a generally flat body 22 which may be formed of insulating material such as by being molding of plastic. The body 22 may be of any shape or configuration including curved with portions thereof at different levels to form part or all of a banked curve or a portion of virtually any desired track configuration. However, for simplicity of description the track section 20 and its body 22 are shown as being of generally stright elongated configuration having a substantially flat elongated top wall 24 with upstanding longitudinally extending side walls 26, 28 depending therefrom. End walls 30, 32 depend from the underside of one end of the top wall 24, extend partially thereacross and are set back from the edge of the top wall for a purpose to be described hereinafter. Similarly, end walls 34, 36 depend from the underside of the other end of the top wall 24 and are similarly set back from the edge thereof. Each of the end walls 30 32, 34, 36 has a central depending extension 38, the bottom edge of which is coplanar with the bottom edge of the side walls 26, 28 for support of the track section 20 when resting upon a table top or the like (not shown).

Two longitudinally-extending, upwardly facing grooves 40 extend longitudinally across the length of the track section 20, open through the top wall 24 thereof and open at their opposite ends through the end walls 30, 34, 32, 36. A narrower pair of grooves 42 is associated with and is equally spaced from each of the grooves 40 on either side thereof. The grooves 42 are of equal longitudinal extent with the grooves 40 and likewise open through the end walls 30, 34, 32, 36 at their opposite ends. The grooves 40 are defined within depressed troughs 44 (see FIG. 2) on the underside of the top wall 24, while each of the grooves 42 are defined within depressed troughs 46 on the underside of the top wall. The troughs 46 may be provided with transverse reinforcing ribs (not shown) to aid in lending rigidity to the structure. In a similar manner, the troughs 46 may be provided with transverse reinforcing ribs 48 spaced inward of the end of the track section 20 for adding rigidity to the structure.

The grooves 44 may be used for guiding a model vehicle along the track section 20 while elongated conductor strips 50 (see FIG. 1), inserted within and coextensive with the grooves 42, supply positive and negative electrical connections to a source of electricity for powering the model vehicle. Adjacent conductor strips 50 have tabs 52′ and 52″ formed on their ends which are bent inward toward each other to provide electrical interconnection between adjacent track sections 20, 20*a* (see FIG. 5) in a manner to be described hereinafter.

A generally rectangular projection 54 is located at a corner of the track section 20 in a manner that its upper surface 54′ is coplanar with the top wall 24, its side wall 54″ is coplanar with the side wall 28 (see FIG. 2) and the portion of its bottom surface 54″ which extends beyond the end wall 32 is located above the bottom edge of the side wall 28. A similar projection 55 is located at the diagonally opposite end of track section 20 and is similarly aligned with its side wall 55″ coplanar with the side wall 26 of the track section 20.

A hook 56 is located on the laterally inward surface 58 of the projection 54. The lower surface 60 of the hook 56 is coplanar with the lower surface 54‴ of the projection 54, as best seen in FIGS. 2 and 10. A top surface 60 of the hook 56 is located below the top surface 54′ of the projection 54. The hook 56 is thus located above the bottom edge of the track section 20 and below the top surface of the track section.

The hook 56 includes an upstanding, angled or oblique surface 64 on the inner surface thereof which assumes an obtuse included angle with respect to the laterally inward surface 58. There is a corresponding hook 57 on the diagonally opposite projection 55 which faces laterally inwardly as well. The hook 57 consequently faces in the opposite direction from the hook 56 and has a corresponding angled or oblique surface 65.

A recess 66 appears on the same end of the track section 20 as the projection 54 at the laterally opposite side thereof. The recess 66 is bounded by two mutually perpendicular upstanding walls 68, 70 and a third mutually perpendicular laterally extending wall 72 which is parallel to the plane of the top wall 24. The recess 66 is open on the other sides and is approximately equal in size to the size of the projection 54. The wall 70 (which is parallel to the side walls 26, 28) has an opening 74 therein which is constructed and arranged to receive the hook 56 of the like adjacent track section 20*a* (FIGS. 3 through 8) in a manner to be described hereinafter. As with the projections 54, 55 and hooks 56, 57 a recess 67 which corresponds to the recess 66 appears within the diagonally opposite side of the track section 20.

A lateral detent 76, including a tongue 78 and a mouth 80, depends from the short end of the top wall 24 and is constructed and arranged so that the tongue and mouth are equally distant from the longitudinal center of the top wall. A similar lateral detent 77 depends from the other shorter side of top wall 24 with a tongue 79 and mouth 81 thereof opposite the tongue 78 and mouth 80 on the opposite side of the track section 20. The tongue 78 is attached to the top wall 24 by a rigid extension 82 which does not extend out beyond the shorter edge of the top wall 24. The tongue 78 has an upper surface 84 (see FIG. 10) which is located below the top wall 24 and has a lower surface 86 which is located above the lower edge of the side walls 26, 28.

The mouth 80 has two substantially parallel lips 88 which depend from a rigid downward extension 90 which, in turn, depends from the top wall 24 without extending beyond the end thereof. The lips 88 are joined at their inner ends by an upstanding transverse bridge 92 (see FIG. 4) which serves to rigidify them. The interior sides of the lips 88 are spaced apart by an amount approximately equal to the lateral dimension of the tongue 78 in order that a tongue 79*a* of a like adjacent track section 20*a* may be firmly held by the mouth 80, thereby normally preventing relative lateral movement between the like track sections as described hereinafter.

The interconnection of like track sections **20, 20***a* is readily and positively accomplished as is seen with reference to FIGS. **3, 4** and **5,** the suffix "a" being consistently used herein to denote a component of a second, adjacent like track section. Initially, a projection **55***a* of a like track section **20***a* is aligned with the recess **66** of the first track section **20** while the projection **54** of the first track section is aligned with a recess **67***a* of the like track section. The hook **57***a* of the second track section **20***a* is inserted partially within the opening **74** of the first track section **20** while the hook **56** of the first track section is likewise partially inserted in the opening **75***a* of the like track section resulting in the configuration depicted in FIGS. **3** and **4.** The track sections **20** and **20***a* are shown, in FIGS. **3** and **4,** longitudinally misaligned and apart from one another with the tongue **79***a* of the second track section abutting a lip **88** of the first track section. Due to the extension of the tongue **79***a* beyond the end of the top wall **24***a*, the tongue does not readily pass the lip **88** and thereby prevents immediate alignment of the track sections **20** and **20***a*.

Upon the exertion of laterally opposite inwardly directed forces on the track sections **20** and **20***a* urging them toward one another, the inclined surfaces **64** and **64***a* coact to draw the tracks **20** and **20***a* together. The detent action of the corresponding tongue and mouths is overridden by the lateral force thereby forcing the tongue **79***a* to rest within the mouth **80** and simultaneously causing the tongue **78** to rest within the mouth **81***a* while aligning the grooves **40** with the grooves **40***a* as shown in FIG. **5.** At the same time the oblique faces of the projections **54, 55***a* have resolved the lateral forces into longitudinal forces to draw the sections **20, 20***a* together.

As noted hereinbefore, adjacent conductor strips **50** terminate in inwardly bent tabs **52', 52''**. The tabs **52', 52''** at opposite ends of a typical conductor strip **50** are each bent so as to form different angles with respect thereto (see FIG. **2**). Tab **52'** at the right end of top conductor strip **50** shown in FIG. **2** is bent toward the next adjacent strip forming a substantially right included angle with the conductor strip it is on the end of. Tab **52''** at the left end of the same top conductor strip **50** is bent so as to form an obtuse included angle with respect to said strip.

The conductor strip **50** adjacent the top conductor strip has tabs **52'', 52'** on its right and left ends respectively which are bent toward the top conductor strip tabs. The tab **52''** of the next-to-top conductor strip **50** forms an obtuse included angle therewith, while the tab **52'** thereof forms a substantially right angle with said strip. The remaining adjacent conductor strips **50** include tabs **52', 52''** thereon which are similarly arranged.

As may be noted with greatest clarity in FIGS. **3** and **4,** the alternating included angle arrangement of tabs **52', 52''** with respect to conductor strips **50** results in a tab **52'** with a substantially right included angle being adjacent a tab **52***a''* with an obtuse included angle of an adjacent aligned track section **20***a*.

When adjacent track sections **20, 20***a* are assembled, (see FIG. **5**) the adjacent tabs **52', 52***a''* thereof contact one another to provide the requisite electrical continuity between the track sections. The angled nature of the tabs **52', 52***a''* is such that a positive spring effect is created therebetween, insuring a good connection. During the disassembly process, the different angle between adjacent tabs **52', 52***a''* of adjacent track sections **20, 20***a* reduces the possibility of engagement between said adjacent tabs **52', 52***a''* with attendant damage thereto.

The extension of the tongues **78, 79** beyond the edges of the top wall **24** as well as the location of the corresponding mouths results in positive prevention of normal relative lateral movement between adjacent track sections **20, 20***a* and prevents unwanted lateral separation of the track sections until such separation is desired. Separation of the tracks is accomplished by reversing the direction of the lateral force applied to the track sections **20** and **20***a* resulting in a reversal of the order of events described hereinbefore.

Once the tracks are connected, a certain amount of limited relative flexion therebetween is permitted as illustrated in FIGS. **6, 7** and **8.** FIG. **6** shows the normal or unflexed position of the two track sctions **20** and **20***a* with the projection **55***a* resting on the surface **72.**

In FIG. **7,** the limit of convex upward motion of the track sections **20** and **20***a* is shown as determined by the contact of the upper left edge of the hook **57***a* with the upper surface of the opening **74** as well as the contact between the lower inner edge of the projection **55***a* with the surface **72.**

FIG. **8** shows the limit of the permitted concave downward relative movement between the track sections as determined by the contact between the lower forward edge of the projection **55***a* with the surface **72** as well as by the contact between the leading lower edge of the hook **57***a* with the lower surface of the opening **74.** In addition, the coaction between the upper surface **84** of the tongue **78** and the lower roof surface of the downward extension **90** on adjacent like track sections **20, 20***a* further limits flexion therebetween.

From the foregoing, it is seen that the present invention provides a track construction for model vehicles which is simple to interconnect with other like track sections due to the features described above. The interconnection is especially simple and strong due to the fact that only a single hook and opening need be engaged with a corresponding single hook and opening on an adjacent like track section to provide a construction which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

As will be readily apparent to those skilled in the art, the invention described may be used in other specific forms without departing from its spirit or essential characteristics. The present embodiment is, therefore, to be considered as illustrative and not restrictive, the scope of the invention being indicated by the claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalence of the claims are therefore intended to be embraced therein.

What is claimed is:

1. A track section for model vehicles for aligned linear interconnection with like adjacent track sections comprising an elongated body of insulating material having two ends, a substantially flat top wall with upstanding side walls depending therefrom, a single projection from each end of said track section, a single laterally extending hook being fixed to each of said pro-

jections, said hooks facing in laterally opposite directions, a recess in each end of said track section constructed and arranged to receive a corresponding projection of a like adjacent track section, a hook retaining means at each end of said track section spaced from the end thereof for releasably engaging a corresponding laterally extending hook of a like adjacent track section, and detent means located on each end of said track section for coacting with corresponding detent means of an interconnected like adjacent track section for normally maintaining said aligned linear relationship of said two like adjacent track sections, each corresponding hook and hook retaining means including means for urging like adjacent track sections toward one another and into engagement in response to the application of oppositely directed lateral forces thereto, thereby overriding coacting corresponding detent means of said like adjacent track sections.

2. A track section for model vehicles according to claim **1** wherein said urging means includes a contact surface obliquely disposed with respect to said end of said track section, said contact surface being constructed and arranged to coact with a corresponding hook retaining means of a like adjacent track section to override said coacting corresponding detent means of a like adjacent track section, urge said track sections toward one another and establish said aligned linear relationship therebetween in response to the application of oppositely directed lateral forces thereto.

3. A track section for model vehicles according to claim **2** wherein said detent means includes tongue and mouth means, said tongue projecting longitudinally with respect to the end of said track section and said mouth having an opening projecting longitudinally at least a corresponding amount with respect to the end of said track section, said mouth having lips and a roof constructed and arranged to normally limit movement of a tongue of a like adjacent track section engaged in aligned linear relationship between said lips and roof.

4. A track section for model vehicles according to claim **3** wherein each end of said track section has only one hook and one opening for coacting with a corresponding hook and opening of a like adjacent track section.

5. A track section for model vehicles according to claim **4** wherein said hook retaining means includes an upstanding longitudinally extending wall at least partially bounding each of said recesses with an opening therein constructed and arranged to engage a corresponding laterally extending hook of a like adjacent track section.

6. A track section for model vehicles according to claim **1** including at least one pair of longitudinally extending conducting strips having ends, said conducting strips being mounted on said track section, each of said conducting strips terminating in a tab on each end thereof, each of said tabs being constructed and arranged to define an included angle between said tab and said conducting strip, said included angles being different on different ends of said track section for the same conducting strip and different on the same ends of adjacent conducting strips whereby adjacent tabs of like adjacent track sections define different included angles.

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