

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 November 2008 (06.11.2008)

PCT

(10) International Publication Number
WO 2008/134663 A1

(51) International Patent Classification:
A63H 18/10 (2006.01) A63H 18/00 (2006.01)

(21) International Application Number:
PCT/US2008/061820

(22) International Filing Date: 28 April 2008 (28.04.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/926,583 27 April 2007 (27.04.2007) US
60/966,029 24 August 2007 (24.08.2007) US

(71) Applicant (for all designated States except US): **MATTEL, INC.** [US/US]; 333 Continental Boulevard, El Segundo, CA 90245-5012 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **O'CONNOR, Stacy, Lynn** [US/US]; 1335 Newport Ave, #202, Long Beach, CA 90804 (US). **NUTTALL, Michael, W.** [US/US]; 2012 Fletcher Avenue, South Pasadena, CA 91030 (US).

(74) Agent: **BOEHM, Christopher, C.**; Cantor Colburn LLP, 20 Church Street, 22nd Floor, Hartford, CT 06103-3207 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(54) Title: TOY TRACK SET AND RELAY SEGMENTS

(57) Abstract: A relay segment for a toy track set is provided, the relay segment having a trigger moveably secured to the relay segment proximate to a first vehicle track segment pivotally mounted to the relay segment for adjustable movement with respect to the relay segment, the trigger being capable of movement between a first position and a second position; and a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.



TOY TRACK SET AND RELAY SEGMENTS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of United States Provisional Patent Application Serial Nos. 60/926,583 filed April 27, 2007 and 60/966,029 filed August 24, 2007, the contents each of which are incorporated herein by reference thereto.

BACKGROUND

[0002] Toy vehicle track sets have been popular for many years and generally include one or more track sections arranged to form a path around which one or more toy vehicles can travel. Toy vehicles which may be used on such track sets may be either self-powered vehicles or may receive power from an external source. In order to increase play value of the track sets, various track amusement features have been added to the track sets. For example, track features, such as stunt devices or elements, including loops, jumps, collision intersections, etc., have been included in such track sets to increase the play value of the track sets.

[0003] However, with many track sets, the vehicles run on a closed loop track moving through the same track features lap after lap. Although such track sets may have one or more stunt devices, a vehicle in the track set may perform the same stunt over and over as it travels along the track. Thus, even in track sets with more than one stunt device, the motion of the vehicle generally remains consistent for each vehicle as it travels along a specific section of the track. This repetitive nature of vehicle travel may result in loss of interest in the track set over a short period of time.

[0004] Some track sets have incorporated switching mechanisms to enable a user to direct a vehicle to a select travel path. However, generally such systems require manual manipulation of the track and/or manual actuation of a switch to reroute one or more vehicles traveling on the track. Play possibilities may be limited as travel along the select paths may again become repetitive over a short period of time.

[0005] Accordingly, it is desirable to provide toy track set with interchangeable elements to provide numerous configurations.

SUMMARY OF THE INVENTION

[0006] In one embodiment, a relay segment for a toy track set is provided, the relay segment having a trigger moveably secured to the relay segment proximate to a first vehicle track segment pivotally mounted to the relay segment for adjustable movement with respect to the relay segment, the trigger being capable of movement between a first position and a second position; and a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.

[0007] In another exemplary embodiment, an interchangeable toy track set is provided, the interchangeable toy track set having a plurality of interchangeable relay segments each of which may be coupled to each other to create a plurality of variations for the toy track set, each of plurality of interchangeable relay segments comprising: a trigger moveably secured to the relay segment proximate to a first vehicle track segment pivotally mounted to the relay segment for movement with respect to the relay segment, the trigger being capable of movement between a first position and a second position; and a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.

[0008] In still another exemplary embodiment, a method for actuating a plurality of relay segments of a toy track set is provided, the method comprising: actuating a trigger of one of a plurality of interchangeable relay segments linked to at least one other of the plurality of interchangeable relay segments wherein actuation of the trigger causes a toy vehicle to be launched towards another one of the one of the plurality of interchangeable relay segments, each of the plurality of interchangeable relay segments comprising: a trigger moveably secured to the relay segment proximate to a first vehicle track segment coupled to the relay segment, the trigger being capable of movement between a first position and a second position; and a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position, wherein the toy vehicle launched

towards the another one of the plurality of interchangeable relay segments causes the trigger of the another one of the plurality of interchangeable relay segments to move from the first position to the second position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 shows an example toy vehicle track set including a plurality of relay segments in accordance with an exemplary embodiment of the present invention;

[0010] FIGS. 1a and 1b further illustrate segments of an exemplary toy vehicle track set;

[0011] FIG. 1c shows an internal view of an example relay segment;

[0012] FIGS. 2-11 show example relay segments;

[0013] FIG. 12 shows another example toy vehicle track set including a plurality of relay segments;

[0014] FIGS. 13-17 illustrate still other relay segments in accordance with exemplary embodiments of the present invention;

[0015] FIG. 18 shows still another example toy vehicle track set including a plurality of relay segments;

[0016] FIGS. 19 and 20 illustrate still other relay segments in accordance with exemplary embodiments of the present invention;

[0017] FIG. 21 illustrated still another toy vehicle track set in accordance with another exemplary embodiment of the present invention; and

[0018] FIGS. 22 – 23 illustrate yet another exemplary relay segment.

DETAILED DESCRIPTION

[0019] In accordance with exemplary embodiments of the present invention a customizable track set is provided. In one embodiment, the track set

includes a plurality of interchangeable relay segments each of which may be coupled to each other to create a customized expandable track set. The relay segments may include one or more stunt elements and may be selectively positioned at the beginning, middle, or end of the track set. Each relay segment may be configured to enable a toy vehicle to traverse an obstacle and/or perform a stunt and launch the toy vehicle down a track towards another relay segment, which then may initiate a second vehicle to be released and traverse still another obstacle and/or perform still another stunt.

[0020] An example track set 100 having three relay segments 110, 112, and 114 is shown in FIG. 1. As discussed in more detail below, each relay segment may be selectively positioned in the beginning, middle or end of the track. A user may customize the track by positioning the relay sections in desired portions of the track. In one embodiment, a plurality of relay segments may be sequentially coupled together with a plurality of track segments to generate a series of relay events. The series of events, which may include various stunt elements, can be rearranged in a plurality of sequences and/or parallel paths to provide numerous play patterns. In this way, a user can experience diverse track play and excitement time and time again.

[0021] In this first example, each relay segment 110, 112, and 114 may include an incoming vehicle trigger which may directly or indirectly causes the launching of another outgoing vehicle. The outgoing vehicle from one segment may become the incoming vehicle of a next segment. One or more launchers may be provided to accelerate toy vehicles along the track. As such, the launchers may be configured to engage and urge a toy vehicle to travel along the track. It should be appreciated that although launchers are described herein, vehicles may be manually propelled along the track without the use of a launcher without departing from the scope of the disclosure.

[0022] Although any suitable launcher may be used, in the illustrated embodiments, various automatically and manually-triggered release launcher elements are illustrated. A vehicle may be positioned in launch position such that a launch element may slidingly engage the vehicle to propel the vehicle along the track. The launch element may be biased to a launch position, such as by springs, elastic

bands or any other suitable biasing mechanism such that release of an activator releases its stored potential energy.

[0023] In one example, the relay segments may include triggers, such as conical shaped triggers (shown in FIG. 1 at 120) or angled trigger shapes that are not necessarily conical (shown in FIG. 1a at 120a). As an example, conically shaped trigger 120 may have a cone angle of approximately 45 degrees, which is actuated vertically via contact with a horizontally moving incoming vehicle. It should be appreciated that the cone angle may be of any suitable angle such that an incoming vehicle actuates the trigger. Thus, as a non-limiting example the cone angle may be anywhere from 5-90 degrees.

[0024] Further, while this example shows a conical trigger, alternatively, it may be planar shaped and angled (e.g., approximately 45 degrees) relative to an incoming track. As a further example and as shown in FIG. 1a, trigger 120a may have a flat, angled plane 122a (formed by a plurality of ridges) that is contacted by a vehicle on a track. Again, although shown with an angle of approximately 45 degrees, any suitable angle may be applied (e.g. 5-90 degrees) such that a vehicle actuates the trigger.

[0025] In some relay segments, actuation of a trigger by a first vehicle initiates a stunt and release of a second vehicle on the track set. As an example and referring again to FIG. 1, in the configuration illustrated, track play may be commenced with stunt element or relay segment 114. For example, actuation of a manual release or manual 102 may propel or launch vehicle 122 along track 130 toward a second relay segment 110. In one example embodiment, a relay segment may enable a variable change of vehicle traveling direction (between an incoming and outgoing vehicle), thus further providing variable configurations for more diverse track play.

[0026] It is noted that track 130 includes direction indicators, such as molded-in arrows, or cut-outs which may indicate vehicle direction and/or assembly instructions for a toy track set. For example, the direction indicators may aid in the ease of assembly for an expandable track set, may provide specific direction of vehicle travel used to initiate stunts, or enable passage past obstacles. Although the

direction indicators are shown as a row of cut-out arrows, it should be appreciated that the direction indicators may be of any size and/or shape to indicate assembly direction and/or vehicle travel direction. Further, although a plurality of arrows is illustrated, a single arrow or other cut-out may also be used without departing from the scope of the disclosure. Further, in some embodiments, the direction indicators may be positioned in a center of the track so that the wheels of the vehicles are not impeded. It further should be appreciated that although shown as cut-outs, the direction indicators may be surface indicators, raised moldings, etc.

[0027] Referring back to FIG. 1, vehicle 122 traveling along track 130 in the direction of the direction indicators may contact or engage a second relay segment, e.g. relay segment 110. For example, relay segment 110 may be a stunt element, such as a crane element 125. Upon contact or actuation of trigger 120 through vehicle 122, a crane stunt event may be initiated. In the crane stunt event, a second vehicle, e.g. vehicle 124, may be released from jaws 126 of crane element or crane 125. FIG. 1b further illustrates another embodiment of a crane relay segment.

[0028] As shown in FIG. 1b, a crane relay segment 125a may include two triggers to perform a crane-based stunt. The first trigger may be a switch, such as a cone or other shaped actuation switch 120 at the end of an incoming track. A first vehicle may engage the first trigger and initiate release of a second vehicle which is held in the crane jaws. The vehicle released from the crane jaws 126a may fall and actuate a second trigger 128a to initiate the launch of a third vehicle onto an outgoing track. In addition, in some embodiments, the second trigger may also release a spring-loaded platform to knock off a stack of vehicles. The jaws of the crane, when fully closed, may hold the vehicle in a ready-to-be-released position. FIG. 1c further illustrates the mechanics of an example crane relay segment 125a.

[0029] FIG. 1c illustrates a mechanism 127 for performing the affirmation two trigger event. In one embodiment an upper portion 129 of the crane is moved downward in the direction of arrow 131 wherein a plurality of gears 133 are rotated and potential energy is stored in a spring mechanism that is wound as the gears are rotated and a pawl or catch mechanism engages the gears to prevent back driving of the gears by this spring mechanism, wherein the pawl or catch mechanism is released from the engaging position when a conical surface 121 of trigger 120 is

engaged thus causing the same to pivot about a pivot point 135 with respect to a lower portion 137 of the crane. Once the kinetic energy of the spring mechanism is released the gear train causes the upper portion of the crane to move upward in a direction opposite to arrow 131 which also causes a clasp 139 to release a pair of claw members 141 from their grasping position illustrated in FIG. 1c to the open position illustrated in FIG. 1, wherein a car 124 is dropped and second trigger 128a is activated again releasing stored potential energy to cause another stunt to occur for example the flipping of the toy vehicles illustrated in FIG 1. Clasp 139 may be any suitable arrangement comprising a hook of one of the claw members configured to engage a member of the other one of the claw members to retain the claw members in the position illustrated in FIG. 1c and thus allowing them to open to the position illustrated in FIG. 1 when the upper portion crane is moved upwardly such that the vehicle retained in the claw members is now above trigger 128a.

[0030] Referring again to FIG. 1, following activation of relay segment 110, and release of vehicle 124 onto target 128, launching element 132 and opening shelf 134 may be actuated. Specifically, launching element 132 may launch vehicle 140 along track 142, while opening shelf 134 throwing vehicles 136 and 138. Vehicle 140 may be propelled toward a third relay segment, such as relay segment 112.

[0031] Vehicle 140 may actuate a trigger in relay segment 112. The relay segment 112 may actuate launching element 150 to launch a third vehicle 146 toward relay segment 114. In some embodiments, track events may be terminated at trigger 148. However, in other events, another relay segment, stunt element, or obstacle may be added to the track such that the track does not terminate at trigger 148.

[0032] It should be appreciated that each relay segment may be selectively positioned in the track chain. As an example, relay segment 110 may be at the beginning, middle or end of the track. Similarly, relay segments 112 and 114 may be positioned at the beginning, middle or end of the track. A user may be able to customize the track by positioning the relay segments in a desired order.

[0033] It should be appreciated that the track play of each relay segment may be activated directly or indirectly by actuation of the trigger. As an example of indirect activation, the relay segment may include a stunt element performed by either the first or second vehicle. Further, the stunt element may be performed by a third vehicle. Further still, the stunt element may include multiple simultaneous, parallel, and/or sequential stunts performed by a plurality of vehicles, where the stunts may be performed simultaneously, in sequence with one triggering the next, in parallel, or combinations thereof. In still another embodiment, the launching element and/or the trigger may also include stunt elements performed by one of the first and second, or other vehicles. Although described in regards to actuation of the stunt elements via vehicle triggering, alternatively, track play may commence via manual activation of any of the relay segments or stunt elements. While FIG. 1 shows various example relay segments with multiple stage stunts, as well as without stunts, numerous variations in relay elements are possible.

[0034] Although shown with regard to a single straight-line track, it should be understood that virtually any number of different track designs may be used without departing from the scope of this disclosure. For example, parallel track configurations may be used, as well as combination sequential/parallel track configurations may be used. Further, various stunts may be performed, rather than the drops and/or loops shown, such as jumping over voids, traversing obstacles, etc.

[0035] FIG. 2 shows an example relay segment 200 having a teeter-totter styled stunt element to provide indirect launching via automatic and/or manual trigger activation. Specifically, FIG. 2 shows an incoming track section 210 coupled to a conical trigger 212, which can also be actuated via the manual button 214. In this example, the trigger retains the ramp 220 in spring loaded position when the trigger or conical surface 212 thereof is in a downward position, such that contact by an incoming vehicle on track 210 causes the trigger to move vertically, release a catch that then releases spring loaded motion of ramp 220. For example, a vehicle may be pre-loaded at end 222 and held in place by stop 224. Then, upon release, the ramp 220 may rotate about pivot 226 as shown to launch a vehicle stored at 222. The vehicle may then exit the relay segment through exiting track section 230. In accordance with an exemplary embodiment of the present invention, the higher end

ramp is pulled downward in the direction of arrow 217 to an urging force provided by a spring biased member or elastic member 227 thus causing the ramp 220 to pivot about pivot 226. The retention of the ramp in the illustrated position with the biasing member 227 extended it is facilitated by a catch that will engage a complementary member of the trigger which is moved out of its retaining position when the conical portion or the manual portion that of the trigger is moved thus releasing the stored potential energy of the elastic member.

[0036] While not shown in this example, the exiting track section 230 may be coupled to further track sections that may lead to additional relays segments, for example. Also, incoming track section 210 may be adjustable (e.g., rotatable or pivotally mounted to the relay segment for movement in the direction of arrows 211) to enable an incoming vehicle to enter the relay segment from a plurality of angles. Further, incoming track section 210 may be coupled to track segment that may be mounted to a higher altitude position, such that gravity may “launch” the incoming vehicle. Likewise, exiting track section 230 may also be adjustable.

[0037] FIGS. 3-3B illustrate an exemplary direct acting relay segment 300. Specifically, FIG. 3 shows an incoming track section 310 coupled to the segment proximate to a conical trigger 312, which can also be actuated via the manual button 314. In this example, the trigger locks a launcher in a loaded position when the launcher is moved to a launch position and the trigger is in the position illustrated in FIG. 3. The trigger releases the stored energy of the launcher when a contact portion of the trigger is moved upwardly to release a catch retaining the launcher in the launch position. In one exemplary embodiment contact of the conical surface of the trigger by an incoming vehicle on track 310 causes the trigger to move vertically, release a catch that is retaining the launcher in the launch position. As illustrated in FIG. 3 a spring loaded launcher or protrusion 320 slides between a launched position (illustrated by the solid lines in FIG. 3) and a launch position (illustrated by the dashed lines in FIG. 3) in launcher 322. Accordingly, and as the launcher slides from the launch position to the launched position a toy vehicle in launcher 322 is pushed out of the relay segment. For example, a vehicle may be pre-loaded in launcher 322 until activation. Then, the vehicle may then exit the relay segment through exiting track section 330.

[0038] In this example, the trigger is pivotally mounted to the launching stunt element via pins 311 for movement between a first position and a second position in the direction illustrated by arrows 313, wherein movement of trigger from the first position (illustrated) to the second position (not-illustrated) occurs when a vehicle moves into an area 315 between a contact surface of conical trigger 312 and incoming track segment 310 thus forcing the conical trigger upward and away from track segment 310.

[0039] In addition, and in order to provide manual activation of the trigger (i.e., to begin a series of triggering events by launching the first car from a relay segment or a plurality of users can individually launch a car from separate relay segments or any combination thereof) a manual switch 314 is also secured to the trigger such that an application of a force in the direction of arrow 317 will cause the trigger to pivot about pivot pins 311 and move the contact surface of the conical portion away from the track segment 310 and dust release the launcher from its launch position.

[0040] Referring now to FIGS. 3a-3b, a bottom portion of launcher 322 is illustrated. Here a bottom portion 321 of the launcher 320 slides within a slot 323 of the launcher in order to effect movement from the launch position to the launched position. In accordance with one exemplary embodiment of the present invention a catch 325 secures and retains a portion of bottom portion 321 as it slid into the launch position. In order to provide the biasing force for urging the launcher from the launch position to the launched position a biasing element 327 is secured to the launcher and bottom portion 321. In accordance with an exemplary embodiment of the present invention, the biasing element is an elastic member. Of course, it is understood that any biasing element can be used, non-limiting examples include springs, resilient members and equivalents thereof. In addition, it is also understood that any suitable configuration may be provided for the catch and the bottom portion. In an exemplary embodiment and as the trigger or the conical portion of the trigger moves away from the track segment 310 catch 325, which is secured to the trigger and any suitable manner moves away from its retaining position illustrated in FIG. 3b and allows the elastic member to slide the launcher from the launch position to be launched position thus propelling a toy vehicle out of launcher 322. It is, of course,

understood that the aforementioned description of the movement of the trigger and release of a biasing member is provided as an example and the exemplary embodiments of the present invention are not intended to be limited to the specific embodiment disclosed above. Similarly, exemplary embodiments of the present invention are not limited to launcher described above. For example, other releasable spring biased or otherwise type of toy launchers are found in U.S. Patent Nos. 4,108,437 and 6,435,929 and U.S. Patent Publication 2007/0293122 as well as those known to those skilled in the related arts.

[0041] It should be noted that exiting track sections of each of the relay segments, such as exiting track section 330, may be coupled to further track sections that may lead to additional relays segments. The relay segments may be interchanged such that the track is customized. Also, incoming track sections of the relay segments, such as incoming track section 310, may be adjustable (e.g., rotatably or pivotally mounted to the relay segment for movement in the direction of arrows 309) relative to exiting track section 330 to enable an incoming vehicle to enter the relay segment from a plurality of angles and/or an exiting vehicle to exit the relay segment at a plurality of angles. It being understood that the exiting track section of each relay segment can be coupled to a movable incoming track section of another relay segment via connector track sections releasably secured to each track section via a releasable engagement mechanisms such as a tongue and groove arrangement. Accordingly, and through the use of movable incoming track segment's multiple angles and orientations are capable of being provided by the vehicle tracks set wherein multiple relay segments of installed therein.

[0042] FIG. 4 shows an example indirect acting relay segment 400 having a gravity actuated intermediate falling stunt path. Specifically, FIG. 4 shows an incoming track section 410 coupled to a conical trigger 412, which can also be actuated via the manual button 414. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 410 causes the trigger to move vertically, and push a vehicle positioned at the end section 418 to begin the falling stunt. As the vehicle is moves down ramp 440, it falls through the void 442 and may intermittently contact other track sections (e.g., 444, 446, 448) before landing on track 450. If the vehicle successfully lands on track 450, gravity

moves the vehicle to be launched and it exits the relay segment through exiting track section 430.

[0043] FIG. 5 shows an example indirect acting relay segment 500 having a gravity actuated zig-zag ramp stunt. Specifically, FIG. 5 shows an incoming track section 510 coupled to a conical trigger 512. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 510 causes the trigger to move vertically, and push a vehicle positioned at the end section 518 to initiate movement down ramp 540, such as via rotation by platform 542. As the vehicle is moves down ramp 540, if successful, it is launched and exits the relay segment through exiting track section 530.

[0044] FIG. 6 shows an example relay segment 600 which may be selectively positioned along the track. As an example, the relay segment may include a track receiver 602 such that the track 604 lays into a groove 603 of the relay segment 600 in contrast to sliding male/female connector. A trigger or actuator 605 may be included to effect a stunt. For example, in the illustrated embodiment, activation of the lever (via contact with a traveling toy vehicle on the track) may cause the top of the silo to launched upward to simulate an explosion.

[0045] FIG. 7 shows an example indirect acting relay segment 700 having a gravity actuated hammer launch stunt. Specifically, FIG. 7 shows an incoming track section 710 coupled to a conical trigger 712, which can also be actuated via the manual button 714. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 710 causes the trigger to move vertically, and initiate rotation of hammer box 716 about axis 718. A vehicle may be pre-loaded and positioned within hammer box 716 (which is open at end 740, not shown) such that upon swinging downward and stopping in the horizontal position, momentum is imparted to a vehicle that is launched out and/or down exiting track section 730, which may serve as a stop to stop rotation of hammer box 716.

[0046] While not shown in this example, the exiting track section 730 may be coupled to further track sections that may lead to additional relays segments, for example. Also, incoming track section 710 may be adjustable (e.g., rotatable)

relative to exiting track section 730 to enable an incoming vehicle to enter the relay segment from a plurality of angles and/or an exiting vehicle to exit the relay segment at a plurality of angles.

[0047] FIG. 8 shows two relay segments 800, including a basketball hoop stunt 802 and a ramp stunt/launcher stunt 804. The relay segments may be positioned in any order on the track. Specifically, basketball hoop stunt 802 includes a spring-loaded platform 810 on which a vehicle may pre-loaded. Upon actuation of the manual button 814, spring-loaded platform 810 rotates about axis 816 and if a vehicle passes through hoop 818, it may actuate a secondary trigger 840.

[0048] Another basketball hoop stunt 800a is shown in FIG. 8a. The relay segment may be configured such that an incoming vehicle is flipped up (e.g., via a spring loaded plate) toward a hoop, and if the vehicle lands in the hoop, a second actuator is triggered to launch a second vehicle in the same or alternative direction as the travel of the first, incoming vehicle.

[0049] Similarly, ramp stunt/launcher stunt 804, may be triggered such that, a vehicle, pre-loaded at the top 842 of ramp 850, and held by catch 844, is released (by movement of catch 844) to launch the vehicle out and/or down exiting track section 830, which may actuate or terminate another device, such as rotation of hammer box 716.

[0050] FIG. 9 shows an example indirect acting relay segment 900 having a gravity actuated rotating ramp launch stunt. Specifically, FIG. 9 shows an incoming track section 910 coupled to a conical trigger 912, which can also be actuated via the manual button 914. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 910 causes the trigger to move vertically, and initiate rotation of rotating ramp 916 about axis 918. A vehicle may be pre-loaded and positioned within rotating ramp 916 at end 940 such that upon swinging downward and stopping in the downward position, a vehicle is launched down exiting track section 930. In this example, exiting track section 930 is sloped to further increase exiting speed of an exiting vehicle.

[0051] While not shown in this example, the exiting track section 930 may be coupled to further track sections that may lead to additional relays segments,

for example. Likewise, in this or other examples the incoming track section may be coupled to other relays/stunts via still further track sections. Also, incoming track section 910 may be adjustable (e.g., rotatable) relative to exiting track section 930 to enable an incoming vehicle to enter the relay segment from a plurality of angles and/or an exiting vehicle to exit the relay segment at a plurality of angles.

[0052] FIG. 10 shows an example indirect acting relay segment 1000 having a loop and launch stunt. Specifically, FIG. 10 shows an incoming track section 1010 coupled to a conical trigger 1012, which can also be actuated via the manual button 1014. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 1010 causes the trigger to move vertically and release a catch holding spring loaded launching arm 1016 (note that in FIG. 10, spring loaded launching arm 116 is shown in the fully released state, whereas it is positioned vertically/downward in its pre-loaded state) so that it can rotate about axis 1018 and launch a vehicle pre-loaded at position, generally indicated at 1040. Upon launch, the pre-loaded vehicle travels through the loop track stunt 1042 and is launched out exiting track section 1030. Arrow 1044 indicates the direction of vehicle motion through the loop track stunt 1042. FIG. 10a shows the conical trigger 1012 in a first position while FIG. 10b. shows the conical trigger in a second position as it is moved up by the toy vehicle and in accordance with an exemplary embodiment of the present invention the trigger releases a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.

[0053] FIG. 11 shows still another track set example, in which motion of a single vehicle may initiate a plurality of vehicles through a plurality of relay segments positioned in parallel configuration. Specifically, as shown in FIG. 11, track set 1100 is shown having a first relay segment 1102 including a dual-action vehicle stunt. Specifically, first relay segment 1102 includes incoming track section 1110 coupled to a conical trigger 1112, which can also be actuated via the manual button 1114. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 1110 causes it to move vertically and release a catch holding first and second preloaded vehicles 1120 and 1122, substantially concurrently. Alternatively, the vehicles may be released

sequentially. For example, the release of one vehicle may be delayed relative to release of another vehicle.

[0054] Continuing with FIG. 11, relay segment 1102 includes a first and second ramp 1101, 1103 leading in different (e.g., opposite) directions, such that vehicles 1120 and 1122 may be launched by gravity to first and second exiting track sections, respectively. Further, track set 1100 may include two direct acting relays, such as relay 300, and finishing flag sections 1134 and 1136. As shown in FIG. 11, relays 300 may be positioned coupled to exiting track sections 1130 and 1132 and finishing flag sections 1134 and 1136 via various track segments. Further, as noted herein, vehicles may be preloaded into the two relays 300 (e.g., 1140 and 1142), which can be launched via actuation of vehicles 1130 and 1132, respectively. In this way, a sequential/parallel race configuration can be formed.

[0055] FIG. 12 further illustrates a relay segment configured as a twin tower stunt element 1200. As an example, in the twin tower stunt element, a single input triggering event may cause simultaneously release of two vehicles moving in opposite directions propelled by gravity. It should be appreciated that a manual trigger may be included in each of the relay segments, including the twin tower stunt element, so that the relay segments may be the first stunt in the series. Moreover, in some large relay segments, there may be two or more manual triggers, such as on the front and back side of the element. For example, in the twin tower stunt element as illustrated there is a front manual activation switch. In some embodiments, there may be a similar activation switch on the back of the stunt element.

[0056] FIG. 12 illustrates yet another customizable track set. As with the previous embodiments, the track set may include a plurality of interchangeable relay segments which may be coupled to create a customized expandable track set, wherein the relay segments may include one or more stunt elements and may be selectively positioned at the beginning, middle, or end of the track. In some embodiments, the relay segments may be configured to enable a first toy vehicle to trigger a second toy vehicle to traverse an obstacle or perform a stunt. Further in some embodiments, a relay segment exit vehicle may be released to travel a subsequent relay segment.

[0057] It should be appreciated that the track sets described herein may be used for toy vehicles. As an example, the toy vehicles may be 1:64 scale models, however other sized toy vehicles may be also used. One exemplary range would be 1:50 scale or less, again it is, of course, understood that scales greater or less than 1:50 are contemplated to be within the scope of exemplary embodiments of the present invention.

[0058] A toy vehicle track set 100a having multiple relay segments 110a, 112a, 114a, 116a, 118a and 120a is shown in FIG. 12. As discussed in more detail below, each relay segment may be selectively positioned in the beginning, middle or end of the track. A user may customize the track by positioning the relay sections in desired portions of the track. In one embodiment, a plurality of relay segments may be sequentially coupled together with a plurality of track segments to generate a series of relay events. The series of events, which may include various stunt elements, can be rearranged in a plurality of sequences and/or parallel paths to provide numerous play patterns. In this way, a user can experience diverse track play and excitement time and time again.

[0059] In this example, each relay segment 110a, 112a, and 114a may include an incoming vehicle trigger which may directly or indirectly causes the launching of another outgoing vehicle, also referred to herein as a relay segment exit vehicle. As an example, each relay segment may include an incoming track, such as incoming track 122a, for an incoming vehicle, and an exit track, such as exit track 124a, for an outgoing vehicle. The exit track of one relay segment may be interchangeably coupled with the incoming track of a second relay segment such that the outgoing vehicle from one relay segment may become the incoming vehicle of a next relay segment.

[0060] One or more launchers may be provided to accelerate toy vehicles along the track. As such, the launchers may be configured to engage and urge a toy vehicle to travel along the track. It should be appreciated that although launchers are described herein, vehicles may be manually propelled along the track without the use of a launcher without departing from the scope of the disclosure.

[0061] Although any suitable launcher may be used, in the illustrated embodiments, various automatically and manually-triggered release launcher elements are illustrated. A vehicle may be positioned in launch position such that a launch element may slidably engage the vehicle to propel the vehicle along the track. The launch element may be biased to a launch position, such as by springs or any other suitable biasing mechanism such that release of an activator releases its stored potential energy.

[0062] In one example, the relay segments may include incoming vehicle triggers. The triggers may be configured to enable an incoming vehicle to actuate a stunt and release of an outgoing vehicle from the relay segment. The triggers may be positioned such that a vehicle traveling along the track actuates the trigger.

[0063] As one example, the vehicle triggers may be conical-shaped triggers (shown in FIG. 12 at 126a) or other shaped triggers. As an example, conical-shaped trigger 126a may have a cone angle of approximately 45 degrees, which may be actuated vertically via contact with a horizontally moving incoming vehicle. It should be appreciated that the cone angle may be of any suitable angle such that an incoming vehicle actuates the trigger. Thus, as a non-limiting example the cone angle may be anywhere from 5-90 degrees.

[0064] Further, while this example shows a conical trigger, alternatively, it may be planar shaped and angled (e.g., approximately 45 degrees) relative to an incoming track. As a further example, an example trigger may have a flat, angled plane formed by a plurality of ridges) that is configured to be contacted by a vehicle on a track. Again, although in one example the trigger may have an angle of approximately 45 degrees, any suitable angle may be applied (e.g. 5-90 degrees) such that a vehicle actuates the trigger. Further, the trigger may be engaged under or along the side of the track, such that the vehicle actuates the trigger by traveling over or through a portion of the track.

[0065] In some relay segments, actuation of a trigger by a first vehicle initiates a stunt and release of a second outgoing vehicle on the track set. In some embodiments, manual triggers may also be included, alone or in combination, with the vehicle triggers. Manual triggers may be configured to be actuated such that a

stunt is initiated and/or an outgoing vehicle is released from the relay segment. The outgoing vehicle may travel to a second relay segment.

[0066] It should be appreciated that the track play of each relay segment may be activated directly or indirectly by actuation of a trigger. As an example of indirect activation, the relay segment may include a stunt element performed by either a first or second vehicle. Further, the stunt element may be performed by a third vehicle. Further still, the stunt element may include multiple simultaneous, parallel, and/or sequential stunts performed by a plurality of vehicles, where the stunts may be performed simultaneously, in sequence with one triggering the next, in parallel, or combinations thereof. In still another embodiment, the launching element and/or the trigger may also include stunt elements performed by one of the first and second, or other vehicles. Although described in regards to actuation of the stunt elements via vehicle triggering, alternatively, track play may commence via manual activation of any of the relay segments or stunt elements.

[0067] As an example and referring again to FIG. 12, in the configuration illustrated, track play may be commenced with stunt element or relay segment 110a. For example, actuation of manual release or manual trigger 102a may propel or launch a toy vehicle (not shown) along exit track 124a toward a second relay segment 112a. In one example embodiment, a relay segment may enable a variable change of vehicle traveling direction (between an incoming and outgoing vehicle), thus further providing variable configurations for more diverse track play.

[0068] It is noted that track connector sections, as shown for example at 130a, may be interposed between relay elements extending the distance between a first and second relay element. Thus, in addition to selective positioning of each relay segment, track connector sections may be selectively positioned to enable customization of the track since each of the incoming track sections they are releasably secured thereto are rotatably mounted to the relay segment.

[0069] One or more portions of the track set, such as the incoming track and exit track of the relay segments and/or the track connector segment may include direction indicators, shown at 132, such as molded-in arrows, or cut-outs which may indicate vehicle direction and/or assembly instructions for a toy track set.

For example, the direction indicators may aid in the ease of assembly for an expandable track set, may provide specific direction of vehicle travel used to initiate stunts, or enable passage past obstacles. Although the direction indicators are shown as a row of cut-out arrows, it should be appreciated that the direction indicators may be of any size and/or shape to indicate assembly direction and/or vehicle travel direction. Further, although a plurality of arrows is illustrated, a single arrow or other cut-out may also be used without departing from the scope of the disclosure. Further, in some embodiments, the direction indicators may be positioned in a center of the track so that the wheels of the vehicles are not impeded. It further should be appreciated that although shown as cut-outs, the direction indicators may be surface indicators, raised moldings, etc. In an exemplary embodiment, the arrows are integrally molded with the track and/or relay segment.

[0070] For example, a vehicle released from relay segment 110a and traveling along track 130a in the direction of the direction indicators may contact or engage a second relay segment, e.g. relay segment 112a. As described in more detail below, each relay segment may actuate a stunt. Stunts may include one or more, as well as any combination of, loops, jumps, collisions, simulated explosions, vehicle crashes, vehicle drops, vehicle lifts, vehicle obstacles, vehicle spins and other vehicle obstacles. In some embodiments, stunt vehicles may be preloaded for release upon actuation of the relay segment trigger (e.g. actuation by an incoming vehicle of the vehicle trigger or manual actuation of a trigger).

[0071] For example, relay segment 110a may be a stunt element, such as a falling and pivoting ramp element 138a. Upon contact or actuation of trigger 140a, a falling and pivoting ramp stunt event may be initiated. A stunt vehicle (not shown) may be pre-positioned on platform 142a. In the falling and pivoting ramp stunt event, platform 142a may be rotatably coupled to arm 144a which may be pivotally coupled through pivot 146a to the relay segment. Upon actuation by an incoming vehicle, the arm 144a may swing from a first generally vertically-extended position (shown) to a second generally horizontally-extended position. Further, platform 142a may rotate such that the platform rotates to generally correspond to enable release of the stunt car down exit track 148a. As such, the pre-positioned

vehicle may be released down exit track 148a toward the next relay segment, such as relay segment 114a.

[0072] Addition details illustrating an example falling and pivoting ramp element 112a are shown in FIG. 2. As shown, an incoming track 150a may enable an incoming vehicle to contact or actuate trigger 140a. Although shown as a conically-shaped trigger, it should be appreciated that the trigger may be any suitable, manual and/or vehicle, actuated switch. The incoming vehicle may be stopped at trigger 140a.

[0073] Actuation of trigger 140a may release arm 144a from a first position. The first position, as illustrated, is a substantially vertical position, where platform 142a is in a substantially parallel plane to the ground surface. Upon release of arm 144a from the first position, arm 144a pivots or swings about pivot point or hinge 146a such that the arm falls as indicated by arrow 152a. Further, in some embodiments, platform 142a may be rotatably coupled to arm 144a such that it may rotate as indicated at arrow 154a.

[0074] Release of arm 144a and rotation of platform 142a, results in the arm and platform moving to a vehicle release position indicated in dashed lines in FIG. 13. As shown at 156a, the arm may be substantially parallel to the ground surface such that platform 142a is substantially aligned with exit track 148a. Further, at 158a, the platform has rotated such that a front portion 160a, with an opening for vehicle release, is aligned with the exit platform 148a.

[0075] In one embodiment, the platform 142a includes a front portion 160a and a rear portion 162a. Rear portion may include a stop wall 164a to prevent a preloaded vehicle from prematurely releasing from the platform. Additional vehicle engagement features, such as detents may further retain the preloaded vehicle in the platform during the stunt. As discussed above, upon rotation of the platform, front portion 160a aligns with exit track 148a. The angle of the platform in the release position enables the vehicle to break away from the engagement features and travel down exit track 148a toward a subsequent relay segment.

[0076] In some embodiments, lock features may be provided to lock the arm in the first and second positions. Release structures may be further provided

to enable a user to release the arm from the first and second positions. Further, although not shown in detail in regards to the falling and pivoting ramp element, the relay segments may be configured to fold into compact configurations to reduce packaging size and for ease of storage. Additional examples regarding relay segment folding are disclosed in more detail below.

[0077] Referring back to FIG. 12, following activation of relay segment 112a, and release of a preloaded vehicle from platform 142a onto exit track 148a, the preloaded vehicle is now an incoming vehicle for the next relay segment, such as relay segment 114a. Thus, although described in this example where activation of relay segment 112a results in subsequent release of a vehicle to activate relay segment 114a, other configurations are possible and contemplated. Thus, it should be appreciated that each relay segment may be selectively positioned in the track chain. As an example, relay segment 110a may be at the beginning, middle or end of the track. Similarly, relay segments 112a, 114a, 116a, 118a, 120a may be positioned at the beginning, middle or end of the track. A user may be able to customize the track by positioning the relay segments in a desired order or combination.

[0078] Relay segment 114a is an example of a direct acting relay segment. An incoming vehicle may actuate a trigger 200a which may effect release of a preloaded vehicle from launcher 202a. The preloaded vehicle may exit relay segment 114a toward relay segment 116a along exit track 204a.

[0079] Direct acting relay segment 114a is similar to the relay segment illustrated in FIG. 3 wherein a launching stunt element 300, including an incoming track 310 pivotally mounted thereto proximate to conical trigger 312, which can also be actuated via the manual button 314. In this example, the trigger is pivotally mounted to the launching stunt element via pins 311 for movement between a first position and a second position in the direction illustrated by arrows 313, wherein movement of trigger from the first position (illustrated) to the second position (not-illustrated) when a vehicle moves into an area 315 between conical trigger 312 and incoming track segment 310.

[0080] Movement of the conical trigger 312 again causes release of stored potential energy to move a launching member in a manner similar to that described with respect to FIGS. 3-3c, wherein contact by an incoming vehicle on track 310 causes the trigger to move vertically, release a catch that then releases spring loaded launcher protrusion 320 in launcher 322. For example, a vehicle may be pre-loaded in launcher 322 until activation. Then, the vehicle may then exit the relay segment through exiting track section 330.

[0081] It should be noted that exiting track sections of each of the relay segments, such as exiting track section 330, may be coupled to further track sections that may lead to additional relays segments. The relay segments may be interchanged such that the track is customized. Also, incoming track sections of the relay segments, such as incoming track section 310, may be adjustable (e.g., rotatable) relative to exiting track section 330 to enable an incoming vehicle to enter the relay segment from a plurality of angles and/or an exiting vehicle to exit the relay segment at a plurality of angles.

[0082] Referring back to FIG. 12, an outgoing vehicle from relay segment 114a is an incoming vehicle for relay segment 116a. Incoming vehicle travels along incoming track 163a to actuate trigger 164a of relay segment 116a. Relay segment 116a may be a stunt element, such as an exchanger stunt element or exchanger. The incoming vehicle initiates the stunt, following which a pre-loaded stunt vehicle performs the stunt and exits stunt at 166a toward the subsequent stunt 118a.

[0083] Specifically and as illustrated in FIG. 14 stunt element 161 is configured to provide a multiple loop stunt for a preloaded vehicle. As shown, incoming track 163a is pivotally mounted to the stunt element proximate to a conical trigger 164a. It should be appreciated that although shown as a conical trigger, the trigger may be any suitable shape such that a vehicle traveling on track 163a can activate the stunt. Further, in some embodiments, a manual trigger may also be provided. In this example, the trigger is spring loaded in a downward position, such that contact by an incoming vehicle on track 163a causes the trigger 164a to move vertically and release a catch that then releases a preloaded vehicle down ramp 168a into the exchanger loops 170a.

[0084] As illustrated, a preloaded vehicle may be positioned at the top of ramp 168a and held in launch position by stop 172a. Upon actuation of trigger 163a, stop 172a is released and the preloaded stunt vehicle launches down the ramp to direction changer 174a and then through booster 176a. Booster 176a may be any device to impart addition acceleration onto the toy vehicle. For example, booster 176a may be motorized wheels which further launch the vehicle into loops 170a. A switch 175a may be used to turn on the booster motor.

[0085] A directional key 178a directs the vehicle into alternative loops. For example, in the illustration, the direction key 178a has a path-defining section 180a which provides a rail edge defining the vehicle pathway and a contact switch 182a which upon contact with the vehicle as it travels along the defined pathway is flipped such that the key first defines a first pathway 184a, and upon contact with the vehicle defines a second pathway 186a. Each time the vehicle goes around the loop, the direction key is switched such that the vehicle alternatively travels the first pathway and then the second pathway.

[0086] In some embodiments, a timer may be used to time the vehicle's travel in loops 170a. For example, the vehicle may continue to travel in the loops for a predetermined period, such as a period of 5 seconds or any other preset time period. Following the predetermined period, the vehicle may be ejected from the loops. In other embodiments, the vehicle may perform a predetermined number of loops prior to ejection from the loops.

[0087] Ejection of the vehicle from loops 170a may occur after a predetermined event, a predetermined time, or in some embodiments, upon a user's activation. The vehicle may be ejected from exchanger stunt element 161a. For example, in some embodiments, completion of the predetermined event or time may actuate the directional indicator platform such that it raises up defining a vehicle ejection path.

[0088] As shown in FIG 15, a cavity 190a is provided under the directional indicator 178a. In some embodiments, following completion of the loop portion of the stunt, the directional indicator may move to allow the vehicle to follow a vehicle ejection path to exit track 166a. In other embodiments, completion of the

loop portion of the stunt may trigger a preloaded stunt vehicle positioned in cavity 190a to be launched out along exit track 166a.

[0089] In such embodiments, the vehicle traveling the loops may be ejected from the loops such that the vehicle falls from the exchanger stunt element. For example, the directional indicator may block the traveling path and causes the vehicle to impinge against the tip of the directional indicator and be forced from the track. In some embodiments, additional switches or changes in the boosters may be provided to break the vehicle's travel path resulting in the vehicle being discharged from the loops.

[0090] Returning back to FIG 12, the outgoing vehicle released from relay segment 116a along exit track 166a may travel to relay segment 118a. This outgoing vehicle of relay segment 116a is incoming vehicle for relay segment 118a. Relay segment 118a may be a stunt element, such as a tower stunt element. The incoming vehicle initiates the stunt, following which a pre-loaded stunt vehicle exits stunt element at 340a toward a subsequent relay segment.

[0091] FIG. 16 illustrates an example tower stunt element 300a in more detail. As illustrated, tower stunt element 300a is configured to provide a multiple vehicle stunt. As shown, incoming track 302a is coupled to a conical trigger 304a, which can also be actuated via one or more manual buttons or actuators. Actuation of trigger 304a results in initiation of a tower stunt, including release of a plurality of preloaded vehicles from the tower. For example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 302a causes the trigger to move vertically and release a catch that then initiates a first part of the multiple stage vehicle stunt.

[0092] As an example, a first stunt vehicle may preloaded into launch cavity 306a, wherein cavity 306a includes a launching structure such as a spring-loaded launch slider 307a which upon activation, such as through trigger 304a, slides forward. Motion is imparted to the preloaded stunt vehicle such that the stunt vehicle launches towards a target, such as bulls eye 308a. Although shown as a bulls eye, any design configuration is possible for the target.

[0093] Additionally, additional stunt vehicles may be preloaded into the release boxes 314a and 316a on side towers 310a and 312a respectively. Impact on the target, such as bulls eye 308a, may actuate a second stunt stage. In the second stunt stage, side towers 310a, 312a may be released such that the towers 310a, 312a fall outwards about hinges 318a and 320a as indicated by arrow 322a and 324a respectively. The release boxes are rotatively coupled to the towers such that upon actuation of the second stunt stage the release boxes rotate from a storage position to a release position. The storage position may be any suitable position where a vehicle does not fall from the release boxes. Thus, in some embodiments, the storage position may be such that the release boxes are parallel to the ground surface. In other embodiments, the release boxes may be angled such that the vehicles are retained in the storage boxes.

[0094] Actuation of the second stunt stage effect the release boxes 314a, 316a to rotate about pivot points 326a, 328a as indicated by arrows 330a, 332a. In the release position, the release boxes are angled such that the preloaded stunt vehicles fall from the boxes. Further, towers 310a and 312a fall outward such that preloaded vehicles and the towers crash into the ground surface.

[0095] A third stunt stage may be activated upon completion of the second stunt stage. For example, rotation of the towers from the base may actuate a switch to initiate a third stunt stage. In the third stunt stage, a release box 334a may be preloaded with another stunt vehicle. The release box may be in a first position facing the incoming track 302a and trigger 304a. The release box may be rotatively coupled to the top of the tower for rotation about pivot point 336a. Upon actuation of the third stunt stage, the release box may rotate from the first position to a release position where the preloaded vehicle is released down exit track 340a. As such, in the release position, the release box rotates 180 degrees such that it faces exit track 340a. It is noted that a structural detent mechanism may be used to hold the vehicle in the first position. This detent mechanism may include structure such as the top surface of the tower which when in the first position prevents the vehicle from releasing. In other embodiments, a moveable gate or structure may be provided which prevents movement of the vehicle when in the first position but allows the preloaded vehicle to release when in the release position.

[0096] As such the tower stunt element may be considered a multi-stage stunt element. In this multi-stage stunt element, completion of each stage actuates a further stage. Specifically, in the illustrated embodiment, actuation of the multi-stage stunt element results in actuation of a first stage where a first preloaded vehicle impacts a target; completion of the target impact actuates a second stage where two preloaded vehicles are released and two towers fall outward toward a ground surface; completion of the tower fall actuates a third stage where a fourth preloaded vehicle is launched down exit track 340a. This vehicle is the outgoing vehicle of the tower stunt element and becomes the incoming vehicle for the subsequent stunt.

[0097] Again referring back to FIG. 12, the vehicle released from relay segment 118a traveling along exit track 340a may further engage a relay segment element 120a. In one embodiment, relay segment element 120a is a single vehicle stunt element where the incoming vehicle is the outgoing vehicle. As an example, relay segment element 120a may be an explosion stunt element 350a. As such, the vehicle may actuate a trigger, such as an overhead vehicle trigger 352a while being retained on the track. The trigger may initiate a simulated explosion such as explosion of the top of the silo as shown in FIG. 12. Following actuation of the trigger 352a, the vehicle may continue along and exit relay segment 118a. Additional stunt elements may be added to the end of the track or the track may be terminated.

[0098] An example explosion stunt element 350a is shown in more detail in FIG. 17. It is noted that the explosion stunt element is an overlap element, in contrast to a linking element. Linking elements interconnect by linking one track segment into another track segment. The track segments removably lock together to form a continuous track. Typically, the linking elements including sliding male/female connectors. In contrast, as an overlap element, element 350a includes a track bed 354a which is configured to be positioned such that the track travels through the track bed. As an example and as shown in FIG. 17, the track bed may include a track receiver 356a such that a section of the track, such as a track connector section, may be slid into the receiver 356a and retained by retainer 358a.

[0099] A vehicle traveling along the track may actuate trigger or lever 352a to effect a stunt. Although shown as an overhead trigger, the trigger may be in

any suitable position which does not substantially impede the travel of the vehicle. In other embodiments, the trigger, and/or additional structure following actuation of the trigger, may stop the travel of the vehicle. In the illustrated embodiment, activation of the lever (via contact with a traveling toy vehicle on the track) may cause the top of the silo 360a to launch upward to simulate an explosion. Although in the illustrated embodiment the silo explodes in a single piece, in alternative embodiments, multiple portions of the explosion element may separate. Stunt element further comprises a manual trigger element 362a, manual element 362a is coupled to 352a such that movement of manual element 362a causes a catch to release a spring to launch a top portion 361a away from the stunt element 350 to simulate an explosion.

[00100] While FIG. 12 shows various example relay segments with multiple stage stunts, as well as without stunts, numerous variations in relay elements are possible. Further, although shown in regards to a single track, it should be understood that virtually any number of different track designs may be used without departing from the scope of this disclosure. For example, parallel track configurations may be used, as well as combination sequential/parallel track configurations may be used. Further, various stunts may be performed, rather than the drops and/or loops shown, such as jumping over voids, traversing obstacles, etc.

[00101] FIG. 18 provides another example track set 1000a. Track set 1000a includes a plurality of relay segments, 1100a, 1200a and 1300a. Further, example track set 1000a illustrates track accessory 1050a. As discussed regards to FIG. 12, each relay segment may be selectively positioned in the beginning, middle or end of the track. A user may customize the track by positioning the relay sections in desired portions of the track. In one embodiment, a plurality of relay segments may be sequentially coupled together with a plurality of track segments to generate a series of relay events. The series of events, which may include various stunt elements, can be rearranged in a plurality of sequences and/or parallel paths to provide numerous play patterns. Similarly, track accessories may be selectively positioned anywhere along the track.

[00102] As an example track accessory, flip accessory 1050a enables the user to selectively raise the track 1002a to improve vehicle travel along the track. Such an accessory enables adjustment of the track such that the speed of the

vehicle may be increased. Other accessories may be used to increase or decrease speed, adjust the angle or the track, or otherwise alter the vehicle pathway. As such, the flip accessory may be coupled to one or more track segments that may be mounted to a higher altitude position, such that gravity may “launch” the incoming vehicle.

[00103] Track 1002 may be attached to a pivot plate 1064. In some embodiments, track 1002, such as a track connection section, may be snapped onto pivot plate 1064. In other embodiments, the track may be slid onto pivot plate 1064 or otherwise coupled to plate 1064. Further, although described as a pivot plate in this example, it should be appreciated that the pivot plate may be any suitable structure to enable support and coupling of the track. Use of the flip accessory may enable the track to be positioned such that a steep angle is created for vehicle travel. Vehicles released from the top of the track will increase speed such that the vehicles have sufficient speed to actuate the various triggers of the relay segments. Further, increased vehicle speed enhances play value of the track set.

[00104] A vehicle released on track 1002a may travel to relay segment 1100a. Relay segment 1100a may be a stunt element, such as a spiral crash stunt element. Incoming track 1102a may enable the incoming vehicle to actuate a trigger initiating a spiral crash stunt event. Completion of the stunt may result in two vehicles being released from two exit tracks 1104a, 1106a. Two vehicles are now traveling on the track set. Alternative pathways may be defined for such vehicles or parallel pathways. As described in more detail below, in the illustrated embodiment, the example track set has been configured such that a first vehicle travels to relay segment 1200a and 1300a and the second vehicle travels to relay segment 1202a and 1302a.

[00105] FIG. 19 illustrates an example spiral crash stunt element 1110a. As illustrated, spiral crash stunt element is configured to provide a spiral crash drop for two preloaded vehicles. As shown, incoming track 1102a is coupled to a vehicle trigger, such as a conical trigger 1103a. It should be appreciated that other trigger configurations are possible, including other vehicle trigger configurations, as well as manual trigger configurations, such as a manual trigger 1105a. In this example, the vehicle trigger 1103a may be spring loaded in a downward position, such that contact by an incoming vehicle on track 1102a causes the trigger to move

vertically and through a rod linkage release traveler 1108a from a start position such that the traveler spirals down rod 1112a releasing preloaded vehicles onto exit tracks 1104a and 1106a.

[00106] Two preloaded vehicles may be positioned on carriers 1114a and 1116a. The carriers extend outward and are part of traveler 1108a. Upon actuation of trigger 1103a, traveler 1108a may be released from the start position such that the traveler rotates downwards as indicated by arrow 1117a about rod 1112a. Gravity pulls the traveler downwards with the rod including spiral coil structures which force the traveler to spin as it heads down the rod. A stop plate 1118a stops the traveler in a release position where both carrier 1114a and 1116a are aligned with exit tracks 1104a and 1106a, respectively. Preloaded vehicle may be released onto the exit tracks as outgoing vehicles from spiral crash stunt element 1110a.

[00107] It should be noted that each of the relay segments may be configured to fold to enable storage and/or reduce packing size. As such, many of the pieces of each relay segment are articulated to enable the pieces to fold and the structure to collapse inward. Further, in some embodiments, the relay segments are configured such that at least a top and bottom surface are substantially planar. The substantial planarity enables the relay segment to be more easily packaged or stacked for storage. The folding enables easy storage without the difficulties and frustrations that arise when such structures need to be disassembled for storage or packing.

[00108] As discussed above, spiral crash stunt element 1110a is configured as relay segment 1100a in FIG. 18. After actuation of relay segment 1100a, two preloaded vehicles are released on exit tracks 1104a and 1106a respectively. Additional relay segments may be interposed to improve game play. For example, in the illustrated embodiment, a direct acting relay segment, such as a launch stunt element as shown and discussed in regards to FIG. 3 is shown in the example track set. However, it should be appreciated that any other stunt element may be selectively connected to one or both of exit tracks 1104a and 1106a.

[00109] Referring back now to FIG. 18, outgoing vehicles from relay segments 1200a, 1202a may be incoming vehicles for relay segments 1300a,

1302a respectively. As an example, relay segments 1300a, 1302a may be any stunt element. As illustrated, both relay segment 1300a, 1302a are flip stunt elements.

[00110] FIG. 20 illustrates an exemplary flip stunt element 1310a. As illustrated, flip stunt element 1310a is configured to flip a preloaded stunt vehicle. As shown, incoming track 1304a enables a vehicle 1312a to contact a trigger 1308a and then exit on exit track 1306a. Flip stunt element 1310a may be a stunt element where the incoming vehicle is the outgoing vehicle. As such, the vehicle may actuate a trigger, such as an overhead vehicle trigger 1308a, while being retained on the track. The trigger may actuate the flipping of a preloaded vehicle 1314a from a carriage 1316a. Following actuation of the trigger 1308a, the vehicle may continue along and exit relay segment 1310a along exit track 1306a.

[00111] Similar to the explosion stunt element described above, flip stunt element is an overlap element. As such, flip stunt element 1310a includes a track bed 1316a which is configured to receive a section of the track, such as a track connector section. The track may be slid into the track bed.

[00112] Carriage 1316a is configured to hold the preloaded vehicle prior to actuation of the flip stunt element. The vehicle may be supported by extensions and is configured to rotatively connected to the carriage such that activation of trigger 1308a causes rotation of the carriage such that the toy vehicle held therein is flipped or thrown from the track area.

[00113] Referring now to FIG. 21 another exemplary track set 2000 is illustrated. Track set 2000 includes relay segments 2100 and 2200. As discussed with regard to FIGS. 12 and 18, each relay segment may be selectively positioned in the beginning, middle or end of the track. A user may customize the track by positioning the relay sections in desired portions of the track. In one embodiment, a plurality of relay segments may be sequentially coupled together with a plurality of track segments to generate a series of relay events. The series of events, which may include various stunt elements, can be rearranged in a plurality of sequences and/or parallel paths to provide numerous play patterns.

[00114] In the illustrated track set 2000 an incoming vehicle travels along incoming track 2102 to actuate trigger 2104 of relay segment 2100.

Relay segment 2100 may be a stunt element, such as a gravity-actuated zig-zag ramp stunt element. Thus, the incoming vehicle initiates the stunt, following which the pre-loaded stunt vehicle exits stunt 2100 at 2106 toward the subsequent stunt 2200.

[00115] Specifically, FIG. 21 illustrates an example gravity-actuated zig-zag ramp stunt element 2110. As illustrated, zig-zag ramp stunt element 2110 is configured to provide a zig-zag track path 2108 for a preloaded stunt vehicle. As shown, incoming track 2102 is coupled to a conical trigger 2104. It should be appreciated that other trigger configurations are possible, including other vehicle trigger configurations, as well as manual trigger configurations. In this example, the trigger may be spring loaded in a downward position, such that contact by an incoming vehicle on track 2102 causes the trigger to move vertically and release a vehicle stop 2111 (such as through rod linkage 2113) such that a preloaded stunt vehicle stored at 2112 is released down zig-zag track path 2108.

[00116] The zig-zag ramp stunt element 2110 includes a support brace 2114 which maintains the start of the zig-zag track path in a relatively high vertical position. Gravity enables the car to move down the path. Although not required, in some embodiments, a spring-loaded launcher may be provided to further accelerate the vehicle along the zig-zag track path.

[00117] In some embodiments, various structures or designs may be used to indicate to a user the position for placing a pre-loaded vehicle. For example, different textures, paint or designs may be used to indicate that a vehicle should be loaded for activation in the stunt element.

[00118] In some embodiments, the zig-zag track may include angled sections which slow a vehicle down as it travels down the path. Rails 2116 may prevent the vehicle from careening off of the track. Further, cut-outs 2118 may be provided in the track to further disrupt the vehicles motion adding excitement to the stunt element. In some embodiments, the cut-outs and track shaped may provide enhanced excitement by slowing the vehicle down such that additional anticipation is created.

[00119] It should be appreciated that other stunt elements may include speed control elements. These speed control elements include speed retarders

and speed accelerators. Speed retarders, such as built-in delayed releases, controlled drops, speed, etc., may enhance play value by increasing the anticipation of an event. Further, speed accelerators, including ramp inclines, may, for example, increase play value by keeping vehicles moving through the track set.

[00120] In accordance with an exemplary embodiment of the present invention and referring to FIG. 21, the outgoing vehicle from relay segment 2100 travels to relay segment 2200. The outgoing vehicle is now the incoming vehicle for relay segment 2200 and travels along incoming track 2202 to actuate trigger 2204 of relay segment 2200. Relay segment 2200 may be a stunt element, such as a shock drop stunt element. Thus, the incoming vehicle initiates the stunt, such that pre-loaded stunt vehicle exits stunt 2200 at 2206 toward a subsequent relay element (not shown) or end.

[00121] FIG. 22 illustrates rotating ramp launch stunt 2230 as an example of an indirect acting relay segment having a gravity actuated rotating ramp launch stunt. Specifically, an incoming track 2232 is moveable mounted to the relay segment proximate to a conical trigger 2234, which can also be actuated via the manual button 2236. In this example, the trigger when in the downward position locks an actuatable spring loaded member in an unreleased or loaded position, such that contact by an incoming vehicle on track 2232 causes the trigger to move vertically, and initiate rotation of rotating ramp 2238 about axis 2240. A vehicle may be pre-loaded and positioned within rotating ramp 2238 at end 2242 such that upon swinging downward and stopping in the downward position, a vehicle is launched down exiting track section 2244.

[00122] Referring now to FIG. 23 still another relay segment is illustrated. Here the relay segment is a free-fall stunt element 3110. As illustrated, free-fall stunt element 3110 is configured to provide a free fall stunt for a preloaded vehicle. As shown, incoming track 3102 is coupled to a conical trigger 3104, which can also be actuated via the manual button 3108. In this example, the trigger may be configured to release a spring loaded stunt element such that contact by an incoming vehicle on track 3102 causes the trigger to move vertically and release a catch that then releases a vehicle basket 3111 such that a preloaded stunt vehicle free falls to target 3112.

[00123] The vehicle basket 3111 may be hingedly connected to an arm 3114 as indicated at pivot point 3116. A vehicle may be preloaded in the basket. Activation of trigger 3104 results in the basket swinging downwards, as indicated by arrow 3117, such that the vehicle drops out of the basket and falls toward the ground. FIG. 23 illustrates the basket 3111 in a pre-trigger configuration, where the basket is substantially perpendicular to the arm.

[00124] In some embodiments, the preloaded stunt vehicle is configured to fall onto a target 3112. The target may be part of a platform or other structure. Upon impact with the target, a third vehicle may be released. As an example, a second pre-loaded vehicle may be positioned in cavity 3118. Cavity 3118 may include launching structure such as a spring loaded launch slider 3120 which upon activation slides forward, causing the second preloaded stunt vehicle to be accelerated toward exit 3106. This second preloaded vehicle becomes the outgoing vehicle of relay element 3100.

CLAIMS

What is claimed is:

1. A relay segment for a toy track set, the relay segment comprising:
a trigger moveably secured to the relay segment proximate to a first vehicle track segment pivotally mounted to the relay segment for adjustable movement with respect to the relay segment, the trigger being capable of movement between a first position and a second position; and
a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.
2. The relay segment as in claim 1, wherein the trigger further comprises an angled surface positioned above the first track segment and the first position locates the angled surface a first distance from the first vehicle track segment while the second position locates the angled surface a second distance from the first vehicle track segment, the second distance being greater than the first distance.
3. The relay segment as in claim 2, wherein the angled surface is defined by a frusto-conical member.
4. The relay segment as in claim 2, wherein the first distance is less than a height of a toy vehicle traveling on the first vehicle track segment, wherein the toy vehicle is a 1:50 scale model or less.
5. The relay segment as in claim 2, wherein the trigger further comprises a manual release for moving the trigger from the first position to the second position.
6. The relay segment as in claim 1, further comprising a second vehicle track segment for defining a path of travel for the vehicle launched by the launching element, the first track segment and the second track segment each having a directional indicator integrally molded therein, wherein the directional indicator of the first track segment depicts a path of travel towards the trigger and the directional indicator of the second track segment depicts a path of travel away from the relay segment.

7. The relay segment as in claim 6, wherein the directional indicator is an arrow cut out of the first track segment and the second track segment.

8. The relay segment as in claim 1, wherein the launching element is a spring biased member held in a retracted position by the trigger when the trigger is in the first position, the spring biased member being released from the retracted position when the trigger moves to the second position and the spring biased member launches the vehicle along a second vehicle track segment, the first track segment and the second track segment each having a directional indicator integrally molded therein, wherein the directional indicator of the first track segment depicts a path of travel towards the trigger and the directional indicator of the second track segment depicts a path of travel away from the relay segment.

9. The relay segment as in claim 8, wherein the directional indicator is an arrow cut out of the first track segment and the second track segment.

10. The relay segment as in claim 8, wherein the trigger further comprises an angled surface positioned above the first track segment and the first position locates the angled surface a first distance from the first vehicle track segment while the second position locates the angled surface a second distance from the first vehicle track segment, the second distance being greater than the first distance.

11. The relay segment as in claim 10, wherein the angled surface is defined by a frusto-conical member and the directional indicator is an arrow cut out of the first track segment and the second track segment.

12. The relay segment as in claim 10, wherein the first distance is less than a height of a toy vehicle traveling on the first vehicle track segment, wherein the toy vehicle is a 1:50 scale model or less.

13. The relay segment as in claim 12, wherein movement of the trigger between the first position and the second position is in a first plane and movement of the toy vehicle on the first vehicle track is in a second plane, wherein the first plane and the second plane are not parallel to each other.

14. The relay segment as in claim 1, wherein the launching element simultaneously launches the vehicle and another vehicle from the relay segment when the trigger is moved from the first position to the second position.

15. The relay segment as in claim 1, wherein the launching element further comprises a plurality of mechanisms each being sequentially activated after activation of a first mechanism of the plurality of mechanisms, the first mechanism being activated when the trigger is moved from the first position to the second position and a last of the plurality of mechanisms launches the vehicle from the relay segment.

16. An interchangeable toy track set, comprising:
a plurality of interchangeable relay segments each of which may be coupled to each other to create a plurality of variations for the toy track set, each of plurality of interchangeable relay segments comprising:

a trigger moveably secured to the relay segment proximate to a first vehicle track segment pivotally mounted to the relay segment for movement with respect to the relay segment, the trigger being capable of movement between a first position and a second position; and

a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position.

17. The interchangeable toy track set as in claim 16, wherein the trigger further comprises an angled surface positioned above the first track segment and the first position locates the angled surface a first distance from the first vehicle track segment while the second position locates the angled surface a second distance from the first vehicle track segment, the second distance being greater than the first distance.

18. The interchangeable toy track set as in claim 17, wherein the angled surface is defined by a frusto-conical member and the first distance is less than a height of a toy vehicle traveling on the first vehicle track segment, wherein the toy vehicle is a 1:50 scale model or less.

19. The interchangeable toy track set as in claim 18, wherein the trigger further comprises a manual release for moving the trigger from the first position to the second position.

20. The interchangeable toy track set as in claim 16, wherein at least one of the plurality of interchangeable relay segments further comprises a second vehicle track segment for defining a path of travel for the vehicle launched by the launching element and wherein the second vehicle track segment is configured to be releasably secured to the first track segment of another one of the plurality of interchangeable relay segments such that the path of travel of the vehicle launched by the launching element contacts the trigger of the another one of the plurality of interchangeable relay segments to move the trigger from the first position to the second position.

21. The interchangeable toy track set as in claim 20, wherein first track segment and the second track segment each having a directional indicator integrally molded therein, wherein the directional indicator of the first track segment depicts a path of travel towards the trigger and the directional indicator of the second track segment depicts a path of travel away from the relay segment.

22. The interchangeable toy track set as in claim 21, wherein the directional indicator is an arrow cut out of the first track segment and the second track segment.

23. The interchangeable toy track set as in claim 16, wherein the launching element of at least one of the plurality of interchangeable relay segments is a spring biased member held in a retracted position by the trigger when the trigger is in the first position, the spring biased member being released from the retracted position when the trigger moves to the second position and the spring biased member launches the vehicle along a second vehicle track segment, the first track segment and the second track segment each having a directional indicator integrally molded therein, wherein the directional indicator of the first track segment depicts a path of travel towards the trigger and the directional indicator of the second track segment depicts a path of travel away from the relay segment.

24. The interchangeable toy track set as in claim 23, wherein the directional indicator is an arrow cut out of the first track segment and the second track segment.

25. The interchangeable toy track set as in claim 17, wherein the launching element of at least one of the plurality of interchangeable relay segments further comprises a plurality of mechanisms each being sequentially activated after activation of a first mechanism of the plurality of mechanisms, the first mechanism being activated when the trigger is moved from the first position to the second position and a last of the plurality of mechanisms launches the vehicle from the relay segment, the first distance of the at least one of the plurality of interchangeable relay segments is less than a height of a toy vehicle traveling on the first vehicle track segment, wherein the toy vehicle is a 1:50 scale model or less and movement of the trigger of the at least one of the plurality of interchangeable relay segments between the first position and the second position is in a first plane and movement of the toy vehicle on the first vehicle track is in a second plane, wherein the first plane and the second plane are not parallel to each other.

26. The interchangeable toy track set as in claim 16, wherein the plurality of interchangeable relay segments are each configured to be positioned at a beginning, middle, or end of the toy track set.

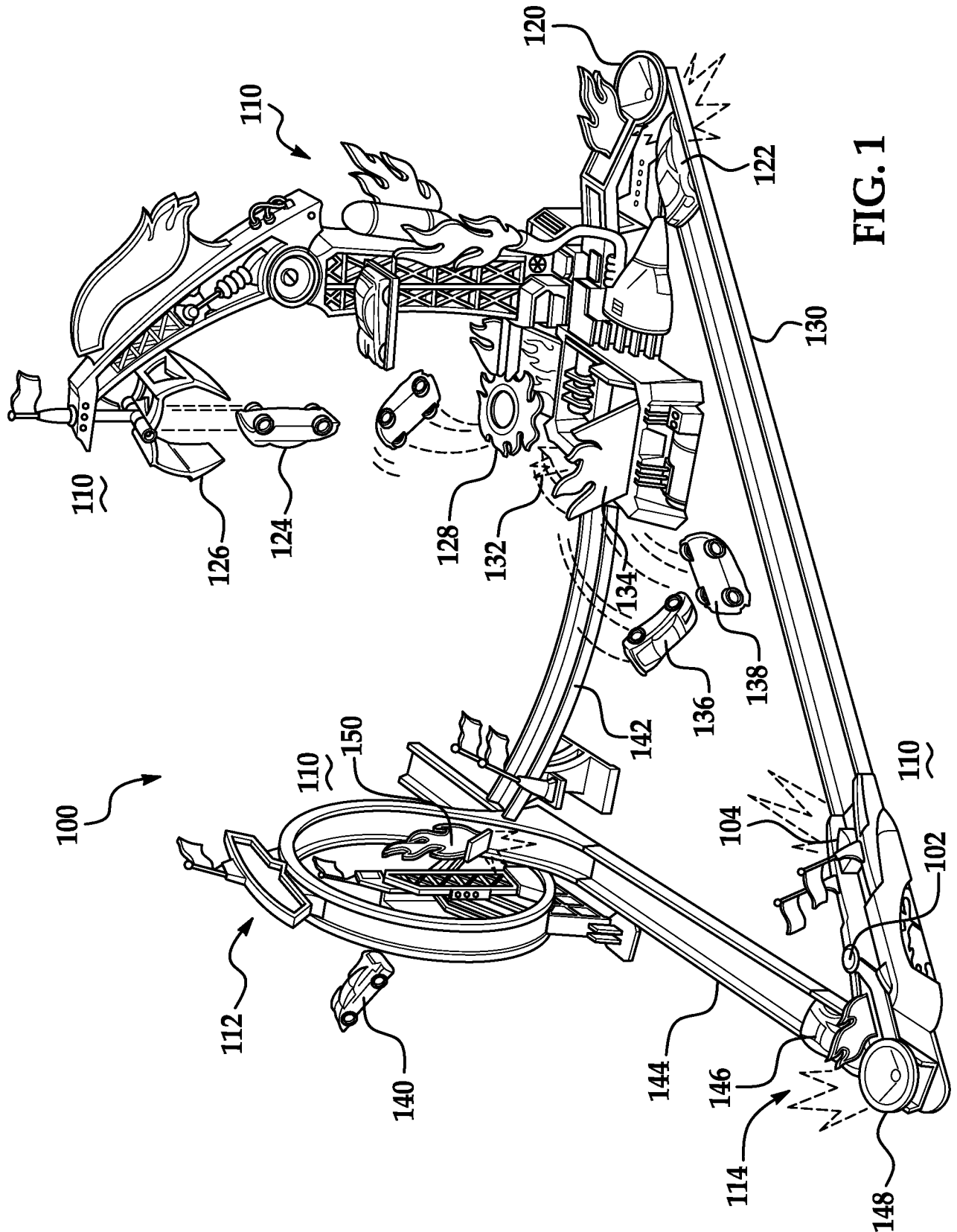
27. The interchangeable toy track set as in claim 16, wherein at least one of the plurality of interchangeable relay segments further comprises a second vehicle track segment for defining a path of travel for the vehicle launched by the launching element and wherein the second vehicle track segment is configured to be releasably secured to the first track segment of another one of the plurality of interchangeable relay segments such that the path of travel of the vehicle launched by the launching element contacts the trigger of the another one of the plurality of interchangeable relay segments to move the trigger from the first position to the second position and the interchangeable toy track set further comprises an actuatable device having a trigger mechanism disposed above a grooved member for receipt of a portion of the second vehicle track segment therein, the trigger mechanism being configured for movement between a first trigger position and a second trigger position, wherein

movement of the trigger mechanism from the first trigger position to the second trigger position causes the actuatable device to actuate.

28. The interchangeable toy track set as in claim 27, wherein first track segment and the second track segment each having a directional indicator integrally molded therein, wherein the directional indicator of the first track segment depicts a path of travel towards the trigger and the directional indicator of the second track segment depicts a path of travel away from the relay segment.

29. A method for actuating a plurality of relay segments of a toy track set, the method comprising:

actuating a trigger of one of a plurality of interchangeable relay segments linked to at least one other of the plurality of interchangeable relay segments wherein actuation of the trigger causes a toy vehicle to be launched towards another one of the one of the plurality of interchangeable relay segments, each of the plurality of interchangeable relay segments comprising: a trigger moveably secured to the relay segment proximate to a first vehicle track segment coupled to the relay segment, the trigger being capable of movement between a first position and a second position; and a launching element for launching a vehicle from the relay segment when the trigger is moved from the first position to the second position, wherein the toy vehicle launched towards the another one of the plurality of interchangeable relay segments causes the trigger of the another one of the plurality of interchangeable relay segments to move from the first position to the second position.



2/19

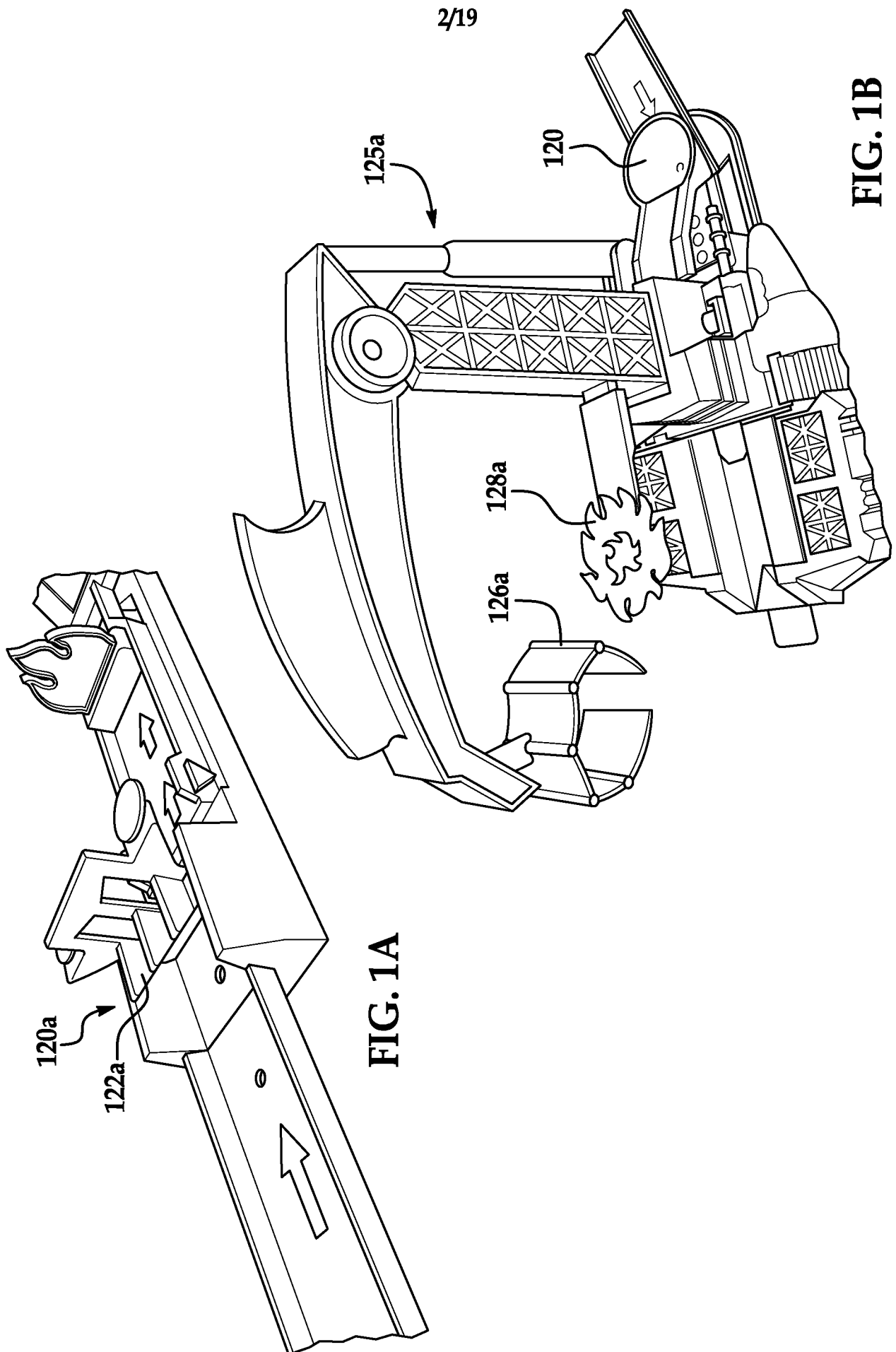


FIG. 1B

FIG. 1A

3/19

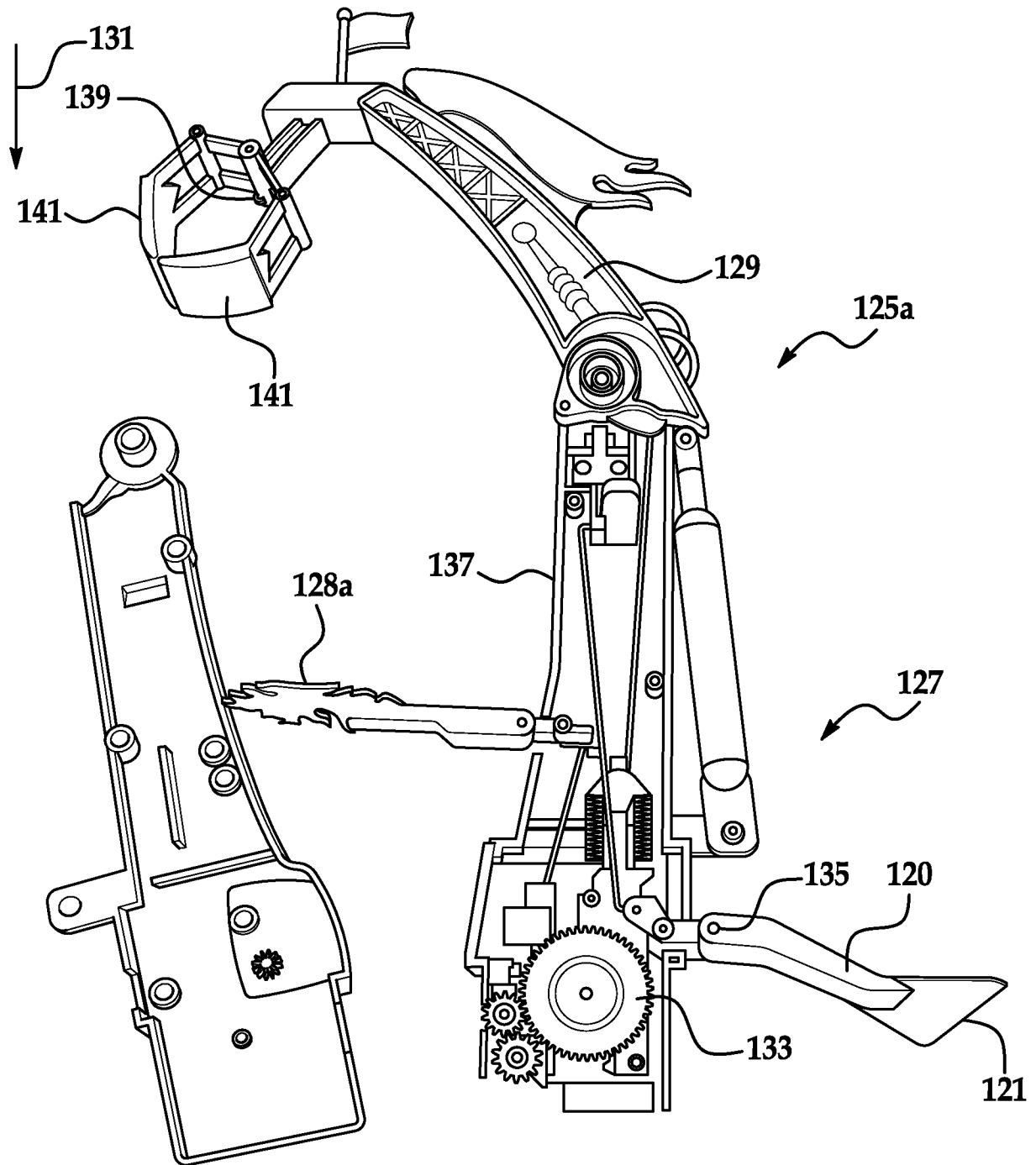
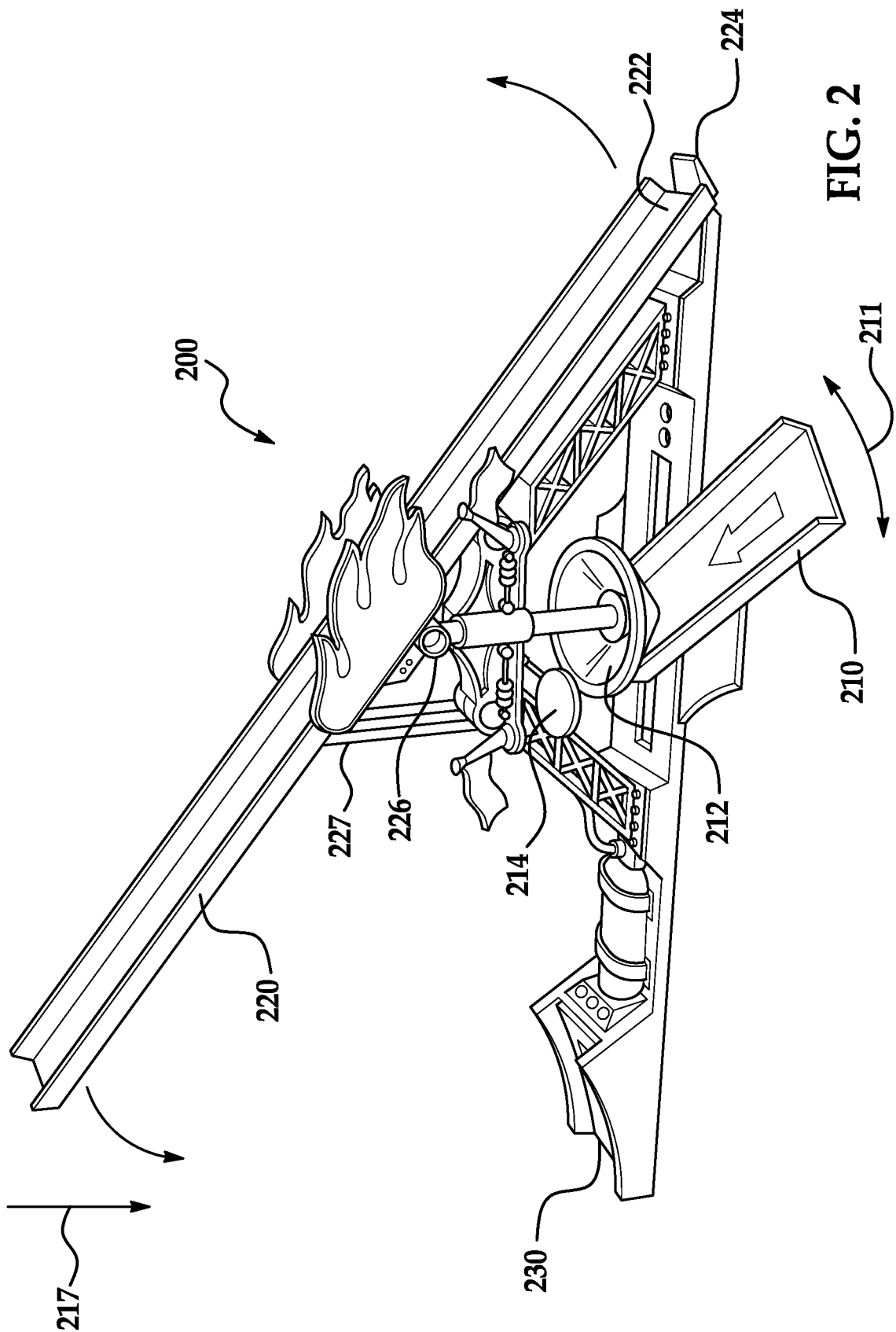


FIG. 1C

4/19



5/19

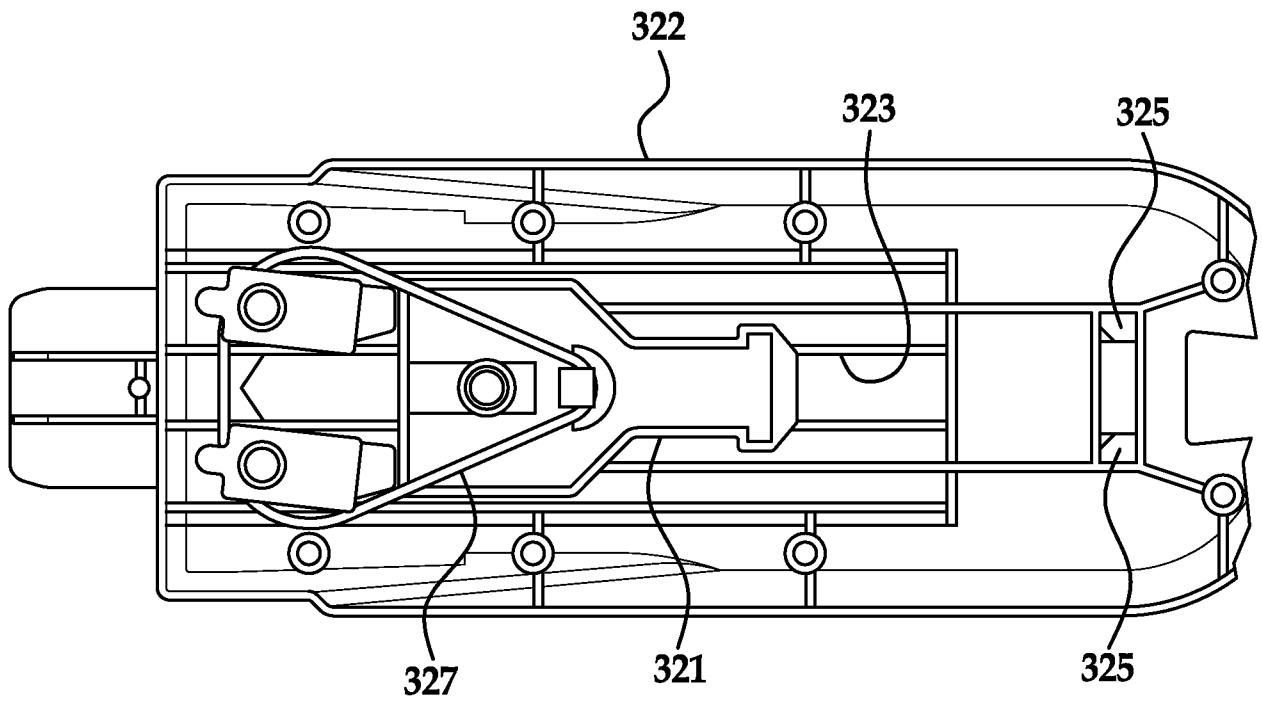


FIG. 3A

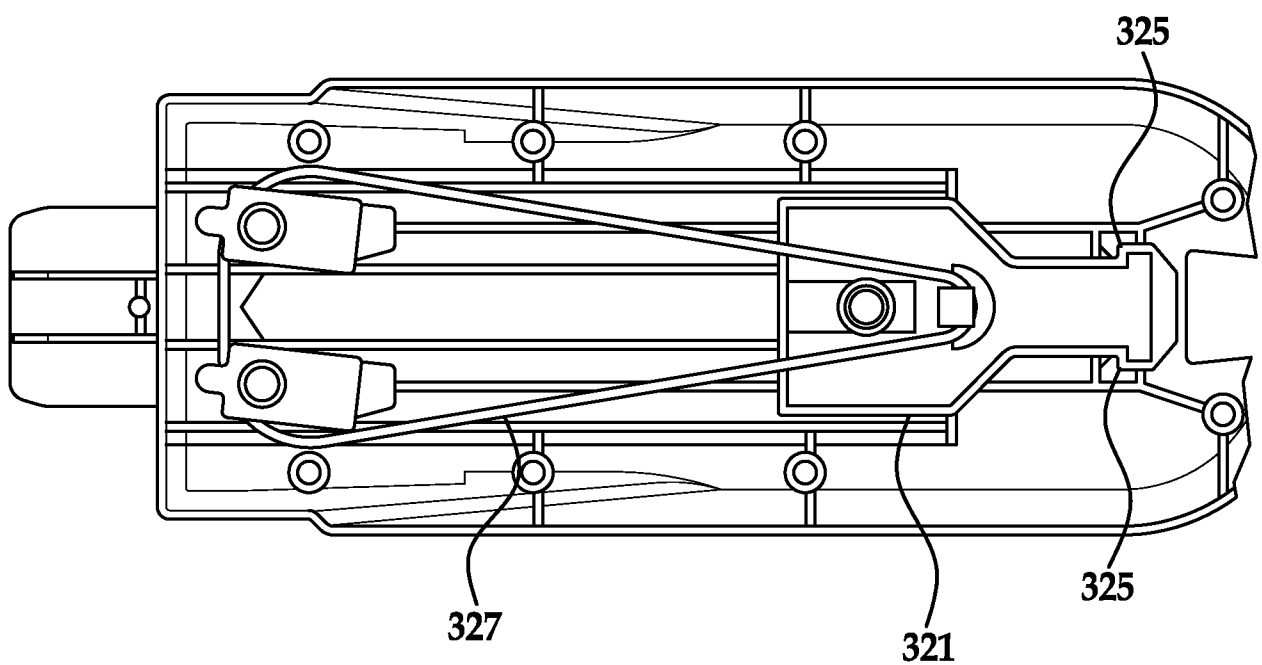


FIG. 3B

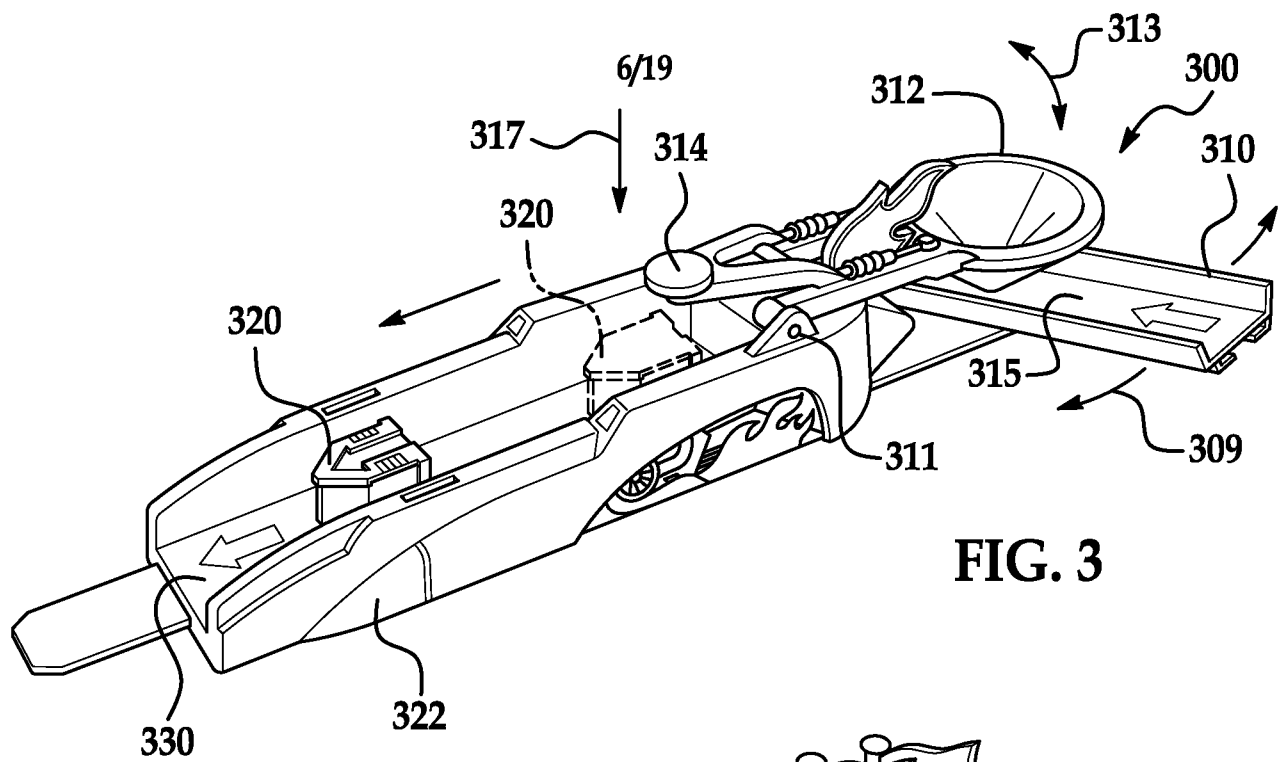


FIG. 3

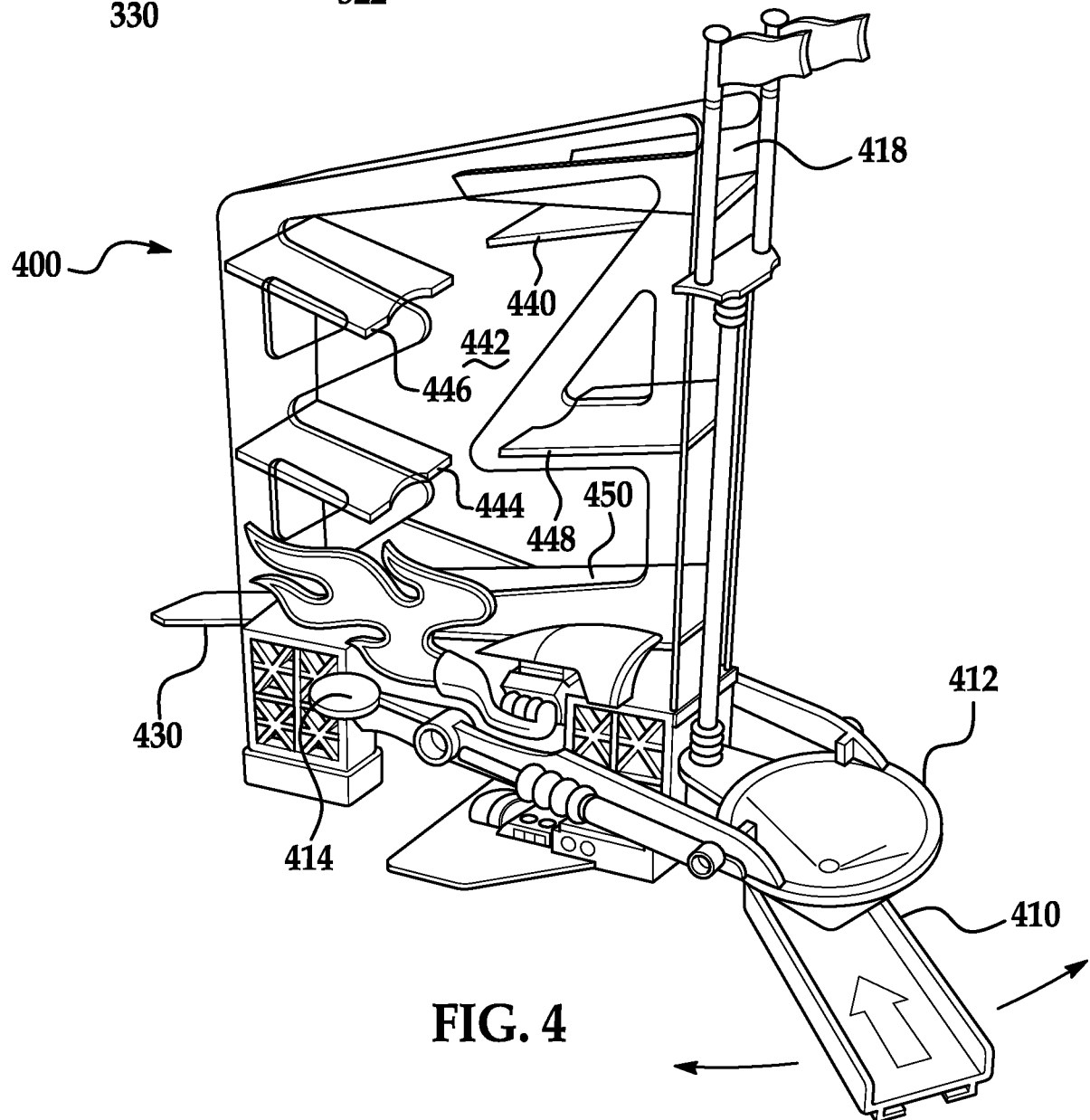


FIG. 4

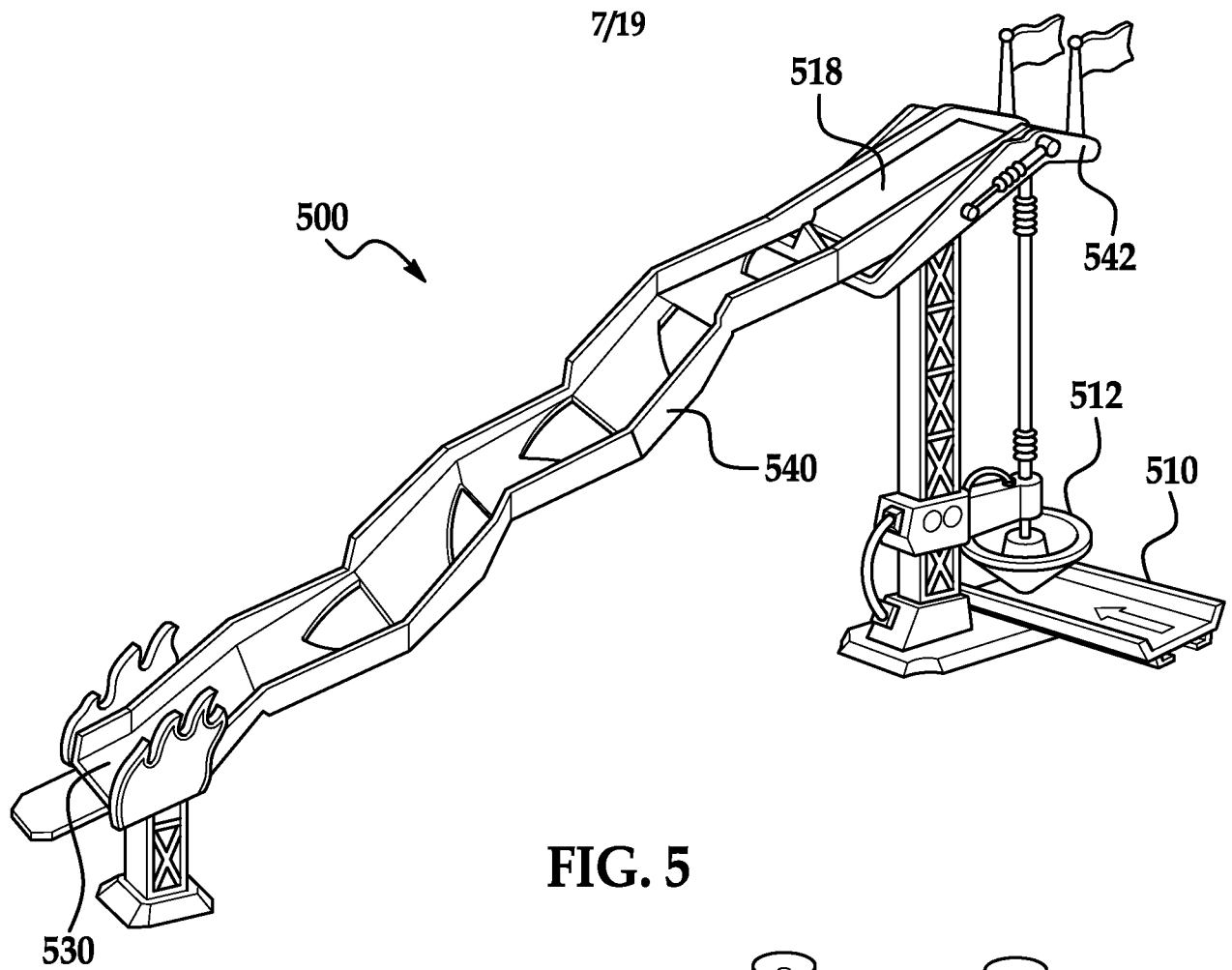


FIG. 5

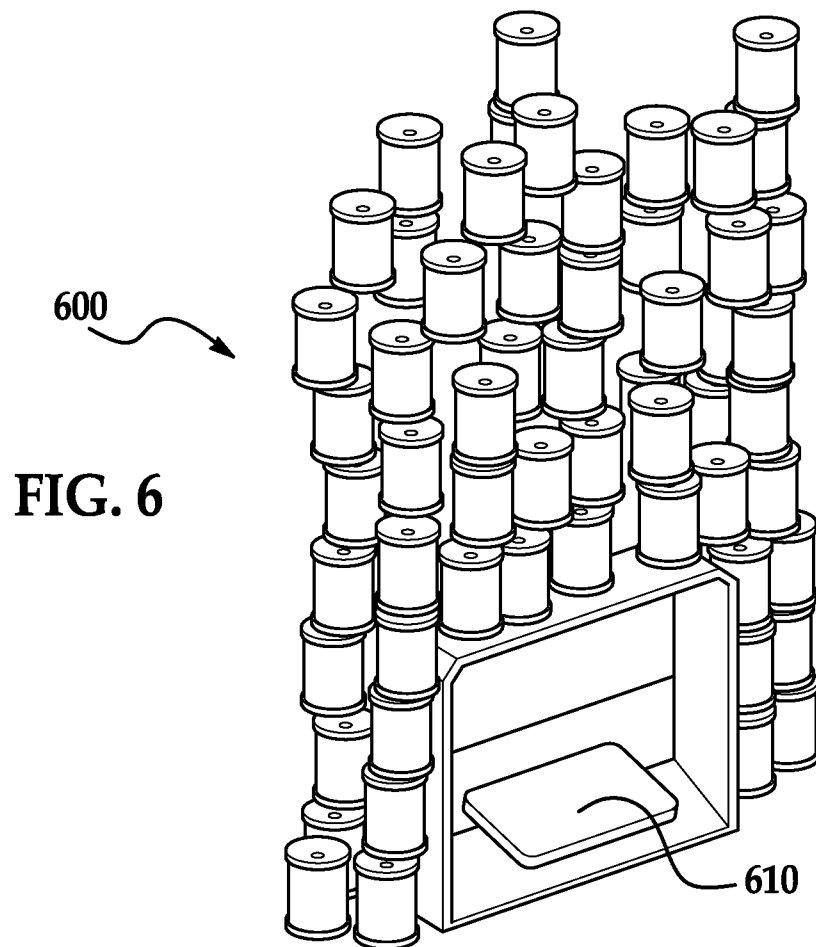


FIG. 6

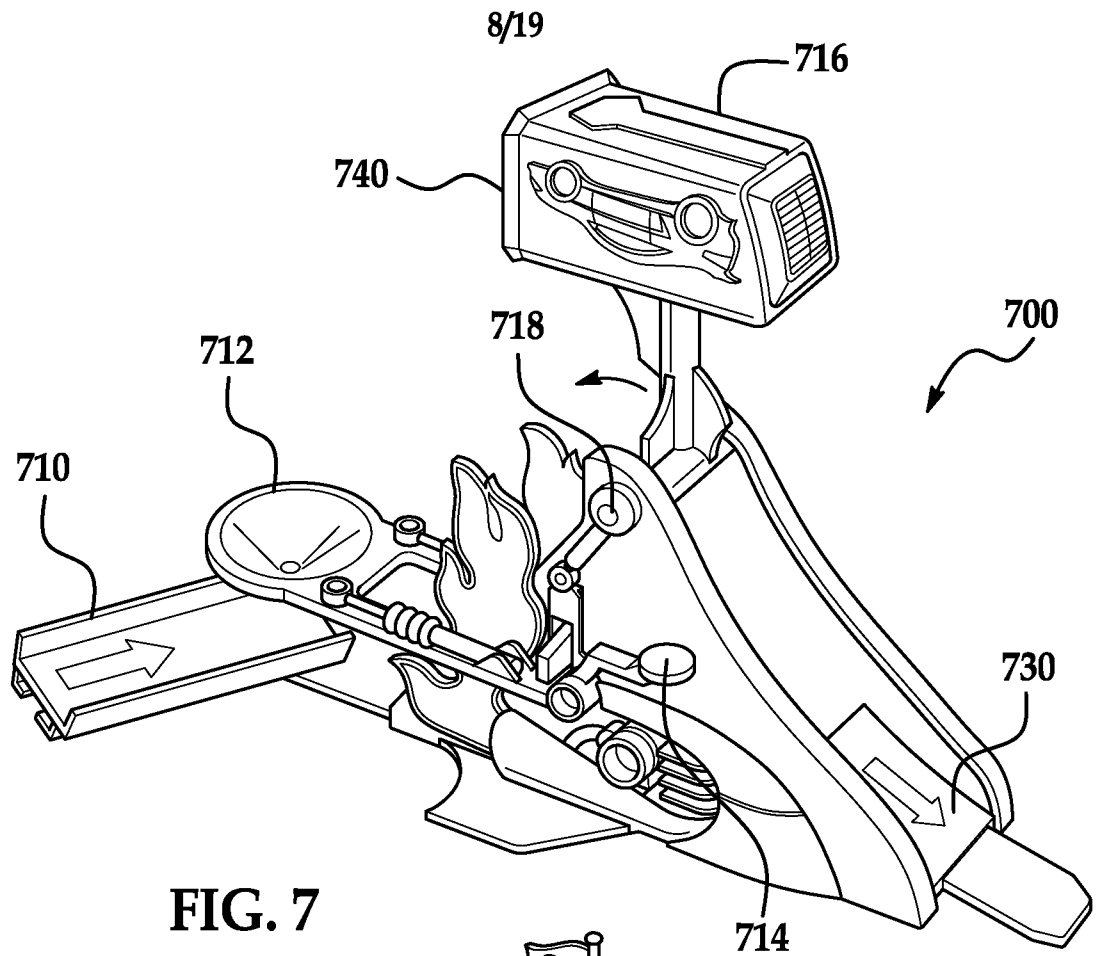


FIG. 7

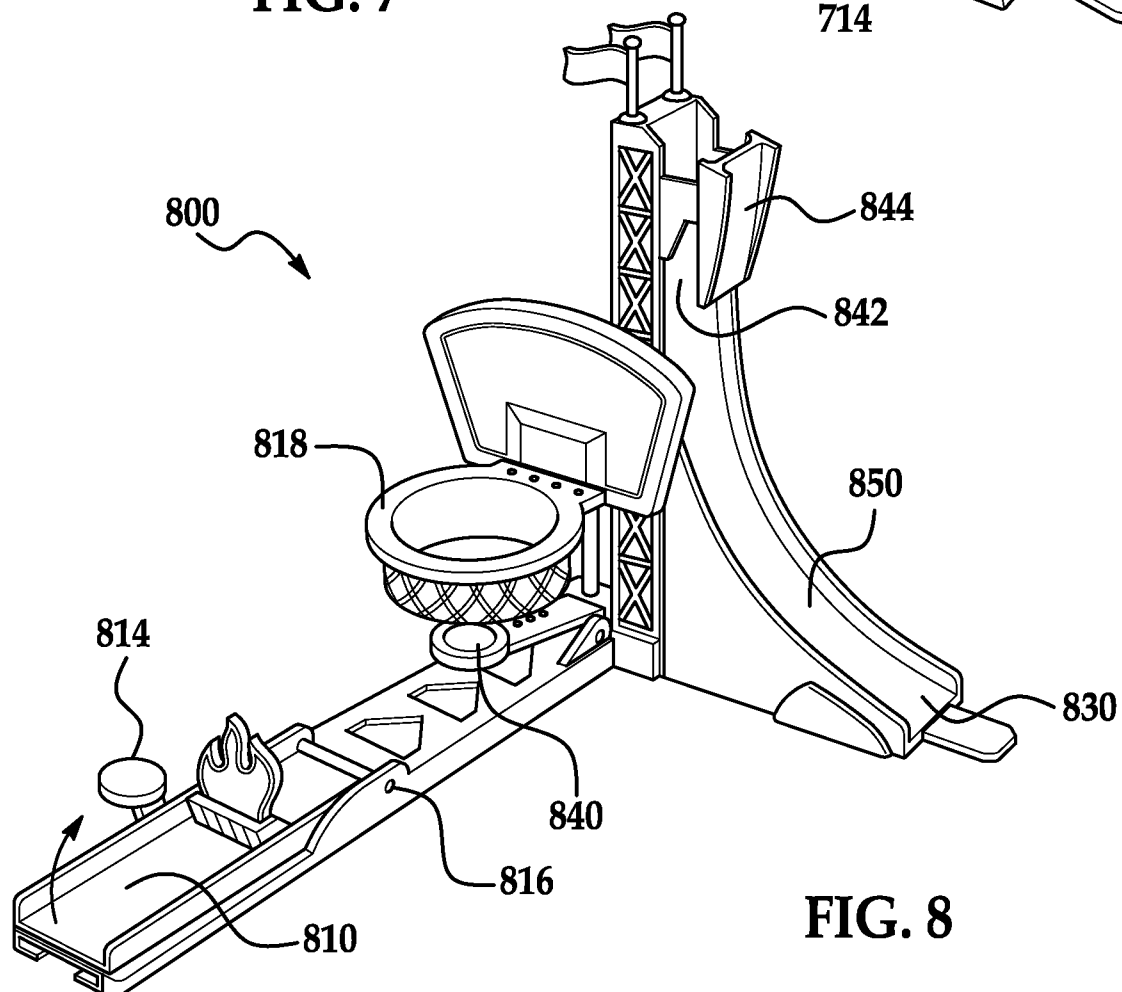


FIG. 8

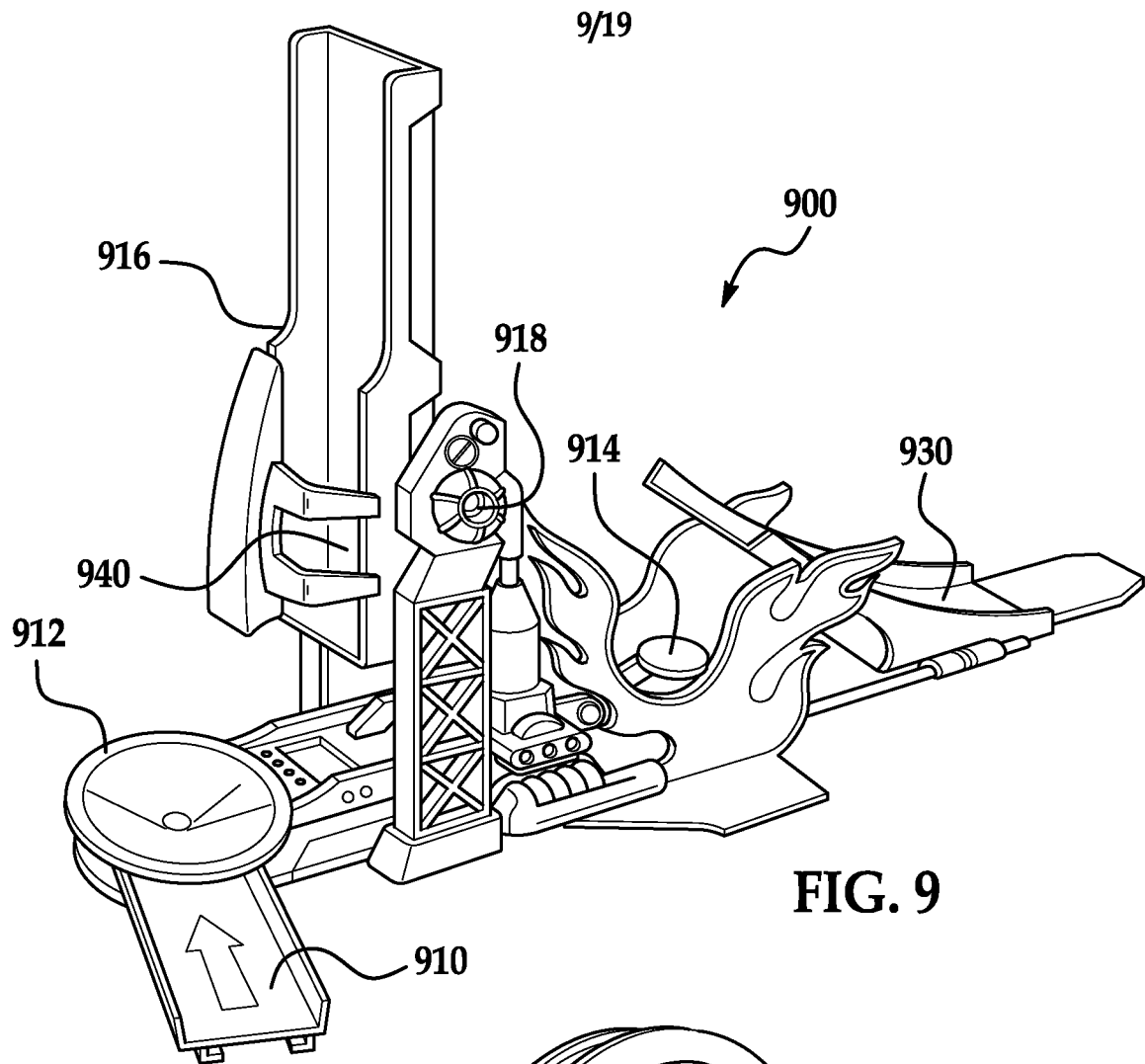


FIG. 9

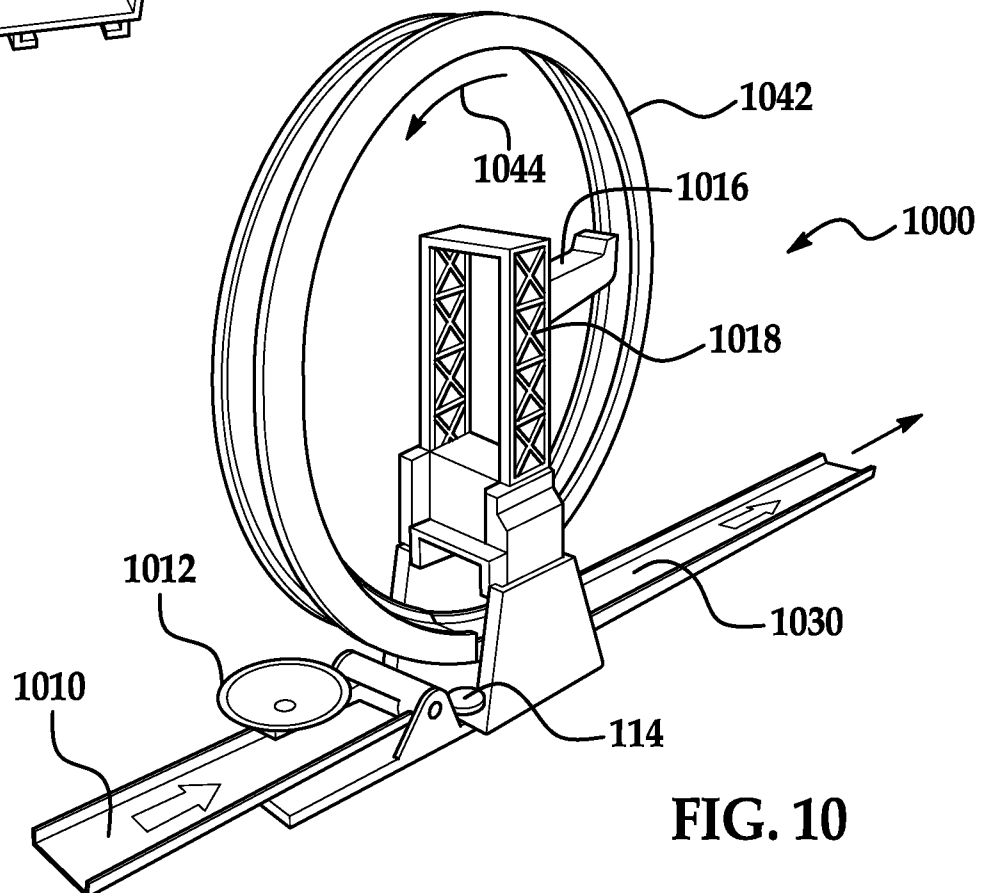
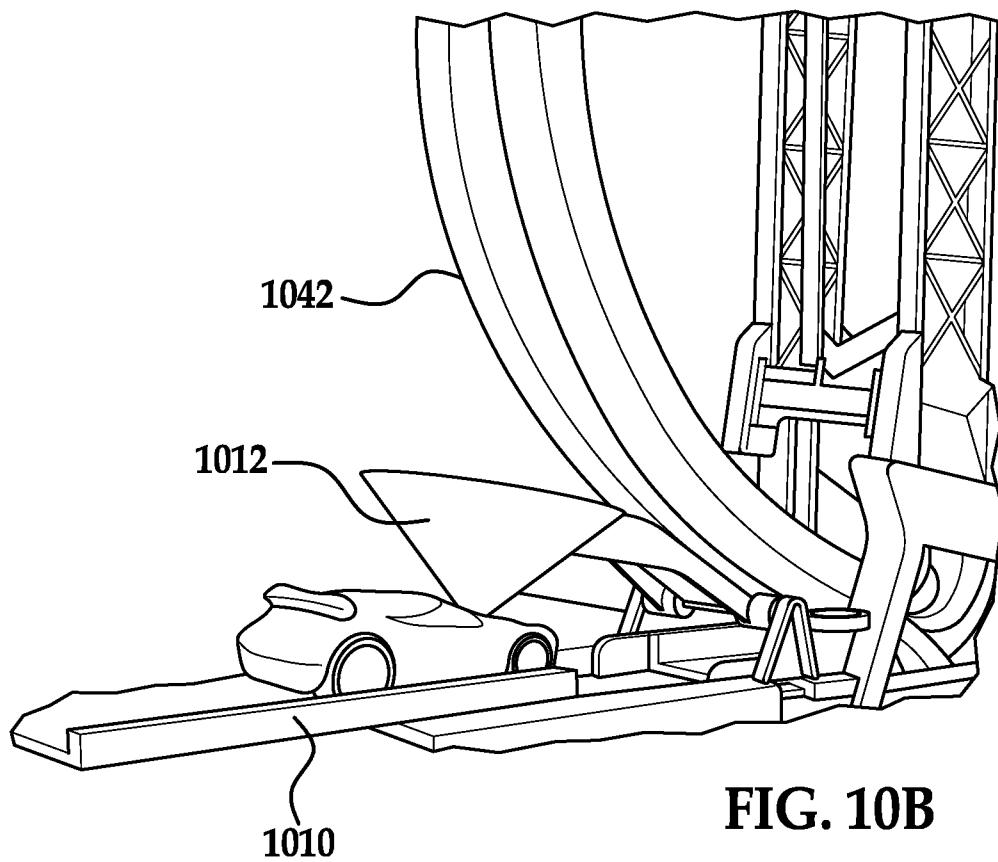
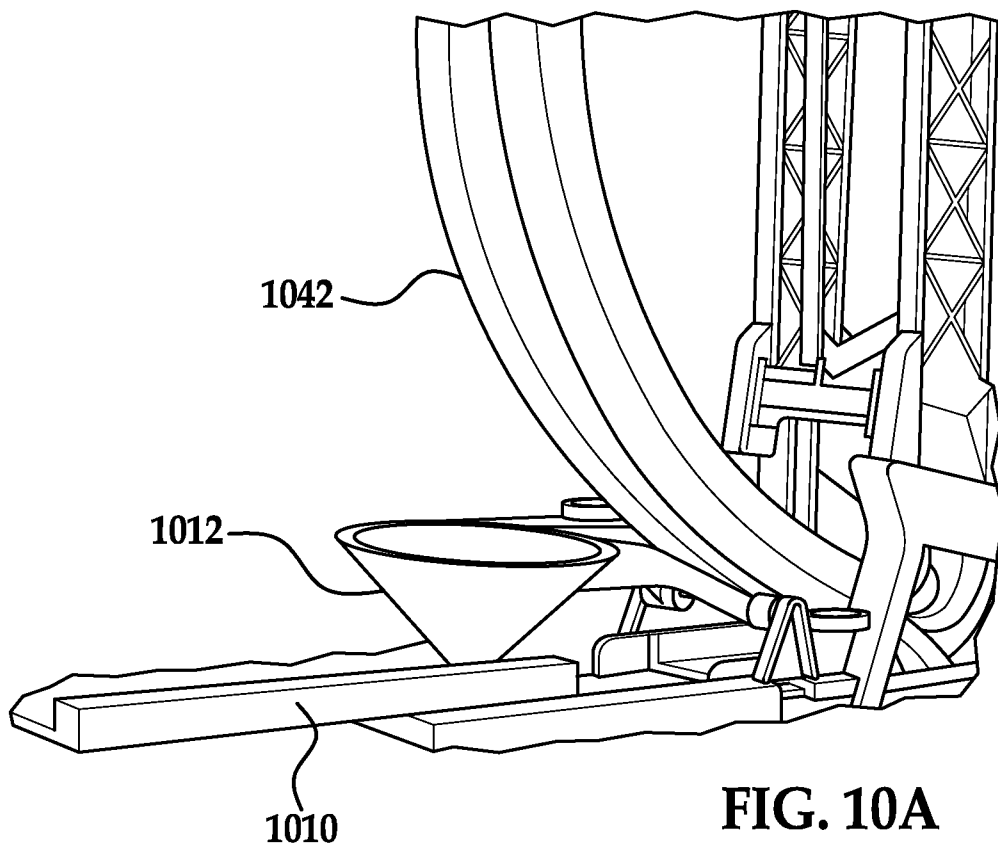
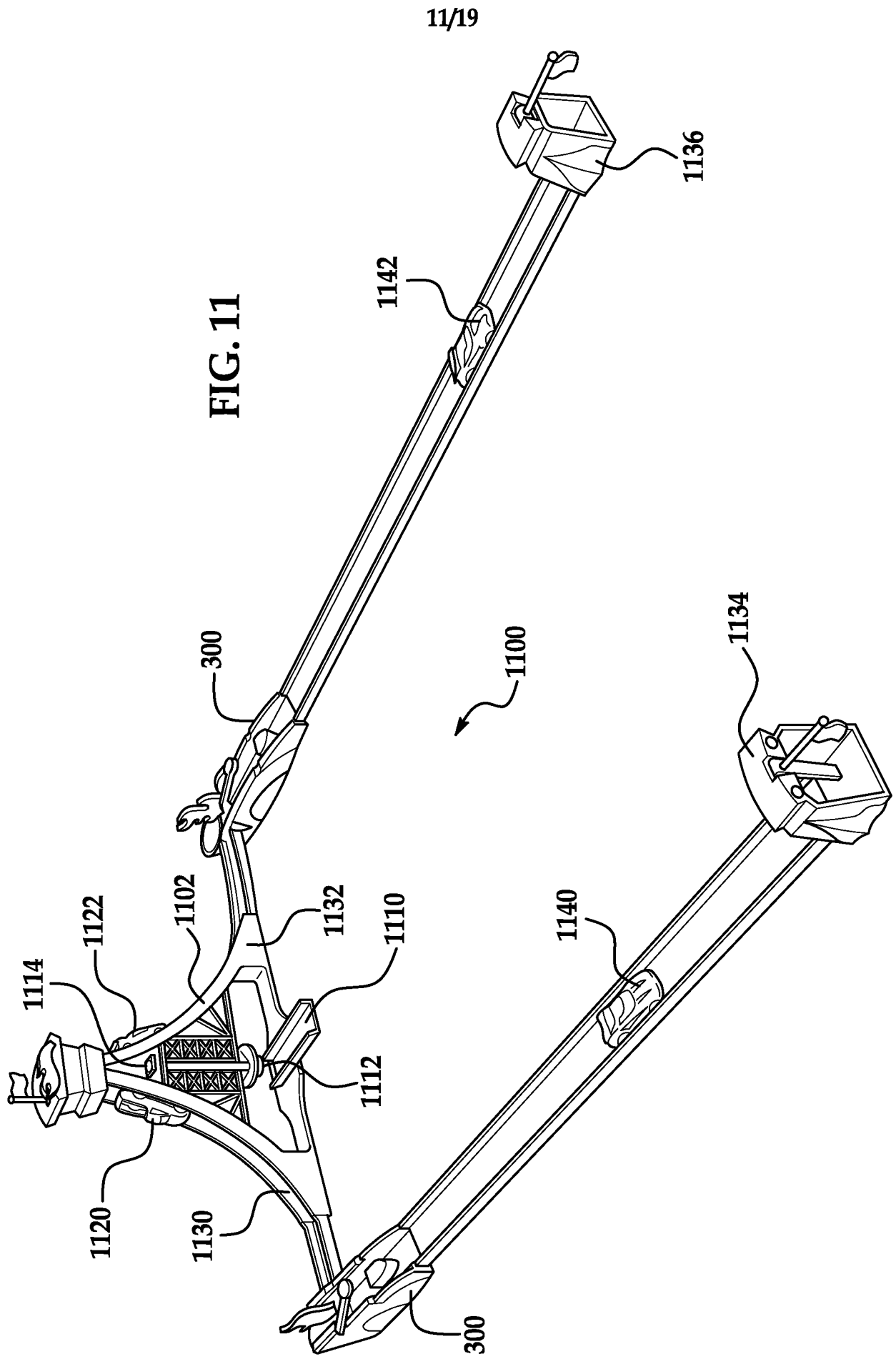


FIG. 10

10/19





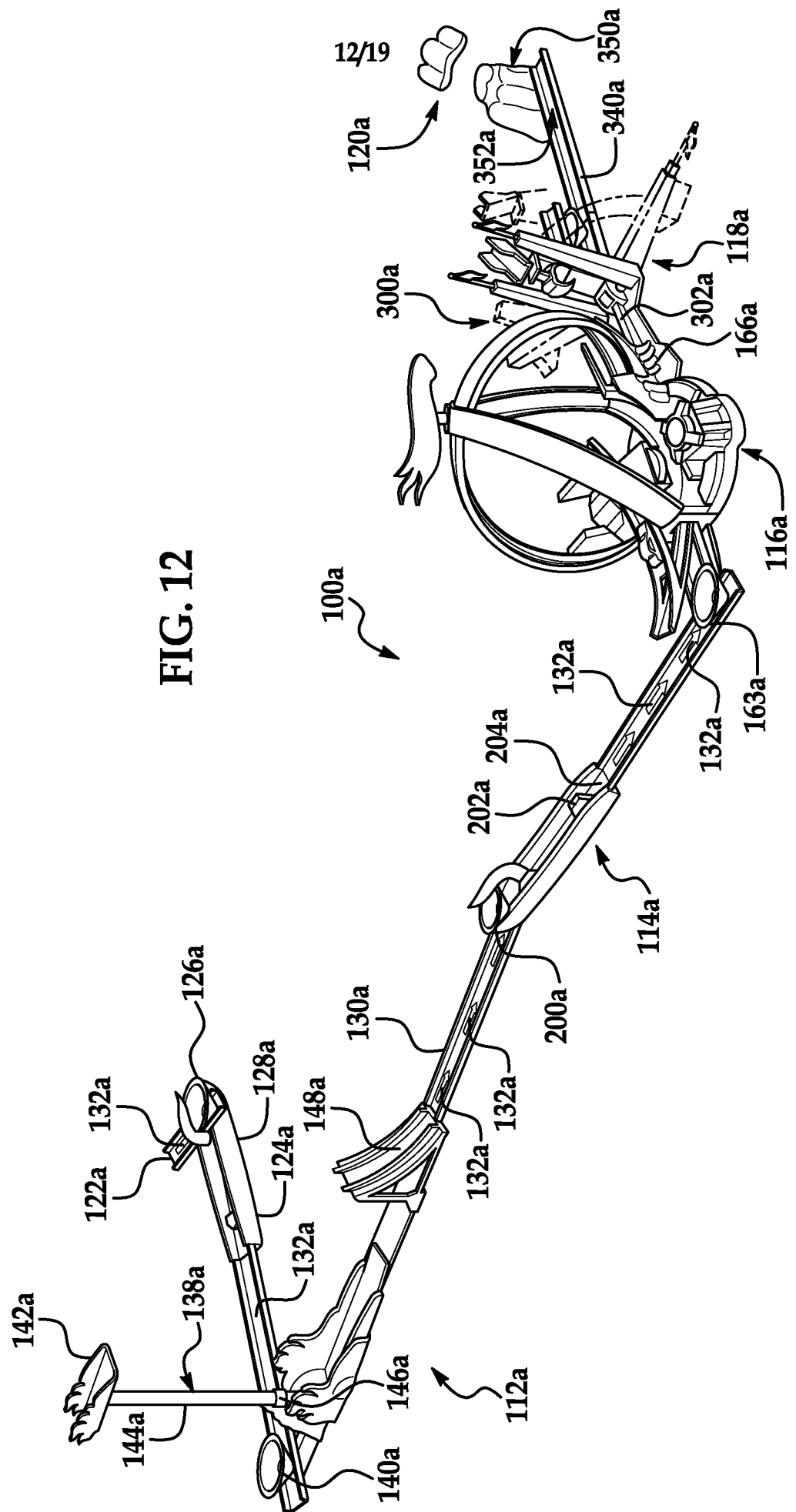


FIG. 13

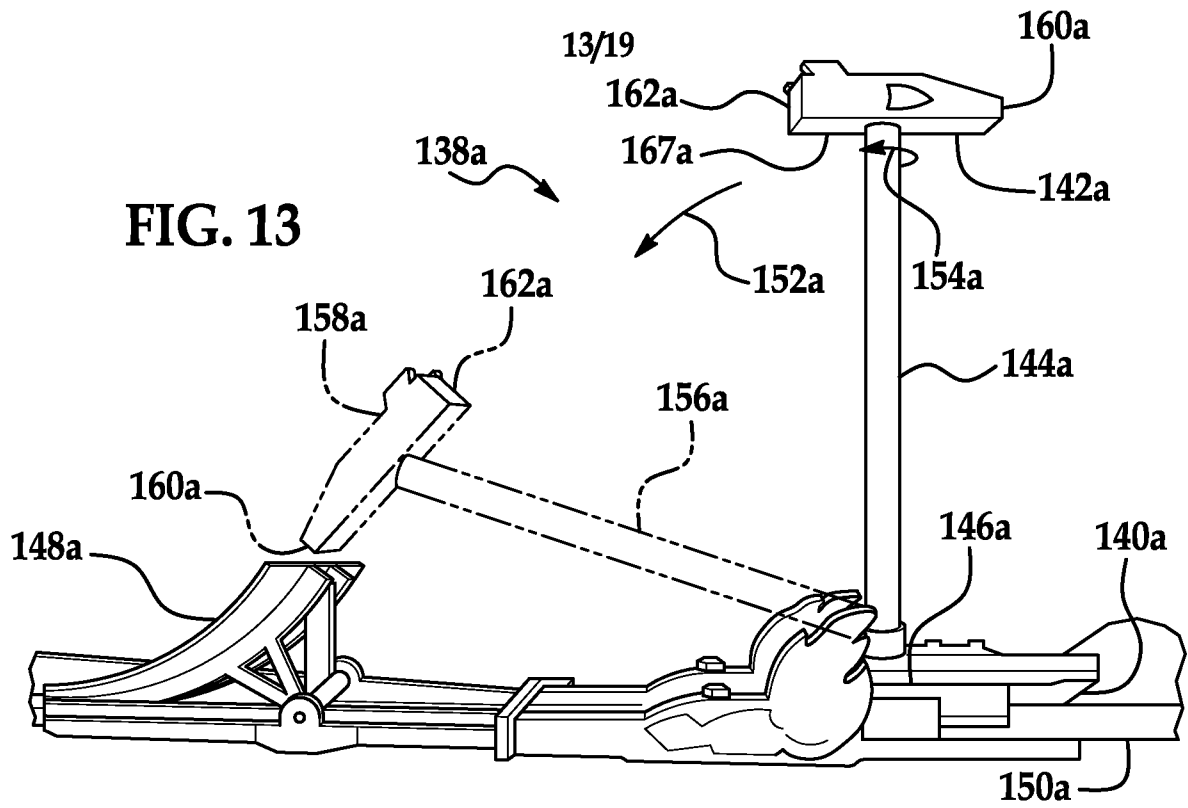
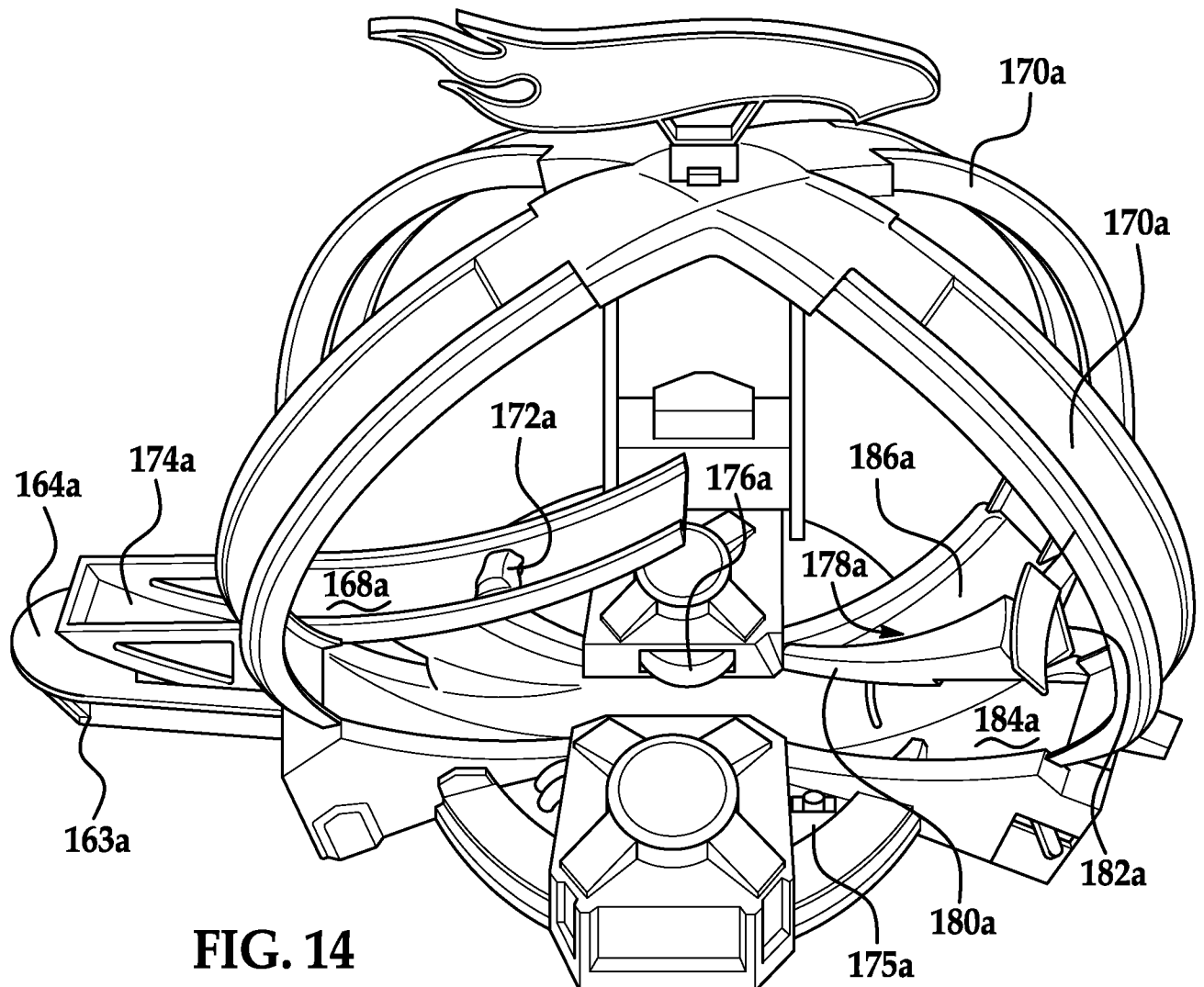
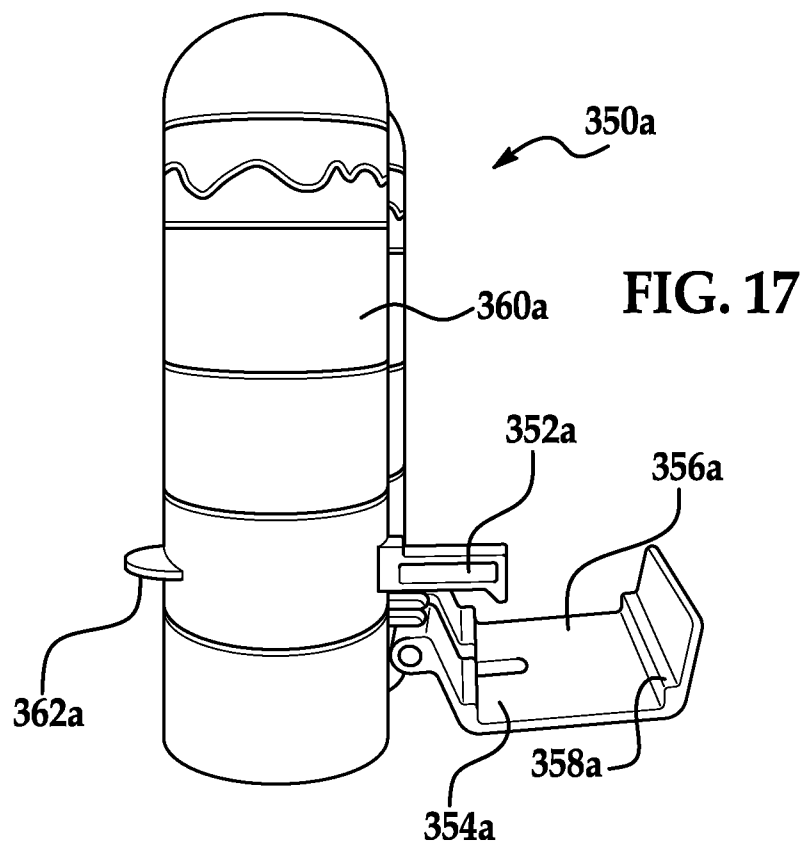
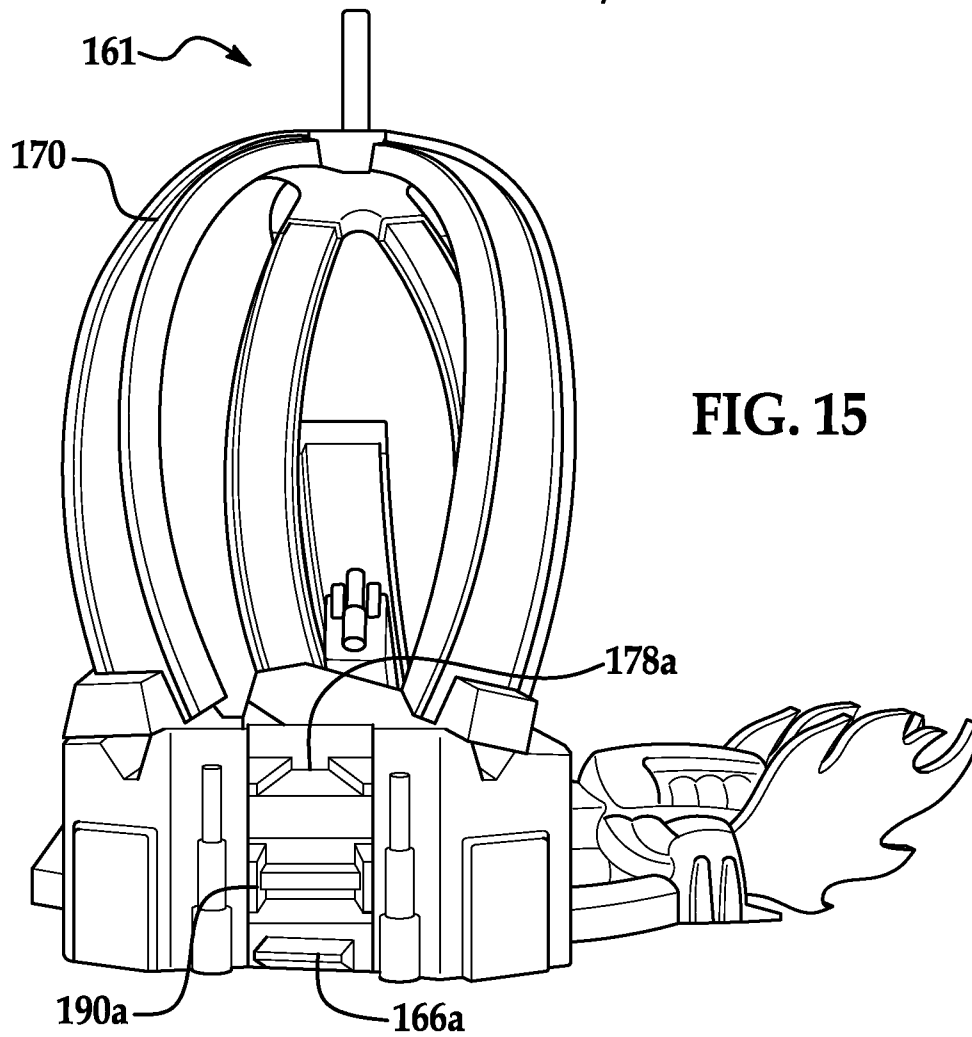


FIG. 14



14/19



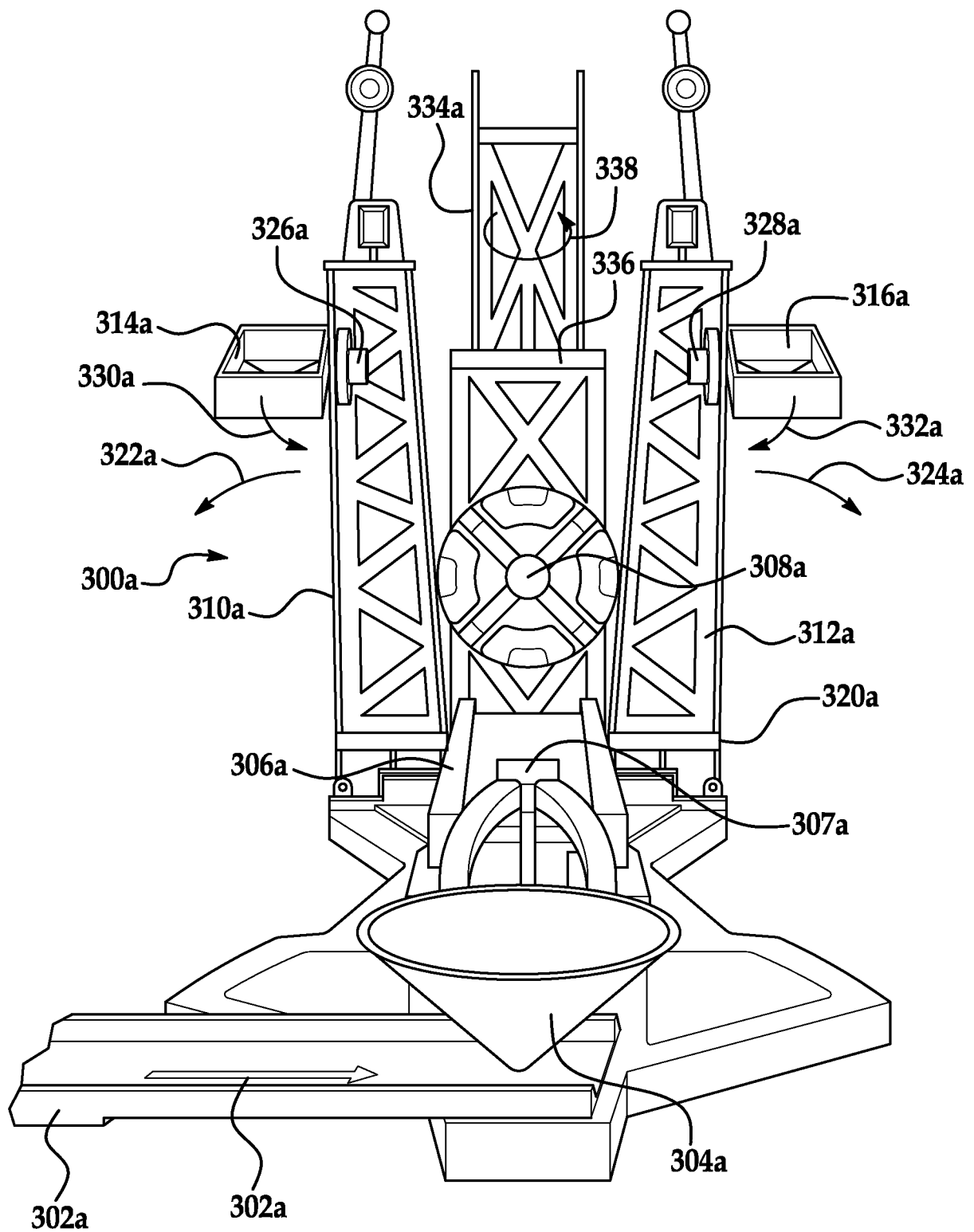
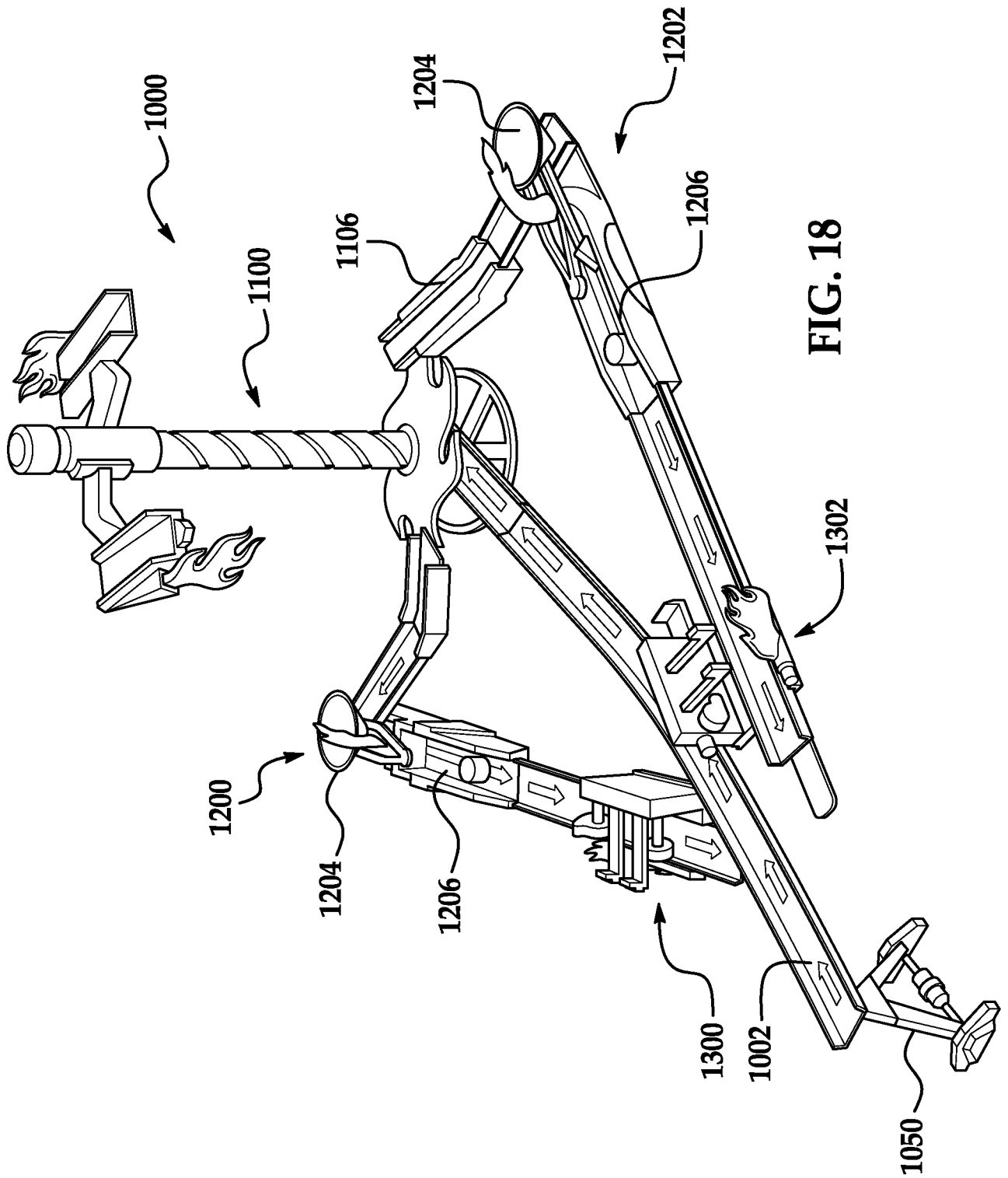
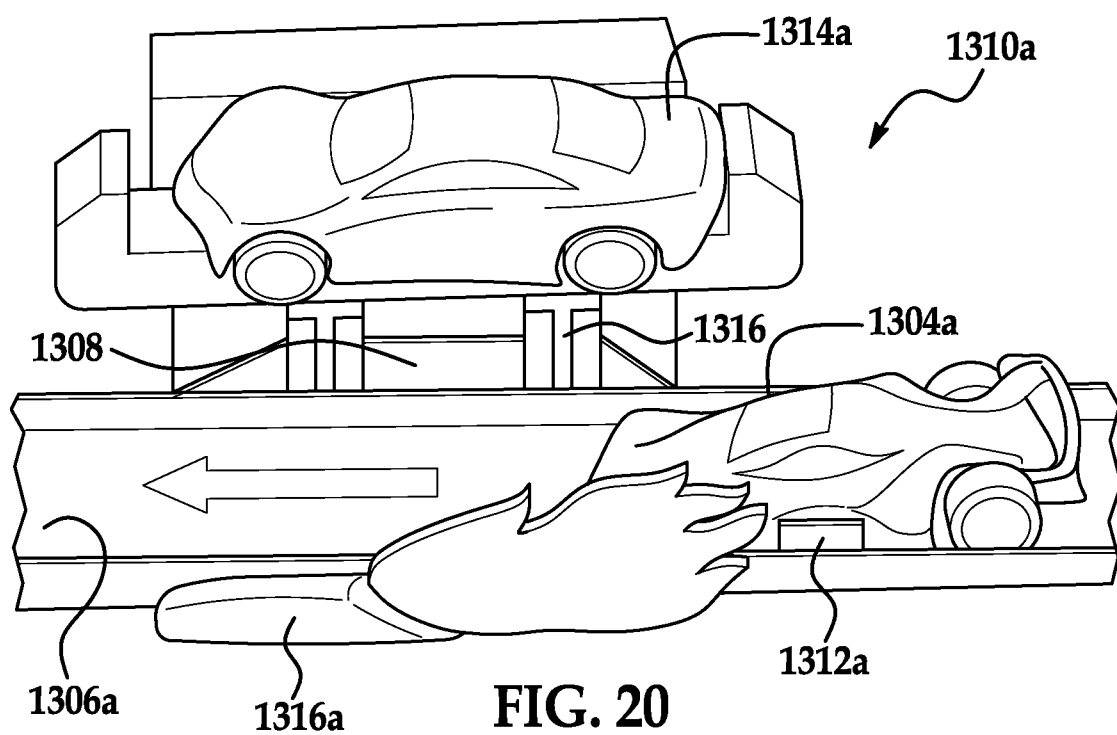
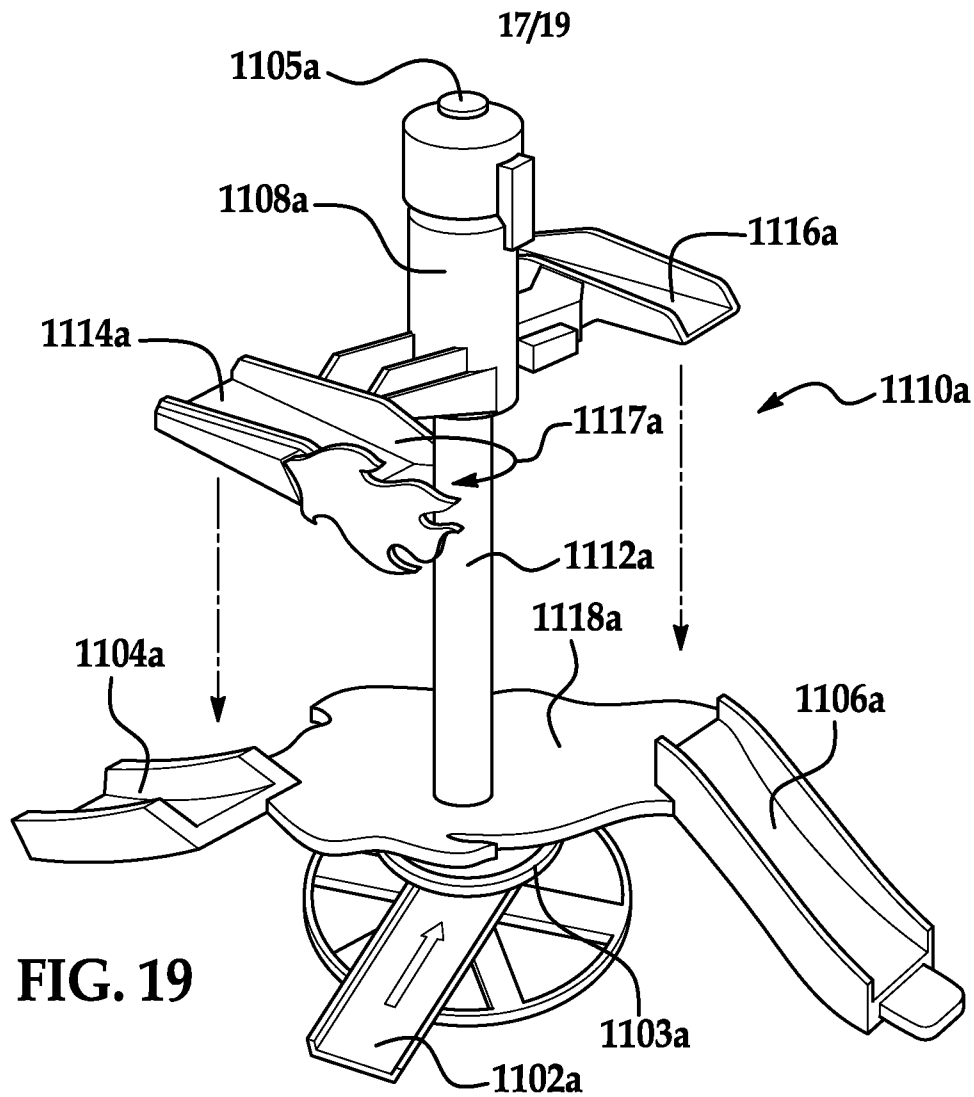


FIG. 16

16/19





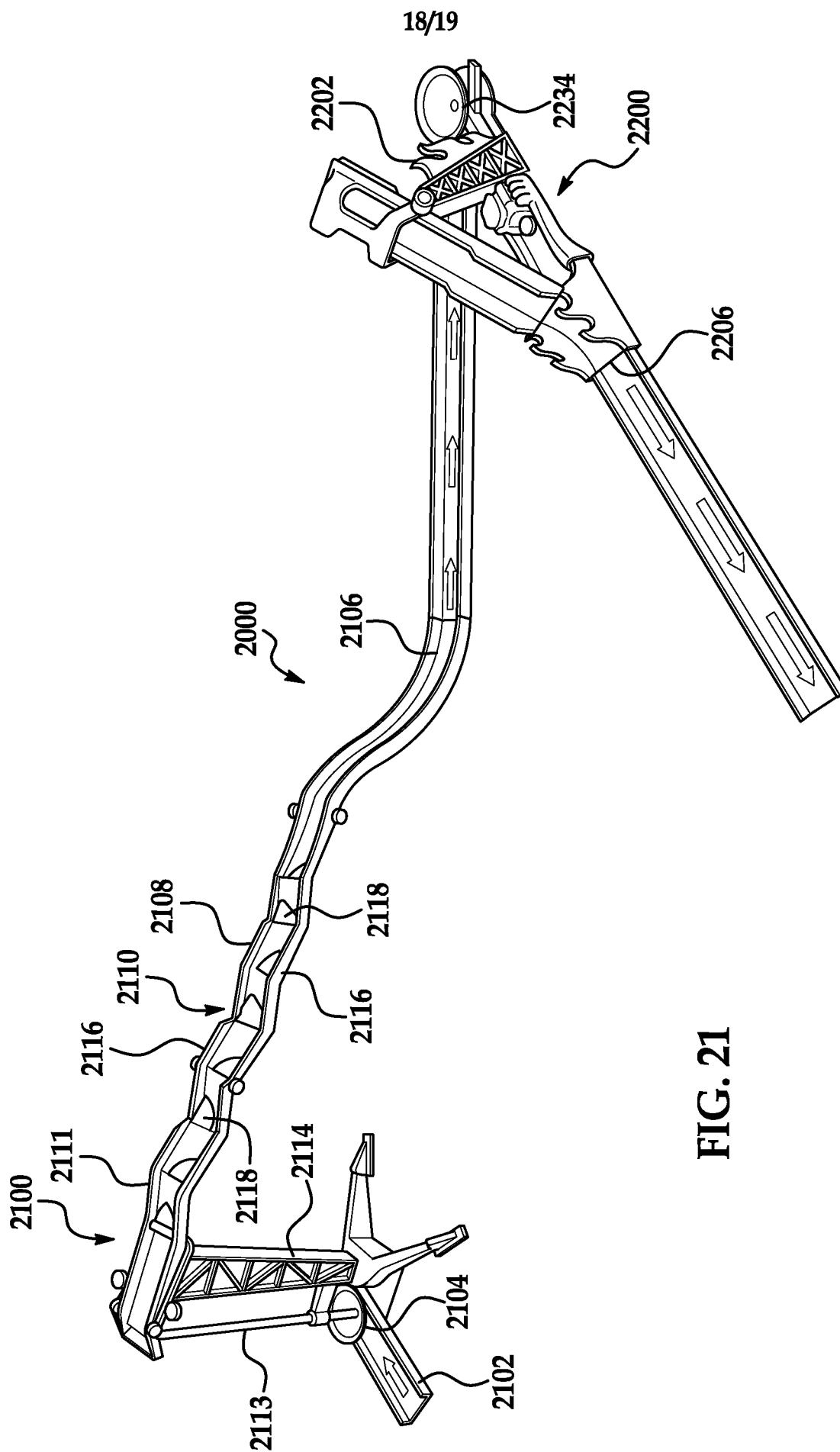


FIG. 21

19/19

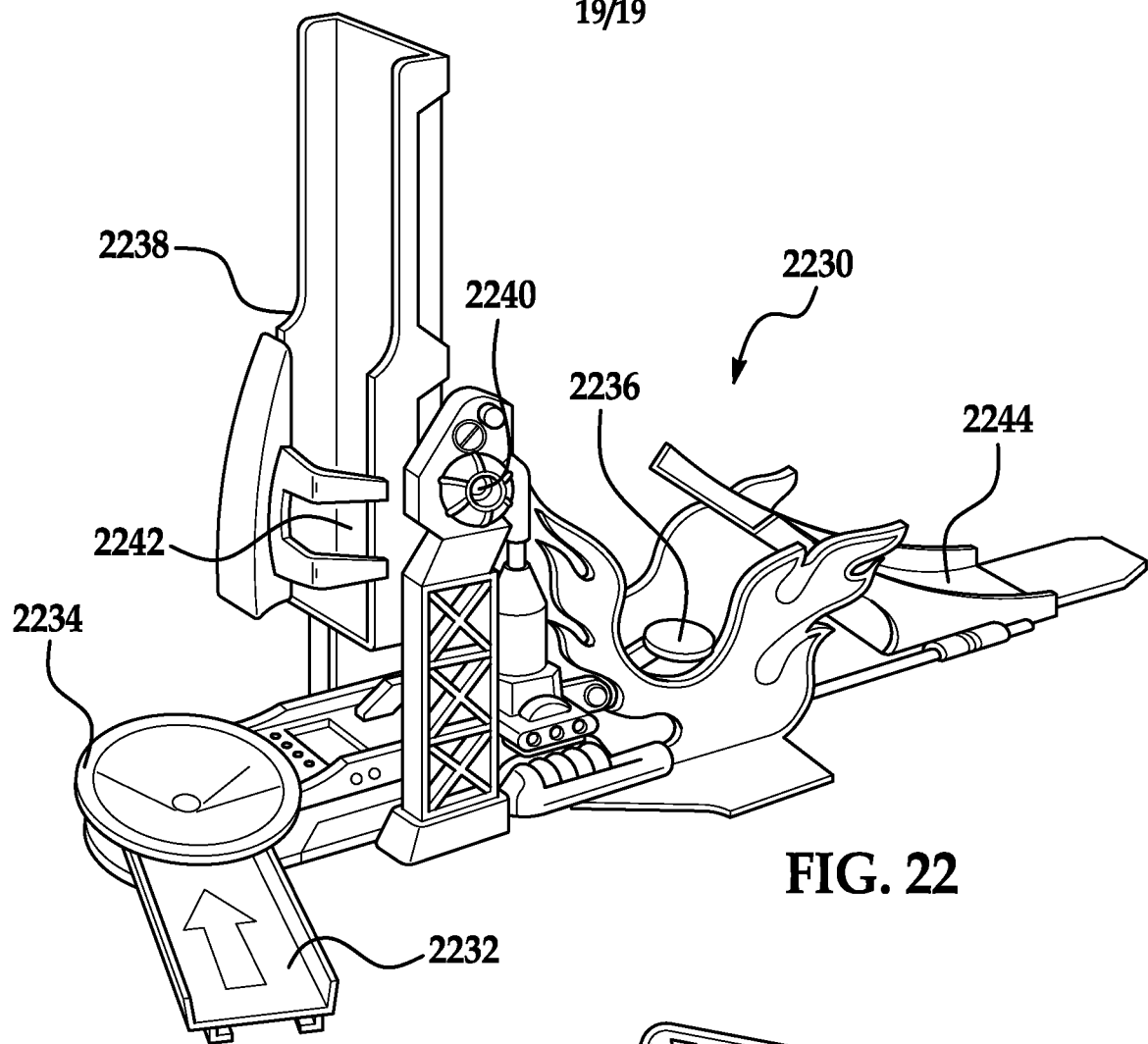


FIG. 22

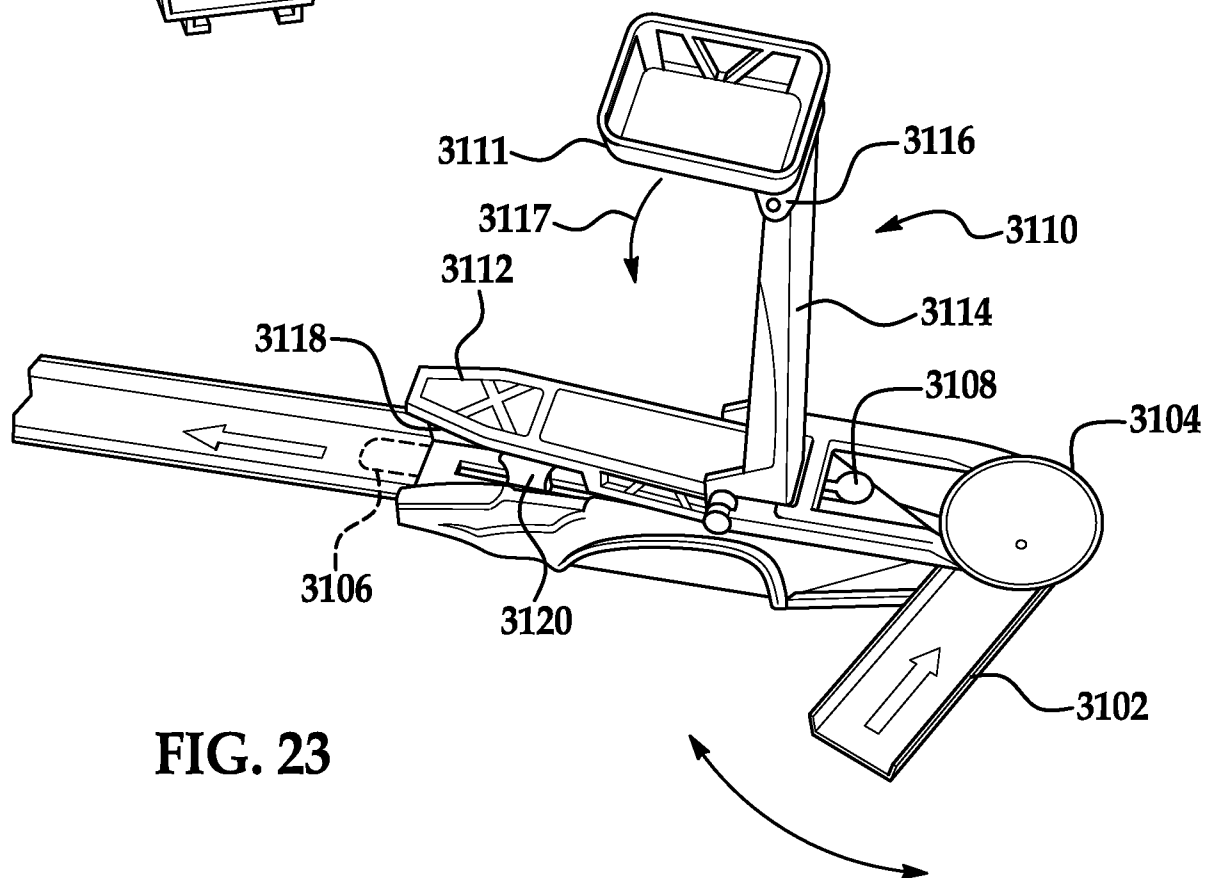


FIG. 23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/061820**A. CLASSIFICATION OF SUBJECT MATTER***A63H 18/10(2006.01)i, A63H 18/00(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 : A63H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility model since 1975

Japanese utility models and applications for utility model since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) & Keywords: "track", "toy", "trigger", "launcher"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0287918 A1 (SHELTMAN, D. A. et al.) 29 December 2005 See claims 1-6 and figures 1-3	1, 8, 9, 14-16 23, 24, 26
Y		6, 7, 20-22, 29
A		2-5, 10-13, 17-19, 25, 27, 28
Y	US 5871385 A (HIPPELY, K. A. et al.) 16 February 1999 See claims 1-10 and figures 1-5	6, 7, 20-22, 29
A		1-5, 8-19, 23-28
A	US 2005/0191938 A1 (SHELTMAN, D. A. et al.) 01 September 2005 See claims 1-4 and figures 1-3	1-29
A	WO 93/03808 A1 (MATTEL, INC.) 04 March 1993 See claims 1 and figures 1-4	1-29



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

17 OCTOBER 2008 (17.10.2008)

Date of mailing of the international search report

17 OCTOBER 2008 (17.10.2008)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

HWANG, Joon Seok

Telephone No. 82-42-481-8431



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/061820Patent document
cited in search reportPublication
datePatent family
member(s)Publication
date

US 2005-287918 A1

29.12.2005

None

US 5871385 A

16.02.1999

None

US 2005-191938 A1

01.09.2005

None

WO 93/03808 A1

04.03.1993

AU 1797492 A

16.03.1993