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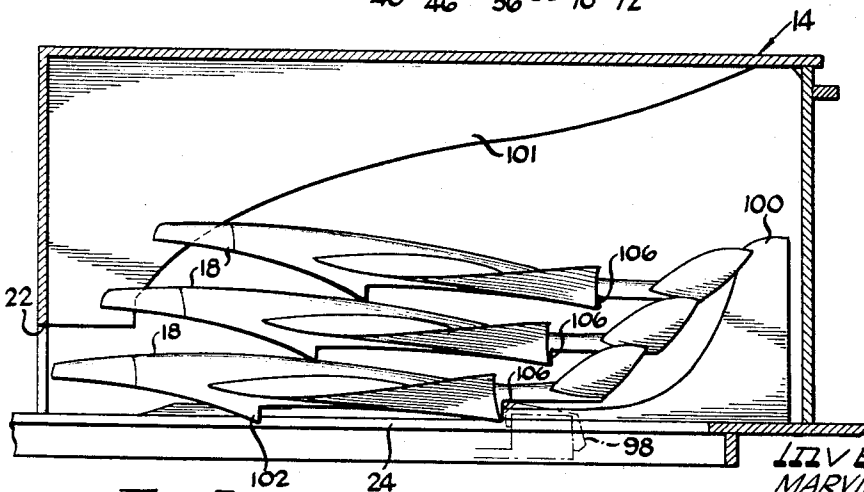
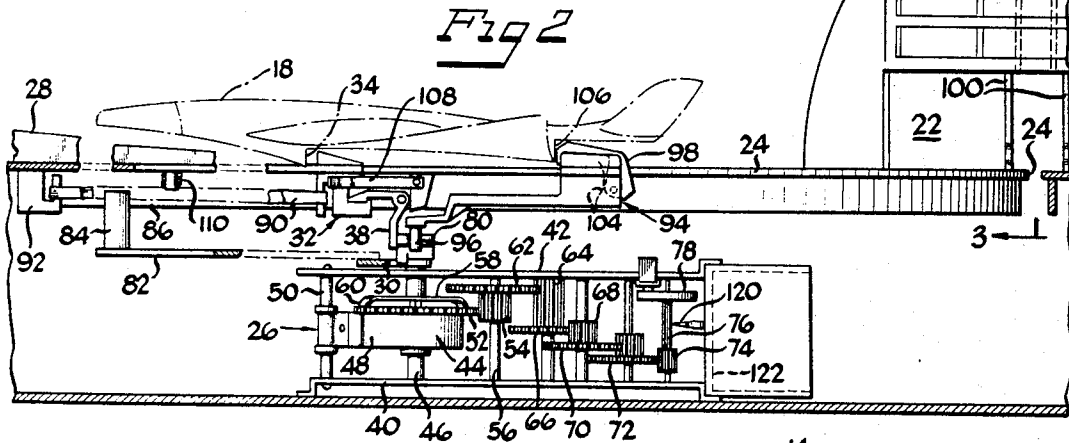
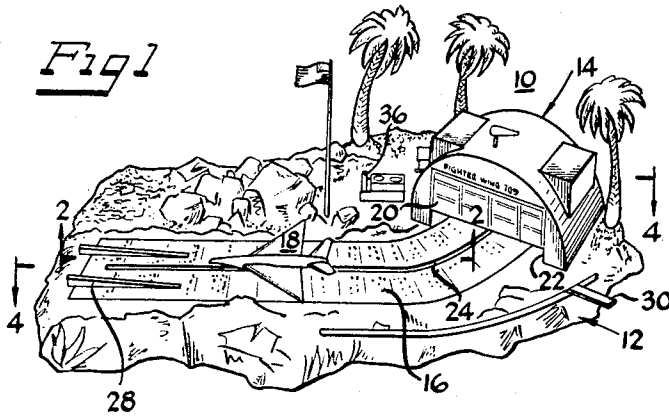
M. I. GLASS ET AL

3,408,768

TOY AIRPLANE LAUNCHING DEVICE

Filed May 5, 1965

2 Sheets-Sheet 1



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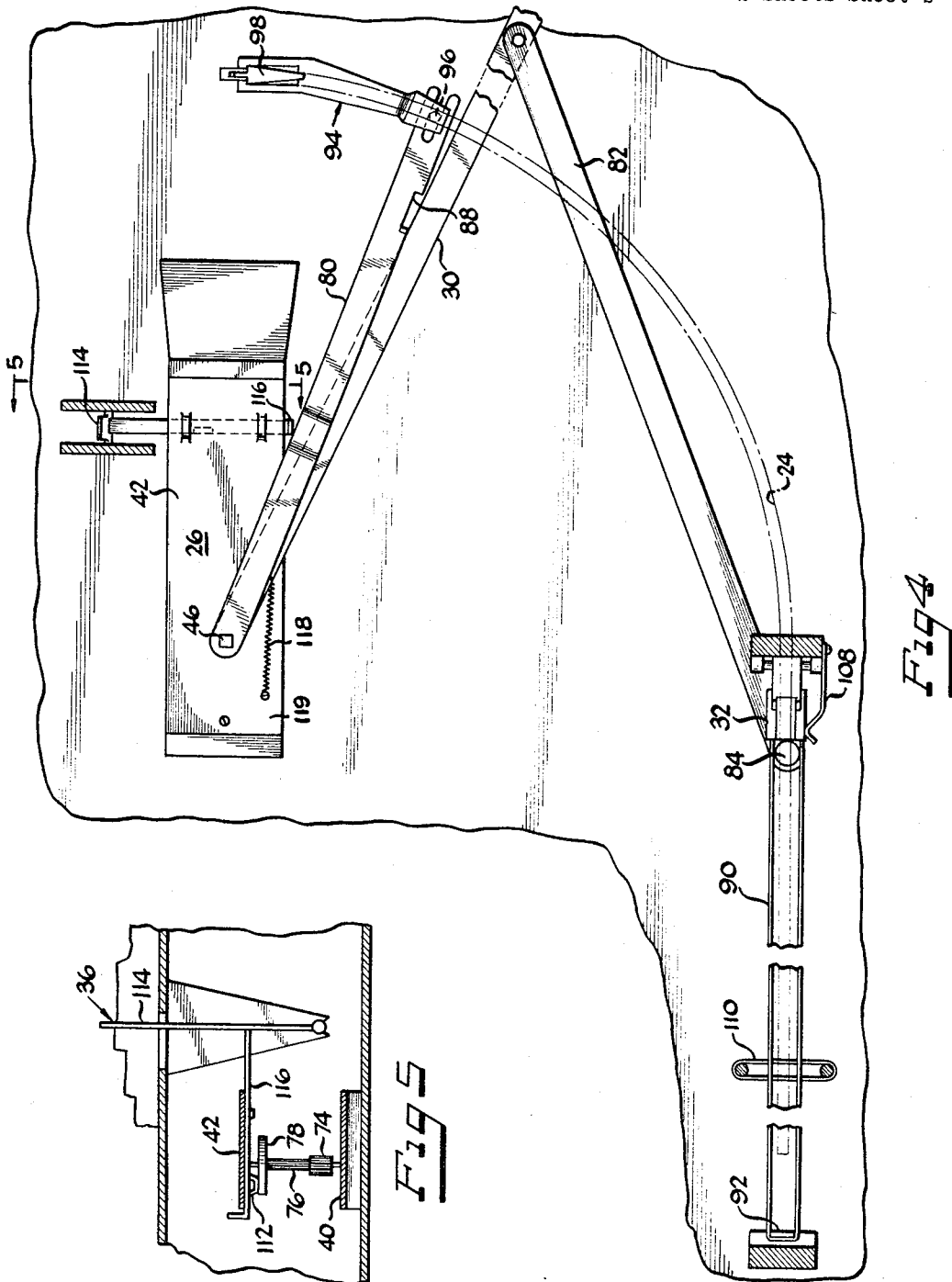
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TOY AIRPLANE LAUNCHING DEVICE

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ABSTRACT OF THE DISCLOSURE

A toy aircraft launching device comprising an elongated hollow base structure with a slot in the upper wall thereof, drive means mounted within the base structure and including a part projecting upwardly in the slot and movable through a path defined by the slot between a first position and a second position, means at the first position providing for the stacking of a plurality of toy airplanes, and a launching element disposed in the slot on the base structure at a position forwardly of the second position. The launching element is biased toward the forward end of its path of movement and away from the second position, and a latch mechanism is provided for releasably holding the launching element in its biased position adjacent the second position. The projecting part of the drive means engages the lowermost toy airplane at the first position and moves it through the slot to the second position where it is transferred onto the launching element. As the projecting part thus reaches the second position in the slot, it trips the latch mechanism to effect launching of the airplane.

The present invention relates generally to a toy and is particularly directed to a toy aircraft launching device.

It is a primary object of the present invention to provide a toy aircraft launching device which is operable to move a toy airplane along a path and into position at which it propels the airplane into the air. A further object of the invention is to provide means for automatically moving a toy airplane through a predetermined path and then at a given position in such path propel the airplane upwardly into the air. Still another object is to provide a toy airplane launching means including a spring wound motor mechanism and a linkage which is driven from such mechanism, which is operable to move a toy airplane along a predetermined path while emitting a high pitched sound simulating a jet motor noise and which propels the airplane into the air at a predetermined point along such path. A further object of the invention is to provide a toy airport including a hangar and a landing strip, wherein a plurality of toy airplanes are stacked in the hangar and then withdrawn from the hangar one at a time to be moved along the landing strip to a position spaced from the hangar where the airplane is propelled into the air. Further objects and advantages will become apparent from the following description of the embodiment illustrated in the accompanying drawings, wherein:

FIGURE 1 is a perspective view of the toy airport;

FIGURE 2 is an enlarged sectional view taken generally along the line 2—2 in FIGURE 1;

FIGURE 3 is a sectional view taken along the line 3—3 in FIGURE 2;

FIGURE 4 is an enlarged fragmentary sectional view, taken generally along the line 4—4 in FIGURE 1, illustrating the mechanism seen in FIGURE 2 with parts thereof having been moved to another position; and

FIGURE 5 is a sectional view taken along the line 5—5 in FIGURE 4.

With reference first to FIGURE 1, the illustrated embodiment of this invention comprises generally a toy airport 10 including a three-dimensional base section 12 depicting a landscape, and the upper surface of the base

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includes a hangar 14 and an airstrip 16 leading from the hangar and extending lengthwise of the base. A plurality of toy airplanes 18, preferably of light weight plastic material, are provided with the airport and are adapted to be stacked within the hangar in superimposed relation to each other, as seen in FIGURE 3. The lower portion of the hangar door 20 (FIGURE 2) is open sufficiently to permit withdrawal or movement of the lowermost airplane from the hangar through the opening 22. Extending from the hangar is a simulated concrete airstrip including a central slotted portion 24 extending from a position within the hangar to a position adjacent the end of the airstrip. Concealed within the hollow base is the aircraft launching mechanism 26 which is operable to pull the lowermost airplane from the hangar along the path of the slot 24 and, at a predetermined point on such path, propel the airplane upwardly into the air. The upward movement of the airplane is preferably aided by a pair of inclined launching strips 28 located at the far end of the runway. The described launching action is effected by movement of a lever 30 extending outwardly of the base and movable from a forward position to a position underlying the hangar. Such movement winds the spring motor mechanism 26 and causes a launching assembly 94 to engage a depending edge portion 106 on the airplane, and subsequent release of the drive means and launching assembly by movement of a release lever 36 causes the launching assembly 94 to move from the hangar 14 through slot 24 at a relatively slow rate of speed until it reaches a previously tensioned launching element 32 releasably held by a latch means 38 and trips the latch to release element 32 and provide a sudden force against the airplane which propels it forwardly and upwardly.

More particularly, the launching mechanism 26 within the base (FIGURE 2) comprises a pair of frame members 40, 42 fixed to the base in spaced-apart parallel relation and mounting a spring motor and a series of gears providing a speed reduction drive means. A main drive shaft 46 has fixed thereto an inner end of a flat spring coil 48 having its outer end portion fixed to a transverse shaft 50 on the frame. The flat coil spring provides a spring wound motor for the mechanism, and the shaft 46 also has rotatably mounted thereon a main drive gear 52 which is disposed in meshing engagement with a spur gear 54 rotatably mounted on a second shaft 56. A conventional one-way clutch means is provided in the form of a member 58 which is fixed to shaft 46 for rotation therewith and which has opposite end portions 60 disposed for cooperation with recesses (not shown) in the upper face of drive gear 52. As shaft 46 is rotated to wind or tension the spring 48, the clutch portions 60 slide over the openings in the gear face to permit the gear to remain stationary. However, upon release of the tensioned spring to cause shaft 46 to rotate in the opposite direction, the clutch portions engage a pair of the openings and effect an accompanying rotation of the drive gear 52. The spur gear 54 is integral with a larger gear 62 providing means for driving through a series of gears 64, 66, 68, 70, 72 to a pinion gear 74 at the end of the gear train. The pinion gear 74 is rotatable in unison with an elongated gear or corrugated shaft section 76 and a flywheel 78 which also comprises part of the locking means for the motor drive mechanism.

The main drive shaft 46 has fixed to its upper end portion an elongated member or lever 80 (FIGURE 4) which is bifurcated at its free end and the latter is movable through the arcuate path defined by the slot 24 in the airstrip. Loosely mounted on the main drive shaft 46 just below the elongated member 80 is the lever 30 which has its free end projecting outwardly of the base to provide the handle for conditioning or "cocking" the launching mechanism. An outer portion of this lever 30 has a

pivotal connection with one end of a second link 82 which includes a vertically extending pin 84 on its other end for movement through a guideway defined beneath the forward portion of the slot in the airstrip by side wall portions 86 extending beneath the slot. The lever 80 has a downwardly bent section 88 disposed in the path of the lever 30, so that movement of the latter in a counterclockwise direction, as seen in FIGURE 4 effects movement of the lever 80 and the main drive shaft 46 to thereby wind the flat coil spring 48. Such movement of the linkage also draws the pin 84 rearwardly from the position seen in FIGURE 2 to the position seen in FIGURE 4. This movement forces the slidable launching part 32 positioned in the slot 24 against the biasing action of a rubber band 90 extending between such part and a bracket 92 on the base, to a position of engagement with the releasable latch member 38 wherein the rubber band is then held taut. More particularly, the rear position of the launching part 32 includes a shoulder which is thereby engageable with a cooperating shoulder portion on the pivotally mounted latch element, as seen in FIGURE 2.

At the outer end of the motor driven lever 80 is the assembly 94 including a pin 96 at the forward end engaging the bifurcated end of the lever 80 for movement with the latter through the path of the slot 24. The rearward portion of this assembly 94 includes a pivotally mounted piece 98 which is engageable with a rear or tail portion of the toy airplane. In this respect, it is to be noted in FIGURE 3 that the planes are stacked within the hangar 14 with the fuselage portions disposed between ribs 100 and ribs 101 so as to guide the planes downwardly to a position wherein a portion 102 of the lowermost plane rests within the slot 24. A small leaf spring 104 (FIGURE 2) biases the pivotally mounted pusher piece 98 upwardly, so as to permit the piece to be depressed as the assembly 94 moves back in the hangar beneath the stacked planes and to then move upwardly as the piece 98 reaches the tail section to thereby increase the area available for engagement with a shoulder section 106 on the tail to facilitate pushing the plane from the hangar. Forward movement of the lever 80, to the left in FIGURE 4, effects movement of the lowermost airplane from the hangar and to the position seen in FIGURE 2, where the airplane is then moved over the launching element 32 to a position such that a rearwardly facing shoulder portion on the airplane is forwardly of a vertical forward surface of the launching element. As the lever 80 moves the assembly 94 to this position the free end of lever 80 also strikes the lower arm of the latch 38 to swing the latter upwardly and thereby release the launching element 32 for forward movement in response to the tension provided by the rubber band 90. A flat spring 108 is fixed to the base in position to press against the side of the launching element 32 so as to retard the initial forward movement of the latter until there is firm engagement of the forward edge of the launching element with the rearward shoulder on the airplane. This insures a firm engagement between the two pieces to provide the most satisfactory propelling force on the airplane. Further, there is provided a second rubber band 110 transversely of slot 24 and in the path of launching element 32 to limit the movement and absorb the shock of the latter during launching operations. As indicated previously, the inclined strips 28 on the runway just ahead of the launching position are disposed for engagement by the wings of the plane and assist in lifting the airplane upwardly. If desired, these strips may be adjustable vertically to cause a change in the path of the plane, such as banking to the left or right or climbing at a steeper angle etc.

In order to hold the spring wound motor and gear train in a position of readiness or a "cocked" condition, there is preferably provided a lock-out in the form of pivotally mounted lever 36 (FIGURES 4 and 5) having a detent 112 frictionally engageable with a recess in the

upper surface of the flywheel 78. One arm of this lever projects upwardly through the base and the other arm 116 is positioned for engagement by the lever 80 to move the detent 112 into the recess and lock the drive mechanism after the spring motor is wound. In this respect, a spring 118 (FIGURE 4) is connected between lever 30 and an upper plate portion 119 of launching mechanism 26, in order to move lever 30 to a position shown in FIGURE 2 out of the way of movement of releasing latch 32. Movement of the arm 114 forces the detent from the recess and away from the flywheel 78 so that the gear train is set in motion and gear 76 can move at a relatively high speed. The relatively high speed rotation of gear 76 is utilized to provide an accompanying sound simulating the whine of a jet motor. More specifically, the sound is produced by a very thin and flexible member or reed 120 fixed at one end to a sounding diaphragm 122 (FIGURE 2) and having its free end in position for striking engagement by the corrugation in the elongated gear element 76. The sound continues as a plane is brought out of the hangar and then fades away as the plane is launched and the spring driven mechanism stops.

Thus it is seen that there is provided a novel and amusing toy aircraft launching device affording action simulating a real airport. Although shown and described with respect to particular structure, it will be apparent that various modifications might be made without departing from the principles of this invention.

What is claimed is:

1. A toy aircraft launching device comprising a base structure defining a runway for toy airplanes, means defining a slot extending lengthwise of said runway, drive mechanism mounted on said structure beneath said runway and including a part projecting upwardly through said slot and movable through a path defined by said slot, said launching device including biasing means mounted on said structure beneath said runway and a launching element projecting upwardly through said slot and movable through a forward portion of said slot, means for releasably latching said launching element in a biased condition, said drive mechanism including means operable to move said part to further move a toy airplane through a rearward first portion of said path and position the airplane on said launching element, and said latch means being operable upon engagement thereof by said means of said drive mechanism to release said launching element for forward movement along said slot to propel the airplane forwardly.

2. A toy aircraft launching device comprising a base structure defining a runway for toy airplanes, means defining a slot extending lengthwise of said runway, drive mechanism mounted on said structure beneath said runway and including a part projecting upwardly through said slot and said drive mechanism including means for moving said part through a first portion of the path defined by said slot, said launching device including biasing means mounted on said structure beneath said runway and a launching element separate from said projecting part and projecting upwardly through said slot and movable through a second path portion which is a forwardly extending continuation of said first portion, and means for releasably latching said element in a biased condition immediately forward of the end of said first path portion, said latch means being operable upon engagement thereof by said means for moving said projecting part to release said launching element for movement.

3. A toy aircraft launching device comprising a base structure defining a runway for toy airplanes, means defining a slot extending lengthwise of said runway, drive mechanism mounted on said structure beneath said runway and including a part projecting upwardly through said slot for engagement with a toy airplane and said drive mechanism including means for moving said part through a first portion of the path defined by said slot,

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said launching device including biasing means mounted on said structure beneath said runway and a launching element separate from said projecting part and projecting upwardly through said slot and movable through a second path portion which is a forwardly extending continuation of said first portion, means for releasably latching said element in a biased condition immediately forward of the end of said first path portion, said latch means being operable upon engagement thereof by said means for moving said projecting part to release said launching element for movement, and means for effecting operation of said drive mechanism to move said projecting part from a rearward position in said slot through said first path portion to a forward position adjacent said launching element.

4. A toy aircraft launching device comprising an elongated hollow base structure including a generally horizontal upper wall presenting a flat upper surface, means defining an elongated slot in said upper wall which extends a substantial distance along the length thereof, drive mechanism mounted on said structure within said base structure including a part projecting upwardly in said slot and said drive mechanism including means for moving said part through a path defined by said slot between a first position and a second position, said projecting part in said slot being constructed to engage a rearward lower portion of a toy airplane and move the latter forwardly to said second position along the slot, a launching element mounted on said structure and disposed in said slot forwardly of said second position for movement through a continuation of the path defined by the slot between said first and second positions, means for biasing said launching element toward the forward end of the path and away from said second position, latch means for releasably holding said launching element in its biased position adjacent said second position, said launching element being adapted for engagement with said toy airplane, and said means for moving said projecting part being adapted to engage said latch means so that as an airplane is brought up to said second position and positioned on said launching element the latch means is tripped to effect rapid forward movement of said launching element.

5. A toy aircraft launching device comprising an elongated hollow base structure including a generally horizontal upper wall presenting a flat upper surface, means defining an elongated slot in said upper wall which extends a substantial distance along the length thereof, drive mechanism mounted on said structure within said base structure including a part projecting upwardly in said slot and movable through a path defined by said slot between a first position and a second position, means at said first position providing for the stacking of a plurality of toy airplanes in superposed relation to one another, said projecting part in said slot being constructed to engage a rearward lower portion of the lowermost airplane and move the latter forwardly to said second position along the slot, a launching element mounted on said structure and disposed in said slot forwardly of said second

position for movement through a continuation of the path defined by the slot between said first and second positions, means for biasing said launching element toward the forward end of the path and away from said second position, latch means for releasably holding said launching element in its biased position adjacent said second position, said drive mechanism including a portion within said base structure which is movable with said projecting part into engagement with said latch means to operate the latter so that as an airplane is brought up to said second position by said projecting part and positioned on said launching element the latch means is tripped to effect rapid forward movement of said launching element.

6. A toy aircraft launching device comprising an elongated hollow base structure including a generally horizontal upper wall presenting a flat upper surface, means defining an elongated slot in said upper wall which extends a substantial distance along the length thereof, drive means mounted on said base structure within said base structure including a part projecting upwardly in said slot and movable through a path defined by said slot between a first position and a second position, means at said first position providing for the stacking of a plurality of toy airplanes in superposed relation to one another, said projecting part in said slot being constructed to engage a rearward lower portion of the lowermost airplane and move the latter forwardly to said second position along the slot, a launching element mounted on said base structure and disposed in said slot forwardly of said second position for movement through a continuation of the path defined by the slot between said first and second positions, means for biasing said launching element toward the forward end of the path and away from said second position, latch mechanism for releasably holding said launching element in its biased position adjacent said second position, said launching element being adapted for engagement with a forward lower portion of a toy airplane, said projecting part including means cooperating with said launching element and latch means so that as an airplane is brought up to said second position and positioned on said launching element the latch means is tripped to effect rapid forward movement of said launching element, means for effecting operation of said drive means to move said projecting part between said first and second positions along said path, and a sound making device operable by said drive means to simulate a jet motor noise during said movement of said projecting part.

References Cited

UNITED STATES PATENTS

2,070,721	2/1937	Feight	-----	124—16 X
2,860,620	11/1950	Effinger	-----	124—21
3,165,860	1/1965	Glass et al.	-----	46—111

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