Feb. 8, 1966 C. P. LENT 3,233,357

TOY MISSILE AND BASE

Filed July 9, 1962 2 Sheets-Sheet 1

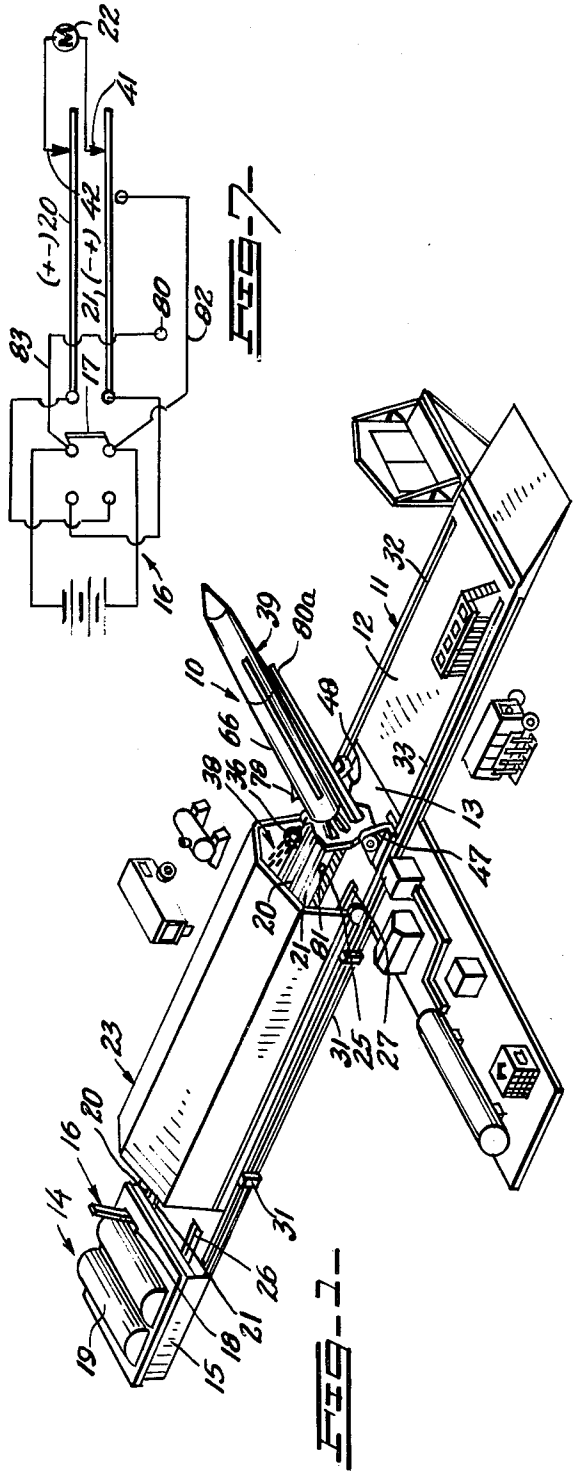


FIG. 7

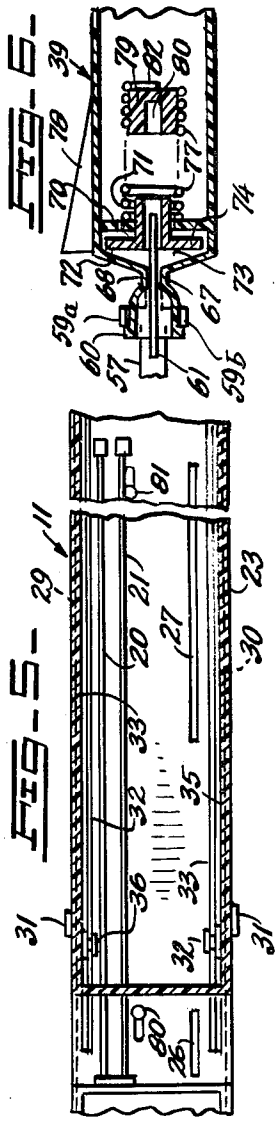


FIG. 6

FIG. 5

INVENTOR.
Constantin P Lent

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FIG. 2

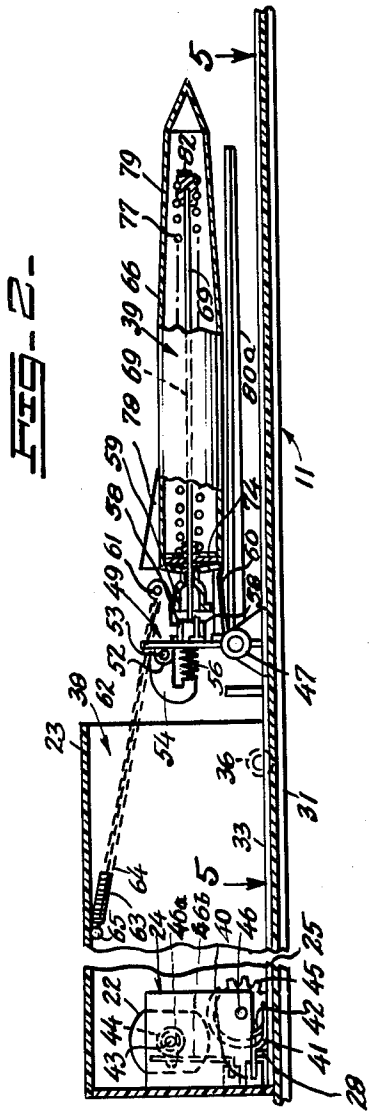


FIG. 4

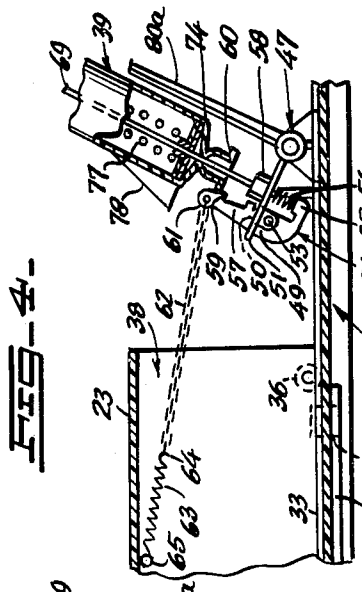
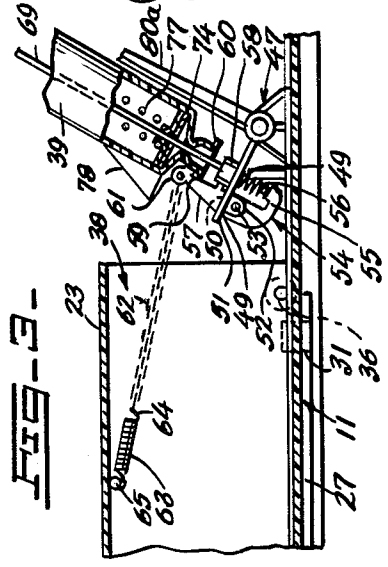


FIG. 3



INVENTOR.
Constantin P. Lent

United States Patent Office

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TOY MISSILE AND BASE

Constantin Paul Lent, 108—02 72nd Ave., Forest Hills 75, N.Y.

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11 Claims. (Cl. 46—12)

This invention relates to an electrically powered model designed for construction by the hobbyist, and more particularly to a realistic model for a missile base which includes means for firing a toy missile.

In a model missile base as disclosed herein it is desirable to provide means for moving a shelter relative to the missile by means of an electric motor driving a suitable gearing assembly in simulation of the movable hangar or shelter used in concealing and camouflaging as well as for safeguarding the full sized missile. Still further, the model missile base is improved by providing means for automatically elevating and then firing the missile off of the launching pad and table. Further, the model missile base is provided with a siren or other audible alarm indicating that the shelter is being moved and the launching table and associated missile are being elevated. Further, the model missile base, and more particularly the movable shelter is provided with a cable or chain means with one end thereof held to the shelter and the other to the launching table and the trigger firing the missile. The operation upon said cable or chain triggering and firing the missile.

Another object of this invention is to provide a model missile base with means for automatically elevating the launching table with the missile mounted thereon as the shelter for the missile is moved along the launching pad.

A further object of this invention is to provide a model missile base with suitable means for holding a missile onto the launching table and for triggering release of the missile.

A further object of the invention resides in the provision of a model missile base incorporating therein a model missile having a spring means for providing the propulsion thereof.

A still further object of the invention resides in the provision of means for automatically sounding an alarm as the shelter for the missile is moved along the launching pad.

A still further object of the invention resides in the provision of cable or chain means connected between the movable shelter and the launching pad, and means for automatically pulling on said cable or chain when the shelter is moving for triggering release of the missile.

A still further object of the invention resides in a chain connected between the shelter and the trigger means so that as the shelter is moved from a position with the missile being horizontal and with the shelter overlying the missile to uncover the missile to a position with the missile being substantially upright, the chain will first rotate the launching table to elevate the missile and then to actuate the trigger means to release the missile so that the spring in the missile will propel the missile off of the launching pad.

A still further object of the invention resides in a chain and spring connected between the shelter and the trigger means, so that as the shelter is moved the chain and spring will first rotate the launching table to elevate the missile and then to actuate the trigger means for triggering release of the missile.

A still further object of the invention resides in a chain connected between the shelter and the trigger means, so that as the shelter is moved the chain will actuate the trigger means for triggering release of the missile.

These, and other objects of the invention will become apparent as the following description proceeds, a preferred embodiment of which is illustrated in the accompanying drawings, by way of example only, wherein:

FIG. 1 is a perspective view of an embodiment of the missile base;

FIG. 2 is a partial longitudinal sectional view of the missile base illustrating the launching pad, the launching table, missile and shelter;

FIG. 3 is a schematic sectional view illustrating the manner in which the movement of the shelter will cause the launching table to be tilted to elevate and orientate the missile;

FIG. 4 is a sectional detail view similar to FIG. 3 illustrating the manner in which further movement of the shelter will cause the trigger means to release the missile for the firing thereof;

FIG. 5 is a horizontal sectional detailed view taken along the line 5—5 of FIG. 2 illustrating the construction of the launching pad;

FIG. 6 is a modification of FIG. 3; and

FIG. 7 is a circuit diagram showing the manner in which the polarity of the motor can be changed to drive the shelter forward or in reverse and to prevent override.

In reference to the drawings, and more particularly to FIG. 1, reference numeral **10** designates the missile base constructed in accordance with the embodiment of the present invention. The base is adapted to be molded out of various suitable materials and substantially all of the parts of this model are molded from polystyrene with the exception of the metallic conductors and contacts as well as the electric motor utilized for operating the movable parts of the model. The model missile base **10** includes a launching pad **11** which has a front section **12** and a rear section **13**. A battery housing **14** is attached to the rear end of the rear section **13**.

The battery housing **14**, as can be seen in FIG. 1 includes a housing section **14** in which there is mounted pairs of battery terminals and suitable batteries (not shown). Connected to said terminals is a switch mechanism **16** controlled by switch lever **17** extending upwardly through the lower battery housing section **14** and through a slot **18** formed in the battery housing cover **19**. The switch **16** is adapted to direct current to the conductive rails **20** and **21** which are embedded in the launching pad **11**. The switch lever **17** is designed to have three positions. The positions are designed to provide positive polarity for the rail **21** and negative polarity for the rail **20** while another position of the switch lever **17** will reverse the polarity of the rails. A third position is an "off" position. This enables the motor **22** driven by the power from the batteries (not shown) to be operated selectively in either direction.

The motor **22** is mounted within the shelter or the shed **23** and is attached to a gear case **24** fixed within the shelter. The shelter is adapted to be moved along the launching pad **11**.

As can be seen from FIG. 5, the launching pad **11** is provided with a gear rack **25** integrally molded with the launching pad **11**. The teeth of the rack rise up from a depressed portion in the launching pad so that the upper ends of the teeth lie substantially flush with the top surface of the launching pad **11**. The launching

pad, has, besides the metallic rails 20 and 21, and the rack 25, a pair of spaced elongated grooves 26 and 27 integrally formed therein. These grooves are adapted for engagement by the siren trigger 28. A pair of guide flanges 29 and 30 are integrally formed with the launching pad 11 on the sides thereof and are adapted to be engaged by the guides 31 placed on the front and the rear of the shelter 23. A pair of rails 32 and 33 are formed on the launching pad as well as a pair of grooves 34 and 35 which are adjacent the flanges 29 and 30 for the purpose of receiving pairs of flanged wheels 36 and 37 arranged in pairs at the front and rear of the shelter 23.

The shelter 23 has an open fromt 32 adapted to provide a housing for the missile 39. Attached to the rear wall of the shelter there is a brush mounting 40 which carries brushes 41 and 42 to the motor 22 so that electric current in the rails 20 and 21 will drive the motor 22. The motor 22 drives a shaft 43 on the end of which there is mounted a drive pinion 44. This pinion is in mesh with a train of gears (not shown) in the gear case 24. A gear 45 mounted on the shaft 46 extends from the gear case 24 and is meshing with the gear rack 25 of the launching pad. Hence, operation of the motor 22 in either direction due to the polarity of the rails 20 and 21 will cause the pinion 44 to drive the speed reducing gear assembly and thus subsequently drive the gear 45 along the rack 25 thereby moving the shelter 23.

Fixed to the shelter 23 is a leaf spring 46. The free end 47 of the leaf spring is adapted to engage the pinion 44 to cause vibration of the leaf spring thereby to emit an audible sound.

As illustrated in FIGS. 1, 2, 3 and 4 there is cemented to the launching pad 11 a pair of trunnions 47 and 48 which provide a pivotal mounting for the launching table or platform 49. The launching table includes a slot 50 formed adjacent to the edge 51 of the launching table and adjacent to the slot 50 there is provided a pair of eyes 52. A shaft 53 extends into the eyes and a trigger 54 is pivoted on the shaft and extends through the slot. The trigger 54 has an L-shaped portion 55 to which one end of the spring 56 is connected, the other end of the spring fitting over a lug integrally formed with the launching table 49. The trigger has another portion 57 provided with a stop for engaging the rib 58 for limiting the lowermost position of the trigger and is provided with a hook portion 59 for engaging the terminal flange 60 of the missile 39. An eye is formed at the end of the hook portion 59 so that the end 61 of a chain 62 can be readily connected to the trigger 54, a spring 63 being connected to the other end 64 of the chain and to any suitable connecting member 65 on the shelter 23.

The missile 39 is preferably formed in two halves which are cemented together and has an elongated body 66 which tapers at the front part and terminates in a conical nose. The tail section of the missile is provided with a restricted portion 67 having a bore 68 forming a guide for the rod 69. Within the cylindrical body there is provided a peripheral flange 70 defining an opening 71. A spring holder 72 is positioned in the space 73 between the restricted section 67 and the flange 70, the spring holder 72 including a disc portion 74 and a tubular portion 75. The spring holder has a bore 76 therethrough adapted to align with the bore 68 and is designed to function in conjunction with the spring 77 to maintain the wider rear end 78 of the spring in place. The other end of the spring has seated therein a spring cap 79 provided with a recess 80 into which the end of the rod 81 is adapted to extend, the cap being limited in its forwardmost position by the closed front end 62 of the spring. A serving arm 80*a* is cemented to the launching table and extends substantially paraliel to the rod 69 and is spaced from the missile. The missile 39 is mounted on the launching table 49 by positioning it over the rod 69 until the rod extends through the restricted portion 67, through the bore 76, and into the recess 80. Thus the missile is forced along the rod 69 tensioning the spring 77 until the trigger 54 is engaged so that the hook portion 59 is cammed over the flange 60 until the hook portion 59 engages the flange 60 to hold the missile to the launching table. In order to stabilize the missile in flight, a plurality of fins 78 may be affixed thereto.

FIG. 6 shows a modification. Whereas FIGS. 1 to 4 inclusive show the utilization of a toggle trigger 54 having one single hook portion 59, in the latter case the trigger 54 is provided with a double, or two hook portions 59*a* and 59*b*. In certain applications it was found that the locking and holding action of the trigger 59 is more secure when two hook portions are available, instead of one, to hold the flange 60 down before launching the missile 39.

OPERATION

The operation of this missile base is initiated by pressing the missile 39 onto the rod 69 until the hook portion 59 of the trigger engages the flange 60 to hold the missile in the cocked position. Then, the switch lever 17 is thrown to start the shelter moving from its forward position overlying the missile. As the shelter moves, the chain 62 will pull the launching table 49 with the missile thereon to an elevated position shown in FIG. 3. Further movement of the shelter will cause tension of the spring 63 to increase until the spring 56 is so compressed that the trigger releases the missile 39 so that the rocket fires immediately after the table 49 has been tilted to the upright position in engagement with the U-shaped stop 90.

Of course, the length of the chain 62 can be adjusted so that the missile fires at the optimum point of operation. As the shelter continues going back the spring contact 41 will ride over the raised contact 80 in the base, lifting the former from the contact with the rail 21, breaking the circut and discontinuing the flow of current to the motor.

To move the shelter forward, the switch 16 is shifted to a position opposite to the one occupied by it, reversing the polarity of the circuit and the motor respectively. The shelter in its forward motion will pull the spring contact 41 off the raised contact 80 to drop it into the rail 21, to re-establish the contact with the rail. The shelter will continue moving forward until the contact 41 reaches to and rides over the other raised contact 81 on the base, lifting the spring contact 41 above the rail 21 to brake its electric contact with the rail. With spring contact 41 now resting on the raised contact 81, an electrical connection is established with the wire 82.

To move the shelter back, to its original starting position, the switch 16 is shifted to its former position, reversing the polarity of the circuit and the motor respectively, inducing the latter to run in reverse. The shelter will begin moving backwards pulling the spring contact 41 off the raised contact 81 to drop it on the rail 21, re-establishing its original electric contact with the latter. The shelter will continue to move back until the spring contact strikes the raised contact 80. Further movement of the shelter will force the spring contact 41 to ride over the raised contact 80 lifting the former off the rail 21 to break its electric contact with the rail to establish instead a contact with the wire 83. The action of the raised spring contact 41 off the rail 21 will shut the supply of current to the motor arresting further movement of the shelter to the rear. It is now obvious that by reversing the position of the toggle switch 70, the shelter may be moved forward again. In its forward motion the spring contact 41 will fall off the raised contact 80 in the base, onto the rail 21 thus re-establishing its former contact with the rail. This process of raising the spring contact 41 off the rail and breaking the circuit repeats itself at either end of the ride of the shelter to prevent override. The manner of shifting toggle switch 16 to change polarity is evident by studying the electric circuit diagram in FIG. 7.

A latitude of modifications are obvious, and in some

instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is here intended that the appending claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What I claim is:

1. A toy missile base comprising a launching pad, a pair of trunnions fixed to said launching pad, a launching table pivotally mounted on said trunnions for receiving a missile, a shelter slidably mounted on said pad, said pad having a rack thereon, a gear carried by said shelter engaging said rack, drive means for rotating said gear to slidably move said shelter relative to said pad, sounding means carried by said shelter, said drive means engaging said sounding means to provide an audible signal upon movement of said shelter, and means connecting said shelter to said table to pivot said table upon movement of said shelter.

2. A toy missile base comprising a launching pad, a pair of trunnions fixed to said pad, a launching table pivotally mounted on said trunnions for receiving a missile, a shelter slidably mounted on said pad, said pad having a rack thereon, a gear carried by said shelter engaging said rack, drive means including a speed reduction for rotating said gear, and means including a chain connected to said shelter and to said table to pivot said table upon movement of said shelter.

3. A toy missile base comprising a launching pad, a launching table pivotally mounted on said pad, a missile mounted on said launching table, trigger means on said table detachably coupling said missile to said table, a shelter slidably mounted on said pad, means for slidably moving said shelter relative to said pad, and means connected to said shelter and to said trigger means to first pivot said table upon movement of said shelter and then actuate said trigger means to release said missile.

4. A toy missile base comprising a base, a launching table pivotally mounted on said base, a missile mounted on said launching table, trigger means on said table detachably coupling said missile to said table, a shelter slidably mounted on said base, between a position with said shelter overlying said missile and a position with said missile uncovered, means for slidably moving said shelter relative to said base, and means connected to said shelter and to said trigger means and operable upon movement of said shelter to uncover said missile to first pivot said table from a position with said missile being horizontal upon movement of said shelter to uncover said missile to a position with said missile substantially upright and then to actuate said trigger means to release said missile.

5. A toy missile base, a pair of trunnions fixed to said base, a launching platform pivotally mounted to said trunnions, a missile mounted on said launching platform, trigger means on said platform detachably coupling said missile to said platform, a shed slidably mounted on said base, means for slidably moving said shed relative to said base, between a position with said shed overlying said missile and a position with said missile uncovered, and means connected to said shed and to said trigger means to actuate said trigger means and operable upon movement of said shed to uncover said missile to release said missile.

6. A toy missile base having a rack thereon, a launching platform pivotally mounted to said base, a missile mounted on said platform, trigger means on said platform detachably coupling said missile to said platform, a shed slidably mounted on said base, a gear carried by said shed and meshing with said rack, drive means for rotating said gear and means to actuate said trigger means and operable upon movement of said shed to uncover said missile mounted to said base to release said missile.

7. A toy missile base having a rack thereon, a pair of trunnions fixed to said base, a launching platform pivotally mounted on said trunnions, a missle mounted on said platform, trigger means on said platform detachably coupling said missile to said platform, a shed slidably mounted on said base, a gear carried by said shed engaging said rack, drive means for rotating said gear for slidably moving said shed relative to said base, between a position with said shed overlying said missile and a position with said missile uncovered, sounding means carried by said shed, said drive means engaging said sounding means to provide an audible signal upon movement of said shed, and means connected to said shed and to said trigger means and operable upon movement of said shed to uncover said missile to first pivot said platform from a position with said missile being horizontal upon movement of said shed to uncover said missile to a position with said missile substantially upright and then actuate said trigger means to release said missile.

8. A toy missile base, a launching platform pivotally mounted on said base, a rod fixed at one end to said platform, a missile, a spring secured at an end thereof to the rear of said missile, a cap secured to the other end of said spring, trigger means on said table engaging said missile with said rod extending into said missile and engaging said cap holding said spring under tension, a shed slidably mounted on said base, means for slidably moving said shed relative to said base, between a position with said shed overlying said missile and a position with said missile uncovered and means and operable upon movement of said shed to uncover said missile, connecting said shed to said trigger means for first pivoting said table upon movement of said shed and then to actuate said trigger means to release said missile so that said spring will fire said missile off of said platform and said rod.

9. A toy missile having a launching pad with a rack thereon, a pair of trunnions fixed to said launching pad, a launching platform pivotally mounted on said trunnions, a rod fixed at one end of said platform, a rocket missile having a spring secured at an end thereof to the rear of said missile, a cap secured to the other end of said spring, trigger means on said platform engaging said missile with said rod extending into said missile and engaging said cap holding said spring under tension, said trigger means including a hingeably mounted arm, a pivot on which said lever is pivotally mounted, said lever having a pair of hook portions engaging said cap holding said spring under tension, a shelter slidably mounted on said pad, a gear carried by said shelter engaging said rack, drive means for rotating said gear for slidably moving said shelter relative to said pad, and means connecting said shelter to said trigger means to first pivot said platform upon movement of said shelter and then to actuate said trigger means to release said rocket missile so that said spring will fire said rocket off of said platform and said rod.

10. A toy missile base comprising a launching pad, a pair of trunnions fixed to said launching pad, a launching table pivotally mounted on said trunnions for receiving a missile, a shelter slidably mounted on said pad, said shelter normally encloses said missile, said pad having a rack thereon, a gear carried by said shelter engaging said rack, means for rotating said gear to slidably move said shelter relative to said pad and said missile to uncover said missile for firing, and means connecting said shelter to said table to pivot said table upon movement of said shelter.

11. A toy base comprising a launching pad, a launching table pivotally mounted on said pad for receiving a missile, a shelter slidably mounted on said pad, said shelter normally encloses said missile, means for slidably moving said shelter relative to said pad and said missile to uncover said missile for firing, and means connecting said shelter to said table to pivot said table upon movement of said shelter.

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RICHARD C. PINKHAM, *Primary Examiner.*

LOUIS R. PRINCE, *Examiner.*

WILLIAM R. BROWNE, *Assistant Examiner.*