April 16, 1946. S. ORKIN 2,398,391

TOY AIRPLANE

Filed March 1, 1945

Fig. 1.

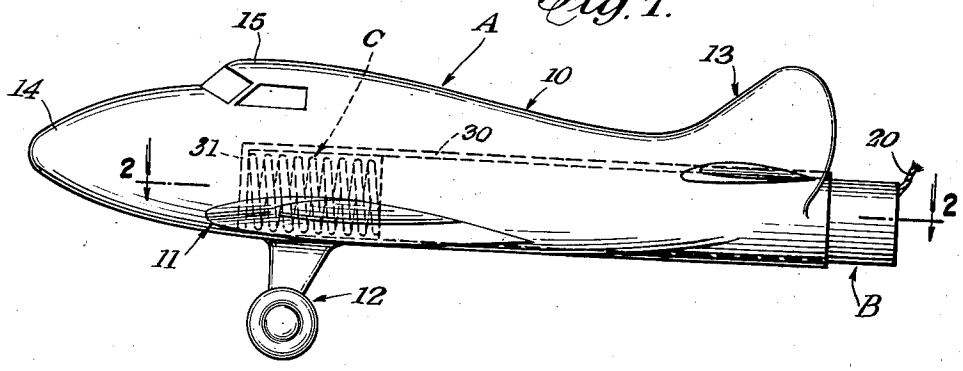


Fig. 2.

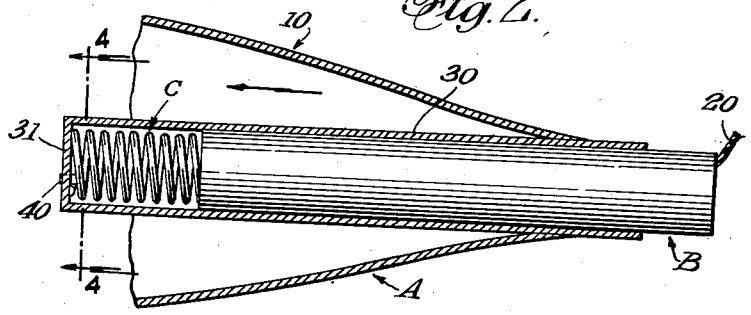


Fig. 3.

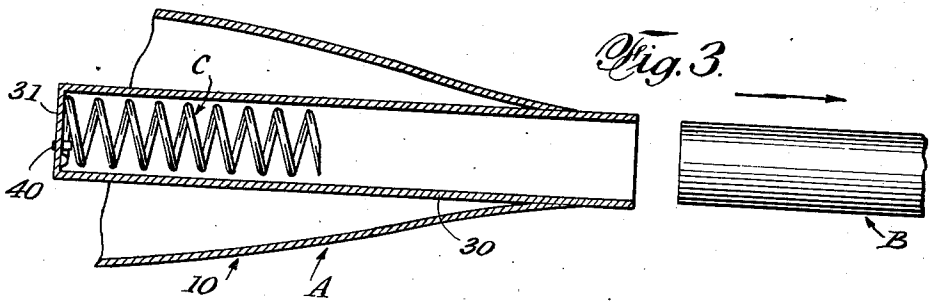
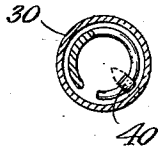


Fig. 4.



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TOY AIRPLANE

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4 Claims. (Cl. 46—76)

This invention has to do with a toy and has particular reference to a toy airplane, it being a general object of the invention to provide a simple, practical and effective toy airplane.

It is a general object of my present invention to provide a toy airplane having jet propelling means operable to drive the plane to a height from which the plane can glide. In accordance with my invention I provide a rocket propelled airplane operable to be driven by the rocket to a considerable altitude from which point the plane is free to glide as it makes its descent to the ground.

Another object of my present invention is to provide a toy airplane of the character described which acts to free itself of the propelling rocket or rocket parts upon the rocket becoming expended. By my present invention the airplane proper is driven by the rocket to a suitable height and when the rocket has expended its driving force it becomes detached from the airplane so that the airplane is lightened by the dislodgment of the rocket and is free to effectively glide.

It is another object of this invention to provide a toy airplane of the character hereinabove described involving means for ejecting an expended rocket from the airplane proper to positively assure separation of the airplane and rocket when the rocket becomes expended.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawing, in which:

Fig. 1 is a side elevation of the toy provided by my invention, showing it in the position in which it starts to fly.

Fig. 2 is an enlarged detailed sectional view taken substantially as indicated by line 2—2 on Fig. 1, showing the rocket in the position in which it is shown in Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing the rocket ejected from the airplane proper.

Fig. 4 is a detailed sectional view taken as indicated by line 4—4 on Fig. 2.

The construction that I have provided involves, primarily, an airplane A, a rocket B, and ejecting means C for ejecting the rocket from the airplane.

In accordance with the broader principles of my invention the airplane A is a toy airplane, that is, a miniature aircraft or a small-scale reproduction of a large airplane, and it may vary widely in size, shape, proportion and construction.

For purpose of example it may be considered that the airplane A is formed or built up in the manner common to toy aircraft. I have shown a monoplane type of airplane involving, generally, a fuselage 10, wings 11 projecting from the sides of the fuselage, and a tail assembly 13 at the rear or tail end of the fuselage. In accordance with typical toy aircraft construction the fuselage 10 may be a hollow or shell-like structure having parts corresponding to the parts commonly found in full size airplanes, for instance, it may have a nose portion 14, cockpit portion 15, etc.

The rocket B employed in carrying out my invention is an expendible element and is preferably an ordinary powder-charged rocket such as is commonly employed in fireworks. In the drawing I have shown a simple or common form of rocket which is round in cross-section and elongate in form. The particular rocket illustrated is flat ended and is of uniform diameter from one end to the other, and is provided at what I will term its rear end with a fuse 20. It will be understood that the rocket may be charged with any suitable powder or combination of powders so that when the fuse is ignited it ignites the powder so that the products of combustion jet from the rear end of the rocket and thus drive the rocket forward.

In accordance with the broader principles of my present invention I apply the rocket to the airplane so that the rocket when ignited serves to drive the airplane. In accordance with my preferred arrangement the rocket is engaged with the fuselage of the airplane since that element of the airplane is centrally located and is most convenient for the reception of the rocket. In practice I prefer to provide a socket member 30 in the fuselage 10 which socket is centrally located within the fuselage and is longitudinally disposed therein and is arranged so that its rear end portion is at or projects slightly from the tail end of the fuselage. The socket is preferably secured to or related to the fuselage so that it serves to reinforce or brace the airplane construction.

The particular socket element shown in the drawing is a straight tubular part fixed within the fuselage and open at its rear end, or at the tail of the fuselage, and closed at or near its forward end by a wall 31. The socket 30 is provided primarily as a slidable support or mounting for the rocket, the parts being proportioned so that the rocket freely slides in the socket. The wall 31 at the forward end of the socket is fixed and forms an abutment or reactionary part to com-

municate with forward driving force set up by the rocket, it being understood, of course, that the socket is suitably anchored or fixed in the fuselage so that the driving force from the rocket is communicated from the socket to the airplane to drive the airpane forward.

It is also to be understood that the various parts are arranged, proportioned, related and balanced so that the airplane will be driven upwardly at a suitable angle as the rocket burns, causing the airpane to be driven to a considerable height.

The ejecting means C provided by my invention is preferably a simple helical spring, that is, a compression spring arranged between the inner end 31 of the socket and the forward end of the rocket. In practice I may employ a light wire spring proportioned to effectively eject the rocket from the socket when the rocket has become expended. The spring may be a loose or floating element simply arranged freely between the end 31 and the forward end of the socket, or it may be attached to one of the parts, that is, either to the socket or to the rocket. In the particular case illustrated I have shown the spring having its forward end attached to the end 31 of the socket by a suitable clip or fastener 40.

In operating the structure of the present invention the rocket B is arranged in the socket 30 preferably so that it has a small portion projecting from the rear end of the airplane to avoid danger of any part of the airpane becoming ignited by the products of combustion issuing from the rocket. Where the ejecting means is to be employed as it preferably is, the spring forming the ejecting means is arranged in the socket ahead of the rocket. To operate the toy it is arranged at the proper angle for flight and the fuse 20 is ignited. The combustion or operation of the rocket drives the plane forward and, due to the manner in which it has been launched and the setting of the parts, such as the wings and tail parts, it advances forward and upward to a considerable height. So long as the rocket operates, that is, as long as the products of combustion are issuing from the rear end of the rocket at a rate to drive the airplane the rocket remains in the socket and its forward thrust is communicated to the airplane to drive it forward.

When the rocket becomes expended, and this ordinarily will happen suddenly, as the powder burns out, the ejecting means acting between the forward end of the rocket and the end 31 of the socket, having been put under compression due to the forward thrust of the rocket, acts to eject the rocket from the socket. Since the rocket fits loosely or freely in the socket it is easily ejected therefrom and will fall from the socket by gravity if the plane is in the proper position.

Once the rocket has been ejected from the airplane the airplane continues in flight, the parts being balanced and proportioned so that the airplane will naturally glide. The airplane having been driven to a substantial height by the rocket will glide a considerable distance, and its performance in the air when the plane is properly designed will afford an unusual degree of amusement.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims:

Having described my invention, I claim:

1. A toy including an airplane having a hollow fuselage open at its tail end and wings carried by the fuselage, a rocket inserted in the fuselage through its open end and free to fall therefrom when expended, and means for ejecting the rocket from the fuselage.

2. A toy including an airplane having a hollow fuselage open at its tail end and wings carried by the fuselage, a rocket inserted in the fuselage through its open end and free to fall therefrom when expended, and a compression spring for ejecting the rocket from the fuselage.

3. A toy including an airplane having a fuselage and wings, a socket in the fuselage open at the tail end thereof, a rocket engaged in the socket free to fall therefrom, and means for ejecting the rocket from the socket.

4. In combination, two members, one a toy airplane the other a rocket, the airplane having an opening to loosely hold the rocket, a spring for ejecting the rocket from the airplane, and means fastening the spring to one member.

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