Feb. 24, 1948. B. P. WATTS 2,436,705

SOUND DEVICE FOR TOY AIRPLANES

Filed March 20, 1946

FIG. 1.

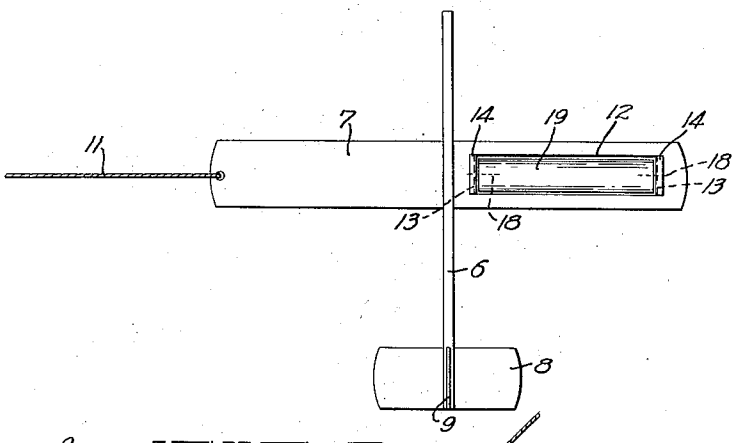


FIG. 5.

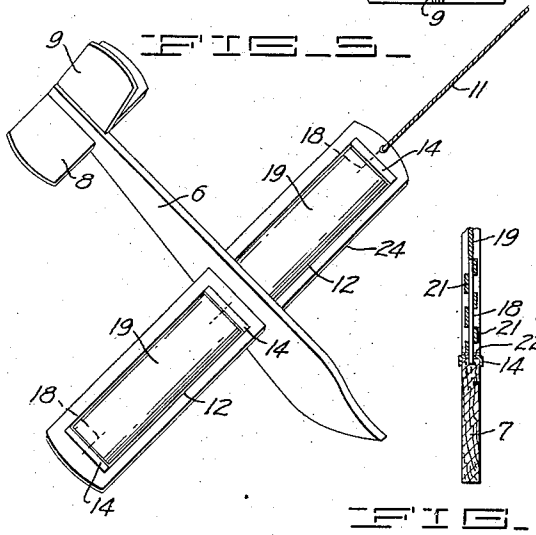


FIG. 2.

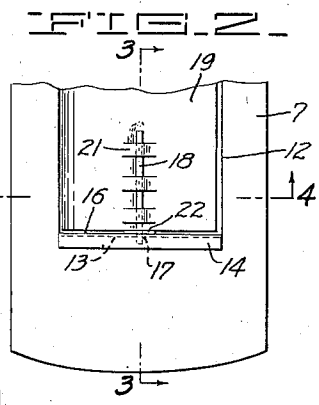


FIG. 3.

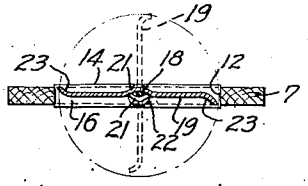


FIG. 4.

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SOUND DEVICE FOR TOY AIRPLANES

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2 Claims. (Cl. 46—52)

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This invention relates to toys capable of aerial flight and has particular reference to sound devices to be used with such toys for simulating motor and propeller flight noises of actual airplanes.

An object of the invention is to provide a flight-actuated sound device for toys of the character described which is capable of emitting a train of comparatively low-frequency pulsations designed to approximate the pitch of the sound emanating from an actual airplane in flight.

Another object of the invention is to provide a sound generating device, for use with aerial flying toys, which is capable, when in operation, of imparting to the body of the toy reactionary vibrations capable of creating in the air through which the toy is flying sound-producing undulations in addition to those created directly by the sound generating device.

A further object of the invention is to provide a sound generating device of the character described which is arranged to be contained entirely within the body of a structural element of the toy in such a manner that nothing is added to the normal frontal resistance of the element to flight through the air.

Still another object of the invention is to provide a sound generating device for aerial flying toys which is capable of producing vibratory pulsations in a large volume of air, as compared with the bulk of the toy, without substantially upsetting the static or flight balances of the toy.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to the drawing:

Figure 1 is a top plan view of a toy airplane in which the sound device of my invention is embodied.

Figure 2 is an enlarged top plan view of the end portion of the wing showing the means for attaching the sound device thereto.

Figure 3 is a vertical sectional view taken in the plane indicated by the line 3—3 of Figure 2.

Figure 4 is a vertical sectional view taken in the plane indicated by the line 4—4 of Figure 2.

Figure 5 is a perspective view of a toy airplane showing the application thereto of multiple sound devices.

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In carrying out my invention I provide a toy simulating an aeronautical device which for the purposes of this description I have chosen to illustrate as an airplane having a fuselage 6, a flight wing 7, and horizontal and vertical stabilizers 8 and 9 respectively all of which may be constructed of balsa wood, sheet fiber or any other lightweight material possessing adequate structural strength and rigidity. The various parts of the toy may be assembled in permanent or relatively demountable relationship as desired. I provide a bridle 11 comprising a flexible cord of any desired length which has one end thereof secured to the toy, preferably at the outer end of the wing member 7. The free end of the bridle may be grasped in the hand of the operator. Although I have shown the bridle attached to the end of the wing member it is possible to secure it to other points on the toy body provided that a dominating portion of the weight of the toy lies beyond the point of attachment and that the plane of the cord intersects the fore and aft center of gravity of the toy.

The sound generating device of my invention is adapted for mounting in various parts of the toy but I have found that the wing member 7 provides the preferred location for the device. In the drawing I have shown the wing member provided with at least one elongated rectangular aperture 12, the ends 13 of which, extending transversely of the wingspan, are enclosed in channel-shaped metal reinforcing caps 14. Each of these caps is provided, centrally of the vertical web 16 thereof, with an aperture 17 in which is journaled a shaft 18 secured to a sheet metal rotor 19 disposed and rotatable in the aperture 12. The shafts 18 are secured in the rotor by shearing from the body of the latter a plurality of oppositely embossed straps 21 which are relatively spaced vertically to form an extended pocket in which the shaft is received after which the straps are squeezed together in a vertical direction so as to firmly and frictionally secure the shaft in place. Washers 22 concentric with the shafts 18 and interposed between the ends of the rotor 19 and the caps 14 insure free rotation of the rotor in the aperture 12. The longitudinal edges of the rotor are each provided with integral and oppositely curved scoops 23 which function, when the wing is moved edgewise through the air, to successively create a greater pressure of the air stream against one radial blade of the rotor than against the other with the re-

sult that the rotor will be rotated in the aperture 12 at a speed proportionate to the velocity of movement of the wing through the air. In order to reduce the inertia of the rotor and to insure rotation thereof at comparatively low wing velocities, it is contemplated to construct the rotor of aluminum or an alloy thereof or to use other similarly lightweight materials which will provide the necessary rigidity and structural strength.

In operation, the toy is flown by swinging it in a circular orbital path at the end of a desired length of bridle 11 which determines the radius of the orbit. During this flight movement of the toy, the rotor will rapidly revolve and will create pulsating disturbances of the air through which it is moving which have a frequency equal to double the rate of rotation of the rotor. Upon reference to Figure 4, it will be readily seen how these pulsations occur. When the rotor is in its full-line position shown in the view, the frontal resistance of the wing to movement through the air will be at a minimum. However, as the rotor moves through its first quarter of revolution, to the dotted line position thereof, the frontal resistance will build up to a maximum degree and a value depending upon the area of the rotor. This will cause air before the advancing rotor to be compressed, which compression again drops to a minimum as the rotor completes its first half revolution and is again concealed within the wing. A similar effect will occur for the final half revolution of the rotor. The resulting pulsations imparted to the air will be impressed on ears of bystanders as an audible tone possessing a pitch depending upon the speed of rotation of the rotor. This tone, by suitable design of the rotor may be made to closely approximate the tone given off by an airplane in power flight. It will also be seen that the pulsations created by the rotors will create a similar reactionary vibration of all surfaces of the toy structure which are in contact with the air thus greatly increasing the volume of air disturbed and consequently materially amplifying the volume of sound. The pitch of the sound may of course be varied by speeding up or slowing down the velocity of the toy along its orbital path of movement.

In Figure 5 I have shown a toy airplane designed to produce a maximum volume of sound when in flight. In this modification I provide the wing 24 with duplicate sound rotors 19 so that a substantial area of the wing is made up of the sound generating elements. The rotors in this form of the invention, and the mountings therefor, are identical with those previously described.

Having thus described my invention in detail, what I claim as new and desire to secure by Letters Patent is:

1. In an aerial flying toy having a wing provided with an aperture, means associated with said toy for moving the latter through the air in controlled flight, and a rotor journaled on said toy within said wing aperture, said rotor comprising a substantially plane member freely revolvable about an axis in its own plane and in the plane of the wing and perpendicular to the direction of flight of the toy, said rotor in operation causing a buzzing or whirring sound to be emitted.

2. In an aerial flying toy having a wing provided with an aperture, means associated with said toy for moving the latter through the air in controlled flight, caps on said wing disposed at opposite sides of said aperture and provided with journals, a rotor comprising a plane member having shafts engaging said journals and freely rotatable about an axis in its own plane, in the plane of the wing and perpendicular to the direction of flight of the toy, said rotor in operation causing a buzzing or whirring sound to be emitted.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,539,469	Dempster	May 26, 1925
2,222,677	Main	Nov. 26, 1940