Toy Convertible Automobile-Plane

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This invention relates to toy automobiles and toy airplanes as played with by children, other than for riding therein, and has for its principal object an improved construction of such toys whereby a combined toy automobile and toy airplane is produced which may readily be converted from one to the other by a child playing with the device. Specific features and advantages of the construction will appear in the following description and accompanying drawing.

In the drawing—

Fig. 1 is a perspective view of our improved toy showing it in the form of a toy racing automobile.

Fig. 2 is a perspective view like that of Fig. 1 but showing the toy converted into an airplane.

Fig. 3 is a central vertical cross section of the device when in the form of a toy airplane.

Fig. 4 is a bottom plan view of the toy when in the form of an airplane.

Fig. 5 is an enlarged cross section of a fragment of Fig. 3 as seen from the line 5—5 thereof.

Fig. 6 is a vertical cross section of Fig. 5 as seen from the line 6—6 thereof.

Fig. 7 is a bottom plan view showing a modified pivoting of the folding wings.

Before describing the drawings in detail the invention may generally be described as a toy automobile having an elongated body of the racing automobile type and with four idler ground wheels upon which it may be freely rolled about. The front wheels are mounted on a pivoted bracket so that they may be pulled down a considerable distance to simulate the landing wheels of an airplane, and the back wheels are mounted on a rocking bracket to be pushed up out of the way and to bring down a single wheel on the opposite end of the rocking bracket to simulate the tail wheel used on some airplane landing gears. Underneath the automobile body are a pair of flat wings which in overlying folded position extending from the front to the rear wheels, and pivoted at their front ends to a cross brace of the body so as to permit the wings to be pulled out to project at right angles from the body to form the airplane wings, while at the rear end of the body are horizontal and vertical vanes which are pivoted to swing under the body and into a slot in the body respectively, to conceal them for the automobile or bring them into out position for the airplane. Besides the above, there is a propeller which, when the toy is an automobile, extends in locked horizontal position across the front end to look like a front bumper, but which may be pulled out to a freely revolving position when the toy is converted into an airplane.

In the drawing, and with reference to Fig. 1, 1 is the automobile (or airplane) body preferably made of sheet metal or plastic, 2 are the front wheels, 3 a pair of rear wheels, 5 is the windscreen, 4 the driver's compartment (or cockpit when a plane), 6 is the substantially pointed rear end of the body, 7 is the exposed outer edge of the wings 1 folded under the body and which look like a narrow rumboard, 8 is the edge of the horizontal tail vanes or elevators, while 9 is the upper edge of a rudder vane folded into a slot 10 in the top of the rear end of the body. The toy as shown in Fig. 1 is a racing automobile and as the wheels all ride on their axles it is free to roll and turn in any direction. At the front end of the body is a bumper comprising a couple of propeller-like blades 11 rotatably mounted on a shaft 12 and projecting horizontally from behind a hub 13 secured to the end of the shaft and which (with the blades), is normally locked against rotation by means of a slot or groove and pin arrangement as will be later described.

When it is desired to convert the toy automobile of Fig. 1 into an airplane as in Fig. 2 the hind wheels 3 are swung upwards on their bracket mounting along the dotted arc shown in Fig. 1 and this brings a single smaller wheel 14 down along the dotted line shown in Fig. 2 with the other end of the bracket 13 as the third wheel of a tricycle landing gear. The vanes 8 are then swung out, vane 9 pulled out of its slot, wings 7 swung out in opposite directions from under the body to stop at position shown in Fig. 2, the front wheels 2 are pulled down on their pivoted bracket 14, and bumper 11 is pulled forward to bring the shaft 12 forward also and shaft locking pin 15 out of groove 16 formed in the end of the shaft bearing 33 and the shaft hub 40 is then turned slightly to rest shaft pin 17 on the end of the bearing 33 as shown in Fig. 3 so that the bumper blades 11 are free to revolve as a propeller. Reversing the operations re-converts the toy into the automobile of Fig. 1.

When the toy is outfounded into the airplane form of Figs. 2 and 3 it may be freely rolled about on its landing-gear wheels.

The various details whereby the movements of the members are accomplished will now be described.

The flat wings are superimposed and both pivoted on a screw 20 screwed into a cross brace 21.
welded or otherwise secured across the body and from which projects a stop pin 22 operating in circular slots 23 in the wings to limit their swinging movement both ways. When the wings are folded they extend longitudinally of the body as indicated by the dotted lines in Fig. 4.

The pivotal screw 20 for the wings preferably projects upwardly through the brace 21 and is provided with a nut 24 spaced from the brace and with a compression spring 25 between the nut and the brace so as to set up a substantial friction on the pivotal joint of the wings, but they are additionally locked in the out position by the extensions 14 of bracket frame 13 upon which the front wheels 2 are mounted. This frame is pivoted horizontally on a pin 26 which extends between the side walls of the body and at the end of the extension arms 14 is a transversely connecting rivet 27 which at opposite ends of its throw engages the hooked ends 28 and 29 respectively of a flat spring 30 which is secured as by screws or rivets 31 to a block 32 in turn secured to the under side of the forward end of the body 1. When the bracket is swung downwardly to the position shown in Fig. 3 to lower the front wheels 2 into the airplane landing gear position, the lower ends 14 of the bracket fall into grooves 33 formed in the outfolded wings and which wings are thereby locked in outfolded position so that they cannot again be swung backwardly until this front wheel bracket is swung clockwise to engage its rivet 27 with the opposite hooked end 23 of the retaining spring clip 33.

When the wings are freed for returning to folded position as shown at the dotted lines in Fig. 4, they may be swung back to said folded position and their extreme right ends will be supported under and against another transverse bracing strip 24 and which is preferably formed with a small hump in the center as at 35 which will nest in corresponding depressions or holes 36 formed near the tips of the wings so as to frictionally stabilize the wings in folded position, an extended strip through a bearing neck 33 on the front end of the body and is resiliently pulled inward by a coiled spring 33 at the inner end of the pin. Outward of the propeller is a rounding hub 40 fixedly secured to the end of the pin and between which and the shoulder at the reduced portion of the pin the propeller 11 is free to revolve. Bearing neck 33 is formed with a transversely extending groove 41 in its face (see Fig. 2) and into which groove two small rearwardly projecting lugs 42 formed on the rear side of the propeller will engage when the pin 37 is drawn inward by its spring 35, and when the lugs 42 are thus engaged the propeller will extend horizontally as shown at 11 in Fig. 1 to simulate the front bumper of an automobile. However, when it is desired to have the propeller free to revolve, the propeller and its shaft are released from engagement of the lugs 42 and the slot 41, and this also brings out of the slot a smaller pin 15 which projects through pin 37 at a point inward of lug 42, so that by then turning the hub 40 slightly to bring pin 15 on top of hub 38 as indicated in Fig. 3 of the drawing the propeller lugs 42 will be perfectly clear of bearing neck 35 (and likewise clear of small pin 75) so that the propeller is then perfectly free to revolve, as it idles on the reduced portion 37 of the pin 31 as previously explained. The revolving of the propeller will not tend to cause the pin 37 to revolve to further cause its small pin 75 to drop back into the slot 41, as the friction set up by spring 39 prevents this.

Returning now to the rear end of the body, the bracket 13 which carries the to automobile wheels 3 and the single airplane landing gear wheel 12 is of Y form with its spread end spaced by a fixed axle 42 at opposite ends of which the wheel 3 are mounted to freely idle, and between the narrow ends of the side bracket is similarly mounted the single wheel 12 on a fixed axle 43. This bracket is pivoted on a transversely extending pivot 44 so that either the single wheel 12 or the two wheels 3 may be swung down to the lower position or elevated to the concealed position within the body as indicated by the drawing of Fig. 3, and the bracket is locked in either position by a spring bolt 45 carried by the bracket and which snaps into a socket 46 or socket 47 respectively at opposite ends of the bracket 13 and which also has a couple of projecting stop pins 43 and 50 at its extreme ends to prevent the spring bolt going too far. This spring bolt is best shown in enlarged form in Figs. 5 and 6 and where it will be seen that the spring bolt is housed in a tube 51 which is attached to bracket 13, and that a spiral spring 52 at the base of the tube urges the pin toward the socket 46 and a small pin 63 projects from the pin 45 through an operating slot 58 in tube 51 and is engaged by a finger lever 55 in turn pivoted at 56 to a tubular transverse brace 51 extending between the Y bracket arms and which is freely mounted on the pivot 43. This finger lever 55 has a small outer operating portion 58 adapted for pressing upon by the fingers to raise and lower the pin 45 from its engagement with either socket, and after which the bracket and its wheels may be swung to either position.

The two horizontal vanes 8 are pivoted on a screw or pin 55 which passes through the superimposed vanes and through a reinforcing lug 60 at the front end of the body and which has a nut or head 61 upon its inner end and which is held and interposed between which is a compression spring 62 to set up sufficient friction for holding the vanes in place. These vanes are also preferably formed with curved slots at 64 which engage a stop pin 65 as explained for the pin 22 and slots 23 of the main wings.

A small knob 66 or hump is preferably placed out of the outermost vane so that the finger may readily grip it for out folding it from folded position. Also small interlocking dent depressions which will nest one another may be formed upon the vanes as indicated at 67 to hold them in the out position, as well as in the in position.

The rudder vane 8 which folds into slot 10 is pivoted on a transversely extending pin 68 and operates in slot 10 as described, and which slot is made sufficiently tight to hold the vane lying snugly in outfolded position. This vane is formed with an intake vane 69 with the limit of lever 55 and permitting it to fold flush with the top of the body and thus enable a larger vane to be used.

Instead of the particular latch construction shown in Figs. 3 and 6 for holding the rear wheel bracket in up or down position, any suit-
able construction may be used or it may be substantially like that shown for the front bracket if desired.

Instead of pivoting the wings to a single pivot as shown in Fig. 3 and also in Fig. 4 the wings may be formed as shown in Fig. 7 (which shows them in folded position) and wherein they are pivoted at transversely spaced points 76 and 77 and may have two flat spur gears 72 and 73 attached to their under sides in meshing relation so that upon outfolding either wing the other wing will automatically open also. One of these pivots may be squared as shown at 70 so that a key may be used upon it if desired. In this modification the wings are designated 71.

Having thus described our convertible combination toy automobile and airplane it will be evident that the form of the body may be varied considerably, and it should also be noted that in toys of this kind various features are painted upon the outside of the body as may be desired, and any modification coming within the spirit of the invention is intended to be covered by our appended claims.

We claim:

1. A convertible toy automobile-airplane comprising an elongated vehicle body provided with a straight flat under side, a pair of front road wheels and a pair of rear road wheels adjacent the rear end of the body and supporting the body for rolling about, a pair of flat plate wings vertically pivoted to the under side of the body adjacent the rear of the front wheels in a manner to be extended outwardly from the body and fold to an overlapping position flat under and against the body means for retaining the wings so folded, a rudder vane pivoted at the rear of the body to fold through a slot into the body, and a pair of laterally extending elevator vanes at the rear portion of the body vertically pivoted thereto to fold under the body.

2. A convertible toy automobile-airplane comprising an elongated hollow body, a pair of front road wheels and a pair of rear road wheels adjacent the rear end of the body and supporting the body for rolling about, a pair of wings vertically pivoted to the under side of the body adjacent the rear of the front wheels in a manner to be extended outwardly from the body and fold to a position under the body, a rudder vane pivoted at the rear of the body to fold through a slot into the body, and a pair of laterally extending elevator vanes at the rear portion of the body vertically pivoted thereto to fold under the body, and brackets for the front and rear wheels respectively both horizontally pivoted to the body to swing downward and upward with respect to the body and rollably supporting the body operationally at two different elevations from the ground.

3. A convertible toy automobile-airplane comprising an elongated hollow body, a pair of front road wheels and a pair of rear road wheels supporting the body for rolling about, a pair of wings vertically pivoted to the under side of the body adjacent the rear of the front wheels in a manner to be extended outwardly from the body and fold to a position under the body, a rudder vane pivoted at the rear of the body to fold into the body, and a pair of laterally extending elevator vanes at the rear portion of the body vertically pivoted thereto to fold under the body, and brackets for the front and rear wheels respectively both horizontally pivoted to the body to swing downward and upward with respect to the body, and means holding the wheel brackets in either up or lower position with wheels projecting somewhat below the body in both positions of the brackets, the rear wheel bracket provided with two wheels on one end and one wheel only on the other arranged for optionally being lowered.

4. In a structure as specified in claim 2, the bracket for the front wheels interlocking with said wings when outfolded and bracket is swung downward to hold said wings outfolded.

5. In a structure as specified in claim 1, a two bladed propeller at the extreme front end of the body, means revolvably mounting said propeller, and means optionally locking the propeller against rotation and with blades extending horizontally in simulation of an automobile front bumper.

6. A convertible toy automobile-airplane comprising an elongated vehicle body, a pair of front road wheels, and a pair of rear road wheels adjacent the rear end of the body and supporting the body for rolling about, a pair of wings vertically pivoted to the under side of the body adjacent the rear of the front wheels in a manner to be extended outwardly from the body and fold to a position under the body, a rudder vane pivoted at the rear of the body to fold through a slot into the body, and a pair of laterally extending elevator vanes at the rear portion of the body vertically pivoted thereto to fold under the body, and means frictionally retaining said wings in folded position and said elevator vanes in folded and outfolded position.

7. In a structure as specified in claim 2, the bracket for the rear wheels being pivoted between its ends to the body and carrying two wheels at one end of the bracket and a single wheel at the other.

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