Jan. 14, 1941. D. T. EMMICK, SR 2,228,697

TOY GLIDER AND CARRIER

Filed March 22, 1940 2 Sheets-Sheet 1

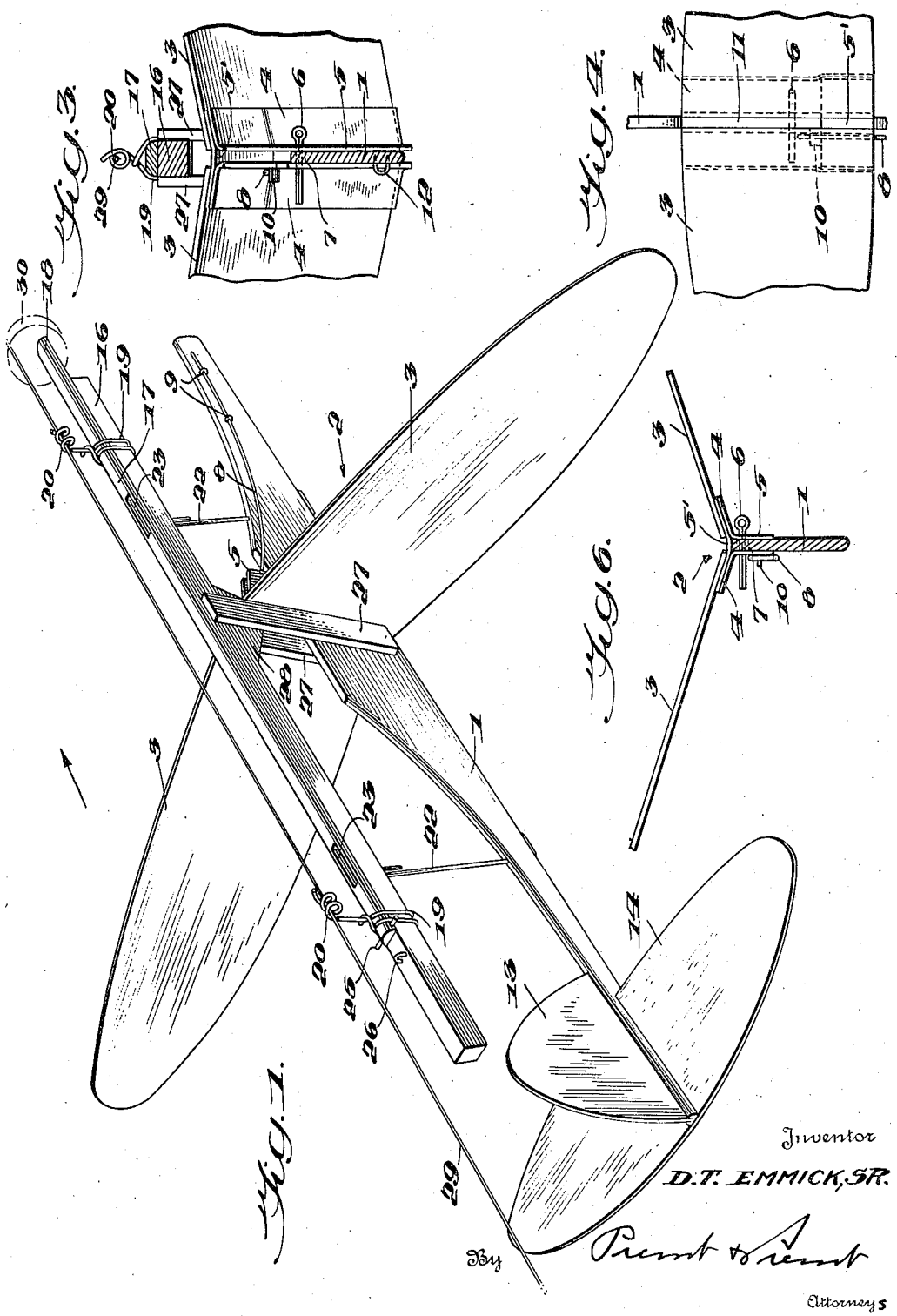


Fig. 1.

Fig. 3.

Fig. 4.

Fig. 6.

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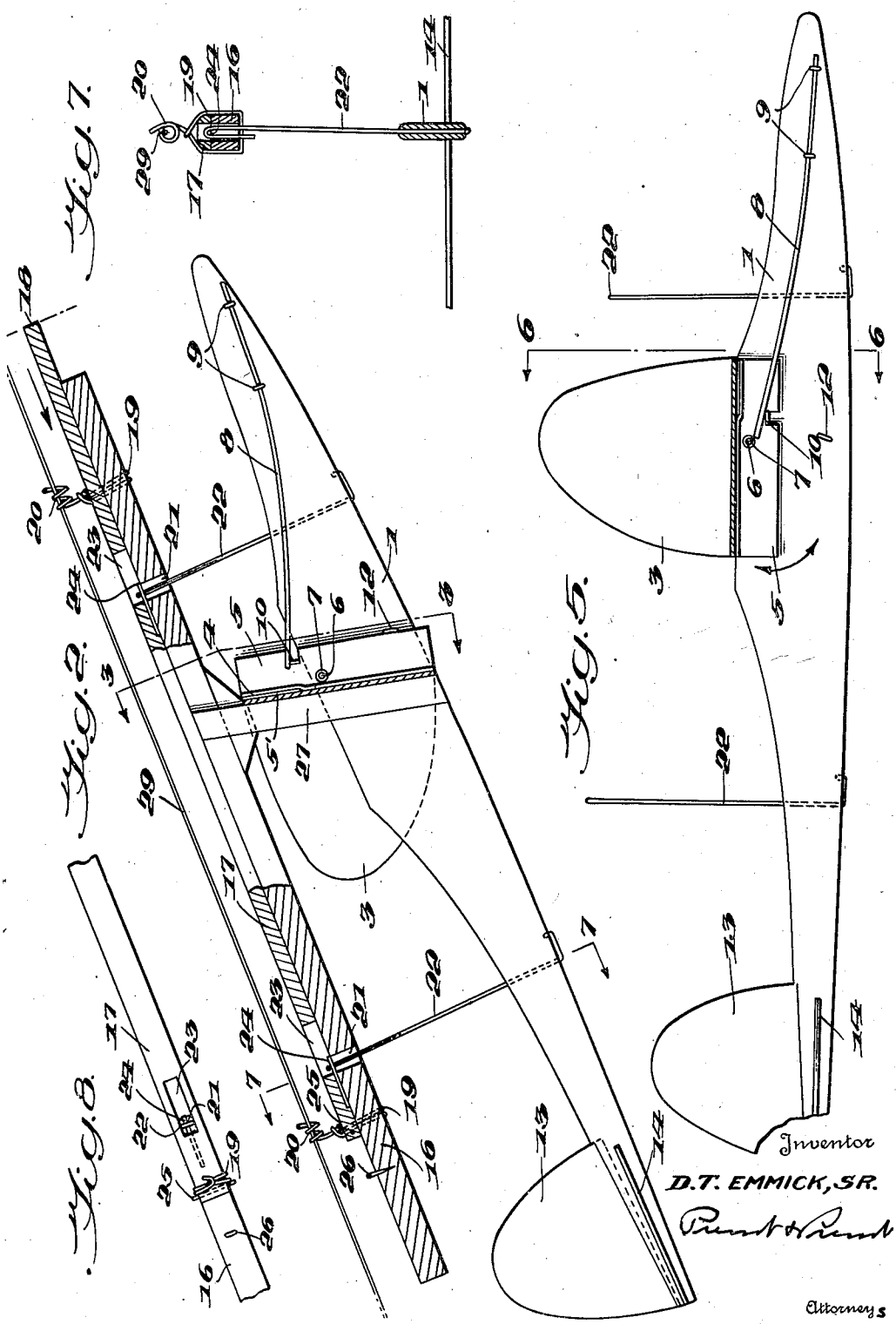


Fig. 7.

Fig. 2.

Fig. 8.

Fig. 5.

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# UNITED STATES PATENT OFFICE

2,228,697

## TOY GLIDER AND CARRIER

Donald Talbott Emmick, Sr., Tulsa, Okla.

Application March 22, 1940, Serial No. 325,469

6 Claims. (Cl. 244—155)

My invention consists in new and useful improvements in a toy glider and releasing carrier for use in connection with kites and the like and has for its object to provide a simple construction whereby a glider may be elevated to a predetermined point on a kite string and automatically released to slowly glide to the ground.

Another object is to provide a glider wherein the angle of incidence of the wings may be adjusted for elevating the carrier and glider on a kite string.

A further object of my invention resides in the novel construction of spring tensioned pivoted wings on the glider which cooperate with a supporting rack on the carrier to simultaneously catapult the glider into the air and adjust the wings for flight upon the operation of an automatic releasing means.

A still further object of the invention is to provide a novel latch mechanism on the carrier releasable by a suitable abutment arranged at a predetermined point on the kite string.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel features hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout the several views,

Fig. 1 is a perspective view of the glider and carrier in place on a kite string.

Fig. 2 is a longitudinal sectional view of the same.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary top plan view of the wing assembly.

Fig. 5 is a side elevation of the glider with one wing in section.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 2, and

Fig. 8 is a fragmentary plan view showing the locking means on the latch bar of the carrier.

In the drawings, 1 represents the body of my improved glider which is preferably constructed of balsa wood or other light material and is more or less streamlined in the conventional manner as clearly shown in Fig. 1. The wing assembly designated generally by the numeral 2 consists of a pair of wings 3 preferably of balsa wood, secured at their inner extremities to a saddle member which straddles the upper edge of the body 1 and is pivotally secured to the latter by any suitable means. In the form shown in the drawings, this wing supporting saddle consists of a pair of transversely spaced vertical legs 5 formed of light metal, the upper edges of which terminate in oppositely disposed outwardly bent flanges 4 to which the inner extremities of the wings 3 are cemented or otherwise secured. The vertical legs 5 are joined together and maintained in the proper spaced relation by a relatively narrow strip of metal 5' which extends across the upper faces of the flanges 4 at their forward ends and is rigidly secured thereto. The saddle is pivotally mounted adjacent the upper edge of the body 1 by a cotter pin 6 which extends through opposite openings in the vertical legs 5, a short metallic sleeve bearing 7 being provided in the body 1 to facilitate freedom of rotary movement.

As will be seen from Figs. 3 and 6, the flanges 4 of the saddle are arranged at such an angle that the wings 3 extend slightly upwardly towards their tips for the purpose hereinafter set forth.

The wing assembly 2 is normally retained in flying position by any suitable spring means, that shown in the drawings consisting of a length of resilient wire 8 secured to the forward end of the body by small staples 9, its free end being tensioned over a lug 10 projecting from the outer side of the adjacent saddle leg 5, whereby the saddle and the wings supported thereby are retained substantially in a horizontal plane as shown in Fig. 5.

The saddle is rotatable about the pivot pin 6 against the tension of the spring 8, the space between the legs 5 disposed rearwardly of the cross piece 5' forming an elongated clearance 11 (Fig. 4) which extends to the rear end of the saddle, to accommodate the thickness of the body 1 when the wing assembly is rotated on its axis. This rotation is limited by any suitable stop or abutment 12 (Fig. 5) arranged at a predetermined point on one side of the body 1 in the line of movement of the saddle over said body.

The rear portion of the body 1 is provided with the conventional rudder 13 and elevator 14 which are also preferably constructed of balsa wood or other suitable light material.

16 represents the main supporting strip or body of a carrier also preferably composed chiefly of balsa wood or the like, said body carrying a longitudinally slidable latch bar 17, one end of which extends beyond the adjacent end of the

main strip 16 and serves as an abutment 18 as will hereinafter appear. The members 16 and 17 are retained in this sliding relation by suitably shaped loops of wire 19, the free end of which terminate in helical carrier guides 20 which are arranged in longitudinal alignment adjacent the outer face of the latch bar 17 so as to receive the kite string.

At longitudinally spaced points in the strip 16, I provide openings 21 adapted to receive the ends of similarly spaced carrier hooks 22 secured to and extending upwardly from the body 1 of the glider. The latch bar 17 is provided with longitudinal slots 23 spaced to register with the openings 21. At one end of each slot 23 and extending slightly into the slot is a locking pin 24 fixed to the latch bar 17 and movable therewith, said locking pins being adapted to span the respective openings 21 in the strip 16 when the latch bar 17 is moved to its extreme forward position which is determined by a transverse stop pin 25 at one end of the latch bar arranged to abut the adjacent wire loop 19. The rearward movement of the latch bar 17 is limited by a stop pin or abutment 26 located in the upper face of the strip 16 in line with the rear end of the latch bar.

Thus, when the carrier hooks 22 are inserted through the respective openings 21 in the strip 16, their ends are disposed transversely in the slots 23 and when the latch bar 17 is slid forwardly to its extreme position, the pins 24 engage the respective carrier hooks.

When the glider is placed on the carrier, the wing assembly 2 is rotated to its limiting stop 12 and is retained in this position by an angularly disposed wing rack 27 on the carrier. As shown in Fig. 1, this wing rack consists of a pair of transversely spaced arms secured at one end to the main strip 16 of the carrier and preferably reinforced by a brace member 28 interposed between the two arms and secured to one edge of the strip 16. The arms 27 are adapted to straddle the body 1 of the glider and engage the upper surfaces of respective wings to hold the same at the proper angle of incidence against the tension of the spring 8 when the lock pins 24 are in locking engagement with the carrier hooks 22.

Having described the construction of my improved glider and carrier, its use and operation are as follows:

As heretofore mentioned, this device is for use in connection with conventional kites and the like, although it may be used with an string or cord depending from an aerial support to the ground. For the purpose of illustration, however, we will assume that a kite has been flown to a predetermined elevation, the kite string being represented by the numeral 29 in Fig. 1. A suitable stop or abutment 30, which may be in the form of a cork, is fixed to the kite string at any desired distance from the ground. The carrier is first slidably mounted on the string 29 with the projection 18 on the latch bar 17 directed upwardly. It will be noted that due to the shape of the guides 20, it is not necessary to thread the string from its end, it being possible to apply the guides at any point on the string by simply twisting the string into the convolutions of the guides.

The wing assembly of the glider is then tilted or rotated on its pivot pin 6 against the tension of spring 8 until the saddle legs 5 abut the stop 12 and while in this position the glider is placed on the carrier with the upper surface of the wings in engagement with the inclined wing rack 27, the latter straddling the body portion 1. During this operation, the latch bar 17 has been retracted to its rearmost position so as to clear the openings 21 in the strip 16 for the reception of the carrier hooks 22, and when these hooks have reached the slots 23 in the latch bar, the latter is slid forwardly so as to bring the locking pins 24 into locking engagement with the ends of the respective carrier hooks.

The tension of the spring 8 on the projecting lug 10 of the saddle leg 5 tends to return the wings to their original horizontal or flying position and in so doing, causes a pressure to be exerted on the upper surface of the wing rack 27 and in turn on the carrier hooks and locking pins, thus developing sufficient friction on the pins 24 to prevent accidental dislodgment.

Due to the adjusted angle of incidence of the wing assembly with respect to the body 1, while locked in this position, as well as the relative angle, or the angle of dihedral of the individual wings, a lifting surface is provided whereby the glider and carrier are caused to travel upwardly on the kite string by the force of the wind or currents of air, and when the projecting end 18 of the latch bar 17 strikes the abutment 30 on the string 29, the latch bar is forced rearwardly, withdrawing the locking pins 24 from the hooks 22. Immediately upon the release of the carrier hooks, the spring 8 forcibly returns the wing assembly to the substantially horizontal flying position of Fig. 5 and in so doing kicks or catapults the glider from the carrier into the air. The wing assembly having now returned to flying position, the glider floats slowly to earth. The carrier then descends on the kite string by gravity and the operation is repeated for elevating the same or another glider.

From the foregoing it is believed that the construction and advantages of my invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details disclosed without departing from the spirit of my invention as set out in the following claims.

What I claim and desire to secure by Letters Patent is:

1. The combination with a toy glider having adjustable wings normally in flying position, of a carrier therefor for use in connection with a kite string, means for slidably supporting the carrier on a kite string, latch means for locking said glider on said carrier, means on said carrier cooperating with said adjustable wings for regulating their angle of incidence to facilitate the elevation of said carrier and glider on said kite string, means for automatically releasing said latch means to detach said glider from said carrier, and means for automatically returning said wings to flying position upon the operation of said releasing means.

2. A device of the class described including a glider having a wing assembly rotatable about an axis transverse of said glider, spring means for normally maintaining said wing assembly in flying position, a glider carrier for use in connection with a kite string, means for slidably supporting said carrier on a kite string, latch means for locking said glider on said carrier, means on said carrier cooperating with said wing assembly for regulating the angle of incidence of the latter to facilitate the elevation of said carrier and glider on said kite string, means for automatically releasing said latch means to detach said glider from said carrier, said spring means automatically returning said wing assembly to flying posi-

tion upon the operation of said releasing means.

3. In a glider carrier for use in connection with a kite string, a main body, a latch bar longitudinally slidable on said body, means for slidably supporting said carrier on a kite string, a glider wing rack projecting angularly from said body, and means on said latch bar for locking a glider in place on said wing rack.

4. In a toy glider including a body portion, a wing assembly comprising a saddle member pivotally mounted astride said body on an axis transverse of the latter, a rearwardly extending opening in said saddle to accommodate the thickness of said body and permit the rotation of said saddle about the sides of said body, a pair of wings fixed to said saddle on either side of said opening, and spring means for normally maintaining said wing assembly in substantially horizontal flying position.

5. In a toy glider including a body portion, a wing assembly comprising a saddle member pivotally mounted astride said body on an axis transverse of the latter, a rearwardly extending opening in said saddle to accommodate the thickness of said body and permit the rotation of said saddle about the sides of said body, a pair of wings fixed to said saddle on either side of said opening, spring means for normally maintaining said wing assembly in substantially horizontal flying position, means cooperating with said wing assembly for slidably supporting said glider on a kite string with said wing assembly tilted axially on said body against the tension of said spring means, to serve as a wind-actuated elevating surface for raising said glider on said kite string, and means for automatically releasing said glider into the air at a predetermined elevation.

6. A glider carrier for use in connection with a kite string including a main body portion, a latch bar longitudinally slidable on said body, means for slidably supporting said carrier on a kite string, a glider wing rack projecting angularly from said body, said body having longitudinally spaced openings therein to receive a pair of corresponding spaced glider hooks, said latch bar having a pair of slots spaced to register with said openings, a latch pin fixed to said latch bar adjacent each slot and adapted to engage said carrier hooks when said latch bar is in its forward position and to release said hooks when said latch bar is in its rearward position.

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