Jan. 9, 1940. J. H. KLEINBERG 2,186,587

GLIDER TOY

Filed June 20, 1939

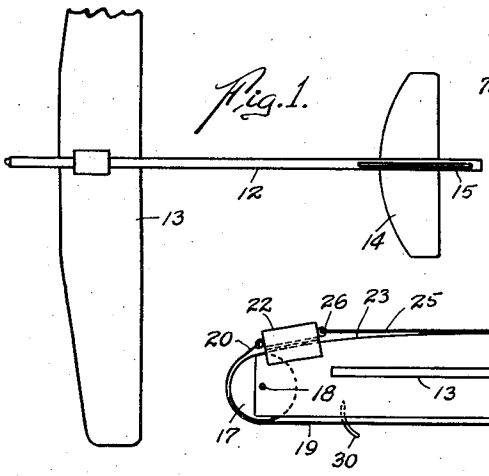


Fig. 1.

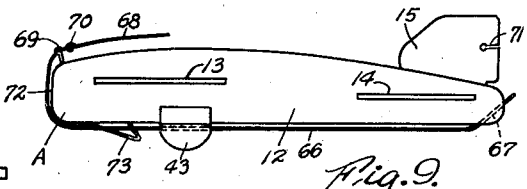


Fig. 9.

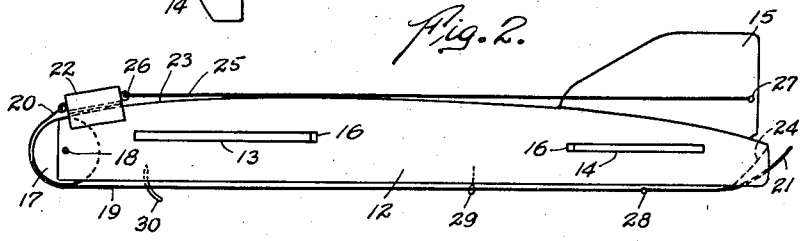


Fig. 2.

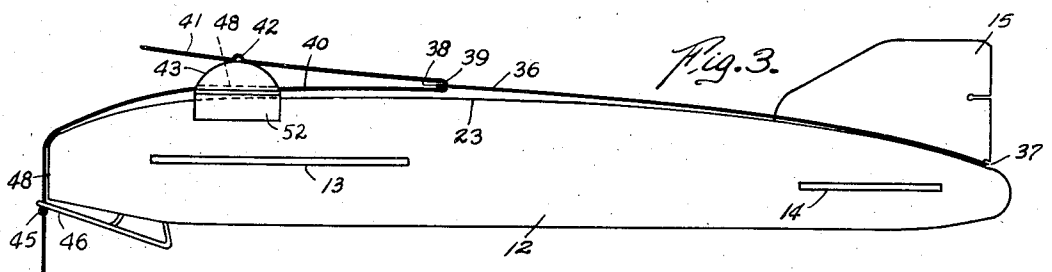


Fig. 3.

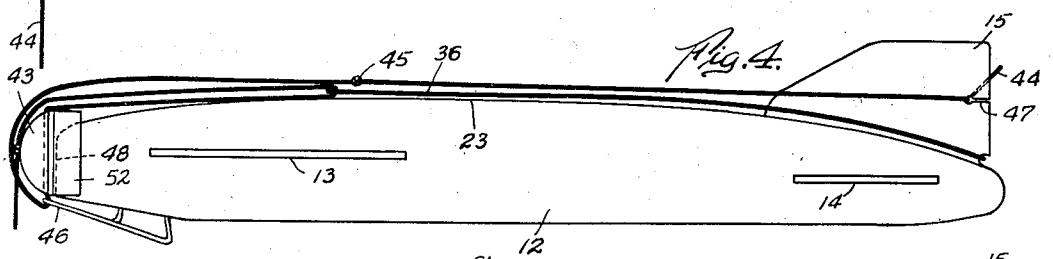


Fig. 4.

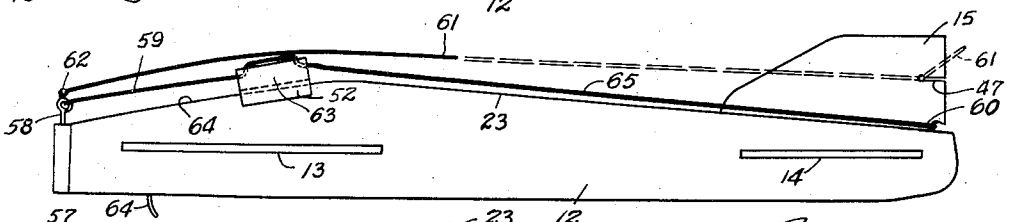


Fig. 5.

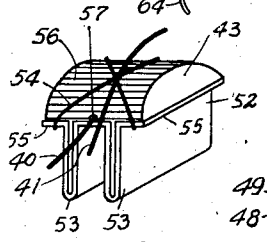


Fig. 6.

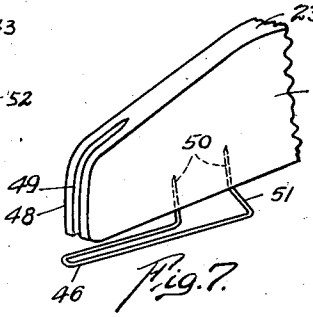


Fig. 7.

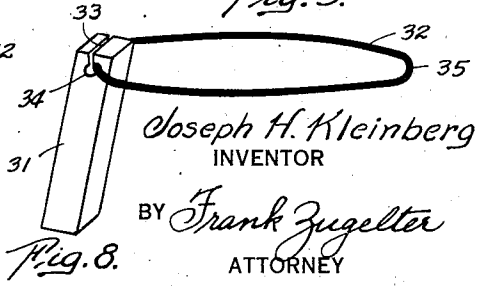


Fig. 8.

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GLIDER TOY

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Application June 20, 1939, Serial No. 280,139

10 Claims. (Cl. 46—79)

The present invention relates to a glider toy, and especially to one which is equipped with means operating automatically, and after the glider has been placed in flight, to cause the glider to perform various so-called stunts.

An object of the invention is to provide a stunt performing glider which has been so simplified and constructed of inexpensive materials, that it may be manufactured at an extremely low cost.

Another object of the invention is to provide a device of the character stated, which is exceptionally light in weight, and is therefore safe as a child's toy, since the force of impact of a light body is not apt to be dangerous or injurious to life and property.

A further object of the invention is that of providing simple and inexpensive means in a glider toy for accomplishing a delayed action of certain of the parts, so that the glider toy will be permitted to attain a substantial altitude before the automatic means goes into operation for conditioning the device for stunt flying.

Another object of the invention is to provide stunt controlling apparatus in a glider toy, which is constituted chiefly of rubber bands instead of the usual complicated mechanisms heretofore proposed for accomplishment of the stunting function.

The foregoing and other objects are attained by the means described herein and disclosed in the accompanying drawing, in which:

Fig. 1 is a top plan view on a reduced scale, disclosing the general configuration of the device of the invention.

Fig. 2 is a side view of a highly simplified form of glider embodying the invention, this view being disclosed chiefly for the purpose of illustrating the principle upon which the invention operates.

Fig. 3 is a side elevational view of a preferred form of glider toy embodying the present invention, showing the stunt control mechanism in the operative condition.

Fig. 4 is a view similar to Fig. 3, but showing the stunt control mechanism in the inoperative position assumed while the glider is held in readiness for projection, and while it is gaining altitude subsequently to projection.

Fig. 5 is a side elevational view of a modification.

Fig. 6 is a perspective view of a sliding weight which forms a detail of the invention.

Fig. 7 is a fragmental perspective view of the nose of the glider disclosed in Figs. 3 and 4.

Fig. 8 is a perspective view of a sling or projector such as may be employed to place the glider in flight.

Fig. 9 is a fragmental perspective view of a further modification, showing an alternative construction of the forward portion of the glider.

With reference to the accompanying drawing, it will be expedient to apply like reference numerals to similar parts in all the drawing figures, wherein such parts are common thereto. Accordingly, in all views, the body of the glider will be indicated by the reference character 12, the forward wing by 13, the tail wing by 14, and the rudder by 15. The wings 13 and 14 may be applied in any suitable manner, such by inserting them through openings 16 formed transversely in the glider body. Ordinarily the wings will fit tightly enough in the openings to maintain a substantially fixed relationship to the body. It is to be expressly understood that the mode of attaching he wings and rudder to the body, is of no material consequence.

In accordance with Fig. 2, the nose of the glider may carry a grooved pulley 17 which is freely rotatable upon an axle 18, and over the pulley periphery where it is exposed at the extreme forward end of the glider body, there extends a rubber band 19 which may have opposite ends 20 and 21. The end 20 is fixed to a weight 22 which is slidable along the top edge 23 of the glider body. The end 21 of the band 19 is adapted to enter a vertical slit indicated at 24 formed in the tail of the glider body. As shown in Fig. 2, the band 19 is in a stretched condition so as to keep the weight 22 located near the nose of the glider. The slit 24 at the tail end, is of lesser width than the diameter of the rubber band when unstretched, but said slit is sufficiently large to permit the free end 21 of the rubber band to slowly slip therethrough, until finally it will leave the slit and permit a second stretched rubber band 25 to pull the weight rearwardly to a position at which the center of gravity of the body will be shifted from the nose portion to a location above the wing 13. The ends of rubber band 25 are anchored upon the weight at 26, and upon some fixed portion of the glider, preferably near the tail thereof, as at 27. The distance that the weight may shift rearwardly under the influence of the stretched rubber band 25, when the free end 21 of band 19 leaves the slit 24, may be determined by a knot or other stop means 28 on band 19, striking a small eyelet or other abutment 29 fixed to the lower edge of the glider body.

From the foregoing, it should readily be under-

stood that the glider of Fig. 2 is conditioned for flight by stretching the rubber band 19 in a rearward direction until the end 21 thereof may be inserted into slit 24, thereby to advance the weight 22 to the nose of the glider body as indicated, against the opposing force of the stretched rubber band 25. Upon thusly conditioning the glider for projection, the operator may squeeze the slit 24 together for clamping the rubber band end 21 against slippage through the slit, while at the same time a sling or projector such as is indicated in Fig. 8, may be applied to the stationary hook 30 in readiness to send the glider in flight. It is to be expressly understood that the projector shown in Fig. 8 is merely one example of a suitable projector that may be used for the purpose just explained, and as such, it may comprise a wooden handle 31 with a strong rubber band 32 secured to one end of the handle in any suitable manner. The particular manner of attaching the rubber band 32 as shown in Fig. 8, consists in furnishing the upper end of the handle with a transverse slit 33 terminating in a bore 34 wherein the rubber band permanently rests. By applying the looped end 35 of the band to the hook 30 of the glider body and holding the glider in one hand while the handle 31 is held in the other hand, the band 32 may be stretched, and the glider subsequently released so as to result in projection of the glider high in the air. As the glider approaches its maximum height, the free end 21 of the rubber band slowly slips through the slit 24, and before the glider has completed its descent, the band end 21 will have left the slit, permitting the band 25 to retract the weight 22 for changing the center of gravity of the glider, thereby causing the glider to stunt as it descends. The release of the weight 22 as above explained may be timed by permitting more or less of the band end 21 to protrude from the slit, and the character of stunt performed will depend upon the location of the knot or stop 28, and the strength or the tension of the rubber band 25.

By anchoring the pulley 17 so that it may not rotate upon the axle 18, a different stunting effect may be obtained, for then the movement of the weight 22 rearwardly when the rubber band end 21 is released from the slit, will be slow or gradual, and it will accordingly be appreciated that the gradually shifting center of gravity thereby resulting will gradually or progressively alter the maneuvers of the glider. It is to be understood that a tight pulley 17 will be the equivalent of a rounded integral nose on the glider body, so that the pulley may be eliminated, if desired.

The foregoing fully explains the principle of the operation of the improved glider toy, and the same principle is employed in the modified forms of the device disclosed in Figs. 3, 4, and 5. It may here be stated that the rubbers 25 and 19 may have substituted therefor a single rubber anchored to the weight in the manner disclosed in Fig. 5. By using the Fig. 5 type of anchorage, the position of the weight along the rubber may be changed at will, for determining the glider maneuvers, which in all cases depend upon the shifting center of gravity as influenced by the weight.

In the modification of Fig. 3, the character 36 indicates an endless rubber band which loops into a notch 37 at the tail of the glider, the opposite reaches of the band lying at opposite sides of the rudder 15. The remaining loop at the opposite end 38 of this band receives a loop 39 of a length of rubber 40 which is not endless. One end 41 of rubber band 40 is clamped at 42 upon the top of a slidable or shiftable weight 43, the details of which are clearly shown in Fig. 6. The opposite end 44 of rubber band 40 has a knot or stop at 45, which may not pass through a wire loop 46 which is supported by a glider body in the manner disclosed in Fig. 7. An intermediate portion 48 of the rubber band 40 is anchored relative to the slidable weight.

The relationship of the parts as disclosed in Fig. 3, is the relationship existing while the glider is descending and stunting, or the relationship in which the parts will be found upon completion of the flight.

To prepare the glider of Fig. 3 for flight, the operator grasps the rubber band end 44 and pulls downwardly until the weight 43 is slid forwardly to the nose of the glider, whereupon the end 44 is moved upwardly over the top edge of the glider body and stretched until the free end 44 may be inserted into the notch 47 of the rudder. The relationship of the parts will then be as disclosed in Fig. 4. The rubber band end 44 (Fig. 4) will gradually slowly slip from the notch, and when it does, the knot or abutment 45 will snap forwardly to a position against the wire loop 46, while at the same time the weight 43 will be influenced by the pull of rubber band 36, thereby resulting in shifting of the weight rearwardly to the Fig. 3 position. It is to be expressly understood that the weight 43 need not be pulled so far forwardly as to rest upon the flat forward surface 48 of the glider nose, that is, the length of the rubber band end 44 may be of sufficient extent to dispose the weight 43 to substantially a position corresponding to the position of weight 22 in Fig. 2. There is an advantage, however, in advancing the weight over the nose of the glider, so that the weight rests upon the flattened surface 48 as disclosed in Fig. 4, the advantage being that the weight will protect the glider against damage in the event that it lands nose first against a hard object before the slipping end 44 of the rubber band 40 has had an opportunity to become dislodged from the notch 47. There is a second advantage in disposing the weight directly upon the nose of the glider body, and that is that greater distance or height can be obtained by the glider when its center of gravity is located very close to the nose or advancing end of the glider body.

Referring now to Fig. 7, it may be noted that the nose of the glider may be grooved as at 49, if desired, for keeping the rubber band 40 in position thereon. Also, it should be noted, that the wire loop 46, whose pointed ends 50 may be driven into the material of the glider body, provides also a hook portion 51 to be engaged by the loop at 35 of the projector shown in Fig. 8, when it is desired to put the glider into flight.

With reference to Fig. 6, it may be noted that weight 43 may comprise a metallic stool 52 having spaced depending legs 53 providing a channel for reception of the upper edge of the glider body, and upon the flat top of the stool may be fastened the weight 43. It has been found that the element 43 may be constructed of rubber, and that an endless rubber band of small size, indicated at 54 may be crossed upon the weight and held to the stool by passing the rubber band over the weight and beneath the outwardly extending flanges 55 of the stool. The free end 41 of rubber band 40 may be anchored to the weight by passing

it beneath the rubber band 54, and slippage may be prevented by suitable roughing or corrugating of the upper face of the weight, as indicated at 56. The character 57 of Fig. 6 indicates how the weight may be slightly grooved to provide an anchorage for the rubber band 40, as indicated at 43 of Fig. 3.

The details of construction mentioned in describing Figs. 6 and 7 are of very minor importance, and it is to be accordingly understood that such details are not concerned with the broader aspect of the invention. For example, it is immaterial how the weight is attached to the stool, or how the rubber band connections to the weight are effected; nor is it even necessary that the weight 43 be a separate piece rather than an integral part of the stool 52. The details of the wire loop 46 of Fig. 7 likewise may be altered, and especially might the loop portion of the wire be made separately from the hook portion 51 thereof, as might be suggested by observing the nose end of the glider disclosed in Fig. 5.

In the modified form of the device disclosed in Fig. 5, the nose of the glider may be provided with a wire loop 58 adapted to receive slidingly therethrough, a rubber band 59. One end 60 of the rubber band is anchored near the tail of the glider body. The opposite end of said rubber band is indicated at 61. Between the end 61 and the eye 58, a knot or other abutment 62 is applied to the rubber band. Between the eye 58 and the anchored end 60 of the rubber band, the weight 63 is attached. Weight 63 is adapted to slide along the upper edge 64 of the glider body, and it may straddle said edge as previously explained in connection with Fig. 6. The anchorage between the weight 63 and the rubber band 59, may be effected by piercing the weight at its upper corners and threading the rubber band therethrough as shown.

To condition the Fig. 5 glider for flight, it is necessary only to stretch the end 61 rearwardly until it may be lodged in the notch 47 of the rudder, as indicated by the broken line. Such stretching of the rubber band will of course advance the weight 63 to the nose of the glider body, perhaps very close to the eye 58, and as explained in connection with the other drawing figures, the glider then may be projected by applying the projector of Fig. 8 to the hook 64. When the end 61 finally slowly slips through the notch 47 in the rudder, the portion 65 of the rubber band will act upon the weight to retract it to the position indicated by Fig. 5, at which position the knot or abutment 62 will be stopped by the eye 58.

From the foregoing, it will be noted that every form of the glider illustrated and described herein depends, for its maneuvering function, upon the slipping of a rubber band end slowly and progressively through a notch or other frictional holding means which holds the rubber band end just tightly enough to preclude rapid dislodgement thereof. A child operating the device may obtain various effects by allowing either little or much of the rubber band end 44 to extend through the frictional holding means 47, thereby to time the delayed action of the weight movement. Varying effects may also be had by changing the location of the knot or abutment in each instance, or by applying rubber bands having different tension characteristics. Other effects may be obtained, for example by increasing or decreasing the length of the rubber band end 41 (Fig. 3) by adjusting it through the clasp or holder 42, or through the frictional holding device 54 disclosed in Fig. 6. The weight may easily be adjusted along the rubber band 40 of Fig. 3 or along the rubber band 59 of Fig. 5 for obtaining the varying flight effects.

The modified form of the device disclosed in Fig. 9 will be seen to have a marked resemblance to that form of the invention disclosed in Fig. 2, however, in Fig. 9, the weight 43 which corresponds to the weight 22 of Fig. 2, is adapted to be located upon the nose of the glider in the manner of Fig. 4. To explain further, the character 66 discloses a rubber band having one end anchored at 67 near the tail of the glider, while the opposite end 68 has been passed through an eyelet 69 at the nose of the glider. A knot or other suitable stop 70 is provided between the eyelet and the extreme end 68 of the rubber band. Intermediate the ends of the band, the weight 43 is fixed to the band, and said weight is slidable as in the other forms of the invention. To condition the Fig. 9 device for flight, the operator need only stretch the end 68 rearwardly to the tail, and engage it within the 71, from which said end can slowly slip in the manner heretofore explained. While the end 68 is held within the notch, the weight will be disposed directly upon the flat nose 72 of the glider body, in substantially the manner of Fig. 4. In so disposing the weight, it will of course have to be boosted over the projecting hook 73, but when the end 68 leaves the holding notch 71, the weight will leave the nose 72 and jump over the projecting hook to the position indicated in Fig. 9. The knot or stop 70 cannot pass through the eye 69. It should be particularly noted that Fig. 9 may be made to operate in the manner explained in connection with Fig. 2, by merely making 71 the permanent anchorage for the end 68 of the rubber band, and providing for the delayed frictional release at the point 67, as disclosed at 24 of Fig. 2. Thusly modified, the weight 43 of Fig. 9 will be disposed along the top edge of the glider body, as in Fig. 2, and the eyelet 69 will be located at the point A, all of which amounts to a mere reversal of parts capable of performing the function intended according to the present invention. The various forms of the invention disclosed herein are not to be confused with glider constructions wherein the wings are adapted for shifting movement bodily along the axis of the glider body, since such constructions are clearly inferior from the standpoint of durability and simplicity. Although in the various disclosures of the drawing, the weights are shown as being slidable along the body, it should be understood that such weights may be mounted pivotally or otherwise, so long as they may be considered shiftable toward and from the nose of the glider body.

In the Fig. 4 disclosure, it should be noted that accuracy of disclosure has been sacrificed to obtain clarity, by showing the various rubber bands apparently unsupported upon the nose of the glider. Actually, of course, the portions of the rubber bands shown forwardly of the weight 43 in Fig. 4 will rest directly upon the weight, instead of being spaced therefrom as drawn in the interest of clarity. If the rubber bands be manipulated as was explained previously for conditioning the glider for flight, proper operation is assured, although the various reaches of the rubber bands will rest closely adjacent or upon one another, both at the front of the glider and along the top edge thereof. In each instance,

the top edge of the glider body is indicated generally by the character 23.

In the construction illustrated by Fig. 9, the weight 43 performs an added function, which is that of furnishing a buffer or resilient landing gear. When the glider lands substantially horizontally, the weight will contact the landing surface with a yieldingly frictional engagement, thereby effectively arresting the forward movement of the glider without injury to the parts.

It is to be understood that various modifications and changes in structural details of the various devices may be made, within the scope of the appended claims, without departing from the spirit of the invention.

I claim:

1. In a glider toy, the combination of a winged body including a frictional holding means, a weight shiftable lengthwise of the body, means tending to yieldingly urge the weight in one direction substantially lengthwise of the glider body, and means temporarily held by the frictional holding means and attached to the weight, for temporarily overcoming the force of said yielding means, to delay shifting of the weight by said yielding means until the glider reaches a predetermined stage of its flight course.

2. In a glider toy, the combination of a winged body having a nose and a tail, a weight shiftably mounted upon the body, including means for yieldingly urging the weight into movement from the nose region toward the tail region of the glider body, and time delay means for temporarily restraining the weight against such movement, for a limited time during the flight of the glider toy.

3. In a glider comprising a winged body having opposed edges, a nose, and a tail portion, the combination which comprises a weight shiftably supported for movement relative to the body from the region of the nose toward the tail region thereof, an elastic weight shifting element having opposite ends and an intermediate portion, said weight being anchored to the intermediate portion of the weight shifting element, means anchoring one end of the weight shifting element to the body near the tail region thereof with said end extending along one edge of the glider body, and means releasably holding the other end of said weight shifting element, when stretched, in position along the opposite edge of the glider body, for establishing the position of the weight with respect to the length of the glider body, said releasably holding means constituting a timer for release of the weight to the contractile action of the stretched anchored end of the elastic weight shifting element, for delayed shifting of the weight.

4. In a glider, the combination of a winged body having opposed edges, a nose, and a tail portion, a weight slidable along one edge of the body from the region of the nose toward the tail portion of the body, an elastic rubber element secured to the weight and to the body tending always to urge the weight in the direction of the tail portion, and a second elastic rubber element secured to the weight, said second element having a free end stretchable in a direction opposing the direction of movement of the weight imposed by the first elastic element, and a slipping anchorage means on the glider for insecurely anchoring said free end of the second elastic element, to eventually release the weight to the weight-moving influence of the first elastic element, for delayed shifting of the weight.

5. In a glider, the combination of a winged body having a nose and a tail portion, a weight shiftable from the region of the nose toward the tail of the glider body, means on the extreme front of the glider nose for supporting the weight in position to receive impacts occasioned by head-on collision of the glider with an object in its path of flight, and a time-delay means self-operative normally during flight, for shifting the weight from its position of rest upon the glider nose, toward the tail portion of the glider body.

6. In a glider, the combination of a winged body having a nose and a tail portion, a weight shiftable from the region of the nose toward the tail of the glider body, means on the extreme front of the glider nose for supporting the weight in position to receive impacts occasioned by head-on collision of the glider with an object in its path of flight, and a time-delay means self-operative normally during flight, for shifting the weight from its position of rest upon the glider nose, toward the tail portion of the glider body, and means for limiting the extent of such weight movement.

7. In a glider, the combination of a winged body having a nose and a tail portion, a weight shiftable from the region of the nose toward the tail of the glider body, and means operative upon the shiftable weight to first slowly, then suddenly, shift the weight in the direction stated.

8. In a glider, the combination of a winged body having a nose and a tail portion, a weight shiftably mounted upon the glider body for movement from the nose toward the tail portion of the glider body, and self-operative means for slowly and gradually shifting the weight in the direction stated, during flight of the glider.

9. In a glider, the combination of a notched body comprising a wing, a nose, and a tail portion, a weight shiftable from the region of the nose toward the tail portion of the glider body, weight control means including an elastic cord attached to the weight, for temporarily holding the weight in position upon the glider body adjacent to the nose thereof incident to a tensioned condition of the cord, said cord having a free end releasably held in the notch aforesaid while the cord is tensioned, with the weight held temporarily as stated, the size of the notch being gauged to the thickness of the cord in order that the cord when under tension may slowly free itself from the notch, thereby releasing the weight to the influence of the weight control means to shift the weight toward the tail portion of the glider during flight.

10. In a glider, the combination of a notched body comprising a wing, a nose, and a tail portion, a weight shiftable from the region of the nose toward the tail portion of the glider body, an elastic cord having opposite ends, one end being fixed to the shiftable weight and the other end being fixed to the glider body in position to normally yieldingly urge the weight from the region of the nose toward the tail portion of the glider body when the elastic cord is tensioned, and a second cord having opposite ends, one anchored relative to the weight and the other being releasably held in the notch of the glider body, to temporarily maintain the tensioned condition of the elastic cord while establishing the position of the shiftable weight adjacent to the glider nose, the releasable end of the second cord when freed from the notch under the yielding influence of the elastic cord serving to release the weight to the shifting influence of the elastic cord.

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