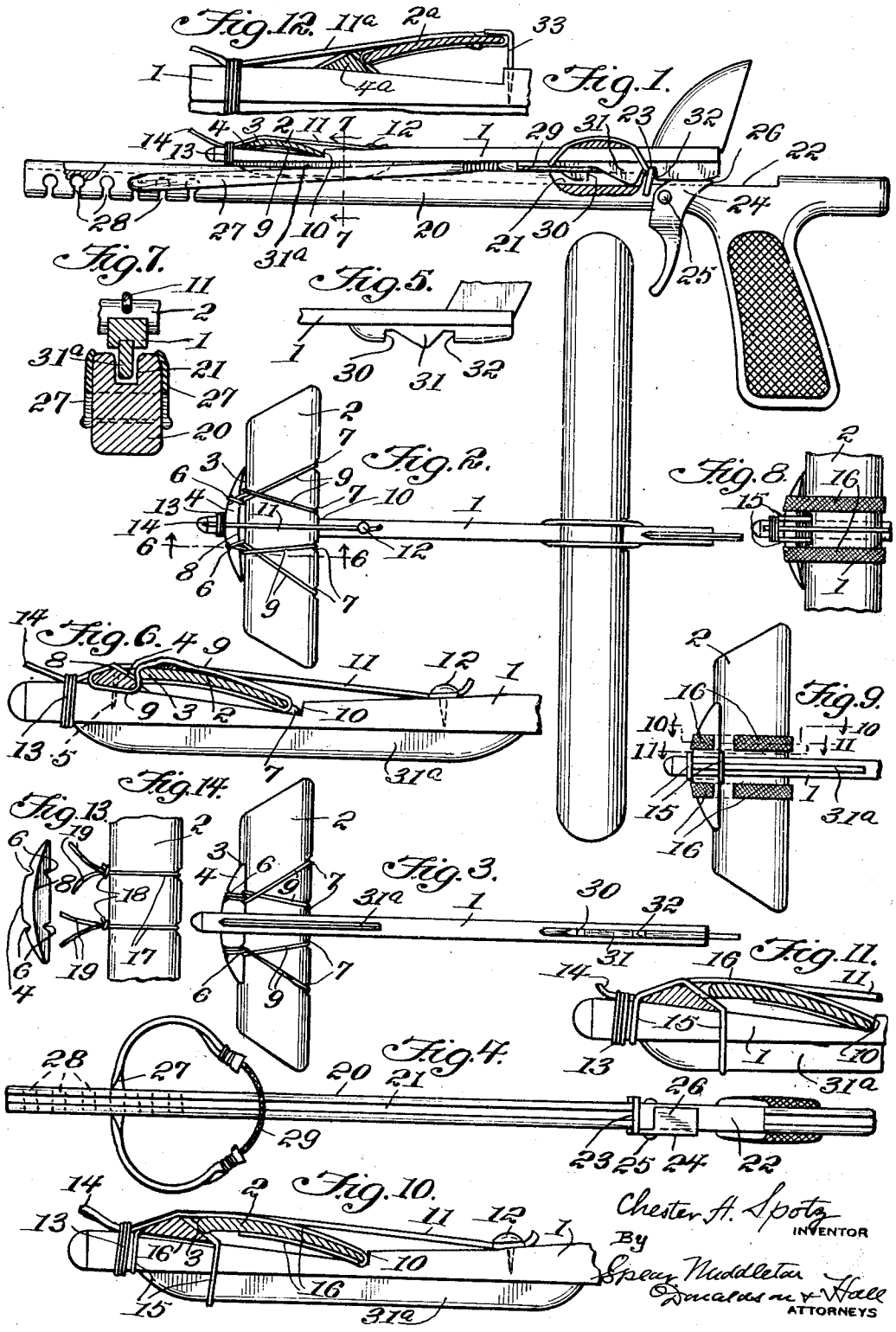
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TOY GLIDER

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TOY GLIDER

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The invention relates to toys of the type in which the miniature glider is projected by a device in the general form of a toy gun and it concerns features relating both to the glider and to the gun.

The invention is shown in the accompanying drawing in which

Figure 1 is a side view partly broken away of the complete toy.

Fig. 2 is a top plan view of the glider portion of the toy.

Fig. 3 is a bottom plan view of Fig. 2 with the main wing omitted.

Fig. 4 is a top plan view of the gun.

Fig. 5 is a detail view of the rear part of the glider.

Fig. 6 is a sectional view on line 6—6 of Fig. 2.

Fig. 7 is a cross section on line 7—7 of Fig. 1.

Fig. 8 is a top plan view of a modified way of mounting a self-adjustable wing on the glider.

Fig. 9 is a bottom plan view of Fig. 8.

Fig. 10 is a sectional view on line 10—10 of Fig. 9.

Fig. 11 is a sectional view on line 11—11 of Fig. 9.

Fig. 12 is a detail view showing the rear or main wing of the glider mounted thereon to have self-adjustment.

Figs. 13 and 14 are detail views showing a modified form of connection between the self-adjustable wing and the cross piece of the glider.

Referring first to the glider this comprises a body part or stem 1, having a wing 2 mounted at its front end so as to have swinging movement vertically or up and down relative to the body to accommodate itself automatically to varying air pressures. The manner of mounting this wing so as to swing about its front edge at 3 as a pivot may be carried out in various ways. Figs. 1, 2, 3 and 6 illustrate one way in which a cross piece 4 is fixed by a nail or screw 5, Fig. 6, to the body to extend transversely of the same and project at either side. This cross piece is notched at 6 and the wing is also notched at 7. Rubber bands 9 are twisted or looped about the cross piece and the wing as shown, said bands being lodged in the notches to retain them against displacement. These bands hold the wing to the cross piece but allow pivotal movement vertically about the front edge where it lies adjacent the cross piece and with said front edge slightly above and forward of the edge of the cross piece which on its upper side presents two upwardly inclined faces converging to the line 8. The rear edge of the wing lies adjacent a shoulder 10 on the body which shoulder furnishes an abutment which receives the initial backward thrust of the wing when the glider is first projected from the gun. The projection of the glider into space by the gun takes place under considerable force and as the wing is attached to the cross head by the yielding rubber bands it would recede from its prescribed position when it is first projected were the shoulder not provided to resist this action. This action would be due to the comparatively severe banking of the air in front of the wing at the beginning of the glider's flight but with the shoulder as a part of the structure any tendency for the wing to yield backwardly as a whole will be resisted by its rear edge coming against the shoulder. After the initial impact of the wing against the air is past then the wing, under the reaction of the rubber bands, will free its rear edge slightly from contact with the shoulder and the wing then will be free to rise and fall at its rear part relative to the body according as the variations in the banking of the air takes place, or in other words, the wing will have self-adjustment by a swinging movement about its front edge according to the varying air resistances which it meets in its flight. This self-adjustable wing controls the flight and causes this to take place substantially straight in the direction in which the glider is projected. It prevents the glider from performing a sharp upward curve or loop at the start because it yields to the comparatively excessive air pressure on the initial stage of the flight. As the flight progresses the wing will rise and fall pivotally relative to the body of the glider as it meets varying air resistances.

The body 1 of the glider being in the form of a comparatively thin rod it follows that the shoulder 10 is not extensive and is normally spaced apart from the edge if the wing, and therefore should the glider land on the end of the wing it will yield on that end away from the cross piece and thus damage to the wing will be prevented.

This yielding action will be due to the elasticity of the rubber band.

In order to apply varying yieldable pressure to the wing for pressing it downwardly a rubber cord or short length of rubber 11 is used attached by a broad headed tack 12 to the glider body or stem and having its other end passing beneath a rubber band 13 so that by pulling upon this end 14 the rubber strip 11 will be strained and added, though yielding, resistance to the upward swing of the wing will be applied. The band 13 is wrapped a number of times about the body of the glider. To reduce the tension on the wing the rubber strip 11 is pulled backward through the band 13.

Instead of connecting the cross piece rigidly to the glider body it may be yieldingly connected thereto by a rubber band 15, Figs. 8, 9, 10 and 11, and the wing instead of being connected to the cross piece by rubber bands may be connected thereto by tapes 16 Fig. 8.

In this instance, if the wing lands upon one end the whole organization including the wing and the cross piece will yield and no damage will result, this being due to the yielding of the rubber band 15 connecting the head or cross piece with the glider stem or body.

In Fig. 13 I show another means of connecting the wing and head consisting of strings 17 passing around the wing, each being knotted at 18 leaving loose ends 19 which may pass around the head or cross piece and tied thereto.

The gun consists of an elongated body or "barrel" 20 grooved lengthwise at 21, notched at its upper side at 22 and provided with an insert piece at 23 extending across the gun and closing the rear end of the groove 21. A trigger 24 is pivoted at 25 said trigger consisting of a sheet metal or other suitable piece lying against the side of the gun and having a plate-like extension 26, Fig. 4, lying in the recess 22, and just in rear of the insert or shoulder 23. For propelling the glider an elastic member consisting in part of a flat rubber piece 27 extends through any one of a series of notches 28 arranged along the lower side of the gun and the rear portion 29 of this band or loop engages a shoulder 30 facing rearwardly of the glider and forming a part of a fin or guide member 31 extending down from the bottom face of the body of the glider. This fin or guide member is comparatively thin. It runs in the groove 21 of the gun and it extends lengthwise and centrally of the lower face of the glider body or stem.

This fin also has a shoulder 32 facing forwardly and located in rear of the shoulder 30 and spaced apart therefrom.

In cocking the toy the glider is inserted with its guide fins 31, 31*a*, in the groove of the gun and with the propelling band portion 29 engaging the shoulder 30 and by drawing the glider backward along the gun its shoulder 32 is made to engage the insert shoulder piece 23 as shown in Fig. 1. When this has been done the elastic propelling band 27, 29 will have been stretched to the prescribed degree to place strong propelling force upon the glider and the device now is in "cocked" condition ready to be operated to project the glider into space as a result of the reaction of the rubber band when the glider is released. For releasing the glider the trigger is pulled which causes the plate-like part 26 thereof to lift the rear end of the glider high enough to disengage it from the inset-shoulder 23, whereupon the elastic will exert its force and project the glider from the gun. It will be noticed that when the device is cocked the body of the glider extends in an upwardly and rearwardly inclined position relative to the upper surface of the gun so that the glider at its rear portion is spaced apart from the gun. This space receives the portion 29 of the propelling band which extends along this space to the shoulder 30 with which it engages. The relation of the shoulder 30 to the other parts is important. It is below the glider body some distance forward of the rear end thereof and it lies forward of and spaced apart from the cocking shoulder 32 of the glider. By reason of this relation and the downward trend of the elastic from the shoulder 30 to the notch 28, the pull of said elastic is slightly downward and is applied at a point forward of the cocking shoulder and forward of the rear end of the glider body. As a result there will be no tendency for the pull of the elastic to "cock up" the glider relative to the gun but the glider will be projected in the direction of its body or of its general "lie" relative to the gun.

The several notches 28 are provided so that the child may adjust the propelling force to his strength so that he may readily cock the gun.

The principle of the self adjustable wing may be carried out in connection with the rear wing if desired. This is illustrated in Fig. 12 in which the wing 2*a* is normally held in its uppermost position, i. e., inclining upwardly and backwardly from the cross piece 4*a*. It is held up by a rubber cord 11*a* against a stop 33.

I claim:

1. A toy glider comprising a center stem, a wing extending transversely thereof, a

cross-piece secured at the front part of the stem, and in relation to which the wing has self-adjustment and to which said wing is attached to swing up and down.

2. A toy glider having a body portion or stem and a wing extending transversely thereof, and mounted to swing up and down about its front edge, said wing being mounted to yield if it strikes upon either end, substantially as described.

3. A toy glider having a cross piece rigidly fixed to the body and a wing connected to the cross piece to swing up and down in respect thereto and to yield edgewise and in respect to said cross piece if said wing strikes upon one end.

4. A toy glider having a body member a cross piece yieldingly connected to the body member and a wing pivotally connected to the cross piece, said cross piece being adapted to yield if the wing strikes on end.

5. A toy glider having a stem and a wing mounted thereon to have self-adjusting swinging movement up and down and a rubber piece to apply tension to said wing, extending over the wing and held at one end to the stem, said rubber being adjustable by stretching it longitudinally of the stem varying tensions on the wing.

6. A toy glider having a body member a wing mounted thereon to have self-adjusting swinging movement up and down and a rubber piece to apply tension to said wing, attached at one end to the body member, the other end being adjustably connected to the body member for stretching the rubber to exert varying tensions on the wing said rubber piece passing through a rubber band surrounding the body member which band holds the rubber piece pressed against said body but permits its adjustment.

7. A toy glider having a body portion and a transverse wing, said body portion having a fin of less thickness than the body depending therefrom centrally thereof with a forwardly facing shoulder to engage a part on a projector and a rearwardly facing shoulder adapted to be engaged by the loop of an elastic carried by the projector, said fin acting to guide the body substantially as described.

8. A toy glider comprising a body portion, a transverse wing, and shoulders below the body portion one facing rearwardly to receive the propelling elastic of a projector or gun and the other facing forwardly and adapted to engage a shoulder on the projector, the first mentioned shoulder being nearer the front end of the glider than the other shoulder to cause the elastic in propelling the glider from the gun to counteract tendency of the glider to tilt upwardly under the influence of air pressure against the wing.

9. In combination, a toy glider having a body portion and a transverse wing, guide means comparatively thin depending from said body extending lengthwise and centrally thereof and presenting one shoulder directed forwardly and another shoulder facing rearwardly, a gun having a groove to receive said thin depending guiding means, a shoulder extending across said groove and adapted to be engaged by the forwardly facing shoulder of the glider, said gun having a recess in rear of the shoulder of said gun, a trigger having a glider lifting portion in said recess, and an elastic loop attached to the front end of the gun body and engageable by the rearwardly facing shoulder on the glider.

10. In combination, a toy glider having a body member and a wing attached thereto, a rearwardly facing shoulder under the body and a forwardly facing shoulder also under the body and in rear of the shoulder first mentioned, a gun having a groove for guiding the glider with a shoulder at the rear end of said groove with which shoulder the forwardly facing shoulder on the glider engages, said glider being supported on the gun with the body of the glider slightly elevated in respect to the body of the gun so as to leave the rearwardly facing shoulder exposed above the gun and an elastic secured to the gun and engaging said exposed shoulder, substantially as described.

11. A toy glider having a wing extending in a direction transverse to the longitudinal axis and yieldably mounted to swing about its front edge to accommodate itself automatically to varying air pressures, a body carrying said wing and in relation to which the wing may yield in the longitudinal direction of said body, said body having a shoulder against which the rear edge of the wing abuts when the same yields towards the rear of the glider under the initial impact with the air, substantially as described.

12. A toy glider having a wing extending transversely of its stem or body portion, a yielding mounting for said wing by which the wing may recede along the stem, and a stop on the glider to limit the yielding movement, substantially as described.

13. A glider having a center stem, a wing secured thereto, said stem having a depending fin with a rearwardly facing shoulder at the front portion of said fin, a forwardly facing shoulder at the rear portion of said fin, and intermediate of the length of said fin, said fin presenting a rearwardly extending and downwardly facing edge face in respect to the forwardly facing shoulder, said edge face of said fin being adapted to receive pressure upwardly from the trigger of the gun, substantially as described.

14. A toy glider including a body member a wing mounted on the body member to have swinging movement up and down thereon, means for exerting a yieldable pressure on the

wing including an elastic member extending across the wing and means securing said elastic member to said body member for adjustment in the direction of the length of the glider to increase or decrease the pressure on the wing.

In testimony whereof, I affix my signature.

CHESTER A. SPOTZ.