Dec. 14, 1954 K. C. HOWARD 2,696,960

CONTROLLED KITE

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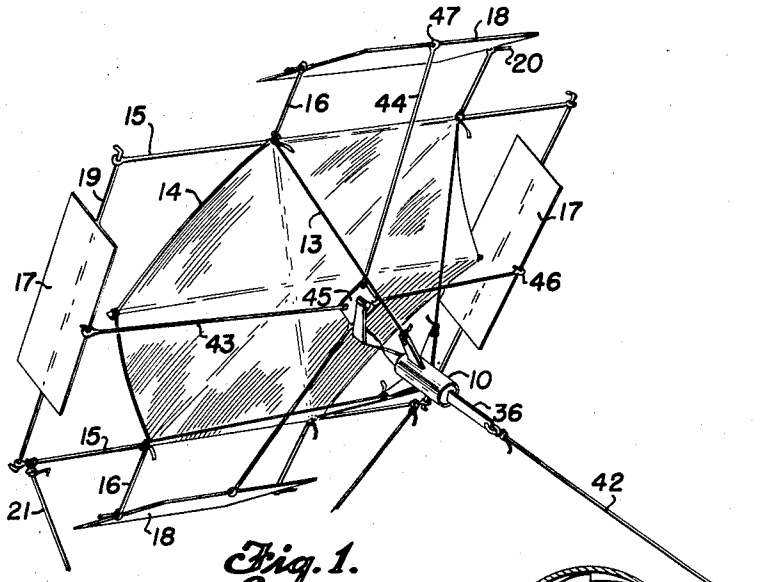


Fig. 1.

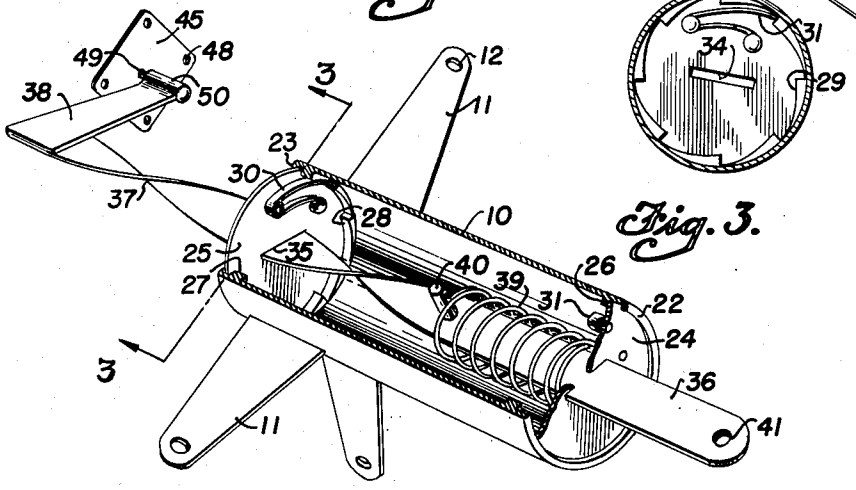


Fig. 2.

Fig. 3.

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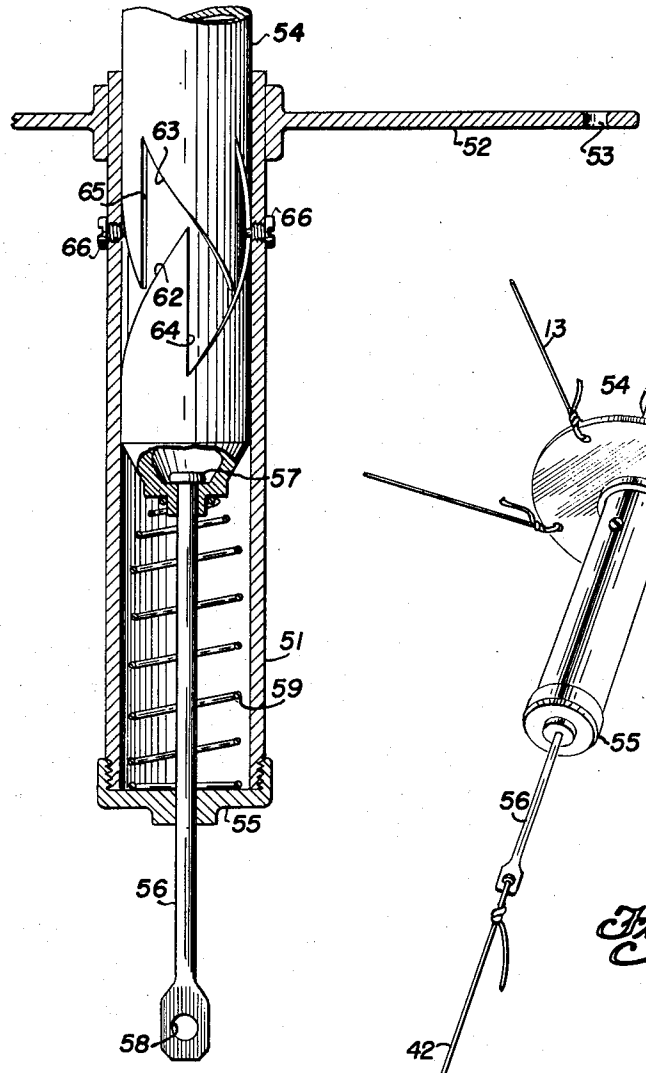


Fig. 5.

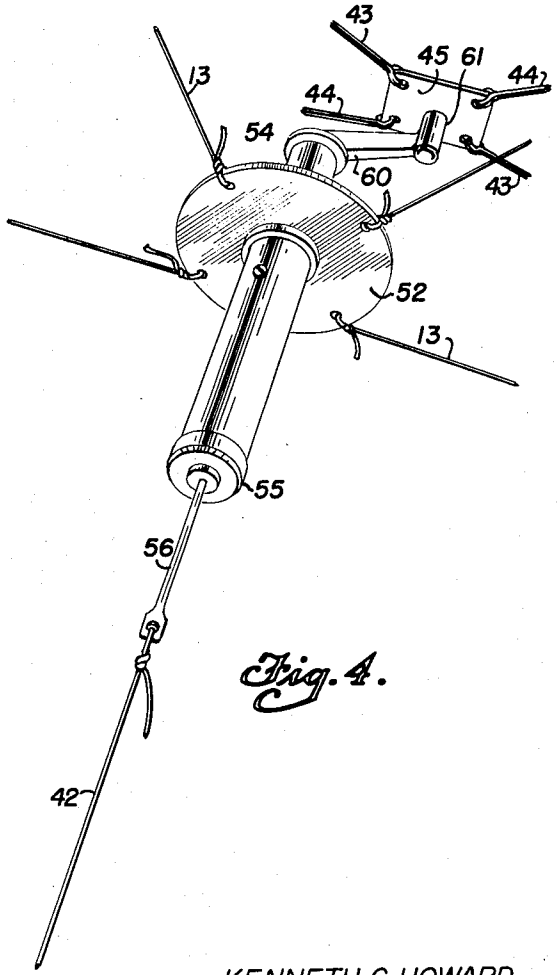


Fig. 4.

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CONTROLLED KITE

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4 Claims. (Cl. 244—153)

This invention relates to kites and has reference to vane controlled kites which are controllable from the ground during flight.

The vane controlled kite disclosed herein is readily controlled from the ground by merely altering the tension on the kite string. Such control not only provides greater interest when flying a kite for amusement, but may also have other applications such as positioning scientific instruments carried aloft by kites, and for similar purposes.

An object of the invention is to provide a ground controlled kite of the vane type whose control is continuous and employs the principle of the helix cam.

Another object of the invention is to provide a ground controlled vane type kite having a plurality of adjustable vanes, the control of which is achieved with a single central control.

The invention will be more readily understood by reference to the accompanying drawings and the following description.

Figure 1 is a perspective view of one form of the present invention.

Figure 2 is an enlarged perspective sectional view of the kite control element illustrated in Figure 1 and the inner construction of which is disclosed in detail in U. S. Patent Number 2,613,894, issued October 14, 1952.

Figure 3 is a sectional view of the control element taken on line 3—3 of Figure 2 and illustrated without the actuating bar.

Figure 4 is an enlarged perspective view of an alternate control element.

Figure 5 is a longitudinal sectional view of the control element illustrated in Figure 4.

The form of the invention shown in Figures 1 through 3 includes a cylindrical control unit housing **10** having laterally projecting ears **11** intermediate its ends, together with holes **12** in the outer ends of the ears for attaching the bridle strings **13** of a kite **14**. The kite **14** shown is hexagonal and is provided with spaced horizontal and vertical frame members **15** and **16** which project beyond the perimeter of the kite. Vertical and horizontal vanes **17** and **18** are mounted on vertical and horizontal shafts **19** and **20** which are respectively journaled in the ends of the parallel vertical and horizontal frame members **15** and **16**. A tail bridle **21** is attached to the lower horizontal frame members **15** near the outer ends of the latter and supports a tail, not shown.

The forward and rearward ends of the housing **10** are inwardly flanged, as at **22** and **23**, for retaining rotatable forward and rearward disks **24** and **25**. Internal shoulders **26** and **27** within the housing **10** rotatably support the disks **24** and **25** on the inner sides of the flanges **22** and **23**. Ratchet teeth **28** and **29** are formed in the inner peripheries of the shoulders **26** and **27** for engaging the outer ends of U-shaped springs **30** and **31** mounted on the opposing surfaces of the rotatable disks **24** and **25**. The springs **30** and **31** are mounted on the respective disks by means of projecting pins **32** and **33**, but other suitable means may be used for this purpose. The teeth **28** and **29** and their coacting springs **30** and **31** are arranged so that both disks **24** and **25** will rotate in the same direction. Slotted openings **34** and **35** are formed through the disks **24** and **25** and slidably receive a flat bar **36** therethrough. The bar **36** is twisted intermediate its ends, as at **37** and has a laterally projecting bar **38** secured to the rearward end thereof. A compression

spring **39** is mounted around the bar **36** in the forward end of the housing **10** and is held in that position by means of a lateral pin **40** positioned through said bar. A hole **41** is provided in the forward end of the bar **36** for attaching the kite string **42**.

Push-pull rods **43** and **44** are pivotally connected with the leading edges of the vertical and horizontal vanes **17** and **18**, and all of said rods are centrally connected with a control plate **45** forwardly of and substantially near the plane of the kite **14**. It will be noted that the connections at the ends of the push-pull rods **43** and **44** are relatively loose, the same being in the form of bends for engaging holes **46** and **47** in the vanes **17** and **18** and holes **48** in the control plate **45**, and whereby the latter is permitted limited forward and rearward movement. A pin **49** projects from the forward face of the control plate **45** and is pivotally received in a sleeve **50** on the outer end of the control arm **38**.

The form of the invention shown in Figures 4 and 5 includes a cylindrical control unit housing **51** having a circular flange **52** therearound with holes **53** in its periphery for receiving the forward ends of bridle strings, such as the bridle string **13** heretofore described. A cylindrical cam body **54** is received in the rear open end of the housing **51**. A cap **55** is threadedly secured on the forward end of the body **51** and slidably receives a forwardly projecting pin **56**, the inner end of which is provided with a head **57** inside of the cam body **54**, whereas the outer end is provided with a hole **58** for attachment with a kite string, such as the kite string **42**, heretofore described. A helical compression spring **59** is mounted around the last described pin **56** and bears against the inner surface of the cap **55** and against the forward end of the cylindrical cam body **54**.

The extending rearward end of the cam body **54** is provided with a rigid lateral arm **60** having a sleeve **61** thereon for rotatably receiving a forwardly projecting crank pin, such as the one **49** heretofore described, and which pin and control plate **45** are connected with push-pull rods **43** and **44**, as described in the foregoing.

The surface of the cylindrical cam body **54** is provided with an arrangement of opposing helical faces **62** and **63** each arranged in series around said surface and respectively divided by straight faces **64** and **65** parallel with the axis of the body **54** and alternately arranged with respect to each other and in overlapping relation. Shouldered screws **66** extend through the housing and the inner ends of which provide cam followers for coaction with the cam faces **62**, **63**, **64** and **65**.

In operation, the control arm **38** or **60** is initially positioned upright and the kite is then flown in the usual manner. In the last referred to position the horizontal vanes **18** provide inclined surfaces for increasing the lift of the kite **14**, and the vertical vanes **17** have little or no effect on the flying attitude. By slackening the strings temporarily, and then letting the string become taut, the arm **38** or **60** is caused to assume a different angle of rotation, causing the push-pull **43** and **44** to change the relative positions of the vertical and horizontal vanes **17** and **18**. By repeating the last referred to slackening and tightening operation, the vanes **17** and **18** may be caused to assume any desired angle relative to the length of the kite string **42**.

In connection with the first described control unit, the reciprocal movement of the bar **36**, and the ratchet action applied to the disks **24** and **25**, causes the arm **38** to progressively rotate about the axial center of the housing **10**. In connection with the form of the invention shown in Figures 4 and 5, the reciprocal action of the cylindrical cam body **54** causes the followers to alternately bear against the helical cam faces **62** and **63** and to likewise cause progressive rotation of the arm **60** about the axial center of the body **51**.

The described forms of the invention are not limited to the construction herein shown and described but may be made in many ways within the scope of the appended claims.

What is claimed is:

1. A kite comprising a kite body, vanes rotatably supported by said body outwardly of the center thereof, a

control unit supported by said body and having a crank arm positioned to rotate in an orbit inwardly of said vanes, a reciprocating member forming a part of said control unit, means operably connecting said reciprocating member with said arm for rotating the latter, means connecting said crank arm with said vanes rotating the latter, and a kite string attached to said reciprocating member.

2. A kite comprising a kite body, vanes rotatably supported by said body outwardly of the center thereof, a control unit supported by said body, said unit comprising a cylindrical housing, rotatable disks in each end of said housing, ratchet means within said housing permitting rotation of said disks both in the same direction, slots through said disks, a helically formed bar extending through said slots, a spring connecting said bar with said housing for normally urging said bar in one direction, an arm on the end of said bar adjacent the body of said kite, means connecting the outer end of said arm with said vanes rotating the latter, and a kite string attached to the remaining end of said bar.

3. A kite comprising a kite body, vanes rotatably supported by said body outwardly of the center thereof, a control unit supported by said body, said unit comprising a tubular housing, a reciprocal cylinder cam body slidably received in said housing, an extending lateral arm integrally connected with said cam body, means connecting said arm with said vanes, a spring within said

housing normally moving said cam body toward said kite body, means connecting said cam body on the end thereof opposite said arm with a kite string, cam faces in the surface of said body, and at least one follower supported by said housing and arranged to contact said cam surfaces, said cam surfaces being in the form of opposingly arranged helical surfaces positioned in interfitting space relation with respect to each other.

4. A kite control comprising a cylindrical housing adapted to be secured to the forward end of a kite bridle, a cylindrical cam body slidably mounted within said housing, helical cam faces in the surface of said cam body, at least one follower in said housing having its inner end positioned for coacting with said cam faces, a lateral arm integrally secured to said cam body and positioned outwardly of one end of said housing, a spring within said housing arranged to urge said cam body in one direction, and means connecting the spring of the kite to be flown with an integral part of said cam body.

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