May 20, 1958 H. J. MARTIN 2,835,462

KNOCKDOWN ROTARY KITE

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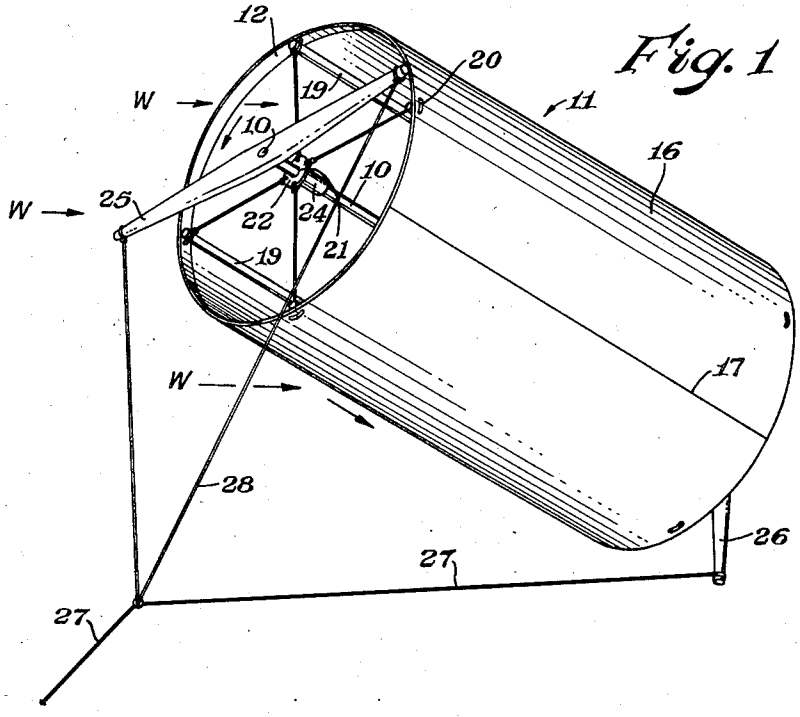


Fig. 1

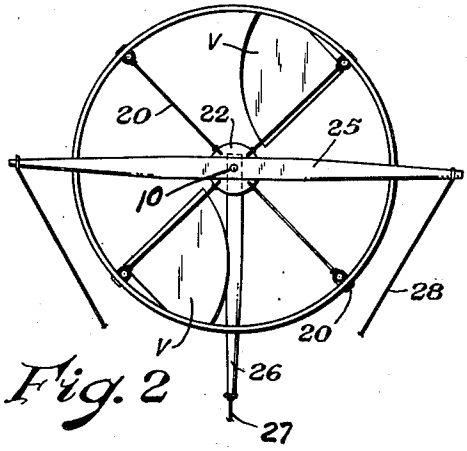


Fig. 2

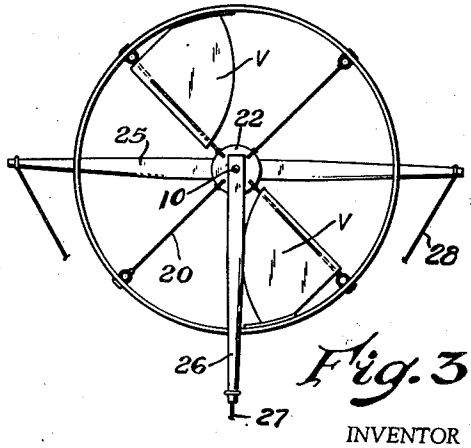


Fig. 3

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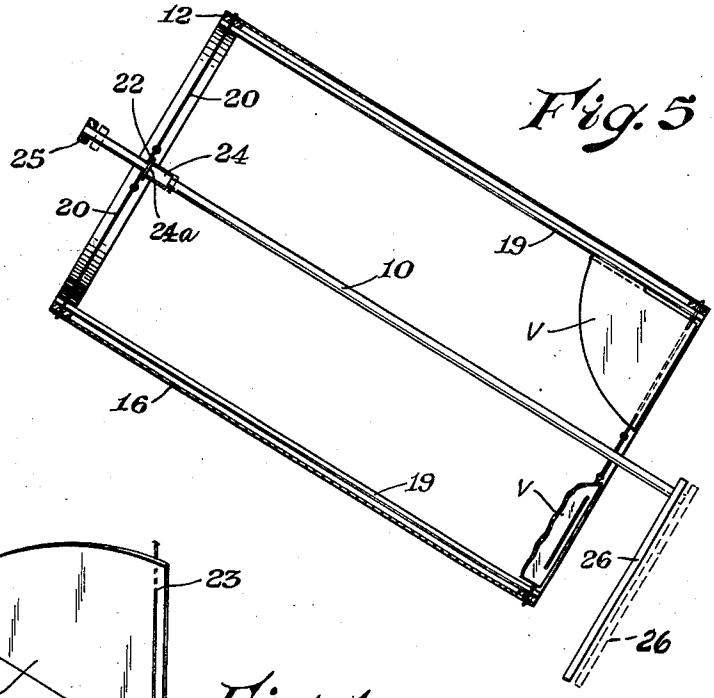


Fig. 5

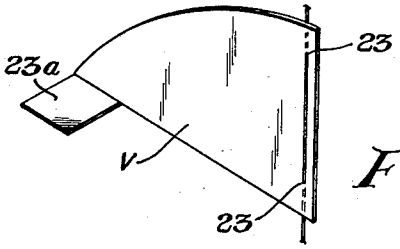


Fig. 4

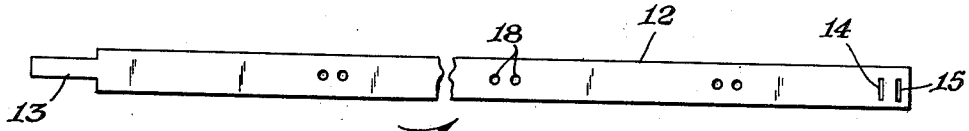


Fig. 6

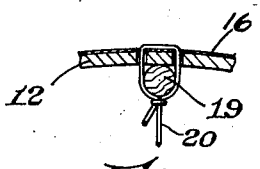


Fig. 8

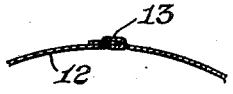


Fig. 7

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KNOCKDOWN ROTARY KITE

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Application February 15, 1954, Serial No. 410,117

13 Claims. (Cl. 244—153)

This invention relates to kites and more particularly to a knockdown rotary kite which can be readily assembled by children.

One of the prime objects of the invention is to design a kite which rotates while in the air to produce an attractive animated effect.

Another object of the invention is to design a knockdown kite of this type whose component elements can be readily manufactured and shipped in small cartons and the like and later, after sale, easily assembled by a child.

A further object of the invention is to design a well-stabilized rotary kite which is light in weight and can be flown on days when there is relatively little wind, yet which is of sturdy and durable construction and can be flown in heavy winds.

Another object of the invention is to design a kite wherein simple and efficient means are acted upon by the wind to revolve the kite which is constructed so that frictional and air resistance opposing rotation is minimized.

A further object of the invention is to design a kite comprising relatively few component parts of a simple nature which can be economically manufactured and sold in competition with conventional type kites.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion, and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is a perspective, elevational view of the kite in flying position, the arrows indicating the direction of the wind and the direction of rotation of the kite.

Fig. 2 is a front, elevational view thereof.

Fig. 3 is a rear, elevational view thereof.

Fig. 4 is a perspective, elevational view of one of the vane members.

Fig. 5 is a longitudinal, sectional view of the kite, the broken lines indicating another position of the central shaft thereof.

Fig. 6 is a view of one of the strips which can be employed to form a supporting hoop.

Fig. 7 is a fragmentary, sectional view showing the free ends of the hoop strip in assembled relation.

Fig. 8 is a fragmentary, sectional view illustrating the manner in which the radially extending cords which connect the various elements of the rotary member are tied in position.

Referring now more particularly to the accompanying drawings in which I have shown the preferred embodiment of my invention, my kite comprises broadly a stationary central shaft **10** on which a wind-receiving cylindrical member **11** is rotatably mounted. The kite is designed so that it can be readily assembled by a child from the prefabricated parts which are provided.

Flexible, light metal or plastic strips **12** (see Fig. 6), formed with a tongue **13** at one end thereof and a pair of transversely disposed slots **14** and **15** at the opposite end may be provided to form hoops for supporting the light paper body **16** of the kite. The ends of the strips **12** are joined as shown in Fig. 7 with the tongue **13** extending from underneath through the slot **14** and thence back through the slot **15**, the extreme end of the tongue thence being bent reversely as shown. The paper body **16** which is shipped as a single tightly rolled sheet, can then be glued to the outer peripheral faces of the hooped strips **12** which are employed to support the ends thereof, the overlapped edges of the sheet being preferably secured with a suitable glue at **17**. Clearly, the glue employed in assembling the kite should be of a type which is insoluble in water and will be unaffected should the kite accidentally become wet.

It will be obvious that pairs of closely spaced openings **18** are provided at circumferentially spaced intervals in the hooped strips **12** and a sharp tool may be employed to punch corresponding openings in the body surface **16** of the kite. Parallelly disposed, longitudinally extending braces **19** can then be secured in position by looping the outer ends of radially disposed strings or cords **20** through each pair of openings **18** and tying them around the braces **19** as shown in Fig. 8. The opposite ends of the cords **20** are tied to disk-like bearings **22** through openings **21** provided therein.

Oppositely disposed segmental vanes V are provided angularly at the rear end of the kite, the vanes being preferably formed of heavy paper having openings **23** along the right angular edge thereof through which the cords **20** extend. The opposite ends of the vanes are provided with tabs **23***a* which are bent laterally to the wind-receiving portions thereof and may be glued to the inner surface of the body **16**. The vanes V extend inwardly at approximately a 45° angle to a vertical plane taken through the axis of rotation of the rotary member **11** in Figs. 2 and 3 and operate to spin the member **11** in a counter-clockwise direction when the kite is flying and they are struck by a wind which is proceeding in the direction W.

It will be seen that the shaft **10** extends through bearings **22** and projects beyond the ends of the rotary member **11**. Provided on the shaft **10** is a stop **24** and mounted thereadjacent on the front face thereof and loosely on the shaft **10** is a disk-like bearing **24***a*. Since the cords **20** are somewhat slack, it will be clear that the rotary member **11** has a certain flexibility when the foremost bearing **22** is in engagement with the disk **24***a*, and further the member **11** has a limited amount of axial play on the shaft **10** (see Fig. 5) which minimizes frictional resistance when the kite is in flight and the member **11** is rotating.

A stabilizer **25** which spans the front end of the kite is provided on the front end of the shaft **10**, and a stabilizer **26** is provided which depends from the rear end of the shaft **10** at approximately right angles to the stabilizer **25**. A line **27** is tied to the end of the stabilizer **26** and extends through and is tied to a looped line **28** which is tied to the respective projecting ends of the stabilizer **25**, the line **27** thence leading to the ground as usual.

Gusts of wind proceeding through the cylindrical member **11** strike the vanes V and rotate the member **11** on the shaft **10**, the rotation of the cylinder creating a lift in addition to the lifting effect of the wind on the surface **16**, which even on days on which there is

relatively little wind, keeps the kite aloft. With the kite flying in the position shown in Fig. 1, the stop **24** prevents the member **11** from slipping into engagement with the stabilizer **26** and there is relatively little frictional drag due to rotation of the front disk bearing **22** relative to the disk **24***a* or the disk **25** relative to the stop **24**. The tilt of the kite in the air (see Fig. 1) controls the rate of climb thereof, the air striking the undersurface of the kite and being turned downwardly thereby so that a lift is imparted to the kite. Further, a lift is imparted to the kite by air proceeding into the rotating member **11** and being turned downwardly thereby. The tilt of the kite may be varied by adjusting the length of the line **27** between the line **28** and stabilizer **26**, and it is of course desirable to do this in accordance with the amount of wind on a given day. The relative disposition of the stabilizers prevents the kite from rolling in the air about the point where the lines **27** and **28** are joined and the ends thereof from swaying laterally with respect to one another in the wind. The longitudinal axis of the kite in the air is thus retained in the directional path of the wind.

It will be apparent that I have perfected a very practical rotary kite which can be very readily assembled and flown by children. Suitable figures are provided on the outside surface **16** so that the rotation of the member **11** is readily discernible from the ground and the animation is pleasurable.

What I claim is:

1. In a rotary kite, a tubular wind-receiving surface, a central axially disposed shaft extending beyond the ends thereof on which said surface is rotatably mounted, means catching the wind to cause rotation of the surface, bearings on said shaft connected to said surface to rotate therewith, a line for said kite, and means connected to the ends of said shaft and to said line permitting the kite to fly with the longitudinal axis thereof lying in the prevailing path of a wind current.

2. The combination defined in claim 1 in which said means connected to the ends of the shaft comprises a stabilizer member spanning one end of the kite and a second stabilizing member at the opposite end of the kite disposed substantially perpendicular to said first mentioned stabilizing member, flexible line means connecting the stabilizer members to said line.

3. The combination defined in claim 1 in which radially disposed cords connect the bearings and wind-receiving surface.

4. In a rotary kite a tubular, cylindrical member open at the ends thereof, an axial shaft for said member extending beyond the ends of said member, disks of relatively small diameter revolvable on said shaft adjacent each end of said member, radially disposed cords tied between said disks and the ends of said member, stop means fixed to said shaft near the front end thereof for limited engagement with said disk on the front end of said shaft, means on said member for causing rotation of said member in the wind, stabilizer means on said shaft for maintaining the kite in steady flight with the axis of the kite disposed in the directional path of the wind, and a line for said kite leading from said stabilizer means.

5. The combination defined in claim 4 in which said stabilizer means comprises a laterally disposed stabilizer bar on the front end of said shaft spanning said member with both ends thereof extending beyond the edge of said member, a depending stabilizer bar on the rear end of said shaft extending beyond the edge of said member, said line connecting the ends of said lateral stabilizer bar and the depending end of the companion stabilizer bar to said line.

6. The combination defined in claim 4 in which said means for rotating said member comprises diametrically opposed segmental vanes with an angular edge thereof connected to said radially disposed cords, the other angular edge of each vane having laterally bent tabs secured to the inner wall of said member, said vanes extending inwardly from the rear end of said member at opposite angles with respect to the axis of rotation thereof.

7. The combination defined in claim 4 in which said member is mounted on strips with the ends thereof interconnected to form hoops, the hoops being spaced apart and supporting the cylindrical wind-receiving surface.

8. The combination defined in claim 7 in which spaced apart pairs of openings are provided in said hoops and surface and longitudinally extending braces are provided for said member, the outer ends of said cords looping through said pairs of openings and being tied around said braces.

9. In a rotary kite, a tubular wind receiving surface open at the ends thereof to permit the passage of air currents therethrough, substantially axially disposed shaft means on which said surface is mounted, vane means on said surface for catching the wind to cause rotation of the surface, a line for said kite, and means connected to said shaft means and to said line stabilizing the kite so that it flies with its longitudinal axis lying in the prevailing path of wind current.

10. A kite construction comprising a hollow, cylindrical member; support means for said member including a first part located substantially axially within said member and other parts extending radially from said first part and connected to said member; stabilizing means on said first part and operable during flight of said member to maintain the latter in such position that its longitudinal axis lies substantially in the direction of a wind current, said stabilizing means including an elongated element arranged normally to said first part; and a line connected to said stabilizing means for permitting captive flight of said kite.

11. A construction as set forth in claim 10 wherein said first and other parts are relatively rotatable.

12. A construction as set forth in claim 11 including vane means mounted on said member for imparting relative rotation of said member and said first part.

13. A construction as set forth in claim 12 wherein said vane means are mounted within said member.

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