

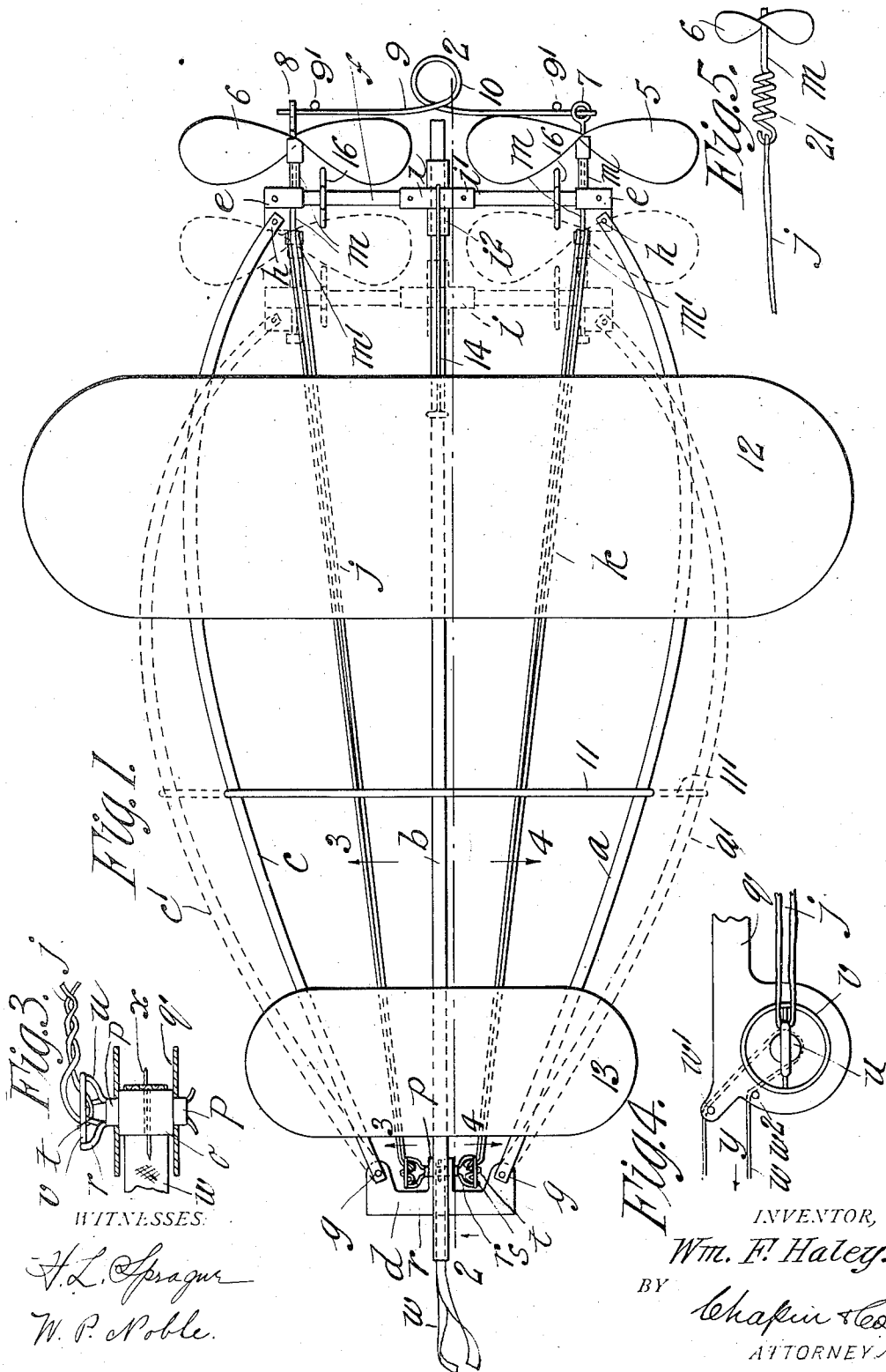
W. F. HALEY.
TOY AEROPLANE.

APPLICATION FILED MAY 10, 1912.

Patented June 3, 1913.

2 SHEETS—SHEET 1.

1,063,536.



WITNESSES:
A. L. Sprague
W. P. Noble.

INVENTOR,
Wm. F. Haley.
BY
Chapman & Co.
ATTORNEY.

TOY AEROPLANE.

Patented June 3, 1913.

1,063,536.



H. L. Sprague
W. P. Noble.

Wm. F. Haley.

Chapin & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM FRANKLIN HALEY, OF SPRINGFIELD, MASSACHUSETTS.

TOY AEROPLANE.

1,063,536.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed May 10, 1912. Serial No. 696,320.

To all whom it may concern:

Be it known that I, WILLIAM F. HALEY, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Toy Aeroplanes, of which the following is a specification.

This invention relates to improvements in toy aeroplanes of the type in which a plurality of supporting planes are employed to keep the toy afloat and in which a plurality of propeller blades are used for driving the machine through the air.

The object of the invention relates particularly to the winding device for the propeller blades. Heretofore it has been difficult matter to wind the springs or other device which drive the blades, to a uniform tension, so that when the winding mechanism is removed from the machine the blades will be driven at the same speed and will rotate for the same length of time. This difficulty is especially hard to overcome where more than one propeller blade is used.

Referring to the drawings, forming a part of this application, Figure 1 is a plan view of my invention clearly illustrating the arrangement of the propeller blades, the supporting planes, and the winding mechanism for the propeller blades, also showing the supporting frame-work which is partially composed of flexible members. Fig. 2 is a sectional view on the line 2—2 of Fig. 1 showing the manner in which the aeroplane is supported when at rest and also the manner in which the supporting planes are arranged or connected to the frame-work, and in dotted lines the position of the rear supporting plane at the beginning of the flight. Fig. 3 is an enlarged detailed plan view partially in section, of the winding mechanism for the propeller blades showing how the rubber bands which drive the propeller blades are attached thereto, and also the means for imparting a rotary motion to this winding mechanism. Fig. 4 is an end elevation on an enlarged scale of Fig. 3 clearly showing how the endless winding ribbon is arranged to pass around the barrel element of the winding mechanism to impart a twisting movement to the rubber or elastic bands which drive the propeller blades. Fig. 5 is a modification of the connecting means between the winding mechanism and the propeller blades.

Referring to the drawings in detail, *a*, *b* and *c* designate three longitudinally arranged members of the frame which are arranged in the same plane, the members *b* and *c* being pivotally connected at their front and rear ends to plates or bridge-pieces *d* and *e*, and extending between the plates *e* is a transverse rod *f*.

g designates the pins by means of which the elastic rods *a* and *c* are pivotally connected to the plate *d*.

h designates the pivot pins by means of which the flexible rods *a* and *c* are connected to the rods *e* at their rear ends.

i is a tubular member through which the transverse rod *f* passes and to which it is secured by means of pins *j*.

The bar *b* passes loosely through the part *i* of the member *i* and is shown in dotted lines in Fig. 1 with the plate *i* drawn forward. As the bars *a* and *c* spring outward during the winding process the rod *f* and the plates *e* and *i* assume the dotted line positions.

Referring now particularly to the winding mechanism by means of which the rubber bands shown at *j* and *k*, and which extend from the propeller shafts *m* to the winding barrel *o* are wound. The barrel *o* consists of a cylindrical part having bearing portions *p* in the parallel members *q* which are an integral part of the plate *d*. Attached to the barrel member *o* are outwardly extending arms *r* which are folded back as shown at *s* and then forward again as shown at *t* whereby a V-shaped loop *u* is formed, and passing through these loops on opposite sides of the machine are the rubber bands *j* and *k*. It will be noticed in Figs. 1 and 3 that the part *t* extends slightly forward or outside of the ring *v*. Passing over the barrel portion *o* is an endless tape or belt *w* for rotating the barrel and this rotation is accomplished by means of the band *w* engaging the pins *w*¹ and *w*² so that when the operator pulls on this tape or belt in the direction indicated by the arrow *y* the barrel will be rotated causing the rubber bands *j* and *k* to be twisted in opposite directions as shown by the arrows 3 and 4. The tape *w* is guided by the pins *w*¹ and *w*². It should be particularly observed from the construction of the barrel and the arrangement of the ring *v* and the V-shaped part *t*, that when the band *w* is drawn forward the rubber bands 3 and 4 will slip from one

side of the member *t* to the other thus preventing the inner ends of the rubber bands from winding around the barrel or drum, the ring *v* serving to always maintain the attaching end of the bands *j* and *k* in the bottom part of the V-shaped part *t*.

The two propeller blades are shown at 5 and 6 and are mounted, on the shafts *m* which extends beyond the blades 5 and 6 and are formed with a loop in each as shown at 7 and 8. The outer ends of the rubber bands *j* and *k* are attached to the shafts *m* as shown at *m*¹. These shafts pass through the bar *f* and in which they revolve. During the winding operation a wire 9 having a loop 10 therein is temporarily inserted in the loops 7 and 8 to prevent the propeller blades from rotating while the drum *o* is being actuated by the endless band *w*, and after the rubber bands *j* and *k* are wound up sufficiently tight the wire 9 is removed by simply pressing inward on the sides of the loop 10 thereby withdrawing the ends of the wire 9 from the loops 7 and 8. This permits the wound up bands *j* and *k* to readily unwind and rotate the propeller blades 5 and 6 in the opposite direction for the purpose of propelling the toy through the air. The wire 9 is also provided with loops 9¹ to retain the same in place in the loops 7 and 8 during the winding operations.

Located on the flexible bars *a* and *c* is an elastic or rubber band 11 so that when the bands *j* and *k* are wound up the bars *a* and *c* will be bowed outward into the dotted line position *a*¹ and *c*¹. At the same time the rubber band 11 is stretched to the dotted line position 11¹. This construction serves to draw the bars *a* and *c* back again to the full line position simultaneously with the unwinding and lengthening of the bands *j* and *k* and therefore assists in automatically maintaining a constant or uniform rotation of the propeller blades 5 and 6.

12 and 13 designate supporting planes that are attached to the frame work of the toy. The plane 12 being slightly curved as shown in Fig. 2 with one end attached to the middle brace *b* as shown at 12¹. Its rear portion is designed to slide upon a wire 14 which is attached to the plate *i* and the bar *b* respectively. This wire, as shown in Fig. 2, is arranged in an inclined position on the plane 12 before the rubber bands *j* and *k* are wound up and the dotted lines the position of the plane after the bands are wound, thus when the machine starts to fly, plane 12 is in inclined position and at the end of the flight it assumes nearly the original position as shown in Fig. 2 at full lines. The purpose of causing the plane 12 to assume such a position is that as the machine runs down, the return of the plane 12 to a horizontal position helps to maintain

the machine in flight, and is automatically operated by means of the inclined wire 14 and the flexible bars *a* and *c*. Plane 13 is attached to the middle brace bar *b* by means of the wires 13¹ and 13².

For supporting the machine when not in use a plurality of rollers is shown in Figs. 1 and 2 and these consist of a piece of wire twisted into a circular shape as indicated at 15 and 16 which are rotatively mounted on the shafts 17 and 18 which wires are carried upward and attached to the brace bars *b* and *c* respectively, as indicated at 19 and 20.

As a modification in which the rubber band 11 is omitted I may insert between the inner end of the shafts *m*, on which propeller blades 5 and 6 are mounted and the ends of the rubber bands *k*, a coiled spring 21 in which during the winding operation of the rubber bands *j* and *k* will as they shorten, separate the coils of the spring 21 and during the unwinding operation of the bands *j* and *k* the coils 21 will again come together and thus serve to exert a longitudinal tension on the bands *j* and *k* and thus prolong the rotative movement of the propeller blades in the same manner that the band 11 serves to bring back and lengthen the bars *a* and *c* in Fig. 1 to their original full line position.

It is to be understood that I do not limit myself to the exact construction shown in the figures in which the middle bar *b* slides through the perforated plate *i* as I may have the bar *b* slide freely through the plate *d* at the front end of the machine and have the bar *i* fixed, which construction would be a simple reversal of that herein shown and described and would not in any way change the operation or the result already described.

It is to be understood that my invention is not limited to the winding up of the rubber bands for two propellers as it may be used to wind up a single rubber band to operate a single propeller only.

What I claim, is:

1. In a toy aeroplane, the combination with the frame-work and the propellers located thereon, elastic bars extending from the propellers to the winding means, said means comprising a rotatable member, elastic devices extending from said member to the propellers, means to cause the elastic devices to be operated in opposite directions.

2. In a toy aeroplane, the combination with a supporting frame, of a plurality of propeller blades, a winding device, elastic connections between the blades and said device, the said winding device being provided with projections over which a winding tape device passes, means to retain the propeller blades stationary during the winding operation, and to simultaneously release them at the end of the winding operation.

3. In a toy aeroplane, the combination

with a supporting frame of a plurality of propeller blades, a winding drum, elastic connections between the blades and the drum, the drum being provided with projections over which a winding tape passes, means to retain the propeller blades stationary during the winding operation and to simultaneously release them at the end of the winding operation, a supporting plane and means to automatically incline the plane during the winding operation and to cause it to assume substantially a horizontal position during the unwinding operation.

4. A winding device for toy aeroplanes comprising a member mounted for rotation, a V-shaped element carried thereby, a device into which the V-shaped element projects, whereby when an elastic motor device or band is attached to the V-shaped element a twisting motion will be imparted thereto.

5. In a toy aeroplane the combination, a supporting frame flexible members at the side adapted to bow outward, an inclined element on the frame, a supporting plane engaging said element to cause it to assume an inclined position as the side members are bowed outward.

6. A device to impart a twisting or turning movement to an elastic band comprising a rotatable or barrel member, attaching devices on the member and to which one end of the band is secured, said devices including a guard element movable with the rotatable member to prevent the band from winding on the attaching device.

7. In a toy aeroplane, a frame work, a supporting plane thereon, propelling devices for the toy, means to position the plane at an angle to the frame-work in proportion as the propelling devices are in a wound or unwound condition, said means comprising an inclined member attached to the framework, and means on said plane to engage the inclined member, as described.

8. A winding device comprising a barrel member, a tape or belt device to rotate said member, an attaching device to which an elastic band or element is secured, and a guard member to prevent the band from coiling around the barrel member.

9. In a toy aeroplane, the combination, a

rigid frame-work, propeller devices therefor, the outer side members of the frame-work being adapted to bow outward, a member secured to a transverse member of the frame-work and formed with an opening therethrough to receive the middle longitudinal member of the frame, whereby when the side members assume a bowed out position the middle member will slide through said member.

10. A plate member for securing the members of an aeroplane together, a winding drum, said member being formed with downwardly extending portions in which said drum is mounted, and guiding devices in said portions over which a winding tape or belt passes as described.

11. In a toy aeroplane, the combination, a pair of propeller blades, shafts to support the same and formed with a loop at their ends, means to rotate the same in opposite directions, means inserted in the loops to simultaneously retain the blades against rotation while being wound and to permit the blades to be simultaneously released.

12. In a winding device for a toy aeroplane, the combination with a frame, a pair of propeller blades, elastic means extending from the winding device to said blades, means to simultaneously rotate the elastic means in opposite directions, means to prevent the elastic means from coiling up on the winding device and means to simultaneously retain the pair of propeller blades against movements during the winding up operation.

13. In a toy aeroplane the combination with the frame-work, a propeller blade, a winding device, an elastic motor device connecting the winding device and the propeller blade, an elastic member of the frame being adapted to bow outwardly as the motor device is wound up, whereby when the motor device runs down the return of the elastic member to its original position will assist and prolong the operation of the motor device which drives the propeller blade.

WILLIAM FRANKLIN HALEY.

Witnesses:

HARRY W. BOWEN,
K. I. CLEMONS.