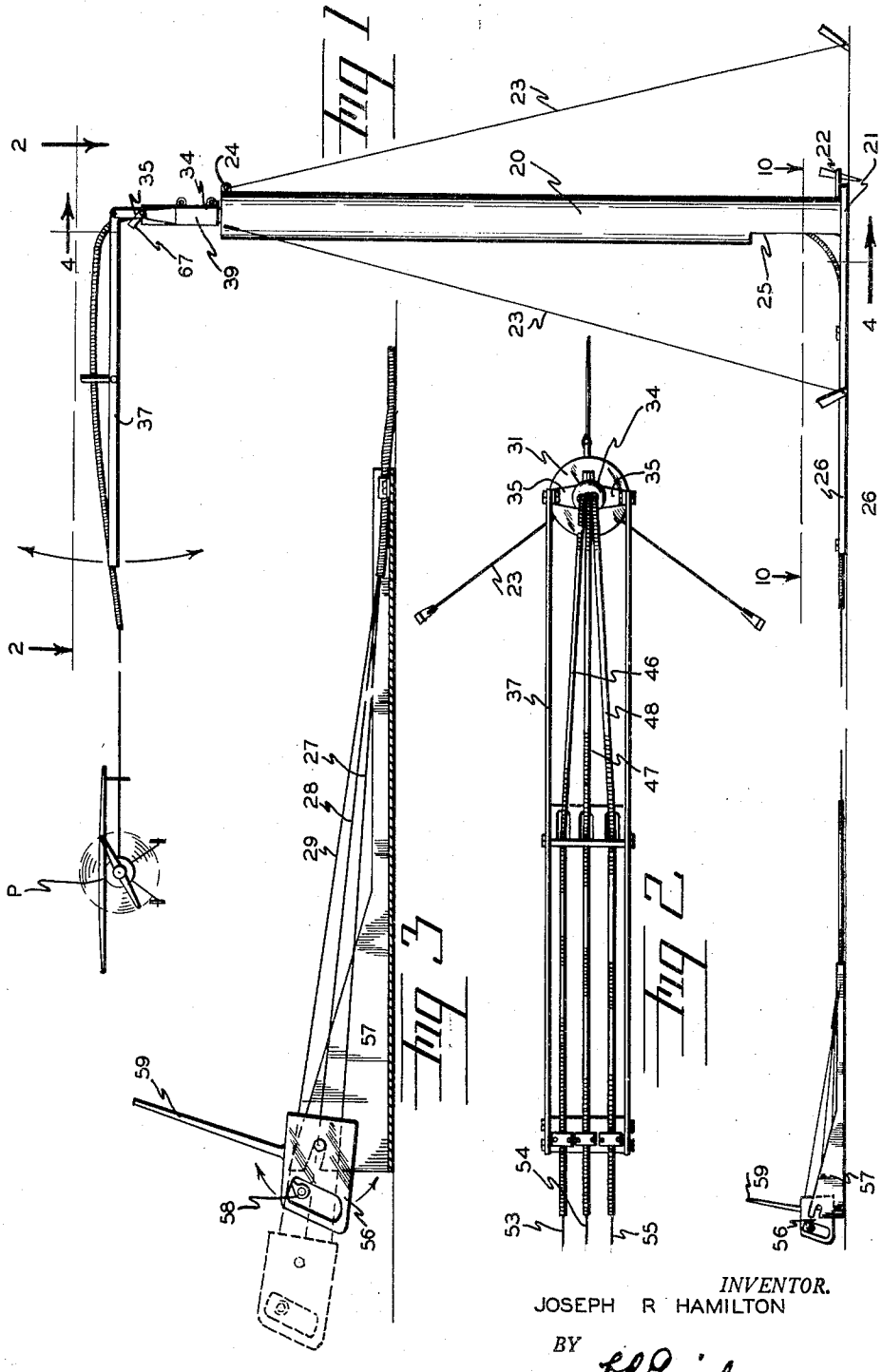
Sept. 1, 1953 J. R. HAMILTON 2,650,827

PYLON

Filed Jan. 21, 1952 3 Sheets-Sheet 1




INVENTOR.
JOSEPH R HAMILTON
BY
ATTORNEY

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PYLON

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Fig 11

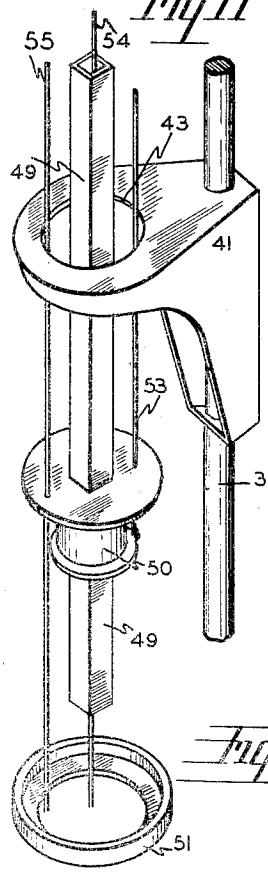



Fig 5

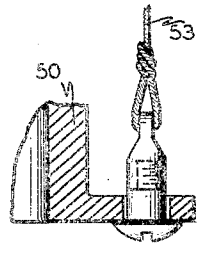
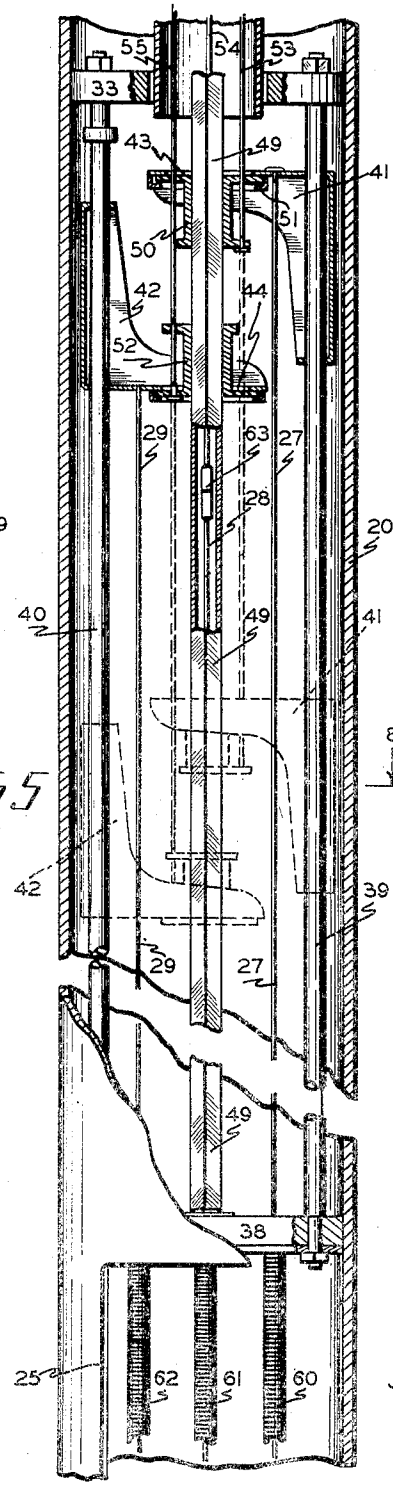



Fig 12



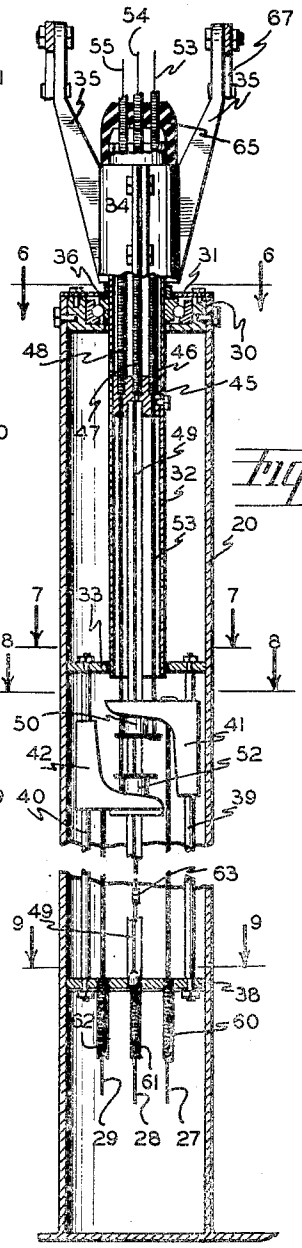




Fig 4

INVENTOR.
JOSEPH R HAMILTON
BY P. R. Pfeiler.
ATTORNEY

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PYLON

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Fig 10

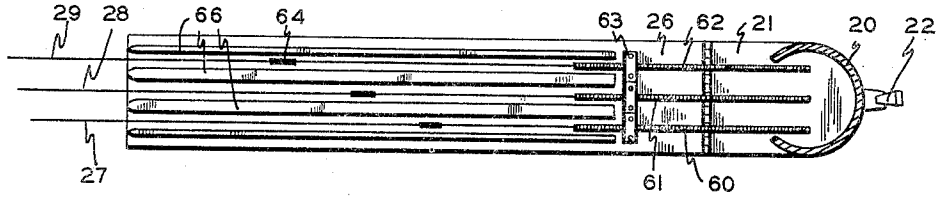



Fig 6

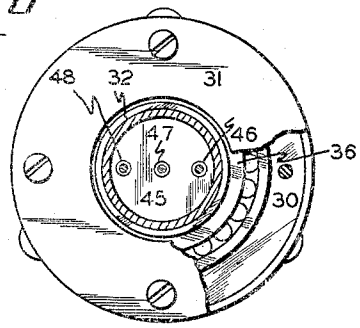



Fig 7

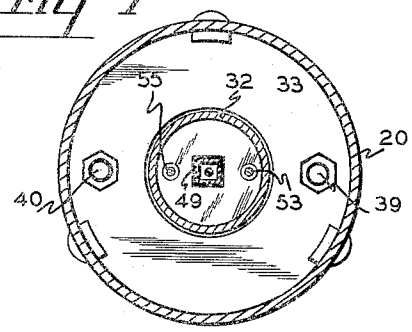



Fig 9

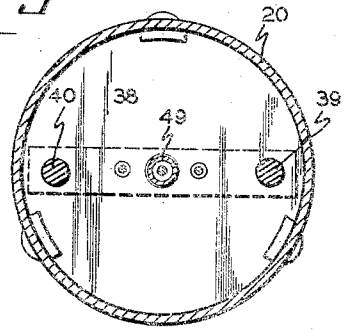
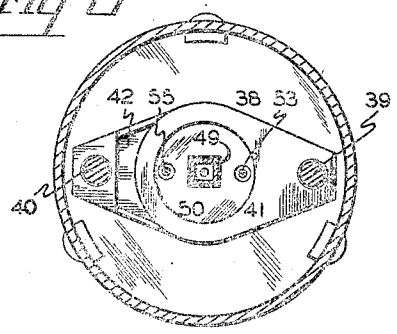



Fig 8




INVENTOR.
JOSEPH R HAMILTON

BY

ATTORNEY

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# UNITED STATES PATENT OFFICE

2,650,827

## PYLON

Joseph R. Hamilton, Baker, Oreg.

Application January 21, 1952, Serial No. 267,371

7 Claims. (Cl. 272—31)

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In general this invention relates to a small tower assembly suitable for use as a guiding means for mechanical, self-propelled models or toys, such as motor boats, motor vehicles and airplanes, and relates especially to model pylons or control towers employed in the flying of model airplanes.

An object of this present invention is to provide a tower or pylon through the medium of which two or more control lines can be connected to a circling, mechanically-driven or self-propelled device, and to a central manually-operated control, without resulting in any twisting of the control lines or the winding of the control lines upon each other during the continued circling movement of such device.

Another object of this invention is to provide a central tower or pylon through the medium of which a plurality of control lines can be connected to a circling motor-driven device and through which each control line can be manipulated independently of, and without interference from, any other control line while the device continues its circular path around the pylon.

A more specific object of this invention is to provide an improved model pylon to be employed in the flying of a model airplane, which pylon will readily accommodate itself to any directional movement of the airplane.

A further and related specific object is to provide a pylon which can be employed in connection with the triple line control means described in my U. S. Patent No. 2,543,965, issued March 6, 1951, and entitled "Flight Control for Model Airplanes."

The manner in which the above objects and other advantages are attained with the present invention, and the construction and manner of application of my improved pylon, will be briefly described with reference to the accompanying drawings.

In the drawings:

Fig. 1 is an elevation of my pylon illustrating the same in use in connection with the flying of a model airplane, the flying of which airplane is controlled by means of three separate manually-operated control lines;

Fig. 2 is a top plan view of the top portion of the pylon taken on line 2—2 of Fig. 1, but drawn to a larger scale, and showing in detail the pivoted top arm assembly;

Fig. 3 is an enlarged sectional elevation of the manual control device, shown also in Fig. 1, from which control lines lead into the lower portion of the pylon;

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Fig. 4 is a sectional elevation corresponding to line 4—4 of Fig. 1, but drawn to a larger scale;

Fig. 5 is a similar but fragmentary sectional elevation of part of the pylon drawn to a considerably larger scale and illustrating in broken lines the adjustable positions of certain movable elements;

Fig. 6 is a section corresponding to line 6—6 of Fig. 4 drawn to a larger scale;

Fig. 7 is a similar enlarged section corresponding to line 7—7 of Fig. 4;

Fig. 8 is a similar enlarged section corresponding to line 8—8 of Fig. 4;

Fig. 9 is a similar enlarged section corresponding to line 9—9 of Fig. 4;

Fig. 10 is an enlarged plan section on line 10—10 of Fig. 1;

Fig. 11 is an enlarged perspective view of one of the movable elements located within the pylon and its associated members; and

Fig. 12 is a fragmentary section of one of the movable elements showing a preferred manner of connecting a control line to the element.

Referring first to Figs. 1, 4 and 10, my improved pylon includes a tubular main housing 20 attached to a base 21 and adapted to be mounted in substantially vertical position on the ground and firmly held in such position by any suitable means such as a peg 22 and guy lines 23, which guy lines are connected to ears 24 at the top of the main housing, the bottoms of these lines then being secured to pegs driven into the ground at spaced distances from the bottom of the housing. A portion of the tubular housing 20 is cut away at the bottom as indicated at 25 in Fig. 1, to facilitate the free passage of control lines and conduits over the base and up into the housing. An additional base section 26 (Figs. 1 and 10), hinged to the housing base 21, provides a protective guideway for the three control lines 27, 28 and 29, to be referred to later.

A bearing-supporting ring member 30 (Figs. 4 and 6) is secured in the top of the main housing 20 and is surmounted by a ring-shaped cover disc 31. A race and suitable ball bearings are supported in the member 30 and thus provide a rotatable mounting for a secondary tube 32, a portion of which extends above the top of the main housing 20. A companion race 36 is secured on the secondary tube 32 so as to hold this tube suported by the ball bearings and the member 30. A ring 33 (Figs. 4 and 7) secured within the housing 20, acts to keep the bottom end of the tube 32 in position while permitting the tube to rotate freely.

A bracket clamp **34**, having a pair of diametrically-opposite upwardly-extending supports **35** (Figs. 1, 2 and 4), is secured on the upper portion of the tube **32** above the main housing **20**. A top arm assembly **37** (Figs. 1 and 2) is pivotally mounted on the upper end of the supports **35** and will be referred to again later.

A second disc **38** (Figs. 4, 5 and 9) is secured within the lower portion of the main housing **20**. A pair of parallel stationary and diametrically opposite guide rods **39** and **40** have their upper and lower ends secured to the ring **33** and the disc **38** respectively. A pair of brackets **41** and **42** are slidably mounted on the rods **39** and **40** respectively. These brackets are identical in size and shape, the shape of bracket **41** being shown clearly in Fig. 11, but these brackets are oppositely positioned, as shown in Figs. 4 and 5. Bracket **41** has a central circular opening **43** (Fig. 11) extending through its top horizontal portion, and bracket **42** has a central opening **44** of the same size extending through its corresponding bottom horizontal portion.

A circular support member **45** is secured within the tube **32** in the relative location shown in Fig. 4. Three vertical channels, serving as passageways for three control wires, extend through the member **45**. Three flexible conduits **46**, **47** and **48** (Figs. 4 and 6) for the control wires have their lower ends secured in the upper enlarged portions of these channels in the support member **45** respectively. A central square-shaped tube **49** has its upper end secured in the member **45** in alignment with the central channel of the same. The bottom end of this square-shaped tube **49** is rotatable within a circular guideway in the disc **38**. A control line extends through this square tube **49**.

A spool member **50** (Figs. 4, 5 and 11) is formed with a square shaped center hole of the proper size so that the spool member will slide up or down on the square tube **49**, but will be rotated by the tube **49** whenever the tube rotates. The top face of the spool **50** is of larger diameter than the circular opening **43** in the bracket **41** so that the spool **50** is prevented from sliding upwardly through the opening **43**. A ring clip **51** (Fig. 5) secured to the under side of the top face of bracket **41** acts to hold the spool **50** in engagement with this bracket while permitting the spool to rotate freely with respect to the bracket. A second similar spool member **52** (Figs. 4 and 5 is located within the central opening **44** of the other bracket **42** and is rotatable in the bracket **42**. The bottom disc of the spool **52** bears against the bottom face of the bracket **42**.

A control wire **53**, which leads to the airplane (or other device to be operated and controlled through the intermediary of the pylon), passes through the conduit **46** and has its lower end connected to the upper spool **50**. Another control wire **55**, which passes through the conduit **48**, passes through an outer opening in the spool **50** and has its lower end connected to the lower spool **52**. The third control wire **54** passes through conduit **47** and continues down in the square tube **49**.

From the description thus far it will be apparent that, for example, as the airplane, which is indicated at P in Fig. 1, to which the three control wires **53**, **54** and **55** are attached, pursues its circular course about the pylon, the top arm assembly **37**, carrying the upper portions of the conduits **46**, **47**, **48**, through which the control wires pass, will be swung around and thus will rotate the tube **32** with which the top arm assembly is connected. Rotation of the tube **32** in turn will cause rotation of the inner square tube **49** and with it the spool members **50** and **52**. It will also be apparent that since all these members or parts of the pylon rotate in unison, the three control lines **53**, **54** and **55** within the pylon will maintain the same relative positions with respect to each other. In other words, there will be no winding of one control line on another.

A manual control device, indicated in general by the reference character **56** in Figs. 1 and 3, is removably and pivotally supported in a mounting box **57** by means of a pair of pins which engage a slot in each of the side walls of the mounting box as indicated in the drawings. The mounting box **57** is adapted to be set on the ground at a distance from the base of the pylon where the operator is to be stationed. This control device **56** is described in detail in my above mentioned U. S. Patent No. 2,543,965 and therefore need not be described again here. The control device **56** is so constructed that it will operate three separate control lines or wires independently of each other, one control line being operated by relative movement of a finger trigger **58** (Fig. 3), and the other two control lines being operated by the rocking of the device on a horizontal axis in one or the other direction respectively. To facilitate the control of the rocking of the device, when the device is rockably supported in the mounting box **57** as shown, I prefer to attach a supplemental hand lever **59** to the frame of the device as shown.

The three wires **27**, **28** and **29**, connected to the control device **56**, pass through suitable flexible conduits secured in the base of the mounting box **57**, and the wires pass thence along the ground to the base extension **26** of the pylon. Subsequently the wires pass through three similar flexible conduits **60**, **61** and **62**, the outer ends of which are attached on the base extension **26**, by any suitable means such as the metal straps indicated at **63** in Fig. 10, and then these conduits with their control wires enter through the opening **25** into the lower portion of the housing **20** of the pylon. The upper or inner ends of these conduits **60**, **61** and **62** are secured to the disc **38** (Figs. 4 and 5) and the control wires **27**, **28** and **29** continue upwardly through the disc **38**. The wire **28** continues a short distance up inside the square tube **49** to a swivel connector **63** (shown more clearly in Fig. 5) through the intermediary of which the wire **28** is connected to the wire **54**. Thus the wires **28** and **54** become in effect sections of a single control line with their swivel connection between them. As a result, the rotation of the tube **32**, square tube **49** and conduit **47** with the wire **54**, as previously described, does not produce any rotation, and consequently no twisting of the wire **28**.

The wires **27** and **29** have their inner or upper ends connected to the sliding brackets **41** and **42** respectively (Figs. 4 and 5). Consequently a downward pull on wire **27**, for example, would result in a downward pull on the sliding bracket **41** and its associated spool **50**, which in turn would produce a downward pull on the wire **53**. Similarly a downward pull on wire **29**, producing a downward pull on bracket **42** and its associated spool **52**, would produce a downward pull on wire **55**. However, since the wire **55** is free to slide through the spool **50** and the bracket **41**, a downward pull on bracket **42** would not produce any downward pull on bracket **41** or wire **53**. Fur-

thermore, since the spools 50 and 52 are free to rotate in their respective brackets, and since the brackets themselves can not rotate but can only move up or down, no twisting of the wires 27 and 28 will be produced by the rotation of the upper portion of the pylon assembly. The wire 27, bracket 41, spool 50, and wire 53 in effect become a single control line having two sections joined by a rotatable connecting means. Similarly wire 29, bracket 42, spool 52 and wire 55, become in effect a single control line in two sections connected by rotatable means.

Thus the composite control lines 27—53, 28—54, and 29—55, form the three control lines by which the manual control 56 is connected to the related control means mounted in the airplane P. Each control is operated independently of the others, but the centrifugal pull on all three control lines caused by the normal flight of the airplane will be equally divided among the three control lines in the manner explained in my U. S. Patent No. 2,543,965 previously referred to. Should the airplane take a path with a shorter radius, thus causing the lines between the top arm assembly 37 and the airplane to develop slack, this slack can be taken up immediately if desired by pulling the manual control device 56 outwardly temporarily to the position indicated by the broken lines in Fig. 3.

In addition to the means for connecting the two sections of each of the composite control lines, I have found it desirable though not absolutely necessary, to provide a plurality of swivel connectors in each line. For example, where the line sections are connected to the spools 50 or 52, I have found that a swivel connection such as that illustrated in Fig. 12 may be desirable. Also additional swivels may be interposed anywhere along the lines, such as indicated at 64 in Fig. 10. Since the individual wires used for the control lines may be formed of twisted strands, a pull on such a wire may cause the wire to twist slightly of its own accord. In such case the swivel connections permit this to occur freely without producing any twisting in any other portion of the composite control line.

Where the conduits 46, 47 and 48, carrying the wires 53, 54 and 55, leave the top of the tube 32 and pass on to the adjacent top arm assembly 37, I prefer to provide an additional protective rubber cap 65 (Fig. 4). While this is not absolutely necessary and could be omitted it does afford a desirable additional protection to the flexible conduits at the point where the top arm assembly is hinged and also aids in keeping rain out of the interior of the pylon.

On the ground, also as a means of protecting the flexible conduits 60, 61 and 62, and the wires 27, 28 and 29 (Fig. 10) from any possible injury, I provide bars or ribs 66 along the base extension 26. These bars or ribs form grooves in which the conduits and control wires are placed. Travel of the airplane along the ground around the base of the pylon and over the base extension 26, which occurs in the take-off or landing of the airplane, can take place without any danger of injury to the conduits or control lines by the riding of the airplane over the base extension.

When the airplane in the course of its flight makes a sudden downward dive, or when the airplane is caused to make a ground landing, the top arm assembly 37 is free to swing downwardly so as to follow the airplane in its course. However, in order to prevent this arm assembly from



dropping too far down and thus coming into contact with the tubular housing of the pylon or with the guy lines 23, and also to aid in restraining the airplane from approaching too close to the pylon itself, I provide a pivoted limit arm 67 on each of the supports 35, as shown in Fig. 1. These limit arms 67 can be swung out so as to come into engagement with the top assembly when the top assembly swings downward to a predetermined angle and thus prevent any further downward swing of the top assembly.

Numerous minor changes and additions could also be made in the pylon within the scope of this invention.

I claim:

1. In a pylon for use with a self-propelled model device, a main support, an assembly rotatably mounted in said main support, a tube in said assembly rotated with said assembly, a slidable element mounted in said main support for up and down sliding motion, a rotatable member in engagement with said element, said member slidable on said tube and rotated by said tube whenever said assembly rotates, a plurality of composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections adapted to be connected with said device, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, an upper section of another control line located on the outside of said tube with its bottom end attached to said rotatable member, a lower section for said latter mentioned control line having its upper end connected to said slidable element, said bottom sections of said control lines extending from the bottom portion of said main support, whereby said upper sections of said control lines will rotate with said assembly without twisting one on the other and without causing any twisting or rotation of said bottom sections, and whereby said control lines can be manipulated from the ground through the intermediary of said pylon while said device pursues its circular course.

2. In a pylon of the character described for use with a self-propelled model device, a main housing, an assembly rotatably mounted in said main housing, a top arm connected with said assembly, a central tube in said assembly rotated with said assembly, a slidable bracket mounted in said main housing for up and down sliding motion, a rotatable spool in engagement with said bracket, said spool slidable on said tube and rotated by said tube whenever said assembly rotates, a plurality of composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections extending along said top arm and adapted to be connected with said device, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, an upper section of another control line located on the outside of said tube with its bottom end attached to said rotatable spool, a lower section for said latter mentioned control line having its upper end connected to said slidable bracket, said bottom sections of said control lines extending from the bottom portion of said main housing, whereby said upper sections of said control lines will ro-

tate with said assembly without twisting one on the other and without causing any twisting or rotation of said bottom sections, and whereby said control lines can be manipulated from the ground through the intermediary of said pylon while said device pursues its circular course.

3. In a pylon of the character described for use with a self-propelled model airplane, a main support, a rotatable assembly rotatably mounted in said main support for rotation on a substantially vertical axis, a top arm pivotally mounted on said assembly so as to swing up and down with respect to said assembly, a central tube in said assembly rotated with said assembly, a pair of slidable elements mounted in said main support for up and down sliding motion, a rotatable member in engagement with each of said elements, said members slidable on said tube and rotated by said tube whenever said assembly rotates, three composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections extending along said top arm and adapted to be connected with said airplane, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, the upper sections of the other control lines located on the outside of said tube and having their bottom ends attached to said rotatable members respectively, bottom sections for said latter mentioned control lines having their upper ends attached to the corresponding slidable elements respectively, said bottom sections of said control lines extending from the bottom portion of said main support, whereby said upper sections of said control lines will rotate with said assembly without twisting on each other and without causing any twisting or rotation of said bottom sections, and whereby said control lines can be manipulated from the ground through the intermediary of said pylon while said airplane pursues its circular course.

4. In a model pylon of the character described, a main housing, a rotatable assembly rotatably mounted in said main housing, a base for said main housing, a central square-shaped tube in said assembly rotated with said assembly, a pair of slidable brackets mounted in said main housing for up and down sliding motion, a rotatable spool in engagement with each of said brackets, said spools slidable on said tube and rotated by said tube whenever said assembly rotates, three composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections adapted to be connected with said airplane, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, the upper sections of the other control lines located on the outside of said tube and having their bottom ends attached to said rotatable spools respectively, bottom sections for said latter mentioned control lines having their upper ends attached to the corresponding slidable brackets respectively, said bottom sections of said control lines extending from the bottom portion of said main housing over said base.

5. A pylon for use with a self-propelled model airplane including a main housing, a rotatable assembly rotatably mounted in said main housing for rotation on a substantially vertical axis,



a top arm pivotally mounted on said assembly so as to swing up and down with respect to said assembly, means for limiting the downward swing of said arm, a base for said main housing, an opening into said main housing above said base, a square-shaped tube in said assembly rotated with said assembly, a pair of slidable brackets mounted in said main housing for up and down sliding motion, a rotatable spool in engagement with each of said brackets, said spools slidable on said tube and rotated by said tube whenever said assembly rotates, three composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections extending along said top arm and adapted to be connected with said airplane, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, the upper sections of the other control lines located on the outside of said tube and having their bottom ends attached to said rotatable spools respectively, bottom sections for said latter mentioned control lines having their upper ends attached to the corresponding slidable brackets respectively, said bottom sections of said control lines extending from the bottom portion of said main housing through said opening and over said base.

6. The combination of a model self-propelled device attached to a plurality of control lines, a manual control for operating said control lines, and a pylon for said control lines interposed between said manual control and said device, said pylon having a rotatable assembly, a tube in said assembly rotated with said assembly, a slidable bracket mounted in said pylon for up and down sliding motion, a rotatable member in engagement with said bracket, said member slidable on said tube and rotated by said tube whenever said assembly rotates, a plurality of composite control lines extending upwardly through said pylon, each control line including an upper section and a lower section, said upper sections connected with said device, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, an upper section of another control line located on the outside of said tube with its bottom end attached to said rotatable member, a lower section for said latter mentioned control line having its upper end connected to said slidable bracket, said bottom sections of said control lines extending from the bottom portion of said pylon and thence to said manual control.

7. The combination of a model airplane attached to a plurality of control lines, a manual control for operating said control lines, and a pylon for said control lines interposed between said manual control and said airplane, said pylon having a main housing, an assembly rotatably mounted in said main housing, a base for said main housing, an opening into said main housing above said base, a central square-shaped tube in said assembly rotated with said assembly, a pair of slidable brackets mounted in said main housing for up and down sliding motion, a rotatable spool in engagement with each of said brackets, said spools slidable on said tube and rotated by said tube whenever said assembly rotates, three composite control lines extending

upwardly through said pylon, each control line including an upper section and a lower section, said upper sections connected with said airplane, one of said upper sections extending upwardly from said tube, a swivel element attached to the bottom end of this upper section, a bottom section having its upper end attached to said swivel element, the upper sections of the other control lines located on the outside of said tube and having their bottom ends attached to said rotatable spools respectively, bottom sections for said latter mentioned control lines having their upper ends attached to the corresponding slidable brackets respectively, said bottom sections



of said control lines extending from the bottom portion of said main housing through said opening and over said base and thence to said manual control.

JOSEPH R. HAMILTON.

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