

Sept. 3, 1946.

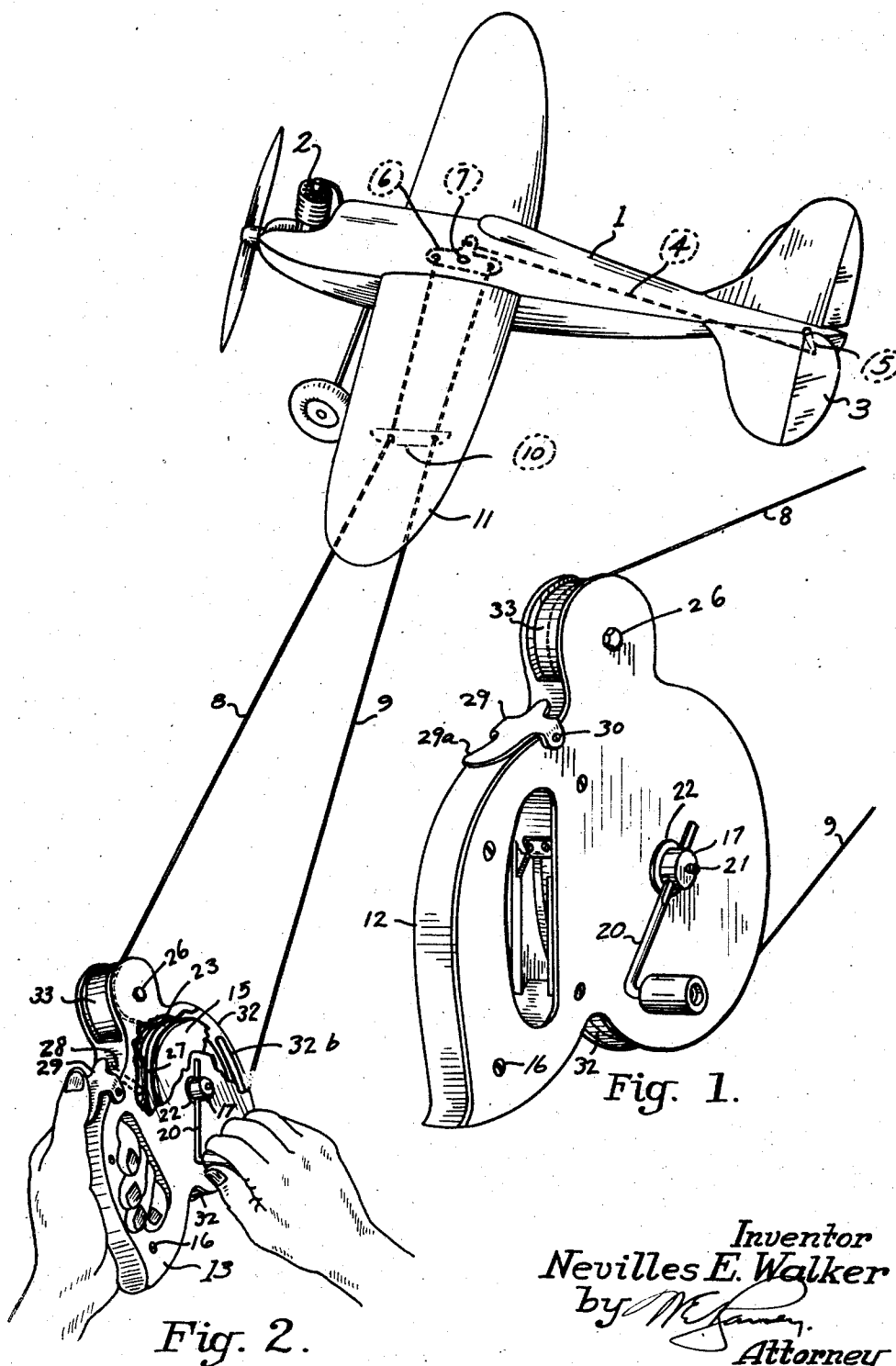
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2,406,874

RETRACTABLE CONTROL ELEMENT FOR TOY AIRPLANES

Filed May 22, 1944

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

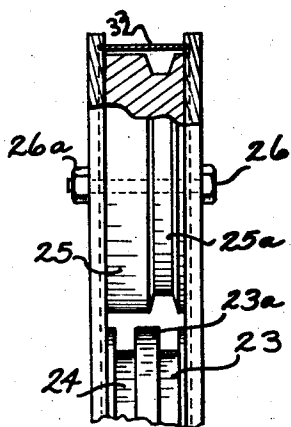


Fig. 3.

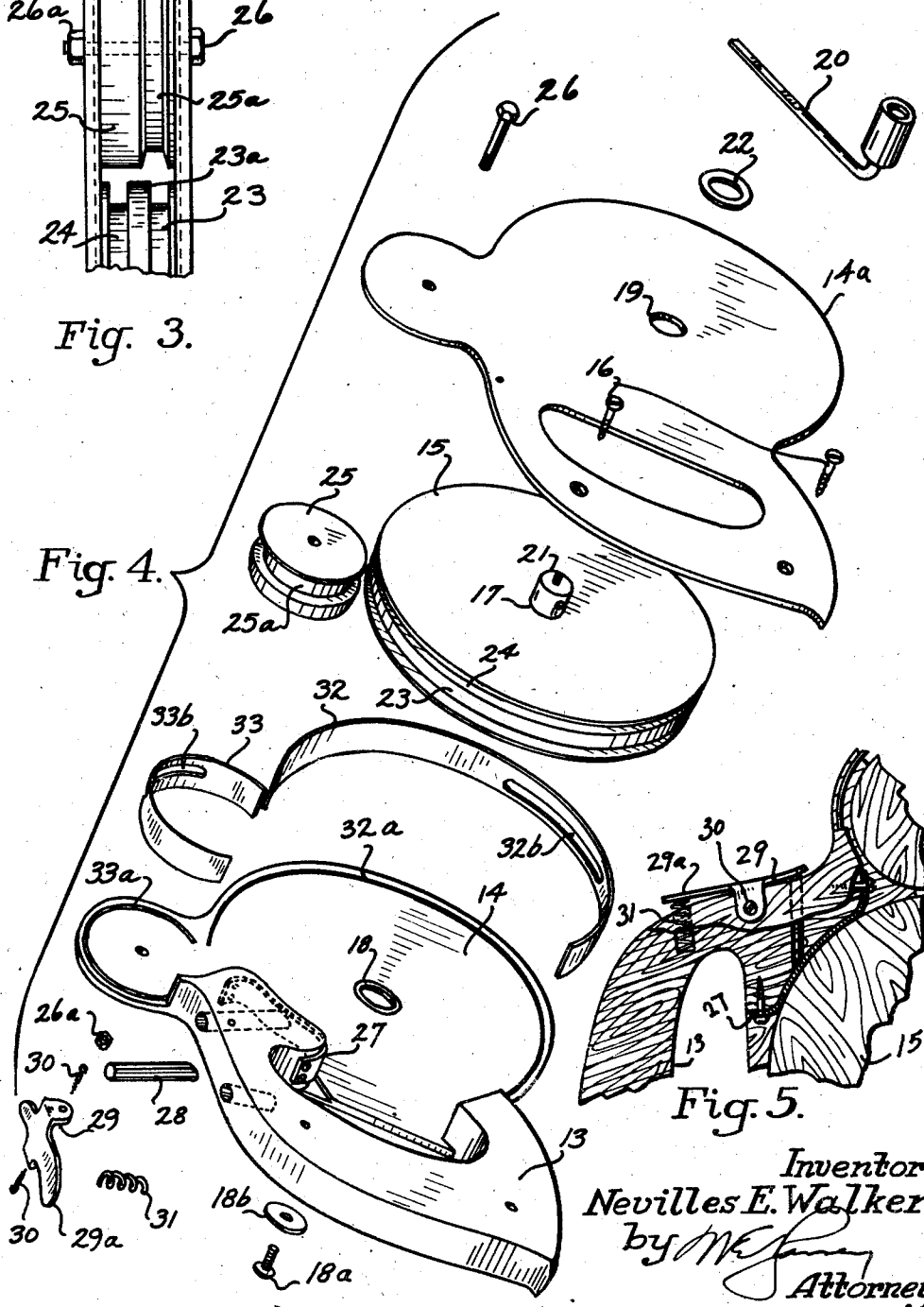


Fig. 5.

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3 Sheets-Sheet 3

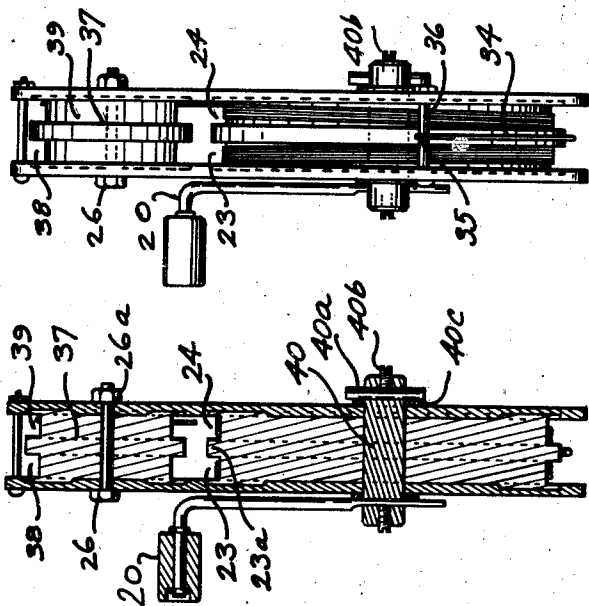


Fig. 8.

Fig. 7.

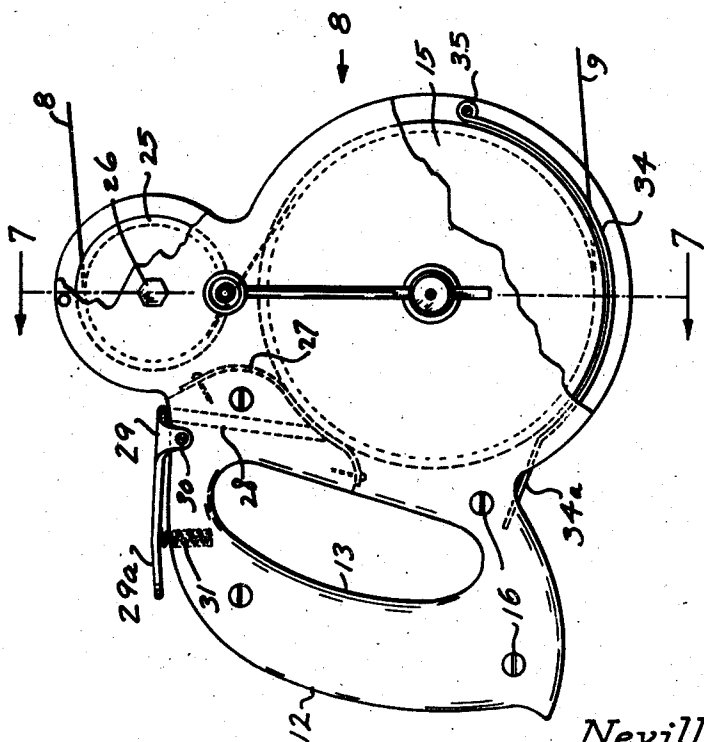


Fig. 6.

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UNITED STATES PATENT OFFICE

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RETRACTABLE CONTROL ELEMENT FOR
TOY AIRPLANES

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Application May 22, 1944, Serial No. 536,664

7 Claims. (Cl. 46-77)

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My invention relates to controlled captive-type toy airplanes of the general type described and illustrated in United States Patent No. 2,292,416, issued August 11, 1942, to myself. Such type of toy airplane is self-propelled and is adapted to fly in a more or less circular path, defined by the length of control lines held by an operator. Said control lines or wires are manipulated to actuate elevators or other controls to vary the vertical height of flight of the said toy airplane. Frequently it is necessary to shorten or lengthen said control lines quickly to vary the path of flight of said toy airplane to meet changes in flying conditions, such as in gusty air. It has also been deemed desirable to be able to vary the effective length of said lines, so that said plane will not fly about a circular path of circumscribed radius.

With this end in mind, the object of my invention is to provide a control which will effect such manipulation and yet will permit the said control lines or wires to be paid out or reeled in without affecting such control. It is necessary to provide two control lines, and it is essential that these be pulled in simultaneously without interference, one with the other, or without kinking or tangling them. This object is attained by arranging in said control handle, brake and guide elements for attaining this end result without lessening the close control necessarily maintained over the airplane in flight.

The details of my invention are hereinafter described with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of one embodiment of a control mechanism adapted to be incorporated in said control handle, showing control wires leading therefrom;

Fig. 2 is a perspective view of a toy airplane having such control, and illustrating the manner in which the effective length of said control lines may be varied;

Fig. 3 is a fragmentary elevation with portions shown broken away, illustrating the manner in which the parts of said reel are arranged relatively, in said control element;

Fig. 4 is a exploded view showing the operating parts of said control, detached but superimposed to show the operating parts thereof;

Fig. 5 is a fragmentary view with some of the parts shown in section, illustrating the manner in which a trigger-actuating friction brake may operate upon the rotatable drum of said control;

Fig. 6 is a side elevation of a modification of a control mechanism embodying my invention, with some portions of the casing being shown

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broken away, and other parts shown in dotted lines, illustrating the details thereof;

Fig. 7 is a sectional view, taken substantially on the line 7-7 in Fig. 6, illustrating the arrangement of said parts; and

Fig. 8 is an elevation taken on the direction of the arrow 8 in Fig. 6 of said modification.

A toy airplane 1 adapted for control by my invention may be of any construction, and the details thereof are of small importance, except that it must have some propelling agency, such, for example, as an motor 2, and must have elevators 3 or other manipulatable devices for varying the vertical elevation at which said plane flies.

A control for said elevators is effected through some mechanism, such, for example, as is illustrated and described in the United States Patent heretofore identified. Suffice it to say, that one mechanism might include a stiff rod 4 joined at one end to a control lever 5, secured to said elevators, and at the other end to a T-shaped operating lever 6, pivotally mounted in the fuselage of said airplane upon a pivot 7. Two of the ends of said lever are secured to operating wires or elements 8 and 9, respectively, which slidably engage guides formed in an element 10, secured to the underside of the wing 11 of said toy airplane.

When wire 8 is pulled, it rocks the lever to cause the plane to climb, and when wire 9 is pulled, it causes the plane to dive. Said wires pass over the top and bottom of handle 12, respectively, and at said points are spaced a substantial distance apart. The operator holds said handle by one hand, grasping grip 13. Thus, by flexing his wrist, he can cause said plane either to tend to climb or to dive.

The parts described heretofore are similar to parts shown in my previous Patent No. 2,292,416. In said Letters Patent, however, the wires 8 and 9 are continuous, or are joined together at the handle, and, thus, the length of the control wires is fixed, and the length of said wires determines the radius of the circular course about which said toy airplane may fly.

In my present invention said control handle comprises a body 14, which defines the grip, and which also serves as one side onto which a drum 15 may be mounted. Said body preferably is made substantially in one piece, with a removable side 14a secured in place by screws 16 or other fastening devices. Said drum is carried by a short section of shafting 17, one end of which bears in a recess 18 formed in said body 14, and the other end of which extends through and

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bears in an aperture 19 formed centrally of side 14a. The end of the shaft which bears in said recess 18 is held in place by a bolt 18a having a washer 18b mounted thereon. A substantial portion of said shafting extends through said side 14a, and a crank 20 extends diametrically through said shaft end, held in place by a set screw 21. A washer 22 is preferably provided as a wearing element to protect said side 14a.

Said drum preferably has two grooves 23 and 24 formed about the periphery thereof, so that it might be said that said drum comprises a pair of sheaves lying along side of each other. Wire 8 is spooled about groove 23, and wire 9 is spooled about groove 24. Inasmuch as it is necessary to pay out and reel in wires 8 and 9 simultaneously, and as wire 9 is paid out from the bottom of drum 15, and as wire 8 leaves the drum at the upper side thereof, it is necessary that wire 8 be reversed in direction. To this end, I mount an idler pulley 25 in said body, journaled upon a bolt 26 extending through the body and its removable side, and having a nut 26a threaded thereon. That is, wire 8, in leaving groove 23, makes an S-shaped turn as it leaves the drum, and makes a right about the idler pulley 25. The said idler pulley is provided with a groove 25a which aligns, more or less, with groove 23, as is shown in Fig. 3, so as to lead said wire 8 off more or less in a straight line.

The section of shafting 17 is fixed to the drum, and, thus, turns with it. Thus, when the crank rotates the shafting, it correspondingly rotates the drum. Inasmuch as the grooved portions of drum 15 are of equal diameter, said drum pays off and reels in the wires 8 and 9 uniformly.

To prevent the drum 15 from turning inadvertently, I provide a trigger-actuated friction brake, bearing on said drum. Said brake and its actuating mechanism are shown most clearly in Fig. 5. A length of friction material 27, such as leather, is loosely secured in place to the grip 13, and a slidable pin 28 tends to push the friction material toward the drum. A thumb-pressed trigger 29 is pivotally mounted intermediate its ends upon screws 30, and the trigger is normally held in position to force the pin inwardly by a compression spring 31 tending to push the thumb piece 29a upwardly.

About the periphery of the drum, and facing the grip 13, I preferably arrange a curved metallic band 32, which is seated in a close fitting groove 32a in the body and in a similar groove in the side 14a. Aperture 32b is formed centrally thereof, through which wire 9 is led. Said aperture serves to guide said wire both from and towards the drum, so as to prevent said wire from becoming tangled or from cutting the body or the sides thereof.

A similar band 33, seated in groove 33a in the body and side, and provided with an aperture 33b, serves a similar function with regard to the wire 8.

In Figs. 6 to 8, inclusive, I show a modification of my invention, insofar as guiding devices for said wires are concerned. Similar letters of reference are given to all similar parts, and will not be further described in detail.

In said modification a relatively stiff wire 34 encircles the lower portion of drum 15, as is shown in said figures. One end 34a of said wire is straightened and is seated tightly in the grip and body portions of said handle, and the other end 35 is formed into a loop which encircles a bolt 36. Said wire closely encircles the flanged

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portion 23a which divides grooves 23 and 24 from each other and tends to prevent either of said wires, and particularly wire 9, from jumping over said flange.

In said modification I make idler pulley 37 with two grooves 38 and 39 which are aligned with grooves 23 and 24, respectively. Thus, said wires 8 and 9, respectively, may be interchangeably mounted upon either of said grooves 23 or 24 and may be led off onto the aligned grooves 38 and 39, respectively. Also, in said modification the section of shafting 40 extends through both the body 14 and the side 14a. To lock the shafting on the body side, I place a transverse key 40a through the shafting, holding it in place by a set screw 40b, said key being spaced from the outer face of the body by a washer 40c.

I claim:

1. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of means associated with said handle for reeling in and paying out said control wires simultaneously from two points, respectively, sufficiently spaced to permit the gripping of the handle intermediate said points, for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires.

2. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously from two points, respectively, sufficiently spaced to permit the gripping of the handle intermediate said points, for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires.

3. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously from two points, respectively, sufficiently spaced to permit the gripping of the handle intermediate said points, for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires, and a releasable brake having a friction member bearing on said drum for controlling the rotation of said drum.

4. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously from two points, respectively, sufficiently spaced to permit the gripping of the handle intermediate said points, for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires, and a trigger-actuated, releasable brake having a friction member bearing on said drum for controlling the rotation of said drum.

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5. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously from two points, respectively, sufficiently spaced to permit the gripping of the handle intermediate said points, for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires, said drum comprising a pair of laterally spaced sheaves of equal diameter for spooling on and paying out said wires simultaneously.

6. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously for varying the radius of flight of said toy airplane without dis-

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turbing the control effected by said handle through said wires, said drum comprising a pair of laterally spaced sheaves of equal diameter for spooling on and paying out said wires simultaneously, and widely spaced guides on said handle for leading said wires toward and from said spaced sheaves.

7. The combination with a self-propelled toy airplane, having a pair of control and flight limiting wires secured thereto, adjustable elevators operatively connected to one end of said wires, and a distant control handle secured to the other end thereof, of a rotatable drum journaled in said handle for reeling in and paying out said control wires simultaneously for varying the radius of flight of said toy airplane without disturbing the control effected by said handle through said wires, said drum comprising a pair of laterally spaced sheaves of equal diameter for spooling on and paying out said wires simultaneously, and widely spaced guides on said handle, including an idler pulley, for leading said wires toward and from said spaced sheaves.

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