Jan. 3, 1961 C. L. GARVER ET AL 2,966,807

POTENTIOMETER ADJUSTER

Filed April 21, 1958 2 Sheets-Sheet 1

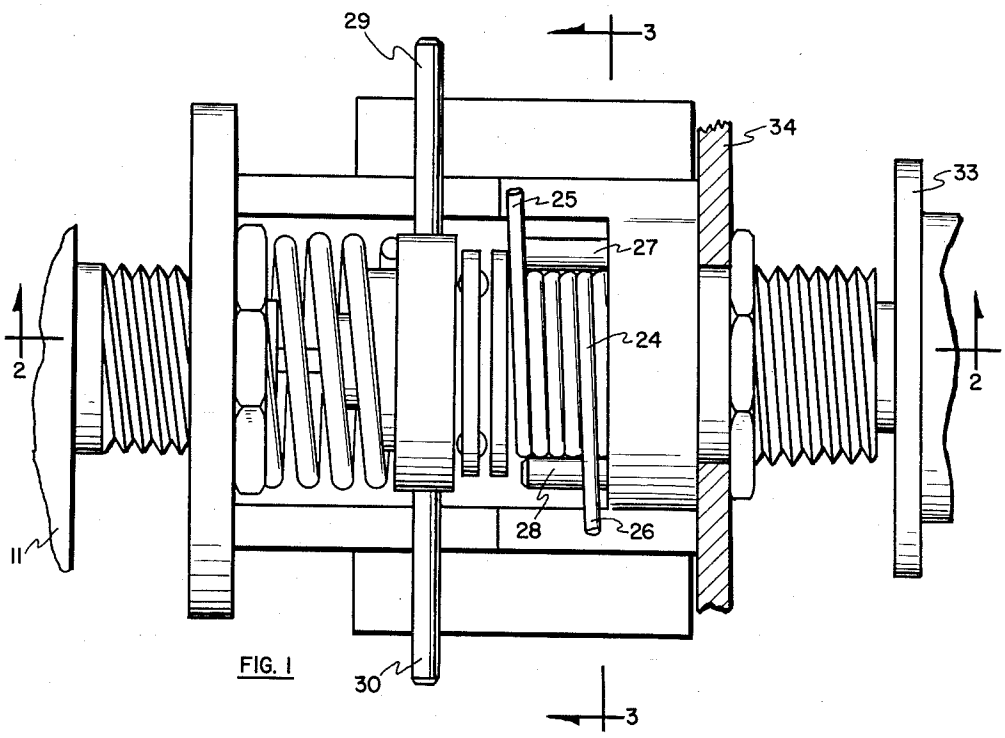


FIG. 1

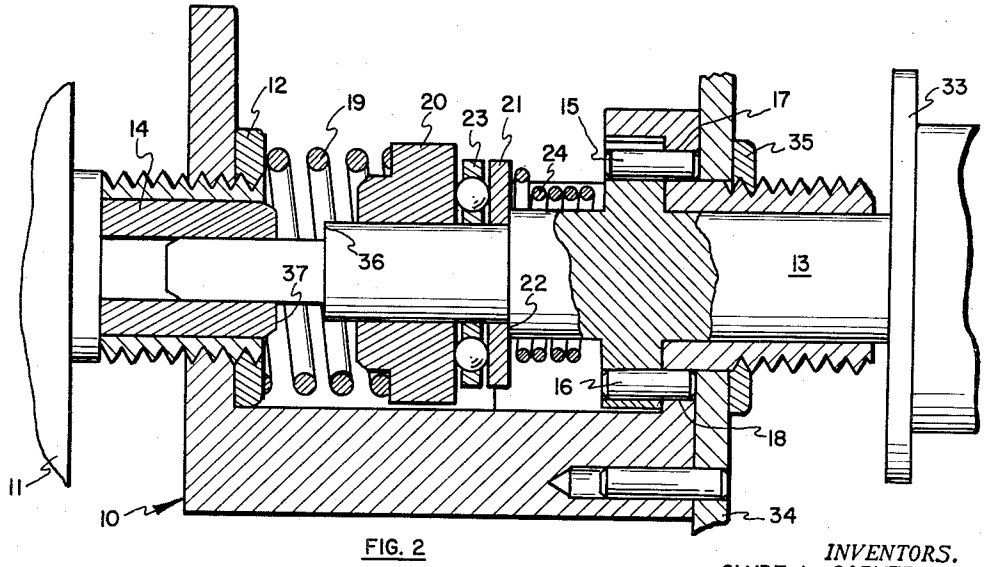


FIG. 2

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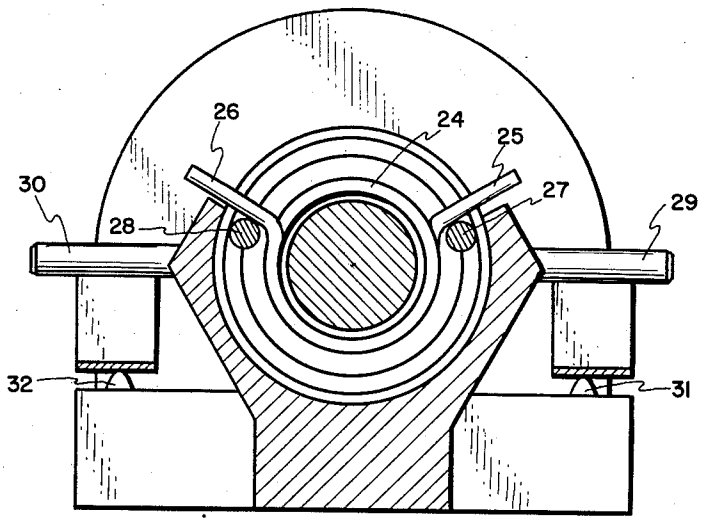


FIG. 3

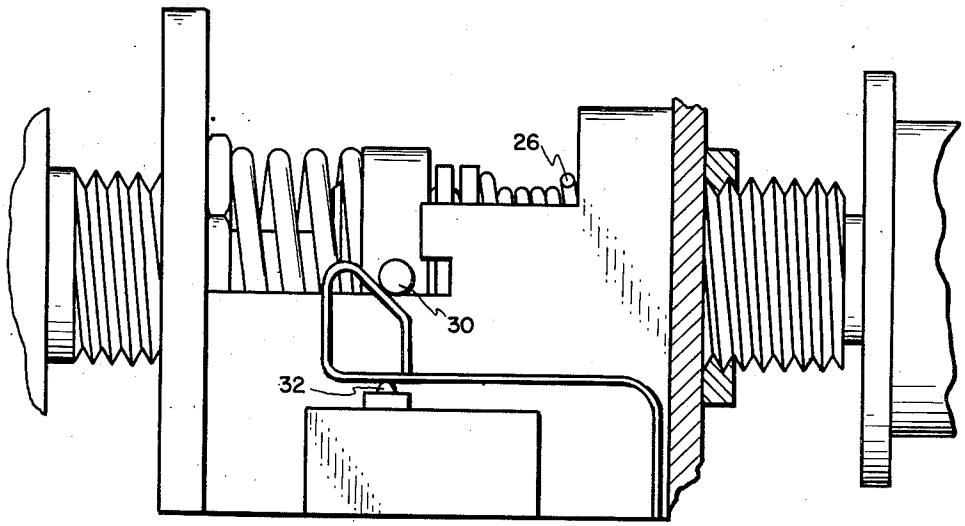


FIG. 4

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POTENTIOMETER ADJUSTER

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4 Claims. (Cl. 74—504)

This invention relates to improvements in rotatable controls such as those employed in instrument panels to adjust the setting of a potentiometer, variable condenser or other adjustable apparatus.

It is desirable to have a control switch which operates one or more switches, adjusts a potentiometer or other adjustable apparatus and returns to zero or null position re-establishing one or more circuits after an adjustment has been made. It is also desirable to protect this control knob against accidental disturbances. In the past, the control knobs or switches have been placed in recesses in the panel or have been covered to avoid accidental disturbances. Also, manual operation was required to return the control knobs to the zero or null position. By protecting the control knob from accidental disturbances, the control knob is placed in a position which makes access somewhat difficult and manual return to zero or null position of the control knob leaves an opportunity for error.

Therefore, it is an object of this invention to provide a control switch which is easily accessible and yet prevents inadvertent movement.

It is another object of this invention to provide a control switch which will automatically return to the angular zero or null position from either a clockwise or counter-clockwise setting.

Other objects and a fuller understanding of the invention will become apparent from the following description when taken in conjunction with the drawings in which:

Fig. 1 is a top view of the present invention;

Fig. 2 is a cross-sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken along line 3—3 of Fig. 1; and

Fig. 4 is a side view of the present invention.

Referring now to the drawings, there is shown in Fig. 2 a support **10** having screw threads on one end thereof. A potentiometer **11** has screw threads thereon and is capable of being threaded into the support **10** and locked there by the locking nut **12**. The shaft **13** protrudes through support **10** such that the rotation axis of shaft **13** is in line with the rotation axis of the tuning screw **14** of potentiometer **11** and the shaft **13** protrudes into a slot in the tuning screw **14**. The shaft **13** has pins **15** and **16** attached to and extending from the flange on shaft **13**. The pins **15** and **16** extend into the holes **17** and **18** in the support **10**.

A coil spring **19** abuts one end of the support **10** and the collar **20**, which surrounds a portion of shaft **13**, contacts the other end of spring **19**. It is to be noted that the shaft **13** is capable of rotating relative to the collar **20**. A metal ring **21** rests against the shoulder **22** of shaft **13** and is separated from the collar **20** by bearing **23**. The ring **21** is urged against the shoulder **22** of shaft **13** by the spring **19**.

A second spring **24** is positioned about the circumference of shaft **13** and has its ends **25** and **26** extending out on opposite sides of the shaft **13** and over the support **10**. A second set of pins **27** and **28** attached to the shaft **13** are positioned such that rotation movement of the shaft **13**, in either a clockwise or counter-clockwise movement, will cause one of the pins **27** or **28** to push against one end of the spring **24** and effect a torque to be exerted upon the shaft **13**. A third set of pins **29** and **30** extend from the collar **20** so that when the shaft **13** is moved longitudinally, the longitudinal force in one direction against the spring **19** is transmitted from shaft **13** through the ring **21** and bearing **23** causing the collar **20** and pins **29** and **30** to also move longitudinally. Rotation of shaft **13** does not cause any rotation of collar **20**. Micro switches **31** and **32** are positioned to be actuated by the longitudinal movement of pins **29** and **30**. The spring **19** urges the collar **20**, shaft **13** and pins **29** and **30** back to a neutral position when the force on shaft **13** is released. The shaft **13** also has on one end thereof a control knob **33**. The support **10** is adapted to fit in a hole in panel **34** and be held there by a nut **35**.

As shown in the drawings, the control switch is in a locked position; the pins **15** and **16** are in the holes **17** and **18** and thereby restrict rotational movement of the shaft **13**. If, however, a force is applied to the shaft **13** sufficient to overcome the urging of spring **19** along the longitudinal axis, the shaft will move linearly until its shoulder **36** comes in contact with the end **37** of potentiometer **11**. Once in this position, the pins **15** and **16** are out of the holes **17** and **18** and hence, the shaft **13** may rotate if torque is applied. If the shaft is turned, for example, in a clockwise direction, it can be seen then that the pin **28** will pick up the end **26** of spring **24** thereby forcing the other end **25** of spring **24** against the support **10**. The spring **24** causes a torque to be exerted upon the shaft **13**. When the torquing force applied to the shaft **13** at the control knob **33** is released, the spring **24** urges the shaft back to a neutral or null angular position and the spring **19** urges the shaft **13** in a longitudinal direction causing the pins **15** and **16** to re-enter the holes **17** and **18** and thereby lock the shaft **13** in its neutral or null position.

It is to be noted that the sample use of this switch has been with a potentiometer and in this example it is desirable to actuate two switches prior to changing the setting of the potentiometer **11**. This is accomplished by the pins **29** and **30** extending from the collar **20** such that when the shaft **13** moves into a position whereby the pins **15** and **16** are not restricting rotation of shaft **13**, the switches **31** and **32** are actuated by the pins **29** and **30** and when the shaft **13** returns to its neutral position, the switches **31** and **32** are also allowed to return to their original position.

Although the present invention has been described with a certain degree of particularity, it is understood that various modifications in the details and arrangements of parts may be had without departing from the spirit and scope of the invention as hereinafter claimed:

We claim:

1. A control device comprising a support, a shaft mounted on said support having linear and angular freedom relative to said support, means for prohibiting rotation of said shaft in a first linear position, first resilient means for urging said shaft into said first linear position, and second resilient means for urging said shaft into a first neutral rotary position from which said shaft is capable of being temporarily urged by sufficient force to overcome both of said resilient means and disengage said prohibiting means into a position other than said first linear and rotary positions.

2. A control device comprising a support, a shaft mounted on said support having linear and angular freedom relative to said support, said shaft having pins thereon for engaging said support and restricting rotation of said shaft when said shaft is in a first linear position, first

spring means for urging said shaft into said first linear position and second spring means for urging said shaft into a first neutral rotary position from which said shaft is capable of being temporarily urged by sufficient force to overcome both said resilient means and disengage said restricting means into a position other than said first linear and rotary positions.

3. A control device comprising a support, a shaft mounted on said support having linear and angular freedom relative to said support, said shaft having first pins thereon for engaging said support and restricting rotation of said shaft when said shaft is in a first linear position, first spring means for urging said shaft into said first linear position, and a second spring means having the ends of said second spring extending over said support and a second set of pins on said shaft such that when said shaft is rotated at least one of said second pins is positioned to pick up one end of said second spring while the other end of said second spring is held against said support causing a torque to be exerted on said shaft in the opposite direction of rotation of said shaft, said shaft being capable of

being temporarily urged by sufficient force to overcome both of said spring means and disengaging said first pins into a position other than said first linear and neutral rotary positions.

4. The device as claimed in claim 3 wherein said shaft has provisions associated therewith for actuating a switch when said shaft is moved linearly to and from said first linear position.

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