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R. M. SIGMON, JR
COAXIAL DIAL LOCKING DEVICE

2,643,632

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FIG. 1.

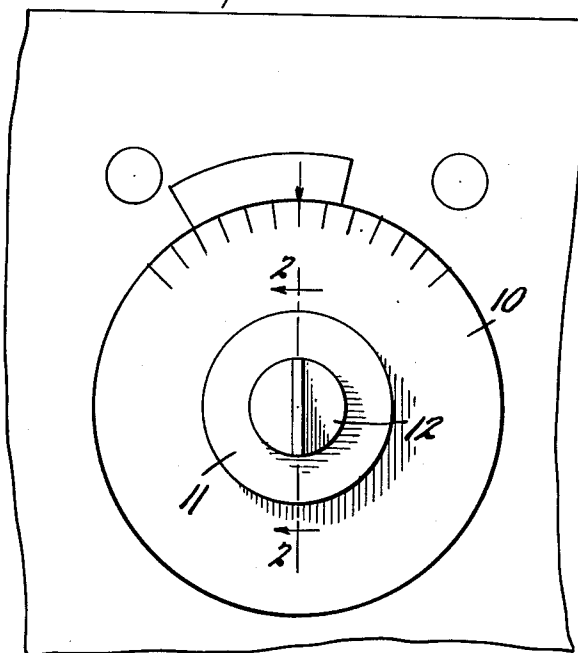


FIG. 2.

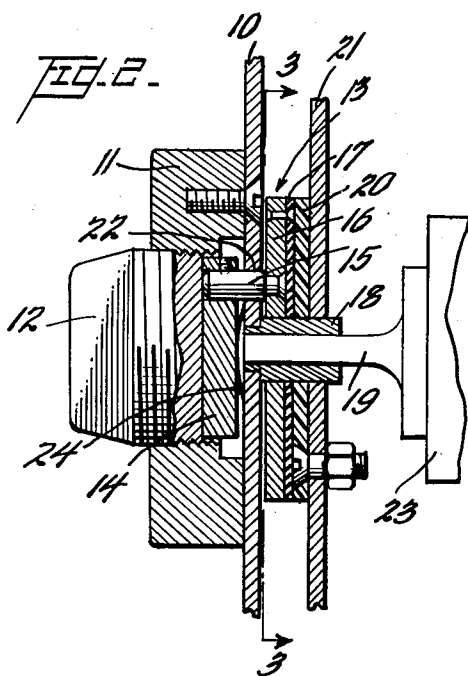
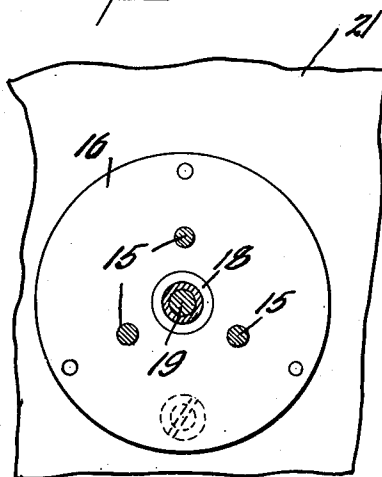


FIG. 3.



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COAXIAL DIAL LOCKING DEVICE

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5 Claims. (Cl. 116—129)

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This invention relates to locking devices for adjustable controls and more particularly to a device for locking the indicating dial of a rotatable control in any desired position about its axis of rotation.

In various types of instruments, it is often desirable to accurately adjust the tension or friction on the control knobs of the instrument from the outside or front panel and to make this adjustment in a simple and rapid manner. Furthermore, after the adjustment has been made, the knobs and controls should be of such construction that they can be easily changed without resort to a special tool for releasing the tension or friction.

In a large number of instruments, the indicating dial is secured to and rotates with the knob or control and it is desirable to lock the dial of this type of instrument without the use of a distorting force on the outer extremity of the dial which would produce inaccuracies in the dial setting.

Accordingly, one object of this invention is to provide a locking device which can be adjusted without the application of force to the outer extremity of the dial.

Another object is to provide a control knob which may be accurately adjusted and to provide proper tension or friction for readily locking the control in an adjusted position.

Another object of the invention is to provide a locking assembly for effecting fine adjustment of the friction on the control knob and to have the locking means so constructed that a special tool is not needed to obtain the adjustment.

With these and other objects in view, the invention comprises a control knob secured to an indicating dial which is mounted on a shaft for rotating a control member. The control knob is internally threaded to receive a lock bolt which when turned in one direction moves forward to force a slidable engaging assembly into contact with a stationary friction plate. The tension on the dial and hence on the control shaft is thus increased until the dial is locked in position. When the lock bolt is turned in the opposite direction, the contact plate of the engaging assembly is separated from the fixed friction plate and the tension on the dial is released. The dial and the control shaft may then be rotated to any desired position by turning the control knob.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein

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Fig. 1 is a front elevational view of an indicating dial and the locking device embodying the invention;

Fig. 2 is an enlarged cross-sectional view taken along line 2—2 of Fig. 1 showing the indicating dial, its control knob and the locking assembly; and

Fig. 3 is a sectional view taken along line 3—3 of Fig. 2.

Referring now to the drawings, wherein like reference numerals indicate the same elements throughout the several views, attention is first directed to Fig. 2 wherein the reference numeral 10 designates an indicating dial on which is securely mounted a control knob 11. The dial 10 is also attached to a bushing 13 which is secured to a shaft 19 to rotate a control member 23. The control knob 11 has a central opening which is internally threaded to receive a rotatable lock bolt 12, the outer end of which protrudes beyond the front face of the control knob. Clockwise rotation of the lock bolt 12 moves a frictional engaging assembly, indicated generally as 13, to the right as viewed in Fig. 2 to compress a resilient member 24 which is inserted between a block 14 of the assembly 13 and the dial 10 to force the assembly 13 to the left when the bolt 12 is rotated counterclockwise to unlock the dial.

This frictional engaging assembly 13 consists of a block 14, a plurality of pins 15 drive fitted into the block and securing in spaced relation thereto a holding plate 16, and a facing 17 of friction material secured to the holding plate. The block 14 and the holding plate 16 are positioned and spaced on opposite sides of the indicating dial 10. The securing pins 15 slidably extend through apertures 22 in the dial and position the block 14 with respect to the holding plate 16 so that the sliding movement of the engaging assembly 13 is limited by the predetermined fixed spacing between the block 14 and the plate 16. Any suitable friction material may be used for the facing 17, however, experiments have shown that corprene, a synthetic rubber made from ground cork and rubber derivatives, is an excellent facing material.

The forward movement of the reciprocable assembly 13 forces the facing 17 into engagement with a fixed knurled fibre friction plate 20 secured to a stationary panel 21. Frictional contact between the stationary friction plate 20 and the facing 17 prevents rotation of the control knob 11 and indicating dial 10 and hence locks the dial 10 in any desired position.

From the foregoing detailed description, it is believed that the general operation of the appa-

ratus may be readily understood. The indicating dial 10 is rotated to a desired position by means of control knob 11 to move the shaft 19 and the control mechanism 23 attached thereto to a predetermined position. To lock the dial and the controls 23 actuated thereby in the desired position, the control knob 11 is held firmly in one hand while the lock bolt 12 is threaded into the control knob with the other hand to compress the spring 24 and move the assembly 13 forward or to the right as viewed in Fig. 2. The slidable engaging assembly 13 is thus moved forward until the facing 17 contacts the stationary friction plate 20. Frictional engagement between the facing and the friction plate locks the dial 10 and the actuated mechanism in position.

To release the locking device, the control knob 11 is held in one hand while the lock bolt 12 is manually threaded out of the control knob to release the assembly 13. The compression spring 24 then forces the assembly 13 and its friction facing 17 away from the stationary friction plate 20. The dial 10 is free to be rotated to any desired position.

Thus the indicating dial 10 may be rapidly locked and released in any desired position without using a special tool and without using a distorting force on the dial.

It is to be understood that the above described arrangements are merely illustrative of the application of the principles of the invention, and numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for locking a dial, comprising a hollow control knob secured to the dial, a stationary friction plate, a movable friction plate slidably connected to the dial and mounted parallel to the stationary plate, and means concentrically movable in the hollow of said control knob to actuate the movable friction plate parallelly toward the stationary friction plate to cause full area contact therebetween to lock the dial against movement.

2. In a device for locking a rotatable hollow control knob after it is set at a predetermined position, a stationary flat friction plate, a movable flat friction plate, a lock bolt threaded in the hollow of said control knob to move said movable flat friction plate parallelly into plane contact with said stationary flat friction plate to prevent rotation of the control knob, means connected to the said movable flat friction plate and to prevent rotation of said movable flat friction plate relative to said control knob, and resilient means for normally holding the movable flat friction plate away from the stationary flat friction plate in unlocked position.

3. A mechanism for locking dials comprising a

hollow, internally threaded control knob secured to a dial; a member threaded into the hollow of and coaxial with said control knob and having one end protruding beyond the control knob; a stationary flat friction plate; a movable flat friction plate; and means frictionally securing said movable flat friction plate to the other end of said threaded member for moving the said movable plate into contact with said stationary flat friction plate to lock the dial in a predetermined position when said member moves forward in the hollow of the control knob.

4. In a device for locking rotatable dials, a hollow internally threaded control knob secured to the dial; a stationary friction plate; a slidable engaging means including a block, spacing members and a holding plate, the sliding movement of said engaging means being limited by the spacing between the block and the holding plate; and a member threaded into the hollow of said control knob to force the engaging means into engagement with said friction plate to lock the dial in position, said member being threaded out of the hollow of said control knob to release the dial.

5. In a device for locking a member in any desired rotative position; a shaft for rotating said member; an indicating means secured to the shaft and rotatable therewith; means for rotating the indicating means, the shaft and the said member to a desired position; a stationary friction plate positioned about said shaft; and slidable engaging means movable into engagement with said stationary friction plate to lock the indicator, the shaft and the said member in the desired selected position; said slidable engaging means including a movable friction plate mounted parallel to the stationary plate and positioned between the indicating means and the stationary friction plate, pins secured at one end to the movable friction plate and having their opposite ends extending through the indicating means to prevent relative rotation between the movable friction plate and the indicating means, but permitting sliding movement therebetween, a block secured to the ends of the pins that extend through the indicating means, means adjacent said block and slidable with respect to the indicator and the rotating means for moving the block, pins, and plate so that the movable friction plate will be forced into locking engagement with the said stationary friction plate.

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