July 1, 1958 T. T. GREENE, SR 2,841,034

CONTROL MECHANISM WITH AUTOMATIC STOP MECHANISM

Filed Nov. 21, 1955

FIG. 1

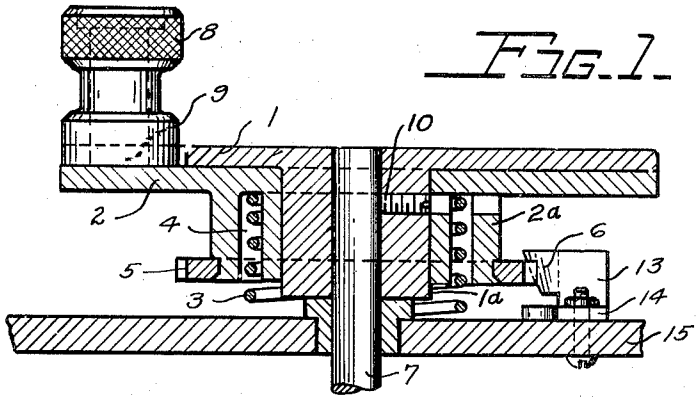


FIG. 2

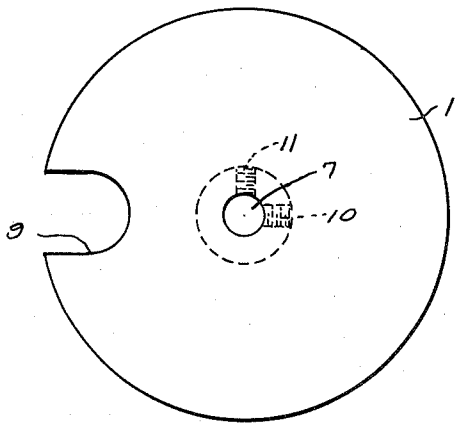


FIG. 3

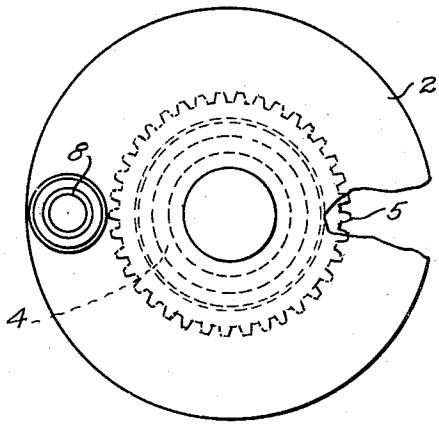
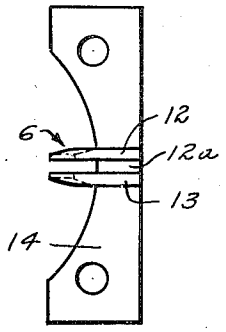


FIG. 4



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CONTROL MECHANISM WITH AUTOMATIC STOP MECHANISM

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4 Claims. (Cl. 74—528)

This invention relates to a simple and effective mechanism for locking a tuning dial in its adjusted position, and more particularly to an automatic locking mechanism which cannot be accidentally released after the tuning dial has been adjusted to any position.

A further object of the invention is to provide a control knob for adjusting a tuning dial to a desired position and then locking the same in its adjusted position in one operation.

A still further object of the invention is the provision of a control knob which is held in the locked position under action of a spring and depressible against the action of said spring to an unlocking position.

Another object of the invention is the provision of an automatic stop means for a tuning dial control member by which the operator may unlock and then adjust the latter to a desired position after which said stop means is returned automatically to its locked position.

It has been found that a simple and effective tuning dial arrangement is required, as for example, in an automatic aircraft bombing system where rapid tuning and automatic locking is desired with a minimum number of operations.

Other objects and advantages of the invention will become apparent from the following description, taken in connection with the accompanying drawings, in which like reference characters refer to like parts in the several figures.

Figure 1 illustrates the control knob and locking mechanism in its raised or locked position.

Figure 2 is a top view of the outer or top disc.

Figure 3 is a similar view of the inner or lower disc parts being broken away.

Figure 4 illustrates a top plan view of the locking rack used in the invention.

Referring more particularly to Figure 1 of the drawings, the control mechanism comprises an outer or upper circular disc **1** having a relatively elongated depending portion **1***a* which rotatably and slidably supports an inner circular disc **2** having a similar depending portion **2***a* in surrounding, circumferential relation to depending portion **1***a* of disc **1**. A coil spring **3**, located within an annular spring groove **4** incorporated in the depending portion 2*a* of said inner disc 2, acts to hold or urge the latter in or to its upper or locked position. A lock gear **5** is fixed to the bottom of said inner disc **2** in circumferential relation thereto and engages a locking rack or tooth member **6** when in its upper position. A tuning dial control member or adjustment shaft **7** is attached by means of set screws **10** and **11** (note Fig. 2) in the hub of the outer disc **1**. By first applying downward or inward pressure to a small control knob **8** which is attached to the upper surface of the inner or lower disc **2** and rotating the same, the shaft **7**, and tuning dial (not shown) is rotatably adjusted to any desired position. On release of the applied downward pressure on the knob **8**, the inner disc **2** is automatically returned to its upper position by the spring **3** and the lock gear **5** is thus brought into locking engagement with the upwardly and inwardly inclined teeth **12** and **13** of the locking rack **6** thereby stopping further adjustment of the tuning dial member **7** until such time as the next adjustment is required.

Referring to Figure 2 of the drawings it is seen that the outer or upper disc **1** is designed so as to have a cut-out portion or notch **9** to fit the periphery of the knob **8** which provides space for the small control knob **8** and provides a snug driving connection between the periphery of the knob **8** and the upper disc **1**. Thus, the control mechanism is comparatively compact and simple in design and can be easily operated with one hand without interference between the parts, with a minimum of space utilized. The outer or upper disc **1** is attached to the tuning dial control member or shaft **7** by two set screws **10** and **11** shown in Figure 2 to enable preliminary adjustment of said shaft member **7** with respect to said disc **1**.

With reference to Figure 3, the inner or lower disc **2**, including the lock gear **5** only, is illustrated with the relative location of the spring groove **4** for receiving coil spring **3** that is designed to hold said disc **2** in its uppermost position to the lock gear **5** with locking rack **6** of Figure 4.

Referring to Figure 4 the locking rack **6** consists of a pair of prongs or teeth **12** and **13** mounted on a supporting plate **14** which is rectangular in shape having a cut away at **15** to provide clearance for the lock gear **5** as the latter is depressed from its locking position. The two prongs or teeth **12** and **13** are separated as shown to provide a space therebetween for the gear teeth of lock gear **5** and a slot filler block **12**[a] is soldered therebetween. The front engaging edges of the prongs or teeth are upwardly and inwardly inclined and radially tapered inward. The supporting plate **14** is mounted in turn on the base plate **15** and so dimensioned to properly position the inclined tapered edges of the prongs or teeth **12** and **13** with respect to the teeth of the lock gear **5** when the latter is in the raised or locking position to securely lock the gear **5** against rotation.

To summarize the operation, when the lower or inner disc **2** with its lock gear **5** is depressed to disengage the locking rack **6**. This is accomplished by depressing the small adjustment control knob **8** which is then free to be manually rotated to rotate the upper disc **1** to adjust the tuning control member **7** to a desired position. On release of the downward pressure on said control knob **8**, the spring **3** automatically returns or elevates said inner disc **2** and its lock gear **5** to its upper or locked position again as shown in Figure 1.

The sliding close fit engagement of the sides of the knob **8** with the sides of the notch **9** provide a positive coupling connection between the lower disc **2** and the upper disc **1** at all times.

I claim:

1. A locking control means comprising a rotatably mounted upper disc having a cut-out portion, a control member rigidly connected to said upper disc, a lower disc in telescopic engagement with said upper disc and rotatable therewith in lower unlocked position and rigidly mounted therewith in an upper locked position, a lock gear circumferentially mounted in fixed relation on said lower disc, a lock member in engagement with said lock gear when said lower disc is in said upper locked position, and a control knob in engagement with said cut-out portion rigidly mounted on the upper surface of said lower disc and depressible to move said unlocked disc to said lower position to disengage said lock gear from said lock member.

2. A locking control means as in claim 1, said lock

member comprising a lower base plate mounted adjacent to and below said lower disc in surrounding relation to said control member and a lock member mounted on the upper surface of said base plate comprising a supporting plate having a pair of integrally mounted prongs extending above said supporting plate inwardly towards said control member, each of said prongs consisting of a relatively narrow elongated member having a front engaging edge inclined upwardly and inwardly, said prongs being parallel and separated from each other to receive one of the teeth of said lock gear to lock said upper disc and said control member in an adjusted position when said lower disc is in its upper locked position.

3. A tuning control locking means comprising a main rotatably mounted control member having an elongated depending portion with a relatively narrow central opening adapted to fixedly mount a tuning dial control element, a rotatably mounted latch member normally biased in an upper latched position in depending-contacting relation to said main control member and having a depending portion in surrounding telescopic engagement with and slidably movable relative to the depending portion of said main control member, means for slidably moving said latch member relative to said control member between a latched position and an unlatched position against the normal bias of said latch member comprising a depressible element mounted on said latch member and projecting through and in interfitting engagement in an opening in said main control element and manually operable to depress said latch member to an unlatched position and to simultaneously rotate said latch and control members together as a single unit when in depressed position, and lock means preventing rotation of said control member when said latch member is in latched position in depending contact relation to said main control member, said lock means comprising a toothed element positioned on the depending portion of said latch member and a pair of elongated, projecting latch elements independently positioned adjacent to said toothed element and separated to receive said toothed element therebetween and positively retain said latch and control members in an adjusted position of rotation when said latch member is returned to its upper locked position.

4. In a tuning dial control, a rotatably mounted first disc having a cut-out portion, a second disc rotatably

mounted with and sildably positioned on said first disc normally retained in a first, nonrotatable locked position and movable relative thereto to a second, unlocked rotatable position therewith, means for repositioning said second disc relative to said first disc to said second position and maintaining engagement therebetween comprising a manually controlled element affixed on said second disc and slidably engaged in the cut-out portion of said first disc and depressible to move said second disc to said second, unlocked position to enable simultaneous rotation of said first and second discs, and means cooperating with said discs to prevent rotation thereof when said second disc is in said first, locked position comprising a pronged member fixedly mounted relative to said discs, and a lock member affixed to said second disc engaged by said pronged member in a selected position of rotation of said discs when said second disc is in said first, locked position, said manually controlled element consisting of a control knob in continuous slidable contact with said first disc in said cut-out portion and slidably movable relative thereto and having an intermediate narrow portion to indicate when said pronged member is disengaged from said lock member to permit simultaneous rotation of said discs, said second disc automatically returning to said first, locked position to reengage said pronged and lock members on release of said control knob.

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