

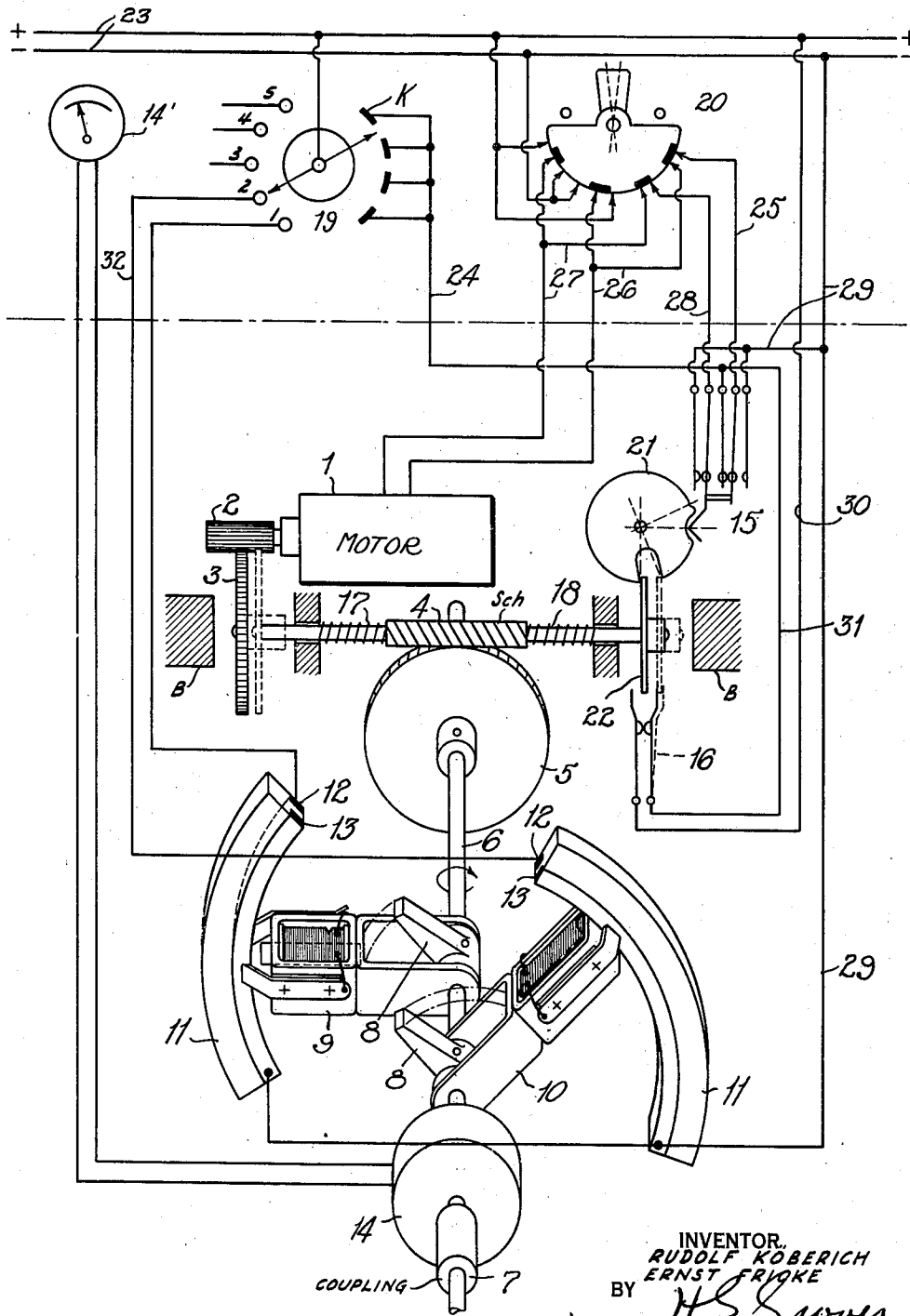
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DEVICE FOR THE REMOTE READJUSTMENT OF ROTARY MEMBERS

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DEVICE FOR THE REMOTE READJUSTMENT
OF ROTARY MEMBERS

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Our present invention relates to an improve-
ment in remote control of rotary members, es-
pecially rotatable tuning means of implements
employed in wireless communication. For such
tuning means as condensers, variometers etc.
5 devices have already been suggested, in which the
axle to be readjusted is provided with a plurality
of cam disks, each of which co-operates with a
definite rest. The remote control takes place in
the manner that a rest corresponding to the de-
10 sired tuning is moved from the position of rest
which it normally occupies into an operating po-
sition in which it forms a catch for the cam disk
conjugated thereto. If, thus, after this control
15 of the rest has been effected, the driving members
are started by means of an auxiliary motor, one
of the cam disks encounters the rest and stops
thereby the driving members in the desired po-
sition.

There are provided on one shaft up to 12 cam
disks so that a corresponding number of wave
lengths can be adjusted. In order to pass over
quickly to other wave lengths the suggestion has
already been made to make such a set of cam
25 disks exchangeable so as to render it possible
to substitute for a set another set, the cam disks
of which have prior thereto been brought to the
desired relative position. It is now indeed pos-
sible to pass over comparatively quickly to other
30 wave lengths, but a presupposition thereto is that
a corresponding number of previously adjusted
sets is available. This is not always the case,
especially not with portable stations, as, for in-
stance, such on flying machines. Besides also
35 the weight and the space required play a part in
a certain sense, as is true also of the fact that
the driving members which is to be remote con-
trolled and at which the set of cam disks is to be
exchanged is not easily accessible.

These difficulties are obviated, according to the
present invention, by making the rests themselves
continually remote-readjustable, for which pur-
pose, viz. for the remote control of the driving
member, as well as for the remote control of the
45 rests, solely two selective switches are provided
at the control place, say, for instance, in an pilot's
cabin. The position of the rests, as readjusted
at the time being, is made known by a re-signal-
ling device.

The invention is illustrated diagrammatically
and by way of example on the accompanying
drawing on which is shown a constructional form
of the arrangement and combination of parts
constituting our invention.

In the drawing, 1 is a motor which through gear

wheels 2, 3, drives a worm 4 which is geared to
a worm wheel 5. The worm wheel 5 is seated
upon a shaft 6 which by way of a coupling de-
vice 7 drives the variable tuning means such as
a rotary condenser assembly. Seated on the shaft
6 are catch or stop levers 8. The station detents
9 and 10 are pivoted about the shaft 6, and they
are retained in position upon the fixed rings 11
by friction. The outer portions of the detents
9 and 10 are in the form of magnets which are
energized by current by way of supply bars 12, 13
10 on the rings 11. Element 14 is a revertive-signal
(check-back signal) means of any desired kind
which will transmit to indicator 14' the position
of the shaft 6 and thus also the position of the
15 tuning means. The contact arrangements 15 and
16 are actuated by axial displacement of the shaft
of the worm 4. The working position of the worm
is fixed by two springs 17, 18, with suitable bias-
ing tension so that the worm is retained in its
20 median position while allowing deviation of the
worm to the right or the left-hand side upon the
shaft 6 being locked as when a lever 8 hits a
stop, if the motor is running. At the transmitter
end, in addition to the instrument 14' for in-
25 dication or reading the revertive signals, there
are provided a station selector switch 19 to ad-
just or set the drive to the desired detent and a
tumbler switch 20 for adjusting the detents.

Adjustment to a selected station or detent po-
sition is accomplished in the following fashion:

Suppose that the drive mechanism initially is
in a position so that the stop lever 8 bears with
spring pressure upon the core of the energized
magnet of detent 9. The spring pressure is due
35 to the fact that the worm 4 has been shifted to-
wards the right-hand side so that it occupies a
position as indicated by the dash-lines. In this
condition, the right-hand spring 18 produces the
spring or bearing pressure of the stop lever 8.
40 Relief of the spring 18 is prevented in this ar-
rangement by self-locking of the worm 4. The
contact bank 15 has been caused to assume the
position as shown by the aid of the disks 21 and
22. Contact 16 is opened.

To tune to another station or, in other words,
in order to cause the drive mechanism and the
rotary condenser into the position of let us say
detent 10, the station selector switch 19 is turned
from position 1 to 2 (as shown in drawing). In
50 so doing, through the agency of a diametrically
positioned wiper contact k, the motor 1 is tran-
siently (for a brief instant) switched in circuit
thus supplying motor circuit which flows from
the positive pole of the source of current by way
55

of the wiper contact *k* of the selector switch 19 and the line 24 to the contact bank 15, thence by way of the line 25 to a contact of the tumbler switch 20, by lines 26 to the motor 1, by way of lines 27 back to another contact of the tumbler switch 20, line 28 to another contact spring of contact 15 and lines 29 back to the negative pole of the source of current supply 23. The direction of rotation of the motor 1 is governed by the position of the contact bank 15. In the position as shown, it will be assumed that the direction of rotation of the motor is so that the worm 4 when the motor 1 starts is first shifted from the position as indicated by dash-lines into the median position, thus closing contact 16 and through the latter the motor 1 stays in circuit. The motor circuit is now from the positive pole of the source of current 23, line 30, closed switch 16, line 31, a contact spring of the contact 15, line 25, a contact of the tumbler switch 20, the lines 26 to the motor 1, thence through the lines 27 by way of another contact of the tumbler switch 20, the line 28, another contact spring of contact 15 and lines 29 back to the negative pole of the source 23. Displacement of the worm towards the left-hand side beyond the median position is prevented by the left spring 17. The biasing tension of the two springs 17, 18, is so chosen that in the median position of the worm 4 the worm wheel 5 rotates conjointly with the shaft 6. It is only when the shaft 6 is locked in place that the tension of the spring will be surmounted and the worm be shifted to the right or the left-hand side. In other words, the shaft 6, as the setting operation proceeds further, will be caused to turn in the sense of the arrow. By the operation of the station selector switch 19 when in position 2, the magnet of detent 10 has been cut in circuit. The current then flows from the positive pole of the source 23 by way of the contact 2 of the selector switch 19, the line 32 to the busbar 12 of the ring 11, through the magnet of detent 10, through the busbar 13 and line 29 back to the negative pole of the source 23. The core of the said energized magnet is pulled inwardly and acts as a stop for the stop lever 8 associated with detent 10. As a consequence, the shaft 6 is locked in position and thus occupies the desired detent position. But since the motor and the worm continue to rotate, the latter is shifted to the left-hand side and thus by the aid of the left-hand spring 17 produces the bearing pressure of the stop lever 8. The disk 21 as a result will be turned a certain angle clockwise and thus the contact bank 15 is changed in circuit. At the same time, the disk 22 which has been moved to the left opens the contact bank 16 and the motor 1 is disconnected. The setting operation has been thus completed.

When selecting another position by the selector switch or dial 19, the whole operation or cycle is repeated in the opposite direction of rotation. In other words, setting to any detent position may be accomplished from the left or the right; a difference in setting thus resulting may be eliminated by virtue of the fact that the stop levers 8 are given a certain amount of backlash or play corresponding to the setting difference rather than being fixedly seated upon the shaft 6.

For the adjustment of the detents 9 and 10 upon the rings 11 both the selector switch 19 as well as the tumbler switch 20 must be operated. By the selector switch 19 first the detent which

is to be adjusted is selected. The drive mechanism, in a way as hereinbefore described, is set to this detent position; in other words, the magnet of detent 10 is energized, the core is drawn inwardly and the corresponding stop lever 8 in the course of the revolution comes to engage against the magnet core which now protrudes. By throwing over of the tumbler switch 20, the connections between the contact banks 15 and 16 and the motor are then broken and the motor is directly switched in from the tumbler switch 20. The direction of rotation may be chosen at will by throwing over of the switch to the left or the right-hand side. Inasmuch as the supply of the current, when the motor is switched in as indicated, is effected directly by way of the tumbler switch 20, and not by way of the contact 16, no disconnection will be brought about when the worm is shifted to the right or to the left. If, then, by the fixed stops 8 another shift of the worm shaft is prevented, the entire torque of the motor will be transmitted to the shaft 6. Hence, by the stop lever 8 which engages the protruding magnet core of detent 10, as will thus be seen, the motor torque acting at the shaft 6 will be brought to act upon the detent. The detent in question, say, detent 10, will then be shifted with great force and as a result it slides on the ring 11 until the tumbler switch 20 has been restored to its median position. The position of the detent in question incidentally will be indicated by the reverte signal device 14'. If the detent has been shifted beyond the desired position, in other words, if it has been displaced too far, then the direction of rotation of motor 1 is altered by the tumbler switch 20, worm 4 initially returns to its median position and thereupon turns the shaft 6 in the opposite direction to a point where the stop lever 8 comes to strike from the other side the projecting magnet core of the detent 10. By a brief tap, the detent may then be caused to assume the proper position. After the detent has been adjusted, the tumbler switch 20 is returned to its median position.

We claim:

1. In a radio receiving apparatus, an adjustable controlling element, a plurality of selectively operable means each acting upon operation to effect the movement of said element to a desired position, each of said means comprising a member adjustable with respect to said element whereby each desired position may be adjustably predetermined, means for operating said selectively operable means from a remote point and means for selectively and individually adjusting any one of said members with respect to said element from said remote point.

2. In radio receiving apparatus provided with an adjustable controlling element, an electric motor for operating said adjustable controlling element, selectively operable means acting upon selective operation thereof to control the operation of said motor to thereby effect the movement of said adjustable controlling element to any one of several different positions, said last-named means including a plurality of individually adjustable means each serving to adjustably fix the various positions to which said adjustable controlling element may be operated through operation of said selectively operable means and means including an electric motor and a selectively operable switching means for adjusting any one of said individually adjustable means.

3. In radio receiving apparatus having a positionally adjustable element and an electric motor

for operating said element, operable means representing a predetermined position of said element and acting upon operation thereof to effect the movement of said element through operation of said motor from any position of its adjustment to the particular predetermined position represented thereby, said operable means including an adjustable device arranged to adjustably fix said predetermined position, and means including said electric motor for adjusting said adjustable device so as to change the position of said element represented by said operable means.

4. In radio signalling apparatus, an adjustable controlling element therefor, a motor for operating said element, a plurality of selectively operable means for controlling the operation of said motor to cause it to adjust said element to any one of a predetermined number of positions, a plurality of adjustable stops one for each of said selectively operable means arranged to stop the movement of said controlling element when said motor has adjusted the element to the position determined by the actuated selectively operable means and the adjustment of the corresponding adjustable stop, means including an electric driving motor and a selectively operable switching means for adjusting any one of said adjustable stops so as to thereby change any one of the positions to which the adjustable controlling element is operated.

5. In radio signalling apparatus, an adjustable controlling element therefor, a motor for actuating said element, a selectively operable means acting upon operation to control the operation of the motor and thereby effect the movement of said controlling element and stop it in a desired position, said means including a stop adjustable relative to the controlling element so as to provide for determining the respective desired stopping position of the controlling element, electric driving means for adjusting said stop, means for controlling the operation of the selectively operable means from a remote point, and means at the remote point for controlling the operation of said electric driving means to thereby provide for changing the stopping position of the adjustable controlling element.

6. In radio signalling apparatus provided with an adjustable tuning device, a motor for actuating said tuning device, a selectively operable means acting upon operation to control the operation of the motor and thereby to effect the movement of said tuning device and to stop it in a desired position, said means including an element movable with said tuning device and acting upon a stop which is adjustable relative to the tuning device so as to provide for determining the respective desired stopping position of the tuning device, electric driving means for adjusting said stop, means for controlling the operation of the selectively operable means from a remote point,

and additional means at the remote point acting in conjunction with said other means at the remote point for controlling the operation of said electric driving means to thereby provide for changing the position at which adjustable controlling element is stopped upon the actuation of said selectively operable means.

7. In radio receiving apparatus, an adjustable controlling element, a selectively operable means acting upon operation thereof to effect the movement of said controlling element to a predetermined position, said means including a member adjustable with respect to said element and acting to adjustably fix the position to which the controlling element is adjusted upon actuation of said operable means, means for operating said selectively operable means from a point remote from the radio receiving apparatus, and means including said last-named means and an operable switching device for selectively adjusting said adjustable member from said remote point so as to thereby change the position to which the controlling element is adjusted upon actuation of the selectively operable means.

8. In radio receiving apparatus as described in the next preceding claim, a second selectively operable means acting upon selective operation thereof to effect the movement of said controlling element to a predetermined position, said second selectively operable means including a second member adjustable with respect to the controlling element and acting to adjustably fix the position to which the controlling element is adjusted upon actuation of said second selectively operable means, means for operating said second selectively operable means from said remote point, and means including said last-named means and said operable switching device for selectively adjusting said second member from said remote point to thereby change the position to which the controlling element is operated upon actuation of said second selectively operable means.

9. In radio receiving apparatus, an adjustable controlling element, a plurality of selectively operable means acting upon selective operation thereof to effect the movement of said controlling element to any one of a predetermined number of positions, each of said means including a member adjustable with respect to said element and acting to adjustably fix the various positions to which the controlling element may be operated, means for operating said selectively operable means from a point remote from the radio receiving apparatus, and means including said last-named means and an operable switching device for selectively adjusting any one of said members from said remote point.

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