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PUSH-BUTTON MULTIRANGE RADIO TUNER

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Fig. 1

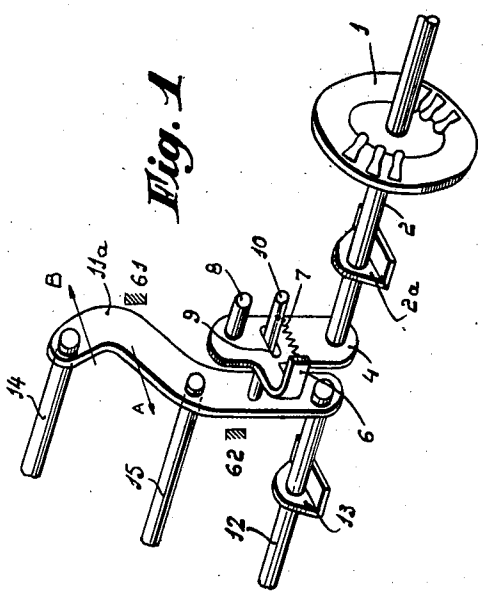
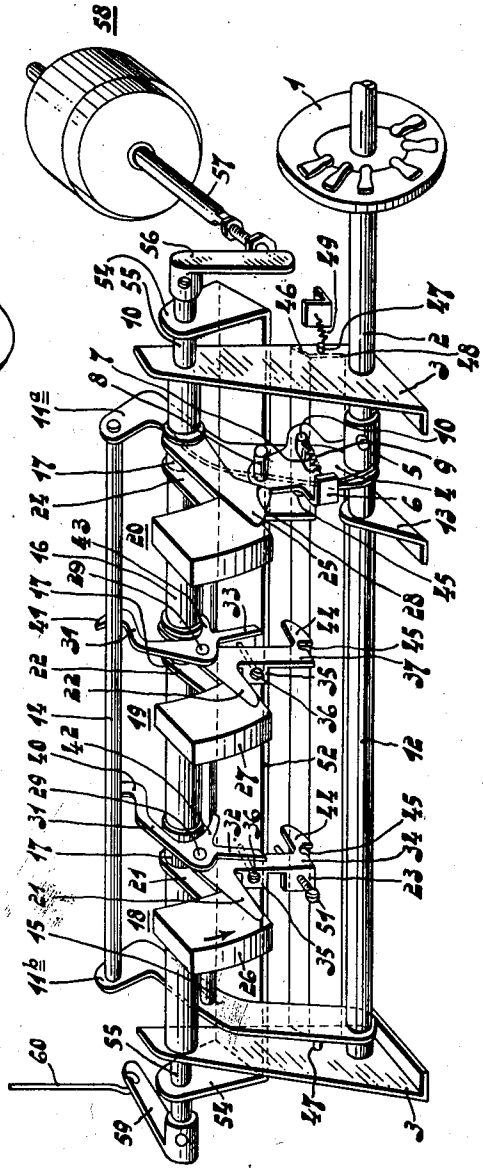


Fig. 2



INVENTORS
ALEXANDRE HOROWITZ
JAN TIMMERMAN
BY H. G. Brown
ATTORNEYS.

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PUSH-BUTTON MULTIRANGE RADIO TUNER

Alexandre Horowitz and Jan Timmerman, Eindhoven, Netherlands, assignors to Radio Corporation of America, New York, N. Y.

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6 Claims. (Cl. 250—40)

This invention relates to a push-button radio receiving set comprising a wave-range change-over switch or band-switching mechanism which can occupy three or more positions. It exhibits the feature that the control mechanism of the switch includes an elastic coupling which when bringing the switch into two of its positions acts as a fixed coupling, whereas in changing over to the third position one of the parts of the coupling is blocked by a fixed stop as a result of which the other coupling part rigidly connected to the wave-range change-over switch is movable relatively to the first-mentioned part.

Owing to this control mechanism the total available stroke of the driving member of the wave-range switch is available when the wave-range switch is being brought into two of its positions, at least if this is effected by means of push-buttons, so that this does not require excessive efforts since with this adjustment the coupling acts as a fixed coupling. This is of particular importance when by means of the push-buttons, not only the wave-range switch must be operated, but when also the tuning condenser must at the same time be brought into the position corresponding to the desired station. When the wave-range change-over switch is to be brought into a position different from the two positions referred to, the elastic coupling is operated. This requires additional effort, it is true, but it is of little importance since the key concerned is used solely for bringing the wave-range switch into the other position referred to.

In a suitable form of construction of the set according to the invention a spring is provided between both parts of the coupling which spring in bringing the switch into two of its positions firmly interconnects both coupling parts due to its rigidity, whereas upon adjustment to the third position of the wave-range switch it changes its length, as result of which the two parts of the coupling are movable with respect to each other.

The radio receiving set according to the invention may comprise a push-button for each range of wave-lengths, two of which push-buttons act on a swing or pivoted frame member capable of occupying two positions, which swing or pivoted frame member controls the wave-range switch with the interposition of the coupling and is connected to one coupling part, whereas one or more other push buttons act on the other coupling part without the intermediary of the coupling.

In practice this can be realized in a way involving little space by providing, according to the invention, that the shaft of the swing and the shaft rigidly connected to the wave-range switch are disposed coaxially, whereas on the side of the swing there is provided a pin which acts as one coupling part and passes through a slot in a plate-shaped member provided on the shaft rigidly connected to the wave-range switch, the last-mentioned member carrying the other coupling part, which parts are interconnected by means of a spring.

The invention will be more clearly understood by reference to the accompanying drawing which represents, by way of example, one form of construction thereof.

Fig. 1 illustrates the principle of the coupling mechanism, the various control members having been omitted. Fig. 2 represents the same coupling mechanism in association with a push-button tuning mechanism of a radio receiving set.

In Fig. 1 the shaft 2 has rigidly connected to it the rotor of a wave-range switch 1 which can occupy three positions. The shaft 2 is rotatable in a journal 2a. On this shaft there is provided the plate-shaped member 4 which has a projecting part 6 and a pin 8 and is further provided with a slit-shaped aperture 9 through which there extends the pin 10. Between the projecting part 6 and the pin 10 there is stressed a stiff spring 7. The pin 10 is rigidly secured to one of the sides 11a of a swing which is only partly represented in Fig. 1. This swing is mounted on a shaft 12 which is rotatable in a bearing 13; between both sides of the swing there are provided connecting bars 14 and 15. The movement of the swing in its bearings is limited by two fixed stops 61 and 62 so that the swing can move only through a limited angle.

As appears from Fig. 2 the bars 14 and 15 are acted upon by projecting parts which are secured to the push-buttons forming part of the tuning system. These projecting parts act either on rod 14, by which the swing is drawn in the direction of arrow A (Fig. 1), until it engages stop 62, or on rod 15 by which the swing is moved in the direction of arrow B until the side 11a engages stop 61. These movements are followed by pin 10 and also, through the intermediary of the stiff spring 7, by the projection 6 provided on the member 4. Thus the wave-range switch 1 can be brought into two positions. When it is desired to bring this wave-range switch into its third position the projecting part 8 is engaged by means of a special push-button 20, as will be explained hereinafter in connection with Fig. 2. As result thereof the swing is taken along, if this would not yet be the case, during the first part of the move-

ment until the side 11*a* of the swing engages the stop 61. During the further part of this movement the spring 7 is compressed as result of which shaft 2 and consequently also the rotor of the wave-range change-over switch 1 receives a further movement whilst shaft 12 is at rest, thus ensuring the desired effect. A latching arrangement (not represented) provides that the wave-range change-over switch 1 retains this position for an optional time.

The tuning mechanism together with this coupling will be now more clearly explained by reference to Fig. 2. The shaft 12 is rotatable in supports 3 and 13 and has secured to it the above-mentioned sides 11*a* and 11*b* of the wave-range switch swing. Between the upper portions of supports 3, 3 there is provided a hollow shaft 16 in which is rotatable a solid shaft 55 having secured to it a tuning swing consisting of the two sides 54 and the connecting part 52. The shaft 55 has furthermore secured to it cranks 56 and 59 of which the first mentioned one transmits the movement of the tuning swing to the slidable shaft 57 of the tuning condenser 58 constructed as a slidable condenser, whereas the second crank drives the dial pointer (not shown) by means of rod 60.

The push-buttons 18, 19 and 20 on bushings 17 are rotatable on the hollow shaft 16. For simplicity Fig. 2 only shows a few push-buttons of different types. Push button 18 is a normal push-button of which there are usually a certain number, say six; by operating this button the tuning condenser is adjusted and at the same time the wave-range change-over switch is brought into the position corresponding to this station. The button comprises the part 26 which is pressed in the direction of the arrow for operation. This part is secured between two sides 21 attached to the bushing 17. The right side 21 is provided with a projection 34 which is provided at one end with a rectangularly bent part 23. Herein is provided an adjustable screw 51 one end of which cooperates with the edge 52 of the tuning swing. In accordance with the position of screw 51 the swing and consequently also the movable part of the tuning condenser, will be shifted over a definite distance. By adjustment of screw 51 the push-button in question can be made available for tuning to another station. This key is held in its depressed position by a recess 45 in a tag 44 which tag upon pressing depressed the top 46 of a latch which is acted upon by a spring 49 and is rotatable about shaft 47—47, which latch after passing part 44 engages the recess 45 and thus holds the key in its depressed position.

On the right side 21 of the key 18 there is further provided a member 31 which is rotatable about point 29 and by the action of screw 36 screwed into the side piece 35 secured to the side 34 this member can occupy two positions, namely, the position indicated at key 18 and the position of piece 31 at key 19. In the manner shown at key 18 the stop 42 cooperates with the cross bar 15 of the wave-range switch swing; on pressing key 18 the wave-range switch swing is pressed to the rear. If, contrary thereto, the set screw 36 of the member is turned and the member 31 occupies the position indicated at key 19 the hook 41 upon depression of the key will draw forwards the wave-range switch swing through the intermediary of the cross bar 14. Due to the shape and the position of stops 42, 43 and hooks 40, 41 solely the stop 42 acts in the position of member 31 at key 18, hook 41 solely acting in the position of this member at key 19. Thus the key is adjusted to the wave-range corresponding to the station to which the button is adjusted. The key 19 differs from key 18 in that the former key is not equipped with a member capable of cooperating with the tuning swing so that upon operation of this key solely the wave-range change-over switch is brought into a definite position. The presence of this kind of key is advantageous when the set is equipped with a knob for manual operation in which case the wave-range change-over switch is consequently operated by keys.

Keys 18 and 19 permit the set to be adjusted only to two ranges of wave lengths, whereas key 20 especially serves to bring the wave-range change-over switch into a third position. This key, as well as the other keys, is rotatable with two sides 24 and 25 on a bushing 17 provided on the hollow shaft 16. The side 11*a* of the swing is so shaped that it can pass, if necessary, over a small distance between the two sides of the key. The side 25 of the key is provided with a stop 28 which in the manner set forth by reference to Fig. 1 cooperates with pin 8. The side 24 is also furnished with a recess 45 by means of which the depressed key 20 is held by latch 46. The plate-shaped part 4 is secured to shaft 2 by means of a bushing 5 and a screw fastened thereto. The operation of the coupling mechanism between shafts 12 and 2 entirely corresponds to that shown in Fig. 1 so that any further description is superfluous.

It will be appreciated that the principle illustrated in the drawing can also be realised in various other ways thus obtaining, inter alia, the advantage that for operating the wave-range change-over switch no springs need be stressed. Since the push buttons will usually serve only to tune to stations of the long and medium wave-range the wave-range switch swing will preferably be caused to act on these ranges of wavelengths, the ultra-short wave-range being then controlled by means of key 20.

What we claim is:

1. In a radio receiver, a tuning device, a rocker bar for adjusting the tuning device, a plurality of push-buttons, adjustable means carried by said push-buttons whereby selective operation of said push-buttons actuates the rocker bar to tune the receiver to a predetermined station, band-switching mechanism incorporated in said receiver, a second rocker bar for adjusting said mechanism, and second adjustable means carried by said push-buttons for actuating the latter rocker bar, whereby operation of any selected push-button effects simultaneously the tuning and band-switch adjustments.

2. In a radio receiver, a tuning device, a rocker bar for adjusting the tuning device, a plurality of push-buttons, adjustable means carried by said push-buttons whereby selective operation of certain of said push-buttons actuates the rocker bar to tune the receiver to predetermined stations, band-switching mechanism incorporated in said receiver, a second rocker bar for adjusting said mechanism, and second adjustable means carried by said certain push-buttons, whereby operation of a selected push-button effects simultaneously the tuning and band-switch adjustments, and an auxiliary push-button operative to effect only adjustment of the band-switching mechanism.

3. In a multi-band radio receiver, a tuning de-

vice, a rocker bar for actuating said device, band-switching mechanism having at least two positions of adjustment, a second rocker bar adapted to actuate said mechanism to one or the other of said two positions, and a plurality of push-buttons each carrying a plurality of adjustable means, one of said means adapted to cooperate with tuning device actuating rocker bar and the other means adapted to cooperate with the actuating rocker bar for the band-switching mechanism.

4. In a multi-band radio receiver, a tuning device, rocker bar for actuating said device, band-switching mechanism having three positions of adjustment, a second rocker bar adapted to actuate said mechanism to one or the other of two positions, a plurality of push-buttons each carrying a plurality of adjustable means, one of said means adapted to cooperate with tuning device actuating rocker bar and the other means adapted to cooperate with the actuating rocker bar for the band-switching mechanism, and an auxiliary push-button adapted to actuate the band-switching mechanism to its third position of adjustment.

5. In a multi-band radio receiver, band-switching mechanism having at least three positions of adjustment, a control member for actuating said mechanism to two of said positions of adjustment, an operating member having adjustable means capable of selectively actuating the control member to one or the other of said two positions, and an auxiliary operating member adapted to actuate the band switching mechanism to its third position of adjustment independently of the first actuating member.

6. In a multi-band radio receiver, band-switching mechanism having at least three positions of adjustment, a position determining member associated with said mechanism, a control member for actuating said position determining member to only two of said positions of adjustment, an operating member having adjustable means capable of selectively actuating the control member to effect adjustment of the switching mechanism to one or the other of said two positions, and an auxiliary operating member operated to actuate the position determining member independently of the first actuating control member to effect adjustment of the switching mechanism to the third position.

ALEXANDRE HOROWITZ.
JAN TIMMERMAN.