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Sept. 8, 1959

E. J. POLLEY

2,903,575

CONTROL SYSTEM

Filed May 6, 1955

3 Sheets-Sheet 1

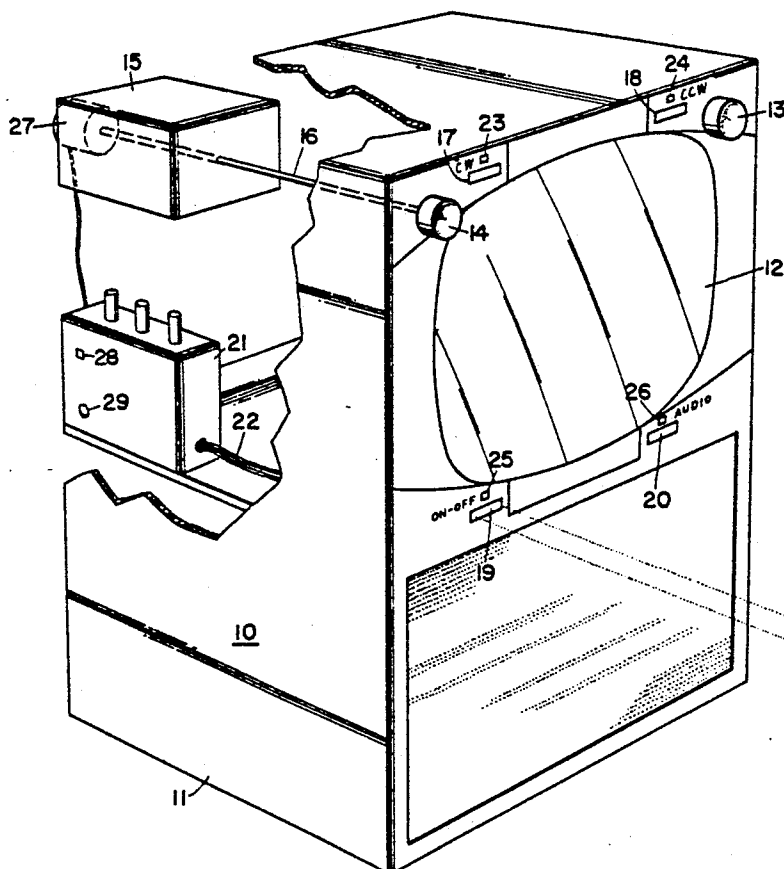


FIG. 1

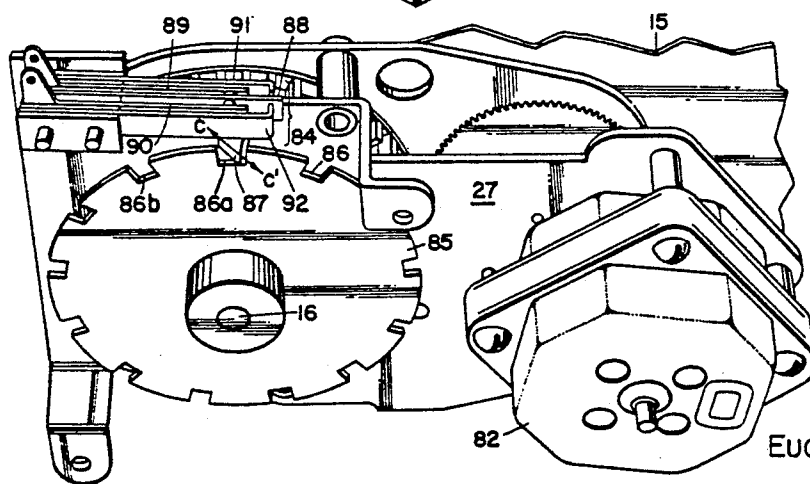


FIG. 3

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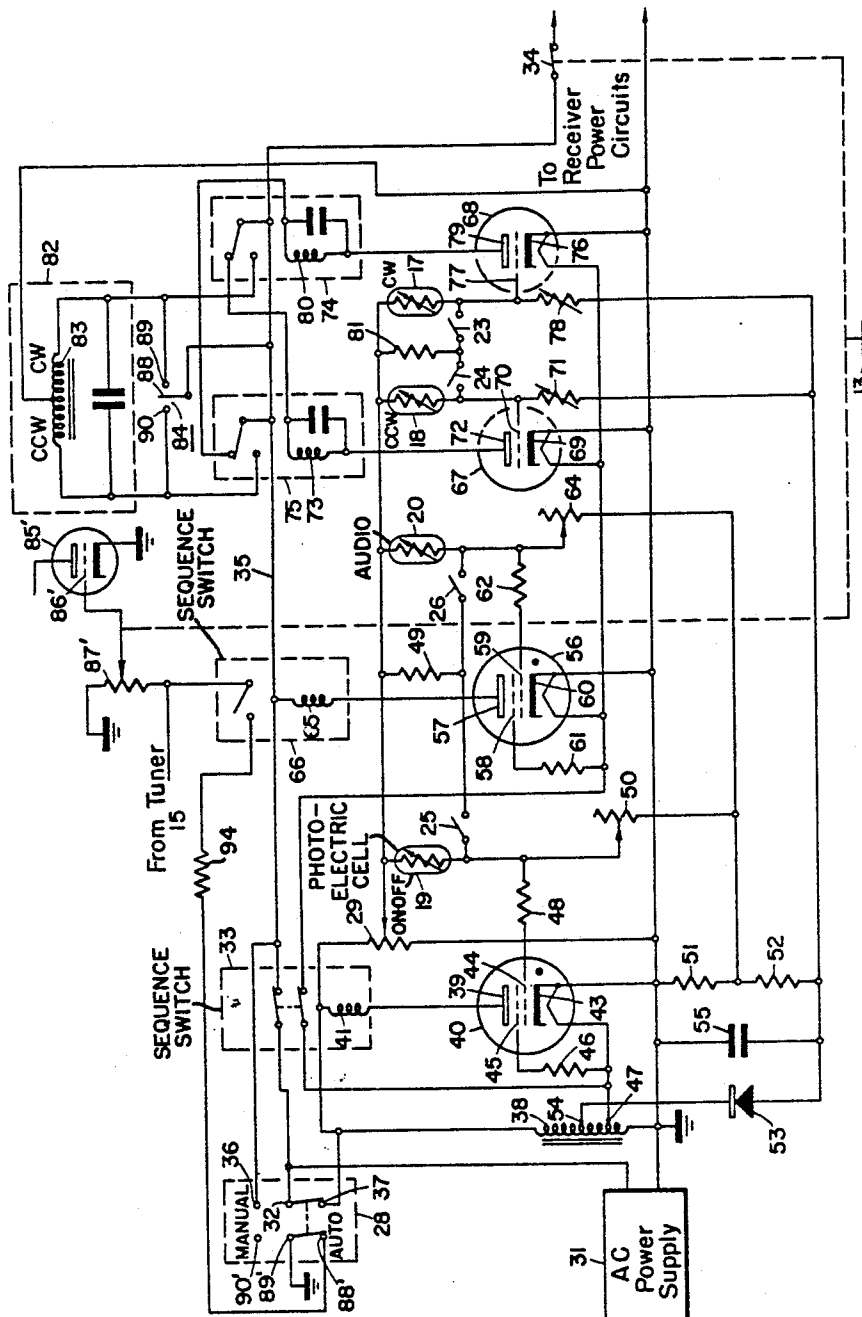
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

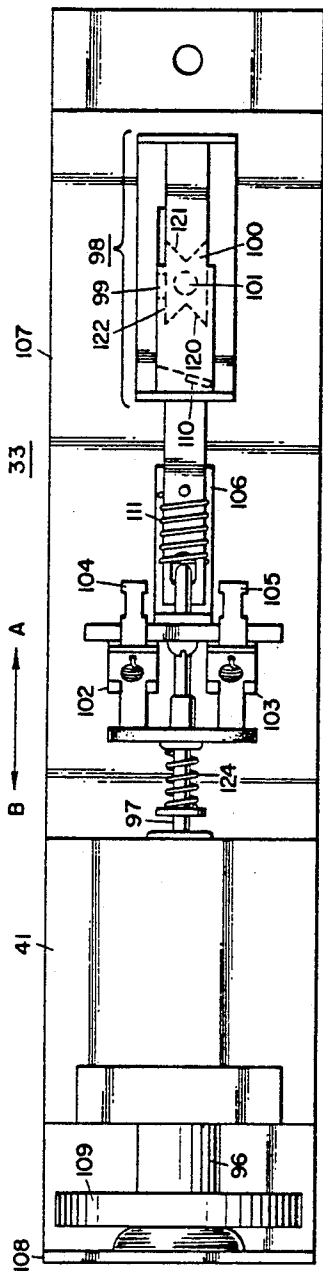


FIG. 4

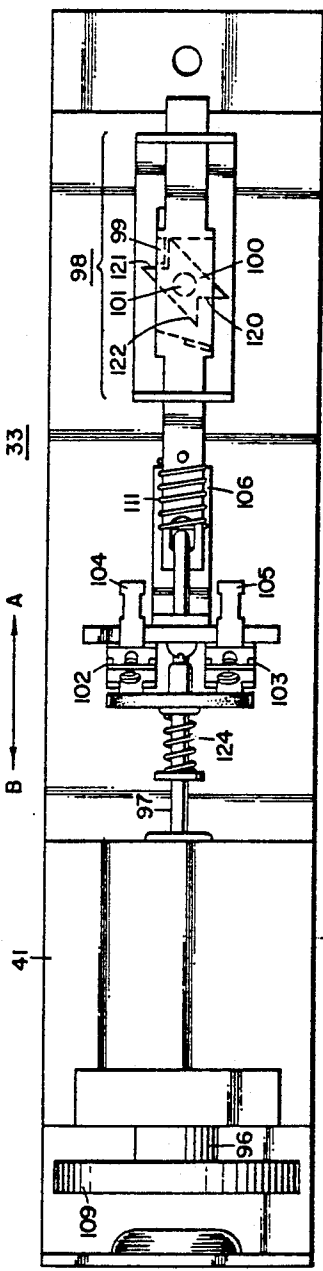


FIG. 5

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2,903,575

CONTROL SYSTEM

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Application May 6, 1955, Serial No. 506,433

3 Claims. (Cl. 250—20)

This invention is directed to a new and improved control system for a wave-signal receiver. The control system is particularly useful in adjusting the operating characteristics of a television receiver, and will be described in that connection, although it may also be used with other types of receivers.

In the past, many different remote control arrangements have been proposed for both radio and television receivers, some of which have been exploited commercially. Most of these remote control systems require physical interconnection between a remote control station and the receiver, usually by a conductive wire or multi-conductor cable. Although some of these systems have been relatively convenient and effective in operation, they are always subject to the principal disadvantage that the wire or cable linking the remote control station to the receiver is not particularly attractive in appearance and may often cause accidents when laid across a portion of the floor where people must walk.

Remote control systems in which receiver characteristics are varied in response to signals from a portable miniature radio transmitter have also been developed. These systems have generally been unsatisfactory in that the receivers may be triggered to a change in operating characteristics by signal-waves emanating from sources other than the control transmitter. In addition, radio-linked remote control systems may create objectionable interference in the radio or television broadcast bands or in other portions of the radio spectrum used for communication purposes. These systems also tend to be rather complex and expensive to manufacture.

It is a general object of this invention to provide a new and improved remote control system which is simple and economical and yet which affords versatility and accuracy of control and adjustment.

It is a further object of the invention to provide a control system for a wave-signal receiver which may be actuated by means of a controllable light source; in other words, to provide a remote control system in which tuning or other characteristics are varied by means of a light beam.

It is a further object of the invention to provide a remote control system for a wave-signal receiver which permits manual operation without disconnecting or otherwise interfering with remote actuation of the system.

It is a corollary object of the invention to provide a remote control system for a wave-signal receiver which may be readily added to or incorporated in conventional receivers without substantially modifying their basic construction.

Accordingly, the invention is directed to a remote control system for a wave-signal receiver of the type including a station selector circuit actuable between a plurality of predetermined different signal-translating conditions for selection of different received signals, an audio circuit coupled to the station selector and actuable between at least two different signal-translating conditions for utilizing audio information included in the received

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signals, and a power supply circuit coupled to the selector and audio circuits and actuable between two different power-translating conditions. The system includes first and second impedance means each having a substantial change in impedance value in response to a pulse of wave energy from a remote source together with means coupling the first impedance means to a station selector circuit and responsive to a change in impedance value of the first impedance means for selectively actuating that circuit between its different conditions. The system further includes means coupling the second impedance means to one of the audio and power supply circuits and responsive to a change in impedance value of the second impedance means for selectively actuating the one circuit between its different conditions. First and second adjustable impedance elements are coupled respectively in series combination with the first and second impedance means to form first and second networks respectively. A third adjustable impedance element is coupled in series combination with a source of electrical power to form a third network. Finally, the system includes means coupling the third network in series combination with a parallel combination of the first and second networks.

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The organization and manner of operation of the invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in which like elements are identified by like numerals in each of the figures, and in which:

Figure 1 is a perspective view of a television receiver in which a control system constructed in accordance with the invention is incorporated; a portion of the receiver cabinet has been cut away to show various components of the receiver and control system;

Figure 2 is a schematic diagram of an electrical circuit for a control system constructed in accordance with the invention;

Figure 3 is a perspective view of a portion of the control system of Figures 1 and 2, showing a carry-over switch used in that system;

Figure 4 is a plan view of a sequence switch employed in the system of Figures 1 and 2; and

Figure 5 shows the sequence switch of Figure 4 in a different operating position.

Figure 1 illustrates a television receiver 10 having a cabinet 11, a picture screen 12, a combination on-off and volume-control knob 13, and a station selector control knob 14. The structural and electrical characteristics of the television receiver may be entirely conventional and will not be described in detail. In the particular receiver illustrated, the usual station selector or tuner 15 is mounted at the rear of cabinet 11 and is mechanically coupled to selection knob 14 by means of a shaft 16. Tuner 15 is preferably of the turret or band-switch types, although it may also comprise a continuously variable tuning device, in which case it is preferably provided with a mechanical detenting arrangement to identify particular station positions. In addition to station selector 15, receiver 10 also includes the usual audio circuits coupled to the station selector circuit and controlled from knob 13 as well as conventional power supply circuits which are also controlled from knob 13; these circuits are not shown in Figure 1. The power supply circuits, are, of course, coupled to both the audio and station selector circuits in accordance with the usual practice.

The remote control system incorporated in receiver 10 comprises four photo-sensitive switching devices 17, 18, 19 and 20 mounted behind individual recessed openings in cabinet 11 around the periphery of viewing screen 12. The position of these photo-sensitive devices, which may

comprise simple cadmium sulfide photocells or other conventional photo-electric switching devices, is not critical, although they should be spaced from each other by a sufficient distance to permit individual actuation. Photocells 17—20 are electrically coupled by means of a plurality of conductors 22 to a control circuit mounted on an auxiliary chassis 21. A series of switches 23, 24, 25 and 26 are mounted on cabinet 11 in positions closely associated with photocells 17, 18, 19 and 20 respectively and are electrically connected to the photocells in a manner to be described more completely in connection with Figure 2. The electrical circuits mounted on chassis 21 are also coupled to a motor-control apparatus 27 which is mechanically coupled to shaft 16 of station selector 15. The electrical control circuits mounted on chassis 21 are also provided with a master control switch 28 and a master sensitivity control 29 preferably made readily accessible from outside cabinet 11; master switch 28 may be employed to energize or to disable the remote control system, whereas sensitivity control 29 is utilized to compensate for variations in ambient illumination in the room where receiver 10 is located, and as will be more completely explained in connection with Figure 2.

When receiver 10 is placed in operation with master switch 28 positioned to disable the remote control system, the receiver operates in a completely conventional manner. Station selection is achieved by means of control knob 14, and the receiver is turned on and off and sound volume is controlled by means of knob 13. When master switch 28 is thrown to the position in which the remote control system is energized, control knobs 13 and 14 may still be employed to vary the operating characteristics of receiver 10; at the same time, however, the remote control system enabled to control operation of the receiver in response to light impulses from an external controllable light source, here represented as a flashlight 30.

With the receiver in operation, flashlight 30 may be employed to focus a beam of light upon photocell 19 and turn the receiver off without turning control knob 13 to its off position. The control system is so arranged that only a brief impulse of light need be supplied to the photocell to de-energize the receiver; a much longer light impulse has the same effect. A second discrete impulse of light directed to photocell 19 from flashlight 30 may be employed to bring receiver 10 back into operation; again, duration of the light impulse does not affect the sequence of operation.

Flashlight 30 may also be employed to direct a beam of light to impinge upon either of photocells 17 and 18. When the beam is focused upon photocell 17, a motor-control apparatus 27 is energized to rotate tuner shaft 16 in a clockwise direction, thereby changing the signal-translating condition of station selector 15 in accordance with a predetermined station sequence. As long as the light beam is focused upon photocell 17, motor apparatus 27 continues in operation and continues to change the station setting; when the desired station position is reached, the light beam is extinguished or deflected away from the photocell and rotation of the tuner is interrupted. Thus, the effective signal-translating condition of station selector 15 is determined by the duration of the light impulse supplied to photocell 17 from source 30. In the event that the desired station setting is passed, the light beam from source 30 may be shifted to photocell 18, which energizes motor apparatus 27 for rotation in the opposite or counter-clockwise direction. The station setting may thus be corrected or a different station setting selected by counter-clockwise rotation of tuner shaft 16; as before, the ultimate station selected is determined by the duration of the light impulse from flashlight 30.

The light beam from flashlight 30 may also be directed to photocell 20, which is coupled to the audio system of receiver 10 through the electrical control circuit mounted on chassis 21. The connection to the audio system may comprise a motor or other variable drive for

the volume control of receiver 10 or may comprise a simple muting arrangement coupled to the audio system, as will be described in connection with the circuit of Figure 2. Thus, when the viewer desires to maintain a conversation without losing track of the general program continuity, the light beam from flashlight 30 is focused upon photocell 20 to mute the audio system of the receiver. When it is again desired to receive the sound portions of the program in addition to the image version thereof, a second light impulse is applied to photocell 20 to re-energize the audio system and restore it to its operative signal-translating condition. As in the case of the on-off portion of the control system, the photo-sensitive switching mechanism comprising cell 20 is coupled to receiver 10 through a stepping relay or other similar means to establish a sequence of actuation which is independent of the duration of light impulses from flashlight 30.

Figure 2 illustrates an electrical control system suitable for use in the remote control system described in connection with Figure 1. It includes the master control switch 28, here shown as a double-pole double-throw switch. One of the internal terminals 32 of switch 28 is connected to one terminal of an external power source 31, which may comprise the usual 60 cycle 110-120 volt household power supply; the other terminal of the power source, which in this instance is grounded, is connected directly to the power-supply circuits of the receiver (not shown). Master switch terminal 32 is connected through one pole of a double-pole single-throw solenoid-operated sequence switch 33 to the on-off switch 34 of the television receiver by means of an electrical conductor 35. One of the external terminals 36 of master switch 28 is also connected to power conductor 35, bypassing switch 33 for manual operation. A second external terminal 37 adapted to be electrically interconnected with terminal 32 is connected to an auto-transformer 38, the other terminal of transformer 38 being coupled back to the ground terminal of external power source 31. Switch terminal 37 is also connected through the solenoid coil 41 of relay 33 to the anode 39 of a first thyatron 40 and is further connected to ground through a potentiometer comprising master sensitivity control 29.

Thyatron 40 may be of the four-electrode type comprising an indirectly heated cathode 43, a control electrode 44, and a shield electrode 45 in addition to anode 39; the commercially available type 2D21 thyatron may be employed. Shield electrode 45 is connected through a bias resistor 46 to a tap 47 on transformer 38; the filament for cathode 43 is directly connected to the same transformer tap. Cathode 43 is connected to ground and control electrode 44 is coupled through a series-connected circuit comprising an input resistor 48 and photocell 19 to the variable tap on potentiometer 29. An auxiliary or manual-control circuit comprising switch 25 and a resistor 49 is connected in parallel with photocell 19 and the photocell is connected to ground through a potentiometer 50 and a resistor 51. Resistor 51 forms a part of a voltage divider including a second resistor 52, the other terminal of resistor 52 being connected through a rectifier 53 to a second tap 54 on transformer 38. A capacitor 55 is connected in parallel with voltage divider 51, 52.

The circuit of Figure 2 includes a second thyatron switching stage which is substantially identical in construction with the stage just described. It comprises a second thyatron 56 including an anode 57, a shield electrode 58, a control electrode 59, and an indirectly heated cathode 60. Shield electrode 58 and the cathode filament are connected through a second terminal of relay 33 to tap 47 of transformer 38, a biasing resistor 61 being interposed in the shield electrode circuit. Cathode 60 is grounded and control electrode 59 is connected to potentiometer 29 through an input resistor 62 and photocell 20. Photocell 20 is shunted by a series circuit comprising switch 26 and resistor 49; as before,

the photocell is connected back to voltage divider 51, 52 through a variable resistor 64. Anode 57 of thyatron 56 is connected to power supply conductor 35 through the solenoid operating coil 65 of a single-pole sequence switch 66.

The electrical control system also includes an additional control stage comprising two triode sections 67 and 68; the triode sections may comprise the two electrode systems of a 6BX7 or similar double triode. Triode 67 includes a grounded indirectly-heated cathode 69 and a control electrode 70; the control electrode is connected to rectifier 53 through a variable bias resistor 71. The anode 72 of triode 67 is connected through a coil 73 and a pair of normally-closed contacts on a single-pole double-throw switch 74 to power conductor 35. Coil 73 comprises the operating coil of a solenoid-operated single-pole double-throw switch 75 which is substantially identical with switch 74.

The indirectly-heated cathode 76 of the tube 68 is grounded and the control electrode 77 is coupled to rectifier 53 through a variable bias resistor 78. The anode 79 of triode 68 is coupled to power conductor 35 through the operating coil 80 of switch 74 and through the normally-closed contacts of switch 75. Control electrode 77 is coupled to potentiometer 29 through photocell 17 and control electrode 70 of tube 67 is similarly coupled to the potentiometer through photocell 18. A bridging circuit comprising a resistor 81 and manual control switch 23 is connected in shunt with photocell 17, and a similar circuit comprising resistor 81 and switch 24 is connected in shunt with photocell 18.

A reversible motor 82 is included in the control apparatus of Figure 2; the motor illustrated is of the type employing a single center-tapped field winding 83 with the usual phase-shifting capacitor connected across the winding. The center tap winding 83 is connected to ground and one terminal of the winding is connected to a normally-open terminal of switch 75, the other terminal of winding 83 being coupled to a normally-open contact on switch 74. The motor circuit also includes a carry-over switch 84 which will be more completely described in connection with Figure 3.

The circuit diagram of Figure 2 also shows a portion of the audio circuit of the receiver of Figure 1, here illustrated as a triode amplifier 85'. The control electrode 86' of tube 85' is coupled to tuner 15 through a conventional volume-control potentiometer 87' controlled by knob 13; potentiometer 87' is also connected to one terminal of sequence switch 66. The other terminal of sequence switch 66 is connected to an external terminal 88' of master switch 28; when switch 28 is in its automatic position as illustrated, terminal 88' is connected to ground through the internal switch terminal 89'. The remaining external terminal 90' of switch 28 is left as an open circuit.

In order for the electrical control system shown in Figure 2 to be effective, the power supply switch 34 of the receiver must be actuated by knob 13 to its closed position. In addition, it is necessary for master switch 28 to be moved to its "automatic" position, since when it is placed in its "manual" position the control system is effectively by-passed and cannot change the operational characteristics of the receiver. With switch 28 in its automatic position, as shown, the system effectively controls station selection and audio reproduction and in addition can be employed to turn the receiver on and off.

With the illustrated circuit, thyatron 40 is always energized and ready for operation whenever switch 28 is in the automatic position. Consequently, if sequence switch 33 happens to be open at the time when operation of the receiver is desired, it is only necessary to illuminate photocell 19. A light impulse applied to this photocell sharply reduces the impedance of the cell thereby effectively raising the voltage on control grid 44 and firing

thyatron 40. The current conducted by the thyatron flows through solenoid 41 and moves switch 33 to its closed position. The sequence switch remains in this position independently of the duration of the light impulse applied to photocell 19; the construction and operation of a suitable switch for this purpose is described more fully in connection with Figures 4 and 5. To disable the receiver, it is only necessary to apply light to photocell 19 a second time to again energize thyatron 40 and solenoid 41 and return switch 33 to its open-circuit position. The same effect can be achieved by closing switch 25; consequently, the manual control switch effectively simulates the function of photocell 19 and may be employed to either energize or de-energize the receiver. Thus, operation of the power supply circuits of the receiver is effectively controlled by the remote control system; at the same time, the first photo-sensitive switching mechanism of the control system, comprising thyatron 40, sequence switch 33, photocell 19 and switch 25 is employed to energize or de-energize the remainder of the control system along with the receiver.

With switch 33 closed, as shown, all of the remaining circuits of the control system are energized. Light impulses may then be applied to photocell 20 to open and close sequence switch 66 in the same manner as sequence switch 33 is operated by photo-sensitive switching device 19. For normal operation of the receiver, with complete audio reproduction, switch 66 is opened and the signal-translating conditions in the audio system represented by amplifier tube 85' are controlled by potentiometer 87' from knob 13. When it is desired to mute the audio system, light is applied to photocell 20, thus firing thyatron 56 and energizing solenoid 65 to close switch 66. Closing switch 66 effectively shunts the input circuit of the audio amplifier to ground and thereby mutes the audio circuit completely. If only a reduced level of audio reproduction is desired, some resistance 94 may be incorporated in the muting circuit so that audio circuit 85' is not completely disabled. Thyatron 56 may also be energized by closing switch 26 instead of by applying a light impulse to photocell 20 to achieve the same effect.

Sequence switch 66 is of the same general type as switch 33 and is actuated in a sequence independent of the duration of light impulses applied to photocell 20 or of the length of time during which switch 26 is maintained closed. When it is desired to restore audio circuit 85' to its normal signal-translating condition, a second light impulse is applied to photocell 20, again rendering thyatron 56 conductive and energizing coil 65 to open switch 66. Normal audio reproduction may also, of course, be obtained by employing switch 26 to operate the sequence switch circuit. Thus, the second photo-sensitive switch mechanism of the control system comprising thyatron 56, sequence switch 66, photo-sensitive device 20 and switch 26, sequentially actuates audio circuit 85' between its normal operative signal-translating condition and a muted signal-translating condition.

Tuning of the receiver is quite similar to the muting and energizing operation in many respects. For example, photocell 17 may be illuminated to reduce the impedance thereof to a very small value as compared with its unilluminated impedance, thereby rendering triode 68 conductive. The current drawn by triode 68 also flows through solenoid 80, closing the normally-open contacts of switch 74. When switch 74 closes, motor 82 is energized for rotation in a clockwise direction and thus drives tuner shaft 16 (Figure 1) in that direction. Motor 82 is continuously energized and continues to drive the tuner shaft as long as photocell 17 is illuminated. When the light impulse applied to the photocell ends, switch 74 returns to its normally open position and motor 82 is de-energized, effectively determining the station setting of the receiver. Complete rotation of the station selector to the next station setting in sequence is assured by means

of carry-over switch 84, as will be more completely described in connection with Figure 3.

When it is desired to rotate tuner shaft 16 counter-clockwise, a beam of light is focused on photocell 18. Triode 67 is then rendered conductive and energizes solenoid 73, closing switch 75 to connect motor 82 to the power supply for counter-clockwise rotation. In this instance, as with the switching mechanism including photocell 17, triode 68 and switch 74, the motor remains in operation as long as the photocell is illuminated, the final signal-translating condition of the station selector being determined by the duration of the light impulse. Counter-clockwise rotation of motor 82 and of the station selector may also be achieved by closing switch 24 and clockwise movement of the tuning mechanism may be obtained by closing switch 23. It should be noted that the two motor switches 74 and 75 are electrically interlocked so that they cannot be closed at the same time, thereby preventing simultaneous actuation of the two tuning-control switching mechanisms and protecting motor 82.

Sensitivity of all of the photocell-actuated switching circuits may be adjusted by varying the setting of master control 29, thereby adjusting the control electrode operating potentials. Individual adjustment is provided by varying the effective resistance of elements 50, 64, 71, and 78 to vary the operating voltages on control electrodes 44, 59, 70 and 77 respectively. Thus, the system may be adjusted for proper operation over a wide range of ambient illumination levels.

Figure 3 shows a preferred form of the motor driving apparatus 27 including motor 82 and carry-over switch 84. This apparatus is described and claimed in my co-pending divisional application, Serial No. 768,672, filed October 21, 1958, for Tuner Drive Apparatus and assigned to the same assignee as the present application. Apparatus 27 includes a gearing arrangement, not shown in detail, coupling the shaft of motor 82 to tuner shaft 16. A serrated cam 85 is mounted on tuner shaft 16 for rotation therewith and includes a series of indexing indentations 86 spaced around its periphery at positions corresponding to the different station or signal-translating settings for tuner 15. One of the indentations 86a is shown in engagement with a cam-follower 87 which is affixed to the principal contact element 88 of carry-over switch 84; the cam follower extends through slot 86a at an angle of approximately 45° with respect to cam 85 so that rotation of the cam in either the clockwise or counter-clockwise direction displaces the cam follower from the slot as indicated by arrows C and C'. Switch 84 is also provided with two secondary contact elements 89 and 90 disposed on opposite sides of primary contact member 88; secondary contacts 89 and 90 are connected in the electrical circuit of motor 82 as shown in Figure 2.

The preferred embodiment of the carry-over switch illustrated in Figure 3 also includes a pair of damper elements 91 and 92 disposed on opposite sides of primary contact 88. Damper elements 91 and 92 are preferably constructed from resilient material such as Phosphor bronze; the primary contact member is also made from spring material. In addition, the damper elements are constructed to have an effective moment of inertia substantially equal to that of primary contact element 88.

When motor 82 is energized by the circuit of Figure 2 to drive shaft 16 in a clockwise direction, cam follower 87 is forced out of slot 86a in the direction of arrow C and moves primary contact element 88 away from damper element 92 and into contact with secondary contact element 89. If the switching mechanism of Figure 2 comprising cell 17, triode 68 and switch 74 is subsequently de-energized before the station position is reached, carry-over switch 84 maintains a complete electrical circuit to motor 82 until cam follower 87 drops into the next cam indentation 86b. Thus, the carry-over switch prevents interruption of the tuner drive mechanism at a point

intermediate the station settings. When cam follower 87 engages in indentation 86b, resilient primary contact 88 moves back toward its normal open-circuit position. As the primary contact strikes damper 92, movement of the primary contact is immediately arrested, due to the fact that the moment of inertia of the contact is equal to that of the damper element. Consequently, the primary contact member cannot make electrical contact with the other secondary element 90. Carry-over switch 84 therefore permits positive control of the ultimate position of the tuner by means of the two photo-sensitive switching mechanisms shown in Figure 2 without creating undesirable transient pulses in the control system due to vibration of the switch contacts.

Figure 4 illustrates sequence switch 33 in its open-circuit position. The relay comprises solenoid 41 and a plunger 96 mounted axially of the coil; a shaft 97 is mounted coaxially with plunger 96 and extends into engagement with a cam assembly 98. Shaft 97 is biased into engagement with plunger 96 by a spring 124. Cam assembly 98 comprises a pair of cam actuators 99 and 110 affixed to shaft 97 and adapted to cooperate with a double-notched cam 100 rotatably mounted on a pin 101. Shaft 97 also supports a movable contact assembly comprising a pair of electrical contact elements 102 and 103 adapted to engage two stationary contacts 104 and 105 respectively; contacts 104 and 105 are supported by a bracket 106 which, in turn, is mounted on a support base 107 which also serves as a mounting base for solenoid 41 and cam assembly 98. The end of mounting base 107 adjacent solenoid 41 comprises a vertically extending stop member 108 positioned to engage a washer 109 mounted on plunger 96. A bias spring 111 mechanically coupled to shaft 97 urges the shaft and plunger in the direction indicated by arrow B.

When solenoid 41 is energized, as described in connection with Figure 2, plunger 96 is driven against the biasing force of spring 111 in the direction indicated by arrow A until the plunger engages the solenoid housing. Movement of the solenoid plunger drives shaft 97 in the same direction and brings cam actuator 110 into engagement with one surface 120 of cam 100, rotating the cam counter-clockwise through a minor arc to the position illustrated in Figure 5. When coil 41 is subsequently de-energized, plunger 96 and shaft 97 moves in the direction indicated by arrow B in response to the force exerted by spring 111. Cam follower 99 engages a second surface 121 of cam 100 as the solenoid mechanism follows its return stroke and arrests movement of shaft 97 and plunger 96 in the position illustrated in Figure 5, in which contacts 102, 104 and contacts 103, 105 are closed.

Sequence switch 33 remains in the position shown in Figure 5 until solenoid 41 is again energized. Re-energization of the solenoid again drives plunger 96 and shaft 97 in the direction of arrow A. Dog 110 engages another surface 122 of cam 100 and rotates it to a position perpendicular to shaft 97. Subsequently, when coil 41 is de-energized, and plunger 96 begins its return stroke in the direction of arrow B, cam follower 99 engages cam 100 and returns it to the position shown in Figure 4 with electrical contacts 102, 104 and 103, 105 open. Thus, cam assembly 98 establishes a predetermined actuation sequence for the relay which is independent of the time interval for which coil 41 is energized. Each time solenoid 41 is energized, the sequence switch changes from the closed position illustrated in Figure 5 to the open position shown in Figure 4 or vice versa, without regard to the length of time current is supplied to the coil.

The control system of the invention provides for remote actuation of the major receiver functions without requiring any line connection from a remote control station to the receiver; indeed, the only remote control "station" required is a conventional flashlight. Spurious triggering of the control system is almost completely

eliminated, since the sensitivity controls may be adjusted to prevent actuation by normal changes in ambient illumination. Operation of the control system is extremely simple and can be carried out by anyone capable of aiming a flashlight. Thus, the disadvantages and difficulties of known systems are avoided in a relatively economical control system.

While a particular embodiment of the present invention has been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Accordingly, the aim in the appended claims is to cover all such changes and modifications as may fall within the true spirit and scope of the invention.

I claim:

1. A system responsive to pulses of wave energy from a controllable remote source for controlling a wave-signal receiver including a station selector circuit actuable between a plurality of predetermined signal-translating conditions for selection of different received signals, an audio circuit coupled to said station selector circuit and actuable between at least two different signal-translating conditions for utilizing audio information included in said received signals, and a power supply circuit coupled to said selector and audio circuit and actuable between two different translating conditions, said system comprising: first and second impedance means each having a substantial change in impedance value in response to a pulse of wave energy from said remote source; means coupling said first impedance means to said station selector circuit and responsive to said change in impedance value of said first impedance means for selectively actuating the station selector circuit between its aforesaid different translating conditions; means coupling said second impedance means to one of said audio and power supply circuits and responsive to said change in impedance value of said second impedance means for selectively actuating said one circuit between its aforesaid different

translating conditions; a source of electrical power; first and second adjustable impedance elements coupled respectively in series combination with said first and second impedance means to form first and second networks, respectively; a third adjustable impedance element coupled in series combination with said source of electrical power to form a third network; and means coupling said third network in series combination with a parallel combination of said first and second networks.

2. A system as defined in claim 1 in which said first and second impedance means each comprise a photo-sensitive device responsive to light-wave energy.

3. A system as defined in claim 1 in which said first and second networks further comprise first and second manually operable switches coupled individually in parallel with said first and second impedance means, each parallel switch-and-impedance-means combination being in series with the respective adjustable impedance element.

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