

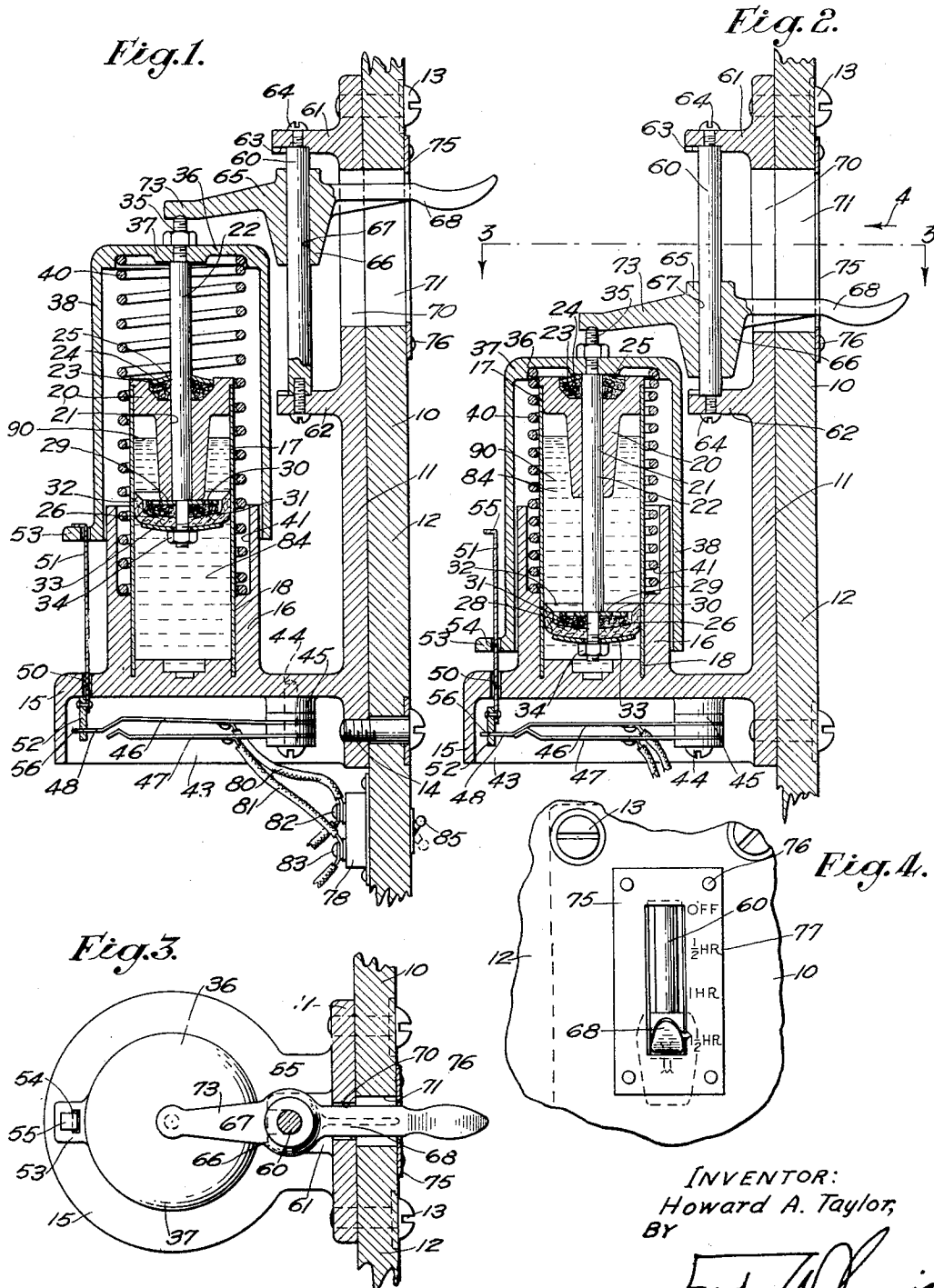
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TIME RELAY FOR RADIO RECEIVING SETS

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TIME RELAY FOR RADIO RECEIVING SETS

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This invention relates to a device for turning off a radio set at the expiration of a predetermined period of time, thus avoiding the possibility of the radio set being inadvertently left on.

It is an object of the invention to provide a simple and efficient time switch which will open the master circuit of a radio at the expiration of a period of time for which the device has been set.

A further object of the invention is to provide a device which may be mounted within a radio cabinet and which may be manipulated from the exterior of the cabinet through the use of an operating handle which extends through the panel or wall of the cabinet.

Another object of the invention is to provide a device mountable within a radio and having a depressible member and a switch controlled by the position of the member, with means for slowly returning said member to its original position, the arrangement and location of the device precluding the manual raising of the depressible member once it is depressed.

A further object of the invention is to provide a device which may be easily and quickly attached to a radio set without the necessity of making changes in the radio receiving apparatus.

Further objects and advantages relate to and may be perceived from the features of construction pointed out in the following part of the specification and illustrated in the accompanying drawings in which,

Fig. 1 is a vertical sectional view showing a preferred embodiment of my invention secured to a wall or panel of a radio receiving set cabinet, the time control device being shown in expanded or extended position.

Fig. 2 is a vertical cross sectional view similar to Fig. 1 but showing the device in collapsed position.

Fig. 3 is a horizontal cross section on a plane represented by the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary elevation derived as indicated by the arrow 4 of Fig. 2 and showing a form of dial plate used in conjunction with the operating handle of the invention.

As shown in the drawing, my invention includes a supporting structure 10 having a vertical mounting plate 11 which may be secured against the inner face of a panel or wall 12 by means of small screws 13 extending through the panel 12 into threaded engagement with the plate 11, as indicated at 14 in Fig. 1. Near the lower end of the plate 11 a bracket 15 extends outwardly in a substantially horizontal direction, this bracket hav-

ing an upwardly extending cylindrical wall 16 thereon. A tubular member or cylinder 17 is secured in vertical position by engagement of its lower end 18 with the cylindrical wall 16. The cylinder 17 is preferably cast in place in the die casting of the mounting plate 11. In the upper end of the cylinder 17 a head 20 is secured, this head 20 having an axial opening 21 through which a piston rod 22 extends and having a packing recess 23 at its upper end in which a body of packing material 24 is held tightly around the piston rod 22 by a substantially flat plate 25 which is pressed into place in the outer end of the recess 23. The packing 24 is designed to prevent leakage from the interior of the cylinder 17 out around the piston rod 22. The inner end of the piston rod 22 carries a piston 26 having substantially tight engagement with the inner face of the cylinder 17 when the piston is moved in upward direction but being so formed that fluid may pass around the exterior of the piston when it is moved in downward direction.

I have found the following piston construction practical and satisfactory. On the lower reduced end 28 of the piston rod 22 a circular plate or disc 29 is placed, this plate or disc having perforations 30 therein. Adjacent to the plate 29 a flat annular body 31 of a fibrous, porous, or percolative material is placed, and a cup washer 32 of leather or suitable fabric is held against the percolative body 31 by a dished plate 33 and a nut 34, which nut threads upon the extreme lower end of the piston rod 22, as shown. The upper end of the piston rod 22 has a reduced extension 35 on which an inverted shell or cup 36 is mounted, this shell or cup having an upper circular wall portion 37 and a downwardly extending cylindrical wall 38, the wall 38 being of such diameter that it may surround the cylindrical wall 16, as shown in Figs. 1 and 2. A compression spring 40, having its lower end received in an annular recess 41 formed in the upper portion of the cylindrical wall 16, engages the lower face of the upper end wall 37 so that the force of this spring 40 will normally tend to hold the cup or shell 36 in the raised position shown in Fig. 1. The bracket 15 has a cavity 43 in its lower face, and by means of screws 44 and bodies 45 of insulating material upper and lower contact members 46 and 47 are secured to the under part of the bracket 15 and within the cavity 43, the outer end 48 of the upper contact member 46 extending beyond the end of the lower contact member 47. Through a vertical opening 50 in the bracket 15, a slide bar or link 51 extends from a block of insulating material

52 in the cavity 43 to a lug 53 which projects from the lower portion of the cylindrical wall 38 forming a part of the shell 36, this lug 53 having a vertical opening 54 therein through which the link 51 extends, there being a hook or toe 55 bent outwardly on the extreme upper end of the link 51 to provide a means of engagement between the shell 36 and the link whereby movement of the shell 36 may accomplish an opening of the switch contacts 46 and 47. The block 52 has an opening 56 therein through which the end portion 48 of the upper contact 46 extends. When the shell 36 is in raised position, as shown in Fig. 1, the hook 55 will be engaged and the link 51 lifted, the upward movement of the link 51 from the position in which it is shown in Fig. 2 to its position of Fig. 1 accomplishing a raising of the upper contact 46 from the lower contact 47.

A slide in the form of a slide bar 60 is held in vertical position adjacent to the upper portion of the shell 36 by upper and lower lugs 61 and 62 which project laterally from the mounting plate 11 of the supporting structure 10, there being shallow recesses 63 in the opposing faces of the lugs 61 and 62 in which the ends of the slide bar 60 are received, small screws 64 being extended through the lugs 61 and 62 into the ends of the slide bar 60 to hold such slide bar firmly in place. An operating member 65 having a central body 66 is provided with a bore 67 to fit the slide 60. An operating lever 68 projects outwardly from the body 66 through a vertically elongated opening 70 in the plate 11 and a similar opening 71 cut in the wall or panel 12 at the time of installing the device in a radio set. An arm 73 projects inwardly from the body 66 so as to engage the upper end of the extension 35 forming the upper extremity of the piston rod 22. The slot 70 in the plate 11 is of such width, as shown in Fig. 3, that it will engage the sides of the operating lever 68 so as to guide the member 65 in a position of alignment which will assure engagement of the upper end of the piston rod 22 by the arm 73.

A dial plate 75 is preferably secured to the wall or panel 12 in a position corresponding to the slots 70 and 71 in which the operating lever 68 is vertically movable, this dial plate being held in place by brads or screws 76 and having time designations thereon, as indicated at 77.

In Fig. 1 I have indicated a master switch 78 of a type used in radio receiving sets for opening and closing the master circuit thereof. In the use of my time relay switch, conductors 80 and 81 are carried respectively to the binding posts 82 and 83 of the master switch 78, thereby making it possible to close the master circuit of the radio set either by use of the switch 78 or by closing the contacts 46 and 47. A body of liquid 84 is placed in the cylinder 17, filling the entire lower portion of the cylinder 17 and part or all of the upper portion thereof, this liquid serving to control the movement of the piston 26 within the cylinder 17, thereby controlling the opening of the switch contacts 46 and 47 after they have been closed in response to downward movement of the shell 36.

The operation of the invention will be perceived from the following. When the shell 36 and its associated parts are held in the fully raised position shown in Fig. 1, the upper contact 46 will be held in a position raised from the lower contact 47 through the use of the link 51. This may be considered the position of rest or inactivity of the time relay switch for the reason that when the parts thereof are in such po-

sition the master circuit of the radio receiving set will not be thereby influenced; therefore, during the time the time relay switch mechanism is in inactive position, as shown in Fig. 1, the radio set may be turned on and off at will by manipulation of the lever 85 of the switch 78. Should the user of the radio set at any time, as upon retiring, desire to have the radio set shut off at the end of a short period of time, say from one-half to one and one-half hours, the switch 78 is opened and the operating lever 68 is forced downwardly from its position of Fig. 1 toward its position of Fig. 2, the distance which the lever 68 is moved downwardly being determined by the time in which it is desired to have the radio set shut off. Let it be supposed that the time circuit is one and one-half hours. The lever 68 will then be forced down to the bottom of its length of travel or to a position adjacent to the $1\frac{1}{2}$ hr. period designation on the dial or indicator plate 75. Through the arm 73, the downward movement of the lever 68 accomplishes a like downward movement of the shell 36 from its position of Fig. 1 to its position of Fig. 2. As the piston 26 moves downwardly with the shell 36, liquid 84 will flow upwardly around the periphery of the piston 26 into the space above the piston within the cylinder 17, which space may be designated as a pressure chamber 90. During downward movement of the shell 36, the spring 40 is collapsed, and upon release of the lever 68 the spring 40 tends to move the shell 36 in upward direction, but the shell 36 can move upwardly no faster than its attached piston 26 which bears against the body of liquid 84 which has passed from the lower portion of the cylinder 17 into the pressure chamber 90. This liquid under pressure in the pressure chamber 90 seeps or percolates slowly through the fibrous or porous body 31 and passes down around the exterior of the diametrically reduced extension into the lower portion of the cylinder 17, thus producing a very slow reduction in the volume of liquid in the pressure chamber 90 and permitting a slow upward movement of the piston 26 and the shell 36 attached thereto. The piston 26 and its component parts are so designed that it will require an established period of time for movement of the piston from the bottom of the cylinder 17 to the upper end of its stroke. During the movement of the shell 36 downwardly from the position in which it is shown in Fig. 1, the hook 55 is released as a result of the lug 53 moving downwardly from its position of Fig. 1 to its position of Fig. 2, thus permitting the link 51 to move downwardly through a distance necessary to accomplish engagement of the upper contact 46 with the lower contact 47. During the time the shell 36 is slowly returned toward its position of Fig. 1, the contacts 46 and 47 will remain closed so as to thereby close the master circuit of the radio receiving set. As the shell 36 approaches the upper end of its movement, the lug 53 will engage the dog 55 and will in turn raise the link 51 so as to remove the upper contact 46 from engagement with the lower contact 47, thus opening the master circuit of the radio set. The length of time that the contacts 46 and 47 will remain closed depends on the distance the piston is moved downwardly. Therefore, the plate 75 may be conveniently graduated to indicate distances to which the lever 68 is to be moved in order to accomplish a desired timing action of the time relay switch.

The disposition of the device within the radio cabinet precludes the manual raising of the shell 36 once it has been depressed, as such manual raising of the shell may prove detrimental to the proper operation of the device.

Although I have herein shown a simple and practical embodiment of my invention, it is to be recognized that certain parts or elements thereof are representative of other parts, elements or mechanisms which may be employed in substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that the invention is not to be limited to the details disclosed herein but shall have the scope of the following claims.

I claim as my invention:

1. In combination with a control panel with an opening therein: a time switch means positioned back of said control panel and operatively connected to a control circuit in a manner to open said circuit after a selectively predetermined time; slidable means extending through said opening of said control panel and manually engageable at the front of said control panel for selectively setting said time switch means for a desired period of operation of said radio set; and a guide rod on said control panel on which said second mentioned means is slidable.

2. In combination with a control panel with an opening therein: a time switch means comprising a base structure connected to said panel rearwardly of said opening; walls forming upper and lower chambers in said base structure; a casing adapted to telescope the upper part of said base structure; expansion means supported by said base structure and extending upwardly in said casing and yieldingly supporting said casing; a piston stem connected interiorly of said casing and extending downwardly into said upper chamber; electrodes in said lower chamber; a piston head on said stem within said upper chamber, said piston head including a wall of percolative material adapted to permit a slow discharge of fluid from the upper to the lower part of said upper chamber during an upward movement of said head; and manually engageable means extending through said panel opening and engage-

able with said casing when moved in one direction for controlling said electrodes by movement of said casing.

3. In combination with a control panel with an opening therein: a time switch means comprising a base structure connected to said panel rearwardly of said opening; walls forming upper and lower chambers in said base structure; a casing adapted to telescope the upper part of said base structure; expansion means supported by said base structure and extending upwardly in said casing and yieldingly supporting said casing; a piston stem connected interiorly of said casing and extending downwardly into said upper chamber; electrodes in said lower chamber; a piston head on said stem within said upper chamber, said piston head including a wall of percolative material adapted to permit a slow discharge of fluid from the upper to the lower part of said upper chamber during an upward movement of said head; and means extending through said panel opening and engageable with said casing when moved in one direction for controlling said electrodes by movement of said casing.

4. In combination with a control panel with an opening therein: a time switch including a base structure connected to said panel rearwardly of said opening; walls forming upper and lower chambers in said base structure; a casing telescoping said base structure; an expansion spring supported by said base structure and yieldingly supporting said casing in an elevated position relative thereto; a piston stem connected interiorly of said casing and extending downwardly into said upper chamber; electrodes in said lower chamber; a piston head on said stem within said upper chamber, said piston head including a wall of percolative material adapted to permit a slow discharge of fluid from the upper to the lower part of said upper chamber during an upward movement of said piston head; and an arm extending through said panel opening and manually engageable with said casing when moved in one direction to control said electrodes.

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