Nov. 9, 1965 W. L. HAMILTON 3,217,127

MERCURY BUTTON SWITCH WITH HORIZONTAL HANDLE

Filed Jan. 30, 1963 3 Sheets-Sheet 1

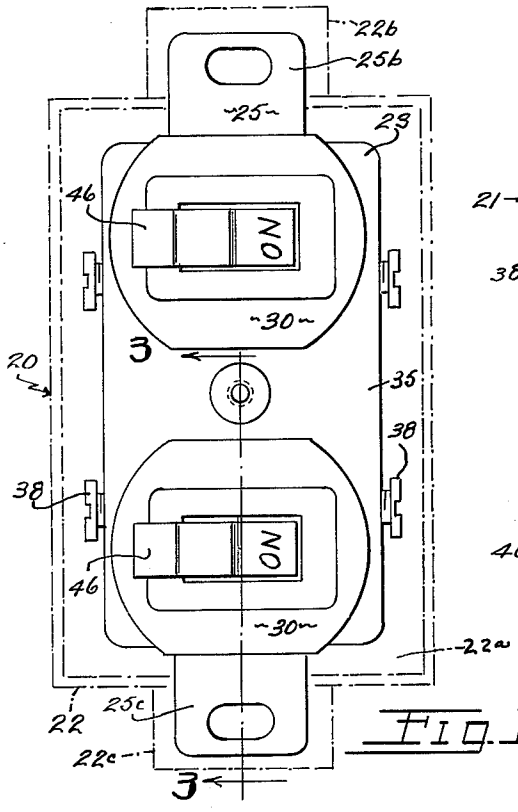

FIG. 1

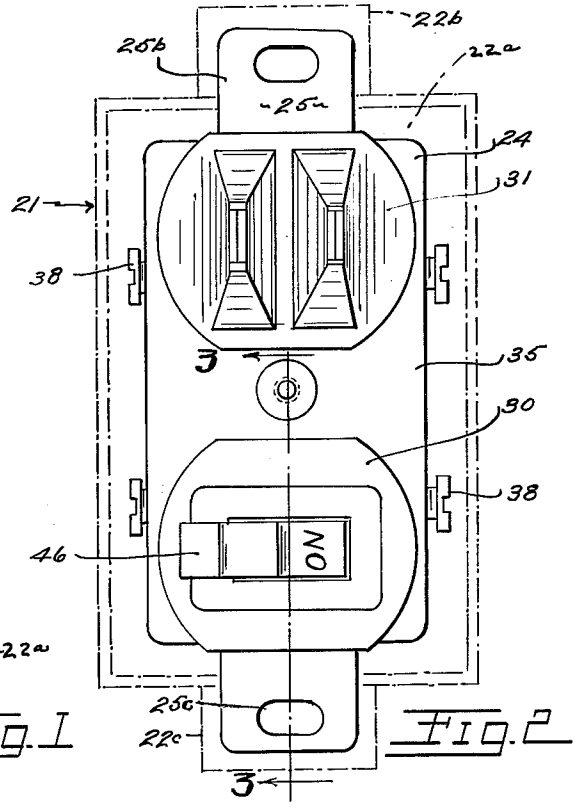

FIG. 2

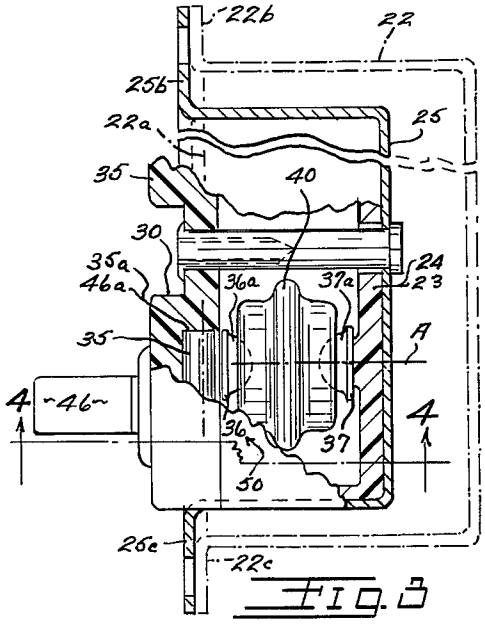

FIG. 3

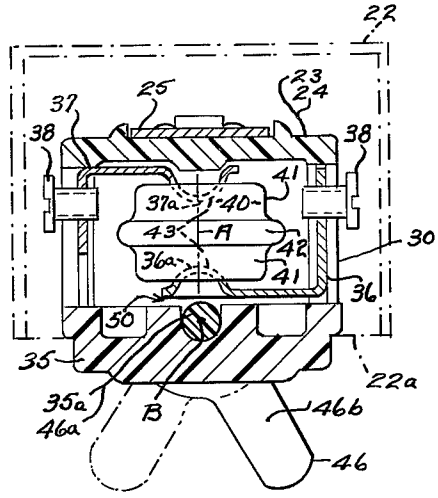

FIG. 4

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MERCURY BUTTON SWITCH WITH HORIZONTAL HANDLE

Filed Jan. 30, 1963 3 Sheets-Sheet 2

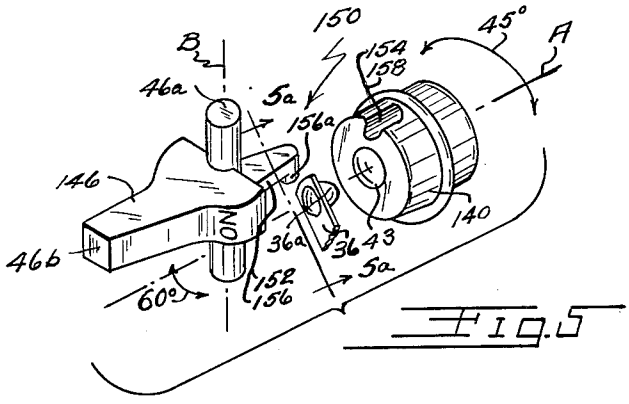

FIG. 5

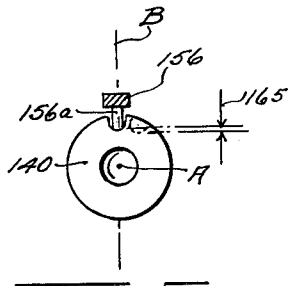

FIG. 5a

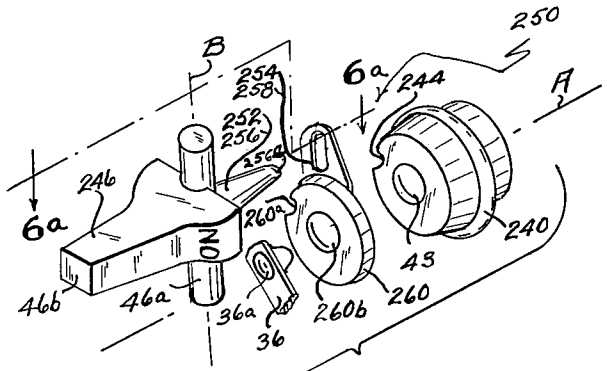

FIG. 6

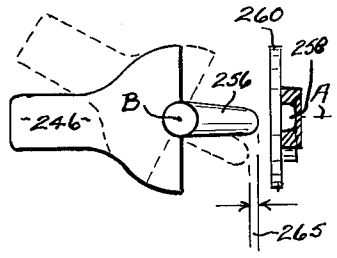

FIG. 6a

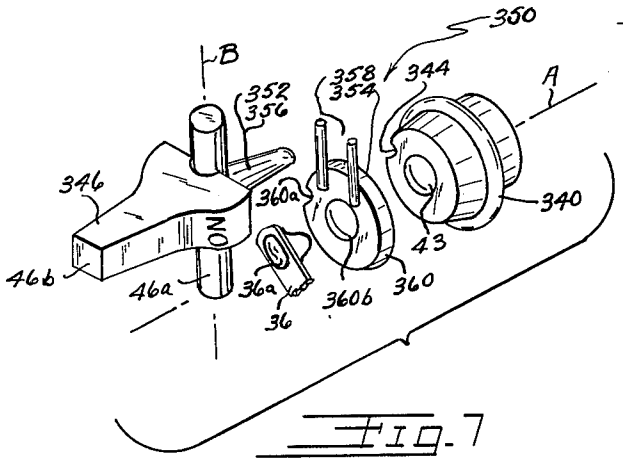

FIG. 7

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MERCURY BUTTON SWITCH WITH HORIZONTAL HANDLE

Filed Jan. 30, 1963 3 Sheets-Sheet 3

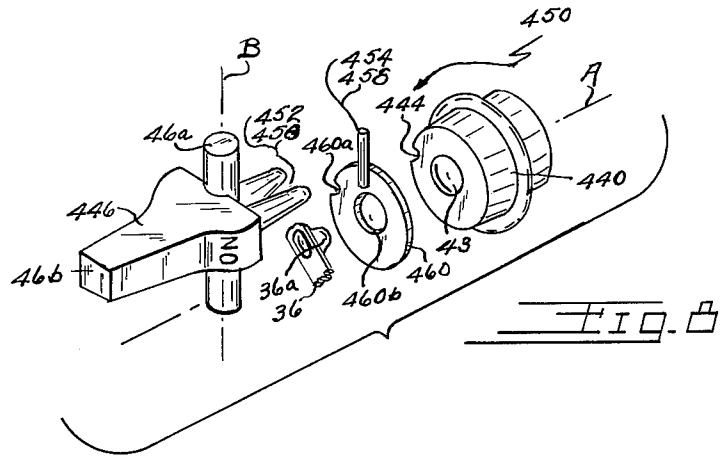

FIG. 8

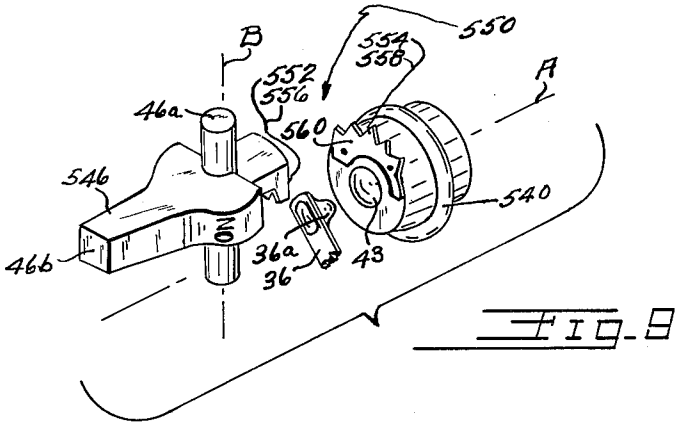

FIG. 9

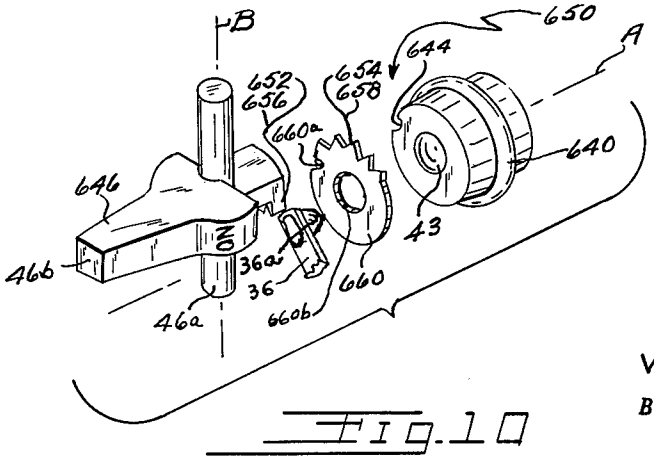

FIG. 10

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United States Patent Office 3,217,127 Patented Nov. 9, 1965

3,217,127
MERCURY BUTTON SWITCH WITH HORIZONTAL HANDLE

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Filed Jan. 30, 1963, Ser. No. 255,030
8 Claims. (Cl. 200—152)

This invention relates to electric switches and in particular to a novel mercury button switch and related assemblies.

Mercury button switches have been widely used for some time for controlling residential lighting circuits as well as for miscellaneous other applications. They have been noted for their silent operation and for their long wear life.

A mercury button switch of the conventional type is disclosed in U.S. Patent No. 2,142,153 issued January 3, 1939 to R. F. Sambleson and entitled "Electric Switch." The construction of a typical mercury button is disclosed in United States Patent No. 2,101,092 issued December 7, 1937 to J. H. Payne, Jr. and entitled "Liquid Contact Switch."

In Payne, note the species shown in FIG. 11, and the unnumbered, component parts therein suitably numbered in FIGS. 3–6. In FIG. 11, the mercury button is a container for mercury **5** which makes or breaks the electrical circuit. The button consists of two hat-shaped metal shells **1** and **2** separated by ceramic insulating barrier **3**, hermetically sealed together by glass ring **8** extending around the peripheries of metal shells **1** and **2** and ceramic barrier **3**. Small hole **4** (about ⅛ inch in dia.) through barrier **3** is offset from the geometric, central axis of rotation of the button so as to allow a suitable quantity of conductive mercury **5** to flow into contact with both metal shells **1** and **2** in the position shown in FIGS. 6 and 11 so as to complete the electrical circuit between them. To interrupt the circuit, the button is rotated about its same geometric axis so that hole **4** in barrier **3** is raised above the level of the surface of mercury **5**, as shown in FIG. 5. Mercury **5** is then divided into two unconnected pools by barrier **3**.

Sambleson shows a mercury button, similar to the button disclosed in Payne, assembled in a complete mercury button switch. In Sambleson, mercury button **3** in FIGS. 1 and 2 is rotatably supported between hemispherical shapes **10** on two contact strips **8**. Contact strips **8** lead to terminals **12** for wires from an external circuit. All of these parts are suitably enclosed and supported by case or housing **6** made of insulating material, usually a phenolic resin plastic. Handle **16** protrudes from case **6** and is arranged to rotate button **3** between the circuit opening position and circuit closing position, as desired, by having a key-type driving connection with mercury button **3** through projection **18** on handle **16** located in recess portion **19** on said button.

Sambleson shows the conventional mercury button switch for residential use wherein switch actuating handle **16** of insulating material is in direct contact with mercury button **3** so that finger pressure on switch **16** rotates this switch and button as a unit. Although this arrangement makes a simple construction and has enjoyed widespread use, it requires that the switch be installed, such as in the wall of a room, in a vertical position with the rotational, central axis of mercury button **3** being horizontally disposed. For example, FIGS. 1 and 2 in Sambleson will have proper vertical orientation if these drawing figures are turned 90 degrees counter-clockwise to show the proper mounting position of the switch. Then, switch **16** moves in a vertical plane.

It should be obvious that if the switch in Sambleson

were oriented in the position shown in FIG. 2 of Sambleson to allow movement of switch **16** in a horizontal plane, as shown by the orientation of switches in applicant's drawing FIGS. 1 and 2, mercury **5** in Payne would be prevented from performing the usual circuit closing function by the action of gravity.

An object of the present invention is to make possible a mercury button switch with a switch actuating handle operating in a horizontal plane by pivotal movement about a vertical axis while the mercury button is rotatable about a horizontal axis.

Millions of horizontal toggle switches, each having its switch actuating handle movable in a horizontal plane similar to each switch in applicant's drawing FIGS. 1 and 2, are presently in residential use, but they are all of the mechanical, snap-action type. These have the disadvantage of making a disturbing, loud click when operated, and have a shorter wear life than mercury button switches.

A further object of the present invention is to provide a mercury button switch having its switch actuating handle movable in a horizontal plane and having quiet operation and/or a long wear life.

A further object of the present invention is to make possible the installation of two or three mercury button switches in a standard single wall outlet box, standard in the electrical industry, wherein heretofore it has been feasible to mount only one mercury button switch, similar to Sambleson's switch in FIG. 6 or 10.

A further object of the present invention is to provide for mounting, in either one half or both halves of a standard single wall outlet box, a mercury button switch adapted to be covered in the conventional manner by a standard two-hole wall cover plate because the mercury button switch in the present invention is similar in appearance, size, operation and installation to the present snap-action, dual switches or duplex convenience outlets.

A further object of this invention is to provide not only a mercury button switch but also a convenience outlet in a standard single wall outlet box wherein it was possible to mount only a single mercury button switch heretofore.

A further object of this invention is to accomplish the aforementioned objects while using the mercury button presently manufactured in large volume by automated production.

A further object of the present invention is to provide either a mercury button switch, or an assembly including said mercury button switch, characterized by its inexpensive manufacturing cost, ease of assembly of its component parts, structural simplicity, strong and sturdy nature, ease of operation or use, desirable operating characteristics, and attractive exterior appearance.

These and other objects of the present invention will become more fully apparent by reference to the appended claims as the following detailed description proceeds in reference to the accompanying drawings wherein:

FIG. 1 is a front view of an electrical unit, containing two mercury button switches, mounted in a single wall outlet box for use in residential lighting circuits;

FIG. 2 is a front view similar to FIG. 1 but with a convenience outlet substituted for the upper switch;

FIG. 3 is a vertical sectional view taken generally along the line 3—3 in FIG. 1 or FIG. 2 through the lower mercury button switch, showing the mounting strap of the electrical unit in solid line and showing the single wall outlet box in dot-dash lines but omitting the drive mechanism between the switch handle and the mercury button;

FIG. 4 is a sectional view taken generally along the line 4—4 in FIG. 3 with a switch actuating handle shown in electric circuit opening position and closing position with one of these positions being shown by solid lines and the other position being shown by dot-dash lines;

FIG. 5 is an isometric, exploded view of a first form of drive mechanism operatively connecting a switch actuating handle and a mercury button;

FIG. 5*a* is a vertical sectional view taken generally along the line 5*a*—5*a* in FIG. 5;

FIG. 6 is an isometric, exploded view of a second form of drive mechanism operatively connecting a switch actuating handle and a mercury button;

FIG. 6*a* is a horizontal sectional view taken generally along the line 6*a*—6*a* in FIG. 6;

FIG. 7 is an isometric, exploded view of a third form of drive mechanism operatively connecting a switch actuating handle and a mercury button;

FIG. 8 is an isometric, exploded view of a fourth form of drive mechanism operatively connecting a switch actuating handle and a mercury button;

FIG. 9 is an isometric, exploded view of a fifth form of drive mechanism operatively connecting a switch actuating handle and a mercury button; and

FIG. 10 is an isometric, exploded view of a sixth form of drive mechanism operatively connecting a switch actuating handle and a mercury button.

Assembly **20** in FIG. 1 and assembly **21** in FIG. 2 are intended to be used in residential lighting circuits in room wall installations. Each assembly includes a single wall outlet box standard in the electrical industry; shown as box **22** having an open front **22***a*; having mounting ears **22***b* and **22***c*, and having interior dimensions of approximately 1⅞" wide, 2⅞" high, and 1⅞" deep.

Assemblies **20** and **21** respectively include electrical units **23** and **24**. Each of these units **23** and **24** includes metal mounting strap **25** having ears **25***b*, **25***c* at opposite ends adapted to be connected to corresponding ears **22***b* and **22***c* through aligned holes therein by screws for mounting the whole assembly in a room wall in the conventional manner.

Each electrical unit **23** or **24** includes two interconnected components, such as either two mercury button switches **30** in FIG. 1 or one mercury button switch **30** and one convenience outlet **31** in FIG. 2, secured together, shaped and spaced apart a distance to fit into the two separate openings in a standard two-hole wall cover plate (not shown) when this unit is mounted in box **22**.

The defects in the prior art should be immediately apparent. Either two switches **30** in FIG. 1 or one switch **30** and one convenience outlet **31** in FIG. 2 look like the presently used construction with snap-action, dual, toggle switches. Each of these in the prior art and in assemblies **20** and **21** in FIGS. 1 and 2 are approximately the same size, fit into box **22**, and are covered by a standard two-hole wall cover plate (not shown) when in use. However, the conventional mercury button switch cannot be used for switch **30** in FIG. 1 or 2. Only one of Sambleson's mercury button switches can be mounted in box **22**. For example, if you turn FIG. 6 in Sambleson 90 degrees counter-clockwise, it will be apparent that only one of these switches will fit into box **22**. If Sambleson's switch in FIG. 6 were retained in the horizontal position illustrated so as to be in the same orientation as switches **30** in applicant's FIGS. 1 and 2, it should readily be apparent that the mercury button in Sambleson's switch would not operate properly to close any electrical circuit connected therethrough.

Electrical units **23** and **24** are each shown mounted in a single outlet box. However, it should be apparent that these units are of such size that any two would fit into a two gang outlet box, three would fit into a three gang outlet box, etc.

For the first time, the present invention makes it possible for a mercury button switch to be used in the horizontal handle orientation shown in FIGS. 1 and 2, to be mounted within a single wall outlet box in no more than one-half the space normally required for a mercury button switch, to be used for the first time in the space and configuration of one of the dual snap switches in the presently used duplex electrical unit, etc.

Each mercury button switch **30** includes switch housing **35** made of insulating material, such as phenolic resin plastic; two brass, electrical contact strips **36** and **37** mounted in housing **35** and having respectively thereon hemi-spherical pivot projections **36***a* and **37***a* each having an electrical lead terminal screw **38**; mercury button **40**; and switch actuating handle **46** extending through the front face of switch housing **35** and having handle portion **46***b* and integrally formed therewith coaxial pivot shaft portions **46***a*, **46***a* mounted in coaxial pivot recesses **35***a* in housing **35** for rotation about vertical axis B by manual manipulation of handle part or portion **46***b* so that switch **46** can swing in a horizontal plane through a limited arc of travel; and suitable drive mechanism **50** operatively connected between switch handle **46** and mercury button **40** so that arcuate movement of handle portion **46***b* in opposite directions will cause arcuate movement of mercury button **40** in opposite directions between electric circuit opening position and closing position for opening or closing an electric circuit through button **40**. FIG. 4 shows switch handle portion **46***b* by solid line and dot-dash line in these two different positions forming end positions for portion **46***b*. Between these positions, mercury button **40** has approximately a 45-degree arcuate swing about its central, pivotal axis A extending perpendicular to the front face of switch housing **35**; and handle portion **46***b* has a 60-degree arcuate swing about its pivotal axis B.

Although axes A and B may be angularly oriented by any angle substantially greater than zero degrees in the broader aspect of this invention, it is preferred that these axes A and B have approximately a 90 degree angle therebetween and the axes A and B intersect so that handle **46** is adapted to move in a horizontal plane between these positions in the manner shown in FIGS. 1–4.

Mercury button **40** can be of any suitable design but is preferably identical with the mercury button presently manufactured in large volume by automated production so as to achieve economies in manufacture. This button **40** is similar to the mercury button **1** shown in FIG. 11 of Payne but has depressions **43** similar to depressions **11** in FIG. 3 of Sambleson. Applicant's mercury button **40** is shown as having two hat-shaped metal shells **41** separated and sealed together by coplanar ceramic insulating barrier and glass ring **42**; and having depressions **43**, **43** on opposite sides thereof coaxially aligned on axis A. Mercury button **40** is mounted in housing **35** for rotation about axis A, extending generally horizontally during switch usage as shown in FIGS. 1–4, by having electrical contact pivot projections **36***a* and **37***a* firmly seated in depressions **43** in button **40** not only to resiliently and tightly straddle button **40** on axis A but also to mount button **40** for rotation on axis A extending perpendicular to the front of switch **30**.

FIGS. 1–4 are intended to be generic to all forms by showing where drive mechanism **50** is generally located while omitting specific structural details of any one single form of drive mechanism **50**, handle **46** or button **40**. In switches **30** in FIGS. 1 and 2, drive mechanism **50** is located below axis A in each of the lower switches **30** and is located above axis A in upper switch **30**.

Button **40**, switch actuating handle **46** and drive mechanism **50** have been illustrated in FIGS. 1–4 as generic to the six species of the invention disclosed in FIGS. 5–10. As will be apparent hereinafter, the description of the structure and the mode of operation in the preceding paragraphs applies generically to the same named parts, positions, axes, etc. hereafter described in FIGS. 5–10 having the same reference numerals except in the **100**, **200**, **300**, **400**, **500** or **600** series.

The six different species shown in FIGS. 5–10 have the variations in structure mentioned hereafter.

Button 40 is shown in FIGS. 5–10 as button 140, 240, 340, 440, 540 and 640 respectively having stamped in their respective peripheries recess portions 158, 244, 344 and 444; having no recess portion in button 540; and having stamped recess portion 644. Such recess portion may be of standard depth, as shown in FIGS. 6, 7, 8 and 10; of either standard or greater depth, as shown in FIG. 5; or be non-existent, as shown in FIG. 9. These recess portions and the coaxial depressions 43 in these buttons correspond respectively to recess portions 19 and coaxial depressions 11 in Sambleson.

Switch actuating handle 46 is shown in FIGS. 5–10 as switch actuating handles 146, 246, 346, 446, 546 and 646.

Drive mechanism 50 may take any suitable form. Six different forms of drive mechanism 50 are shown respectively as drive mechanisms 150, 250, 350, 450, 550 and 650 in FIGS. 5, 6, 7, 8, 9 and 10.

Each of the drive mechanisms illustrated in FIGS. 5–10 have several generic features. First, drive mechanisms 150, 250, 350, 450, 550 and 650 include respectively driver means 152, 252, 352, 452, 552 and 652 molded integrally with, carried by, and movable with switch handle portions 46*b* in switches 146, 246, 346, 446, 546 and 646; and driven means 154, 254, 354, 454, 554 and 654 carried by mercury buttons 140, 240, 340, 440, 540 and 640 and driven by its driver means through a driving contact zone vertically spaced from a horizontal plane through axis A.

Second, one of these driver or driven means includes finger portion 156, 256, 356, 556 or 656 rotatable about axis B or finger portion 456 rotatable about axis A; and the other of these driver or driven means includes recess portion 158, 258, 358, 558 or 658 rotatable about axis of rotation A or recess portion 458 rotatable about axis B.

Third, each of these driven means may be carried by the mercury button in any suitable manner, such as being formed in the surface of the mercury button, as shown by recess portion 158 in FIG. 5; being in FIGS. 6, 7, 8 and 10 a metal or other similar electrically conductive element 260, 360, 460 or 660 located in the circuit through contact strips 36 and 37 and the button and formed as a separate piece detachably secured by a key-type drive connection to the associated mercury button (here shown as driving projections 260*a*, 360*a*, 460*a* and 660*a* located in recess portions 244, 344, 444 and 644) and having central stamped depression 260*b*, 360*b*, 460*b* or 660*b* resiliently clamped on axis A between button depression 43 and socket 36*a*; or being either a conductive or a non-conductive (such as plastic) element 560 in FIG. 9 bonded (secured by welding, adhesive, cement, etc.) to the surface of one of the mercury button shells 41 radially outwardly from depression 43. It should be readily apparent that any one of these three securement forms can be used for any one of the forms illustrated in FIGS. 5–10 instead of the specific one illustrated in any one of these drawing figures.

Also, it should be apparent that any of the different forms in FIGS. 5–10 can be readily designed to use any suitable mercury button with either the standard depth recess portion 244, 344, 444 or 644 shown in FIGS. 6, 7, 8, and 10; deeper recess portion 158 in FIG. 5; or no recess portion shown in FIG. 9. FIGS. 5 and 9 show special mercury buttons, while FIGS. 6, 7, 8 and 10 show the standard mercury button now produced in large volume by mass production.

Now, the specific variations in structure in FIGS. 5–10 will be described in more detail.

In FIG. 5, drive mechanism 150 includes finger portion 156 on switch actuating handle 146 including on its distal end cylindrical follower 156*a* located in indentation or recess portion 158 stamped on mercury button 140, and includes driven means 154 as recess portion 158 located on the periphery of button 140 and directly engaged by follower 156*a*. It should be apparent that when portion 46*b* of switch actuating handle 146 swings about axis B on coaxial pivots 46*a* in FIG. 5 through approximately a 60 degree arc (divided by axis A) between the positions shown in FIG. 4, mercury button 140 in FIG. 5 will rotate about axis A between the circuit opening and circuit closing positions.

In FIG. 6, drive mechanism 250 comprises driver means 252 including finger portion 256 as a single finger with rounded distal end 256*a* engaging socket, indentation or recess portion 258 formed as a single, stamped indentation in element 260 in driven means 254 suitably secured to button 240 to rotate therewith.

In FIG. 6, element 260 is suitably secured to button 240. Element 260 is a separate piece shaped to fit between one of the metal shells of button 240 with depression 260*b* located in depression 43 thereof and between button 240 and pivot socket 36*a* of associated electrical contact strip 36 so as to be held in place by the spring pressure of contact strips 36 and 37 by being resiliently pressed against button 240 by contact strip 36, Element 260 has driving projection 260*a* stamped therein, and located in recess portion 258 not only for angularly locating in proper angular relationship element 260 of driven means 254, driver means 252 and button 240 but also for transmitting torque between element 260 and button 240 by a key-connection. Element 260 is formed of metal, such as brass or any other good conductor of electricity, so as to carry electrical current between contact strips 36 and 37 through button 240 in the circuit closing position. An inspection of the drawings will reveal that the description of the structure and mode of operation in this paragraph applies equally well to the same name parts and mode of operation in FIGS. 7, 8 and 10. However, it should be apparent that elements 260, 360, 460 and 660 may be thin metal stampings taking the form on their peripheries of either: (1) cup-shaped element 260 in FIG. 6 or element 360 in FIG. 7 telescoped over the circular surface on the associated mercury button or (2) a substantially flat element, as shown by element 460 in FIG. 8 and element 660 in FIG. 10.

In FIGS. 7 and 8, driver means 352 and driven means 454 include respectively finger portion 356 and 456 comprising only a single finger; and driven means of 354 and driver means 452 include only two generally parallel fingers forming yoke or recess portions 358 and 458 straddling this single finger. The fingers forming portions 356 and 458 are tapered so as to fit snugly with the pins forming portions 358 and 456 both at the center and ends of the switch actuating motion. The pin or pins spring slightly against the finger or fingers to avoid lost motion. It should be apparent that drive mechanism 450 in FIG. 8 is the inversion of the drive mechanism 350 in FIG. 7.

In FIGS. 9 and 10, finger and recess portions 556, 558, 656 and 658 are gear teeth. In FIG. 9, element 560 is segment-shaped and bonded to its associated mercury button 540. In FIG. 10, element 660 has driving projection 660*a* thereon detachably located in recess portion 644 on the periphery of button 640 by a key-type connection.

The driver means and driven means in the drive mechanisms in FIGS. 5, 6, 9 and 10 is easily resiliently biased into either of the end positions for switch portion 46*b* (either the circuit closing position or the circuit open position) by an over-center action best understood by considering FIGS. 5 and 5*a*. Here, portion 156 is resilient and is easily radially deflectable away from axis A for distance 165 in FIG. 5*a* by other portion 158 by movement between these positions through the center position illustrated in FIGS. 5 and 5*a* with this deflection being along axis B, the axis of rotation of portion 156, and away from the axis of rotation A, the axis of rotation of other portion 158. Axes A and B generally form a plane with distal end 156*a* of portion 156 being located on opposite sides of this plane in the two respective positions. Then, an over-center action is caused by the circular motion of portion 158 about its axis A causing this outward deflec-

tion for distance **165** along axis B as portion **156***a* travels through the plane formed by intersecting axes A and B so as to resiliently lock portion **156** by the resiliency of portion **156** in either of the end positions wherein it is located, whether in circuit open or closed position. An inspection of the drawings will reveal that the description of the structure and mode of operation in this paragraph also apply generically to the same name parts, axes and movement in FIGS. 6, 9 and 10 but with different reference numerals. The aforesaid one portion **156** takes the form of single finger portion **156** in driver means **152** in FIG. 5, of single recess portion **258** in driven means **254** in FIG. 6, and of gear segments **556** and **656** in FIGS. 9 and 10. The other portion aforedescribed is, of course, portions **158, 256, 558** and **658**. FIGS. 5, 9 and 10 operate in basically the same manner as show in FIG. 5*a*. This biasing effect can be obtained in FIGS. 9 and 10 by making gear teeth **558** and **658** high in the center with resilient gear **556** and **656** coacting therewith. FIG. 6 operates in the manner shown in FIG. 6*a* with deflection distance **265** therein being along axis A away from axis B.

This invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive with the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by U.S. Letters Patent is:

1. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle part,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle part and said button so that arcuate movement of said handle part in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said drive mechanism including
  (1) a driver means carried by said switch handle, and
  (2) a driven means carried by said button and pivotally moveable relative to said driver means during switch movement of said button by said handle,
(h) one of said means including a finger portion rotatable about the axis of rotation of said one means,
(i) the other of said means including a recess portion rotatable about the axis of rotation of said other means,
(j) one of said portions being resilient and being deflectable by the other of said portions during movement between said positions with this deflection being along the axis of rotation of said one portion and away from the axis of rotation of said other portion,
(k) said axes generally forming a plane with said one portion being located on opposite sides of said plane in the respective different positions so that an overcenter action is caused by this deflection occurring in said plane for resiliently biasing said one portion into either of said positions wherein it is located.

2. A switch, as set forth in claim **1**, with
(a) said driver means including a single finger portion as said one portion.

3. A switch, as set forth in claim **1**, with
(a) said driven means including a single recess portion as said one portion.

4. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle part,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle part and said button so that arcuate movement of said handle part in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said drive mechanism including
  (1) a driver means carried by said switch handle, and
  (2) a driven means carried by said button and pivotally movable relative to said driver means during switch movement of said button by said handle,
(h) one of said means including a finger portion rotatable about the axis of rotation of said one means,
(i) the other of said means including a recess portion rotatable about the axis of rotation of said other means,
(j) said driven means being said recess portion located in the peripheral surface of said button, and
(k) said driver means being said finger portion including on its distal end a cylindrical follower located in said recess portion.

5. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle part,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle part and said button so that arcuate movement of said handle part in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said drive mechanism including
  (1) a driver means carried by said switch handle, and
  (2) a driven means carried by said button and pivotally movable relative to said driver means during switch movement of said button by said handle,

(h) one of said means including a finger portion rotatable about the axis of rotation of said one means,
(i) the other of said means including a recess portion rotatable about the axis of rotation of said other means,
(j) said driven means including an element secured to said button to rotate therewith,
(k) said element having said recess portion therein as a single, stamped indentation,
(l) said driver means including said finger portion as a single finger with a rounded distal end.

6. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle part,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle part and said button so that arcuate movement of said handle part in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said drive mechanism including
  (1) a driver means carried by said switch handle, and
  (2) a driven means carried by said button and pivotally movable relative to said driver means during switch movement of said button by said handle,
(h) one of said means including a finger portion rotatable about the axis of rotation of said one means,
(i) the other of said means including a recess portion rotatable about the axis of rotation of said other means,
(j) one of said means including only a single finger, and
(k) the other of said means including only two generally parallel fingers straddling said single finger.

7. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle portion,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle portion and said button so that arcuate movement of said handle portion in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said drive mechanism having a driver means driving a driven means through a driving contact zone,
(h) said driving contact zone being located vertically spaced from a horizontal plane through said first axis.

8. A mercury button switch, comprising
(a) a switch housing,
(b) a mercury button mounted in said housing for rotation about a first axis extending generally horizontally during switch useage,
(c) said button being rotatable about said first axis between an electric circuit opening position and closing position,
(d) a switch actuating handle mounted in said housing for rotation about a second axis and having an actuating handle portion,
(e) said first and second axes having approximately a ninety degree angle therebetween, and
(f) drive mechanism operatively connecting said switch handle portion and said button so that arcuate movement of said handle portion in opposite directions will cause arcuate movement of said button in opposite directions between said positions for opening or closing an electric circuit through said button, whereby said handle is adapted to be moved in a horizontal plane between said positions,
(g) said switch housing having a front face through which said switch actuating handle extends,
(h) said mercury button first axis extending perpendicular to said front face.

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