Feb. 7, 1967 W. A. STREUER 3,303,311

PUSH BUTTON ROTARY SWITCH

Filed Nov. 17, 1964 2 Sheets-Sheet 1

Fig. 1.

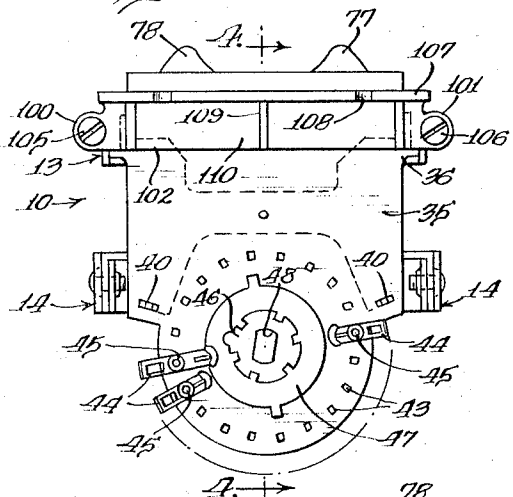


Fig. 2.

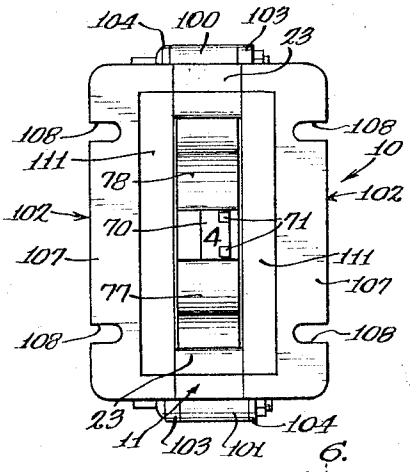


Fig. 3.

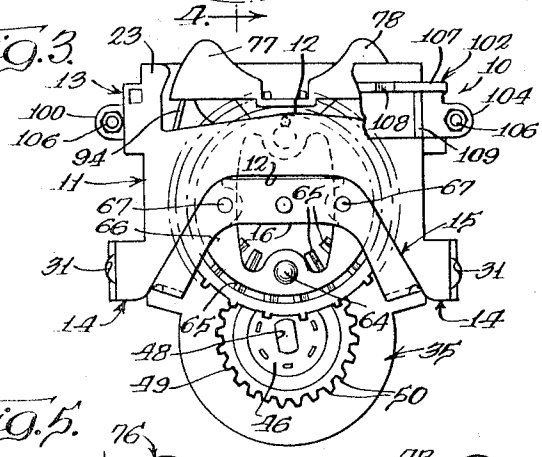


Fig. 4.

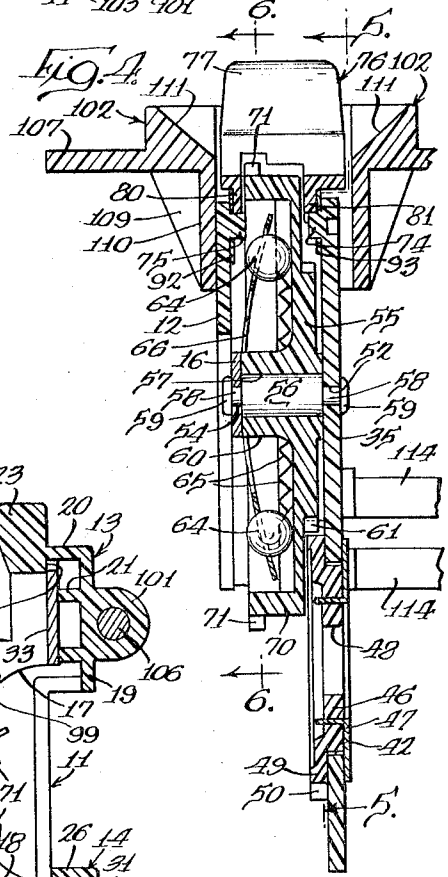
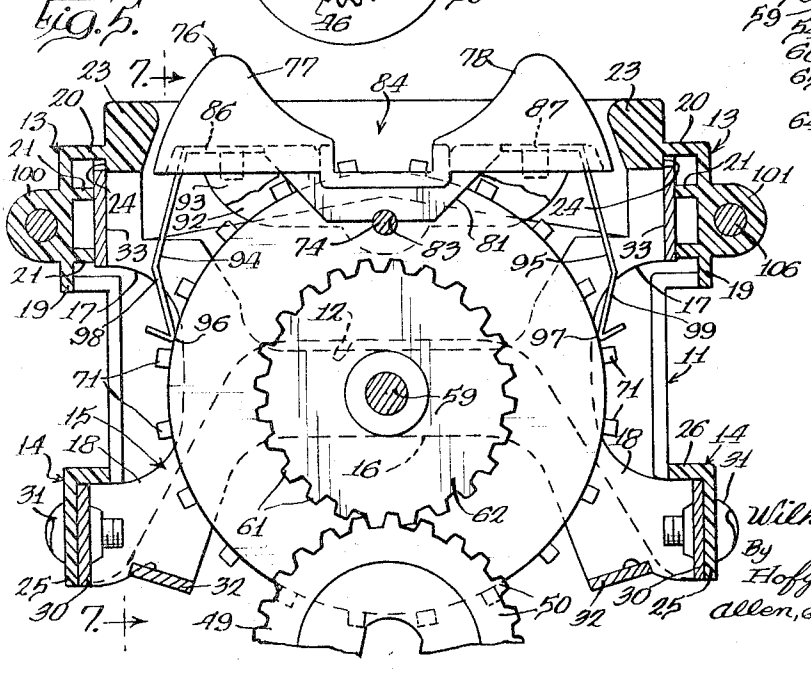


Fig. 5.



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PUSH BUTTON ROTARY SWITCH

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Fig. 6.

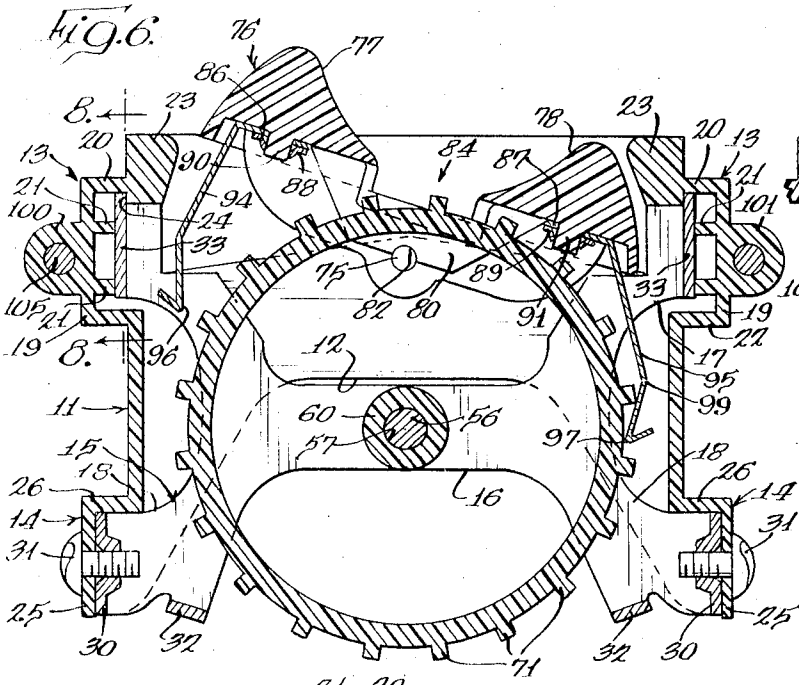


Fig. 7.

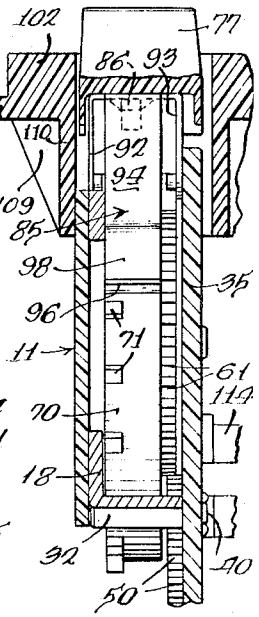


Fig. 8.

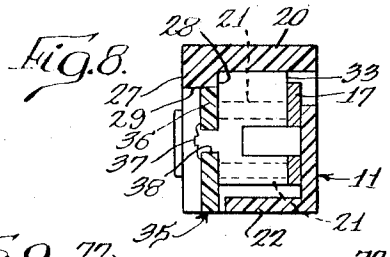


Fig. 9.

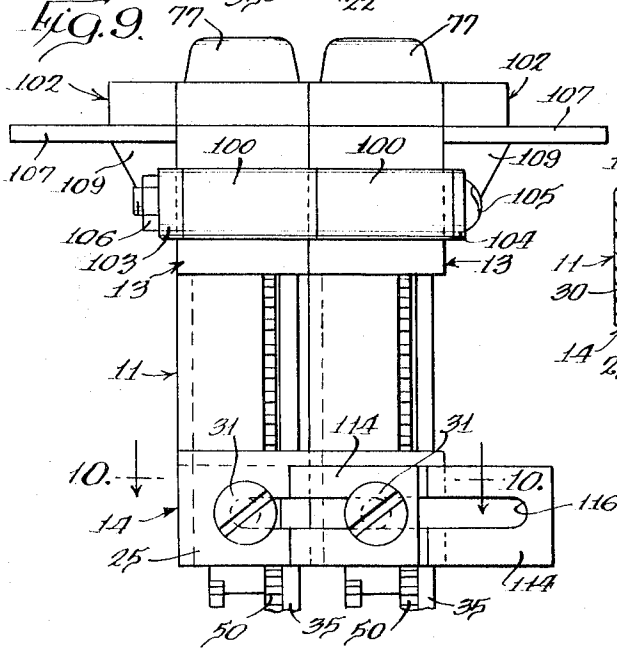
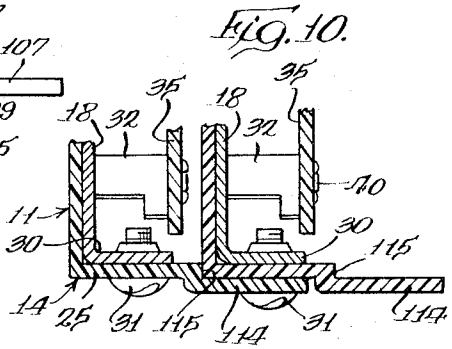


Fig. 10.



United States Patent Office 3,303,311 Patented Feb. 7, 1967

3,303,311

PUSH BUTTON ROTARY SWITCH

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Filed Nov. 17, 1964, Ser. No. 411,823
17 Claims. (Cl. 200—156)

This invention relates to a push button rotary electric switch, and more particularly to a push button rotary electric readout switch wherein a plurality of stator and rotor contacts cooperate to define a plurality of selectable switching stations, and wherein the switch includes visual indicia for indicating the switching station which has been selected.

In the electrical switch art it is well known to provide an electrical switch which converts the reciprocating motions of a manually operable push button into rotary motion of a switch rotor for effecting the desired switching action. In the use of such known devices, the push button is depressed a plurality of times until the desired switching station is reached. One serious disadvantage encountered in the use of known devices is that the switch rotors have been rotatable in one direction only, and thus, if the desired switching station has been passed by, it has heretofore been necessary to rotate the switch rotor another complete revolution by repeatedly depressing the push button. This has been both bothersome and time consuming, and it is the general purpose of the present invention to solve this problem by providing a switch wherein the rotor can be rotated in both directions.

An object of the invention is to provide a rotary readout electric switch having indicia for visually indicating the selected switch station with means whereby the switch rotor can be rotated in opposite directions so that the desired switching station can be selected quickly and without difficulty.

Another object of the invention is to provide a switch as described in the preceding paragraph with novel means for rotating the switch rotor.

A further object of the invention is to provide a rotary electric readout switch as described above with novel detent means for relasably holding the switch rotor in the selected switch station.

A still further object of the invention is to provide a rotary electric readout switch as described above with novel means for rotating the rotor actuating means to a neutral position after the actuating means has been operated.

Still another object of the invention is to provide a rotary electric readout switch as described above with novel frame means for supporting the switch components.

A still further object of the invention is to provide a rotary electric readout switch as described above with means whereby a plurality of switch sections may be stacked together into a compact unitary switching device.

These and other objects of the invention will hereinafter become mor fully apparent from the following descriptions taken in connection with the annexed drawings wherein:

FIG. 1 is a front elevational view of a preferred embodiment of the rotary electric readout switch;

FIG. 2 is a plan view of the switch illustrated in FIG. 1;

FIG. 3 is a rear elevational view of the switch illustrated in FIG. 1, with certain parts broken away for clarity;

FIG. 4 is an enlarged sectional view taken generally along the line 4—4 of FIG. 1;

FIG. 5 is a sectional view taken generally along line 5—5 of FIG. 4;

FIG. 6 is a sectional view taken generally along line 6—6 of FIG. 4, and showing the rocker arm pivoted in a first direction;

FIG. 7 is a sectional view taken generally along line 7—7 of FIG. 5;

FIG. 8 is a sectional view taken generally along line 8—8 of FIG. 6;

FIG. 9 is an enlarged side elevational view of two switch sections stacked together; and

FIG. 10 is a sectional view taken generally along line 10—10 of FIG. 9.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail one specific embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, the illustrated embodiment of the rotary electric readout switch **10** is provided with a frame which includes a first generally planar frame member or bezel **11**. The bezel **11** includes a central web portion **12**, and enlarged portions **13** and **14** are provided at each side of the central portion **12** at the upper end and the lower end thereof, respectively. A second generally planar frame member **15** is fitted within bezel **11**, and includes a central web portion **16** having enlarged portions **17** and **18** at each side thereof at the upper and lower end respectively.

The enlarged bezel portions **13** are defined by a side wall **19**, and top and bottom walls **20** and **22**, each of which extends generally perpendicularly to the plane of the bezel. Spaced ribs **21** extend inwardly from the side walls **19**, and are generally parallel to the top and bottom walls **20** and **22**. As can be best seen in FIG. 8, the forward end of the upper wall **20** of enlarged bezel portions **13** is provided with a downwardly extending portion **27** which provides a rearwardlly facing surface **28**, and a downwardly facing surface **29**. Bezel **11** further includes spaced beads **23** which extend upwardly from each of the top walls **20** of the enlarged portions **13**. Each bead **23** includes an outwardly facing surface **24** at the lower portion thereof which is spaced from the outer end of the ribs **21**.

The enlarged portions **14** at the lower end of the bezel **11** are defined by a side wall **25** and a top wall **26**, each of which are disposed generally perpendicularly to the plane of the bezel.

The lower enlarged portions **18** of the second frame member **15** include legs **30** which are disposed generally perpendicularly to the plane of the second frame member. Legs **30** are nested within the enlarged portions **14** of the bezel **11**, and suitable fasteners, such as screws **31**, secure the first and second frame elements together. The enlarged portions **18** each include a further leg **32** which extends generally perpendicularly to the plane of the frame member **15**, and the purpose of legs **32** will hereinafter be more fully described.

The enlarged portions **17** of frame member **15** each include a leg **33** which extends generally perpendicularly to the plane of the frame member **15**, and legs **33** are nested within the enlarged bezel portions **13**. As can be best seen in FIG. 6, the inner surface of each leg **33** abuts against the outwardly facing surface **24** on one of the bezel beads **23**, while the outer surface of each leg **33** engages the inwardly facing surfaces on one pair of ribs **21**. The forwardly facing surface on legs **33**, FIG. 8, engages the rearwardly facing surface **28** on the downwardly ex-

tending portion 27 of the upper wall 20 of the enlarged bezel portion 13. Thus, it will be readily apparent that the second frame member is positively positioned within the bezel 11, and firmly held therein by the screws 31.

The switch 10 includes a third frame member 35, FIG. 1, that is provided with enlarged portions 36, at opposite sides of the upper end thereof, each of which are seated within an enlarged portion 13 of the bezel 11. As can be best seen in FIG. 8, the enlarged portions 36 are seated against the undersurface 29 on the downwardly extending portion 27 of the top wall 20 of the enlarged bezel portion 13. The rearwardly facing surface of frame member 35 is seated against the forwardly facing surfaces on the legs 33 on frame member 15. The legs 33 also each include a finger 37 which extends through a suitable slot 38 in the frame member 35. Fingers 37 are staked over into engagement with the forward face of the frame member 35 to positively retain the frame member 35 to the frame member 15 and to the bezel 11. Frame member 35 also includes suitable slots 40 at the mid portion thereof, which receive legs 32 therethrough. The forwardly extending portions of the legs 32, FIG. 10, are staked over, as at 40, to positively retain the frame member 35 to the frame member 15.

The switch frame member 35 provides the stator of the rotary electric switch 10, and to this end a transverse opening 42 is provided in the frame member 35 at the lower portion thereof. A plurality of openings 43 (FIG. 1) are arranged in concentric relationship around opening 42, and stator contacts are fixed on the frame member 35 by suitable fasteners, such as eyelets 45, passing through the openings 43. A rotor 46 is rotatably mounted in opening 42, and includes a rotor contact 47 having a plurality of contacting portions which cooperate with the stator contacts 44 to define a plurality of switching stations. Rotor 46 is provided with a central non-circular opening 48, which may be of the well known "double D" configuration, for a purpose to hereafter appear. Rotor 46 includes an enlarged flange 49 which extends radially outwardly therefrom, and which is positioned against the rear face of the frame member 35 adjacent the opening 42. A plurality of gear teeth 50 are provided around the periphery of flange 49 for a purpose to hereafter appear.

An opening 52 is provided in frame member 35, and is concentric with an opening 54 in the central portion 16 of the frame member 15 to define a pivotal axis for a drive wheel 55. A pivot pin 56 is received in a central bore 57 in the hub 60 of the drive wheel 55. Pin 56 includes outer portions of reduced diameter 58, which are received in the openings 52 and 54, and which terminate in enlarged portions 59 that embrace the outer surfaces of frame member 35 and the central portion 16 of the frame member 15. The forward face of the drive wheel 55 is provided with a portion of reduced diameter, and a gear is formed integrally therewith and includes a plurality of gear teeth 61 which mesh with the gear teeth 50 on rotor 46. The means for rotating drive wheel 55 to thereby rotate the rotor 46 between the switching stations will hereinafter be described.

Means are provided for positively retaining the rotor in each of the switching stations, and includes a plurality of circumferentially spaced ribs 65 extending generally radially outwardly from the hub 60 on the rear face of the drive wheel 55. Ribs 65 define therebetween a plurality of detents, each detent corresponding to one of the switching stations, and a pair of diametrically opposed balls 64 are resiliently pressed into the detents by a bowed spring member 66. As can best be seen in FIG. 4, the central portion of the spring 66 is retained between the rearward end of the drive wheel hub 60 and the central portion 16 of the second frame member 15; and suitably diametrically opposed fastener 67 secures the central portion of the spring 66 to the central portion 16 of the frame member 15. Thus, as drive wheel 55 is rotated, the bias of the spring member 66 is overcome and the balls 64 ride over the adjacent rib 65 and snap into the adjacent detent under the urging of spring 66.

Drive wheel 55 includes a rearwardly extending flange 70 at the periphery thereof which is concentric with the axis of the drive wheel, and a plurality of abuttable radial projections 71 extend outwardly from the rearward end of the flange 70. The spacing of projections 71, like the spacing of ribs 65, corresponds to the plurality of switching stations of the switch 10. The portion of the flange 70 between the projections 71 may be provided with indicia, such as numbers or the like, which are visible from the top of the switch (FIG. 2) through a window to be hereafter described to give a visual indication of the switching station which has been selected.

A cylindrical stud 74 is provided on the rearward surface of the frame member 35 adjacent the upper end thereof, and a similar stud 75 is provided on the forward surface of the central portion 12 of bezel 11 in concentric relationship with stud 74 to define a pivot axis. Push button means are pivotally mounted on studs 74 and 75 for rotating drive wheel 55, and includes a rocker arm 76 having manually engageable portions 77 and 78 at opposite ends thereof, and on opposite sides of the pivot axis defined by studs 74 and 75. Rocker arm 76 includes spaced sides 80 and 81 extending between portions 77 and 78, and leaving an open portion 84 at the center of the rocker arm. Sides 80 and 81 are provided with arcuate recesses 82 and 83, respectively, in the undersurfaces thereof, which pivotally support the rocker arm 76 on the studs 74 and 75.

A drive spring 85 (FIG. 7) is fixed to the undersurface of rocker arm 76 for rotating the drive wheel 55. Spring 85 includes an open central portion, and spaced coplanar portions 86 and 87 which are secured to the undersurface of rocker arm portions 77 and 78, respectively. To this end, studs 90 and 91 are provided on the undersurface of rocker arm portions 77 and 78, respectively, and the spring portions 86 and 87 are provided with suitable apertures which fit over studs 90 and 91, respectively. Suitable retaining rings 88 and 89 are fitted over studs 90 and 91 and bear against the respective spring portions 86 and 87 to retain the same against the rocker arm. Spring 85 includes spaced sides 92 and 93 which are suitably apertured and mounted on studs 74 and 75 as can be best seen in FIG. 4. Spring 85 further includes portions 94 and 95 which extend downwardly from the outer end of spring portions 86 and 87, respectively. Spring portions 94 and 95 terminate in respective abutments 96 and 97 which are positioned for engagement with the projections 71 on the drive wheel 55. Spring portions 94 and 95 are bowed slightly as at 98 and 99, respectively, to clear the drive wheel when the rocker arm 76 is pivoted.

Thus, when the rocker arm 76 is pivoted, as by manually pressing the push button portion 78 to a position such as that shown in FIG. 6, the abutment 97 on the spring member 95 moves downwardly into engagement with the adjacent projection 71 on the drive wheel 55 to rotate the rotor 46 between switching stations. As drive wheel 55 rotates, the spring 66 flexes and allows the ribs 65 to pass under the balls 64 as the wheel 55 moves from one detent to an adjacent detent. When the rocker arm 76 is pivoted in a clockwise direction to a position such as that shown in FIG. 6, it will be noted that the abutment 78 moves upwardly and away from the periphery of the drive wheel 55, so that the drive wheel 55 is free to rotate under the action of the abutment 97. When the spring 85 is in the position shown in FIG. 6, the spring portion 95 is displaced outwardly from the pivot axis defined by studs 74 and 75, to create a spring force which has a component tangentially upward from the periphery of wheel 55. As will be readily understood, this force biases the rocker arm 76 in a counterclockwise direction from the actuated position of FIG. 6 toward a neutral

position, such as that shown in FIG. 5. Thus, when the force on rocker arm portion 78 is released, the rocker arm 76 will be automatically returned to a central or neutral position.

If it is desired to successively actuate the rocker arm 76, it is necessary merely to again pivot the rocker arm 76 in a clockwise direction by manually pressing the push button portion 78 to reposition the rocker arm and the spring 85 into the position shown in FIG. 6. This process may be repeated until the desired switching station is reached. It will be readily apparent that because of the symmetry of the switch components, the rocker arm 76 may be pivoted in a counterclockwise direction about its pivot axis by manually depressing push button portion 77, and in this event the abutment 98 would move into engagement with the adjacent projection 71 on the drive wheel 55 to rotate the rotor 46, while the abutment 97 would move to a clearance position spaced from the drive wheel. Thus, it should be clear that the illustrated switch embodiment can be operated in either direction to rotate the rotor to a desired switching station. Because of the open central portions of the rocker arm 76 and the spring 85, the indicia on flange 70 are readily visible, as can be best seen in FIG. 2, and the selected switching station can be readily determined.

Means are provided for securing the switch 10 to a mounting plate (not shown), and include a pair of generally semi-cylindrical sleeves 100 and 101 formed integrally with the bezel extensions 13. As can be best seen in FIG. 2, sleeve 100 is offset rearwardly from sleeve 101, and the purpose of this arrangement will hereafter appear. A pair of generally identical support plates 102 are fixed to the front and rear portions of the switch 10, and each support plate 102 includes a relatively thick sleeve 103 at one end thereof, and a relatively thin sleeve 104 at the opposite end thereof which are positioned in alignment with sleeves 100 and 101. As can be best seen in FIG. 2, the support plates 102 are reversed so that the sleeve 103 of one support plate is at the same end of the switch as the sleeve 104 of the other support plate to thereby produce a symmetrical switch construction. Screws 105 impale the aligned sleeves, and nuts 106 are threaded over the ends of the screws 105 to securely fasten the support plates to the switch. Each support plate 102 includes an outwardly extending flange 107 having mounting slots 108. A plurality of inclined uprights 109 extend between the sides 110 and the flanges 107 of the support plates 102 to strengthen the same. As can be best seen in FIG. 4, the support plates 102 include inclined surfaces 111 adjacent the rocker arm 76 to facilitate readout from all directions.

Means is provided for stacking a plurality of switches 10 into a multisection rotary switch, and the means provided by the illustrated embodiment of the invention prevents the switch sections from being incorrectly assembled, as will hereinafter appear. The above mentioned means are illustrated in FIGS. 9 and 10 wherein two switch sections are shown assembled together. The above mentioned stacking means includes the semi-cylindrical sleeves 100 and 101, and it will be readily understood that since the sleeves 100 and 101 are offset, a sleeve 100 on one switch section will neatly interfit with a sleeve 100 on an adjacent switch section, and the sleeves 101 on adjacent switch sections will also interfit together in a like manner. When the switch sections are reversed, the interference created by the offset sleeves will make it impossible to incorrectly assemble adjacent sections. The stacking means further includes an offset portion 114 of leg 14 which provides a shoulder 115 against which the enlarged bezel portion 14 of an adjacent switch section is seated. Leg portion 114 is provided with a suitable slot 116, through which a screw 31 extends to secure the stacked switch sections together. Because of the offset portions 114, it will be impossible to reverse adjacent switch sections. When a plurality of switch sections are stacked together, it is desirable to provide a common shaft through each of the rotor openings 47, so that the switch sections can be simultaneously actuated.

I claim:

1. In a push button rotary switch, a first frame member, second and third frame members nested within said first frame member, means on said third frame member defining a switch stator, a rotor rotatably mounted in said stator, means on said first and third frame members defining a first axis, a rocker arm pivotally mounted on said first axis, a drive spring carried by said rocker arm and having first and second spring portions disposed on opposite sides of said first axis, an abutment on each of said spring portions, means on said first and second frame members defining a second axis, a drive wheel rotatably mounted on said second axis, a plurality of radial extensions around the periphery of said wheel adapted to be engaged by said abutments to rotate said rotor in opposite directions upon pivotal movement of said rocker arm in opposite directions.

2. In a push button rotary switch, a first frame member, second and third frame members nested within said first frame member, means on said third frame member defining a switch stator, a rotor rotatably mounted in said stator, means on said first and third frame members defining a first axis, a rocker arm pivotally mounted on said first axis and having manually engageable portions disposed on opposite sides of said axis, an abutment carried by each of said manually engageable portions, means on said first and second frame members defining a second axis, and drive means rotatably mounted on said second axis, said drive means having abuttable portions adapted to be engaged by said abutments for rotating said rotor in opposite directions upon pivotal movement of said rocker arm in opposite directions.

3. A push button rotary switch comprising, a first frame member, second and third frame members nested within said first frame member, means positively securing said first and second frame members to one another, means positively securing said second and third frame members to one another, means on said third frame member defining a switch stator, a rotor rotatably mounted in said stator, means on said first and third frame members defining a first axis, push button means pivotally mounted on said first axis, means on said first and second frame members defining a second axis, and drive means rotatably mounted on said axis for rotating said rotor in opposite direction upon pivotal movement of said push button means in opposite directions.

4. A push button rotary switch section as defined in claim 3 wherein the means for positively securing the second and third frame members to one another includes a plurality of openings in said third frame member, and a plurality of portions on said second member each extending through one of said openings and having an outer end deformed into engagement with a portion of the third frame member surrounding the respective opening.

5. In a push button rotary switch, a switch section comprising: a first frame member, second and third frame members nested within said first frame member, means on said third frame member defining a switch stator, a rotor rotatably mounted in said stator, means on said first and third frame members defining a first axis, push button means pivotally mounted on said first axis, means on said first and second frame members defining a second axis, and drive means rotatably mounted on said second axis for rotating said rotor in opposite directions upon pivotal movement of said push button means in opposite directions.

6. A push button switch section as defined in claim 5 wherein said first frame member includes means for securing an adjacent switch section thereto.

7. In a push button rotary switch, a generally planar frame member having a stator formed integrally therewith; a transverse opening in said frame member; a rotor

rotatably mounted in said transverse opening and having a portion extending outwardly from the plane of said frame member, said portion being larger in diameter than said opening and positioned in facial engagement with the portion of said frame member surrounding said opening; means on said frame member defining a first pivot axis transverse to the plane of said frame member and spaced from said rotor; a drive member rotatable on said first axis and having drive means for engaging said rotor portion; means on said frame member defining a second pivot axis spaced from and parallel to said first axis; and push button means pivotally mounted on said second axis for rotating said drive member in opposite directions to thereby rotate said rotor in opposite directions.

8. In a rotary electric switch, a frame, a stator on said frame, a drive wheel rotatably mounted on said frame and having a plurality of abuttable portions, a rotor rotatable relative to said stator, means coupling said drive wheel to said rotor for rotation of the latter, push button means pivotally mounted on said frame for movement in opposite directions from a neutral position to actuated positions, a drive spring carried by said push button means and having abutment portions engageable with said drive wheel abutments upon movement of said push button means to an actuated position to rotate said drive wheel and said rotor, whereby the drive spring abutment portion engaging said drive wheel is displaced by engagement with the drive wheel to create a force tangential to the periphery of said drive wheel having a magnitude sufficient to return said push button means to the neutral position.

9. In a push button rotary switch, a first frame member, second and third frame members nested within said first frame member, means on said third frame member defining a switch stator, a rotor rotatably mounted in said stator, means on said first and third frame members defining a first axis, a rocker arm pivotally mounted on said first axis and movable in opposite directions from a neutral to actuated positions, a drive spring carried by said rocker arm and having first and second spring portions disposed on opposite sides of said first axis, an abutment on each of said spring portions, means on said first and second frame members defining a second axis, a drive wheel mounted on said second axis for rotation in opposite directions, a plurality of radial extensions around the periphery of said wheel adapted to be engaged by said abutments to rotate said rotor in one direction upon pivotal movement of said rocker arm in one direction, and in an opposite direction upon pivtal movement of said rocker arm in an opposite direction, movement of said rocker arm into either of said actuated positions displacing one of said spring portions to urge said rocker arm toward the neutral position.

10. A rotary switch comprising: a frame; a stator fixed relative to said frame; a rotor rotatable relative to said stator and having gear teeth thereon; cooperating contacts on said rotor and said stator defining a plurality of switching stations; a gear rotatably mounted on said frame and meshing with said rotor gear teeth, said gear having a single row of abuttable portions positioned generally in a common plane; a manually operable rocker arm; means pivotally mounting said rocker arm on said frame; a first rocker arm abutment movable in the plane of said abuttable portions and positioned for engagement with one of said abuttable portions to rotate said gear in a first direction upon pivotal movement of said rocker arm in one direction; a second rocker arm abutment movable in the plane of said abuttable portions and positioned for engagement with one of said abuttable portions to rotate said gear in a second direction upon pivotal movement of said rocker arm in another direction; and releasable detent means engageable with said gear for holding said rotor in a switching station.

11. A rotary switch comprising: a frame; a stator fixed relative to said frame; a rotor rotatable relative to said stator and having gear teeth thereon; cooperating contacts on said rotor and said stator defining a plurality of switching stations; releasable detent means for holding said rotor in a switching station; a gear rotatably mounted on said frame and meshing with said rotor gear teeth, said gear having a single row of abuttable portions positioned generally in a common plane; indicia on said gear for each switching station; window means in said frame for observing said indicia; and a rocker arm pivotally mounted on said frame and having a pair of abutments, each movable in the plane of said abuttable portion and positioned for engagement with one of said abuttable portions upon pivotal movement of said rocker arm in one direction to overcome said detent means and rotate said gear.

12. A rotary switch comprising: a frame; means defining a stator adjacent one end of said frame; a rotor rotatable relative to said stator and having gear teeth thereon; cooperating contacts on said rotor and said stator defining a plurality of switching stations; releasable detent means for holding said rotor in a switching station; a gear rotatably mounted on said frame and meshing with said rotor gear teeth, said gear having a single row of abuttable portions positioned generally in a common plane; and a rocker arm mounted adjacent an end of said frame opposite from said stator for pivotal movement in opposite directions, said rocker arm having a pair of abutments each movable in the plane of said abuttable portions and positioned for engagement with one of said abuttable portions upon pivotal movement of said rocker arm in one direction to overcome said detent means and rotate said gear.

13. In a push button rotary switch including a manually operably push button having actuating means thereon, a drive member for rotating a switch rotor having a gear thereon, comprising: a disc having front and rear surfaces and an outer peripheral edge; a hub extending outwardly from said rear surface at the center of said disc, said hub being adapted to be pivotally mounted on a support; a plurality of circumferentially spaced ribs on said rear surface and extending radially outwardly from said hub, adjacent ribs defining an index station therebetween adapted to receive a detent member for locating said disc at an index station; a gear formed integrally with said disc and extending outwardly from the front surface thereof, said disc gear being adapted to drivingly engage said rotor gear; a flange extending rearwardly from the periphery of said disc; and a plurality of abuttable members on said flange and adapted to be engaged by said push button actuating means to thereby rotate said drive member and said rotor.

14. In a push button rotary switch including a manually operably push button having actuating means thereon, a drive member for rotating a switch rotor having a gear thereon, comprising: a generally circular disc having front and rear surfaces and an outer peripheral edge; a cylindrical hub extending outwardly from said rear surface at the center of said disc, said hub being adapted to be pivotally mounted on a support; a plurality of circumferentially spaced ribs on said rear surface and extending radially outwardly from said hub, adjacent ribs defining an index station therebetween adapted to receive a detent member for locating said disc at an index station; a portion of reduced diameter extending outwardly from the front surface of said disc; a plurality of gear teeth on said reduced diameter portion, said gear teeth being adapted to drivingly engage said rotor gear; a cylindrical flange extending rearwardly from the periphery of said disc; and a plurality of abuttable members extending radially outwardly from said flange and adapted to be engaged by said push button actuating means to thereby rotate said drive member and said rotor.

15. In a push button rotary switch, a generally planar frame member having a central web with pairs of spaced enlarged portions at opposite ends thereof, said gener-

ally planar frame member being adapted to receive a further frame member with mounting portions of said further frame member being positionable in said enlarged portions, each of said enlarged portions including a side wall and a top wall extending generally perpendicularly to the plane of said member, one pair of enlarged portions each including a rib extending inwardly from the side wall thereof and each rib having an outer surface, and means on said generally planar frame member defining a surface spaced from the outer surface of each rib for reception of a mounting portion of said further frame member therebetween.

16. In a push button rotary switch, a generally planar frame member having a central web with pairs of spaced enlarged portions at opposite ends thereof, said generally planar frame member being adapted to receive a further frame member with mounting portions of said further frame member being positionable in said enlarged portions, each of said enlarged portions including a side wall and a top wall extending generally perpendicularly to the plane of said member, one pair of enlarged portions each including a rib extending inwardly from the side wall thereof and each rib having an outer surface, means

on said frame member defining a surface spaced from the outer surface of each rib reception of a mounting portion of said further frame member therebetween, and a portion extending downwardly from the top surface of said last named pair of enlarged portions and defining a surface spaced from and generally parallel to the plane of said frame member also for reception of a mounting portion of said further frame member therebetween.

17. The invention defined in claim 16 wherein the side walls of the pair of enlarged portions at the opposite end of said generally planar frame member from said one pair of enlarged portions include an offset wall portion whereby a further generally planar frame member can be nested thereagainst.

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