Sept. 18, 1956 J. I. CUMBERLAND, JR 2,763,738

SELECTOR SWITCH

Filed Aug. 21, 1953

FIG. 1.

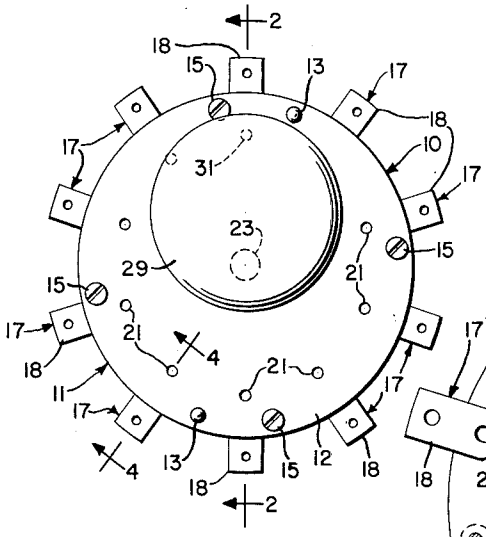


FIG. 3.

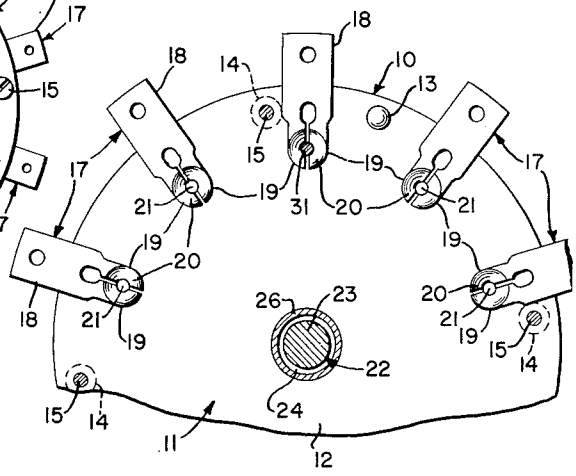


FIG. 2.

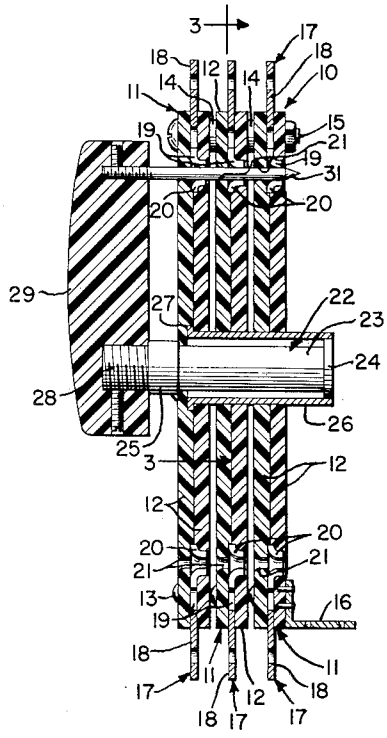
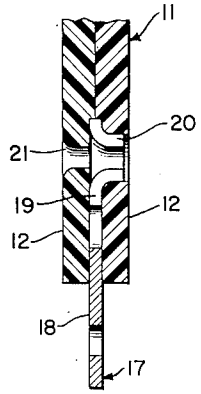


FIG. 4.



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SELECTOR SWITCH

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3 Claims. (Cl. 200—4)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to an electric switch and more particularly to a new and improved selector switch.

Moreover, the invention has particular application to a multiple-position electric switch such as used in the control of inter-connected circuits wherein such circuits may be selected for operation as the switch is actuated to a selected position. Furthermore, the invention contemplates the provision of a selector switch which is efficient and positive in operation, improved in its electrical and mechanical characteristics, economical to manufacture and which possesses all the qualities of ruggedness and durability in service.

An object of the invention is to provide a new and improved selector switch for inter-connecting various types of control circuits.

Another object of the invention is to provide a multiple-position selector switch having new and improved means for locking the switch in a selected position.

A still further object of the invention is the provision of a selector switch having new and improved means settable at will to different settings for selectively rendering various inter-connected electrical circuits effective.

Other objects and many of the attendant advantages of the invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

Fig. 1 is an elevational view of the selector switch constructed in accordance with the present invention;

Fig. 2 is an enlarged sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view taken on the line 3—3 of Fig. 2; and

Fig. 4 is an enlarged sectional view taken on the line 4—4 of Fig. 1.

Referring now to the drawing and more particularly to Fig. 1 thereof, the selector switch of the present invention is generally indicated by the reference character **10**. The switch comprises a plurality of switch banks or contact supports, such as the wafer type tube sockets **11** having a pair of discs **12** in substantial abutting engagement with respect to each other and secured together by rivets **13**. The discs **12** are composed of suitable insulating material such, for example, as "Bakelite." It will be understood that any conventional tube socket may be used as a switch bank **11**. The switch banks **11** are arranged in spaced relation with respect to each other and maintained in spaced relation by sleeves **14** disposed between the banks and carried by bolts **15** arranged about the outer edge of the switch banks as more clearly shown on Figs. 1 and 2. The switch is provided with a bracket **16** whereby the switch may be secured to a panel or apparatus as the case may be.

The switch banks are each provided with a plurality

of female contacts or plugs **17** secured between the discs **12** in any conventional manner, the plugs comprising a tab **18** terminating in a pair of resilient arms **19** having formed thereon a gripping element or socket **20** in alignment with openings **21** formed in one of the discs **17** of the switch banks **11** whereby a group of contacts may be inter-connected as the switch is actuated to a selected position.

As more clearly shown on Fig. 2, the switch is provided with an actuating plunger generally indicated by the reference character **22** and comprising shaft **23** having a bearing **24** formed on one end thereof and a collar **25** formed substantially at the other end thereof. The bearing **24** is disposed within and in engagement with a sleeve **26** molded in one of the discs **12** as at **27**, the collar being normally in engagement with the outermost disc **12**, Fig. 2, when the switch is in a selected position to inter-connect the aforesaid contact elements **17**. By the aforesaid arrangement, the plunger is rotatably and slidably supported within the sleeve **26** and sliding movement of the plunger in one direction is limited by the collar **25** while sliding movement of the plunger in the other direction is limited by the bearing **24**.

Secured to one end of the shaft **23** as at **28** is an actuating knob **29** for actuating the plunger slidably and rotatably within the sleeve **26**, the knob carries an elongated contact member **31** for frictional engagement with the socket **21** carried by the resilient arms **19** of the contacts **17**. Thus by this arrangement the desired contact may be selectively inter-connected as the plunger is rotated to a selected position and slidably inserted into the selected aligned group of contacts **17** thereby to interconnect the aligned contacts **17** and the electrical circuits connected thereto. Furthermore, by employing the resilient contact arrangement as heretofore set forth, positive contact between the sockets **21** and the contact member **31** is assured as the plunger **22** is rotated to a selected position and the contact member is forcibly and slidably moved into engagement with the selected group of sockets since the spring arms **21** thereof frictionally engage and grip the contact member. By providing the push-pull arrangement for inter-connecting the contacts selectively it will be understood that proper electrical contact between the contact member and the socket is assured for the reason that during insertion and/or withdrawal of the contact member in and out of the spring arm arrangement, the aforesaid elements are maintained free from all foreign matter due to such movement of the contact member and the frictional contact between the contact member and the resilient arm structure of the contacts.

Furthermore, while the aforesaid arrangement may be employed for inter-connecting a number of control circuits of various types, if desired, one of the switch banks may be connected in series to provide a common ground connection for a plurality of inter-connected circuits, or for establishing a power supply from a suitable source of electrical energy for such circuits as the case may be.

From the foregoing description, it is apparent that a new and improved selector switch has been devised for selectively inter-connecting a plurality of resilient contacts thereby to render suitable control circuits, electrical devices and apparatus effective wherein a predetermined sequence of operation of the switch components is necessary to select for operation the desired control circuits, devices and apparatus. Furthermore, the aforesaid switch provides new and improved contact elements which invariably provide efficient and positive electrical contact therebetween as the switch is operated selectively to a closed position.

Obviously many modifications and variations of the

present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A selector switch comprising a plurality of switch banks, each of said banks comprising a pair of insulating discs having a centrally disposed bore and a plurality of apertures formed therein and disposed arcuately about the bore, a plurality of bifurcated contact devices on each of said banks and having a plurality of extruded apertured contact elements formed therein respectively aligned with said apertures and disposed between the discs of each pair, each of said contact devices having means for establishing an external electrical connection thereto, means for clamping together the discs of each pair thereby to retain said contact devices secured therebetween, means for clamping said pairs of discs in stacked spaced relation with said contact devices electrically insulated from each other and with the contact elements thereof in respective alignment, a sleeve bearing disposed within said bore and carried by said discs, a plunger slidably and rotatably arranged within said bearing, a manually manipulative selection control knob composed of insulating material and carried by said plunger, and an elongated contact rod secured to the knob parallel to said plunger, said rod being constructed and arranged to slideably engage and interconnect all the aligned contact elements of a selected group of contact devices.

2. A selector switch comprising a plurality of aligned switch banks, each of said banks comprising a pair of flat insulating discs having a centrally disposed bore and a plurality of apertures formed therein and disposed arcuately about the bore, a plurality of bifurcated contact devices having a flat portion and a plurality of apertured contact elements formed therein, each of said contact elements comprising a pair of complementary semi-cylindrical contact surfaces respectively aligned with said apertures and disposed between the discs of each pair such that the contact devices lie completely within the planes of the outer flat surfaces of the respective pairs of discs, each of said contact devices having means on said flat portion for establishing an external electrical connection thereto, means for clamping together the discs of each pair thereby to retain said contact devices secured therebetween, means for clamping said pairs of discs in aligned spaced relation with said contact devices electrically insulated from each other and with the contact elements thereof in respective alignment, a sleeve bearing disposed within said bore and carried by said discs, a plunger slidably and rotatably arranged within said bearing, a selection control knob composed of insulating material and carried by said plunger, a pointed contact rod secured to the knob parallel to said plunger for engaging and interconnecting a selected aligned group of said pairs of contact surfaces, and means secured to one of said banks for mounting said switch.

3. A selector switch comprising a plurality of switch banks composed of pairs of discs of insulating material and having a plurality of arcuately disposed complementary recessed portions formed therein, a plurality of insulated bifurcated contact devices respectively disposed within said recessed portions and retained thereby when the discs of each pair are clamped together, means for clamping the discs of each pair in snugly abutting relation, a plurality of pairs of contact elements respectively formed on said contact devices, each of said contact elements comprising a pair of semi-cylindrical contact surfaces constructed and arranged to receive and grippingly engage a contact rod passing therethrough, means for establishing an individual external circuit connection to each of said contact devices, means for securing said banks with the contact elements thereof in aligned relation thereby to form sets of aligned contacts, said sets being equal in number to the number of contact devices of each bank, a switch actuating control member composed of insulating material pivotally and slidably carried by said banks about an axis parallel to the axes of said sets of contacts, and a contact rod carried by said control member for gripping engagement with said contact surfaces whereby the contact elements of a selected set of contact devices are interconnected as the control member is rotated to a contact selecting position and thereafter moved axially to a closed position.

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