April 12, 1960 W. A. BARDEN 2,932,698

ELECTRIC SWITCH UNIT WITH MAIN AND AUXILIARY SWITCHES

Filed Nov. 12, 1957 3 Sheets-Sheet 1

Fig. 1.

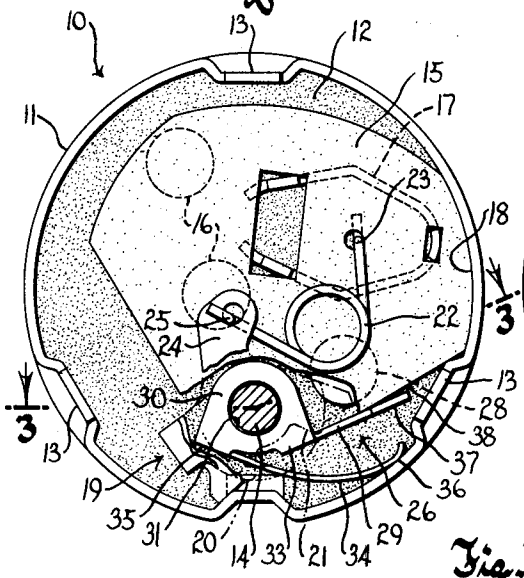


Fig. 2.

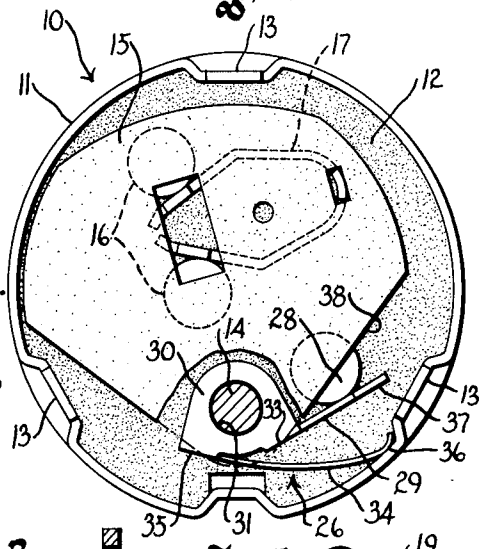


Fig. 3.

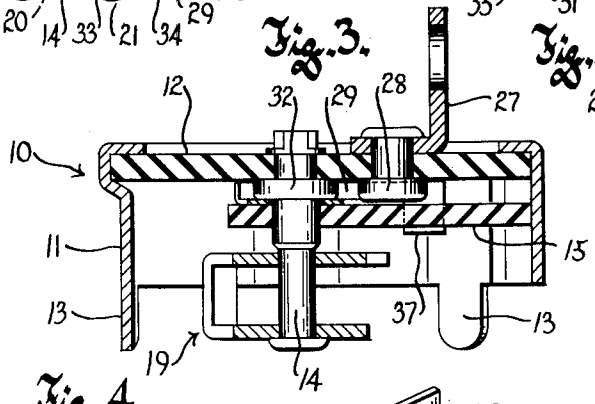


Fig. 5.

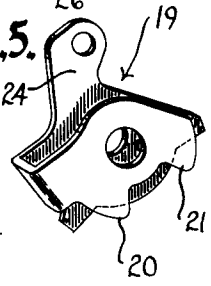
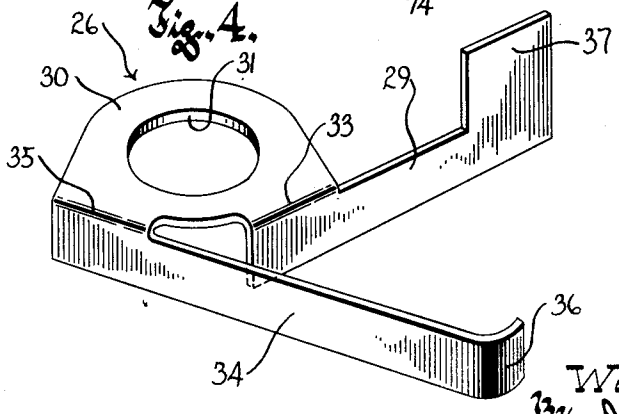


Fig. 4.



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Fig. 6.

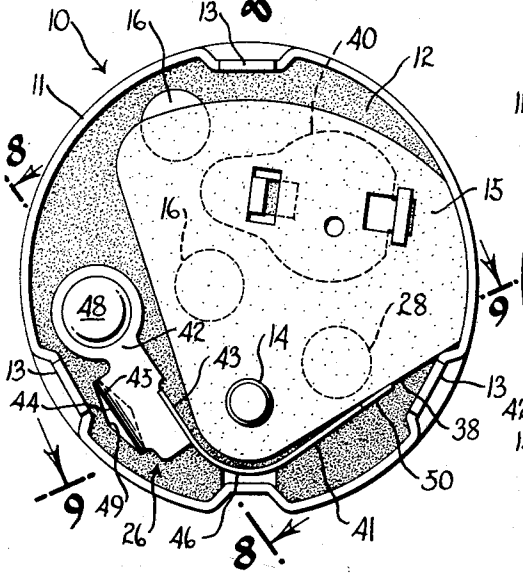


Fig. 7.

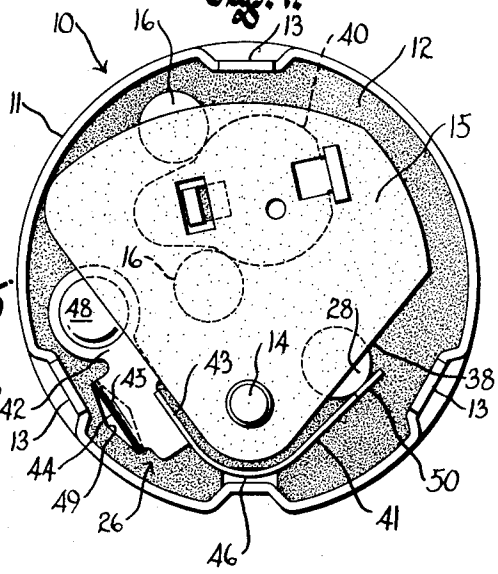


Fig. 8.

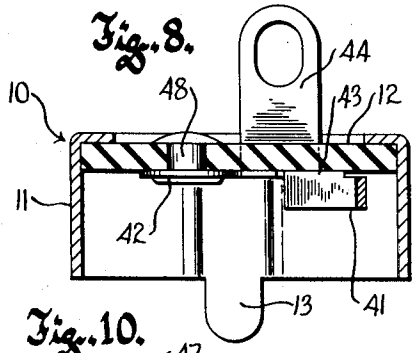


Fig. 9.

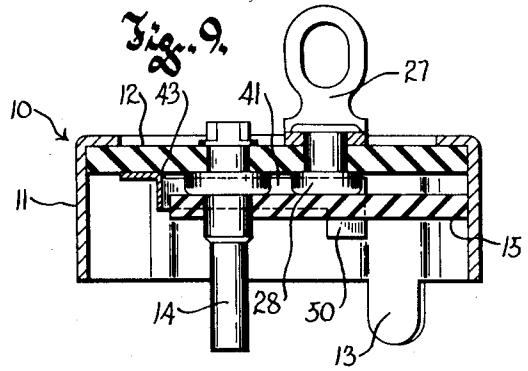
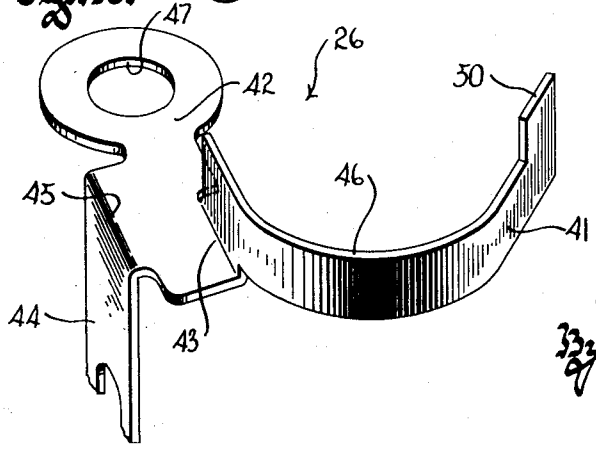


Fig. 10.



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ELECTRIC SWITCH UNIT WITH MAIN AND AUXILIARY SWITCHES

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Fig. 11.

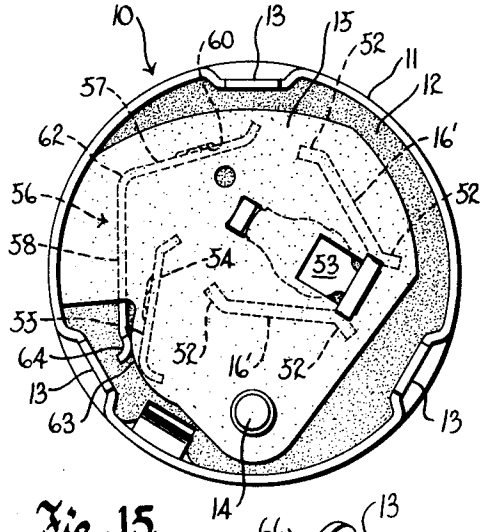


Fig. 12.

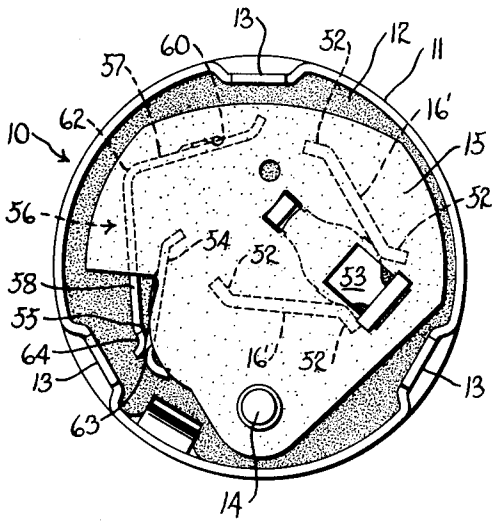


Fig. 15.

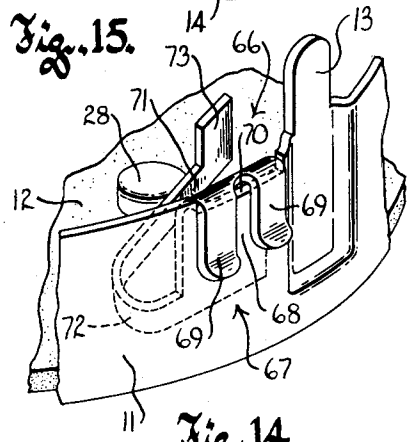


Fig. 13.

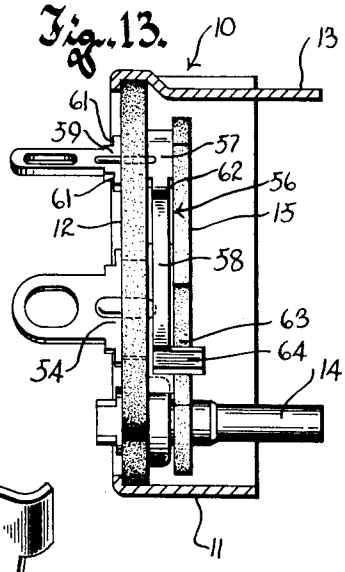
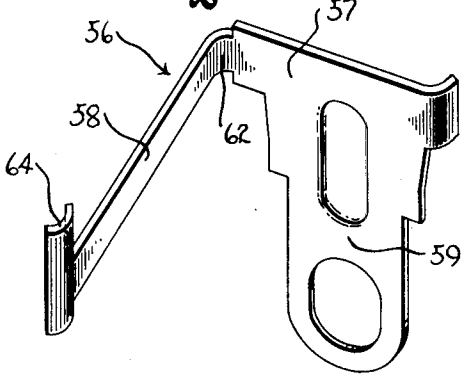


Fig. 14.



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United States Patent Office 2,932,698
Patented Apr. 12, 1960

2,932,698

ELECTRIC SWITCH UNIT WITH MAIN AND AUXILIARY SWITCHES

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Application November 12, 1957, Serial No. 695,879

17 Claims. (Cl. 200—6)

This invention generally concerns combination electrical control devices of the type comprising a variable resistor having an electric snap switch mounted on its back and operated by the shaft of the resistor. Electrical control devices of this nature are used extensively but not exclusively in radio and television receivers to control the supply of power to the receiver and to regulate its volume, and they are especially useful in instances where space is at a premium.

More particularly this invention relates to improvements in electric snap switches of the type which are especially adapted for association and joint operation with variable resistors. In general it is the purpose of this invention to provide a compact and inexpensive electric switch instrumentality of the character described with main and auxiliary switches so as to adapt the device for the control of a power supply circuit as well as an auxiliary circuit.

More specifically it is the purpose of this invention to provide an electric switch instrumentality of the character described which comprises a main snap switch of a conventional construction, and a simple and inexpensive auxiliary switch so designed that it may be incorporated in the housing of the main switch without enlargement thereof or reorganization of any of the operating parts of the main switch.

In this connection it is a further object of the invention to provide an electric switch instrumentality of the type which comprises a conventional snap switch especially adapted for association and joint operation with variable resistors, and in which an auxiliary switch is incorporated in such a way that no change need be made in the tooling necessary for the production of the main switch.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate several complete examples of the physical embodiments of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a plan view of an electric switch instrumentality embodying this invention, portions thereof being broken away for the sake of clarity;

Figure 2 is a view similar to Figure 1 but showing the operating parts of the switch in another position;

Figure 3 is a sectional view taken through Figure 1 along the line 3—3;

Figure 4 is a perspective view of the contactor per se for the auxiliary switch;

Figure 5 is a perspective view of the switch operating cam per se;

Figure 6 is a plan view similar to Figure 1 but illustrating a modified embodiment of the invention;

Figure 7 is a view similar to Figure 6 but showing the operating parts of the switch in another position;

Figure 8 is a sectional view taken through Figure 6 along the plane of the line 8—8;

Figure 9 is a sectional view taken through Figure 6 along the plane of the line 9—9;

Figure 10 is a perspective view of the contactor per se for the auxiliary switch of the instrumentality shown in Figure 6;

Figure 11 is a plan view similar to Figure 6 but illustrating another embodiment of the invention;

Figure 12 is a view similar to Figure 11 but showing the operating parts of the switch in another position;

Figure 13 views the internal structure shown in Figure 12 in the left-side elevation, but with the side wall of the housing in section;

Figure 14 is a perspective view of the contactor per se; and

Figure 15 is a fragmentary perspective view showing still another form of contactor for the auxiliary switch.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts, the numeral **10** generally designates the housing of a conventional snap switch of the type which is especially adapted for association and joint operation with a variable resistor or volume control (not shown) to provide therewith a combination or tandem unit on the order of that shown and described in Patent No. 2,177,284 issued to N. C. Schellenger on October 24, 1939. The housing comprises a cylindrical sheet metal shell providing a side wall **11**, and a disc of insulating material fixed to and closing one end of the shell to provide a base **12** normal to the shell axis and upon which the switch mechanism is mounted. The base and shell together constitute a cup-shaped switch housing which is securable to the back of a variable resistor housing by tangs or ears **13** formed integrally with the side wall **11** of the switch housing and projecting forwardly from the rim thereof.

The switch has no operating shaft of its own, and it is actuated as a consequence of rotation of the shaft of the volume control (not shown).

The mechanism of the switch is well known and may be substantially identical to that shown in Figures 12, 13 and 14 of the aforesaid Patent No. 2,177,284. It comprises a pivot post **14** fixed to the base **12** and projecting perpendicularly from the inner face thereof at a location near one side wall portion of the housing. This post provides a support upon which a switch arm **15** is pivotally mounted. The switch arm is a flat substantially sector shaped piece of insulating material having its apex portion freely rotatably journaled on the post, with its underside parallel to and opposing the inner face of the base. The heads **16** of rivets fixed in the base project from the inner surface of the base and serve to space the switch arm from the base. The rivet heads **16** also provide a pair of stationary contacts spaced from the post and from one another along a line which is radial to the post. The switch arm, therefore, may swing edgewise back and forth in the housing, from one side thereof to the other, directly over the stationary contacts **16**.

The rivets whose heads provide the stationary contacts **16** also serve to secure terminal clips (not shown) to the base with the clips disposed at the rear of the base.

Drivingly connected with the switch arm and confined between it and the inner face of the base is a substantially U-shaped bridging contactor **17**, the legs of which face toward the stationary contacts and converge

slightly toward one another so as to be wedgingly engageable between the side contact surfaces on the stationary contacts. In the positions of the parts seen in Figure 1, the bridging contactor is separated from the stationary contacts and the switch arm edgewise abuts the side wall of the housing as at 18 to define the switch open position. In the positions of the parts seen in Figure 2, the switch arm has been swung counterclockwise to a switch closed position defined by the wedging engagement of the legs of the bridging contactor 17 between the stationary contacts 16 with a force that causes the legs of the contactor to be flexed toward one another.

Switch opening and closing motion is imparted to the switch arm by means of a switch operating cam 19 such as shown in Figure 5, but which has been only partially indicated in Figure 1. The cam 19 is pivotally mounted on the post 14, outwardly of the switch arm, to rotate back and forth about the post axis. It has a notch in one edge thereof which faces the adjacent side wall portion of the switch housing and provides opposing angularly spaced horns or abutments 20 and 21 on the cam which are adapted to be transiently drivingly engaged by a blade-like lug on a rotating part of a variable resistor (not shown) to which the switch is attachable. Thus initial clockwise rotation of the shaft of the variable resistor will bring the lug on the rotating part of the resistor into driving engagement with the abutment or horn 20 to impart clockwise rotation to the operating cam, as viewed in Figures 1 and 2. Such clockwise rotation of the cam is adapted to effect counterclockwise actuation of the switch arm on its pivot post, and closure of the switch. Opening of the switch is effected upon counterclockwise rotation of the operating shaft of the resistor to engage the driving lug thereof with the other abutment or horn 21, to impart counterclockwise rotation to the operating cam, which in turn effects clockwise swinging of the switch arm to its switch open position shown in Figure 1.

Such back and forth pivotal motion of the switch arm is effected with a snap action, by means of an overcenter torsion spring 22 (shown only in Figure 1) having one of its legs connected with the switch arm as at 23 and its other leg connected to an arm 24 on the operating cam as at 25.

As stated previously, the snap switch described thus far is of conventional construction and is presently available on the market. For example, it may be a low voltage, high current switch useful in automobile radio receivers to govern the supply of power to the receiver.

In accordance with this invention, the mechanism described constitutes a main switch, and it is a feature of this invention that an auxiliary switch generally designated 26, for controlling a secondary circuit such as that for the pilot light of the receiver, may also be incorporated with the main switch, in the housing thereof, without in any wise altering the construction of the main switch components or its housing. All that is necessary is to replace the rivet which was previously used to secure a dummy terminal clip 27 to the rear of the base, with a rivet having a contact defining head 28 exposed on the inner face of the base. By way of explanation, it may be stated that the terminal clip 27 was previously provided on switches of this type as a convenience for wiring receiver circuits, and it did not constitute one of the switch terminals. According to the present invention, however, the terminal 27 is utilized as one of the terminals for the auxiliary switch, being electrically connected to the stationary contact 28 of the auxiliary switch.

As best seen in Figures 1 and 2 the stationary contact 28 of the auxiliary switch is spaced from the stationary contacts 16 of the main switch and from the post 14, and near that side wall portion of the switch housing toward which the switch arm 15 moves during switch opening motion thereof. Cooperating with the stationary contact 28 is a contactor blade 29 which extends lengthwise along the inner face of the base, edgewise thereto, from a hub 30 to which the inner end of the blade is integrally joined. The hub 30 has a central aperture 31 therein of a size to freely receive the pivot post 14, and the hub is journaled on the post at a location under the switch arm 15, with the hub flatwise confined between the underside of the arm and a circumferential enlargement 32 on the base of the post. The plane of the hub 30, of course, is normal to the post axis, and the contactor blade 29 is bent down from one peripheral portion of the hub as at 33 so as to lie in a plane which is parallel to the post axis. The outer end portion of the contactor blade extends between the stationary contact 28 of the auxiliary switch and the adjacent side wall portion of the switch housing, and it is adapted to engage the side contact surface of the stationary contact in the switch closed position seen in Figure 2 with a light biasing force.

The biasing force with which the contactor blade engages the stationary contact 28 is supplied by means of a second blade 34 formed integrally with the hub 30 and bent downwardly from another peripheral portion thereof as at 35 so as to dispose the biasing blade edgewise to the base and between the contactor blade 29 and the adjacent side wall portion of the housing. As seen in Figure 4, the biasing blade is normally substantially straight, but its outer end portion is curled inwardly as at 36 and engages the adjacent side wall portion of the switch housing to not only ground the contactor 29 to the housing but to hold it engaged with the stationary contact 28 with a slight degree of spring force.

For this latter purpose, it will be noted that the blades 29 and 34, which extend in the same general direction between the stationary contact and the adjacent side wall portion of the switch housing, diverge substantially widely in their free condition seen in Figure 4. However, when the contactor assembly is installed on the pivot post 14, the biasing blade 34 is flexed toward the contact blade 29, and its medial portion is bowed outwardly toward the side wall of the housing so that the blade applies torque to the hub 30 tending to turn it counterclockwise as viewed in Figures 1 and 2, thus urging the contactor blade toward engagement with the stationary contact 28.

In the closed position of the main switch shown in Figure 2, the contactor 29 of the auxiliary switch will also be in its switch closing position engaging its cooperating stationary contact 28. Clockwise swinging of the switch arm 15 under the action of its overcenter spring 22 toward switch open position is relied upon to effect opening of the auxiliary switch, and for this purpose, the free end of its contactor blade is formed with an extension 37 lying in the plane of the blade and projecting away from the base 12 so as to lie in the path of movement of the switch arm and to be engaged by an adjacent edge 38 of the arm just before the arm reaches its switch open position.

In this way, the force of the overcenter spring 22 is relied upon to effect opening of the auxiliary switch, during final switch opening motion of the arm, although it should be noted that the entire force of the overcenter spring is available to maintain good pressure engagement of the bridging contact 17 with the stationary contacts 16 of the main switch in the closed position of the latter.

The light biasing force acting upon the contactor of the auxiliary switch and supplied by the blade 34 of the auxiliary switch contactor assembly effects return of the contactor 29 to its switch closed position engaging the stationary contact 28 during switch closing motion of the arm 15 of the main switch, at which time the edge portion 38 of the switch arm moves out of engagement with the extension 37 on the free end of the contactor blade 29.

Referring to Figure 3, it will be noted that with ex-

ception of the extension **37** on the contactor **29**, no portion of any of the parts of the auxiliary switch extends outwardly of the base beyond the plane of the underside of the switch arm **15**. Both blades **29** and **34** of the contactor assembly for the auxiliary switch are narrow enough to easily fit under the hub or apex portion of the switch arm, so that the auxiliary switch **26** takes up practically no additional room inside the switch housing nor does it require modification or rearrangement of the main switch parts or enlargement of its housing for its incorporation therein. In addition the provision of one small and inexpensive sheet metal stamping, namely the contactor assembly comprising the hub **30** and the two blades **29** and **34**, is all that is required to not only mount the contactor of the auxiliary switch on an existing part of the main switch but to also bias the auxiliary switch contactor to its switch closed position.

As stated previously, when used in an automobile radio receiver, the bridging contactor **17** and its cooperating stationary contacts **16** control the supply of high current to the receiver, and the auxiliary switch **26** may be connected in an auxiliary circuit such as a pilot light circuit for the receiver, to control the supply of low current needed for the pilot. The auxiliary switch when closed, of course, completes a circuit from the current source through the pilot light and switch contactor blade **29** to the metallic side wall of the switch housing and hence to ground.

In the embodiment of the invention shown in Figures 6 through 10, the main switch is substantially the same as that described hereinbefore, with the exception that it is provided with a rigid bridging contactor **40**. Otherwise, the arrangement of stationary contacts **16** and **28** for the main and auxiliary switches is the same as that previously described.

The auxiliary switch **26**, however, has a contactor assembly which differs from that previously described in that its contact blade **41** forms part of an assembly which comprises a flat body portion **42** having the inner end of the contact blade turned up from one side edge thereof as at **43**, and having an integral terminal **44** formed thereon and bent downwardly from an opposite side edge of the body portion as at **45**. The intermediate portion of the contact blade is curved as at **46** and extends around the pivot post **14**, between the post and the adjacent side wall portion of the switch housing, so that the body portion **42** of the contactor assembly is located at the side of the pivot post remote from the stationary contact **28**. Stated another way, it may be said that the stationary contacts **16** of the main switch are disposed along a line substantially radial to the pivot post **14**, and that the stationary contact **28** is fixed to the switch base at one side of this radial line while the body portion **42** of the contactor assembly is disposed at the opposite side of said radial line.

The body portion **42** of the contactor assembly seats flatwise upon the inner face of the base and has an aperture **47** therein to receive the shank of a rivet **48** by which it is rigidly secured to the base, with the contact blade projecting therefrom lengthwise along the base but disposed edgewise with respect thereto. The terminal **44** on the contactor assembly passes rearwardly through a suitable aperture **49** in the base to be exposed at the rear of the switch housing, where it and the terminal **27** for the stationary contact **28** of the auxiliary switch are readily accessible for connection in a low current auxiliary circuit.

Due to the shape of the auxiliary contact blade and especially its curved medial portion **46**, the contactor is inherently tensioned or biased toward its switch closed position engaging the side contact surface of the stationary contact **28** with a substantially light force. This bias, of course, is readily overcome by the force of the overcenter torsion spring (not shown) which acts on the

switch arm, so that during switch opening motion of the switch arm, an edge **38** thereof is carried into engagement with an extension **50** on the contactor to move the contactor blade to its switch open position.

Again in this case it will be noted that the contactor assembly lies wholly beneath the plane of the outer face of the switch arm **15**, except for the tip of its extension **50**, so that the auxiliary switch can be easily accommodated in the switch housing without the need for enlargement thereof or any reorganization or modification of the component parts of the main switch.

In the construction shown in Figures 11 through 14, the main switch is substantially the same as that hereinbefore described except that its stationary contacts **16'** are elongated and are provided by the heads of T-shaped metal stampings formed and secured to the insulating base in the manner disclosed in Patent No. 2,529,716 issued to A. J. Vaksvik et al. on November 14, 1950. The stems of the T-shaped stampings project rearwardly through the insulating base to provide terminals (not shown) for the main switch, while the heads of the T extend lengthwise along the inner face of the base in edgewise relation thereto, and in convergent relation to one another. The ends of the heads are curled over as at **52** to lend stability to the combined terminal posts and stationary contacts.

The bridging contactor **53** in this case is also a solid metal stamping which is wedgingly engaged edgewise between the convergent ends of the stationary contacts by the overcenter torsion spring (not shown) in the manner previously described, upon clockwise snap actuation of the switch arm to its switch closed position shown in Figure 12.

The stationary contact **54** of the auxiliary switch is provided by the head of a T-shaped stamping fixed to the base and affording a combined contact and terminal post similar to those described in connection with the main switch. The side contact surface **55** of the stationary contact faces away from the contacts of the main switch, toward the side of the wall portion of the switch housing which is engaged by the switch arm **15** in the switch open position shown in Figure 11.

Cooperating with the stationary contact of the auxiliary switch is a contactor **56**.

The contactor **56** comprises a narrow elongated strip of metal bent flatwise intermediate its ends to provide a pair of angularly disposed legs **57** and **58**. The leg **57** is formed with an integral terminal portion **59** which projects rearwardly through an aperture **60** in the base to the rear of the switch housing and has portions thereof swaged over onto the rear face of the base as at **61** to rigidly anchor the contactor to the base with its angularly disposed legs arranged edgewise with respect to the base and extending along the inner face thereof.

The other leg **58** of the contactor extends alongside the outwardly facing contact surface **55** on the stationary contact **54** and constitutes the movable contactor blade of the auxiliary switch. Its free end portion is curled toward the stationary contact as at **62** and normally engages the stationary contact under light spring force in the switch closed position of the instrumentality seen in Figure 12.

Both the stationary contact **54** and the major portions of both legs of the contactor **56** are disposed under the switch arm **15**, and switch opening motion is imparted to the blade **58** during switch opening motion of the switch arm by the engagement of an edge portion **63** on the arm with an upstanding extension **64** on the free extremity of the contactor. In this case also, the force of the overcenter spring (not shown) by which the switch arm is snapped to its switch open position is relied upon to overcome the bias tending to hold the contactor blade **58** in its switch closed position, and to thereby effect opening of the auxiliary switch during the final motion of the switch arm toward its switch open position. Upon

snap actuation of the switch arm toward its switch closed position, the inherent bias on the contactor blade 58 of the auxiliary switch returns it to its switch closed position engaging the outer face 55 of the stationary contact 54.

In the embodiment of the invention illustrated in Figure 15, the details of the main switch have not been shown, but may be assumed to be the same as in any of the previously described embodiments of the invention. The stationary contact 28 of the auxiliary switch is preferably, though not necessarily, like those of the switches shown in Figures 1 through 10, and it is fixed in the base 12 at a location near to but spaced from the side wall 11 of the switch housing.

The movable contactor 66 of the auxiliary switch, however, is constructed to be supported directly from the side wall 11 of the housing at a location adjacent to the stationary contact 28. For this purpose, the contactor 66 is formed with an inverted U-shaped attaching portion 67 providing opposing legs which are spaced apart a distance to tightly fit over the rim portion of the side wall 11. The outer leg is bifurcated as at 68 to provide adjacent spring fingers 69 which normally converge slightly toward the inner leg, so as to assure clamping of the rim portion of the side wall between the inner and outer parts of the contact attaching portion under spring force. If desired the rim of the housing side wall may be notched, as at 70, to receive the bight of the attaching portion and thus prevent it from interfering with attachment of the switch housing to the back of a variable resistor.

Formed integrally with the attaching portion 67 of the contactor is a contact blade 71 extending lengthwise along the inner face of the base 12 edgewise with respect thereto. The inner end of the blade is sharply curved, as at 72, adjacent to its junction with the attaching portion 67, so as to dispose the free outer portion of the blade 71 intermediate the inner leg of the attaching portion 67 and the stationary contact 28. The curved inner portion 72 of the blade also serves to yieldingly bias the free end portion of the blade into engagement with the stationary contact 28.

An extension 73 on the free end of the blade, projecting outwardly away from the base and lying in the path of movement of the switch arm (not shown) of the main switch, enables the contactor blade 71 to be separated from the stationary contact 28 during motion of the switch arm between switch open and switch closed positions in the manner described hereinbefore.

While the notch 70 in the rim of the side wall 11 of the housing prevents circumferential displacement of the contactor 66 along the side wall, it will be appreciated that the securement of the switch housing to the back of a variable resistor will also preclude displacement of the contactor off of the side wall, in a direction outwardly of the base 12.

From the foregoing description taken together with the accompanying drawings, it will be readily apparent that this invention provides for the incorporation of an auxiliary switch in the housing of a conventional snap switch without entailing any change in the size, construction, or arrangement of the parts of the latter.

What is claimed as my invention is:

1. In an electric switch instrumentality of the character described: a cup-shaped housing having a cylindrical side wall of metal, and a bottom wall of insulating material providing a base; a post mounted on the base and projecting perpendicularly from its inner face, adjacent to one side wall portion of the housing; a main switch in said housing comprising a pair of stationary contacts on the inner face of the base, a switch arm mounted on said post for back and forth swinging motion about the post axis, between switch open and switch closed positions, and a bridging contactor connected with the switch arm to swing back and forth therewith, and engageable with said stationary contacts in the switch closed position of the arm; and an auxiliary switch in said housing, comprising another stationary contact mounted on the base and having a side contact surface disposed substantially perpendicularly to the inner face of the base; a movable contactor for said auxiliary switch; and means fixed with respect to the base supporting said last named contactor for movement in a defined path across and parallel to the inner face of the base between a switch closed position engaging the side contact surface of said other stationary contact and a switch open position spaced therefrom, said movable contactor of the auxiliary switch being biased toward engagement with the stationary contact of the auxiliary switch, and a part on the auxiliary switch contactor lying in the path of said switch arm as it moves in its switch opening direction so that said last named contactor will be moved to its switch open position against the bias thereon as a consequence of movement of the switch arm to its switch open position.

2. The electric switch instrumentality of claim 1 wherein the movable contactor for the auxiliary switch comprises a hub freely rotatably journalled on said post and a contact blade connected to the hub and projecting therefrom edgewise to the base to have its free end portion engaged with the side contact surface of said other stationary contact in the switch closed position of the auxiliary switch.

3. The electric switch instrumentality of claim 2 wherein the auxiliary switch contactor blade is biased toward engagement with said other stationary contact by spring means which reacts between the side wall of the housing and said hub to apply torque thereto in a direction such as to yieldingly maintain the contact blade in engagement with said other stationary contact, said spring means serving to ground the contactor of the auxiliary switch to the side wall of the housing.

4. The electrical switch instrumentality of claim 3 further characterized by the provision of an overcenter spring connected with the switch arm to effect snap actuation of the arm in both directions, said overcenter spring exerting a force on the arm which is greater than the force exerted on the contactor of the auxiliary switch by its biasing spring.

5. The electrical switch instrumentality of claim 4 wherein said spring means for biasing the contactor of the auxiliary switch to its switch closed position comprises an elongated resilient arm integral with the hub and having its outer end portion engaged with the side wall of the housing.

6. The electrical switch instrumentality of claim 5 wherein said hub is confined between the switch arm and the base.

7. The electric switch instrumentality of claim 1, wherein said stationary contacts project from the inner face of the base; wherein said switch arm comprises a flat piece of insulating material closely overlying the stationary contacts and parallel to the base; and wherein the movable contactor for the auxiliary switch comprises a blade which is disposed edgewise to the base and lies entirely between the planes of the outer face of the switch arm and the inner face of the base, except for that part of the blade which lies in the path of switch opening motion of the switch arm.

8. The electric switch instrumentality of claim 1, wherein the stationary contacts of the main switch are spaced apart along a line which is radial to said post; wherein the stationary contact of the auxiliary switch comprises a rivet in the base having a head thereon projecting from the inner face of the base and located to one side of said line; and wherein the contactor of the auxiliary switch comprises a sheet metal stamping having a flat body portion flatwise overlying and secured to the inner face of the base at the opposite side of said line, an elongated resilient blade integral with the body portion and projecting therefrom edgewise to the base,

said blade having a free end portion which is disposed at the first designated side of said radial line and is cooperable with the stationary contact of the auxiliary switch, and having a curved intermediate portion connecting the free end portion of the blade with the body of the contactor and passing around the post, between it and the adjacent side wall portion of the housing, said curved intermediate portion of the blade being tensioned to urge the free end portion of the blade toward engagement with the stationary contact of the auxiliary switch.

9. The electric switch instrumentality of claim 8 further characterized by the provision of a terminal for the auxiliary switch formed integrally with the body portion of the auxiliary switch contactor and projecting therefrom through an aperture in the base to the exterior of the housing; and further characterized by the provision of a second terminal for the auxiliary switch secured to the outer face of the base by the rivet which provides the stationary contact of the auxiliary switch.

10. The electric switch instrumentality of claim 1 wherein the stationary contacts of the main switch are spaced apart along a line which is radial to the post; wherein the stationary contact of the auxiliary switch comprises a member projecting from the inner face of the base and having a contact surface which faces away from said line; and wherein the movable contactor of the auxiliary switch comprises a blade anchored at one end to the base and disposed edgewise with respect thereto, one side of the free end portion of the blade facing toward and being engageable with the contact surface of said member, said blade being tensioned to normally engage the contact surface of said member under spring force.

11. The electric switch instrumentality of claim 1, wherein the stationary contacts of the main switch have contact surfaces which are spaced apart along a line which is radial to said post; wherein the stationary contact of the auxiliary switch comprises a substantially flat strip of metal rigidly secured to the base and projecting edgewise from the inner face thereof with its contact surface facing away from said line and in the direction of switch opening motion of the switch arm; and wherein the movable contactor of the auxiliary switch comprises a strip of sheet metal bent flatwise intermediate its ends to provide a pair of angularly disposed legs, one of said legs being rigidly secured to the base and projecting edgewise from the inner face thereof near one end of the stationary contact of the auxiliary switch, and the other leg extending alongside the contact surface of the stationary contact of the auxiliary switch and being flexible toward and from engagement therewith, said other leg being tensioned at its junction with the rigid leg so as to normally engage the stationary contact of the auxiliary switch under spring force.

12. The electric switch instrumentality of claim 11, further characterized by the provision of terminals for the auxiliary switch formed integrally with its stationary contact and with said rigid leg of its contactor, said terminals projecting through the base to be accessible at the exterior of the housing.

13. The electrical switch instrumentality of claim 1 wherein said other contact has a side contact surface which is substantially perpendicular to the base; and wherein the movable contactor for the auxiliary switch comprises a body portion secured to the cylindrical side wall of the housing, and a contact blade connected to the body portion and projecting therefrom edgewise to the base to have its free end portion engage with the side contact surface of the said other stationary contact in the switch closed position of the auxiliary switch.

14. The electrical switch instrumentality of claim 13 wherein the contact blade of the auxiliary switch comprises an elongated resilient arm integral with said body portion and serves to provide the force by which it is biased toward engagement with said other stationary contact.

15. The electrical switch instrumentality of claim 13 wherein the body portion of the auxiliary switch movable contactor is secured to the cylindical side wall by spring clamp means engaging over the rim portion of said side wall.

16. In an electric switch instrumentality of the character described: a base of insulating material having a flat face; a main switch carried by the base and including a switch arm of insulating material movable back and forth in a defined path, parallel to the flat face of the base, between switch open and switch closed positions, a contactor carried by said arm to move therewith, and stationary contacts on the base engageable by the contactor in the switch closed position of the arm; an auxiliary switch including stationary contact means projecting up from the flat face of the base, an auxiliary switch contactor, means connected with the base supporting said auxiliary switch contactor for movement between switch open and switch closed positions along a path parallel to the flat face of the base, and biasing means acting on the auxiliary switch contactor and urging it towards its switch closed position; and means for effecting opening of the auxiliary switch as a consequence of movement of the switch arm to one of its said positions, comprising a part on said auxiliary switch contactor located to be incidentally engaged by the switch arm during motion of the latter toward said one position thereof, said part being spaced from the switch arm when the arm is in the other of its positions so that the arm does not interfere with closure of the auxiliary switch.

17. In an electric switch instrumentality of the character described; a base of insulating material having a flat face; a switch arm; a contactor carried by the arm; means mounting the arm and constraining it to movement along a defined path parallel to the flat face of the base in opposite directions between a switch open and a switch closed position; stationary contact means on the base engaged by the contactor in the switch closed position of the arm; a movable auxiliary switch contactor; stationary auxiliary switch contact means on the base engageable by said auxiliary switch contactor; means fixed with respect to the base mounting the auxiliary switch contactor and constraining it to motion independently of the switch arm but in a path lying in a plane parallel to the path of movement of said arm, between a switch open and a switch closed position engaging said stationary auxiliary switch contact means; spring means yieldingly biasing the auxiliary switch contactor towards its switch closed position; cooperating abutment means on the switch arm and the auxiliary switch contactor spaced from one another when the arm is in one of its said positions to permit the auxiliary switch to be closed by the spring means acting on its contactor, and engageable during movement of the arm toward its other position to effect separation of the auxiliary switch contactor from its stationary contact means; and overcenter spring means having a force greater than that of the first mentioned spring means and connected with the arm to effect snap actuation thereof to both of its said positions, said overcenter spring means acting upon the auxiliary switch contactor through said cooperating abutment means during movement of the arm to said other position thereof so as to assure opening of the auxiliary switch.

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