April 8, 1969 R. D. MILLER ET AL 3,437,768

DRAWOUT SWITCHGEAR OPTIONALLY INTERLOCKED WITH AN AUXILIARY SWITCH

Filed Sept. 18, 1967

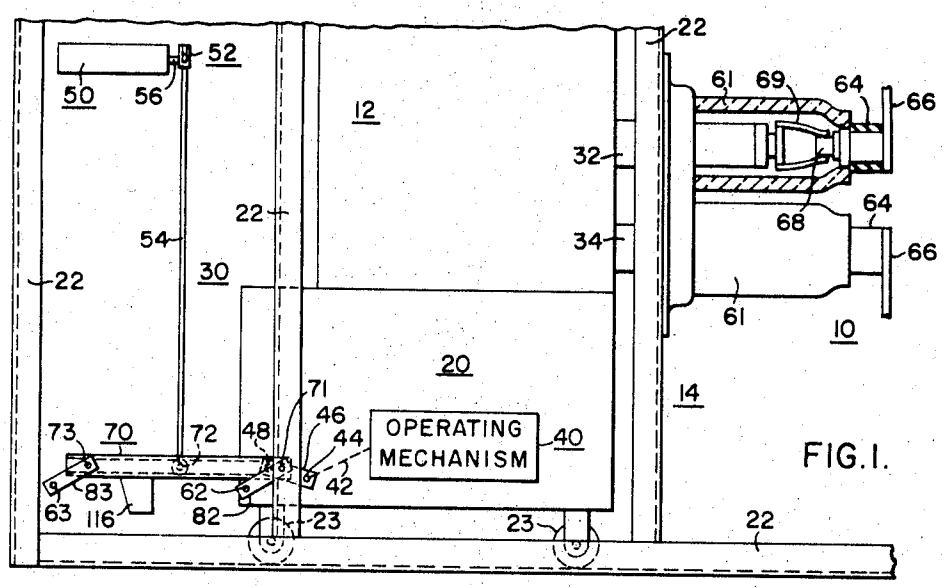



FIG. 1.

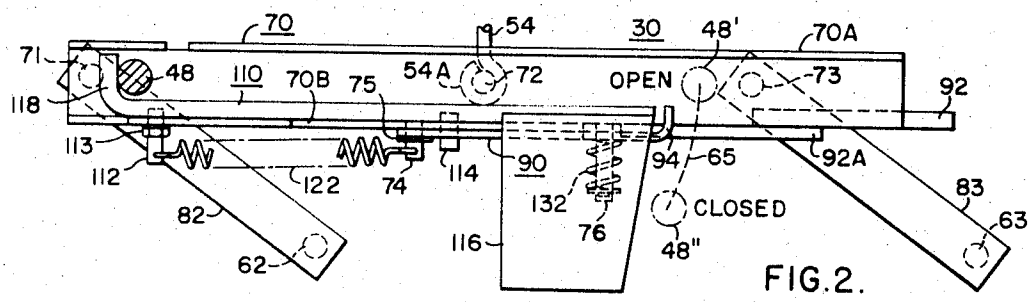



FIG. 2.

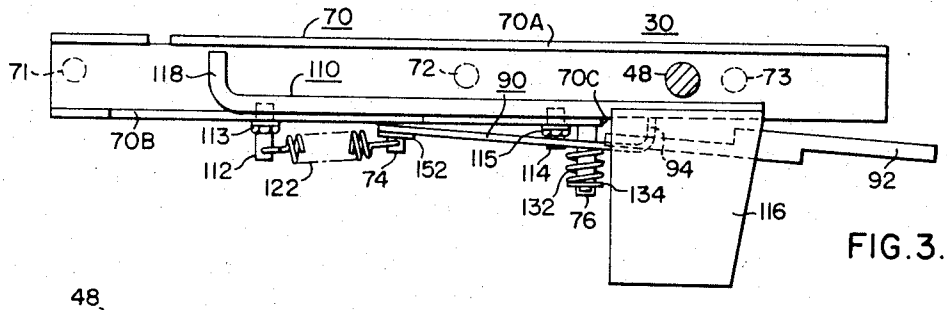


FIG. 3.

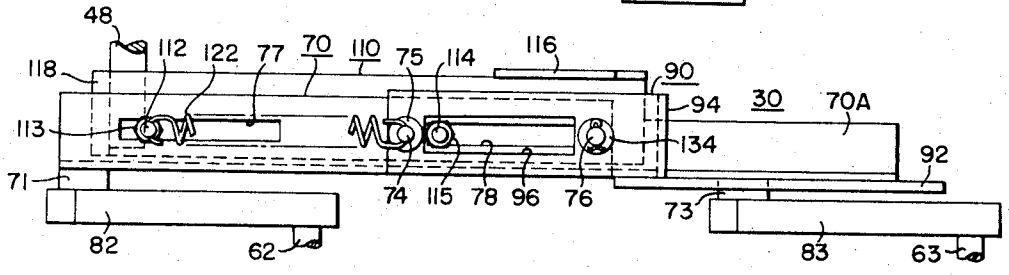


FIG. 4.

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# DRAWOUT SWITCHGEAR OPTIONALLY INTERLOCKED WITH AN AUXILIARY SWITCH

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U.S. Cl. 200—50 6 Claims

## ABSTRACT OF THE DISCLOSURE

A switchgear structure having a drawout circuit interrupter disposed in a cubicle or housing and movable between test and operating positions is disclosed. An auxiliary switch means is mounted on the cubicle and is operatively connected to the operating mechanism of the circuit interrupter in the operating position of the circuit interrupter by a control means to be actuated between operating positions whenever the operating mechanism moves between corresponding operating positions. The auxiliary switch means is normally operatively disconnected from the operating mechanism of the circuit interrupter when the circuit interrupter is in the test position, but the control means is actuable to operatively connect the auxiliary switch means to the operating mechanism of the circuit interrupter to actuate the auxiliary switch means between operating positions upon the movement of the operating mechanism between operating positions when the circuit interrupter is in the test position.

In the construction of switchgear equipment of the drawout type, the circuit interrupter or circuit breaker which forms part of the switchgear equipment includes a plurality of primary disconnecting contacts and a plurality of secondary disconnecting contacts which are useful in certain control and indicating circuits. When the drawout circuit interrupter is in the normal operating position inside the associated cubicle or houing, both the primary and the secondary disconnecting contacts on the circuit interrupter engage corresponding stationary contacts which are mounted on the associated cubicle or housing. When the drawout circuit interrupter is actuated from the normal operating position to the test position, the primary disconnecting contacts on the circuit interrupter are disconnected from the associated stationary contacts, while the secondary disconnecting contacts on the circuit interrupter normally remain engaged with the associated stationary contacts provided inside the associated cubicle or housing. In applications where the required number of secondary disconnecting contacts exceeds the number which can be provided on the drawout circuit interrupter, one or more auxiliary switch means may be disposed and mounted inside associated cubicle or housing along with means to actuated the operation of the auxiliary switch means when the circuit interrupter is in the normal operating position in response to the operation of the operating mechanism of the circuit interrupter. The contacts of an auxiliary switch means of the type described therefore indicate whether the main contacts of the associated circuit interrupter are either open or closed when the circuit interrupter is in the normal operating position. In known switchgear equipment which has been employed in the past, when the drawout circuit interrupter is in the test position, the associated auxiliary switch means where provided is normally arranged to be inoperable with the operating mechanism of the associated circuit interrupter. It has been found in certain applications, however, that for some control and indicating purposes, it is desirable that the auxiliary switch means operate in response to the



operation of the operating mechanism of the associated circuit interrupter both in the operating and test positions of the circuit interrupter. It is therefore desirable to provide an improved means for actuating the operation of auxiliary switch means in switchgear equipment of the drawout type in both the normal operating position and the test position of the circuit interrupter or only in the normal operating position, as desired.

It is an object of this invention to provide a new and improved switchgear structure including a drawout circuit interrupter.

Another object of this invention is to provide an improved means for actuating the operation of an auxiliary switch means mounted in a switchgear cubicle or cell by the operation of the operating mechanism of a drawout circuit interrupter disposed in the cubicle.

A more specific object of this invention is to provide a means for operatively connecting the operating mechanism of the drawout circuit interrupter to an associated auxiliary switch means mounted in a switchgear cubicle when the circuit interrupter is in the operating position, for normally operatively disconnecting the auxiliary switch means from the operating mechanism when the circuit interrupter is in the test position and, when actuated to do so, for operatively connecting the auxiliary switch means to the operating mechanism of the circuit interrupter when the circuit interrupter is in the test position.

Other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a view, partly in side elevation and partly in section, of a portion of a metal-clad switchgear unit embodying the principal features of the invention;

FIG. 2 is an enlarged side elevational view of a portion of the switchgear unit shown in FIG, 1 illustrating a first operating position of certain parts of the switchgear unit;

FIG. 3 is an enlarged side elevational view proportion of the switchgear unit shown in FIG. 1 illustrating a second operating position of the parts of the switchgear unit shown in FIG. 2; and

FIG. 4 is an enlarged bottom view of the portion of the switchgear unit which is shown in FIG. 2.

Referring now to the drawings, in FIG. 1 in particular, there is illustrated a portion of a metal-clad or metal enclosed switchgear cell or housing **10** which may be constructed by securing sheet metal members to angle frame members **22** in a manner well known in the art. A circuit interrupter or circuit breaker **20** is normally disposed in the cell or cubicle **10** and may be moved horizontally into an out of the cubicle **10** on the wheels **23** which run on rails or tracks (not shown) disposed at the bottom of the cubicle **10**. The cubicle **10** includes a front compartment in which the circuit breaker **20** is disposed and a rear compartment **14** in which the power conductors or bus members **66** may be disposed for connection to the circuit breaker **20** through suitable primary disconnecting contacts.

The circiut breaker **20** is of the general type which is described in greater detail in U.S. Patent 2,900,464 issued Aug. 18, 1959, to R. E. Frink and P. Olsson which is assigned to the same assignee as the present application. The circuit breaker **20** includes an operating mechanism **40**, as indicated diagrammatically in FIG. 1, which is adapted to actuate the main contacts (not shown) of the circuit breaker **20** between open and closed positions. The operating mechanism **40** is of the type which is described in greater detail in U.S. Patent 3,254,186 which

issued May 31, 1966, to W. H. Fischer and which is assigned to the same assignee as the present application. The operating mechanism **40** is operatively connected as indicated diagrammatically at **42** in FIG. 1 to a shaft **44** which rotates between first and second positions when the operating mechanism **40** actuates the associated separable contacts of the circiut breaker **20** beween open and closed positions and which may be the main operating shaft of the operating mechanism disclosed in the above-mentioned patent. In order to indicate whether the main contacts of the circuit breaker **20** are in the open or closed positions and for another purpose which will be described hereinafter, a lever **46** is mounted on the shaft **44** for rotation therewith between first and second operating positions which correspond to the open and closed positions of the main contacts of the circuit breaker **20**. In order to actuate the control means **30**, as will be described hereinafter, a driving pin **48** is mounted on the lever **46** adjacent to the end thereof for rotation with the lever **46** and the shaft **44**.

The circuit breaker **20** also includes a plurality of pairs of substantially horizontal insulating bushings **32** and **34** with the bushings of each pair being spaced from one another in a common vertical plane and with the different pairs of bushings being laterally spaced from one another. As shown in FIG. 1, each of the bushings **32** and **34** has mounted at the inner end thereof a primary movable disconnecting contact, as indicated at **69**, which is disposed to engage a primary stationary contact **68** which is disposed inside an insulating tube **61** which, in turn, is mounted in the rear compartment **14** of the cubicle **10**. Each of the stationary contacts **68** is electrically connected to one of the power conductors **66** through an electrical conductor or stud which is electrically insulated by suitable means, such as the insulating tube **64**.

In order to operatively connect one or more auxiliary switch means **50**, which are mounted on the cubicle **10** inside the front compartment **12** adjacent to the path of movement of the circuit breaker **20**, to the operating mechanism of the circuit breaker **20** at least when the circuit breaker **20** is in the normal operating position shown in FIG. 1, the control means **30** is provided. The auxiliary switch means **59** may include a plurality of separable contacts (not shown) and may be of the rotary type as disclosed in detail in U.S. Patent 3,229,051 which issued Jan. 11, 1966, to R. Hauser et al. and which is assigned as the same assignee as the present application. As illustrated, the auxiliary switch means **50** includes an operating shaft **56** to which the control means **30** is operatively connected.

More specifically, the control means **30** includes a parallel linkage means **30** which is pivotally mounted on one of the walls of the cubicle **10** inside the front compartment **12** adjacent to the path of movement of the circuit breaker **20**. As shown in FIGS. 1 and 2, the parallel linkage means includes the generally parallel supporting links **82** and **83** and the operating channel member or driven member **70**. The lower ends of the links **82** and **83** are pivotally connected to the fixed pivot pins **62** and **63**, respectively, which, in turn, are mounted on one of the sidewalls of the cubicle **10**. The upper ends of the links **82** and **83** are pivotally connected to the operating channel member **70** adjacent to the opposite ends thereof at the pivot pins **71** and **73**, respectively, which are mounted on one side of the operating channel member **70** away from the flange or sidewall portions **70A** and **70B** of the channel member **70** which is generally U-shaped in cross section. It is to be noted that the lower flange or sidewall portion **70B** of the channel member **70** extends from the left end of the channel member **70**, as viewed in FIG. 2, for only a portion of the axial length of the channel member **70** with the lower sidewall portion **70B** terminating short of the right end of the channel member **70**, as indicated at **70C** in FIG. 3. The channel member **70** is operatively connected to the operating shaft **56** of the auxiliary switch means **50** by a vertically extending connecting rod **54** which is pivotally connected at its lower end to a pivot pin **72** which, in turn, is mounted on one side of the channel member **70** away from the flange or sidewall portions **70A** and **70B**, as best shown in FIGS. 1 and 2. The upper end of the connecting rod **54** is pivotally connected to a lever arm **52** which in turn is mounted on the operating shaft **56** of the auxiliary switch means **50** for rotation therewith.



It is to be noted that when the circuit breaker **20** is in the normal operating position shown in FIG. 1, the driving pin **48** whose movement is actuated by the operation of the operating mechanism **40** of the circuit breaker is disposed between the flange portions **70A** and **70B** of the channel member **70** adjacent to the left end of the channel member **70**, as viewed in FIG. 2. The position of the driving pin **48**, as shown in FIG. 2, therefore corresponds to the normal operating position of the circuit breaker **20** as shown in FIG. 1, and also corresponds to the operating position of the operating mechanism **40** which, in turn, corresponds to the open position of the main contacts of the circuit breaker **20**. When the operating mechanism **40** of the circuit breaker **20** actuates the main contacts of the circuit breaker from an open position to a closed position, the driving pin **48** is actuated from the position shown in FIG. 1 in a generally clockwise arcuate path about the axis of rotation of the shaft **44** to a second position which is angularly displaced from that shown in FIG. 1 by a predetermined angle in a clockwise direction about the axis of rotation of the shaft **44**, such as an angle of approximately 50 degrees. When the driving pin **48** is actuated, as just described, by the operation of the operating mechanism **40** when the circuit breaker **20** is in the normal operating position as shown in FIG. 1, the driving pin **48** will travel in the arcuate path just described to thereby actuate the channel member **70** from the position shown in FIGS. 1 and 2 in a generally downward direction to a new operating position in which the channel member **70** will be in a position which is generally parallel to that shown in FIG. 2 but vertically displaced in a downward direction. The connecting rod **54** is also actuated in a downward direction since the connecting rod **54** is operatively connected to the channel member **70** to thereby rotate the operating shaft **56** of the auxiliary switch **50** from a first operating position to a second operating position which corresponds to the closed position of the main contacts of the circuit breaker **20** and which also corresponds to a different operating position of the operating mechanism **40** of the circuit breaker **20**.

When the circuit breaker **20** is moved from the normal operating position shown in FIG. 1 to the test position which is horizontally displaced from that shown in FIG. 1 toward the left, as viewed in FIG. 1, the driving pin **48** will be actuated from the position shown in FIG. 2 adjacent to the left end of the channel member **70** toward the right until the driving pin **48** reaches the position indicated in phantom at **48'** in FIG. 2, which corresponds to the test position of the circuit breaker **20** and also to the operating condition of the operating mechanism **40** which, in turn, corresponds to the open position of the main contacts of the circuit breaker **20**. It is to be noted that when the circuit breaker **20** is in the test position and the driving pin is positioned toward the right end of the channel member **70** as indicated at **48'** in FIG. 2, the driving pin, as indicated at **48'**, is positioned adjacent to a portion of the channel member **70** in which the lower sidewall portion or flange portion **70B** is omitted. When the operating mechanism **40** of the circuit breaker **20** therefore changes from the operating position which corresponds to the open position of the main contacts of the circuit braker and which corresponds to the position of the driving pin as indicated at **48'** in FIG. 2 to a second

operating position which corresponds to the closed position of the main contacts of the circuit breaker **20** and which corresponds to the position of the driving pin, as indicated at **48''** in FIG. 2, after traveling along an arcuate path, as indicated at **65** in FIG. 2, the channel member **70** will not normally be actuated from the position shown in FIG. 2 by the operation of the operating mechanism **40** since the driving pin **48** while traveling from the position indicated at **48'** to the position indicated at **48''** will not engage the lower sidewall portion **70B** of the channel member **70**. The auxiliary switch means **50** therefore will not be normally operatively connected to the operating mechanism **40** of the circuit breaker **20** when the circuit breaker **20** is in the test position, as indicated by the position of the driving pin at **48'** in FIG. 2.

In order to permit the operative connection of the auxiliary switch means **50** to the operating mechanism **40** of the circuit breaker **20** when the circuit breaker **20** is in the test position as well as in the normal operating position, the control means **30** includes a generally L-shaped bar member **110** which is slidably disposed between the sidewall portions **70A** and **70B** of the channel member **70** as best shown in FIGS. 2 and 3. In order to guide the axial movement of the bar member **110** with respect to the channel member **70** and to retain the bar member **110** in assembled relation with the lower sidewall portion **70B** of the channel member **70**, the bar member **110** has mounted thereon a pair of axially spaced threaded studs **112** and **114** which extend generally downwardly from the bottom of the bar member **110** through associated spaced generally rectangular slots **77** and **78**, respectively, which are provided in the lower sidewall portion **70B** of the channel member **70** as best shown in FIGS. 2 and 4. The retaining nuts **113** are provided on the respective threaded studs **112** and **114** underneath the lower sidewall portion **70B** of the channel member **70**, as best shown in FIG. 4. In order to bias the bar member **110** axially toward the right with respect to the channel member **70**, as viewed in FIG. 2, the biasing spring **122** is provided with the left end of the spring **122** being connected through an opening in the lower end of the stud **112** which is mounted on the bar member **110** and with the right end of the spring **122** being connected through an opening in a stud **74** which extends downwardly from the lower sidewall portion **70B**, as best shown in FIGS. 2 and 3. It is to be noted that the bar member **110** includes a vertically extending portion as indicated at **118** against which the driving pin **48** bears when the circuit breaker **20** is in the normal operating position and the operating mechanism **40** of the circuit breaker **20** is in the operating position which corresponds to the closed position of the main contacts of the circuit breaker **20**.

In order to releasably latch the bar member **110** in the operating position corresponding to the position of the driving pin indicated at **48'** and shown in FIG. 2, a generally L-shaped latch member **90** which is mounted on the lower sidewall portion **70B** of the channel member **70** with the main portion of the latch member **90** disposed adjacent to and parallel the lower sidewall portion **70B** of the channel member **70** and with the vertically extending latch portion **94** of the latch member **90** being disposed to the right of the right end of the bar member **110**, as viewed in FIG. 2. The left end of the latch member **90** is supported on the stud **74** which extends downwardly from the lower sidewall portion **70B** of the channel member **70** through an opening provided in the latch member **90** with a washer **75** being disposed on the stud **74** between the left end of the latch member **90** and the portion of the stud **74** which receives the right end of the biasing spring **122** as shown in FIG. 2. The latch member **90** is also supported adjacent to its right end on the stud **76** which extends downwardly from the lower sidewall portion **70B** of the channel member **70** through an opening provided in the latch member **90**. In order to bias the right end of the latch member **90** in a generally upward direction with respect to the stud **76** on the lower sidewall portion **70B** of the channel member **70**, a biasing spring **132** is disposed on the stud **76** between the right end of the latch member **90** and a washer **134** which is disposed on the stud **76** and retained in assembled relation therewith by a cotter pin **76** which passes through an opening adjacent to the end of the stud **76**. The biasing spring **132** serves to prevent the movement of the bar member **110** to the right from the position shown in FIG. 2 by maintaining the upwardly extending portion **94** of the latch member **90** in the axial path of the bar member **110** when the circuit breaker **20** is actuated to the test position and the driving pin **48** is actuated to the position indicated in phantom at **48'** in FIG. 2 to the right of the bar member **110**. It is to be noted that the latch member **90** also includes a generally rectangular slot **96** in the bottom thereof as shown in FIG. 4 which then permits the sliding movement of the bar member **110** when released under the influence of the biasing spring **122** with the slot **96** being large enough to accommodate the nut **115** which is disposed on the threaded stud **114**. In order to permit the manual release of the bar member **110** by actuating the right end of the latch member in a downward direction, a latch release lever **92** is secured to the latch member **90** adjacent to the right end thereof by suitable means, such as welding, with the latch release lever extending to the right axially beyond the right end of the channel member **70**.

In order to prevent the movement of the driving pin from the position indicated at **48''** in FIG. 2—which corresponds to the test position of the circuit breaker and also to the operating position of the operating mechanism **40** which, in turn, corresponds to the closed position of the main contacts of the circuit breaker **20** toward the left, as viewed in FIG. 2—underneath the channel member **70**, which might permit damage to certain parts of the control means **30**, the interlocking member **116** is secured to the bar member **110** adjacent to the right end thereof, as shown in FIGS. 2 and 3. The interlocking portion or gusset plate **116** extends downwardly from the bar member **110** just beyond the edge of the lower sidewall portion **70B** of the channel member **70** and is disposed to prevent the rightward movement of the bar member **110** when the driving pin is in the position indicated at **48''** in FIG. 2 when the circuit breaker is in the test position.

Considering the overall operation of the control means **30**, the driving pin **48** which is actuated by the operation of the operating mechanism **40** will be in the position as indicated in solid lines in FIG. 2 when the operating mechanism **40** of the circuit breaker **20** is in the normal operating position and when the main contacts of the circuit breaker **20** are in the open position. As mentioned previously, the driving pin **48** as shown in FIG. 2 is disposed between the flange portions **70B** and **70A** of the channel member **70** and is disposed to bear against the vertically extending portion **118** of the bar member **110** to thereby assist in maintaining the bar member **110** in the position shown in FIG. 2. When the driving pin **48** is actuated to follow an arcuate path about the axis of rotation of the shaft **44** as described previously in a generally downward direction as viewed in FIG. 2 the channel member **70** will also be actuated in a generally downward direction to thereby actuate the auxiliary switch means **50** through the connecting rod **54** from a first operating position to a second operating position. The separable contacts of the auxiliary switch means **50** will therefore be operably connected to the operating mechanism **40** of the circuit breaker **20** and will provide an indication of the operating position of the main contacts of the circuit breaker **20** as reflected in the operating position of the operating mechanism **40**. It is to be noted that when the circuit breaker **20** is actuated from the test position to the normal operating position shown in FIG. 1, the driving pin **48** will move from the position

indicated in phantom at 48' in FIG. 2 axially along the channel member 70 to the final position indicated in solid lines in FIG. 2 to thereby reset the bar member 110 to the normally latched position shown in FIG. 2.

When the circuit breaker 20 is actuated from the normal operating position shown in FIG. 1 to the test position which is displaced toward the left, as viewed in FIG. 1, the driving pin 48 which is shown in solid lines in FIG. 2 in a position which corresponds to the normal operating position of the circuit breaker 20 to a new operating position as indicated at 48' in FIG. 2 which is axially displaced along the channel member 70 to thereby permit the bar member 110 to move slightly toward the right, as viewed in FIG. 2, until the right end of the bar member 110 bears against the latch portion 94 of the latch member 90 under the influence of the biasing spring 122 which actuates the bar member 110 to slide or move axially with respect to the channel member 70. It is important to note that when the driving pin 48 which is actuated by the operating mechanism 40 moves to the position indicated in phantom at 48' in FIG. 2, the operating mechanism 40 is operatively disconnected from the auxiliary switch means 50 since the driving pin 48 will not actuate the channel member 70 when the operating mechanism 40 actuates the driving pin 48 to move from the position indicated at 48' along the arcuate path 65 to the second operating position of the driving pin as indicated at 48'' in FIG. 2, which corresponds to the closed position of the main contacts of the circuit breaker 20. In other words, the auxiliary switch means 50 will not change position in response to a change in the operating position of the operating mechanism 40 of the circuit breaker 20 when the circuit breaker 20 is in the test position and when the bar member 110 is held in the normally latched position shown in FIG. 2 by the latch member 90 against the force exerted on the bar member 110 by the biasing spring 122. As previously mentioned, the latch member 90 is biased to its normal latching position by the upward force exerted on the latch member 90 by the biasing spring 132 which is disposed on the stud 76.

If desired, the control means 30 may be manually actuated to operatively connect the auxiliary switch means 50 to the operating mechanism 40 of the circuit breaker 20 by manually depressing the latch release lever 92 when the circuit breaker is moved from the normal operating position shown in FIG. 1 to the test position which corresponds to the position of the driving pin, as indicated at 48' in FIG. 2. By depressing or pushing down the right end of the latch release lever 92, as indicated in FIG. 3, the latch member 90 will be actuated to move in a limited rocking movement about the left end of the latch member 90 against the upward force exerted on the latch member 90 by the biasing spring 132 to thereby release the right end of the bar member 110 which will then be actuated axially toward the right by the biasing spring 122 until the bar member 110 reaches the position shown in FIG. 3. The driving pin 48, as shown in FIG. 3, will then be disposed between the upper sidewall portion 70A of the channel member 70 and the right end of the bar member 110. If the operating mechanism 40 of the circuit breaker 20 is then actuated to change from the position which corresponds to the closed position of the main contacts of the circuit breaker 20, as indicated in phantom at 48', in FIG. 2 to thereby actuate the driving pin 48 in an arcuate movement generally downward as viewed in FIGS. 2 and 3, the channel member 70 will then be actuated also in a generally downward direction, as supported on the parallel links 82 and 83. The connecting rod 54 will also be actuated in a downward direction to cause the separable contacts of the auxiliary switch means 50 to move from one operating position to another operating position in response to the movement of the operating mechanism 40 of the circuit breaker 20 between operating positions when the circuit breaker 20 is in the test position. In other words, by releasing the bar member 110 which is actuated to position shown in FIG. 3, the auxiliary switch means 50 can be operatively connected to the operating mechanism 40 of the circuit breaker 20 when manually actuated to do so in the test position of the circuit breaker 20 as well as in the normal operating position as shown in FIG. 1.

Whenever the auxiliary switch means 50 has been operatively connected to the operating mechanism 40 of the circuit breaker 20 as just described and the circuit breaker 20 is subsequently moved from the test position back to the normal operating position as shown in FIG. 1, the driving pin 48 as indicated in phantom at 48' in FIG. 2 will move from that position to the position indicated in solid lines in FIG. 2 to thereby automatically reset the bar member 110 to the normally latched position whenever the circuit breaker 20 is restored to the normal operating position. As mentioned previously, the interlocking portion 116 provided on the bar member 10 prevents the bar member 110 from moving to the right as viewed in FIG. 2 when the driving pin is in the position indicated in phantom at 48'' in FIG. 2 and therefore might be disposed underneath the bar member 110 which might otherwise cause damage to the operating parts of the control means 30.

It is to be understood that the teachings of the applicant's invention may be applied to switchgear equipment employing a circuit interrupter which includes fused disconnect switches, as well as automatic circuit breakers of the type described in detail.

The apparatus embodying the teachings of this invention has several advantages. For example, a control means is provided which normally operatively connects an auxiliary switch means to the operating mechanism of an associated drive circuit breaker whenever the circuit breaker is moved to the normal operating position while normally operatively disconnecting the operating mechanism of the circuit breaker from the auxiliary switch means when the circuit breaker is in the test position but permitting the user to manually actuate the disclosed control means to operatively connect the operating mechanism of the circuit breaker to the auxiliary switch means in the test position as well as in the normal operating position. In addition, the control means is automatically reset to the normal mode of operation with the auxiliary switch means operatively disconnected from the operating mechanism of the associated breaker whenever the circuit breaker is actuated to the normal operating position. Finally, the control means as disclosed prevents the driving parts on the operating mechanism of the circuit breaker from being disposed underneath the channel member of the control means which might otherwise cause damage to certain parts of the control means.

Since numerous changes may be made in the above described apparatus and different embodiments of the invention may be made without departing from the spirit and scope thereof, it is intended that all the matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A switchgear apparatus comprising an enclosing housing, a circuit interrupter normally disposed in the housing and movable between an operating position and a test position, said circuit interrupter including an operating mechanism movable between first and second operating positions, auxiliary switch means having first and second operating positions mounted inside and secured to the housing, control means operatively connected between the operating mechanism of the circuit interrupter and the auxiliary switch means when the circuit interrupter is in the operating position to actuate the auxiliary switch means between the first and second operating positions upon the movement of the operating mechanism be-

tween the first and second operating positions, said control means normally operatively disconnecting the operating mechanism of said circuit interrupter from the auxiliary switch means when the circuit interrupter is in the test position, said control means being actuable to operatively connect the operating mechanism of said circuit interrupter to said auxiliary switch means when the circuit interrupter is in the test position to thereby actuate the auxiliary switch means between operating positions upon the movement of the operating mechanism between operating positions.

2. The combination as claimed in claim 1 wherein the control means comprises a driving member on the circuit interrupter which is rotatable with the operating mechanism upon the movement of the operating mechanism between operating positions, a parallel linkage means mounted on said housing and operatively connected to the auxiliary switch means, the parallel-linkage means including a driven member disposed to be normally engaged by said driving member only when the circuit interrupter is in the operating position and a normally latched, releasable member slidably mounted on the driven member to be engaged by the driving member when released only when the circuit interrupter is in the test position.

3. The combination as claimed in claim 2 wherein the driven member comprises a channel-shaped member pivotally connected adjacent its ends to a pair of parallel links and including a pair of spaced sidewall portions, one of said sidewall portions extending for only part of the axial length of said channel-shaped member to permit movement of said driving member in the test position of said circuit interrupter without engaging said channel-shaped member.

4. The combination as claimed in claim 3 wherein an additional means is provided for biasing the releasable



member axially with respect to the channel-shaped member toward a position in which the driving member engages the releasable member in the test position of the circuit interrupter, and a releasable L-shaped latch member mounted on the channel-shaped member to normally latch the releasable member in a position in which the driving member does not engage the releasable member in the test position of the circuit interrupter.

5. The combination as claimed in claim 4 wherein the releasable member is generally L-shaped in configuration and after release is actuable by the movement of the driving member to the normally latched position whenever the circuit interrupter is moved from the test position to the operating position.

6. The combination as claimed in claim 5 wherein the releasable member includes an interlocking portion which engages the driving member in one operating position of the operating mechanism when the circuit breaker is in the test position to prevent movement of the driving member axially with respect to the channel-shaped member.

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