

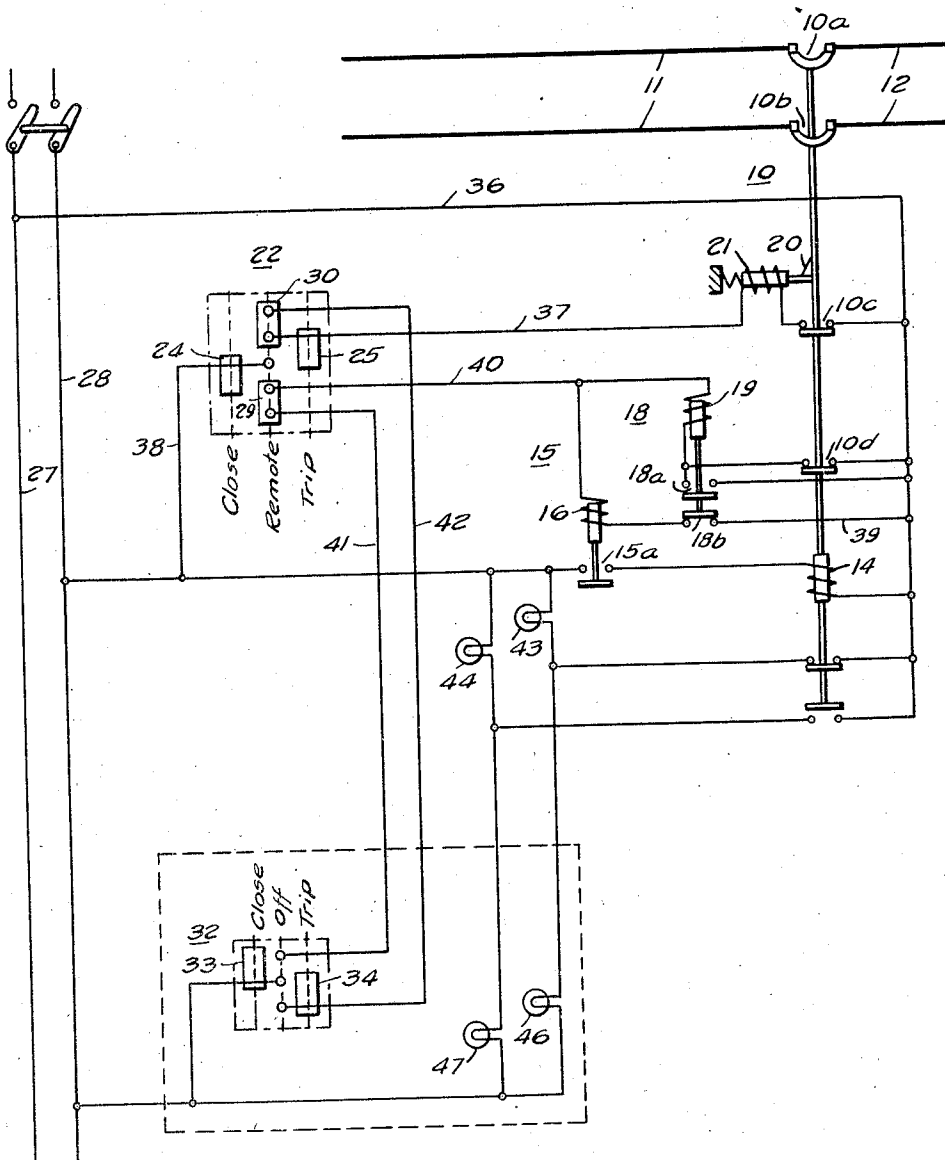
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LOCAL AND REMOTE CONTROL SYSTEM FOR CIRCUIT BREAKERS

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WITNESSES:

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LOCAL AND REMOTE CONTROL SYSTEM
FOR CIRCUIT BREAKERSHerman B. Wortman, Pittsburgh, Pa., assignor
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My invention relates, generally, to control systems and has reference in particular to circuit breaker control systems.

Generally stated, it is an object of my invention to provide a circuit breaker control system which is simple and inexpensive to manufacture and is easy to operate.

More specifically, it is an object of my invention to provide for complete local control of a circuit breaker and to provide, in addition, for remote operation of the circuit breaker at the discretion of an operator at the circuit breaker location.

It is also an object of my invention to provide for selective operation of a circuit breaker either locally or remotely without requiring a separate transfer switch or a circuit breaker interlock switch.

Another object of my invention is to provide for using a single manual control switch at a circuit breaker location for operating the circuit breaker and for determining whether or not the circuit breaker may be controlled from a remote point.

Other objects will in part be obvious, and will in part be explained hereinafter.

In practicing my invention a manual control switch is provided at a circuit breaker location for controlling both local and remote operation of the circuit breaker. In one position the control switch provides an energizing circuit for the circuit breaker trip means, in another position it provides an energizing circuit for the closing means, and in a third position it sets up control circuits for the trip and closing means so that they may be selectively controlled by a remote control switch.

For a more complete understanding of the nature and objects of my invention reference may be made to the following detailed description which may be read in connection with the accompanying drawing, in which the single figure is a diagrammatic view of a circuit breaker control system embodying the invention in one of its forms.

Referring to the drawing the reference numeral 10 may denote, generally, a circuit breaker for effecting connection of a pair of conductors 11 to an associated pair of conductors 12 through main contact members 13a and 13b for controlling the flow of electrical energy therebetween. Energization of the circuit breaker operating winding 14 may be controlled in any suitable manner such as by means of a circuit breaker switch 15 having an operating winding 16 and a cut-off relay 18 having an operating winding 19. The circuit breaker

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may be retained in the closed position by latch means 20 having associated therewith a trip winding 21 for releasing the latch means to open the circuit breaker.

In order to provide for controlling the operation of the circuit breaker 10, means such as the control switch 22 may be provided adjacent the circuit breaker location. The control switch 22 may, for example, be of the drum type having movable contact members 24 and 25 for effecting connection of the circuit breaker switch 15 and the trip winding 21 in "close" and "trip" operating positions of the switch, respectively, to a suitable source of control voltage which may be represented by the conductors 27 and 28. The switch 22 may be of the "stay put" type which remains in any position to which it is operated until it is operated to another position.

With a view to providing for selectively controlling the circuit breaker 10 either directly from the circuit breaker location or from a remote point additional contact members 29 and 30 may be provided on the control switch 22 for providing energizing circuits when the switch is in the "remote" position for the circuit breaker switch 15 and the trip winding 21 in conjunction with a remote control switch 32. The control switch 32 may be of the pushbutton type or may also be of the drum type as shown, having a contact member 33 for connecting the circuit breaker switch 15 to the control conductors 27 and 28 in the "close" position and a contact member 34 for connecting the trip winding 21 to the control conductors in the "trip" position.

With the circuit breaker in the closed position as shown, the local control switch 22 may be operated to the "trip" position so as to provide an energizing circuit for the trip winding 21 from the control conductor 27 through conductor 36, through auxiliary contact members 10c of the circuit breaker, trip winding 21, conductor 37, contact member 25 of the local control switch 22, and conductor 38 to the control conductor 28. The latch means 20 is thereby released opening the circuit breaker. With the local control switch 22 remaining in the "trip" position the operator may safely work on the circuit breaker since it is impossible for the circuit breaker to be closed by means of the remote control switch as the closing circuit therefrom is interrupted by reason of contact member 29 of the local control switch 22 being in the "open" position.

The circuit breaker may be readily closed by the operator at the circuit breaker location by operating the local control switch 22 to the

"close" position. An energizing circuit will thereby be provided for the operating winding 16 of the circuit breaker switch 15 from the control conductor 27 through conductor 36, conductor 39, contact members 18b of the cut-off relay 18, operating winding 16, conductor 40, contact member 24 of the local control switch 22, and conductor 38 to the control conductor 28. The control switch 15 closes, completing an energizing circuit for the operating winding 14 of the circuit breaker through contact members 15a. The circuit breaker 10 closes and provides an energizing circuit for the operating winding 19 of the cut-off relay 18 through contact members 10d. The cut-off relay then operates to disconnect the operating winding 16 of the circuit breaker switch from the control conductors by opening contact members 18b so as to deenergize the operating winding 14 of the circuit breaker in the well known manner. A holding circuit for the cut-off relay is provided through contact members 18a. With the local control switch 22 remaining in the "close" position, operation of the circuit breaker from the remote location by means of the remote control switch 32 is again prevented, since the remote tripping circuit is interrupted by reason of contact member 30 of the local control switch 22 being in the "open" position.

Whenever the operator is through working on the circuit breaker or whenever he desires to return the circuit breaker to the control of the remote control switch 32, the local control switch 22 may be operated to the "remote" position. In this position the circuit breaker may be either closed or tripped depending upon its operating position, directly under the control of the remote control switch 32 through obvious operating circuits established through the conductors 41 and 42, and contact members 29 and 30 of the local control switch, respectively.

Suitable signal means such as the red and green lamps 43, 44 may be provided in conjunction with the local control switch for indicating the operating position of the circuit breaker. Means such as the red and green lamps 46 and 47, respectively, may be provided in conjunction with the remote control switch 32 for likewise effecting indication of the operating position of the circuit breaker.

From the above description and the accompanying drawing it will be apparent that I have provided in a simple and effective manner for selectively controlling a circuit breaker from local and remote locations. Operation of the circuit breaker is always directly under the control of the local operator. In this manner the local operator may always be sure of the operating position of the breaker and may safely work on it whenever he has tripped the circuit breaker from the circuit breaker location, without the danger of having it inadvertently closed from the remote location while he is working on or about it.

Since certain changes may be made in the above description and different embodiments of the invention may be made without departing from the spirit and scope thereof, it is intended that all of the matter contained in the above description and shown in the accompanying drawing shall be considered as illustrative and not in a limiting sense.

I claim as my invention:

1. In a control system for a circuit breaker having trip and closing means, circuit means including a remote control switch operable to different positions to provide different circuits for selectively energizing the trip and closing means, and additional circuit means including a local control switch operable to different positions to provide operating circuits for selectively energizing the tripping or closing means or setting up an operating circuit for the remote control switch.

2. For use with a circuit breaker having trip means and closing means, a local control switch operable to different positions and circuit means connected therewith to provide circuits to selectively energize the trip or closing means or set up remote energizing circuits for said means, and a remote control switch so connected as to be selectively operable to complete one or the other of the remote energizing circuits when the local control switch is operated to set up the remote energizing circuits.

3. In a control system for a circuit breaker having a closing winding and a trip winding, switch means operable to provide a circuit to effect energization of the closing winding from a source of electrical energy, a local control switch operable to different positions to provide different circuits to effect energization of the trip winding, effect energization of the switch means, or set up remote control circuits for energizing the trip winding or switch means, respectively, and a remote control switch selectively operable to different positions for providing circuits to effect energization of either the trip winding or the switch means over one or another of the remote control circuits.

4. The combination with trip means and closing means for a circuit breaker, of circuit means including a local control switch having contact members operable to different positions for connecting either the trip means or the closing means to a source of electrical energy or connecting them to remote control conductors in different ones of the operating positions, and a remote control switch connected to the remote control conductors operable to different positions connected to selectively energize the trip and closing means.

5. A control system for a circuit breaker having an operating winding comprising trip means, a remote control switch operable to different positions connected to set up control circuits to effect energization of the operating winding or the trip means, and a local control switch operable to different positions connected to effect energization of the operating winding or the trip means or to complete the control circuits set up by the remote control switch.

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The following references are of record in the file of this patent:

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