Dec. 26, 1961 A. L. HUEHNEL 3,014,359

PADLOCK ATTACHMENT FOR CIRCUIT BREAKER DOOR

Filed Oct. 10, 1958 2 Sheets-Sheet 1

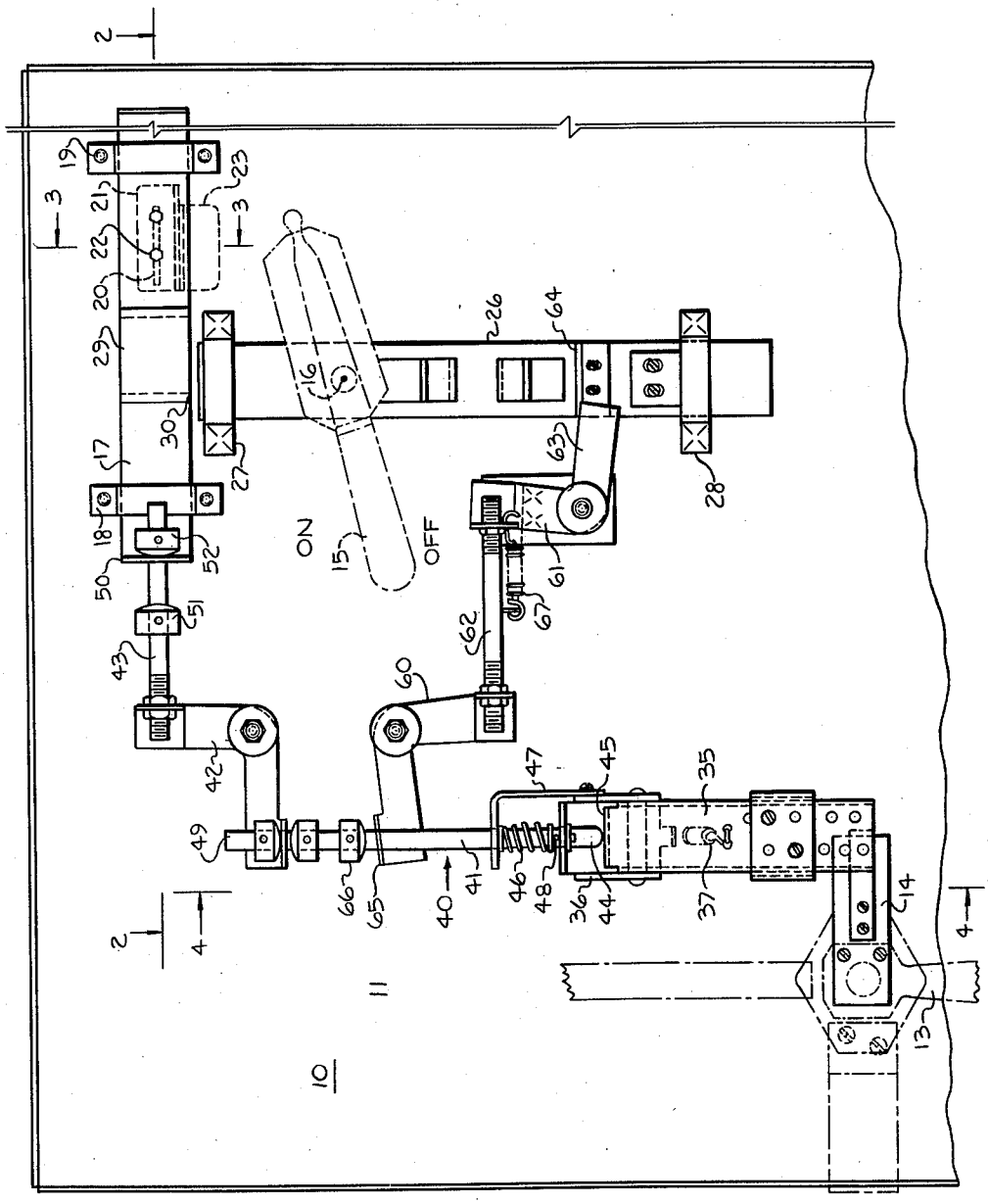


Fig. 1

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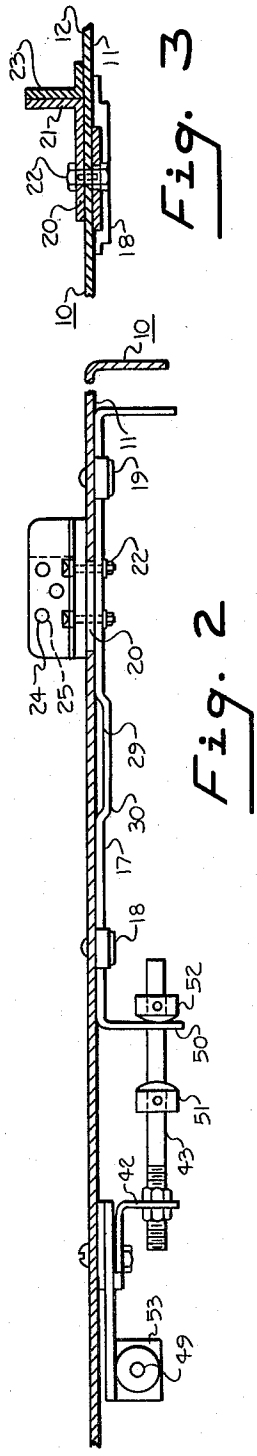


Fig. 3

Fig. 2

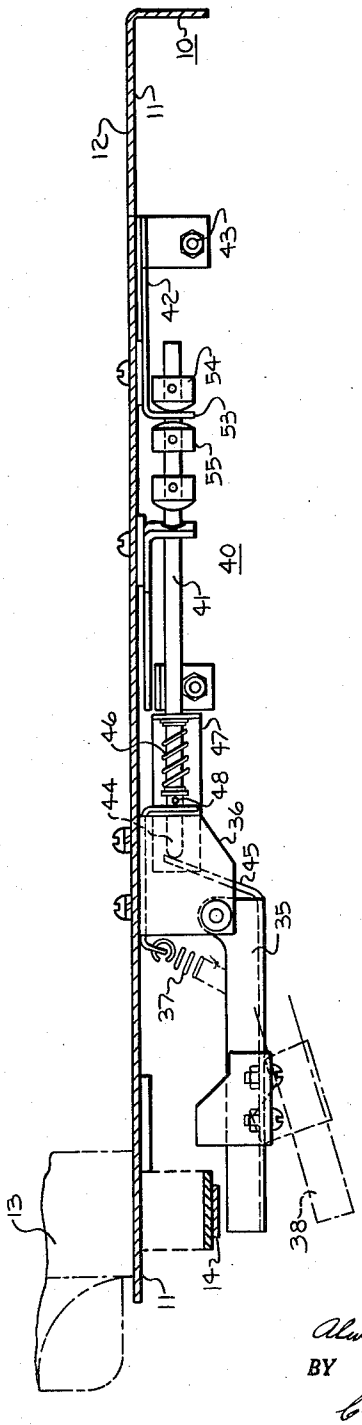


Fig. 4

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3,014,359 PADLOCK ATTACHMENT FOR CIRCUIT BREAKER DOOR

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4 Claims. (Cl. 70—212)

This invention relates to protective devices for the enclosures of circuit breakers, including a protective device so arranged that the cover or door handle can be turned to open position only while the circuit breaker operating handle is in off position and a padlock receivable locking device on the outside of the door is in an unlock position.

One of the objects of the present invention is to provide a protective device for a circuit breaker enclosed in a cabinet which will prevent the cabinet door being opened while the circuit breaker is closed or in one position.

Another object of the present invention is to provide an interlocking mechanism between a circuit breaker operating handle, a cabinet door handle, and a padlock receivable locking device which will allow the door handle to be moved to the open position only while the circuit breaker operating handle is in off position and the padlock receivable locking device is in unlock position.

A further object of the present invention is to provide a new and novel padlock receivable locking device which has a slide bar on the inside of the enclosure or cabinet in interlocking arrangement with the door handle and circuit breaker operating handle and a pair of angle or L-shaped members on the outside of the door, one of these members being stationarily fixed to the door and the other being secured to the slide bar for movement therewith, and both members having padlock pin receiving holes alignable to receive a pin or padlock to prevent sliding of the slide bar.

Other objects and a full understanding of the device will become apparent from the following description and the attached claims when taken in conjunction with the accompanying drawings which are not to scale and in which:

FIGURE 1 is a plan view of at least part of the inside of a circuit breaker enclosure cover or a door showing the protective device, the circuit breaker operating handle being illustrated in phantom to illustrate its relationship with the protective device;

FIGURE 2 is a view taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a view taken along the line 3—3 of FIGURE 1; and

FIGURE 4 is a view taken along the line 4—4 of FIGURE 1 and because of its length has been turned relative to the other figures on the same sheet.

A preferred modification of the invention is illustrated in the drawings for the purpose of exemplification and not for the purpose of limitation since it is understood that various details of the parts may be altered without departing from the spirit and scope of the invention as illustrated and hereinafter described and claimed.

The protective device for a circuit breaker (not shown) generally comprises a cover or door 10 for a cabinet which encloses the circuit breaker. This cover or door 10 has an inside surface 11 and an outside surface 12. Extending through the door is a door handle 13 which is pivotal between an open position and a closed position. In the drawings the handle 13 is illustrated in its closed position wherein it locks the door in closed position. The handle 13 has a latch engageable portion 14 next adjacent the inside surface 11 of the door 10.

In FIGURE 1 the circuit breaker handle 15 is illustrated in phantom as being pivotally movable about a pivot axis 16 between an off position and an on position. The handle 15 is illustrated in its off position and would be raised or pivotally moved generally upwardly or clockwise about pivot axis 16 in FIGURE 1 to an on position in which the circuit breaker would be closed or on. It is noted that pivot axis 16 moves upwardly and downwardly in FIGURE 1 between the on and off positions with handle 15 while the handle 15 pivots at least partially about the axis 16. When the handle 15 is in the off position the circuit breaker would be in the off position. The circuit breaker and handle are not illustrated or described in full detail since circuit breakers having handles which are pivotally moved are well known in the industry and since the present protective device may be used with any one of the many such circuit breakers.

FIGURE 1 illustrates the protective device as including a first slide bar 17 slidably mounted by means of brackets 18 and 19 on the inside surface 11 of the door 10 with the first slide bar 17 being slidable lengthwise between a lock position and an unlock position. The slide bar 17 is illustrated in FIGURES 1, 2, and 3 in the lock position and would be moved lengthwise to the left (FIGS. 1 and 2) to its unlock position. As further illustrated the door 10 has a slot 20 disposed behind the slide bar 17 with the slot extending lengthwise of the slide bar. On the outside of the door and next adjacent the outside surface thereof is an L-shaped member 21 which is secured to the slide bar 17 by bolts 22 or other suitable means extending through the slot 20 so that the L-shaped member on the outside of the door is moved between lock and unlock positions simultaneously with the movement of the slide bar 17.

To lock the slide bar in the lock position there is provided an angle member 23 which may also be L-shaped and which is welded or otherwise stationarily fixed to the outside surface of the door and which is aligned with the L-shaped member 21. The L-shaped member and the angle member have at least a pair of holes, such as the holes 24 and 25, respectively, which are externally of the door or circuit breaker cabinet and which are aligned to receive a padlock, pin or other suitable locking device while the slide bar 17 is in lock position. These holes 24 and 25 are of a size to prevent the insertion of a lock pin through both holes while the slide bar 17 is in an unlock position in which the holes are displaced from each other. If desired, and preferably, more than one pair of holes is provided so that more than one padlock may be locked onto the protective device at one time.

As further illustrated a second slide bar 26 is slidably mounted by means of brackets 27 and 28 on the inside surface of the door. This second slide bar 26 is operatively attachable to handle 15 at pivot axis 16 and thus is slidable lengthwise by the circuit breaker handle 15 in a direction transverse to the direction of the first slide bar 17 as circuit breaker handle 15 moves pivot axis 16 when it is moved between the on and off positions. When the circuit breaker handle 15 is moved to off position the second slide bar 26 is moved away from the first slide bar 17 and when the circuit breaker handle 15 is moved to the on position the slide bar 26 is moved towards the slide bar 17. As is further illustrated the slide bar 17 has a notch 29 aligned to receive the slide bar 26 to permit the slide bar 26 to slide in a direction towards a slide bar 17 when the slide bar 17 is in unlock position. The slide bar 17 also has interference means such as the bent portion 30 arranged to be abutted by the slide bar 26 and thereby prevent movement of the slide bar 26 in a direction towards the slide bar 17 when the slide bar 17 is in lock position. As illustrated the

slide bar 26 will abut the interference portion 30 of slide bar 17 while the slide bar 17 is in the position of FIGURE 1, thereby protectively locking the circuit breaker handle 15 in the off position when the slide bar 17 is in lock position. Naturally when the slide bar 17 is in unlock position, or moved to the left in FIGURE 1, the notch 29 will receive and thereby permit slide bar 26 to move upwardly so that the circuit breaker handle 15 may be pivoted to the on position.

There is also provided in the present protective device a latch means 35 which is engageable with the latch engageable portion 14 of the door handle 13. The latch 35 is pivotally carried by a support bracket 36 so that it normally hangs by its own weight in a latch position wherein it interferes with the latch portion 14 and prevents pivotal movement of the door handle 13. In addition to the positioning of the latch 35 in the latch position by its own weight there is a spring 37 having one end engaging the latch 35 and the other end secured to the support 36 to urge the latch 35 towards the latch position. When the latch 35 is pivoted outwardly from the inside surface 11 of the door to the position illustrated in phantom by lines 38 in FIGURE 4, the door handle 13 may be pivoted or turned.

There is further provided an interlocking mechanism interconnecting the slide bar 17 and the latch 35. This interlocking mechanism 40 includes a latch operating member 41, a lever 42, and a connecting rod 43. The latch operating rod 41 is slidably mounted on the inside surface of the door and has one end 44 abuttable against an operating end 45 of the latch member 35 in such manner that when the rod 41 is moved downwardly in FIGURE 1 the latch member 35 is pivoted to unlatch position to permit turning of the door handle 13. A compression spring 46, compressed between a portion 47 of the support 36 and a pin 48 in the rod 41, normally urges the rod 41 in the downward direction to move the latch member 35 to the unlatched position.

The lever 42 is pivoted on the inside surface of the door and has one end connected by the connecting rod 43 to one end of the slide bar 17 and the other end operatively connected to the top end 49 of the rod 41. In this instance it has been found desirable to provide the slide bar 17 with a bent end 50 through which the rod 43 extends and to provide the rod 43 with a pair of adjustments 51 and 52, one on each side of the end 50. Similarly the end of the lever 42 which is operatively engaged with the end 49 of the rod 41 has a portion 53 through which rod end 49 extends and on opposite sides of which are adjustments 54 and 55, respectively. These adjustments are so arranged that when the slide bar 17 is in the lock position the rod 41 is maintained in a position which compresses the spring 46 and allows the spring 37 to maintain the latch 35 in the latched position. Also when the slide bar 17 is in unlock position the spring 46 urges the rod 41 downwardly in FIGURE 1 to overcome spring 37 and move latch 35 to unlatch position.

The interlock mechanism 40 and more specifically rod 41, is also interlocked with slide bar 26 through levers 60 and 61 and a connecting rod 62 which interconnects the adjacent ends of levers 60 and 61. Lever 61 has its free or extreme end 63 abuttable against a portion 64 of the slide bar 26 and lever 60 has its free or extreme end 65 abuttable against a stop 66 on the rod 41. A spring 67, interconnected between the door 10 and the lever 61 normally urges the levers 60 and 61 and their connecting rod 62 to a position in which extreme end 65 abuts adjustment 66 to cause rod 41 to hold spring 46 in compression, thereby allowing latch 36 to be positioned in its latch position. The abutment 64 on slide bar 26 and the adjustment 66 on rod 41 are so positioned that when the handle 15 is in the off position the end 65 may be out of engagement with the adjustment 66 and when the handle 15 is in on position the end 65 cooperates with the abutment 66 to prevent the rod 41 from unlatching latch 35.

It is apparent that the present device performs the functions and objects of the invention by allowing the door handle 13 to be moved to open position only while the circuit breaker operating handle 15 is in the off position and the slide bar 17 is in the unlock position. When the slide bar 17 is in lock position it may be maintained in that position by inserting a padlock, pin, or the like, through the now aligned holes 24—25 to protectively prevent movement of the circuit breaker handle to the on position to close the circuit breaker. The slide bar 17 and the locking assembly, including the angle member 23 and the L-shaped member 21, thus provide an interlock, part of which is on the inside of the door 10, and part of which is on the outside of the door 10, with that part on the outside of the door adapted to receive a padlock to provide complete safety and protection for workers.

It should be understood that it is not desired to limit this invention to the exact details of the locking systems herein specifically shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A protective device for a circuit breaker having a handle pivotally movable between an off position and an on position and a cabinet for protectively enclosing said circuit breaker, said device comprising, a door for said cabinet and provided with an inside surface and an outside surface, a first slide bar slidably mounted on the inside surface of said door, and slidable lengthwise between a lock position and an unlock position, a slot in said door extending lengthwise and in continuous register with said first slide bar, a first member next adjacent the outside surface of said door and secured to said first slide bar for movement therewith, a second member stationarily fixed to said door and aligned adjacent to and with said first member, said first and second members having at least a pair of holes externally of said cabinet which are aligned to receive a padlock pin when the first slide bar is in said lock position and displaced to prevent the insertion of a lock pin in said pair of holes when the first slide bar is in said unlock position, a second hole bar on the inside surface of said door and slidable lengthwise by said circuit breaker handle in a direction transverse to the direction of sliding movement of said first slide bar and away from said first slide bar when the circuit breaker handle is moved to said off position and towards said first slide bar when the circuit breaker handle is moved to said on position, said first slide bar having notch means arranged in alignment with the second slide bar to permit the second slide bar to slide in a direction towards the first slide bar when the first slide bar is in said unlock position, said first slide bar having interference means arranged ot be abutted by said second slide bar and thereby prevent movement of the second slide bar in a direction towards the first slide bar when the first slide bar is in said lock position, thereby protectively locking the circuit breaker handle in said off position when the first slide bar is in said lock position and permitting movement of the circuit breaker handle between said off position and said on position when the first slide bar is in said unlock position.

2. The structure of claim 1 wherein said first and second members are of L-shaped cross section.

3. A protective device for a circuit breaker having a handle pivotally movable between an off position and an on position and a cabinet for protectively enclosing said circuit breaker, said device comprising door means for said cabinet and provided with an inside surface and an outside surface, first slide bar means slidably mounted on said door means and slidable lengthwise between a lock position and an unlock position, a slot in said door means extending lengthwise of said first slide bar means and in

continuous register with the first slide bar means, said first slide bar means extending through said slot and having one portion next adjacent the outside surface of said door means and another portion next adjacent the inside surface of the door means, said first slide bar means and said door means having means externally of said cabinet which are aligned to receive a padlock pin when the first slide bar means is in said lock position and displaced to prevent the receipt of a lock pin when the first slide bar means is in said unlock position, second slide bar means mounted on the inside of said door means and slidable lengthwise by said circuit breaker handle in a direction transverse to the direction of sliding movement of said first slide bar means and away from said first slide bar means when the circuit breaker handle is moved to said off position and towards said first slide bar means when the circuit breaker handle is moved to said on position, said first and second slide bar means having cooperative portions arranged to permit the second slide bar means to slide in a direction towards the first slide bar means when the first slide bar means is in said unlock position and to prevent movement of the second slide bar means in a direction toward the first slide bar means when the first slide bar means is in said lock position, thereby protectively locking the circuit breaker handle in said off position when the first slide bar means is in said lock position and permitting movement of the circuit breaker handle between said off position and said on position when the first slide bar means is in said unlock position.

4. A protective device comprising a door having an inside surface and an outside surface for a circuit breaker enclosure cabinet, a door handle extending through said door and pivotable between an open position and a closed position, said handle having a latch engageable portion adjacent the inside surface of said door, a circuit breaker handle for a circuit breaker pivotally movable between an off position and an on position, a first slide bar slidably mounted on the inside surface of said door and slidable lengthwise between a lock position and an unlock position, a slot in said door extending lengthwise of said first slide bar, a first L-shaped member adjacent the outside surface of said door, means extending through said slot and securing said first L-shaped member to said first slide bar for sliding movement therewith, a second L-shaped member stationarily fixed to the outside surface of the door and aligned with said first L-shaped member, said first and second L-shaped members having at least a pair of holes accessible externally of said cabinet which are aligned to receive a lock pin when the first slide bar is in said lock position and displaced to prevent the insertion of a lock pin in said pair of holes when the first slide bar is in the unlock position, a second slide bar on the inside surface of said door and slidable lengthwise by said circuit breaker handle in a direction transverse to the direction of sliding movement of said first slide bar, said second slide bar being movable away from said first slide bar when the circuit breaker handle is moved to said off position and towards said first slide bar when the circuit breaker handle is moved to said on position, said first slide bar having notch means arranged in alignment with the second slide bar to permit the second slide bar to slide in a direction towards the first slide bar when the first slide bar is in said unlock position, said first slide bar having interference means arranged to be abutted by said second slide bar and thereby prevent movement of the second slide bar in a direction towards the first slide bar when the first slide bar is in said lock position, thereby protectively locking the circuit breaker handle in said off position when the first slide bar is in said lock position and permitting movement of the circuit breaker handle between said off position and said on position when the first slide bar is in said unlock position, a spring biased latch engageable with the latch engageable portion of the door handle, said spring biased latch being biased by a spring to a first position to prevent movement of the door handle and movable to a second position permitting movement of the door handle between its closed and open positions, a latch actuator engageable with the spring biased latch, said latch actuator being biased by a spring to a normal position wherein it engages and moves the spring biased latch to its second position and movable to a retracted position wherein it is disengaged from the spring biased latch so the spring biased latch may move to its first position, a first interlock means interconnecting the first slide bar and the latch actuator, said first interlock means being arranged to move the latch actuator from its normal position to its retracted position as the first slide bar is moved from its locked to its unlock position and to permit the latch actuator to move from its retracted to normal position as the first slide bar is moved from its unlocked to locked position, a second interlock means interconnecting the latch actuator and the second slide bar, said second interlock means being arranged to move the latch actuator to its retracted position whenever the second slide bar is in a position in which the circuit breaker handle is in the on position and arranged to permit the latch actuator to move to its normal position when the second slide bar is in a position in which the circuit breaker handle is in the off position, said first and second interlock means each being constructed and arranged to independently move the latch actuator to its retracted position whereby said door handle can be moved to the open position so the door of the cabinet may be opened only while the circuit breaker handle is in the off position and and the first slide bar is in the unlock position.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,014,359 December 26, 1961

Alwin Leopold Huehnel

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 44, for "hole" read -- slide --; line 56, for "ot" read -- to --.

Signed and sealed this 15th day of May 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents