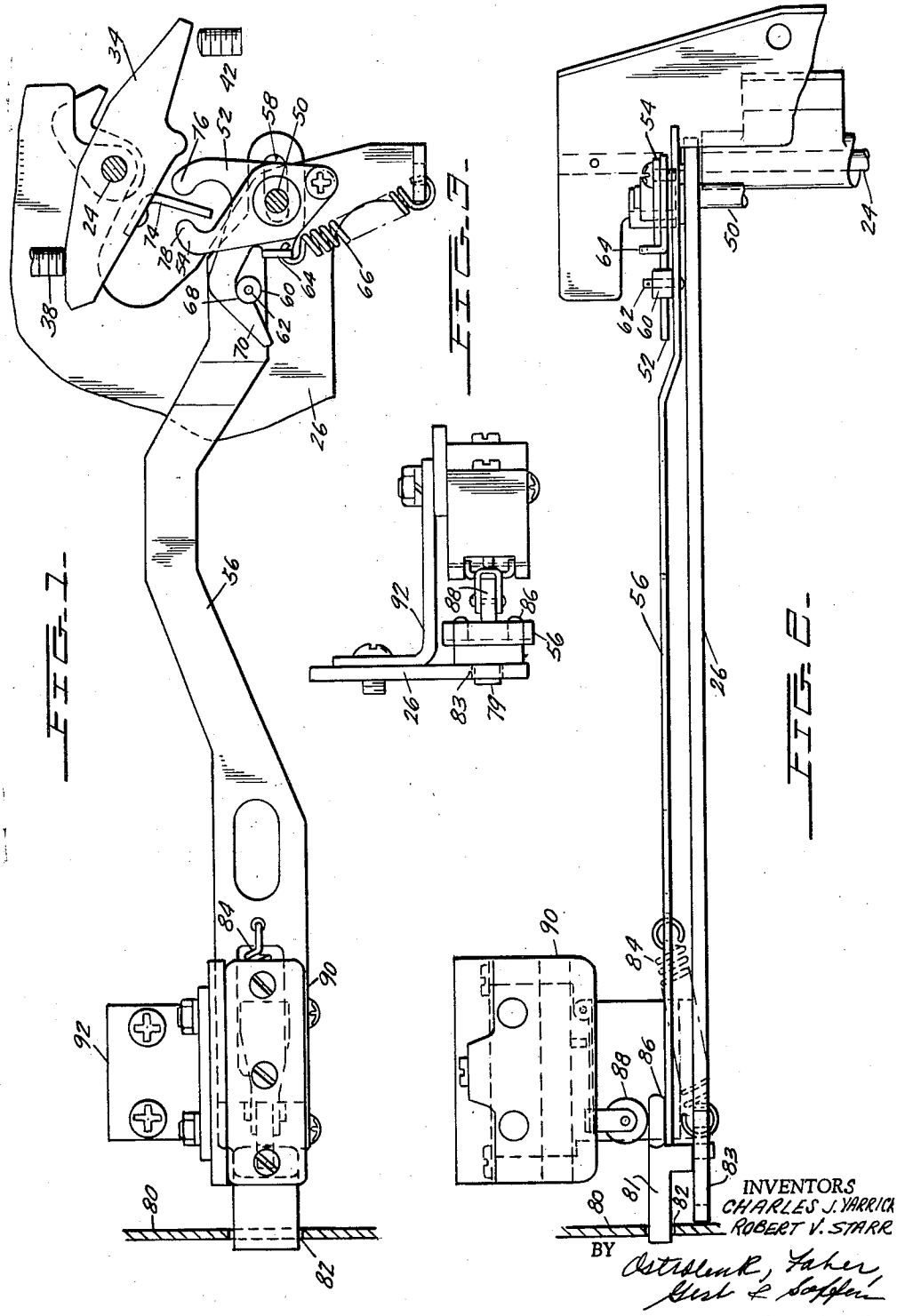
Dec. 25, 1962 C. J. YARRICK ET AL 3,070,682

AUTOMATIC TRIP INDICATOR AND LOCKOUT FOR CIRCUIT BREAKERS

Filed Feb. 17, 1959 4 Sheets-Sheet 1



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AUTOMATIC TRIP INDICATOR AND LOCKOUT FOR CIRCUIT BREAKERS

Filed Feb. 17, 1959 4 Sheets-Sheet 2

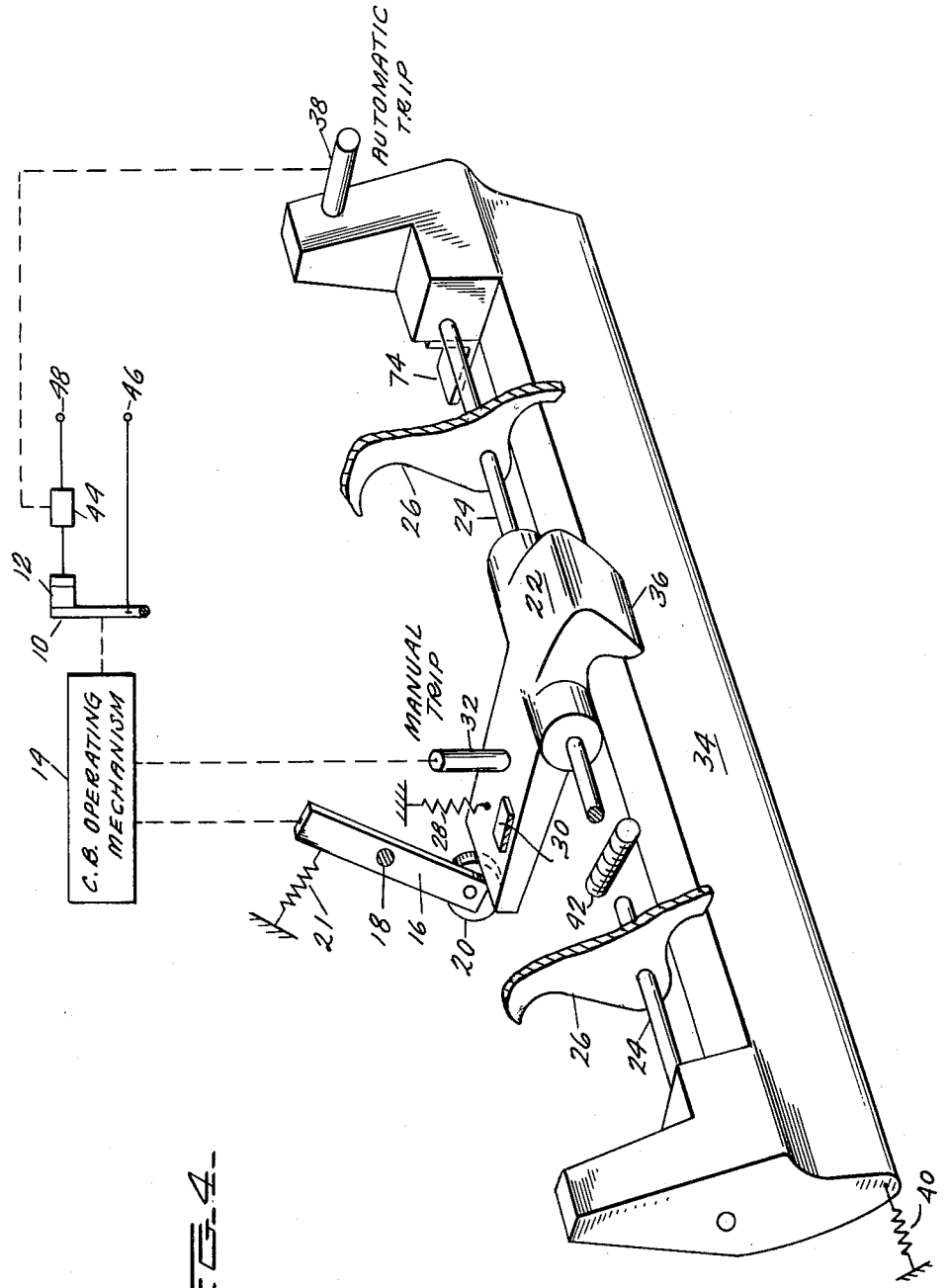


FIG. 4

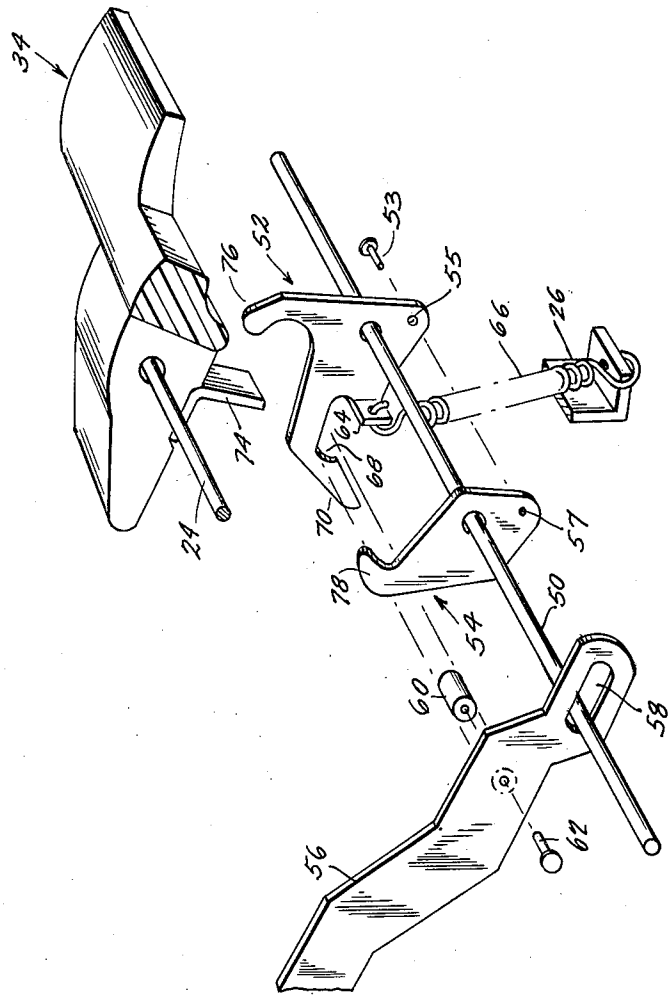
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AUTOMATIC TRIP INDICATOR AND LOCKOUT FOR CIRCUIT BREAKERS

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FIG. 5.



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AUTOMATIC TRIP INDICATOR AND LOCKOUT FOR CIRCUIT BREAKERS

Filed Feb. 17, 1959 4 Sheets-Sheet 4

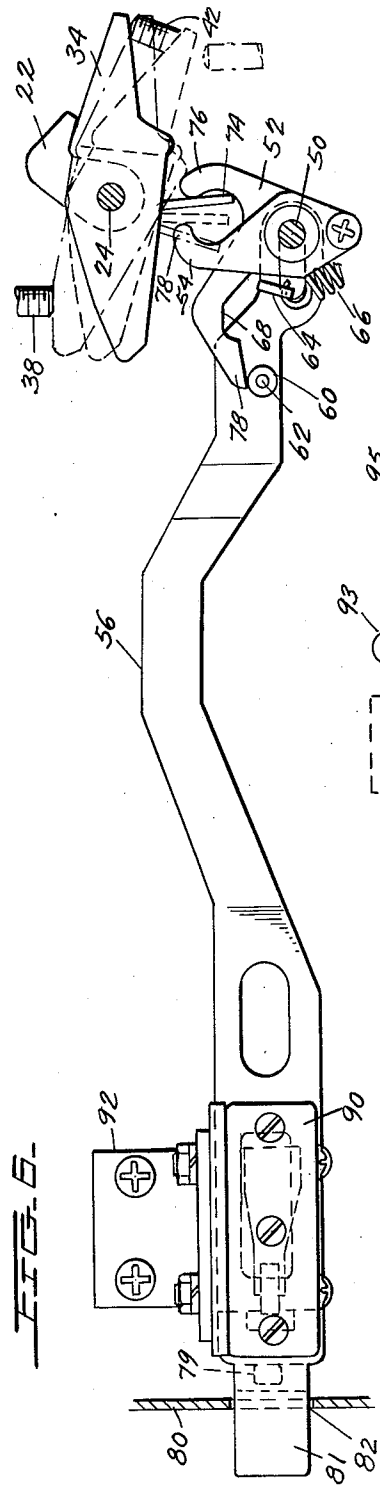


FIG. 6.

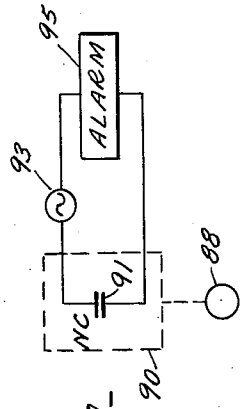


FIG. 8.

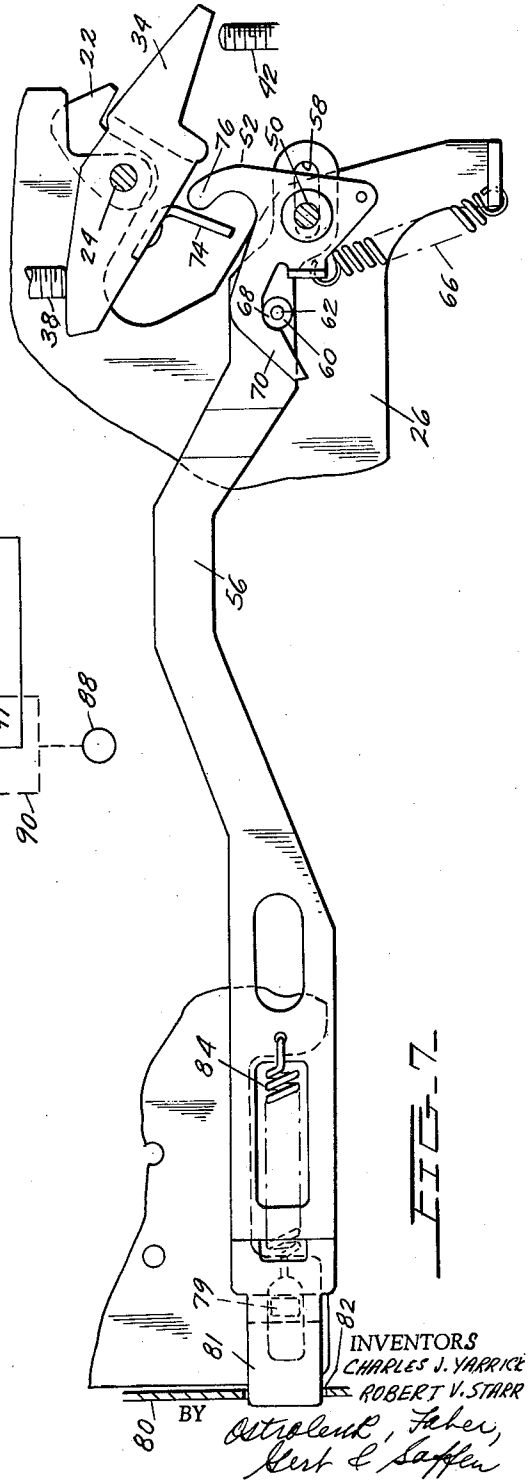


FIG. 7.

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AUTOMATIC TRIP INDICATOR AND LOCKOUT FOR CIRCUIT BREAKERS

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Filed Feb. 17, 1959, Ser. No. 793,725
7 Claims. (Cl. 200—167)

This invention relates to an indicating and lock-out means for circuit breakers wherein an indication of whether the circuit breaker has been automatically tripped or normally tripped is indicated by a perceivable indicating means, and the circuit breaker operating mechanism may be automatically locked out to require a manual resetting prior to reclosing the breaker.

In many circuit breaker applications, it is desirable to know whether the circuit breaker has been tripped automatically because of an overload or fault current, or whether the circuit breaker has been normally tripped by a manual operating means, or by a shunt trip means. This indication, in some instances, should be made at the circuit breaker, and, in some cases, at some remote control point, or both.

It is further desirable, in some instances, that the breaker be automatically locked out after the breaker is tripped so that a manual resetting operation is required in order to reclose the circuit breaker contacts. This will prevent the accidental closing of the circuit breaker by personnel not aware of the fact that the circuit breaker is open due to some fault on the line, and that the fault may still exist or be under repair.

The invention is primarily applicable to the type circuit breaker having a circuit breaker trip latch and a tripper bar associated with the trip latch. The circuit breaker trip latch latches some portion of the operating mechanism so as to maintain the circuit breaker contacts engaged and in its latched position. This circuit breaker trip latch may be directly operable by the circuit breaker manual operating means and by the shunt trip means, if such is provided. The tripper bar, however, is usually operated only by the automatic trip devices which operate responsive to either or both overload currents which flow for a predetermined time, or by short circuit currents due to severe faults on the line being protected or any other automatic trip device. Thus, there is an independent motion of the circuit breaker latch under normal circuit breaker operating conditions while both the tripper bar and the circuit breaker latch are moved responsive to automatic operating conditions.

We have taken advantage of this fact by causing our novel indicating and lockout means to be operable from the circuit breaker tripper bar. Therefore, the indicator means will be operated when the tripper bar is moved due to automatic interruption. However, under normal interruption where only the trip latch is operated, it will be apparent that the indicating means operatively connected to the tripper bar will not be operated.

In order to reset the circuit breaker latch mechanism after automatic operation, it is always required that the tripper bar be returned to its normal position. Therefore, by providing an auxiliary latch means for the indicator, we further cause lockout of the latch mechanism by preventing the tripper bar from returning to its normal position after an automatic operation through auxiliary mechanism associated with the indicating means.

Accordingly, the primary object of this invention is to provide a novel trip indicator for circuit breakers which perceivably indicates the difference between an automatic operation and a manual operation.

Another object of this invention is to provide a novel trip indicator device for circuit breakers which also provides lockout of the circuit breaker mechanism to prevent reclosing of the breaker until a manual operation is performed.

A further object of this invention is to provide a novel automatic trip indicator for circuit breakers which gives a perceivable indication of automatic trip operation at either or both the circuit breaker location and a location remote from the circuit breaker.

A further object of this invention is to provide a novel trip indicator which may be associated with the lockout means for a circuit breaker which is extremely simple in construction and may be conveniently added to equipment in present use.

These and other objects of this invention will become apparent from the following description when taken in connection with the drawings, in which:

FIGURE 1 shows a side view of our novel automatic trip indicator and lockout mechanism in connection with a typical circuit breaker trip mechanism.

FIGURE 2 is a bottom view of the mechanism of FIGURE 1.

FIGURE 3 is a front view of the reset button and alarm contact switch of FIGURES 1 and 2.

FIGURE 4 is a perspective view of a typical circuit breaker and tripper bar, and further schematically illustrates the manner in which this trip mechanism is associated with the circuit breaker.

FIGURE 5 is an exploded perspective view of the trip indicator and lockout mechanism of FIGURES 1 and 2.

FIGURE 6 is similar to FIGURE 1, and illustrates the operation of the mechanism of FIGURE 1 under automatic trip conditions.

FIGURE 7 illustrates the manner in which the mechanism of FIGURE 1 may be modified when it is only desired to indicate an automatic trip operation at the circuit breaker location.

FIGURE 8 illustrates a typical circuit diagram of the manner in which the automatic trip indicator operates an alarm contact for controlling a remote circuit or an audible or visible alarm means.

Referring first to FIGURE 4, there is schematically illustrated a typical circuit breaker and the manner in which it is associated with a trip latch mechanism. Thus, a movable circuit breaker arm and contact 10 are movable into and out of engagement with a stationary contact 12. The operating mechanism for the movable contact structure 10 is schematically illustrated as block 14. Since the specific structure of this operating mechanism is not necessary in the understanding of the present invention, it is believed sufficient to show it in this schematic manner. However, one typical mechanism that could be used is fully described in copending application Serial No. 773,468 filed November 12, 1958, now abandoned, entitled Control Mechanism for Spring Close Circuit Breakers in the names of Charles J. Yarrick and Einer H. Fredrickson, which is herein incorporated as part of the present specification.

Generally, the circuit breaker operating mechanism is associated with a pivotally supported roller arm 16 which is pivoted at a fixed pivot 18 and carries a latch roller 20. The latch roller 20 is normally latched by a circuit breaker latch 22 which is pivotally carried on shaft 24, which, as is seen in FIGURE 1, is carried from the mechanism housing fragmentarily shown as housing portion 26. The circuit breaker latch 22 is normally biased by a biasing means 28 to rotate clockwise against a stop means 30.

For purposes of clarity, the complete circuit breaker latch mechanism is only shown in FIGURE 4, while the remaining figures only show the tripper bar engaging portion latch member 22.

As further schematically illustrated in FIGURE 4, a manual trip pin 32 is operatively connected with the circuit breaker operating mechanism so that the pin 32 will be depressed responsive to a normal operation of operating mechanism 14, such as a manual operation or a shunt trip operation. By depressing pin 32, it is apparent that latch 22 will rotate counter-clockwise about shaft 24 so that roller 20 will be released to permit member 16 to rotate by virtue of a biasing means 21 in a counter-clockwise direction about pivot 18 so as to cause the operating mechanism 14 to separate the circuit breaker contacts.

Shaft 24 further pivotally carriers a tripper bar 34 which bridges the latch 22 and has a portion fitting under the outwardly extending portion 36 of circuit breaker latch 22. Therefore, it will be apparent that when tripper bar 34 rotates in a counter-clockwise direction about shaft 24, it will pick up latch 22 and rotate latch 22 counter-clockwise to allow latch roller 20 to move. The tripper bar 34 is normally biased in the clockwise direction against a stop member 38 by means of a biasing spring 40, this being shown only in FIGURE 4, and not shown in the remaining figures, in order to simplify these figures.

In order to operate tripper bar 34 against bias 40 so as to cause subsequent operation of latch roller 20, a tripping screw 42 is associated with some desired type of automatic trip mechanism (not shown) which is connected in series with terminals 46 and 48 of the circuit including circuit breaker contacts 10 and 12. The mechanism (not shown) for example, will become operative when a short circuit current flows between terminals 46 and 48 so as to depress pin 42 and thus rotate tripper bar 34 in a counterclockwise direction against the biasing force of spring 40. As above mentioned, this will cause a subsequent operation of the circuit breaker movable contact through the release latch roller 20 and operation of the circuit breaker operating mechanism 14.

The mechanism described above is typical of that used in many circuit breaker applications. The purpose of the present invention is to adapt this mechanism in an economical manner with a trip indicating means which may be further used as a lockout means which will give a perceivable indication of whether the circuit breaker operated due to manual trip or automatic trip, and will further lock out the circuit breaker in the event that the circuit breaker operated due to the automatic trip. This mechanism is best seen in FIGURES 1, 2, 3 and 5, and comprises a shaft 50 which is supported below shaft 24 which carries the latch mechanism, and is carried by the mechanism housing 26 in the same manner as is shaft 24.

It will be noted from the following that shaft 50 carries all of the mechanism required for the trip indication and lockout, and may be conveniently adapted to equipment presently in operation so long as they have an independent circuit breaker latch and tripper bar.

Shaft 50 then pivotally mounts an indicator latch 52 and a lockout plate 54. Members 52 and 54 are caused to move as an integral body by virtue of the removable fastening means 53 which extends through apertures 55 and 57 of members 52 and 54 respectively to interconnect them at that point. As will be described hereinafter with reference to FIGURE 7, the lockout plate 54 may be omitted where it is only desired to obtain automatic trip indication without the lockout feature. Shaft 50 further carries an indicator member or link 56 which has a slot 58 at the end thereof which receives shaft 50. Indicator link 56 further carries a roller 60 which is connected thereto by any desired fastening means 62 in a manner well known in the art.

Indicator latch 52 has a protruding ear 64 which, as seen best in FIGURES 1 and 5, carries a biasing spring 66 which is connected to a portion of mechanism housing 26. This normally biases indicator latch 56 counter-clockwise about shaft 50 so that latching depression 68 of protruding end 70 normally engages roller 60 carried by link 56, as best seen in FIGURE 1, and as illustrated in dotted lines in FIGURE 5.

An indicator latch actuator is riveted to tripper bar 34, as seen in the figures. The indicator latch actuator 74 is the member which interconnects the latch system of the breaker to the automatic trip indicator, and in order to adapt an existing circuit breaker with the trip indicator of this invention, it is only necessary that this additional member 74 be added to the circuit breaker latch mechanism. As best seen in FIGURE 1, the latch actuating member 74 is positioned between protruding fingers 76 and 78 of indicator latch 52 and lockout plate 73 respectively.

As shown in FIGURES 1, 2 and 3, the indicator link 56 extends from the latch mechanism toward the front of the circuit breaker, as partially shown by escutcheon front plate 80. The extreme left-hand end of link 56 is terminated in an indicator button 81 which protrudes through aperture 82 and has a protruding portion 79 guided in a slot 83 of housing 26. Thus, the link 56 is supported at either end by slot 83 in mechanism housing 26, and by shaft 50 which is carried by the mechanism housing.

Button 81 may be made of translucent material so that when it is inside escutcheon plate 80, and there is very little side lighting, it is dark and obscure, but, when moved forward and out of the escutcheon, the side light makes it bright and illuminates the front lettered surface.

The left-hand portion of link 56 is, as seen in FIGURES 1 and 2, provided with a biasing spring 84 which has its right-hand end connected to link 56 and its left-hand end connected to the mechanism housing 26. Accordingly, biasing spring 84 normally biases indicator link 56 and button 81 to the left, this motion being defeated by the engagement between latch depression 68 of indicator latch 52 and roller 60 of link 56.

As best seen in FIGURE 2, indicator button 81 has an overlapping section 86 with link 56 at which the two members are fastened as by riveting or any other desired manner. This overlapping portion 86 is used as an actuating cam for roller 88 of switch 90. Switch 90 is fastened to the mechanism housing 26 by means of bracket 92, as best seen in FIGURE 3. The switch 90 may be of any standard type well known in the art.

For illustrative purposes, switch 90 is schematically shown in FIGURE 8 as comprising a normally closed contact 91 which is operatively connected to roller 88. Contact 91 is connected in series with a voltage source 93 and alarm or signal 95 which is connected to source 93 when cam 86 permits roller 88 to drop.

The manner in which the indicator device operates may now be considered with particular reference being made to FIGURE 6. FIGURE 6 shows three positions of the tripper bar 34. The dot-dash line position illustrates the tripper bar during normal operating conditions where the latch member 22 would normally latch the operating mechanism in its closed position. The dotted line position of tripper bar 34 illustrates an intermediate position of the tripper bar under automatic operation and at the point at which the circuit breaker latch 22 is picked up by the tripper bar 34. Finally, the solid line position illustrates the fully operated position for the tripper bar 34.

Assuming now that, due to some automatic trip condition, the pin 42 is moved from its dot-dash position of FIGURE 6 to the solid position of FIGURE 6, it is clear that tripper bar 34 will be rotated counterclockwise about shaft 24. This motion will cause indicator latch actuator 74 to move into engagement with finger 76 of indicator latch 52 to begin to rotate indicator latch 52 clockwise about shaft 50. As soon as indicator latch 52 has rotated sufficiently to remove the latch detent 68 from roller 60 of link 56, the link 56 will be driven to the left under the influence of biasing spring 84, and thus cause button 81 to be moved outwardly through the escutcheon front plate 80, as shown in FIGURE 6 to indicate an automatic trip operation. Note that if the operation had been a manual

one and due only to the rotation of the breaker latch 22, the tripper bar 34 would never be moved so that the indicator latch 52 will remain latched with link 56.

Furthermore, under the automatic operation, the leftward motion of link 56 will cause cam 86 to be removed from roller 88 of switch 90 to thereby actuate switch 90 in order to cause the operation of alarm 95 of FIGURE 8 which may be at the breaker, or at a remote station, or both.

In order to prevent the resetting of the circuit breaker by personnel who are unaware of the reason for its operation, the lockout plate 54 is so associated with latch actuator 52 that it is rotated therewith from the position of FIGURE 1 to the position of FIGURE 6. So long as it is in this position, an attempt to reset tripper bar 34 fails, because the indicator latch actuator 74 which must be rotated clockwise during the resetting of the tripper bar 34 engages finger 78. However, since indicator latch 52 is prevented from rotating in a counterclockwise direction because of the engagement between end 70 and roller 60, the lockout plate 76 cannot rotate, and the tripper bar 34 cannot be reset. This, of course, reminds the operator that the automatic trip indicator must be reset, and he is, therefore, aware of the occurrence of an automatic trip operation.

Once the operator is certain that it is safe to reclose the breaker, he can reset the mechanism by depressing button 81. This will cause roller 60 to move into detent 68 while biasing spring 66 pulls the indicator latch 52 and lockout plate 54 in a counterclockwise position to latch link 56 in the reset position, and to permit tripper bar 34 to be rotated to its reset position, as shown in FIGURE 1.

As seen from the above, our novel invention permits lockout by means of the additional lockout plate 54 which is removably connected to indicator latch 52. If lockout is not desired in a particular application, the lockout plate 54 may be removed with only the indicator latch 52 remaining in place. This condition is shown in FIGURE 7 whereby operation of the indicator link 56 is identical to that described for the case of FIGURE 6, with the exception of its being possible to reset tripper bar 34 without resetting the indicator mechanism.

Note that FIGURE 7 also has excluded the use of the contact device for purposes of automatic alarm, since the sole purpose of the structure of FIGURE 7 is to cause a local indication at the breaker of the reason for the tripping of the circuit breaker. Thus, if the circuit breaker is tripped and button 81 is not ejected through the escutcheon front plate 80, the operator knows that the breaker was manually operated, while, if the button is ejected, the operator knows that the breaker was operated due to operation of one of the automatic trip elements of the circuit breaker.

Although we have described preferred embodiments of our novel invention, many variations and modifications will now be obvious to those skilled in the art, and we prefer therefore to be limited not by the specific disclosure herein but only by the appended claims.

We claim:

1. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaegd positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation.

2. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a lockout bar having a first arm engageable with said extension; fastening means securing said lockout bar to said release

member to prevent movement of said second latch member when said reciprocating member is in said second position.

3. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a lockout bar having a first arm engageable with said extension; fastening means securing said lockout bar to said release member to prevent movement of said second latch member when said reciprocating member is in said second position; said release member having a first arm engageable with said extension and being further adapted to prevent resetting of said circuit breaker prior to resetting of said indicator means to said first position.

4. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first postion to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a lockout bar having a first arm engageable with said extension; fastening means securing said lockout bar to said release member to prevent movement of said second latch member when said reciprocating member is in said second position; said release member having a first arm engageable with said extension and being further adapted to prevent resetting of said circuit breaker prior to resetting of said indicator means to said first position; alarm means the end of said reciprocating arm opposite said roller having a notched portion positioned adjacent said alarm means, said notched portion adapted to energize said alarm means when said reciprocating member is moved to said second position.

5. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a

reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a biasing member connected to said release member being adapted to urge said release member second arm into locking engagement with said roller when said reciprocating member is in said first position, said extension means being adapted to urge said second arm out of engagement with said roller against the force of said biasing member.

6. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a biasing member connected to said release member being adapted to urge said release member second arm into locking engagement with said roller when said reciprocating member is in said first position, said extension means being adapted to urge said second arm out of engagement with said roller against the force of said biasing member; a second biasing member connected to said reciprocating arm and adapted to urge said reciprocating arm towards said second position when said roller is disengaged from said release member second arm.

7. An indicator means for a circuit breaker; said circuit breaker comprising a pair of cooperable contacts movable between an engaged and disengaged position, an operating mechanism connected to at least one of said pair of cooperable contacts for moving said cooperable contacts between their said engaged and disengaged positions, a manual operating means, an automatic operating means and a latch means; said latch means including a first and second latch member; said first latch member being connected to said operating mechanism; said operating mechanism maintaining said pair of cooperable contacts engaged when said first latch member is in a first latched position; said operating mechanism disengaging said pair of cooperating contacts when said first latch member is in a second unlatched position; said second latch member being movable independently of said first latch member; said second latch member being movable into engagement with said first latch member to move said first latch member from its said first position to its said second position; said manual operating means being movable in engaged position with said first latch member to move said first latch member from its said first position to its said second position independently of said second latch member when said circuit breaker is manually operated; said automatic operating means being movable to an engaged position with said second latch member to move said second latch member into engagement with said first latch member responsive to operation of said automatic operating means; said indicator means being connected to said second latch member; said indicator means being moved from first position to a second position responsive to operation of said automatic operating means and said movement of said second latch member into engagement with said first latch member; said indicator means including a release member having first and second arms, said second latch member having an extension abutting said first arm; a reciprocating arm biased in a first direction; said reciprocating arm having a roller engageable with said second arm to lock said reciprocating arm in a first position against said bias; said first arm adapted to rotate said release member upon engagement with said extension to release the reciprocating arm roller to permit said reciprocating arm to move in said first direction to a second position indicative of the occurrence of an automatic trip operation; a biasing member connected to said release member being adapted to urge said release member second arm into locking engagement with said roller when said reciprocating member is in said first position, said extension means being adapted to urge said second arm out of engagement with said roller against the force of said biasing member; a second biasing member connected to said reciprocating arm and adapted to urge said reciprocating arm towards said second position when said roller is disengaged from said release member second arm, the end of said reciprocating arm adjacent said alarm means being manually movable to reset said indicator means; said release member first arm being adapted to prevent manual resetting prior to resetting of said circuit breaker.

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