Sept. 11, 1962 G. J. GEISSNER ET AL 3,053,958

CIRCUIT BREAKER HANDLE BAFFLE

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FIG. 1.

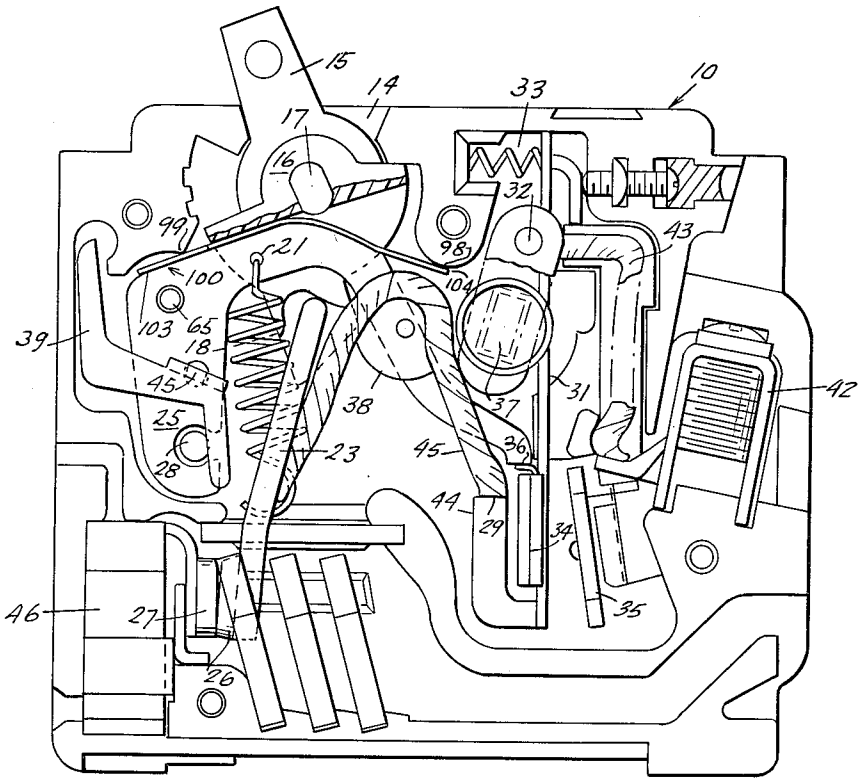
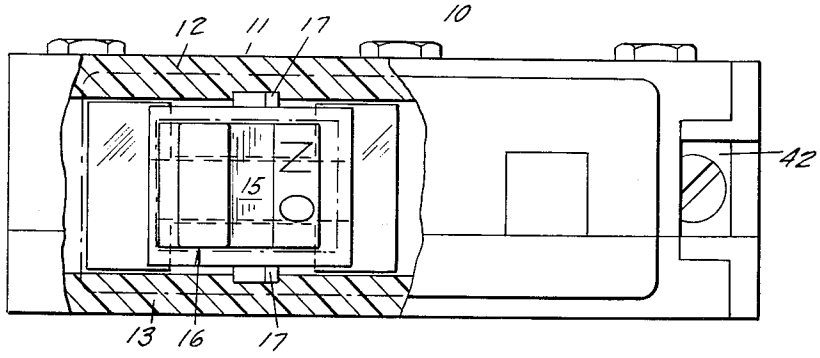


FIG. 4.



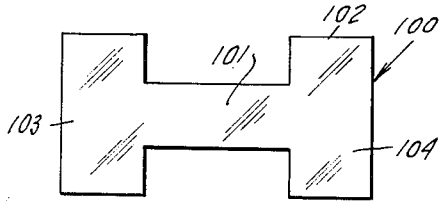


FIG. 6.

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FIG. 2.

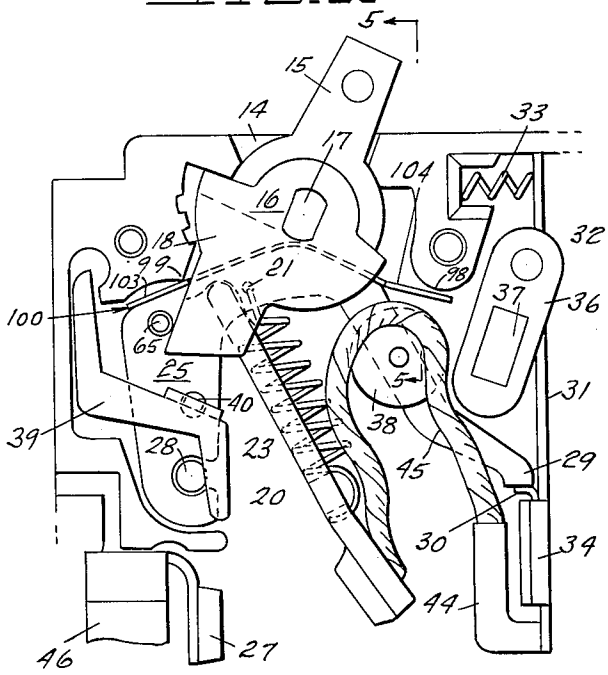
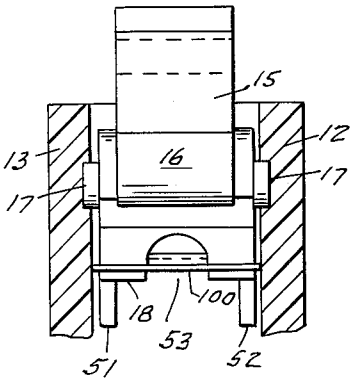


FIG. 5.



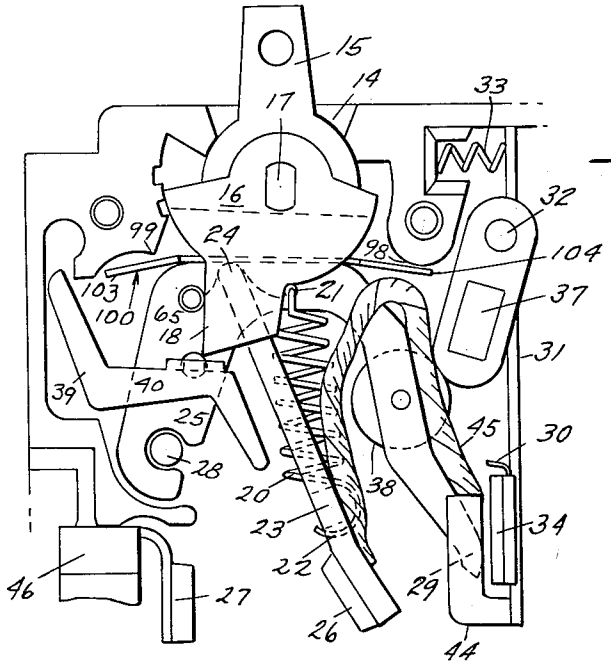


FIG. 3.

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CIRCUIT BREAKER HANDLE BAFFLE

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Filed Nov. 19, 1959, Ser. No. 854,094
4 Claims. (Cl. 200—168)

The instant invention relates to circuit breakers in general and more particularly to a novel sealing means which prevents flame and other ionized particles from coming out of the circuit breaker case through the opening providing for the manual operating handle.

Today circuit breakers for home and light industrial applications, say in the ratings between 10 and 100 amperes, are usually constructed with a molded insulating case and a manual operating handle which is pivoted close to the handle opening in the case. Such a construction is illustrated in detail in the Felix E. Myers copending application Serial No. 807,885, filed April 21, 1959, now Patent No. 2,996,589, issued August 15, 1961, entitled "Pivoted Bimetal," and assigned to the assignee of the instant invention.

With this type of construction, it is extremely difficult to prevent ionized particles produced during circuit interruption from coming out of the handle opening. Thus, when the circuit breaker is being closed on a short circuit, or high amplitude fault, the operator manually closing the breaker is in great danger of being burned.

The prior art has attempted to solve this problem by providing a shield that moves with the contact arm and attempts to confine flame and ionized particles to a region other than the handle section. Another prior art method comprises the utilization of a grease in the handle section that was intended to close off the portions of the handle opening not occupied by the handle. In practice both of these arrangements have been found to be unsatisfactory.

The instant invention solves the previously recited problem by providing an H-shaped sealing member which is constructed of insulating sheet material. The sheet material is in the order of .008 inch thick and is comprised of a fiber so as to be flexible. The web of the H is placed in a handle recess in such a position that the openings along the top and bottom of the handle are protected. There is further sealing as the gases, during interruption, tend to force the fiber sheet against the boundaries defining any openings in the handle region, thus forming a seal which prevents any flame or particles from coming out of the handle opening.

Accordingly, a primary object of the instant invention is to provide a novel means for preventing flame and other ionized particles from coming out of a circuit breaker handle opening.

Another object is to provide a novel handle baffle for molded case circuit breakers in which the handle of the circuit breaker is pivoted close to the handle opening.

Still another object is to provide a novel circuit breaker handle baffle which comprises an H-shaped member constructed of flexible insulating sheet material.

These as well as other objects of the instant invention shall become readily apparent after reading the following description of the accompanying drawings in which:

FIGURE 1 is a side elevation of a circuit breaker including the sealing baffle means of the instant invention. The near portion of the housing has been removed to reveal the internal mechanism of the circuit breaker which is in the On position.

FIGURES 2 and 3 are fragmentary views of the circuit breaker mechanism. In FIGURE 2 the circuit breaker

is in the manual open position while in FIGURE 3 the circuit breaker is in the tripped position.

FIGURE 4 is a plan view of the circuit breaker of FIGURE 1.

FIGURE 5 is a cross-section taken through line 5—5 of FIGURE 2 looking in the direction of arrows 5—5 and illustrates the pivotal mounting of the manual operating handle.

FIGURE 6 is a plan view of the sealing baffle.

Now referring to the figures, circuit breaker **10**, with the exception of sealing means **100**, is described in detail in the aforesaid copending application, Serial No. 807,885, filed April 21, 1959, now Patent No. 2,996,589, entitled "Pivoted Bimetal."

Briefly, circuit breaker **10** comprises a molded housing **11** separable into two sections **12, 13**. When the housing sections **12, 13** are mated an opening **14** is formed at the top thereof for operating handle **15** which forms a portion of manual operating member **16**.

Operating member **16** includes projecting pivot portions **17** which are received by cavities in housing section **12, 13** (FIGURE 5) to provide a pivotal connection between operating member **16** and housing **11**. Manual operating member **16** further includes an operating portion **18** which is positioned internally of housing **11** and extends from pivot **17** in a direction opposite to the extension of operating handle **15**.

Main operating spring **20** is secured at **21** to operating cradle **25** and at **22** to movable contact arm **23**. The upper end of contact arm **23** is pivoted at **24** to operating portion **18** while the lower end of contact arm **23** carries movable contact **26** which in the closed position of circuit breaker **10**, is in engagement with stationary contact **27**. Cradle **25** is a releasable member pivotally mounted to case formation **28**.

Cradle **25** includes a latch tip **29** which is engaged by latch **30** to restrain cradle **25** in the reset position of FIGURES 1 and 2. Latch **30** is carried by arm **31** which is pivoted to housing **11** at **32** and is biased in a clockwise direction about pivot **32** by compression spring **33**. Arm **31** comprises a bimetal element which, when heated, deflects so as to move latch **30** to the right with respect to FIGURE 1. Magnet **34** is carried by bimetal **31** at the lower end thereof and cooperates substantially with stationary armature **35** to provide an instantaneous trip means for circuit breaker **10**.

Member **36**, having rectangular opening **37**, is also pivoted at **32** and, as explained in the aforesaid Patent No. 2,996,589, provides a convenient means for manually interconnecting a plurality of circuit breaker **10** for simultaneous automatic operation. Roller **38**, carried by releasable cradle **25**, is engageable with member **36** for operation thereof when latch tip **29** is released by latch **30**. Z-shaped kicker **39** is pivotally carried at **40** to cradle **25** and is engageable with contact arm **23** upon automatic tripping of circuit breaker **10** so as to apply a force which pries contacts **26, 27** apart.

The current path through circuit breaker **10** comprises load terminal **42**, braid **43**, bimetal **31**, conducting element **44**, braid **45**, contact arm **23**, movable contact **26**, stationary contact **27** and female stab type line terminal **46**.

The operating portion **18** of manual operating member **16** includes spaced arms **51, 52** which straddle cradle **25** and form a recess **53** in which the web **101** of baffle means **100** is disposed. Arm **51** engages cradle pin **65** to rotate cradle **25** counterclockwise from the released position of FIGURE 3 to the latched position of FIGURE 2.

Sealing baffle means **100** comprises a generally H-shaped member **102** constructed of thin sheet material, preferably a flexible fibre insulating material such as fish paper. The web **101** of member **102** is positioned to ex-

tend perpendicular to the pivotal connection between annual operating member **16** and housing **11** formed by pivots **17**. Baffle member **102** is maintained in operative position by being interposed between cradle **25** and the portions of operating member **16** between pivots **17**.

It is to be noted that the handle pivots **17** are positioned extremely close to the handle opening region **14** of housing **11**. It is also to be noted that pivot **17** is interposed between baffle member **102** and handle opening **14**.

During circuit interruption by circuit breaker **10**, the ionized gases formed between cooperating contacts **26**, **27** create a pressure within housing **11** which forces the sides **103**, **104** of the H-shaped member **102** upward to form a gas seal. That is, side **103** is forced against the internal formation **99** of housing **11** and side **104** is forced against internal formation **98** of housing **11**.

Thus, we have provided novel means for sealing handle opening **14** during circuit interruption. The novel means comprises the simple inexpensive H-shaped member **102** which is operatively positioned without altering existing circuit breaker constructions.

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

We claim:

1. A circuit breaker including a housing, a manual operating member, means providing a pivotal connection between said operating member and said housing, said operating member including an operating handle extending through an opening in said housing and projecting beyond the confines of said housing; a sealing means operatively positioned and constructed to close off portions of said opening not occupied by said operating member; said sealing means comprising a sheet-like member constructed of flexible material; said operating member also including an operating portion disposed within said housing; said operating handle and said operating portion extending from said pivotal connection in opposite directions; said operating portion having a recess; said sheet-like member having a first portion thereof disposed within said operating portion recess; the ends of said sheet-like member being relatively stationary with respect to motion of said operating handle.

2. A circuit breaker including a housing, a manual operating member, means providing a pivotal connection between said operating member and said housing, said operating member including an operating handle extending through an opening in said housing and projecting beyond the confines of said housing; a sealing means operatively positioned and constructed to close off portions of said opening not occupied by said operating member; said sealing means comprising a generally H-shaped member; said operating member also including an operating portion disposed within said housing; said operating handle and said operating portion extending from said pivotal connection in opposite directions; said operating portion having a recess; said H-shaped member having it web disposed within said operating portion recess, the ends of said H-shaped member being relatively stationary with respect to motion of said operating handle.

3. A circuit breaker including a housing, a manual operating member, means providing a pivotal connection between said operating member and said housing, said operating member including an operating handle extending through an opening in said housing and projecting beyond the confines of said housing; a sealing means operatively positioned and constructed to close off portions of said opening not occupied by said operating member; said sealing means comprising a generally H-shaped member; said operating member also including an operating portion disposed within said housing; said operating handle and said operating portion extending from said pivotal connection in opposite directions; said operating portion including a pair of arms spaced to form a recess therebetween; said H-shaped member having its web disposed within said operating portion recess; said pivotal connection being interposed between said H-shaped member and said housing opening, the ends of said H-shaped member being relatively stationary with respect to motion of said operating handle.

4. A circuit breaker including a housing, a manual operating member, means providing a pivotal connection between said operating member and said housing, said operating member including an operating handle extending through an opening in said housing and projecting beyond the confines of said housing; a sealing means operatively positioned and constructed to close off portions of said opening not occupied by said operating member; said sealing means comprising a generally H-shaped member; said operating member also including an operating portion disposed within said housing; said operating handle and said operating portion extending from said pivotal connection in opposite directions; said operating portion including a pair of arms spaced to form a recess therebetween; said H-shaped member having its web disposed within said operating portion recess, the ends of said H-shaped member being relatively stationary with respect to motion of said operating handle; said circuit breaker also including a pair of cooperating contacts and a latchable cradle which when latched permits said cooperating contacts to be operated to and maintained in engagement; said cradle being operatively positioned to maintain said web within said operating portion recess.

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2,829,222	Dunham	Apr. 1, 1958
2,996,589	Myers	Aug. 15, 1961