

March 17, 1959

F. G. SCHMIDT

2,878,347

SEALING MEANS FOR MOLDED CASE BREAKER OPERATING HANDLE

Filed March 31, 1955

FIG. 1

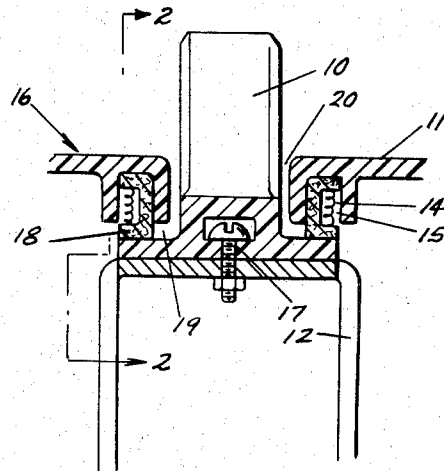
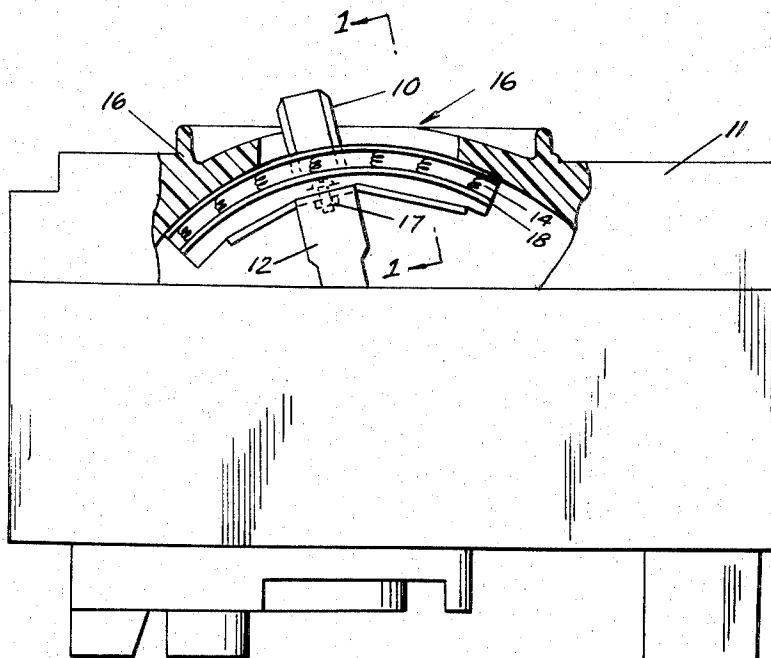


FIG. 2



INVENTOR.  
FREDERICK G. SCHMIDT

BY

*Patrolenck & Fahn*

ATTORNEYS

1

2,878,347

## SEALING MEANS FOR MOLDED CASE BREAKER OPERATING HANDLE

Frederick G. Schmidt, Haverford, Pa., assignor to I-T-E Circuit Breaker Company, Philadelphia, Pa., a corporation of Pennsylvania

Application March 31, 1955, Serial No. 498,240

5 Claims. (Cl. 200-168)

My invention relates to sealing means to prevent the escape of hot gases through the cover of a molded case circuit breaker and more particularly is directed to a novel arrangement whereby biasing means seals off the airgap between a permanently mounted handle and the cover of a circuit breaker.

In the construction of molded case circuit breakers, it is desirable to provide a main housing into which all of the operating components of the circuit breaker are secured and positioned and thereafter position and secure a molded cover thereon.

The operating mechanism is usually provided with a removably mounted handle which extends through an opening in the molded cover. Due to the dimensional variations which occur in the housing and the cover molding, it is necessary to provide additional means to seal off the airgap which may exist between the operating handle and the cover so that gases created when the circuit breaker interrupts a fault line will not escape through the handle opening in the molded cover.

In the prior art, the operating handle has been lodged or urged against the lower surface of the molded cover in order to prevent flash on the occurrence of an interruption of a fault current by insuring a tight fit between the components in spite of the discrepancies or the variations in the dimensions of the molded parts.

The prior art utilized a biasing means such as a spring which was positioned between the operating cradle of the circuit breaker and the molded handle to urge the handle against the molded cover. However, this sealing means is rendered inoperative when the circuit breaker is manually closed against a fault line. That is, if an operator attempts to manually close the circuit breaker, the pressure exerted by him will move the handle toward the operating mechanism against its bias thereby creating a gap between the molded cover and the operating handle. Hence, the defeating of the biasing means due to the pressure exerted by the operator will provide an air path through which flashing and hot gases can leave the circuit breaker through the airgap between the handle and housing and hence, may result in injury to the operator. Therefore, at the time when it is most essential that the biasing means lodge or urge the handle against the lower surface of the cover to prevent flashing mainly when the operator is in front of the circuit breaker, flashing and hot gases will leave the circuit breaker when he attempts to manually close the unit on a fault line.

My instant invention is directed to a novel sealing means which can not be defeated by the operator and is continuously operative.

Accordingly, a primary object of my invention is to provide a novel sealing means to close off the gap between a handle and the cover of a molded case circuit breaker wherein the sealing means cannot be defeated during the manual operation of the circuit breaker.

Another object of my invention is to provide a biasing means which will compensate for the discrepancy

2

in dimensions of molded case parts between the operating handle and molded cover without biasing the operating handle.

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

Figure 1 represents a cross-sectional view of my novel sealing means to close off the air gap between the operating handle and the molded cover of a circuit breaker and shows a view in a direction which is perpendicular to the path of movement of the operating handle.

Figure 2 is a side cross-sectional view of the circuit breaker of Figure 1 taken in a direction parallel to the path of movement of the operating handle.

My invention is particularly adaptable to molded case circuit breakers of the type shown and illustrated in U. S. Patents 2,574,093 issued November 6, 1951, entitled Adjustable Trip to W. H. Edmunds and 2,648,742 issued August 11, 1953, entitled Arc Chute Plate to W. H. Edmunds. Thus, circuit breaker 16 may be of the construction shown in these patents.

The molded cover 11 is provided with a substantially longitudinal opening 20 which extends in the plane of the paper and is provided to receive the operating handle 10 so that it can move from the "off" to the "reset," "on" and "trip" positions.

The handle 10 may be permanently secured to the cradle 12 of the circuit breaker by means such as a rivet or pin 17. Due to the variations in the dimensions of the molded parts of the circuit breaker, an air gap 19 may exist between the cover 11 and the handle 10. My invention is directed to means which will seal off this opening and which can not be defeated during the manual operation of the circuit breaker.

The cover 11 is provided with appropriate recesses 15 which extend for the entire path of movement of the operating handle 10. Felt packing 18, which may have a U-shaped cross-section, is positioned within the recesses 15 with a biasing means such as spring 14 urging the felt packing 18 against the upper surface of the operating handle 10. That is, the spring means 14 continuously urges the felt packing 18 downwardly to thereby seal off the airgap or opening 19 which may exist between the operating handle 10 and the cover 11.

Since the handle 10 is permanently secured to the cradle mechanism 12 by means of the rivet 17, the operator can not move the handle 10 with respect to the cradle 12 so that the separation 19 between the cover 11 and the handle 10 will remain constant. Thus, the felt packing 18 will continuously be urged against the upper surface of the handle 10 whether or not pressure is applied to the handle.

In the event the circuit breaker is opened as a result of a fault current, the airgap 19 will be continuously closed off by the felt packing 18 and hence, no flashing or hot gases will escape through this opening.

In summary, I have provided a novel biasing means for sealing the escape between the handle and the cover of a circuit breaker which can not be defeated by manual operation of the circuit breaker so that continuous protection is provided to prevent flashing and the escape of hot gases whenever the circuit breaker interrupts a fault current.

In the foregoing, I have described my invention only in connection with preferred embodiments thereof. Many variations and modifications of the principles of my invention within the scope of the description herein are obvious. Accordingly, I prefer to be bound not by the specific disclosure herein but only by the appending claims.

I claim:

1. A molded case circuit breaker having a cover, an

3

operating handle, and an operating mechanism; said operating handle rigidly secured to said operating mechanism; said cover having an opening through which said operating handle extends; a resiliently compressible sealing means and a biasing means, both operatively positioned between said operating handle and said cover and within a recess of said cover to remain in sealing position independently of forces exerted on said operating handle.

2. A molded case circuit breaker having an operating mechanism, a cover and an operating handle; said operating handle rigidly secured to said operating mechanism; said cover having an opening to receive said operating handle; said cover having a recess to receive a sealing member; a resiliently compressible sealing member and a biasing means being positioned within said recess; said biasing means and said sealing member operatively positioned to seal off the area between said operating handle and said cover and to remain in sealing position independently of forces exerted on said operating handle; said sealing member being operative to continuously seal off said area between said cover and said operating handle for all positions of said operating handle.

3. A molded case circuit breaker having a cover, an operating handle, and an operating mechanism; said operating handle rigidly secured to said operating mechanism; said cover having an opening through which said operating handle extends; a resiliently compressible sealing means and a biasing means, both operatively positioned between said operating handle and said cover and within a recess of said cover to remain in sealing position independently of force exerted on said operating handle; said recess extending for the entire path of movement of said operating handle.

4. A molded case circuit breaker having a cover, an

4

operating handle, and an operating mechanism; said operating handle rigidly secured to said operating mechanism; said cover having an opening through which said operating handle extends; a resiliently compressible sealing means and a biasing means, both operatively positioned between said operating handle and said cover and within a recess of said cover to remain in sealing position independently of forces exerted on said operating handle; said sealing means comprising a member of C-shaped cross-section; said biasing means being disposed within an area defined by the C-shaped cross-section.

5. A molded case circuit breaker having a cover, an operating handle, and an operating mechanism; said operating handle rigidly secured to said operating mechanism; said cover having an opening through which said operating handle extends; a resiliently compressible sealing means and a biasing means, both operatively positioned between said operating handle and said cover and within a recess of said cover to remain in sealing position independently of forces exerted on said operating handle; said recess extending for the entire path of movement of said operating handle; said sealing means comprising a member of C-shaped cross-section; said biasing means being disposed within an area defined by the C-shaped cross-section.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |          |               |
|-----------|----------|---------------|
| 1,547,009 | Anderson | July 21, 1925 |
| 2,102,545 | Rowe     | Dec. 14, 1937 |
| 2,473,848 | Baxter   | June 21, 1949 |

##### FOREIGN PATENTS

|        |               |               |
|--------|---------------|---------------|
| 26,899 | Great Britain | Nov. 19, 1909 |
|--------|---------------|---------------|