Sept. 15, 1953 M. MALLORY 2,652,462

SHIELDED CIRCUIT BREAKER

Filed Oct. 8, 1951

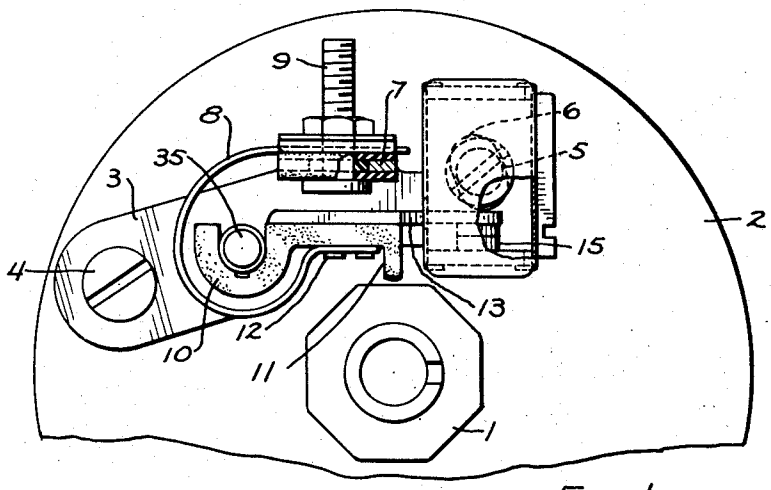


FIG. 1.

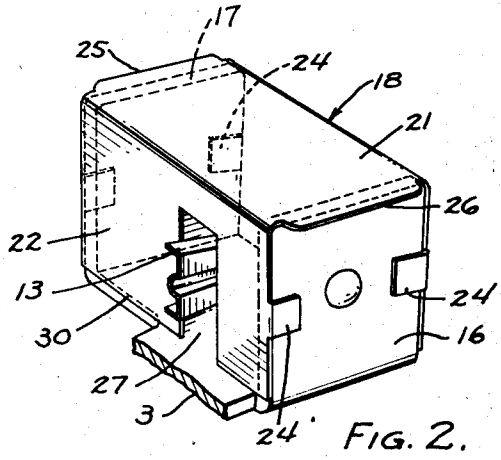


FIG. 2.

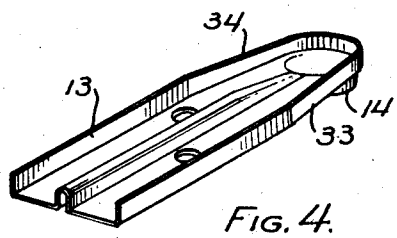


FIG. 4.

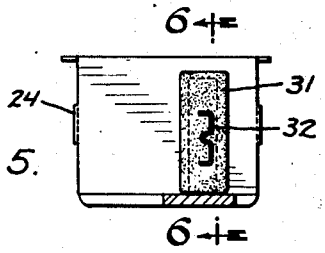


FIG. 5.

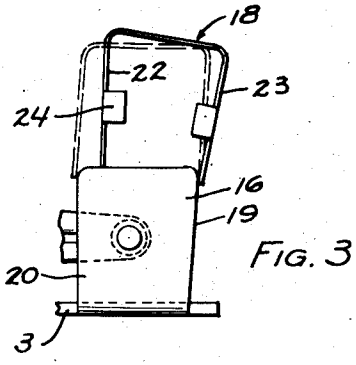


FIG. 3

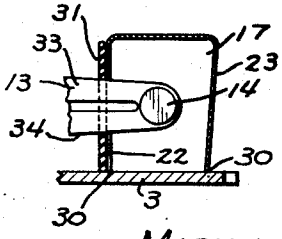


FIG. 6.

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SHIELDED CIRCUIT BREAKER

Marion Mallory, Detroit, Mich.

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11 Claims. (Cl. 200—19)

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This invention relates to a shielded circuit breaker and more particularly to a shielded circuit breaker for an automotive ignition distributor.

It is common practice to grease the cam which operates the circuit breaker to reduce the friction between the cam and the rubbing block. The rotating ignition distributor cam throws this grease and unless the contacts are covered, this grease will be thrown on to the contacts and cause dust to adhere to the contacts. Dust particles between the contacts invariably cause arcing and burning of the contact points which materially reduces the life of the contact points.

It is an object of this invention to produce a shielded circuit breaker which is of simple structure and easily assembled on, and disassembled from, the circuit breaker. This latter feature is important when one desires to insert a feeler gauge between the contact points for proper spacing.

The invention also contemplates a shielded circuit breaker for an automotive ignition system wherein the shielded breaker unit can be adjusted toward and away from the cam without the necessity for removing the shield.

Fig. 1 is a top plan view showing my shielded circuit breaker unit and ignition distributor cam.

Fig. 2 is a perspective view of the shield and circuit breaker arm.

Fig. 3 illustrates the assembly of the shield to the circuit breaker support bracket.

Fig. 4 is a perspective of the metal portion of the circuit breaker arm.

Fig. 5 is a sectional view through the circuit breaker arm showing a closure for the opening for the circuit breaker arm in the shield.

Fig. 6 is a section along the line 6—6 of Fig. 5.

Referring more particularly to the drawings the principal parts are numbered as follows: rotatable cam 1, circuit breaker support plate 2, circuit breaker support bracket 3, pin 4 for pivotally connecting one end of support bracket 3 to mounting plate 2, set screw 5 which passes through an elongated opening 6 in the end of bracket 3 and screws into a threaded opening in plate 2 for securing bracket 3 in whatever position it is adjusted about pivot pin 4, upright arm 7 integral with bracket 3, circuit breaker spring 8 mounted upon arm 7 by bolt 9, molded plastic circuit breaker arm bearing 10 and rubbing block 11, rivets 12 for securing spring 8 and channel section circuit breaker arm 13 to rubbing block 11, movable contact point 14 on arm 13, stationary contact point 15 on upright

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arm 16 of bracket 3, upright arm 17 integral with bracket 3 and parallel to arm 16, cover plate 18.

Arms 16 and 17 are substantially identical in form and the vertical edges 19 and 20 converge downwardly toward the base of bracket 3. Cover 18 is made of any suitable spring material, such as spring steel, and consists of a top portion 21, an integral depending front wall 22 and an integral rear wall 23 and opposed end tabs 24 which overlap the upright arms or walls 16 and 17. The top wall 21 overhangs the bracket arms 16 and 17 as at 25 and 26. Front wall 22 is provided with an opening 27 through which circuit breaker arm 13 extends. The front wall 22 and rear wall 23 converge inwardly and downwardly in their normal unstressed condition, Fig. 3.

To assemble the cover 18 upon its supporting arms 16 and 17, the cover 18 is forced downwardly over the side edges 19 and 20 of arms 16 and 17 which flexes walls 22 and 23 outwardly or away from each other as illustrated in the dotted lines Fig. 3. The cover is slid downwardly until the lower edges 30 of the front and rear walls 22 and 23 bottom or rest upon the bracket 3. The tabs 24 overlap the arms 16 and 17 and hold the cover 18 against endwise movement. When cover 18 is in its final position, Figs. 2 and 6, the walls 22 and 23 are under tension because of the converging edges 19 and 20 of arms 16 and 17. The width of each of the arms 16 and 17 at the base 3 is slightly greater than the distance between the lower edges 30 of the spring cover 18 when in its normal unflexed condition. Thus, the spring tension of walls 22 and 23 of cover 18 co-acts with the converging or tapered side edges 19 and 20 of arms 16 and 17 to draw and hold cover 18 downwardly against bracket 3.

The spring cover 18 can be readily removed by grasping the overhanging portions 25 and 26 and drawing upwardly upon the cover.

For closing opening 27 there is provided a non-metallic, electrically non-conducting cover 31 of any suitable material such as fiber, vulcanized rubber or synthetic rubber such as Neoprene. The cover 31 is provided with an opening 32 therethrough which conforms in shape to the cross section of arm 13, see Fig. 5. The top and bottom edges 33 and 34 of the arm 13 converge inwardly toward the contact 14. This taper co-acts with the cover 31 to hold the same against the front wall 22 of shield 18 to thereby maintain the opening 27 closed. Since cover 31 merely bears against the front wall 22 of shield 18, the cover 31 is free to move back and forth

relative to wall 22 as the circuit breaker arm swings about its pivot post 35 to open and close contacts 4 and 15 due to the co-action of rubbing block 11 and rotary cam 1. Cover 31 preferably is of a flexible or elastic material so that it can be slipped over the contact end of arm 13 into position upon the tapered edges 33 and 34 of the arm 13.

I claim:

1. A shield for a circuit breaker comprising a base and opposed end walls and a resilient cover therefor comprising a top wall and side walls, said top and side walls of said cover overlapping the top and side edges of said end walls and resiliently gripping said end walls to hold the cover in place, one side wall having an opening extending to the bottom edge thereof and adapted for receiving a circuit breaker arm, said cover being vertically slidable over said end walls.

2. The shield defined in claim 1 wherein the side edges of said end walls converge inwardly toward the base.

3. The shield defined in claim 2 wherein the side walls of said cover converge inwardly in their unstressed condition and are spaced apart at their lower ends a distance less than the width of said end walls at their lower ends.

4. A circuit breaker assembly for an automotive ignition system comprising a bracket having a base portion and two upstanding opposed walls integral therewith, a post mounted on said bracket, a circuit breaker arm pivotally supported on said post, a spring carried by said bracket and connected to said arm and tending to turn said arm about said post as an axis, said arm having a rubbing block adapted for contact with a rotary cam for pivoting said circuit breaker arm, a resilient cover comprising a top wall and side walls, said top and side walls overlapping the top and side edges of said opposed walls and resiliently gripping said opposed walls to hold the cover in place, said post, spring and rubbing block being disposed without the area defined by said cover and end walls, one side wall of said cover having an opening therein through which said circuit breaker arm projects, said opening having sufficient clearance with the portion of said breaker arm projecting therethrough to permit pivotal movement of said arm by said cam without contacting the edges of said opening, said opening extending to an edge of said side wall to permit said cover to be slidably arranged on and removed from said end walls, said circuit breaker assembly being adapted for adjustment as a unit toward and away from said cam.

5. The circuit breaker assembly defined in claim 4 wherein the side edges of said opposed walls converge inwardly toward the base.

6. The circuit breaker assembly defined in claim 5 wherein the side walls of said cover converge inwardly in their unstressed condition and are spaced apart at their lower ends a distance less than the width of said end walls at their lower ends.

7. In combination with a pivoted circuit breaker arm, a shield in the form of a box having top, bottom, side and end walls, an opening in one of said walls through which the breaker arm passes, said opening having substantial clearance with the portion of the breaker arm passing therethrough, a cover overlying said opening and slidably engaging said one wall, said cover surrounding and being supported upon said breaker arm and movable relative to the side wall as the breaker arm pivots.

8. The combination defined in claim 7 wherein the end portion of the breaker arm passing through said opening is tapered inwardly of the shield, said cover being slidably supported on said portion of said breaker arm, whereby the taper co-acts with the cover to hold the cover against the face of the side wall in closing relation with the opening for the breaker arm.

9. The combination defined in claim 8 wherein the cover is formed of an elastic material and the opening through said cover corresponds to the cross sectional contour of the arm adjacent said side wall.

10. In combination with a pivoted circuit breaker arm, a shield comprising a base and opposed end walls and a resilient cover therefor comprising a top wall and side walls, said top and side walls overlapping the top and side edges of said end walls and slidably engaging and resiliently gripping said end walls to hold the cover in place, one side wall having an opening therein through which said circuit breaker arm passes, said opening having substantial clearance with the surrounding portions of said breaker arm, a closure overlying said opening, said closure being carried by said breaker arm and in sliding relation with the outer face of said side wall whereby said closure remains on said circuit breaker arm when the resilient cover is slidably disengaged from said end walls.

11. The combination defined in claim 10 wherein the top and bottom edges of said circuit breaker arm converge toward the outer end of said arm, the said closure surrounding and having a sliding fit on the tapered end of said breaker arm whereby the closure and tapered end of the breaker arm cooperate to hold the closure in sliding contact with the outer face of said wall adjacent said opening.

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