Dec. 29, 1953 C. V. CHERMENDY 2,664,474

CIRCUIT BREAKER

Filed Sept. 12, 1951

FIG. 1

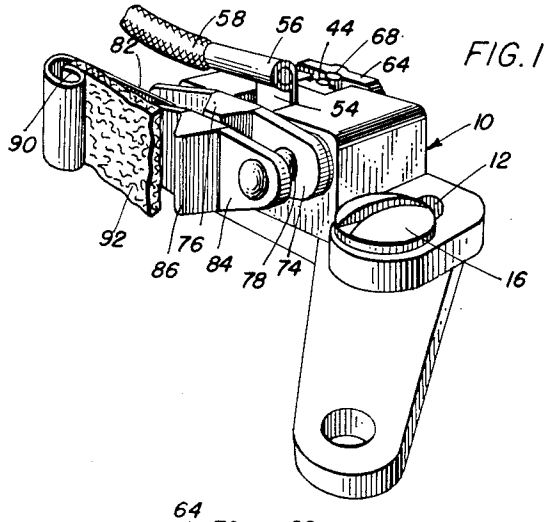


FIG. 2

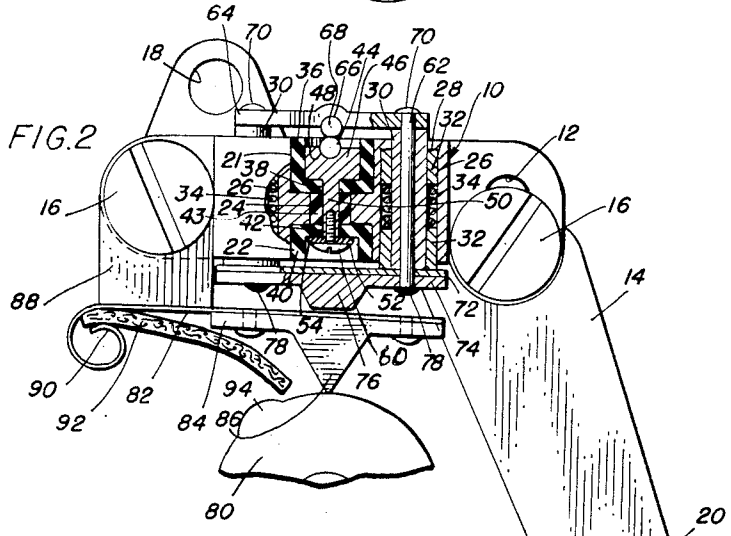
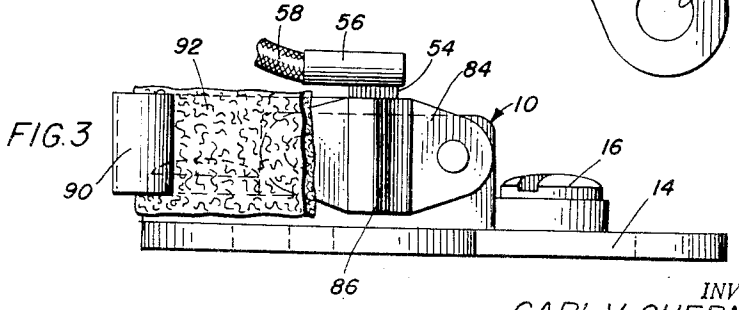


FIG. 3



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CIRCUIT BREAKER

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8 Claims. (Cl. 200—30)

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This invention relates in general to a circuit breaker and is more particularly described as an ignition breaker of the type commonly used in automobiles.

In automobile circuit breakers, it is difficult to set and maintain the breaker points in alignment and to prevent them from becoming pitted or wearing unevenly due to the rapid and continuous engagement of the circuit breaker cam in the rapid intermittent breaking of the circuit. The circuit breaker commonly used for automobile engines is usually mounted upon a vibrating arm which requires accurate setting and adjustment by a skilled mechanic.

The present invention provides an ignition breaker of a different type which may be substituted for the vibrating arms and the fixed breaker points in the present type of equipment and it is designed to be used as a substitute or a replacement therefor.

When subjected to continuous use, circuit breakers are engaged in the same direction by a cam which repeats its operation thousands of times per minute. Even though this is a wiping contact, such continuous action tends to press a contact projection and its mounting bars always in the same direction and even though over-sized bearings and parts are used, the tendency to warp is in one direction and tends to destroy the alignment of the circuit breaker.

An important object of this invention is therefore in the provision of a circuit breaker which makes a line contact instead of a point contact and has an additional contacting means interposed between the circuit breaker and the operating cam.

A further object of the invention is to provide a parallel mounting circuit breaker with a pivoted contact engagement means interposed between it and a circuit breaker cam to maintain the alignment of the parallel mounting.

A further object of the invention is to provide an improved simple and small ignition breaker which has cast insulation adapted to be assembled upon a mounting base and to provide a unitary ignition breaker.

Other objects of the invention will appear in the specification and will be apparent from the accompanying drawings in which,

Fig. 1 is a perspective view of an ignition breaker having an interposed contact device in accordance with this invention;

Fig. 2 is a plan view of the breaker shown in Fig. 1 showing the central portion thereof in section; and

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Fig. 3 is a front elevation of the ignition breaker and the contacter.

In the present invention, the fixed and movable contact members are mounted upon the same block, the movable member being mounted upon parallel bars and the contacting member is pivoted at one end and movable to engage the contacting member of the parallel mounted breaker to protect the latter from the side swiping action of a breaker cam.

Referring now more particularly to the drawings, a mounting block 10 has reduced ears each with a slot 12 for adjustably attaching it to a mounting lever 14 by means of adjusting screws 16. At the ends of the lever are perforations 18 and 20 by means of which the lever may be adjusted and the screws 16 permitting separate adjustment of the block on the lever.

Extending vertically through the block at opposite sides are slots 21 and 22 which may be rectangular and connected through the block by a perforation 24. Extending transversely through the block are end recesses 26 each having a shoulder portion 28 at one end for mounting a pair of bearing sleeves 30, the sleeves being of a diameter to slide within the shoulders 28, and the recesses 26 being slightly larger than the sleeves to receive bushing sleeves 32 preferably of self-oiling material such as Oilite between the sleeves 30 and the recesses 26. Between the pair of bushings 32 for each sleeve is a compressed coil spring 34 tending to separate the bushings.

Seated in the slot 21 is an insulating bushing 36 preferably formed or cast to fit in the slot and having a central hole 38 to register with the perforation 24 in the block. Seated in the slot 22 is a similar insulation 40 having a central hole 42 to register with the perforation 24. Seated in the perforation 24 of the block is a short sleeve 43 of insulating material which connects the insulations 36 and 40 and registers with the perforations thereof.

A fixed circular contact bar 44 of tungsten or other suitable contact material is connected to a contact block 46 by being soldered or otherwise connected in a recess 48 thereof and the contact bar is of a length substantially the thickness of the block 10. The block 46 is seated in the insulation 36 and extending inwardly from the face of the block 46 is a stem 50 which extends through the perforations of the insulations 36 and 40 and through the insulating sleeve 42. At the end of the stem is a washer 52 and a plate 54 which extends upwardly in the slot of the insulation 40 with a curled portion 56 outside of the block at

the upper end of the slot 22 forming an eye for receiving the end of a conductor 58 which is attached to and insulated from the block of the breaker.

A bolt or screw 60 is inserted through a perforation in the plate 54 and through the washer 52 into the end of the stem 50 for tightly binding the plate 54 and the washer against the insulation, and thereby binding all of the insulation pieces, the contact block 46 and the contact bar 44 tightly in assembled position.

Extending through each of the sleeves 30 are rivet rods 62. Connecting the two opposite rods at one end is a contact plate 64 having an intermediate recess 66 for seating a contact bar 68 therein. This contact bar is preferably of tungsten or other suitable contact material of substantially the same length as the fixed contact bar 44 and it is positioned in exact alignment to make a line contact therewith. The contact plate 64 is held upon the rivet by a head 70 at the end of each rivet.

At the other ends of the rivets 62 is a backing plate 72 through which the rods extend and a bumper plate 74 having a central bumper projection 76 adapted to be engaged betwen the rivets 62 for moving them together with their backing sleeves 30. This bumper block may be of any suitable material, but preferably it is of a tough, hard, fibrous compostion which resists abrasion and wear, such as nylon, which is also an insulating material and may be used for the insulating pieces 36, 40 and 42. The plates 72 and 74 are assembled upon the headed ends of the rivet rods 62 before they are inserted through the sleeves 30 and are held against the ends of the sleeves by riveting the opposite ends 70 of the rods or by riveting the adjusting ends of the rods to form heads 78.

The sleeves and rivet rods are of proper length to provide a space between the inner side of the plate 72 and the adjacent surface of the block sufficient to separaate the contact bars 44 and 68 when the projection 76 is engaged and moved, thereby compressing the springs 34, and as soon as this pressure is removed, the spring returns the contacts to their line engagement.

In order to engage the projection 76 and to prevent the unequal wearing of the parallel end bearings due to the direct engagement of an operating cam therewith, an intermediate contact device is interposed between an operating cam 80 and the projection 76 which comprises a resilient arm 82 composed of sheet metal or any suitable supporting material to which is riveted or otherwise secured a contact block 84 of tough, hard, fibrous material which may be similar to the bumper plate 74 and has a projection 86 preferably located in alignment with the bumper projection 76. One end of the arm 82 has an angular extension 88 substantially at right angles to the arm which has a perforation through which one of the fastening screws 16 extend for securing the arm extension firmly to the block 10, the arm, however, being substantially parallel but sprung away from the burner projection 76 to normally provide a slight clearance between them.

At the end of the arm 82 opposite the block 84 is a spring curl 90 adapted to resiliently engage a fibrous pad 92 which is held thereby, this pad extending toward the projection 86 but terminating a short distance therefrom and even extending into the path of a lobe or projection 94 of the cam 80 to operate as a wiper for removing oil or other foreign materials from the contacting surface of the cam.

This intermediate contacting device may be applied to circuit breakers of the block type which are already in operation or it may be installed originally with them. As an attachment, it is readily applied by removing one of the screws 16 by which the circuit breaker is attached to the mounting lever 14 and inserting the screw through the opening provided in the lateral projection 88 of the contact arm.

With this construction, any wiping movement of the operating cam is not transmitted to the breaker operating projection 76, but the attachment is limited to a swinging action due to the resilience of the arm 82 and to the mounting of the arm upon a resilient means or spring at one end thereof. The arm 82 can only swing against the outer end of the projection 76 in a direct contact with it pressing the bumper plate 74 equally at both ends and preventing an unequal or side swiping movement from being applied to the parallel rivet bearings of the circuit breaker.

While this construction has been described in some detail, it should be regarded by way of example and illustration rather than as a limitation or restriction of the invention as various changes in the construction, combination and arrangement of the parts may be made without departing from the spirit and scope of the invention.

I claim:

1. In an ignition breaker, the combination with an ignition breaker device and an operating cam therefor, the device having a bumper projection for operating it and an interposed contacting block between the device and the cam having means for mounting it to swing in engagement with the projection of the breaker device, and a projection on the attachment engaged by the breaker cam and moving the arm directly in contact with the projection of the device.

2. In an ignition breaker, a breaker device having separable contact bars for making a line contact, parallel mounting means for relatively moving the contact bars and a bumper projection between the parallel mounting means, of a cam for operating the device and an operating attachment interposed between the device and the cam comprising an arm resiliently connected to the device and having a projection substantially in line with the projection of the device and adapted to be engaged by the cam and moved thereby so that the arm engages the said projection of the device.

3. In an ignition breaker, a mounting block having an insulated contact bar at one side of the block, a movable contact bar to engage the insulated bar in a line engagement, means comprising parallel mountings extending through the mounting block for supporting the movable contact bar, a bumper plate at the other side of the mounting block attached to the parallel mountings and having an intermediate projection, an arm resiliently mounted at one end of the mounting block and extending over the said projection, means forming a projection extending from the arm and outwardly from the projection of the mounting block, and a cam to engage the projection of the arm and to press it into engagement with the projection of the mounting block.

4. In an ignition breaker, the combination with an ignition device and an operating cam, of an intermediate operating attachment for the device comprising a resilient arm having an extension at one end for mounting the arm to spring

toward and from the device, a contact block carried by the arm having a projection therefrom in the path of the cam and movable by the cam to engage and operate the device.

5. In an ignition breaker, an attachment adapted to be inserted between an ignition breaker and a cam for operating it, the attachment comprising a resilient arm having an extension at one end for resiliently mounting the arm upon an ignition device, a contact block secured to the arm having a projection therefrom adapted to be engaged by the cam and moved to engage the device, the said arm movable upon its extension to directly engage the ignition device.

6. An attachment, in accordance with claim 5, in which a flat wiper is secured to the arm and extends adjacent the contact block projection thereof at the side adapted to be engaged by an operating cam to wipe oil and other material from an operating cam.

7. An attachment in accordance with claim 5, in which the arm has a spring curl at the end opposite the contacting portion thereof, and a fibrous pad inserted in and held by the spring curl and extending toward the projection thereof on the side to first engage an operating cam therefor.

8. In an ignition breaker, a mounting block having attachment ears, an insulated contact bar

fixed at one side of the block, a movable contact bar to engage the fixed bar in a line engagement, parallel mounting means extending through the block to the other side thereof, a bumper plate secured to the mounting means at the other side of the block having an intermediate projection, a cam for operating the movable contact bar, and an operating attachment interposed between the said projection and the cam to prevent the side swiping action of the cam, said attachment having an arm with an extension connected to one of the said attachment ears, the arm being of resilient material and sprung outwardly to clear the contact projection, and a bumper block secured to the arm having a projection substantially in line with the first named projection adapted to be engaged by the cam for moving the arm to swing inwardly and in contact with the first bumper projection equally engaging both of the said parallel mountings.

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