Feb. 10, 1959 E. C. McRAE 2,873,324

DISTRIBUTOR MECHANISM

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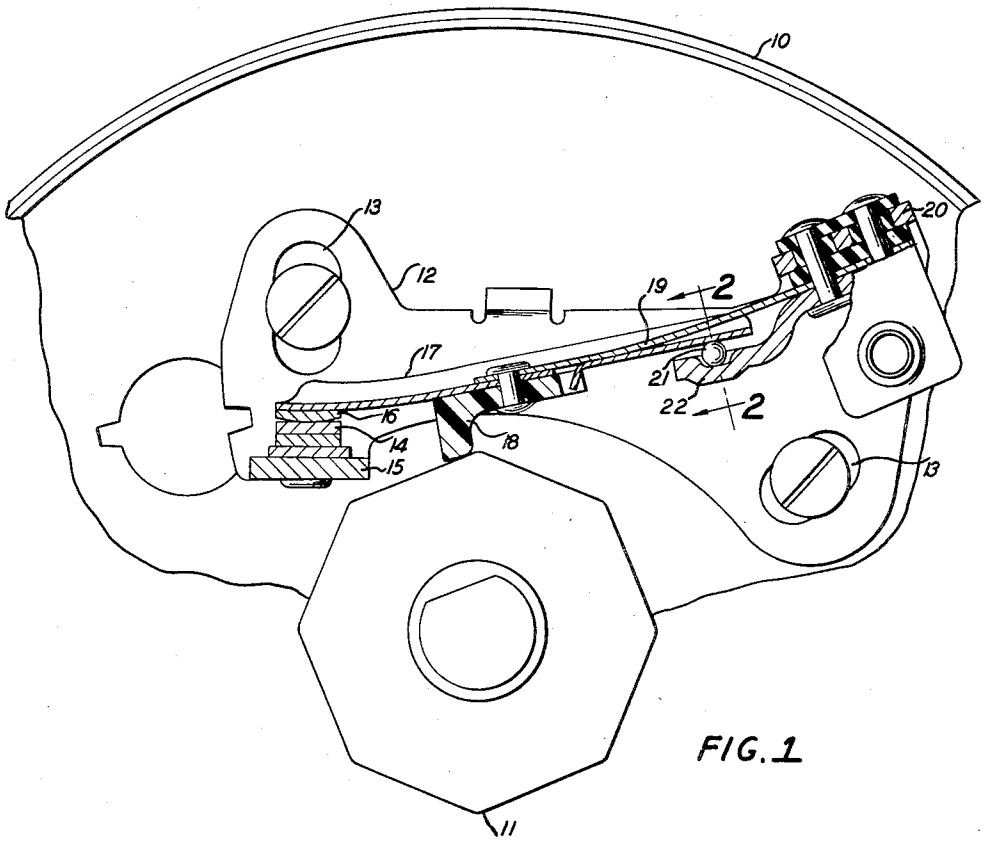


FIG. 1

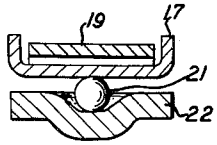


FIG. 2

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DISTRIBUTOR MECHANISM

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2 Claims. (Cl. 200—31)

This invention relates to internal combustion engine ignition apparatus. It is specifically directed to the apparatus employed for repetitiously opening and closing the contact points which generate the high tension spark for the actual ignition of the fuel charge.

This invention has been perfected to enable such contacts to operate at very high speeds while propelled by a comparatively light spring pressure. This invention is further useful in that it permits a greater tolerance of manufacturing irregularities without interfering with the proper operation of the finished mechanism.

The mechanism is fully explained below in conjunction with the two figures of drawing in which—

Figure 1 is a plan view of a distributor employing the invention, and

Figure 2 is a cross section of a portion of the apparatus taken on the line 2—2 of Figure 1.

Referring to Figure 1, the distributor mechanism is supported within a housing **10**. Cam **11** rotates within housing **10** and supplies the driving force to open and close the contact points. The actual contact making and breaking apparatus comprises base **12** which is supported in distributor housing **10** and is secured by fastening means inserted through oblong openings **13**. These openings are made oblong to permit adjustment of base **12** with respect to cam **11**. This permits the spacing of the contact points to be accurately set.

Base **12** is preferably fabricated as a sheet metal stamping and is provided with a turned up ear **15** upon which is mounted stationary contact point **14**. Movable contact point **16** is carried by rigid contact carrying arm **17** which is preferably fabricated in the form of a channel to secure adequate rigidity and lightness. Contact carrying arm **17** carries rubbing block **18** which bears directly upon cam **11** and imparts an oscillatory motion to contact carrying arm **17**. Contact carrying arm **17** is securely fastened to spring **19** which in turn is secured to ear **20**. Ear **20** may also be economically formed by turning up a portion of base **12**. Contact carrying arm **17** must be insulated electrically from base **12**. This is readily accomplished by insulating spring **19** from ear **20**. However, any desired structure may be used as long as contact carrying arm **17** is not in electrical contact with base **12**.

A bracket **22** is positioned adjacent the end of movable contact carrying arm **17** which is remote from movable contact point **16**. The face of bracket **22** is approximately parallel to the corresponding face of contact carrying arm **17**. The face of bracket **22** adjacent contact carrying arm **17** is embossed to receive and confine bearing member **21** which in the preferred form of the invention is a bearing ball. While the embossing which accommodates this bearing member has been shown in the bracket **22** it is to be understood that either the bracket or the contact arm, or both, may be so formed.

Bracket **22** has been shown insulated from ear **20**. This is necessary if bearing member **21** comprises any of the usual electrically conductive metals. However, if bearing member **21** be made non-conductive, bracket **22** need then not be insulated from base **12**. Any equivalent construction which prevents conduction of electricity from contact carrying arm **17** to base **12** through bearing member **21** is acceptable.

Spring **19** is most economically fabricated from flat stock and to exert a force tending to urge movable contact arm **17** against stationary contact **16**, this spring must be assembled bent into an arc convex towards rigid arm **17**. This spring **19** tends to rotate contact carrying arm **17** clockwise. This turning moment is resisted by bearing member **21**.

The fact that spring **19** is in the form of an arc while the contact points are closed and changes its form to an arc of shorter radius when the contact points open causes a slight but definite longitudinal relative motion between contact carrying arm **17** and bracket **22**. The substantially complete elimination of friction between bracket **22** and contact carrying arm **17** by bearing member **21** enables this apparatus to function at higher speeds without increasing the tension in spring **19** and so increasing wear on the rubbing block.

Due to manufacturing irregularities, the working face of rubbing block **18** is not always exactly parallel to the faces of the cam. In the preferred form of the invention which is shown specifically in Figure 2, bearing member **21** takes the form of a single bearing ball. This bearing ball permits torsional flexure of spring **19** to accommodate such irregularities without concentrating stress on localized areas of rubbing block **18**.

I claim as my invention:

1. A distributor mechanism comprising a base plate, a fixed contact supported by the base plate, a bracket and a leaf spring supported by the base plate at a location remote from the fixed contact, said bracket and leaf spring being electrically insulated from the base plate, a rigid contact carrying member supporting a movable contact adjacent one of its ends and secured to the leaf spring at a position remote from the bracket and intermediate the ends of the rigid contact carrying member, a rubbing block secured to the rigid contact carrying member intermediate its ends and a single bearing ball positioned between the bracket and the end of the rigid contact carrying means which is remote from the movable contact, said bearing ball supporting the end of the rigid contact carrying means upon the bracket while permitting free longitudinal movement of the rigid contact carrying member and free torsional flexure of the leaf spring.

2. A distributor mechanism comprising a base plate, a fixed contact supported by the base plate, a bracket and a leaf spring supported by the base plate at a location remote from the fixed contact, a rigid contact carrying member supporting a movable contact adjacent one of its ends and secured to the leaf spring at a position remote from the bracket and intermediate the ends of the rigid contact carrying member, a rubbing block secured to the rigid contact carrying member intermediate its ends and a single bearing ball positioned between the bracket and the end of the rigid contact carrying means which is remote from the movable contact, said bearing ball supporting the end of the rigid contact carrying means upon the bracket while permitting free longitudinal movement of the rigid contact carrying member and free torsional flexure of the leaf spring.

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