March 17, 1970 W. H. COOKSEY 3,501,601

IGNITION DISTRIBUTORS

Filed Feb. 26, 1968 2 Sheets-Sheet 1

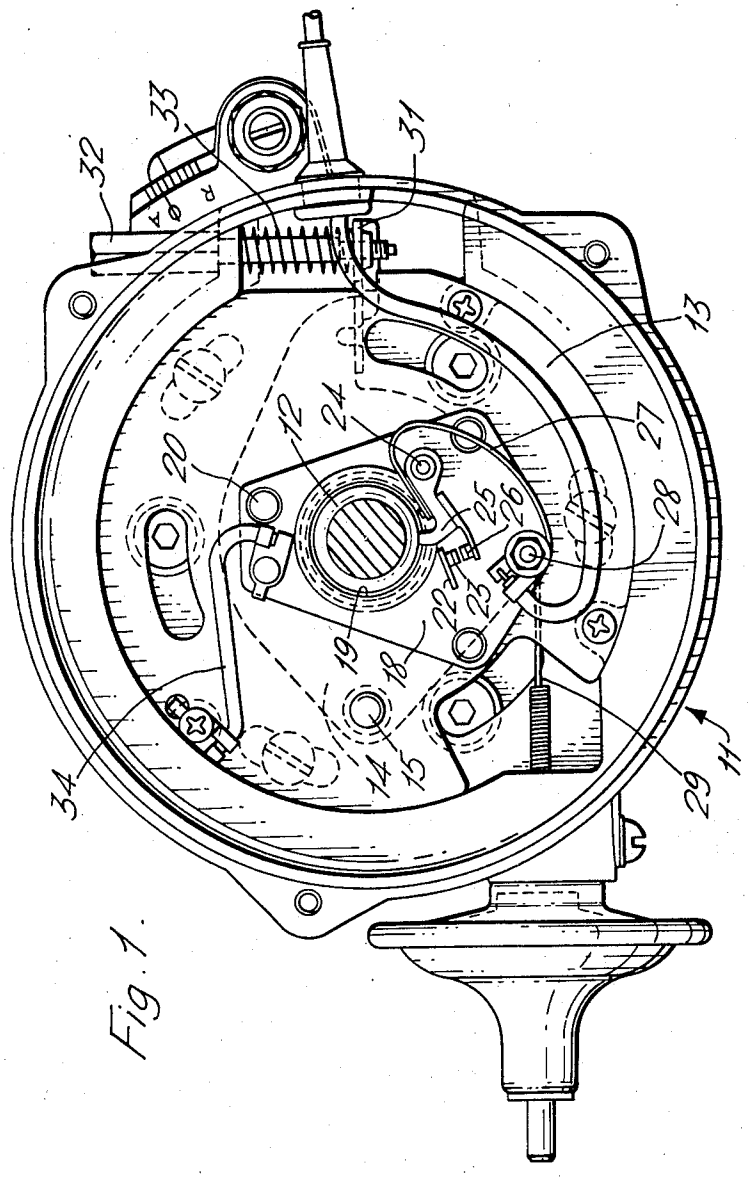


Fig. 1.

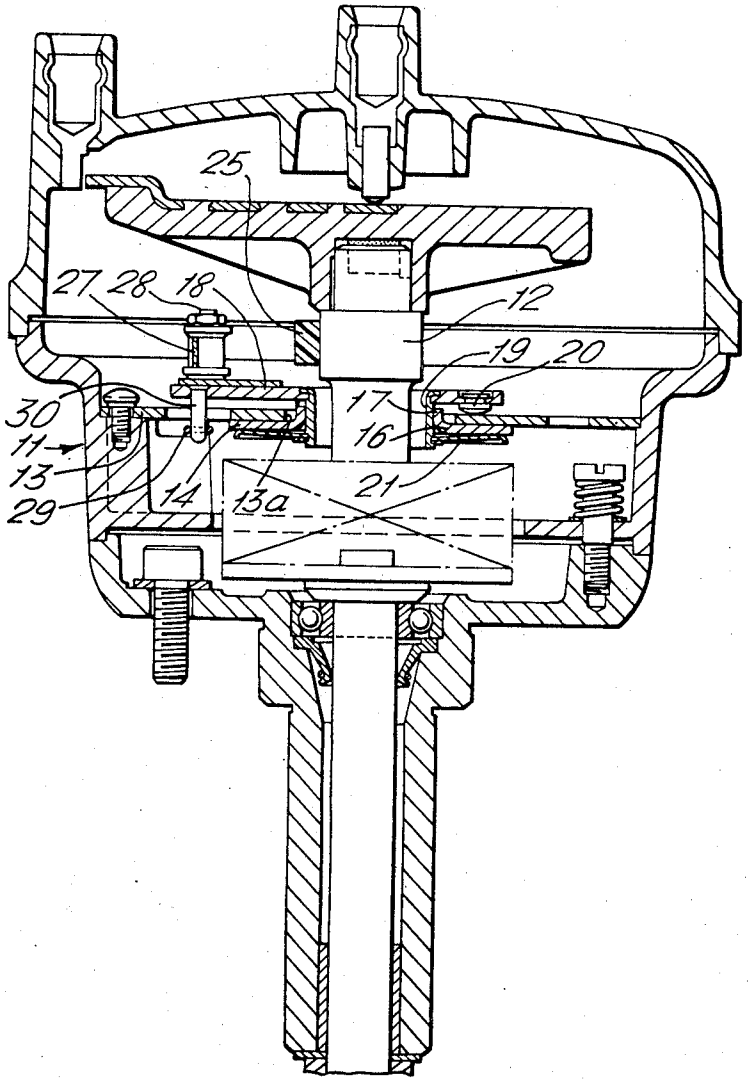
INVENTOR
William Harold Cooksey
BY Hibnett, Downing & Seabrook
ATTORNEYS

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Fig. 2.



INVENTOR
William Harold Cooksey.

United States Patent Office

3,501,601

Patented Mar. 17, 1970

3,501,601

IGNITION DISTRIBUTORS

William Harold Cooksey, Walsall, England, assignor to Joseph Lucas (Industries) Limited

Filed Feb. 26, 1968, Ser. No. 708,353

Claims priority, application Great Britain, Mar. 6, 1967, 10,421/67

Int. Cl. H01h *19/62*

U.S. Cl. 200—30 3 Claims

ABSTRACT OF THE DISCLOSURE

An ignition distributor for use in a road vehicle includes a casing having a cam shaft mounted for rotation therein. A first plate is fixed within the casing and a sleeve surrounds, and is spaced from the camshaft. Second and third plates are engaged with the sleeve so that the second and third plates are parallel with the first plate, and the third plate is angularly movable with respect to the second plate about the axis of the sleeve. Means are provided interconnecting the first and second plates for relative angular movement about an axis offset from the axis of the shaft, and a contact breaker assembly including a fixed contact and a movable contact is carried by the third plate. The arrangement is such that angular movement of the second plate with respect to the first plate acts through the sleeve to move the third plate in a direction to move the contact breaker assembly towards or away from the camshaft so as to adjust the contact gap. Moreover, angular movement of the third plate with respect to the second plate moves the contact breaker assembly angularly with respect to the camshaft to adjust the ignition timing of the distributor.

This invention relates to ignition distributors for use in road vehicles.

An ignition distributor according to the invention includes a casing, a camshaft rotatable within the casing, a first plate fixed within the casing, a sleeve surrounding and spaced from the camshaft, second and third plates engaged with the sleeve so that the second and third plates are parallel with the first plate, and the third plate is angularly movable with respect to the second plate about the axis of the sleeve, means interconnecting the first and second plates for relative angular movement about an axis offset from the axis of the shaft, and a contact breaker assembly, including a fixed contact and a movable contact, carried by the third plate, the arrangement being such that angular movement of the second plate with respect to the first plate acts through the sleeve to move the third plate in a direction to move the contact breaker assembly towards or away from the camshaft to adjust the contact gap, and angular movement of the third plate with respect to the second plate moves the contact breaker assembly angularly with respect to the camshaft to adjust the ignition timing of the distributor.

One example of the invention is illustrated in the accompanying drawings wherein:

FIGURE 1 is a plan view of a distributor with parts thereof omitted for clarity, and

FIGURE 2 is a composite sectional view of the distributor shown in FIGURE 1 showing also the parts omitted from FIGURE 1.

Referring to the drawings, the distributor includes a cylindrical casing **11** having an axially extending cam shaft **12** journalled for rotation therein. Secured within the casing and surrounding the shaft **12** is a first annular plate **13**. A second plate **14** is pivotally engaged with the plate **13** by means of a pin **15**, the plate **14** lying in facial contact with the lower surface of the plate **13**. The plate

14 has a central plunged hole **16** therein and the plates **13**, **14** are so arranged that the short cylindrical axial flange **17** defined by the plunged hole **16** in the plate **14** extends through the central hole **13***a* of the plate **13**, the diameters of the hole **13***a* and the flange **17** being such that a clearance gap is defined between them.

Slidably mounted on the plate **13** is an annular timing plate **18**. The plate **18** is pivotally engaged with the plate **14** by means of a sleeve **19** which is secured at its upper end to the plate **18** and which passes through the central holes in the plates **13**, **14**. The lower end of the sleeve **19** is engaged as a sliding fit in the flange **17** of the plate **14**. An annular disc spring **21** is secured to the free end of the sleeve **19**, the periphery of the spring **21** engaging the lower surface of the plate **14** and serving to urge the plates **14**, **18** towards one another and into engagement with the plate **13**. The plate **18** is provided with slippers **20** which bear against the plate **13** to reduce friction.

Upstanding from the plate **18** is a lug **22** having secured thereto a fixed contact **23**. Moreover, also upstanding from the plate **18** is a pivot post **24** with which an insulating cam follower **25** is pivotally engaged. The cam follower **25** carries a movable contact **26**. One end of a leaf spring **27** is secured to the cam follower while its other end is secured to and insulated from a further post **28** upstanding from the plate **18**. The spring **27** is electrically connected to the contact **26** and serves to urge the contact **26** into engagement with the contact **23**. The arrangement is such that rotation of the camshaft **12** effects movement of the contact **26** towards and away from the contact **23**. The push rod **29** of a known vacuum advance unit associated with the distributor is pivotally engaged with a pin **30** which extends downwardly from the plate **18** so that movements of the rod **29** pivots the plate **18** with respect to the plate **14** about the axis of the sleeve **19**, thereby altering the angular position of the cam follower **25** with respect to the shaft **12** to adjust the ignition timing of the distributor.

Extending downwardly from the periphery of the plate **14** is a lug **31** having therein a screw threaded hole. The lug **31** is engaged by a screw **32** which extends through a clearance hole in the casing **11** of the distributor, a compression spring **33** being interposed between the lug **31** and the casing **11** and surrounding the screw **32**. The head of the screw **32** is larger than the clearance hole in the casing **11** so that as the screw **32** is rotated the plate **14** is caused to pivot about the pin **15**. Pivotal movement of the plate **14** about the pin **15** moves the sleeve **19** and the plate **18** on an arc struck from the pin **15** and so rotation of the screw **32** will move the cam follower **25** towards or away from the cam shaft **12** so as to alter the gap between the contact **26** and the contact **23**.

In use, where the distributor is used in a known conventional ignition system, the contact **23** is earthed through the plate **18** and a lead **34** connected to the casing and the contact **26** is connected through the spring **27** and the primary winding of an ignition coil to a D.C. supply. Thus rotation of the camshaft **12** makes and breaks the electrical circuit to the primary winding of the ignition coil. However, the distributor is primarily intended for use with an electronic ignition system in which a spark is produced at both the make and break of a contact breaker. Such a system enables a distributor having a four-lobe camshaft to be used to control an eight-cylinder engine, but it will be appreciated that if the engine is to run smoothly the makes and breaks must be spaced apart by even intervals. In order to use the distributor shown in the drawings in such an ignition system, the plate **18** is adjusted to position the sleeve **19** substantially concentric with the shaft **12** so that

angular movements of the plate **18** do not move the cam follower **25** substantially towards or away from the shaft **12**. The dimensions of the cam follower and the contact gap are calculated with respect to a particular cam form so that when the distributor is set by rotating the screw **32** to move the sleeve **19** to a position substantially concentric with the shaft **12**, the contact gap will be such as to give equal spacing between the make and break of the contact breaker. In order to compensate for wear at the contacts and at the cam follower **25**, the setting of the distributor is adjusted from time to time using the screw **32**.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. An ignition distributor including a casing, a camshaft mounted for rotation within the casing, a first plate fixed within the casing and through which the camshaft extends, a second plate, positioned parallel to the first plate, pivot means pivotally interconnecting the second plate and the first plate, said pivot means being offset from the axis of the camshaft, so that said second plate is pivotable relative to said first plate about an axis offset from the axis of the camshaft, a third plate, positioned within the casing, a sleeve surrounding and spaced from the camshaft, means coupling the second and third plates to said sleeve, so that said third plate is angularly movable with respect to the second plate about the axis of the sleeve, and a contact breaker assembly carried by the third plate, the contact breaker assembly including a movable contact carried by an insulating heel which engages the camshaft, and a fixed contact engageable by the movable contact, and the arrangement being such that angular movement of the second plate with respect to the first plate about said offset axis causes movement of said sleeve, and consequential movement of said third plate and said contact breaker assembly, towards or away from said camshaft so as to adjust the operating gap between said fixed and movable contacts, while angular movement of the third plate with respect to the second plate, about the axis of said sleeve, moves the contact breaker assembly angularly with respect to the camshaft, so as to adjust the ignition timing of the distributor.

2. A distributor as claimed in claim **1** in which the second and third plates are on opposite sides of the first plate.

3. A distributor as claimed in claim **2** in which the sleeve is secured to the third plate and extends through the first plate in spaced relationship thereto, the second plate being slidably mounted on the sleeve and the second and third plates being resiliently urged towards the first plate.

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ROBERT K. SCHAEFER, Primary Examiner

J. R. SCOTT, Assistant Examiner

U.S. Cl. X.R.

200—31