United States Patent [19]

Rees

[11] **3,795,778**

[45] **Mar. 5, 1974**

[54] **IGNITION DISTRIBUTOR WITH CONTACT BREAKER ASSEMBLY MOUNTING PLATE**

[75] Inventor: **Alfred Rees**, Birmingham, England

[73] Assignee: **Joseph Lucas (Electrical) Limited**, Birmingham, England

[22] Filed: **Jan. 15, 1973**

[21] Appl. No.: **323,382**

[30] **Foreign Application Priority Data**

Jan. 15, 1972 Great Britain 2011/72

[52] **U.S. Cl.** ..... **200/19 R**, 200/30 A, 200/31 DP

[51] **Int. Cl.** **H01h 19/62**

[58] **Field of Search** ... 200/19 R, 19 A, 30 A, 30 AA, 200/31 DP

[56] **References Cited**

UNITED STATES PATENTS

3,688,392	9/1972	Cooksey	200/19 R X
2,896,035	7/1959	Harrington et al.	200/30 AA
R23,749	12/1953	Brunk	200/31 DP
3,091,672	5/1963	Longenecker	200/31 DP UX
2,730,583	1/1956	Brunk	200/31 DP

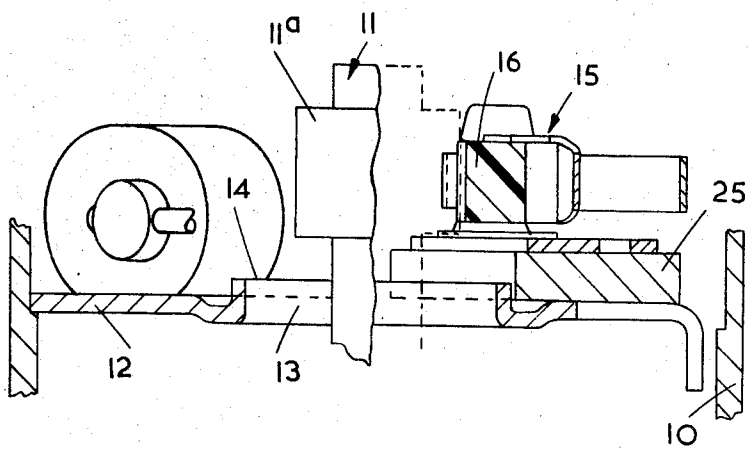
Primary Examiner—James R. Scott

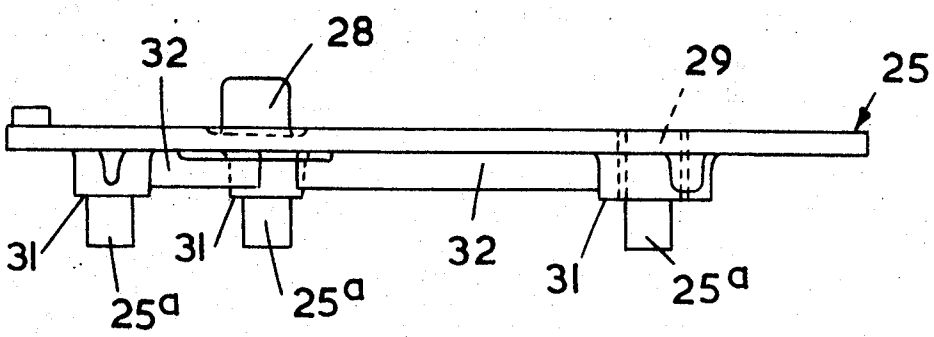
Attorney, Agent, or Firm—Holman & Stern

[57] **ABSTRACT**

An ignition distributor for an internal combustion engine spark ignition system includes a hollow casing having journalled for rotation therein a cam shaft having a cam portion. Secured within the casing is a contact breaker assembly mounting plate, the mounting plate being spaced from the level of the cam portion of the cam shaft. Mounted on the mounting plate is a spacer member, and secured to the mounting plate by way of the spacer member is a contact breaker assembly. The dimensions of the spacer assembly are such that a cam follower of the contact breaker assembly is aligned with, and engageable with the cam portion of the cam shaft.

2 Claims, 5 Drawing Figures





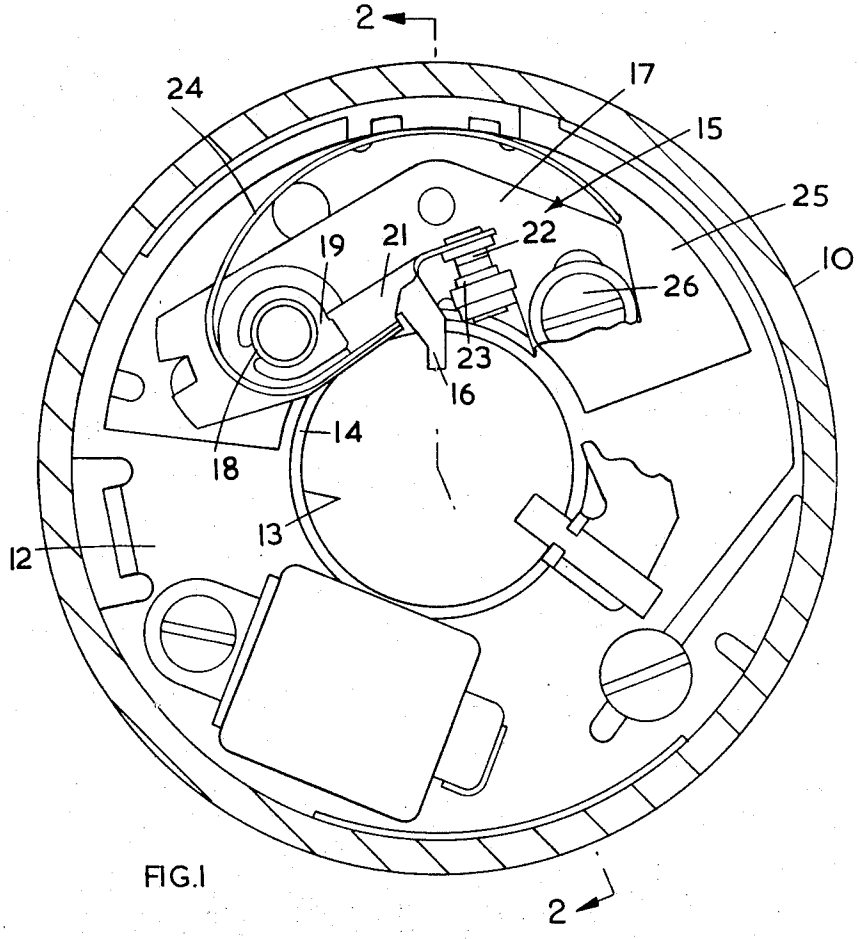

2
24
17
15
25
10
19
21
22
26
23
16
14
18
13
12
2

FIG.1

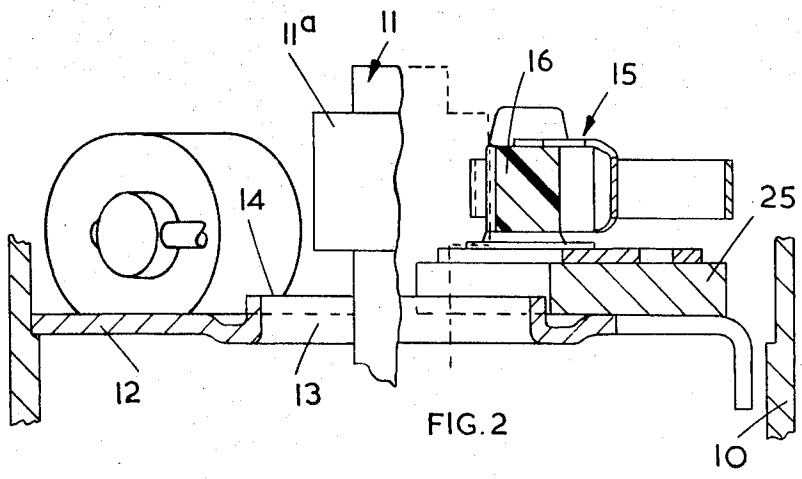

11a
11
16
15
14
25
12
13
10

FIG.2

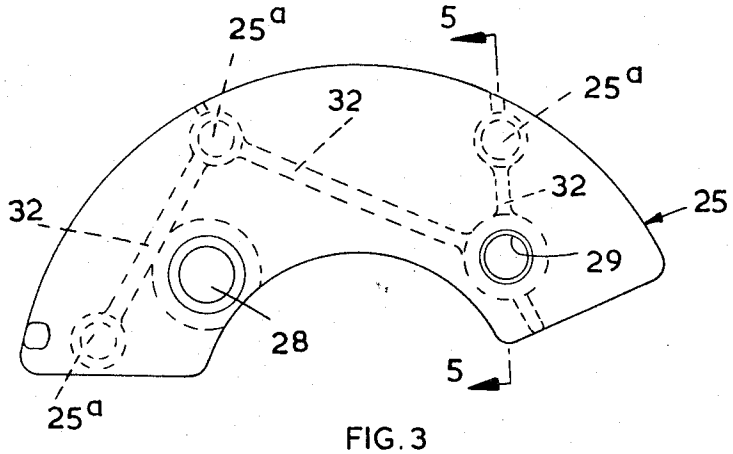


FIG. 3

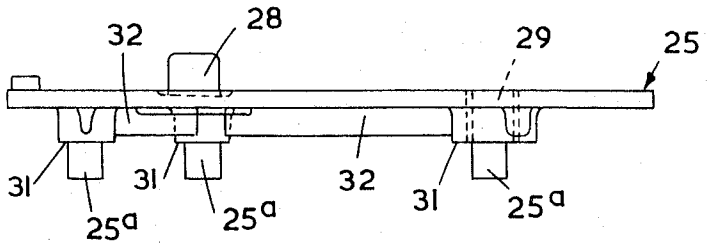


FIG. 4

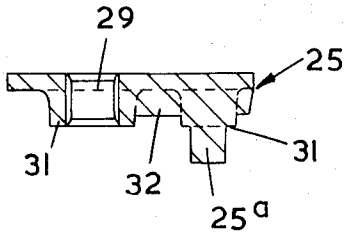


FIG. 5

IGNITION DISTRIBUTOR WITH CONTACT BREAKER ASSEMBLY MOUNTING PLATE

This invention relates to ignition distributors for internal combustion engine spark ignition systems.

There are two common types of ignition distributor, one where the contact breaker assembly of the distributor is mounted for angular movement around the axis of the distributor cam shaft and a second type where the contact breaker assembly is fixed relative to the casing of the distributor. A problem exists in standardization of the distributor components and it is an object of the present invention to minimise this problem.

An ignition distributor according to the invention includes a hollow casing, a shaft mounted for rotation in the casing and having a cam portion, a contact breaker assembly mounting plate secured within the casing and spaced from the level of the cam portion of the shaft, a contact breaker assembly, and a spacer member secured to the mounting plate and supporting the contact breaker assembly, the dimensions of the spacer being such that a cam follower of the contact breaker assembly is engageable with the cam portion of said shaft.

Desirably the mounting plate is arranged to be capable of rotatably supporting a timing plate carrying a contact breaker assembly.

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

FIG. 1 is a plan view partly in section of an ignition distributor with the top cover and the cam shaft thereof removed,

FIG. 2 is a sectional view on the line A—A in FIG. 1,

FIG. 3 is a plan view of an alternative form of the spacer shown in FIG. 1 and 2,

FIG. 4 is a side view of the spacer shown in FIG. 3, and,

FIG. 5 is a sectional view on the line 5—5 in FIG. 3.

Referring to the drawings, the ignition distributor which is for use in the spark ignition system of an internal combustion engine includes a hollow metal casing **10** having journalled for rotation therein an axially extending cam shaft **11.** Rigidly secured to the casing **11** and extending transversely relative to the axis of the casing is an annular mounting plate **12.** The wall of the central aperture **13** of the mounting plate **12** is extended to define an upwardly directed cylindrical spigot **14** the purpose of which will be described later. The cam shaft **11** extends through the spigot **14** and has a cam portion **11***a* spaced above the level of the plate **12.** The portion **11***a* of the shaft **11** is the portion which operates the contact breaker assembly **15** of the distributor a cam follower **16** of the assembly **15** engaging the surface of the portion **11***a* of the shaft **11.** The contact breaker assembly includes an angle plate **17** having upstanding therefrom a hollow sleeve **18** upon which is pivotally mounted an insulating heel member **19** which has the cam follower **16** integral therewith. Secured to the heel **19** is a metal shell **21** which carries the movable contact **22** of the contact breaker assembly. The fixed contact **23** of the assembly is carried by a tag integral with the plate **17** and a conductive spring **24** is secured at one end of the shell **21** and urges the heel **19** to pivot about the sleeve **18** to engage the contact **22** with the contact **23.**

There are two usual type of ignition distributor, one in which the contact breaker assembly of the distributor is mounted on a timing plate rotatably supported on the mounting plate so that the timing plate and therefore the contact breaker assembly can be moved relative to the mounting plate and the cam shaft of the distributor so as to alter the ignition timing of the distributor. In such an arrangement the timing plate is conveniently moved by a vacuum unit connected to the inlet manifold of the internal combustion engine. The second type of distributor dispenses with the timing plate intermediate the contact breaker assembly and the mounting plate, and the contact breaker assembly is secured direct to the mounting plate so as to be immovable relative to the casing of the distributor. A problem exists in standardizing components where both types of ignition distributor are to be provided by a manufacturer, owing to the fact that in the one case the contact breaker assembly is spaced from the mounting plate by a timing plate, whereas in the second example the contact breaker assembly is actually mounted on the mounting plate. In accordance with said one example of the present invention, in order to permit the maximum number of components common to both types of distributor, to be used, there is provided a spacer member **25.** The spacer member **25** is in the form of an arcuate, steel plate which is secured to the mounting plate **12** by means of rivets. The surface of the member **25** remote from the mounting plate **12** is provided with an upstanding post **28,** and the contact breaker assembly is engaged with the surface of the spacer member **25** remote from the plate **12** with the upstanding post **28** extending within the hollow sleeve **18** of the contact breaker assembly, through an aperture in the angle plate **17.** clamping screw **26** extends though an arcuate slot in the angle plate **17** into a screw-threaded bore **29** in the spacer **25** to permit the angle plate to be locked in position relative to the spacer **25** after being pivoted about the axis of the sleeve **18** to adjust the maximum operating gap which can occur between the contacts **23, 22** in use. The casing **10,** the cam shaft **11,** the mounting plate **12,** and the contact breaker assembly **15** can be used without alteration for a distributor arrangement where the contact breaker assembly is mounted on a timing plate rotatably supported by way of a cylindrical bush on the spigot **14** of the mounting plate. Thus the thickness of the spacer member **25** is so chosen that the cam follower **16** of the contact breaker assembly engages that region of the portion **11***a* of the shaft **11** which it would have engaged had the arrangement been a moving contact breaker type arrangement where the contact breaker assembly is mounted on a timing plate. It would be appreciated that in the absence of the spacer member **25** the angle plate **17** of the contact breaker assembly would have been secured direct to the mounting plate **12,** and in this situation it would have been necessary either to use a cam shaft with the portion **11***a* thereof differently positioned, or alternatively a different mounting plate or casing whereby the cam follower **16** could engage the portion **11***a* of the cam shaft.

It is preferred to form the spacer member **25** in metal, so that it constitutes part of the earth side of the electrical circuit of the contact breaker assembly. However, it will be appreciated that if desired the spacer member could be formed from a synthetic resin material in which case the fixed contact **23** of the contact

breaker assembly would be electrically connected to the casing by way of an earth lead. As is shown in FIGS. **3** to **5**, in order to save material the spacer **25** need not be formed as a solid block of thickness equal to the spacing required, but can be formed as a diecast plate having integral rivets **25***a* projecting from one face thereof. The rivets each include enlarged regions adjacent the plate and at the junctions of the enlarged portions and the remainder of the rivets are defined shoulders **31** which in use engage the surface of the plate **12**. Additionally the spacer plate can be formed with a thickened region around the bore **29** which also presents a shoulder **31** to the plate **12**, and the spacer can include integral strengthening ribs **32** extending between the enlarged regions.

I claim:

1. An ignition distributor including a hollow casing, a shaft mounted for rotation in the casing, the shaft including a cam portion, a contact breaker assembly mounting plate fixedly secured within said casing and spaced from the level of said cam portion of said shaft, a spacer member secured to said mounting plate so as to be held against movement relative to said mounting plate in use, a contact breaker assembly mounted on said spacer, the dimensions of said spacer being such that a cam follower of said contact breaker assembly is engageable with said cam portion of said shaft, and, said mounting plate including means whereby said mounting plate is capable of rotatably supporting a timing plate in turn supporting a contact breaker assembly.

2. An ignition distributor as claimed in claim **1** wherein the spacer member is formed from electrically conductive material, and constitutes part of the electrical circuit of the contact breaker assembly.

* * * * *