United States Patent [19]

Mattson

[11] **3,861,225**

[45] **Jan. 21, 1975**

[54] **EXTERNAL FINE TIMING ADJUSTMENT**

[75] Inventor: **Richard W. Mattson,** Rossford, Ohio

[73] Assignee: **Eltra Corporation,** Toledo, Ohio

[22] Filed: **Dec. 19, 1973**

[21] Appl. No.: **426,376**

[52] **U.S. Cl.** ..... **74/54,** 74/569, 74/568, 123/117 R, 123/146.5 A

[51] **Int. Cl.** **F16h 25/08**

[58] **Field of Search** ..... 74/54, 568, 569, 526; 200/30 A, 30 AA, 30 R; 123/117 R, 146.5 A

[56] **References Cited**

UNITED STATES PATENTS

2,018,893 10/1935 Kimball ..... 123/117 R

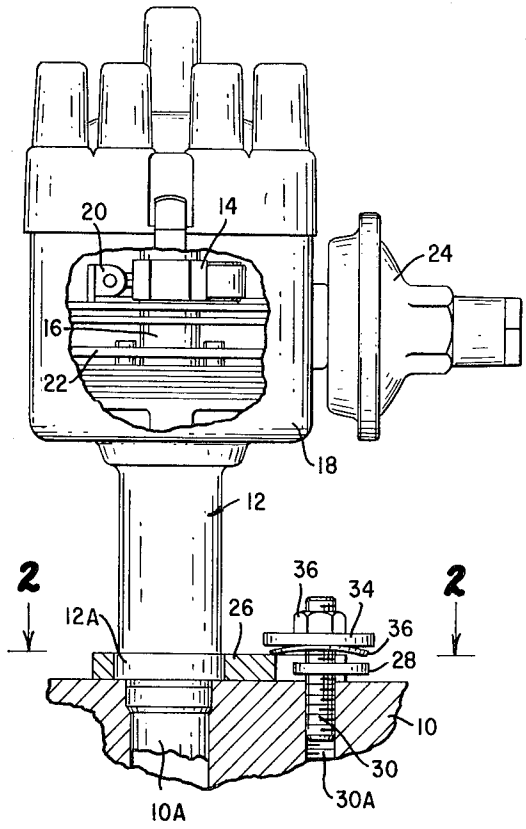
Primary Examiner—Wesley S. Ratliff, Jr.

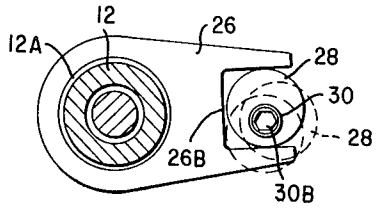
Attorney, Agent, or Firm—D. Henry Stoltenberg

[57] **ABSTRACT**

An ignition tuning adjustment means is disclosed which rotates the distributor housing and assembly by means of a bifurcated arm affixed to the distributor housing, whereby an adjustable cam is enabled to move the arm by small angular increments by the use of simple hand tools, after which, the angular adjustment is made permanent by a locking means. A limiting means for angular rotation is provided for the cam to prevent more than a predetermined angular movement.

4 Claims, 5 Drawing Figures





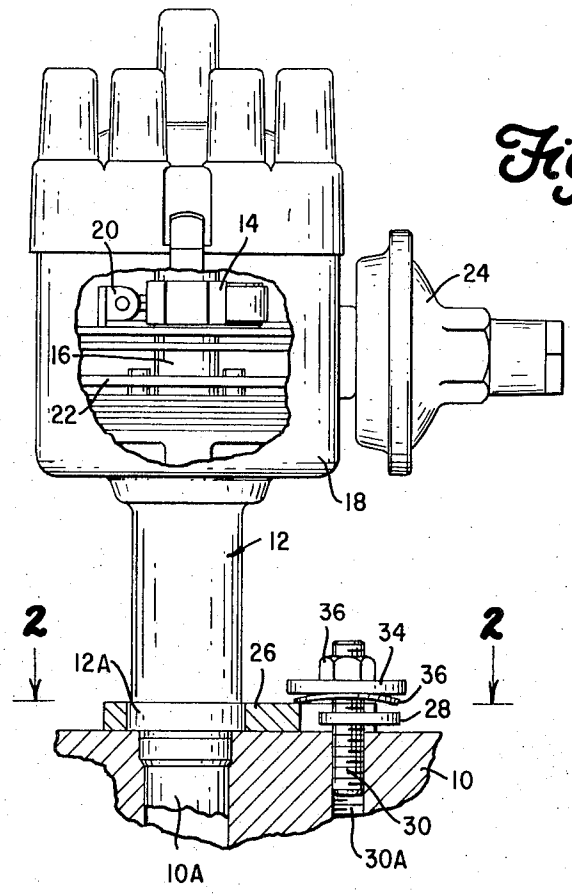


Fig. 1

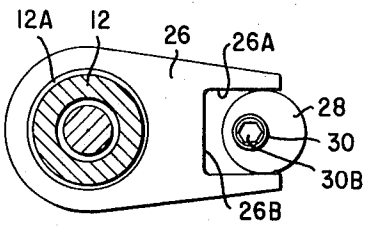


Fig. 2

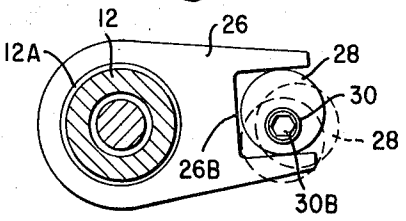


Fig. 3

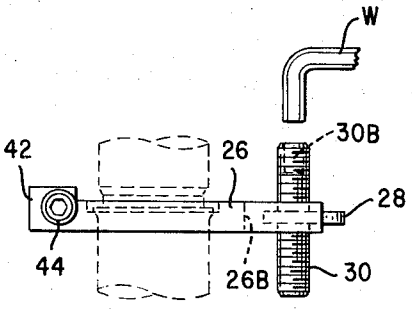


Fig. 5

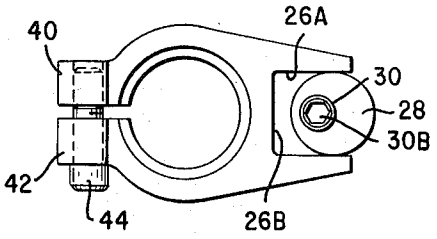


Fig. 4

EXTERNAL FINE TIMING ADJUSTMENT

With the automotive industry utilizing electronic ignition systems for automotive vehicles, which obviates the use of contact points and the adjusting means associated therewith internally of the distributor housing, it has been found necessary to provide an external adjustment means for the distributor to vary the ignition timing of the ignition system, which can be adjusted by the use of simple hand tools. This invention contemplates the provision of a device of this kind.

It is a principal object of this invention to provide an ignition timing adjustment means for distributors of automotive vehicles which is exterior of the distributor casing and can be manipulated by the use of simple hand tools.

It is a further object of this invention to provide an ignition timing adjustment device, which is external of the distributor housing, which after manipulation to correct the ignition timing can be permanently locked in position, but released when desirable for further manipulation to correct ignition timing faults. A means forming a part of the device prevents and limits the adjustment beyond a predetermined angular movement.

Other objects and advantages of this invention relating to the arrangement, operation and function of the related elements of the structure, to various details of construction, to combinations of parts and to economies of manufacture will be apparent to those skilled in the art upon consideration of the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

FIG. **1** is an elevational view of an ignition distributor to which the invention has been applied,

FIG. **2** is a plan view partly in section taken along line **2—2** of FIG. **1**, with the locking means removed,

FIG. **3** is similar to FIG. **2** showing the range of movement of the cam adjusting portion and

FIGS. **4** and **5** are plan and elevational views of a modification of the invention.

Referring to the drawings particularly to FIG. **1**, an engine block **10** is shown on which is mounted in vertical position in a box **10A** an ignition distributor **12** of conventional ignition system for the engine on which it is mounted, and may be provided with a rotatable breaker cam **14** mounted on the vertical distributor shaft **16** rotatably mounted in the distributor housing **10** in a conventional manner. The cam **14** may actuate breaker points **20** or cooperate with an electronic timing device depending on the type of ignition system to be utilized for the engine. A conventional centrifugal advance govenor **22** and a conventional vacuum advance device **24** can also be provided if desired for controlling the ignition timing advance or retard depending on load and/or speed of operation of the engine. In other respects the distributor is conventional.

The neck portion of the distributor housing is provided with a shoulder **12A**, which rests on the upper surface of the block **10** as shown, the shoulder also forming a seat to which is affixed a horizontally-extending arm **26** which may be welded or brazed thereto or it may be clampled thereon as shown in the modification in FIGS. **4** and **5**. The outer end of the arm **26** is bifurcated to form an opened slot **26A**, which loosely embraces an eccentric cam **28** so that the cam is readily rotatable therein. The cam **28** is permanently

affixed as by brazing or welding to a vertical threaded stud **30**, which is fitted vertically into a threaded bore **30A** in the block **10** a suitable distance from the vertical axis of the distributor housing **12** as best seen in FIGS. **1** and **2**. The threaded stud **30** is screwed into the bore **30A**, a sufficient distance to position the cam **28** within the thickness dimension of the arm **26**, so that the cam may be rotated about **180°** by the turning of the stud **30** without displacing it from the slot **26A** in the arm. For turning the stud **30**, a hexagonal slot **30B** is provided in its upper end as shown in FIGS. **2**, **3** and **4**, to cooperate with a conventional Allen wrench W as is well-known in the art. The rotation of the cam **28** is limited by the cam contacting the bottom wall **26B** as shown in FIG. **3** which will maintain the cam within the vertical thickness dimension of the arm **26**.

After the ignition timing for the engine has been adjusted to the desired extent by the angular rotation of the arm **26** by the manual manipulation of the threaded stud **30** and the cam **28** by the Allen wrench W, the arm **26** is locked in position on the upper surface of the block **20** by drawing down a hexagonal nut **32** against washer **34** and spring washer **36** to clamp against the upper surface of the arm **26** by the use of a conventional wrench of suitable size. This is best seen in FIG. **1**, where the parts are shown in assembled loose relation before the ignition timing adjustment has been made.

In FIGS. **4** and **5**, a modification of the affixing means for the arm **26** is shown, wherein the portion of the arm locked to the shoulder **12A** is bifurcated to provide a pair of spaced portions **40** and **42** which are thickened and fitted with a bore, one portion of which is threaded to cooperate with a clamping bolt **44**. This allows the portions **40** and **42** to be drawn together to clamp against the shoulder **12A** of the distributor **12**.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation, and it is not intended to limit the scope of the following claims beyond the requirements of the prior art.

I claim:

1. In an ignition distributor rotatably mounted in the block of an engine whose timing is to be adjusted, a bifurcated arm affixed to the distributor adjacent the engine block, a stud rotatably mounted on the engine block including a cam affixed thereto to cooperate with the bifurcated portion of the arm to move the arm angularly through a predetermined angular movement, means on the stud to cooperate with a hand tool to control the angular movement of the arm, and means cooperating with the stud to lock the parts in a fixed position.

2. The device defined in claim **1**, further characterized by a means limiting the rotation of the cam with reference to the arm.

3. The device defined in claim **1** further characterized by providing a resilient means for locking the parts in fixed position.

4. The device defined in claim **1** further characterized by providing an adjustable means for affixing the arm to the distributor.

* * * * *