April 6, 1954 R. H. HIEGER 2,674,662

ENGINE DISTRIBUTOR

Filed Sept. 26, 1951 2 Sheets-Sheet 1

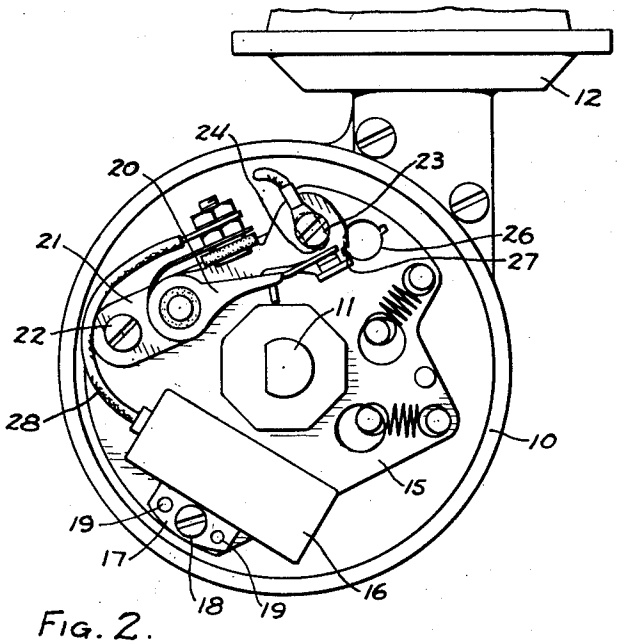


FIG. 2.

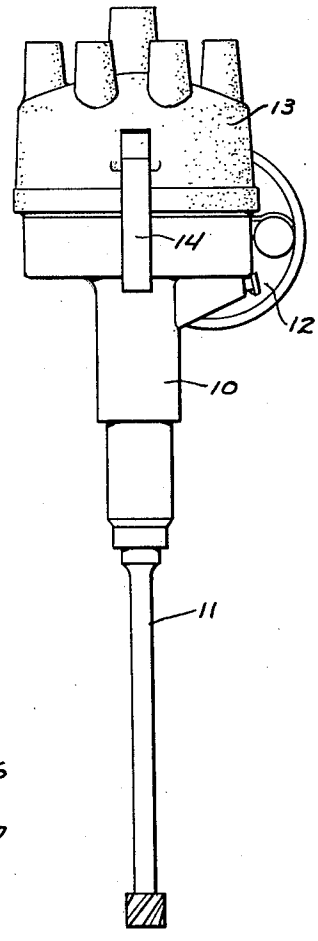


FIG. 1.

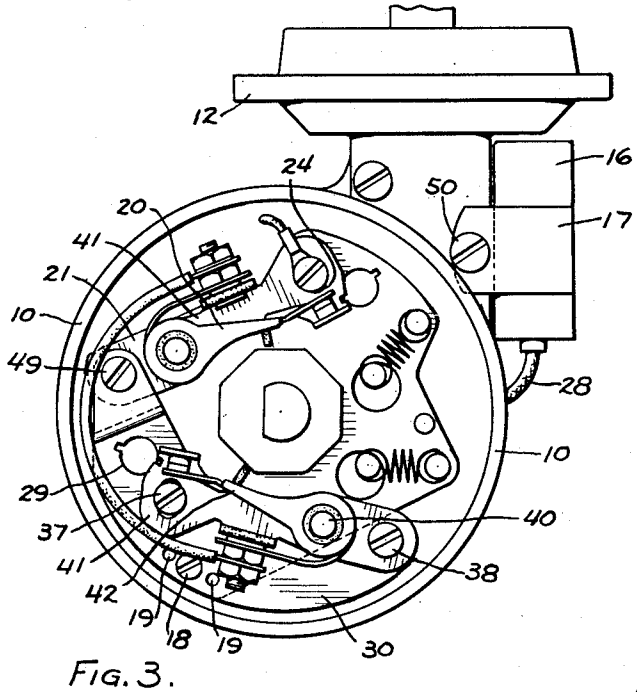


FIG. 3.

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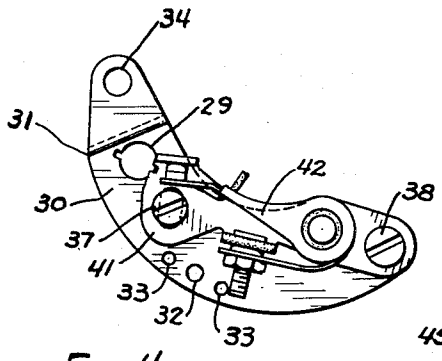


FIG. 4.

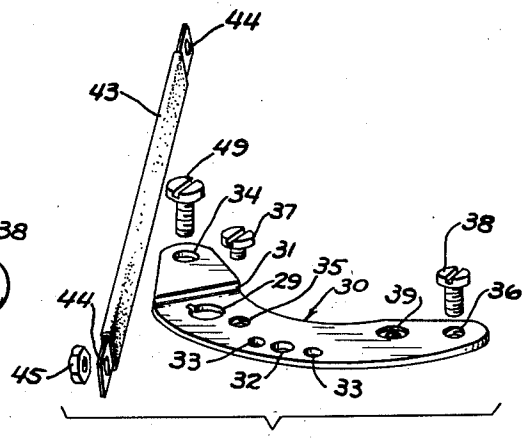


FIG. 5.

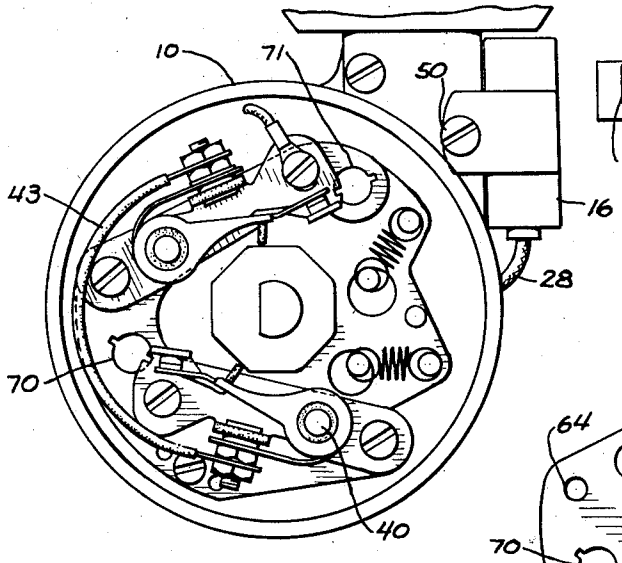


FIG. 7.

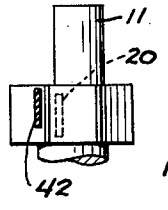


FIG. 6.

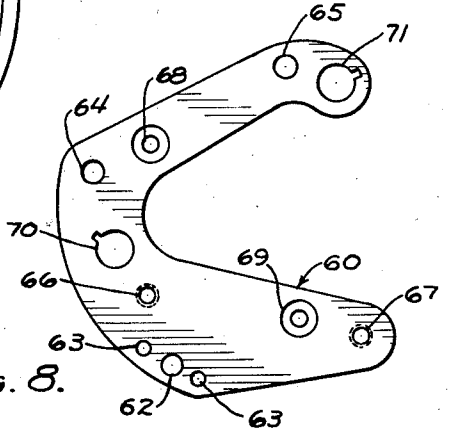


FIG. 8.

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ENGINE DISTRIBUTOR

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6 Claims. (Cl. 200—30)

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This invention relates to automotive distributors and more particularly to distributors of the dual point or long dwell saturation type.

Advantages of dual point distributors have been well appreciated in the art for a number of years, and distributors of such a type have been manufactured and used with great success for a number of years. In view of the greatly improved performance of an automobile engine and economy in its operation when provided with such a distributor, great inventive efforts have been directed to the task of providing means whereby conventional distributors already manufactured and in most cases used in vehicles already on the road could be converted to distributors of the dual point type.

As is well known in the art, a dual point distributor includes two circuit breaker arms instead of one, wired into the primary circuit of the engine ignition system in a predetermined manner. As seen by those skilled in the art, conversion of a conventional distributor into a dual point distributor requires removal and discarding of the original distributor breaker plate on which virtually the entire distributor mechanism is mounted, and substituting therefor a new distributor breaker plate with two breaker arms and other parts forming, in effect, a complete dual point distributor. In the process of such conversion, the distributor must be taken out of the engine and disassembled in order to remove the shaft and the distributor breaker plate and to put the new plate in. As a result, the setting of the distributor is disturbed or destroyed, and a new setting is, therefore, required. Such a system or method of conversion of a distributor is very cumbersome and constitutes, in effect, virtually a complete rebuilding or substitution of the distributor with the exception of its housing, shaft, and a few other parts. As such, it has little advantage over replacing the conventional distributor with a new dual point distributor and scrapping the former. For this reason conversion of conventional distributors already on the road to dual point distributors and attaining the great advantages of the long dwell saturation inherent with dual point distributors, has been greatly impaired, made difficult and not easily available or practicable for an automobile owner who has a conventional distributor already installed in the engine of his automobile.

One of the objects of the present invention is to provide an improved method and a mechanism with the use of which the above disadvantages are overcome and largely eliminated, and conversion of a conventional distributor to a dual point distributor is made very easy and simple.

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Another object of the invention is to provide an improved method and mechanism, or a set or kit of parts, with the use of which a conventional distributor installed in a motor vehicle can be simply and easily converted into a dual type distributor without removing the distributor from the engine or the distributor driving shaft out of the distributor, and without disturbing the distributor setting.

A still further object of the present invention is to provide an improved method and a set of spare parts, with the use of which a conventional distributor installed in a motor vehicle can be speedily and easily converted into a dual point distributor by an average garage mechanic by merely moving the distributor condenser to the outside of the distributor, installing an additional breaker arm and revising one electrical connection.

A still further object of the present invention is to provide a method and means of the nature specified in the preceeding paragraph, whereby a stock distributor arm of conventional type may be used for the second arm and be installed in the distributor without disturbing its original plate and by merely providing an auxiliary plate having locating means ensuring that the second arm is installed in a proper relation to the distributor shaft and other parts of the distributor.

It is an added object of the present invention to provide an improved method and a set of parts or a kit of the nature specified above, which kit includes only a small number of parts simple in construction, dependable in operation and relatively inexpensive to manufacture.

Further objects and advantages of this invention will be apparent from 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 showing a conventional distributor adapted to receive my improved auxiliary plate whereby it can be converted into a dual point distributor.

Fig. 2 is a top view of the distributor of Fig. 1 with the cover thereof removed.

Fig. 3 is a view similar in part to Fig. 2 and showing my auxiliary plate operatively installed in the distributor of Figs. 1 and 2 thereby converting the same into a dual point distributor.

Fig. 4 is a plan view showing one arm aux-

iliary plate with the arm fully assembled thereon and ready to be installed in a distributor.

Fig. 5 is an exploded view showing in perspective the kit of parts required to produce the assembly shown in Fig. 4 without including therein standard parts available in a garage stockroom.

Fig. 6 is a fragmentary view, partly in section, showing the upper end of the distributor shaft with the cam engaged with the rubbing block of two breaker arms.

Fig. 7 is a top view showing a converted distributor with a double arm auxiliary breaker plate.

Fig. 8 shows the double arm auxiliary breaker plate separately.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

For a proper understanding of the present invention, it should be clearly understood that the present invention relates to a distributor of "overlapping long dwell dual point system" and not to what is known in the art as "synchronizing dual point system." In other words, the present invention relates to an improved method and means whereby addition of the second arm in a single breaker arm distributor operates to increase "the dwell" and not to double the number of cylinders serviced by the distributor. It should be appreciated further that modifying distributors by adding second arms thereto in order to double the number of cylinders serviced by the distributor is an old expedient, and that the present invention is not concerned therewith. On the other hand, those skilled in the art have considered it impossible to convert a standard distributor into a long dwell or saturation distributor by means of a simple attachment.

In accordance with the invention, I completely discard the conventional practice of converting conventional distributors into dual point or long dwell saturation distributors by discarding the distributor breaker plate. In accordance with the invention, I retain the original distributor breaker plate and do not disturb the factory setting of the distributor. I provide an auxiliary or supplementary breaker plate which is adapted to be installed on the distributor breaker plate in place of the condenser, with the latter moved to the outside of the distributor housing. Moreover, I utilize the condenser locating means provided on the distributor breaker plate for locating my auxiliary plate and, consequently, the breaker arm in a proper relation to the other parts of the distributor. The auxiliary plate is so constructed that it receives a second standard breaker arm with its bracket and may be secured to the distributor breaker plate with a number of screws. Such a conversion can be attained without removing the distributor from the engine. In order to facilitate conversion of conventional distributors in a garage or a service station, I provide a kit comprising the auxiliary plate, necessary screws, and a connecting insulated metal strip for electrically connecting the breaker arms. Such kit need not include a breaker arm, since such arm is standard and may be procured in a garage from their own stockroom.

In the drawings there is shown, by way of example, a conventional distributor in its original form, and its converted form after the conversion was attained with the aid of my improved plate. Fig. 1 shows in elevation a conventional distributor of the type that is particularly adapted for conversion into a dual point or double arm distributor. Referring to the drawing, the distributor comprises a housing or casing 10 housing within itself the operative mechanism of the distributor which is driven from the engine with the aid of a shaft 11 in a manner well known in the art. A diaphragm housing 12 housing a diaphragm mechanism of the character well known in the art is integrally formed or otherwise provided on the housing 10. A removable cover 13 covering the housing 10 and connected thereto with the aid of spring clamps 14 is provided in a manner well known in the art.

The distributor shaft 11 passes through the distributor breaker plate 15 operatively arranged within the housing 10 and having mounted thereon, in a manner well known in the art, a condenser 16 having a bracket 17 connected to the plate 15 with the aid of a screw 18. The bracket 17 has provided thereon locating recesses 19—19 adapted to engage corresponding bosses provided on the plate 15. The single breaker arm 20 is mounted, in a manner well known in the art, on a breaker arm bracket 21 connected to the distributor breaker plate 15 with the aid of screws 22 and 23. The screw 23 engages the bracket 21 at an elongated hole 24 provided thereon for the purpose of adjustments. An adjustment hole 25 is provided on the plate 15. Notches 26 and 27 provided in the plate 15 (at the hole 25) and the bracket 21, respectively, permit use of a screwdriver for moving the bracket for adjustments. The condenser 16 is electrically connected with the breaker arm 20 with the aid of an electrical conductor 28.

The construction described above is conventional and, therefore, need not be described in further detail, since the description given above is sufficient for the purpose of understanding the present invention.

In accordance with the invention, I provide an auxiliary breaker plate 30 which is crescent-shaped with rounded ends and having a step 31 provided at one of its ends to adapt the plate to underlie the end of the bracket 21. A straight hole 32 corresponding to the hole in the condenser bracket 17 engaged by the screw 18 is provided on the plate 30 together with holes 33, 33 corresponding to the recesses 19, 19 of the condenser bracket 17. A hole 34 provided in the stepped-up end of the auxiliary plate is so positioned that when the plate 30 is placed on the plate 15 after the condenser 16 and the screw 21 are removed therefrom, said hole 34 will register with the hole in the bracket 21 formerly engaged by said screw 22. Tapped holes 35 and 36 adapted to be engaged by screws 37 and 38 for connecting the second breaker arm bracket 41 are provided on the auxiliary plate. A countersunk hole 39 is adapted to receive the shaft 40 of the second breaker arm 42. An adjustment hole 29 with a notch is provided on the plate. A connecting insulated strip 43 having holes 44, 44 at its ends for connecting to the terminals of the breaker arms 20 and 42 and an extra nut 45 is also provided as shown in Fig.

5. Fig. 5 illustrates all special and extra parts necessary for a garage servicing distributors of the particular kind and having other standard parts therefor in stock, to convert such distributor into a dual point or long dwell saturation distributor.

For effecting the conversion, a standard breaker arm 42 with its bracket 41, identical to the breaker arm 20 with its bracket 21, is installed or mounted on the plate 30 and connected to the plate 30 with the aid of screws 37 and 38. The plate so assembled may now be inserted into the distributor. For installation of the plate, the condenser 16 is disconnected from the arm 20, removed from the plate 15 and mounted on the housing 10 with the aid of the screw 50 as shown in Fig. 3. The screw 22 is next removed, and the auxiliary plate 30 is placed in place in the distributor to have its holes 33, 33 engage the condenser engaging bosses provided on the plate 15. This will properly locate the assembled plate and permit the insertion of the condenser screw 18 through the hole 32 and the screw 49 for securing the plate 30 to the plate 15. It will be understood in view of the foregoing that while the screws 18 and 49 engage the plate 15 and secure the auxiliary plate 30 to said plate 15, the screws 37 and 38 connect the second breaker arm bracket 41 to the auxiliary plate 30 at holes 35 and 36, which holes are, therefore, tapped. The desired adjustment of the points of the second breaker arm 42 is effected, in a manner well known in the art, with the use of the adjustment hole 29 provided on the auxiliary plate 30. Thereupon the breaker arms 20 and 42 are electrically interconnected with the aid of the strip 43, as is best shown in Fig. 3. The condenser is electrically connected to the breaker arms across the distributor underneath thereof, the cover 13 is replaced, and the distributor is now ready for use.

It will now be seen in view of the foregoing that by virtue of the provision of my auxiliary plate, the conversion of the distributor is made without disturbing the factory setting of the distributor and without the necessity of removing and substituting the plate 15, as well as without removing the shaft 11 and performing a number of other difficult operations requiring considerable effort and time together with high skill. Such operations are unavoidable where conventional conversion devices and methods are used.

Fig. 8 illustrates a double-arm auxiliary plate with the aid of which conversion similar to that effected with the plate 30 may also be effected. One form of said plate is illustrated in Fig. 8 wherein it is designated generally by the numeral 60. Locating holes 63, 63 corresponding to holes 33, 33 of the plate 30, and a screw-receiving hole 62 are provided to locate the entire plate on the distributor breaker plate. Holes 64 and 65 are adapted to receive screws of the first breaker arm bracket, while holes 66 and 67 receive the screws of the second breaker arm bracket. Some of the screws passing through said holes engage the tapped holes already provided in the distributor breaker plate to connect the plate 60 thereto. Countersunk holes 68 and 69 are adapted to receive the breaker arm shafts. Adjustment holes 70 and 71 enable effecting necessary adjustments in each of the two breaker arm brackets. The entire plate has the shape substantially of a horseshoe and fits into the distributor over the distributor breaker plate after the condenser and the breaker arm bracket are removed therefrom.

With the use of such a double-arm plate, conversion of the distributor is made similar to that described with respect to the single breaker arm auxiliary plate 30, with the exception that the original breaker arm bracket with its breaker arm must be first removed from the distributor together with the condenser. Two standard breaker arm brackets with breaker arms are thereupon mounted on the plate 60. The condenser is mounted on the housing 10. A distributor so converted is shown in Fig. 7.

There is thus provided improved auxiliary breaker arm plates with the aid of which conversion of conventional one arm distributors into two arm distributors is made simple, easy, and dependable, whereby the objects of the present invention listed above and numerous additional advantages are attained.

I claim:

1. An auxiliary plate for an engine distributor including a main distributor breaker plate having mounted thereon one breaker arm on a bracket and a condenser, with said main distributor breaker plate being provided with locating means for locating said condenser thereon and with tapped holes adapted to receive screws holding said condenser and the breaker arm bracket in place, and a cam having as many lobes as there are engine cylinders; said auxiliary plate being adapted to receive a second breaker arm and having means to coact with said condenser locating means to locate said auxiliary plate on said distributor plate and holes through which the condenser screws may be inserted to engage the distributor plate at said tapped holes and thus to hold the auxiliary plate rigidly and immovably on said plate in place of said condenser, said second arm being adapted to be electrically connected with the first arm to produce closing of the primary circuit by the second arm ahead of the first arm to increase the dwell.

2. An auxiliary plate for use with an engine distributor including a main distributor breaker plate having mounted on one side thereof one breaker arm on a bracket having a flat portion secured to said breaker plate by a screw, a condenser mounted on the opposite side of said breaker plate, with said main distributor breaker plate being provided with condenser locating means and tapped holes to receive screws holding said condenser in place, said distributor including a rotatable cam cooperating with said breaker arm and having as many lobes as there are engine cylinders; said auxiliary plate being adapted to be mounted on said plate in the place of said condenser and being of crescent shape and having means to engage said condenser locating means and provided with apertures to overlie the tapped holes, one of the ends of said auxiliary plate having a step to overlie the flat portion of said bracket and an aperture in said step through which the bracket-securing screw may be passed for holding both the arm bracket and the auxiliary plate to the distributor plate; said auxiliary plate adapted to have mounted thereon a second breaker arm adapted to cooperate with said cam, said arms being adapted to be electrically connected whereby rotation of said cam causes the second breaker arm to close before the first breaker arm and to open before the first breaker arm, thereby increasing the dwell period.

3. An engine distributor including a cam hav-

ing as many lobes as there are cylinders in the engine, a distributor breaker plate having one breaker arm provided thereon and having locating means for locating a condenser and tapped holes receiving screws holding said condenser on said plate, said breaker arm operatively engaging said distributor cam, an auxiliary plate having means engaging said locating means for positively locating said auxiliary plate on said distributor plate, and threaded connectors extending into said tapped holes to hold said auxiliary plate on the distributor plate, a second breaker arm mounted on said auxiliary plate and adapted to cooperate with said distributor cam to cause an increased dwell period.

4. A kit for converting into an increased dwell distributor an ordinary engine distributor including a distributor breaker plate having mounted thereon a single breaker arm on a bracket and a condenser, and including a rotatable distributor cam having as many lobes as there are engine cylinders; said kit including an auxiliary breaker plate adapted to be rigidly and immovably mounted on the distributor breaker plate, after the condenser is removed therefrom, and to receive a second breaker arm, said auxiliary plate being crescent shaped and having one end stepped up to overlie said breaker arm bracket, screws for connecting said second breaker arm bracket to the auxiliary plate, and an insulated electric conductor member for connecting the two breaker arms to wire them together in a manner to produce breaking of the primary current by the first arm only, with the second arm closing and opening before said first arm.

5. An auxiliary breaker plate for an automobile engine distributor having a distributor breaker plate with a single breaker arm and a condenser mounted on said plate, said distributor breaker plate having two locating bosses adapted to engage two locating indentations provided on a condenser, said distributor breaker plate also having a tapped hole for receiving a screw holding said condenser in place; said auxiliary plate being adapted to be mounted on

said distributor breaker plate in place of said condenser and having locating indentations adapted to engage said bosses on the breaker plate for locating said auxiliary plate positively on said breaker plate, said auxiliary plate being further adapted to carry a second breaker arm, and having a screw hole registering in predetermined position thereof with said tapped hole for receiving a screw connecting the auxiliary plate to the distributor breaker plate, said second breaker arm being adapted to be wired together with the first arm to effect closing of the primary circuit ahead of the first arm to increase the dwell period.

6. An auxiliary breaker arm plate for use in an engine distributor including a cam having as many lobes as there are cylinders in the engine, a distributor plate having mounted thereon one breaker arm on a bracket and a condenser, and provided with locating means for locating said condenser and with tapped holes adapted to receive screws holding said condenser and the breaker arm bracket having means adapted to engage said condenser locating means for positively locating the auxiliary plate on the distributor plate, said bracket being provided with apertures located to overlie the distributor plate tapped holes, said auxiliary plate being adapted to be mounted on said distributor plate in place of said condenser as well as breaker arm and its bracket means on said auxiliary plate to receive two breaker arms each adapted to cooperate with said cam, said breaker arms being adapted to be electrically connected to produce an increased dwell period.

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