June 6, 1950 J. CALLANDER 2,510,067

DISTRIBUTOR OF INTERNAL-COMBUSTION ENGINES

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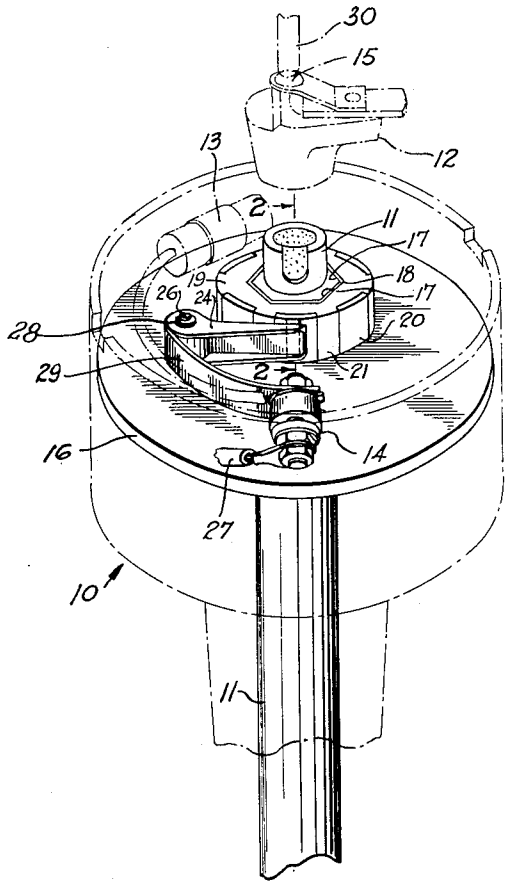

Fig. 1

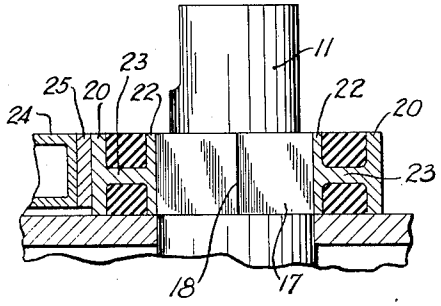

Fig. 2

INVENTOR.
JAMES CALLANDER
BY
Richards & Geier
ATTORNEYS

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DISTRIBUTOR OF INTERNAL-COMBUSTION ENGINES

James Callander, Chatham, N. J.

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1 Claim. (Cl. 200—24)

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This invention relates to the ignition system of internal combustion engines and more particularly to distributors in internal combustion engines.

In the common jump-spark ignition a coil supplies the high voltage necessary to induce the spark to leap the gap of a spark plug. The coil comprises a primary and secondary wiring and when the circuit of the primary is broken a high tension current is produced in the secondary which is successively led to the spark plugs by a rotor or the like. Heretofore, to open and close the circuit of the primary winding in the coil a pair of contacts or points, mounted on springs has been used in cooperation with a rotating cam which periodically broke the contact between the two contacts or points.

The contacts or points of this type of distributor are, after relatively short intervals of time in need of adjustment by a highly skilled mechanic. In addition, because of the constant making and breaking of contact between the two points, they soon become burned and pitted and require replacement. Further, the replacement of the points, also, can only be done by a skilled mechanic.

One object of the present invention is the provision of contacts which may readily be installed in the distributor of an internal combustion engine in place of the old breaker points.

Another object is the provision of a distributor, the contacts of which will be long lasting and will not require fine adjustment.

Yet another object is to provide contacts which will be more dependable in operation than heretofore was thought possible and yet be simple in design and manufactured at low cost without requiring material alterations in the structure of the present distributor.

Other objects and novel features will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel arrangement and co-relation of parts herein fully described, and illustrated in the accompanying drawings, wherein similar reference characters are used to denote corresponding parts throughout the several views, and then finally pointed out and specifically defined and indicated in the appended claim.

The disclosure made the basis of exemplifying the present inventive concept suggests a practical embodiment thereof, but the invention is not to be restricted to the exact details of this disclosure, and the latter, therefore, is to be understood from an illustrative, rather than a restrictive standpoint.

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In carrying out an embodiment of the invention, it was found advantageous to provide a disc with a plurality of radially disposed contact plates mounted so as to rotate with the turning of a shaft, said shaft rotating with the cam shaft of the engine, and a pivotally mounted brush for sliding engagement with said radially disposed contacts.

In the drawings:

Figure 1 is a perspective view of the device, with the other parts of the distributor shown in dot and dash lines; and

Figure 2 is a partial section along the line 2—2 looking in the direction of the arrows of Figure 1.

Referring now to the drawings in detail, 10 indicates the ordinary distributor casing having a distributor shaft 11, rotor 12, condenser 13, electrical terminals 14 and 15, and plate 16. Said distributor shaft 11 carries a rotary member having as many cam surfaces 17 thereon with high points on lobes 18 as there are cylinders in the engine, which is not shown herein, with which the distributor is designed to operate.

The disc 19 made of non-conducting material such as plastic or the like has a plurality of radially disposed contact plates 20 of good conducting material along the outer edge or periphery 21 and has a central opening running transversely therethrough. Said opening has a contact 22 encircling it and adapted to fit over said cams 17 on the distributor shaft 11 and rotate therewith by reason of a tight-fit. Contact plates 20 are each connected to contact 22 by leads 23.

A brush 24, carrying contact 25, is pivotally mounted on pin 26, said pin 26 being rigidly connected to the distributor plate 16 by means of screw threads or the like. A bushing 28 made of non-conducting material serves to insulate the brush 24 from both pin 26 and plate 16. A spring 29 connected at one end to brush 24 and at the other to lead-in 14 constantly urges contact 25 on brush 24 against edge or periphery 21 of disc 19.

It is evident from the foregoing that this device is for use in distributors operating in conjunction with the ordinary non-vibratory type coil which is not shown herein. Terminal 14 indicates where the primary winding of said coil is connected to the distributor by means of a lead 27, a fragment of which is shown in Figure 1, and terminal 15 similarly indicates where the

secondary winding of said coil is connected to rotor 12 by lead 30, also fragmentarily shown in Figure 1.

In operation disc 19 rotates with the distributor shaft 11, said shaft being grounded in the usual manner. Contact plates 20 are grounded through leads 23 to contact 22 which in turn is grounded through shaft 11. As disc 19 rotates, contact 25 on brush 24 and under the influence of spring 29 is in sliding engagement alternately with a contact plate 20 and the non-conducting edge 21 of disc 19 thereby alternately closing and opening the circuit of the primary winding of the aforementioned coil. This has the well known effect of inducing a high voltage in the secondary winding of said coil which is led to the spark plugs of the engine in the usual manner through rotor 12. The relationship between the size of contacts 20, 25 and the space between contacts 20 on the one hand and the spacing between the lobes 18 on the other is such that the time at which the high tension arrives from the secondary winding of the coil to the rotor is not changed from that of ordinary distributors.

The device will function equally well in the less common open-circuit distributor as in the more common closed-circuit distributor.

It is clear that disc 19 will have as many contact plates as there are cylinders in the engine with which it is designed to operate or as there are lobes 18 on the distributor shaft 11. As shown in Figure 1 the device is for a six cylinder engine. If the engine had four or eight cylinders disc 19 would have four or eight contact plates respectively.

To install the device in a distributor in which it is necessary to replace the old circuit breaker points it is only necessary to remove the breaker points with their arms and install brush 24 connecting spring 29 to terminal 14. Rotor 12 is removed and disc 19 is slid on over cams 17. On replacing the rotor the engine is ready to function in the usual manner, no further adjustments of the distributor being necessary.

By reason of the sliding engagement between contact 25 and contact plates 20, the contacts tend to clean themselves and remain free of oil and dirt. Further, sparking between the contacts for all practical purposes is eliminated as a cause of wear of the contacts.

From the foregoing it will be seen that the present invention provides a very simple, inexpensive, yet highly useful means to make and break a circuit in distributors for combustion engines. The illustrations shown above have been given solely by way of illustration and not by way of limitation and the above examples are subject to wide variations and modifications within the scope of the present invention. All such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

In a distributor for combustion engines having a casing, a rotary polygonal conducting member in said casing mounted to rotate with the engine cam shaft, a rotary insulating annular disc enclosing said rotary member, contact plates corresponding in number to the number of sides on said rotary member spaced apart on the outer periphery of said disc, a conducting, annular member having an inner surface fitting over said polygonal, conducting member and an outer surface engaging the inner surface of said annular disc, leads within said insulating, annular disc conductively connecting said contact plates with said annular member, whereby said contact plates are grounded to said rotary member, a brush pivotally mounted at one end to said distributor casing and at the other end in sliding engagement with said periphery of said disc and said contact plates, and a leaf spring connected at one end to said pivotally mounted end of said brush and at the other end connected to said terminal and urging said brush into sliding engagement with said disc.

JAMES CALLANDER.

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