F. V. SCHMID.

AUTOMATIC SPARK CONTROL FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED FEB. 28, 1917.

1,284,471.

Patented Nov. 12, 1918

2 SHEETS—SHEET 1.

Fig. 1.

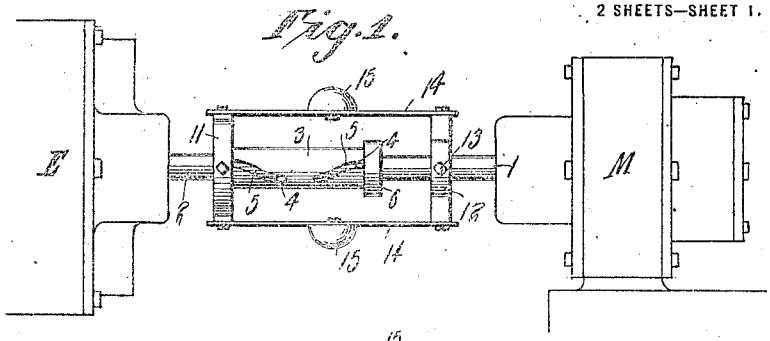


Fig. 2.

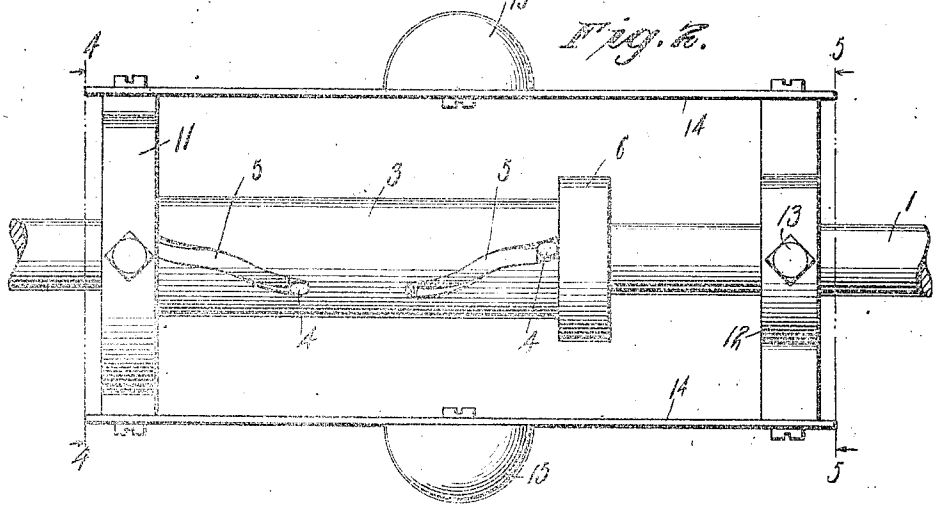
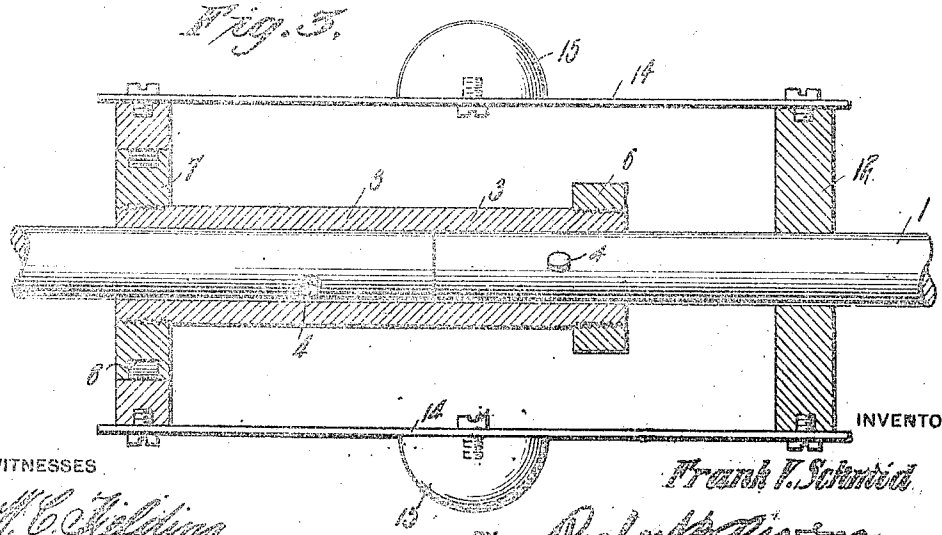


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

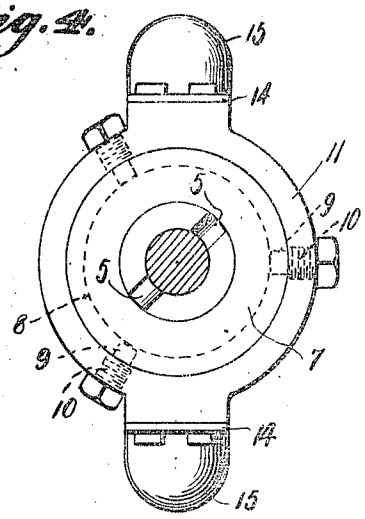


Fig. 5.

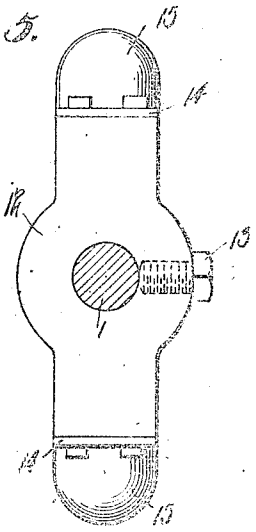


Fig. 6.

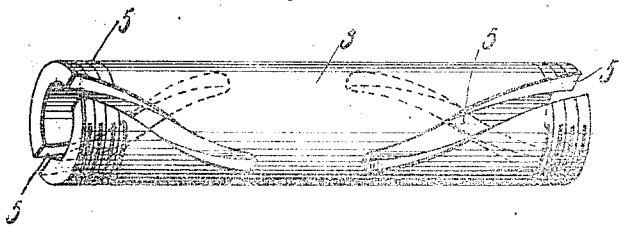
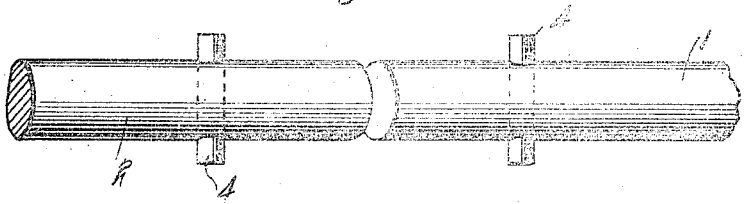


Fig. 7.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SPARK CONTROL FOR INTERNAL-COMBUSTION ENGINES.

1,284,471. Specification of Letters Patent. Patented Nov. 12, 1918.

Application filed February 28, 1917. Serial No. 151,621.

To all whom it may concern:

Be it known that I, FRANK V. SCHMID, a citizen of the United States, residing at Humphrey, in the county of Platte and State of Nebraska, have invented certain new and useful Improvements in Automatic Spark Controls for Internal-Combustion Engines, of which the following is a specification.

This invention relates to improvements in internal combustion engines, and more particularly to a device for automatically controlling the spark of such engines, and which is especially designed for use in connection with automobiles.

The main object of the invention is to provide a simple and efficient device of this character which may be attached to any make of car, new or old, and by the use of which the magneto may be set to spark exactly at the point where the strongest current is flowing and which produces the spark exactly at the right instant during the stroke of the piston thus securing the greatest power from the least fuel.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 represents a side elevation of this improved device shown applied,

Fig. 2 is a similar view on an enlarged scale showing the device constituting the invention with the engine and magneto omitted,

Fig. 3 is a longitudinal section thereof,

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2,

Fig. 5 is a similar view taken on the line 5—5 of Fig. 2,

Fig. 6 is a detail perspective view of the shaft connecting sleeve constituting a part of this invention, and

Fig. 7 is a similar view showing the two shaft sections in connection with which this improvement is used.

In the embodiment illustrated, the device constituting this invention is shown applied to a magneto driving shaft formed in two sections 1 and 2, the section 1 being connected to the magneto indicated at M in Fig. 1 and section 2 driven by the engine E.

A sleeve 3 connects these shaft sections and is engaged therewith by means of studs 4 on the shaft sections and spiral slots 5 in the sleeve. Two of these slots 5 open inwardly from each end of the sleeve at diametrically opposite points and curve in opposite directions. These slots are slidably engaged with the studs 4, two of which latter are carried by each shaft section at diametrically opposite points spaced from the outer ends of the sections (see Figs. 3 and 7).

The sleeve 3 is exteriorly threaded at its opposite ends to receive collars 6 and 7, the collar 7 having an annular groove 8 in its periphery in which operate extensions 9 of screws 10 carried by a governor ring 11. Three of these screws are here shown (see Fig. 4), but it is to be understood that any desired number may be employed. The other governor ring 12 is fixed rigidly to the shaft section 1 by a set screw 13 as is shown clearly in Figs. 2 and 5.

The usual governor springs 14 connect the rings 11 and 12 and carry thereon weights 15 which may be arranged on either side of said springs, being here shown on the outer sides thereof.

In the form of the invention here shown, the sleeve 3 is mounted on the shaft of a magneto which runs clockwise and in the operation of the device it will be understood that when the engine E has been started and the speed increased sufficiently, the governor weights 15 will fly outward and by means of the engagement of the collar 11 with sleeve 3 will move said sleeve to the right so that the revolution of shaft section 2 will be increased as compared to that of the shaft 1, and since the contact breaker, not shown, which controls the spark is placed directly on this shaft section 2 it follows that the spark will be correspondingly advanced, and when the engine slows down and the ring 11 moves outward the spark will be correspondingly retarded. It is to be understood that the spark could be manually controlled by this device by substituting a hand lever for the governor ring 11, the said lever to operate in the groove 8 of collar 7 so that on the shifting of the sleeve toward the magneto, the spark will be retarded and by moving it in the opposite direction from the magneto it will be advanced.

In the embodiment illustrated as before stated, the device is shown applied to a magneto revolving clockwise but it is to be understood that it may be applied to one revolving anti-clockwise by simply removing the collars 6 and 7, withdrawing the shaft sections and reversing the position of the sleeve 3.

From the above description it will be understood that where a device has been once supplied and connected with a governor ring in the manner above described no further attention is required on the part of the operator, the speed of the engine operating to control sleeve 3, shifting it toward or away from the magneto and thereby retarding or advancing the spark to meet the requirements of the engine so that the spark will occur at exactly the right instant of the piston stroke and thereby obtain a maximum amount of power with a minimum consumption of fuel.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains and while I have described the principle of operation of the invention together with the device which I now consider to be the best embodiment thereof. I desire to have it understood that the device shown is merely illustrative and that such changes may be made as are within the scope of the claimed invention.

I claim:—

The combination with a magneto driving shaft composed of two sections, each having a pair of studs projecting laterally therefrom at diametrically opposite points; of a sleeve encompassing said sections and provided at each end with a pair of longitudinally extending spiral slots opening through the ends of said sleeve and extending in opposite directions and adapted to be engaged with the studs on said shaft sections, the slots in one end extending toward those in the other end, and similarly curved, collars removably mounted on the ends of said sleeve, one of said collars having an annular peripheral groove, a pair of governor rings, one of which is fixed to one shaft section and the other loosely encircling said grooved collar, said last-mentioned ring having projections on its inner face loosely engaging the groove of said collar, springs connecting said rings, and weights carried by said springs whereby the sliding of the sleeve is controlled by the speed of the engine to retard or advance the spark.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK V. SCHMID.

Witnesses:

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BERNARD GILSDORF.