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1,468,801

N. H. CLARK

AUTOMATIC SPARK ADVANCING DEVICE

Filed June 7, 1922

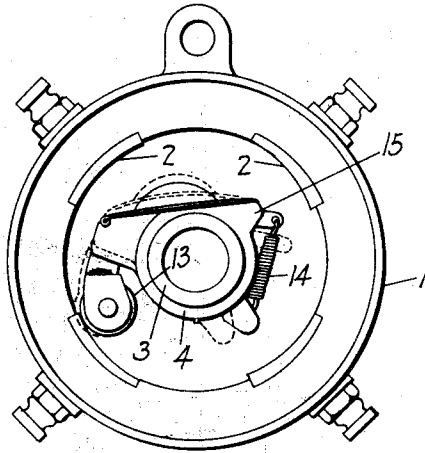


Fig. 1

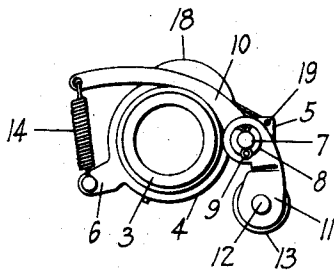


Fig. 2

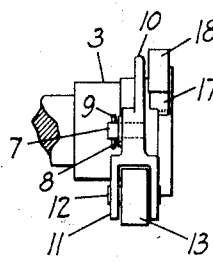


Fig. 3

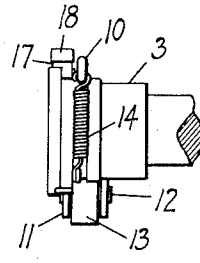


Fig. 4

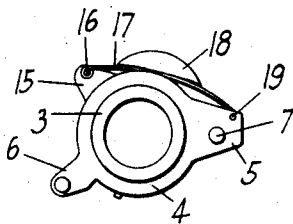


Fig. 5

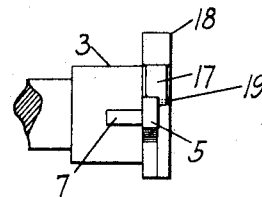


Fig. 6

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UNITED STATES PATENT OFFICE.

NEWELL H. CLARK, OF NEW RICHMOND, OHIO.

AUTOMATIC SPARK-ADVANCING DEVICE.

Application filed June 7, 1922. Serial No. 566,636.

To all whom it may concern:

Be it known that I, NEWELL H. CLARK, a citizen of the United States, residing at New Richmond, in the county of Clermont and State of Ohio, have invented certain new and useful Improvements in Automatic Spark-Advancing Devices, of which the following is a specification.

It is the principal object of my invention to provide simple and effective means to be applied to a commutator of an automobile of a common type, for automatically advancing the spark when the engine attains a certain speed, thereby insuring a hot spark at the right time independently of manual control of the spark adjusting mechanism. By my improved means the spark is automatically produced just before the time of greatest pressure in the cylinder, so that by the time the downward stroke of the piston is started, the highest efficiency of power will have been reached.

Other important and incidental objects will be brought out in the following specification, and particularly set forth in the subjoined claims.

In the accompanying drawings, Figure 1 is a top plan view of a commutator with my improved spark-advancing device applied thereto. Figure 2 is a bottom plan view of the roller mechanism and centrifugal spark-advancing weight. Figure 3 is a side view of said mechanism, looking toward the roller. Figure 4 is a side view of said mechanism, looking toward the spring. Figure 5 is a plan view of said mechanism with the roller arm and spring removed. And Figure 6 is a side view thereof.

Throughout the specification and drawings, similar reference characters denote corresponding parts.

Referring to the accompanying drawings, the numeral 1 designates a commutator housing in the annular wall of which there are set four segmental contact pieces 2 in circuit with coil units not shown. Loosely mounted on a timer shaft 3 is a collar 4 having a front lug portion 5 and a rear lug portion 6. (See Figures 2 and 5.)

Pivotally secured by a pivot pin 7, washer 8 and cotter pin 9 to the front lug portion 5 of the collar 4, is a bowed roller arm 10. The latter has a front forked end 11 which receives a shaft 12 on which there is loosely mounted a contact roller 13. Connected between the rear end of the roller arm 10 and

the lug portion 6 of the collar 4, is a spring 14. (See Figures 1, 2 and 5.)

Fast on the timer shaft 3 is the apertured end of an arm 15. To the outer end of the latter there is pivotally secured, by means of a pin 16, one end of a leaf spring 17 on the outer surface of the middle portion of which there is secured a segmental weight 18. The other end of the leaf spring 17 is pivotally secured to the front lug portion 5 of the loose collar 4, by means of a pin 19.

In operation, when the engine is running, the timer shaft 3 will be rotated by it to turn the arm 15 by which the collar 4 is rotated through the instrumentality of the spring 17. To the lug portion 5 of this collar 4 is pivoted the roller arm 10 that has secured to its outer end the contact roller 13 that engages the contact pieces 2 in the commutator housing.

When the speed of the engine increases, the centrifugal weight 18 will fly outwardly to cause the spring 17, to which it is secured, to pull the collar 4 forwardly around the shaft 3. The collar 4 thus creeping forwardly, will advance the contact roller 13 to cause it to engage the segmental contact pieces 2 earlier, thereby advancing the spark. Then, when the speed of the engine is lessened, the spring 17 will be free to force the collar 4 in the opposite direction around the timer shaft 3 to cause the contact roller 13 to engage the contact pieces 2 later, thereby retarding the spark. It is thus seen that the effect of my improved means is to automatically advance the spark when the speed of the engine increases, and to retard it when the speed of the engine lags.

Having described my invention, I claim:

1. In a device of the type described, the combination with an annular housing, of contact segments set in the inner wall of said housing, a timer shaft projecting into said housing, a collar loosely mounted on said shaft, a roller arm pivotally secured to said collar, a contact roller on said arm adapted to successively engage the contact segments, an arm fixedly secured to said shaft, a spring connected between the last named arm and the collar, and a weight secured to said spring for the purpose specified.

2. In a device of the type described, the combination with an annular housing, of contact segments set in the inner wall of said housing, a timer shaft projecting into

said housing, a collar loosely mounted on
said shaft, a roller arm pivotally secured to
said collar, a contact roller on said arm
adapted to successively engage the contact
5 segments, an arm fixedly secured to said
shaft, a projection on said collar, a flat
spring connected between the last named
arm and the said projection, and a seg-

mental weight secured to the middle portion
of said spring for the purpose specified. 10

In testimony whereof I have hereunto set
my hand this 6th day of May, 1922.

NEWELL H. CLARK.

Witness:

HOWARD S. SMITH.