J. D. MAXWELL.

SPARKING DEVICE FOR EXPLOSIVE ENGINES.

APPLICATION FILED MAR. 12, 1908.

1,120,399. Patented Dec. 8, 1914.

Fig. 1

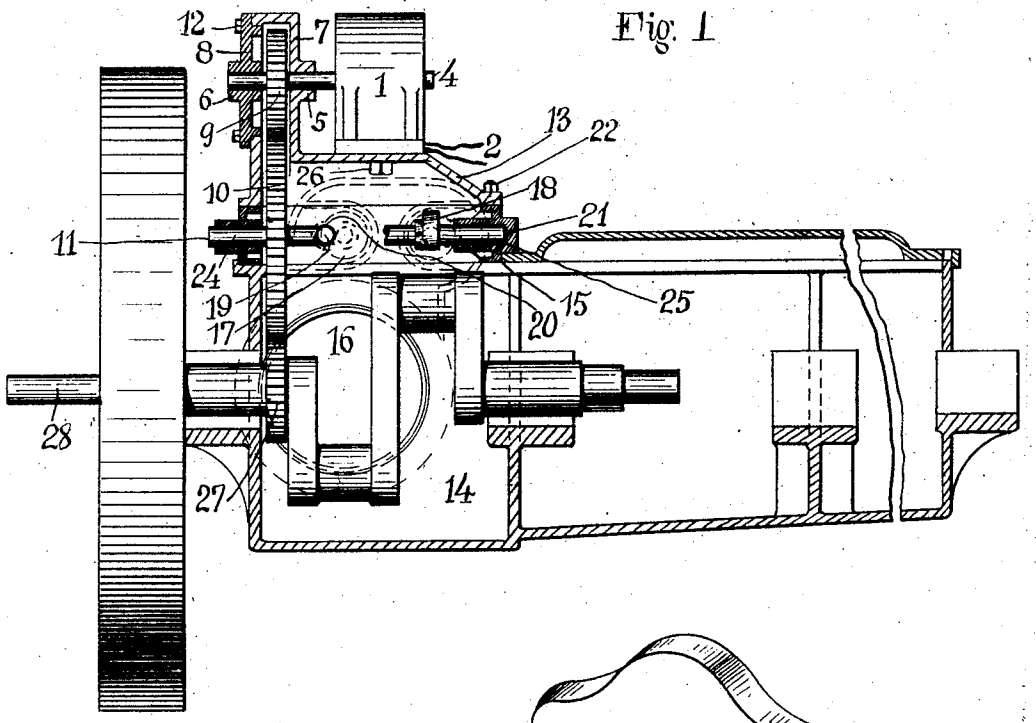
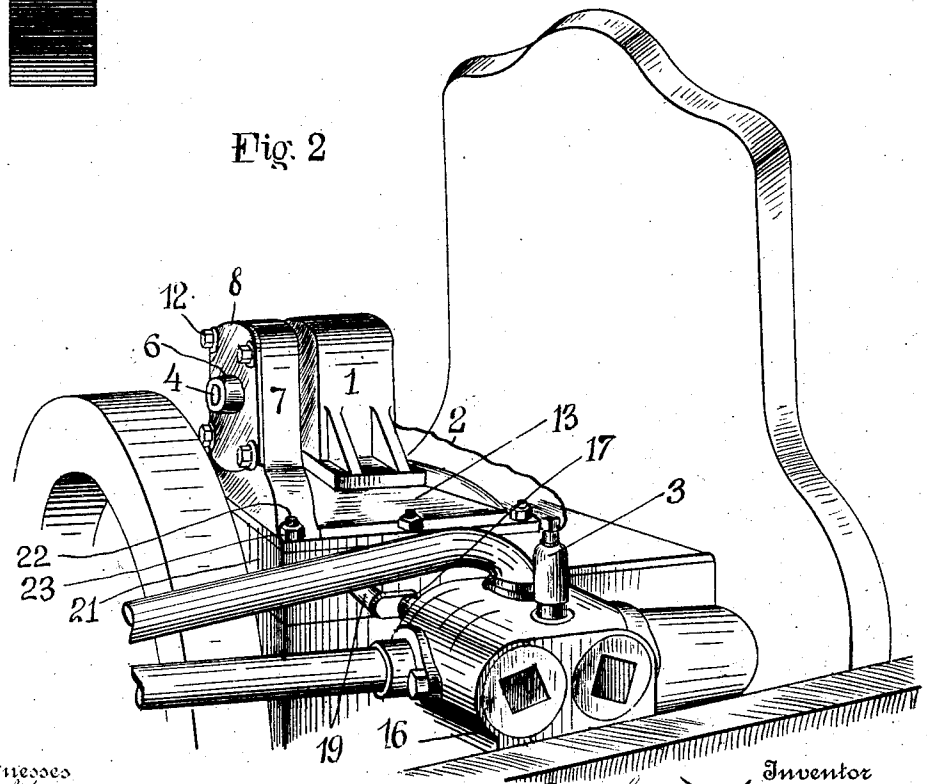


Fig. 2



Witnesses

Inventor

Jonathan D. Maxwell

By his Attorney

Alexander C. Brandt

UNITED STATES PATENT OFFICE.

JONATHAN D. MAXWELL, OF TARRYTOWN, NEW YORK.

SPARKING DEVICE FOR EXPLOSIVE-ENGINES.

1,120,399. Specification of Letters Patent. Patented Dec. 8, 1914.

Application filed March 12, 1908. Serial No. 420,538.

To all whom it may concern:

Be it known that I, JONATHAN D. MAXWELL, of Tarrytown, New York, have invented certain Improvements in Sparking Devices for Explosive-Engines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings designating like parts.

This invention relates to sparking devices for explosive engines and is of particular utility when applied to electrical sparking devices for automobiles, although I wish it understood that I contemplate the use of my invention in any field for which it may be adapted by the nature of my improvements.

The object of my invention is to render the sparking generator quickly and easily removable from the explosive engine, and also to permit its return to operative position, without disturbing other parts, and I preferably construct the closure member of the crank chamber as one part with the support for the sparking generator, the whole being mounted on, and removable as a unitary structure from, the frame carrying the valve motion for the engine cylinders, and so from the engine.

The various features of my invention will be illustrated and described fully in the accompanying drawings and specification and pointed out in the claims.

In the drawings, Figure 1 shows, in vertical, longitudinal section, part of an explosive engine, with enough of a crank chamber, its closure and sparking mechanism, in the construction of which my improvements have been embodied, to illustrate my invention, and Fig. 2 is a view in perspective, of the parts shown in Fig. 1, in place upon an automobile.

In the embodiment of my invention selected for illustration and description to enable ready and complete understanding of my improvements, the part designated by the reference numeral 1 is an electro-mechanical spark generator, which may be of any convenient and suitable construction, provided with electrical conductors 2 of which portions only are shown and which may extend to the sparking plugs 3 (see Fig. 2) directly or through controlling mechanism at any desired part of the apparatus, the spark generator having an actuating shaft 4 mounted in bearings 5 and 6 formed respectively in the stationary part 7 and removable face plate 8 of a casing provided for a gear or other actuating member 9, which, in the instance illustrated, meshes with a gear 10, fast upon a cam shaft 11. The face plate 8 may have suitable fastening means, such as the bolts 12, to secure it in place.

The electro-mechanical sparking device 1, in accordance with my invention, is mounted upon, and removable as a unitary structure with, a member 13, suitable fastening means, as the cap screw 26, being provided preferably, to secure the generator upon the member 13, which serves as a closure for the crank chamber 14, over a hand-hole or opening 15 in the crank chamber, to the sides of which may be bolted in usual fashion cylinders 16, provided with suitable valves 17. To actuate these valves I have illustrated cams 18 engaging spindles 19 carried in bearings 20, extending through, and preferably forming a part of the walls of, a frame 21, this frame with the valve spindles being removably secured over the upper aperture of the crank chamber 14, by suitable fastening means, as the bolts 22 which project through the edges of the closure 13 also, and have nuts 23 to retain the several parts in assembled relation. It will thus be seen that when access to the crank chamber is desired, the sparking generator 1 and the closure 13 can be removed as a unitary structure simply by removing the nuts 23, and if desired the frame 21 can be removed thereafter, carrying with it the cam shaft 11, and this shaft in turn can be removed from its bearings 24 and 25, and the spindles 19 from their bearings 20 when necessary.

I do not claim generically as a feature of my present invention the frame 21 removable with the cam shaft and spindles, as the same forms the subject matter of my application Serial No. 375,572, filed May 25, 1907.

The gear 10 upon the cam shaft meshes with a gear 27 fast upon the crank shaft 28, from which is derived the power to rotate the cam shaft 11 and the generator shaft 4, and it will be observed that each of these shafts and their corresponding gears come away together, and remain associated, so that they can be readily assembled when for any reason the closure and the valve frame have been removed.

Having described my invention thus fully and convenient means for carrying the same into effect, it will be understood that I do not limit myself to the specific form of apparatus selected for illustration, nor in general otherwise than as set forth in the claims read in connection with the specification.

What I claim and desire to secure by Letters Patent is:—

1. The combination with an explosive engine, its crank shaft, and a casing therefor having a removable cover-part; of a spark generator having stationary and rotatable elements, said generator being mounted on, and removable with, said cover part, without altering the relative position of the generator elements; and means to permit action of said generator by said crank shaft, substantially in the manner and for the purpose set forth.

2. The combination with an explosion engine, its crank-shaft, and a casing therefor having an opening opposite said crank-shaft, of a cam-shaft, and its bearing support, said bearing support surrounding said opening and being mounted upon said casing; a closure for said opening; a spark generator mounted on, and removable bodily with, said closure over said cam-shaft support; gearing connecting said cam-shaft with, and to operate, said generator; and means to permit actuation of said cam-shaft and said generator by said crank-shaft, said actuating means being subject to splash lubrication from said crank-shaft; substantially as described.

3. The combination with an explosion engine, its crank shaft, and a casing therefor having an aperture; of a removable valve-gear-case having substantially straight walls constituting an extension of said casing around said aperture; a cam-shaft and co-operating valve-actuating members mounted in and removable with said valve-gear-case; a closure member mounted over said valve gear-case and aperture; an electro-mechanical spark generator carried by said closure member; a gear on said valve cam-shaft, connected operatively with said generator; and means to permit actuation of said generator by said crank shaft, substantially as described.

4. The combination with an explosive engine, its crank shaft, and a casing therefor having an aperture to give access to said crank shaft; of a skeleton bearing-frame mounted on said casing over said aperture, and a cam-shaft carried by, and removable with, said frame; a closure member mounted removably upon, and to cover said frame and aperture; an electro-mechanical spark generator carried by and removable with said closure member; and a series of gears upon said crank shaft, cam shaft and spark generator, intermeshing and inclosed within said casing and skeleton frame when said parts are assembled, to permit positive actuation of said cam shaft and spark generator by said crank shaft; said gears coming away with their respective shafts upon removal of said spark generator and frame respectively; substantially as described.

5. As an article of manufacture, a closure member for a crank-shaft chamber of the class described, and a spark generator mounted thereon, said closure member having a substantially horizontal portion to receive and support a spark generator, and having an upright gear case provided with a bearing for the actuating shaft of said generator.

6. As an article of manufacture, a closure member for a crank shaft chamber of the class described, and a spark generator mounted thereon, said closure member having a substantially horizontal portion to receive and support a spark generator; an upright gear case provided with a bearing for the actuating shaft of said generator, said gear case having a removable face plate to give access to the interior of said gear case without removal of said closure from said chamber.

7. As an article of manufacture, a closure for a crankshaft chamber having a generator seat and an upright gear case; a spark generator mounted on said seat and provided with an actuating shaft extending into said gear case; and a gear on the portion of said shaft within said case; said parts forming a unitary structure removable from said chamber; substantially as described.

8. The combination with a crank case and a crank shaft, of a detachable cover plate for the crank case, a cam shaft mounted in said detachable cover plate, a magneto mounted on said cover plate, and a drive train from said crank shaft to said cam shaft and the shaft of said magneto automatically engaged and disengaged by attachment and detachment of said cover plate.

9. The combination with a crank case, of a detachable cover plate for the crank case, a cam shaft mounted in said detachable cover plate, a gear upon said shaft, a drive connection between said gear and the crank shaft automatically engageable and disengageable by the attachment and detachment of said plate, an enlargement arranged adjacent one end of said plate forming a housing for the gear upon the cam shaft, a magneto carried by said detachable plate, a gear upon the magneto shaft intermeshing with the gear upon the cam shaft and positioned within a recess in said housing, and a detachable cover for said recess.

10. In an engine, the combination with a casing, of a gear therein, a detachable cover

plate therefor, a cam shaft journaled in said cover plate, a bracket arm projecting from said cover plate, a magneto mounted on said bracket arm, a gear on said cam shaft for meshing with the gear within said casing, and a gear on the magneto shaft meshing with said gear on the cam shaft.

Signed at Tarrytown in the county of Westchester and State of New York, this 26th day of February, 1908.

JONATHAN D. MAXWELL.

Witnesses:

ALEXANDER C. PROUDFIT,

J. T. CONNELL.