

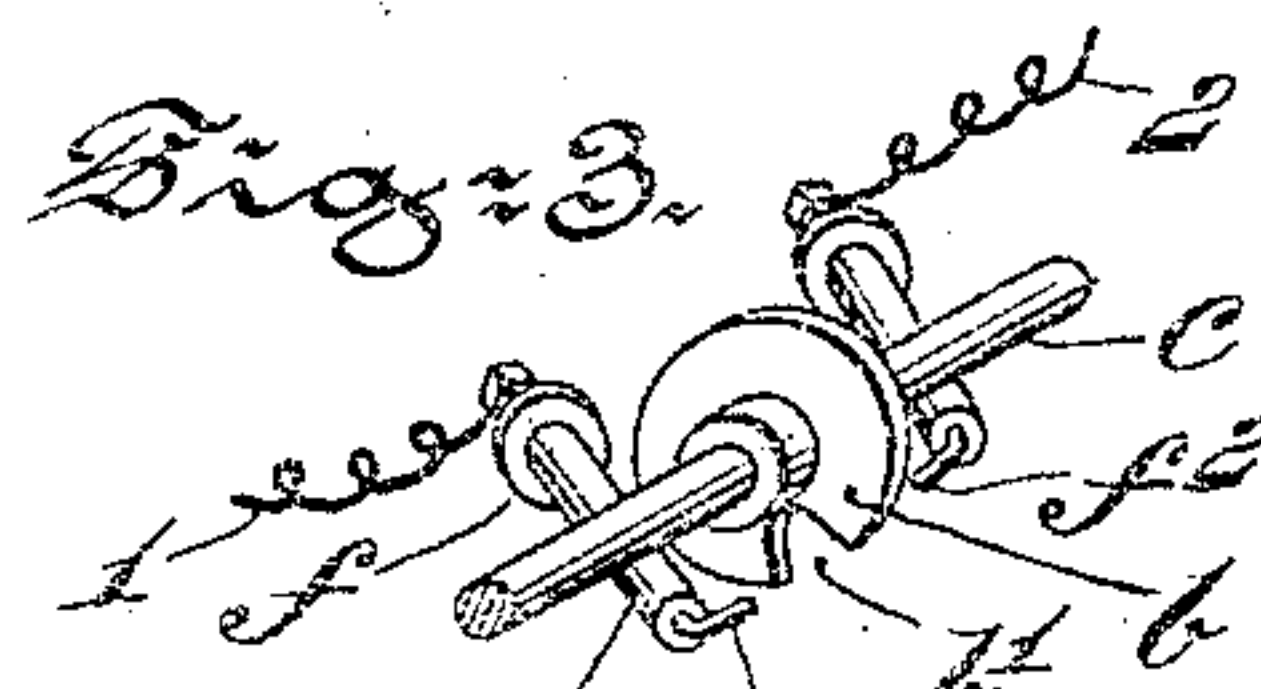
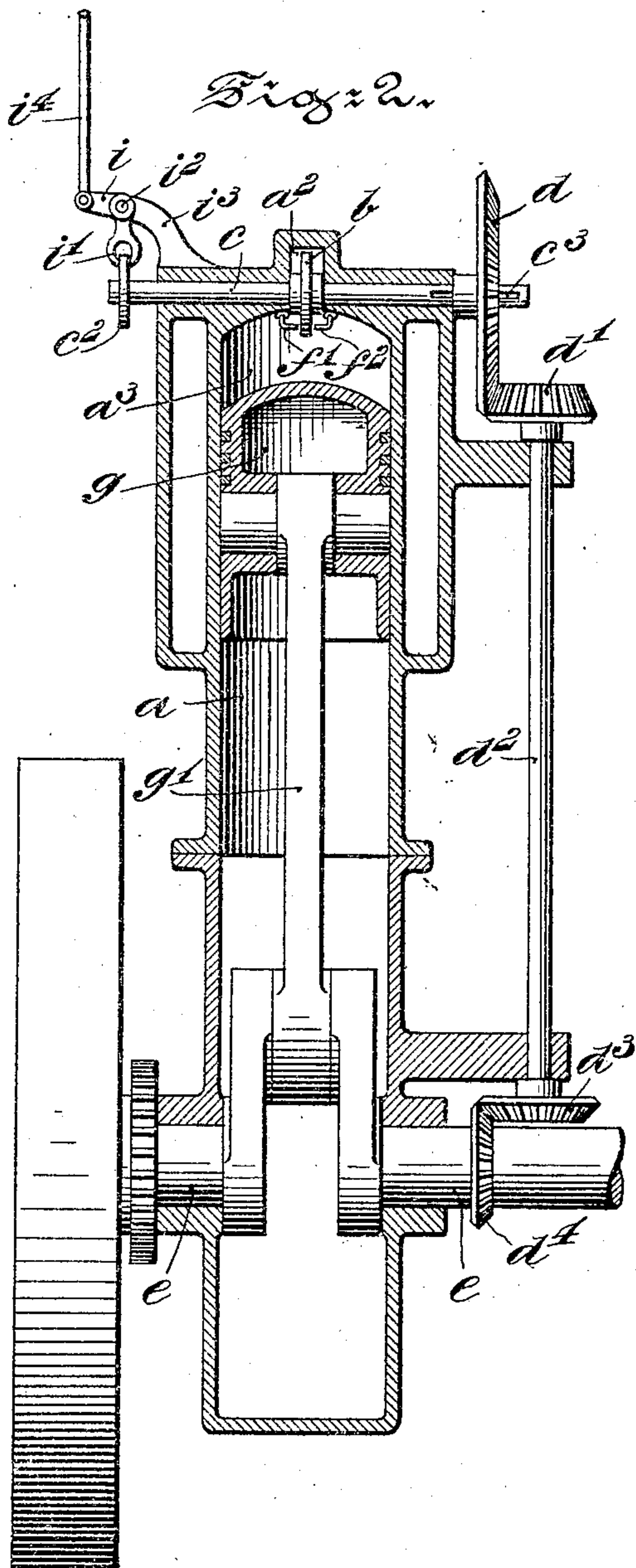
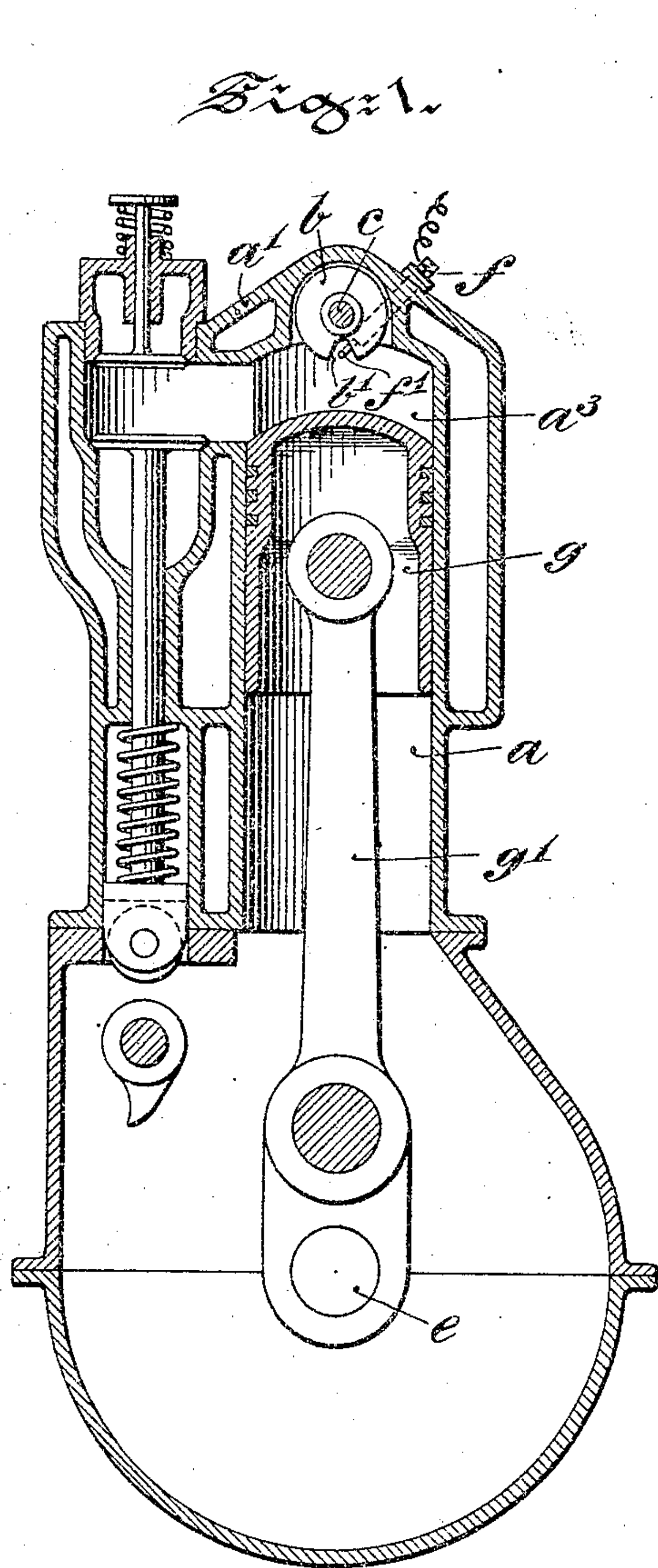
No. 863,369.

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J. S. ELVERSON.

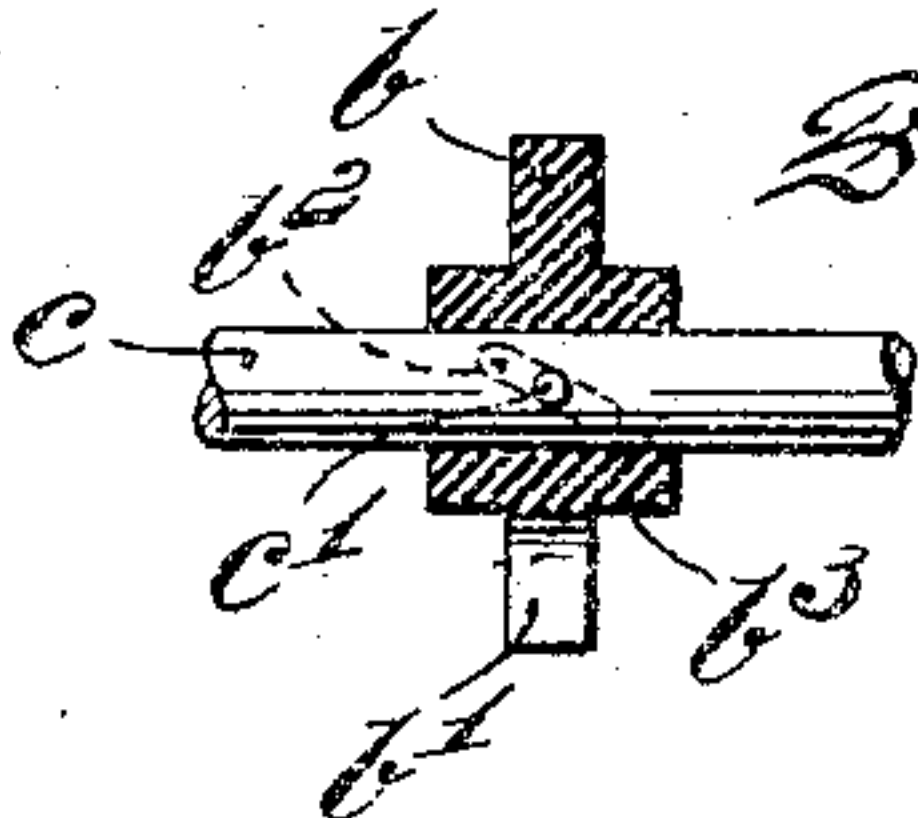
SPARKING DEVICE FOR EXPLOSIVE ENGINES.

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WITNESSES: f3 f1 b1

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SPARKING DEVICE FOR EXPLOSIVE-ENGINES.

No. 863,369.

Specification of Letters Patent.

Patented Aug. 13, 1907.

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To all whom it may concern:

Be it known that I, JOSEPH S. ELVERSON, a citizen of the United States, residing at Catasauqua, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Sparking Devices for Explosive-Engines, of which the following is a specification.

My invention has relation to a sparking device for explosive engines; and in such connection it relates more particularly to non-conducting means, for normally separating the terminals of the sparking device up to the time, in which an ignition of the charge is necessary.

The principal objects of my invention are first, to separate the terminals of the sparking device, by a spark arrester or disk of non-conductive material, which prevents a spark or sparks to pass between the terminals, until an opening of the disk is brought opposite the terminals to which the spark or sparks readily pass; second, to provide the sparking device with means to permit of the adjustment of the non-conducting disk with respect to its actuating shaft, so as to regulate the ignition of the charge of an explosive engine, with respect to the position of the piston thereof; third, to so arrange the terminals of the sparking device as to permit of an adjustment of the same, with respect to the non-conducting disk to compensate for wear of the terminals by the disk; and fourth, to provide means for laterally shifting the shaft carrying the disk, to change the position of the opening thereof, with respect to the terminals.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which

Figures 1 and 2, are views, illustrating in vertical section an explosive engine, the sparking-device arranged in the explosion chamber of the engine, the spark arrester or non-conductive disk arranged between the terminals of the sparking device having an opening or cut-out portion to permit of the passage of the sparks from one terminal to the other, a shaft for supporting and rotating the disk, a gear-mechanism for transmitting the rotary movement of the crank-shaft to the disk-shaft, and means for sliding the same in the head of the engine, all embodying main features of my said invention. Fig. 3, is a detail view, illustrating, perspectively, the sparking device, the non-conducting disk for permitting of the passage of the spark or sparks, when the opening thereof, is brought opposite the terminals; and Fig. 4, is a similar view illustrating partly in section and partly in elevation, the insulating disk, and the means for turning the same on the shaft, by a lateral movement thereof.

Referring to the drawings, *a*, represents the cylinder of an explosive engine, which is closed at its upper end by a head *a*¹, in the present instance formed in-

tegral therewith and in which is arranged a substantially annular chamber *a*², communicating with the explosion chamber *a*³, of the engine. In the chamber *a*², is arranged a disk *b*, consisting of any suitable non-conductive material, preferably of compressed asbestos, which is provided with an opening *b*¹, terminating in the perimeter of the disk *b*, as shown in Figs. 1 and 3. The disk *b*, is supported by a shaft *c*, passing through the head *a*¹, and chamber *a*³, thereof, and is rotated by a bevel-gear *d*, meshing with a bevel-gear *d*¹, which by means of a shaft *d*², and bevel-gears *d*³ and *d*⁴, is rotated by the crank-shaft *e*, of the engine, with a speed sufficient to bring the opening *b*¹, of the non-conducting disk *b*, opposite the terminals *f*¹ and *f*², of electrodes *f*, at each second revolution of the crank-shaft *e*. As shown in Fig. 1, the electrodes *f*, are conducted through the head *a*¹, of the engine, and are insulated from the same by sleeves *f*³, of non-conductive materials. To the electrodes *f*, are secured wires 1 and 2, which connect the same with the positive and negative poles of a source of electric energy, not shown. The terminals *f*¹ and *f*², of the electrodes *f*, are bent and preferably contact with the faces of the non-conductive disk *b*, so as to render impossible the passage of a spark or sparks between the terminals until the opening *b*¹, of the disk *b*, by its rotation lays the same bare. At this movement sparks will pass between the terminals *f*² and *f*³, through the opening *b*¹, and will ignite the charge filling the explosion chamber *a*³, which explosion in a well known manner actuates the piston *g*, and by the pitman *g*¹, the crank-shaft *e*. As shown in Fig. 1, the ignition of the charge in the present instance will take place when the piston *g*, occupies its highest position in the cylinder *a*, and is ready to descend in the same. When, however, it becomes desirable to ignite the charge at the downward stroke of the piston *g*, in which the same has more or less descended in the cylinder *a*, this is readily accomplished by turning the non-conductive disk on the shaft *c*, so as to bring its openings *b*¹, opposite the terminals *f*¹ and *f*², when the piston *g*, has completed a certain distance of its travel. This movement of the disk *b*, is imparted to the same independent of the shaft *c*, by means of a bolt *c*¹, secured to the shaft *c*, which by engaging an oblique slot *b*², arranged in the hub *b*³, of the disk *b*, turns the same when the shaft is laterally shifted in the head *a*¹, as will be readily understood in conjunction with Figs. 2 and 4, of the drawings. The ignition of the charge may thus be regulated *ad libitum* by merely sliding the shaft *c*, in the head *a*¹, of the cylinder *a*, which sliding movement is imparted to the shaft preferably, by a disk *c*², secured to the same, which is engaged by the forked end *i*¹, of a bell-crank lever *i*, pivotally secured in the point *i*², to a bracket *i*³, carried by the head *a*¹. The lever *i*, is actuated by a rod *i*⁴, which, when the engine is used with

an automobile, preferably terminates in proximity to the seat of the operator of the same. The insulating sleeves f^3 , supporting the electrodes f , are obliquely arranged in the head a^1 , so as to permit of an adjustment of the terminals f^1 and f^2 , with respect to the disk b . This adjustment is necessary to compensate for wear of the terminals, which takes place by contacting with the disk b . The disk b , separating the terminals f^1 and f^2 , from each other not alone prevents the passage of sparks between the same, at an inopportune time, but also prevents the accumulation of oxid or sticky matter thereon, which, as is well known, renders the terminals inoperative.

In order to permit of a sliding movement of the shaft i , with respect to the bevel-gear d , the same by means of a key c^3 , is loosely connected with the shaft c .

Having thus described the nature and objects of my said invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a sparking device, an engine having an explosion chamber therein, electrodes having terminals extending into said chamber, non-conducting means having an opening interposed between said terminals and means for actuating said non-conducting means so as to permit the opening thereof to be brought opposite the terminals of said electrodes, said non-conducting means adapted to normally prevent passage of sparks between the same until the openings have been brought opposite said terminals.
2. In a sparking device, an engine having an explosion chamber therein, electrodes having terminals extending into said chamber, rotary non-conductive means interposed between said terminals having an opening, said

means adapted to normally prevent the passage of sparks between the same until the opening frees said terminals and means for rotating said non-conducting means between the terminals of said electrodes.

3. In a sparking device, an engine having an explosion chamber therein, electrodes having terminals extending into said chamber, a rotary-disk contacting with said terminals having an opening, said disk adapted to normally prevent the passage of sparks between the same until the opening frees said terminals and means for rotating said non-conducting means between the terminals of said electrodes.

4. In a sparking device, an engine having an explosion chamber therein, electrodes having terminals extending into said chamber, a shaft, a disk mounted thereon and having an opening, means adapted to movably connect said disk with said shaft, means for rotating said shaft and disk, said disk adapted to normally prevent the passage of sparks between said terminals, until the opening frees the same, and said connecting means adapted to permit of an independent turning of said disk on said shaft.

5. In a sparking device, an engine having an explosion chamber therein, a shaft, a disk having an opening arranged therein, electrodes having terminals extending into said chamber and abutting against said disk, said electrodes arranged so as to be adjustable with respect to said disk to compensate for wear between said terminals and disk, and said disk adapted to prevent the passage of sparks between said terminals until the opening frees the same and means for rotating said shaft and disk.

In testimony whereof, I have hereunto set my signature in the presence of two subscribing witnesses.

JOSEPH S. ELVERSON.

Witnesses:

ALEX N. ULRICH,
J. WALTER DOUGLASS.