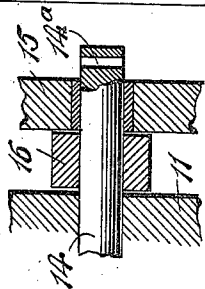
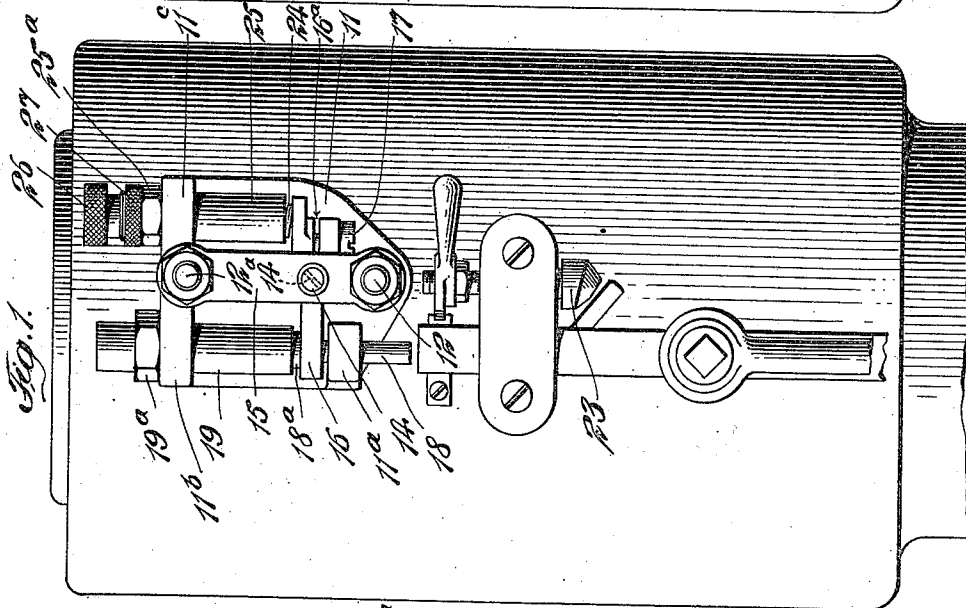
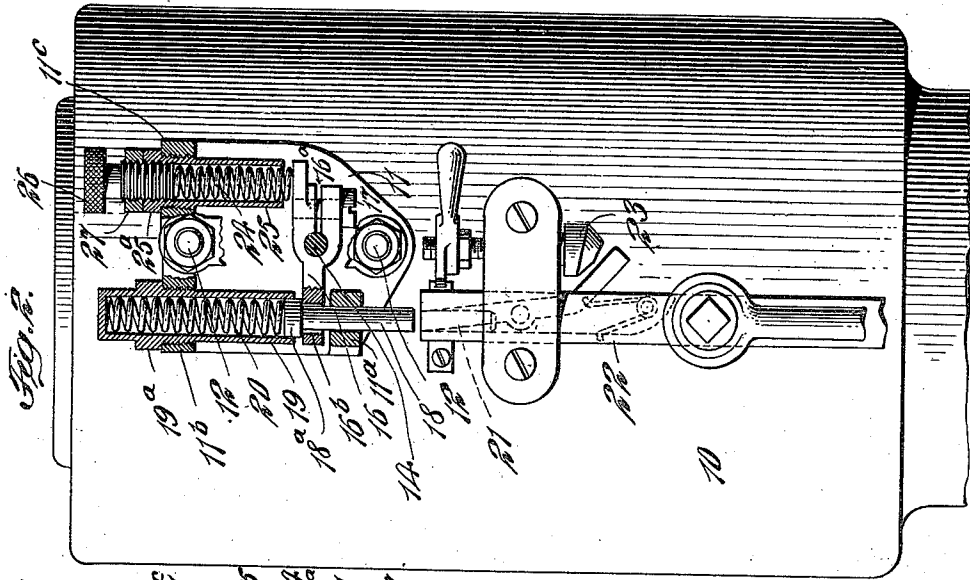


G. GRAY,
IGNITER.
APPLICATION FILED JAN. 21, 1910.

987,800.

Patented Mar. 28, 1911.



Witnesses:
John H. [Signature]
B. B. [Signature]

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By his attorney
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UNITED STATES PATENT OFFICE.

GEORGE GRAY, OF MIANUS, CONNECTICUT, ASSIGNOR TO MIANUS MOTOR WORKS, OF MIANUS, CONNECTICUT, A CORPORATION OF CONNECTICUT.

IGNITER.

987,800.

Specification of Letters Patent.

Patented Mar. 28, 1911.

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To all whom it may concern:

Be it known that I, GEORGE GRAY, of Mianus, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Igniters, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to make and break or contact and release igniting devices for explosive engines, and the underlying object of my invention is to reduce the complication of these devices, at the same time rendering them more certain in operation and easy of adjustment. This object I attain by mounting the movable electrode on a rock shaft which carries a lever joined to the shaft intermediate the ends of the lever. The said ends or arms of the lever are pressed by springs of which one is stronger than the other tending to hold the electrodes separated. By periodically relieving the pressure of the stronger spring and then allowing said spring to act, a rapid engagement and disengagement of the electrodes may be effected thus passing the spark.

A further feature of my invention resides in the manner in which adjustment may be made to take up wear on the electrodes due to the action of the passing current, according to which arrangement provision is made for adjusting the said lever on the rock shaft and an easy means provided for fastening these parts together so that when fastened the connection will be secure. At the same time such connection may be easily released to permit of the adjustment referred to.

My invention involves various other features of importance, all of which will be fully set forth hereinafter and particularly pointed out in the claims.

The accompanying drawings represent, as an example, the preferred manner of practically embodying my invention.

In these drawings—Figure 1 is a front elevation of the igniting mechanism; Fig. 2 is a section taken through the springs and their retainer and also showing the manner of fastening the lever on the rock shaft; and Fig. 3 is a detail section showing the manner of mounting the rock shaft in the plug.

Referring to said drawings and to the reference characters marked thereon, 10 indicates the cylinder of the engine and 11 the

body of the plug which is adapted to be fastened into and over an orifice in the cylinder walls by means of screws 12, all of which will be fully understood from the prior art, particularly my prior Patent No. 956,075, dated April 26, 1910, for improvement in spark plugs. The electrodes are located on the inner side of the plug and are not shown in the accompanying drawings.

14 indicates the rock shaft on which the movable electrode is mounted. This shaft is arranged to turn in the plug or body 11 and extends outward through a bridge 15 on said plug and slightly beyond the same as shown in Fig. 3.

16 indicates the rocking lever, one end of which is split at 16^a and the other end of which is furnished with an orifice 16^b. The split end of the lever carries transversely a screw by which the lever may be clamped on the rock shaft 14, thus securely fastening the parts together. By releasing the screw 17, however, the lever may be freely turned on the rock shaft and in this way the relation between the lever and the rocking electrode may be regulated so as to adjust these parts at any time, and with complete ease. This may be done without taking the plug from the cylinder and to facilitate turning the rock shaft in the lever, said shaft is furnished in its outer end with an orifice 14^a with the walls of which a nail or pin of any sort may be engaged. Carried in a lug 11^a or other bearing on the plug 11 is a vertically reciprocal rod 18 which passes through the opening 16^b in the lever 16 and has above the same a head which is movable freely in the lower end of a retainer tube 19. This tube is closed at its upper end and is threaded in a lug 11^b of the plug.

19^a indicates a hexagonal surface on the tube 19 to which a wrench may be applied to "set up" firmly on the tube. Contained within the retainer tube 19 is a strong spring 20. This spring is of the expansive helical type. Said spring presses down the pin 18 and causes the head 18^a thereof to bear on the lever 16. The pin 18 is periodically moved up by a trigger 21 on a reciprocating rod 22, and the trigger is periodically tripped and thrown out of engagement with the pin 18 by means of a detent 23. These parts 21, 22 and 23 are well known in the prior art and in my prior patent heretofore referred to. The opposite or split end of

the lever 16 is engaged by a spring 24, which is also an expansive helical spring, but of less strength than the spring 20. The spring 24 is situated in a tubular retainer 25 which is screwed into a lug 11^c on the plug 11. The upper end of the tube 25 is open to receive a pin 26 which is screwed thereto to engage the spring 24 and furnished with a lock nut 27 to hold the pin in the desired position. The pin therefore regulates the tension of the spring 24 and by reason of the knurled head on the pin 26 and the knurled nut 27 the pin may be easily and quickly adjusted. The retaining tube 25 is adapted to be permanently screwed into position for which purpose it has a hexagonal wrench surface 25^a.

The operation of the device may be traced as follows: Normally the parts stand as in Fig. 2 in which the trigger 21 is lowered and the superior pressure of the spring 20 holds the lever 16 down on the lug 11^a at which time the electrodes are separated. Upon upward motion of the trigger 21 the pin 18 is engaged and moved upward, disengaging the head 18^a from the lever 16 and relieving said lever of the pressure of the spring 20. Instantly thereafter the spring 24 asserts itself and throws down the opposite end of the lever 16 bringing the electrodes into contact with each other. For a moment the parts remain in this position, but as the continued motion of the trigger 21 brings it into contact with the detent 23 the trigger is thrown to one side, the pin 18 is released and the spring 20 is permitted to drive the pin 18 downward, its head 18^a again striking the lever 16 and restoring the parts in the position in Figs. 1 and 2. This separates the electrodes and passes the spark which ignites the explosive charge. The rod 22 then returns to the position shown in the drawings and the above described operation is repeated.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a gas engine igniter, the combination of a rock shaft, a pair of electrodes, one of which is connected to the rock shaft, an arm intermediately mounted on the rock shaft, springs actuating the ends of the arm to rock the shaft in opposite directions, means for periodically relieving the arm of the action of one spring, chambered retaining members in which the springs are mounted and means for adjusting the tension of the other or second spring, said means for adjusting the tension of the second spring comprising a plug adjustable in the retaining means and engaging one end of the spring to form a backing therefor.

2. In a gas engine igniter, the combination with a body or support having lugs thereon, of retaining tubes mounted in the

lugs, the outer end of one retaining tube being open, adjusting means acting in said end of said tube, expansive springs contained in the tubes, the spring of the first-named tube bearing against said adjusting means, a rock shaft, a pair of electrodes, one of which is connected to the rock shaft, a lever intermediately mounted on the rock shaft having its arms respectively engaged by said springs and means for periodically relieving the lever of the tension of one spring.

3. In a gas engine igniter, the combination with a body or support having lugs thereon, of retaining tubes mounted in the lugs, the outer end of one retaining tube being open, adjusting means acting in said end of said tube, expansive springs contained in the tubes, the spring of the first-named tube bearing against said adjusting means, a rock shaft, a pair of electrodes, one of which is connected to the rock shaft, a lever intermediately mounted on the rock shaft having its arms respectively engaged by said springs and means for periodically relieving the lever of the tension of one spring, said spring so acted upon being of greater strength than the other spring.

4. A gas engine igniter comprising the combination of a support having lugs extending outwardly therefrom, a rock shaft, a bridge spaced from said support and held rigid in respect thereto, a rock lever carried by said shaft beneath said bridge, a pair of electrodes, one of which is connected to the rock shaft, springs acting against the opposite ends of said lever and tending to rock it in opposite directions, means carried by said lugs for retaining said springs in position and means for relieving the lever of the action of one spring.

5. A gas engine igniter comprising the combination of a support having lugs extending outwardly therefrom, a rock shaft, a bridge spaced from said support and held rigid in respect thereto, a rock lever carried by said shaft beneath said bridge, a pair of electrodes, one of which is connected to the rock shaft, springs acting against the opposite ends of said lever and tending to rock it in opposite directions, tubes carried by said lugs for retaining said springs in position and means for relieving the lever of the action of one spring.

6. A gas engine igniter comprising the combination of a support having lugs extending outwardly therefrom, a rock shaft, a bridge spaced from said support and held rigid in respect thereto, a rock lever carried by said shaft beneath said bridge, a pair of electrodes, one of which is connected to the rock shaft, springs acting against the opposite ends of said lever and tending to rock it in opposite directions, adjustable tubes carried by said lugs for retaining said

springs in position and means for relieving the lever of the action of one spring.

7. A gas engine igniter having the combination of a support, two substantially parallel tubes carried thereby, a rock lever extending substantially at right angles to the direction of said tubes and adjacent their ends, a pair of electrodes, one of which is connected to said rock lever, springs within said tubes tending to move said lever in opposite directions and means movable through one end of said lever for relieving said lever of the tension of one of said springs.

8. A gas engine igniter having a support, two substantially parallel tubes carried thereby, a rock lever pivoted intermediate its ends having its ends disposed adjacent the ends of the said tubes, a pair of electrodes, one of which is connected to said rock lever, and springs within said tubes for actuating said lever in opposite directions and means movable through one end of said lever for relieving said lever from the tension of the spring acting upon said ends.

9. A gas engine igniter comprising the combination of a support, a rock shaft carried thereby, a rock lever carried by said shaft, a pair of electrodes, one of which is connected to said rock shaft, springs acting against the opposite ends of said lever and tending to rock it in opposite directions and adjustable tubes carried by said support for retaining said springs in position and means

telescoping with one of said tubes for relieving the lever of the action of the spring within said tube.

10. In a gas engine igniter, the combination of a support, a rock lever, a pair of electrodes, one of which is connected to the rock lever, two springs acting upon the opposite ends of said lever and tending to rock the same in opposite directions, means extending lengthwise of said springs for supporting the latter and means movable through one end of said lever for relieving said lever of the tension of the spring adjacent said end.

11. In a gas engine igniter, the combination of a support, a rock lever, a pair of electrodes, one of which is connected to the rock lever, two springs acting upon the opposite ends of said lever and tending to rock the same in opposite directions, longitudinally adjustable means extending lengthwise of said springs for supporting the latter and means movable through one end of said lever for relieving said lever of the tension of the spring adjacent said end.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE GRAY.

Witnesses:

CLARENCE A. BOYD,
S. F. SCOTT.