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PATENTED APR. 21, 1908.

H. G. & C. C. COULSON.  
SPARKING MECHANISM.  
APPLICATION FILED JUNE 24, 1907.

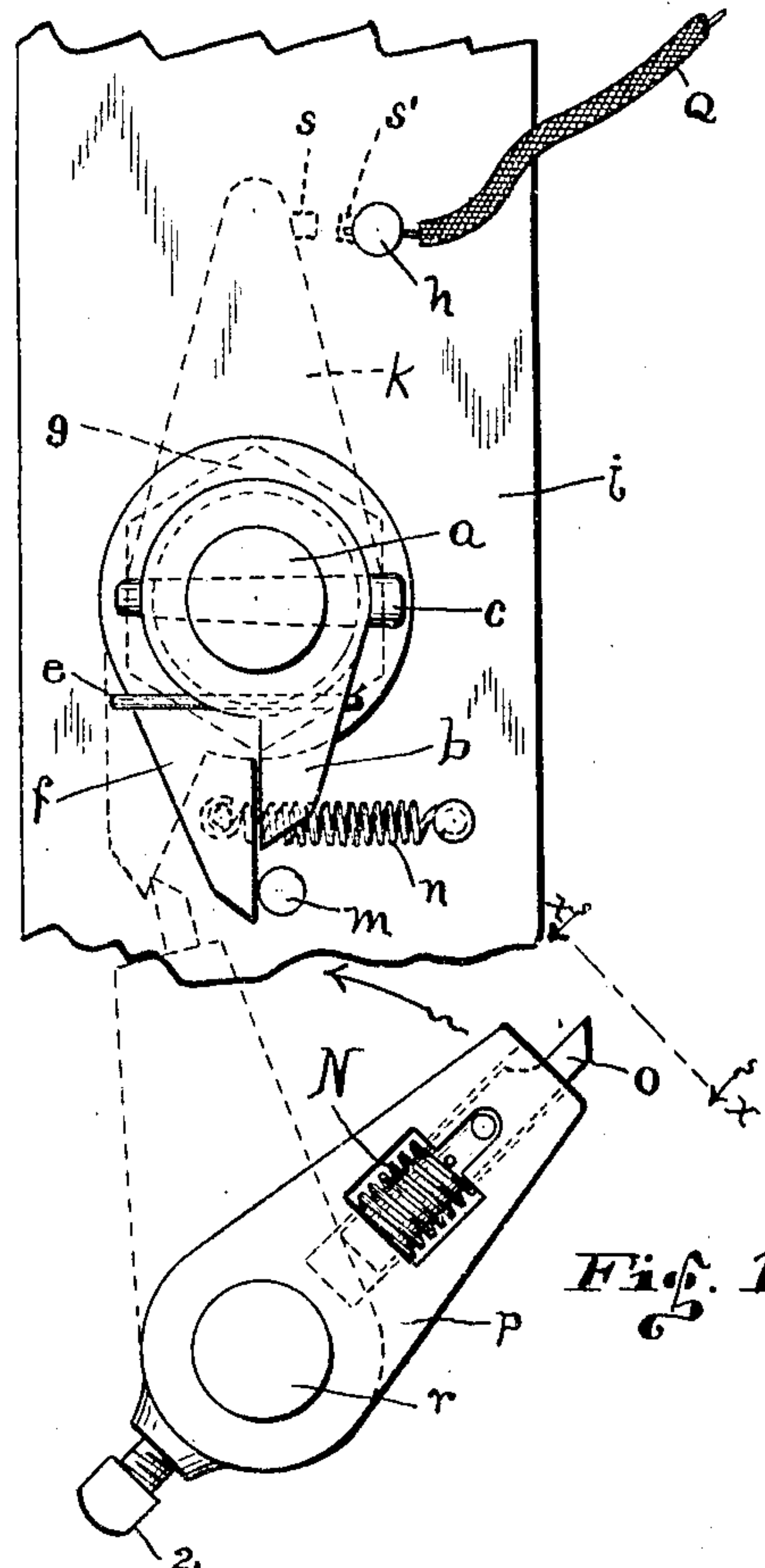


Fig. 1.

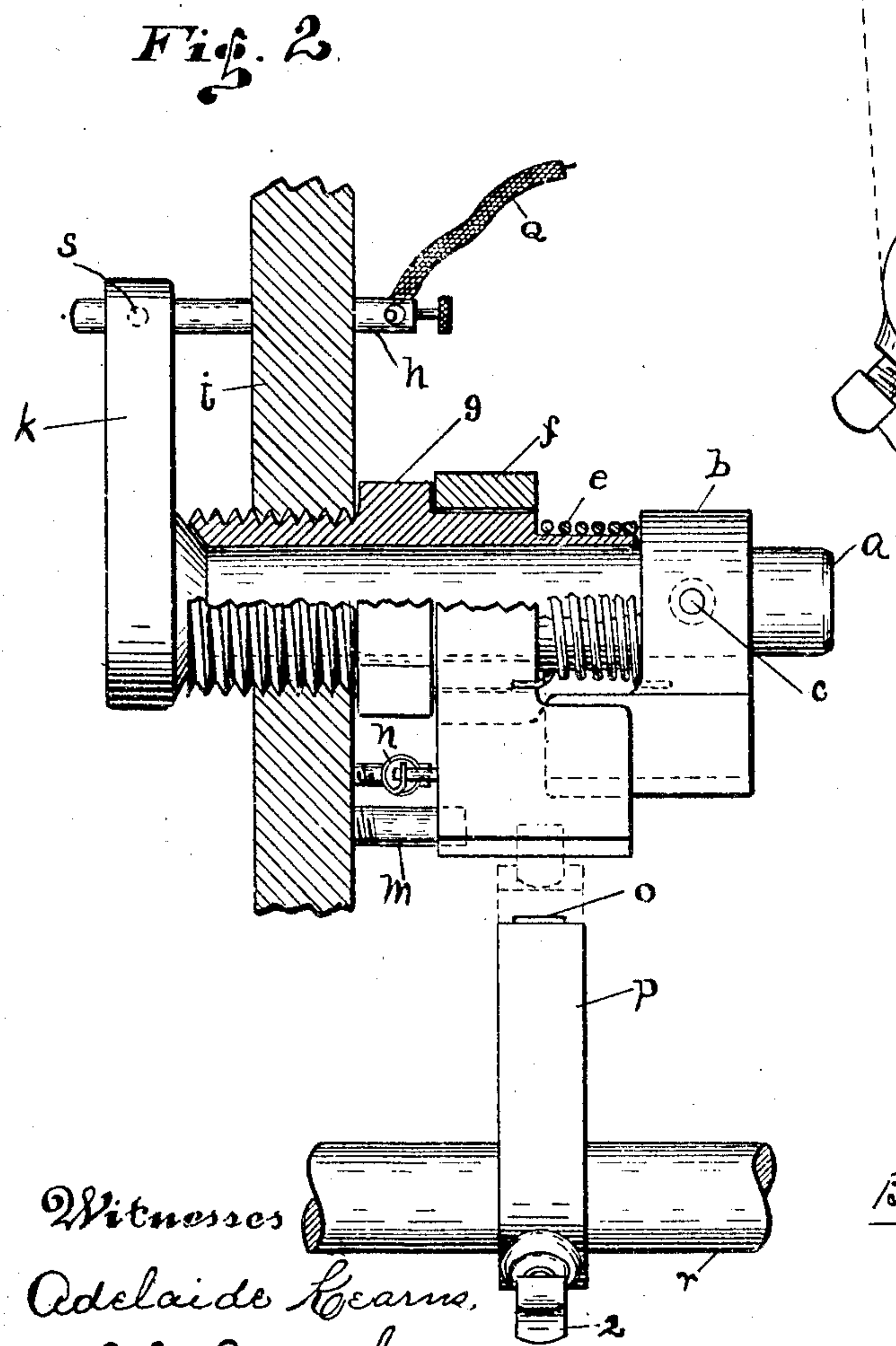


Fig. 2.

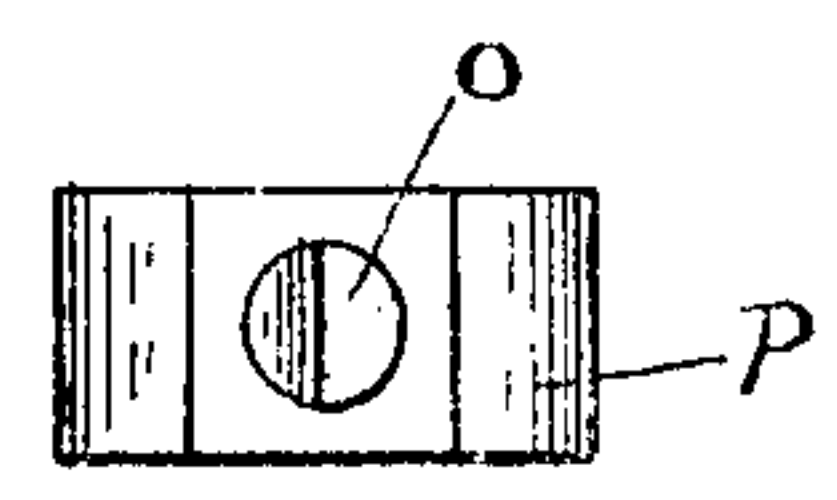


Fig. 3.

Witnesses  
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# UNITED STATES PATENT OFFICE.

HARRY G. COULSON AND CHARLES C. COULSON, OF JAY COUNTY, INDIANA.

## SPARKING MECHANISM.

No. 885,324.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed June 24, 1907. Serial No. 380,391.

To all whom it may concern:

Be it known that we, HARRY G. COULSON and CHARLES C. COULSON, citizens of the United States, residing in the county of Jay and State of Indiana, have invented new and useful Improvements in Sparking Mechanism, of which the following is a full, clear, and comprehensive exposition and specification, being such as will enable others skilled in the art to which the invention relates to make and use the same with absolute exactitude.

The object of our present invention, broadly speaking, is the provision of an improved construction of the class stated designed to give a maximum of mechanical efficiency with a minimum of expense, to provide an electrical sparker constructed on new and improved lines, and in which the item of expense, for installation and maintenance, will be practically nil.

Other objects and specific advantages of our invention will appear in the course of the ensuing specification, and the points which are new will be correlated in the appended claims.

Our invention is intended primarily to be employed in connection with the explosion chamber of gas or gasoline engines, and the special feature of our invention which we desire to emphasize is: The placing of the larger striker-arm, employed in breaking contact of sparker-points, and also all springs, upon members other than the sparker shaft.

Probably the best exemplification of the possibilities and advantages of our invention is shown most clearly in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan or face view of our invention as applied to the cylinder of an explosion engine. Fig. 2 is a vertical part-sectional view of the parts shown in Fig. 1. And Fig. 3 is a detail view of the free end of the adjustable actuating-arm.

Similar indices denote like parts throughout the several views.

In order to render the construction and operation of our invention readily understood, we will now take up a detail description thereof, in which we will describe the construction and operation of the invention as briefly and as compactly as we may.

The letter *i* designates a portion of the cylinder-wall of an explosion engine, the parts to the right of which, in Fig. 2, are outside and the parts to the left are inside the cylin-

der. An aperture is formed through the wall into which is threaded the plug or bushing *g*, which has a central aperture longitudinally therethrough into which is revolvably mounted the sparker-shaft *a* which is expanded at its inner end whereby it is taper seated at its inner end against the inner end of the plug or bushing *g* whereby said shaft may not be moved outward endwise.

The letter *k* designates the contact arm which is integral, or permanently secured, to the inner end of the shaft *a*, and it is disposed at right-angles thereto and it extends upward some distance as designated in Fig. 2. Extending out from near the upper end of the contact-arm is a terminal or contact-point *s*.

The letter *h* designates the insulated electrode which extends through the wall *i* being so located as to engage the free end of the arm *k*, and secured in said electrode, is the terminal or contact point *s'* which is adapted to contact with the point *s*. To the outer portion of the electrode *h* is attached the electric current wire *Q*. On the outer extending portion of said plug or bushing *g* is formed, longitudinally thereof, a bearing face for the large striker arm *f* which as is apparent has no direct connection with the shaft *a*, except by the interposition of the small striker arm *b*, which latter is secured to the outer portion of the shaft *a* by the taper-pin *c*. The letter *e* designates a helical spring which is convoluted around the shaft *a* but is separated therefrom by the reduced extension of the plug or bushing *g* whose outer terminal acts as a shoulder for the inner face of the head of the small striker arm *b*. One end of said spring *e* engages the striker-arm *f* and the other end thereof engages the arm *b*, with the torsion of said spring *e* such as normally to retain said arms in contact with each other.

The letter *r* designates the actuating shaft which is, in this instance, revolvably mounted parallel to the shaft *a* and it is located some distance therefrom. The actuating arm *p* is adjustably secured, by the set-screw 2, to the shaft *r*, and carried by said arm *p* is the spring actuated bevel-end plunger *o*, the same being mounted for endwise movements parallel with the arm *p* and being normally impelled in a direction from said shaft by the coil spring *N* shown in Fig. 1.

The letter *m* designates a stop for the arm *f*, and the letter *n* designates a helical spring secured at one end to the arm *f*, and secured



at the other end to the wall *i*, to retain said arm *f*, normally, in position to be engaged by the plunger *o*, and when not engaged said arm *f* rests resiliently against the stop *m*, at the same time retaining the termini *s* and *s'* apart, as shown in Fig. 1.

It will now be notably apparent that if the striker arm *f* be acted upon by the plunger *o*, carried by the arm *p*, it will be moved to the position in which it is shown in dotted lines in Fig. 1, the shaft *r* continuously revolving in the direction indicated by the arrow. It is also apparent that when the arm *f* is moved as described the shaft *a* will consequently follow in rotation, resiliently, by the action of the torsion of the spring *e*, until the terminal points *s* and *s'* impinge against each other; after which the shaft *a* and the arm *b* will stop while the arm *f* continues to rotate, constantly increasing the tension of the spring *e*. As soon as the arm *p* moves far enough to release the arm *f* from the plunger *o* then the spring *e* will return the arm *f* smartly back against the arm *b*, thereby making an instantaneous break of the current which may be traveling from the terminal point *s'* to the terminal point *s*, the resultant spark being of the desired sufficiency to fire the charge contained in the cylinder.

It will readily be determined that the action of the sparker is independent of the speed of the engine, that is to say of the shaft, *r*, and hence there will be no variation in the size of the spark produced, while at the same time it will be perfectly timed. It is also apparent that the circuit will be periodically broken, the spark being produced between the terminal contacts at every interruption of the current, and that when the engine is not in operation the terminal points will be separated, thereby preventing a waste of current. It should be noted, also, that should the shaft *r* be rotated reversely that no damage will result, as the taper of the plunger *o* will impinge the taper of the arm *f* and thereby driving the plunger down into the arm *p* un-

til the points have passed each other after which the plunger will be impelled to its normal position by the spring *N*.

We desire that it be understood that the specific construction of the details of the invention in which novel features are embodied, as well as the general construction of the parts, may be variously changed and modified without altering the essential principles which are new and useful.

Having now fully shown and described our invention and the best means for its construction to us known at this time, what we claim and desire to secure by Letters Patent of the United States, is—

1. Sparker mechanism for gas engines, comprising a bushing, a sparker shaft therein, an arm fixed on said shaft beyond the outer end of the bushing, a striker arm rotatably mounted on the bushing at a distance from said other arm but having a portion adapted to contact therewith, a spring coiled about the bushing between said arms and operatively connected therewith at its ends, and means for actuating said striker arm.

2. Sparker mechanism for gas engines, comprising a bushing, having its outer end portion reduced, a sparker shaft within said bushing, an arm fixed on said shaft beyond the outer end of the bushing, a striker arm rotatably mounted on the bushing immediately in rear of the reduced portion thereof, being adapted to contact with the other arm, a spring coiled about said reduced portion of the bushing with its ends operatively connected with said arm, and means for actuating the striker arm.

In testimony whereof we have hereunto subscribed our names in the presence of two subscribing witnesses.

HARRY G. COULSON.  
CHARLES C. COULSON.

Witnesses:

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R. M. TOWLE.