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PATENTED FEB. 21, 1905.

A. E. TAYLOR.  
SPARKING IGNITER FOR EXPLOSIVE ENGINES.  
APPLICATION FILED JULY 9, 1903.

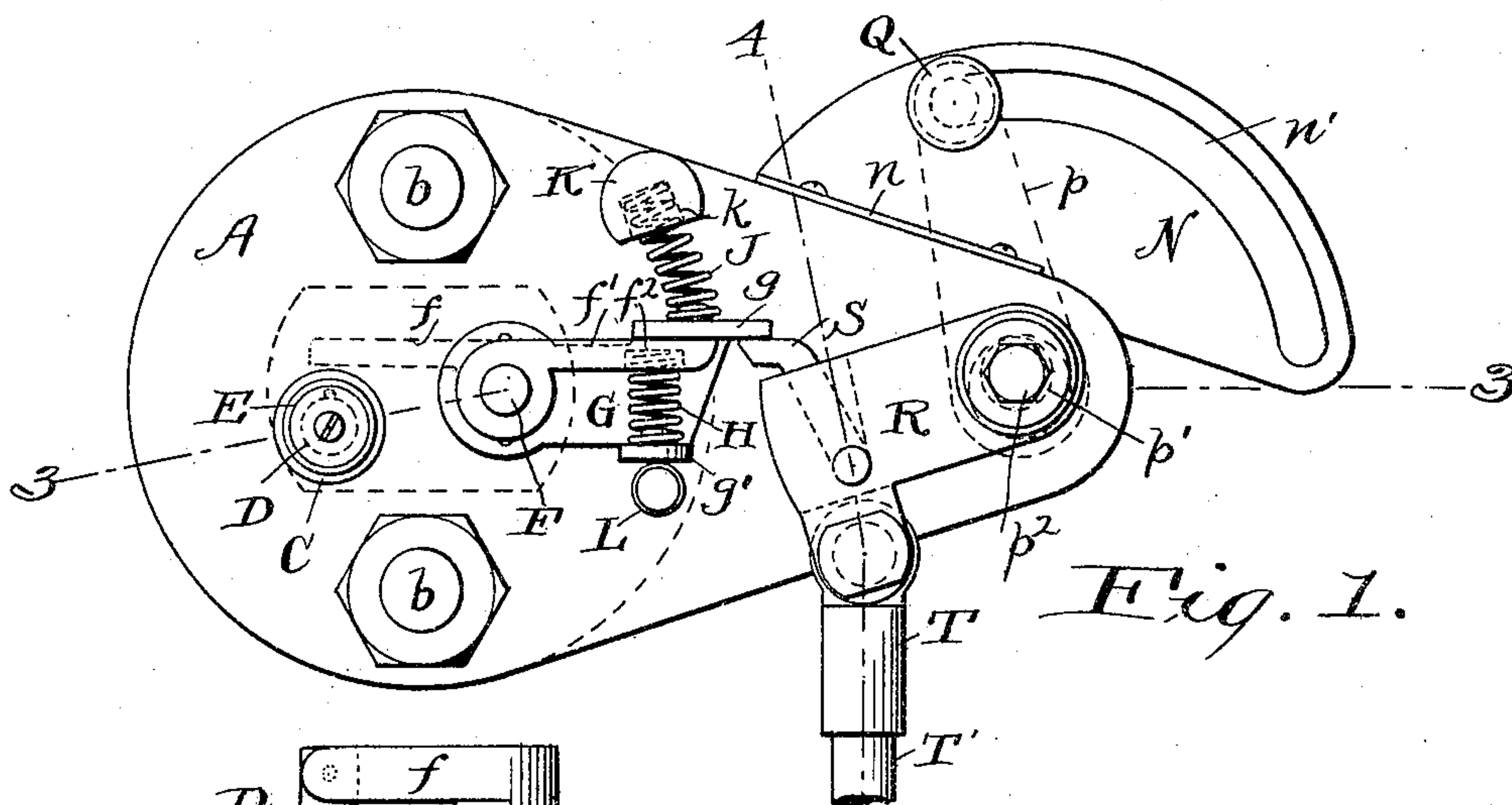


Fig. 1.

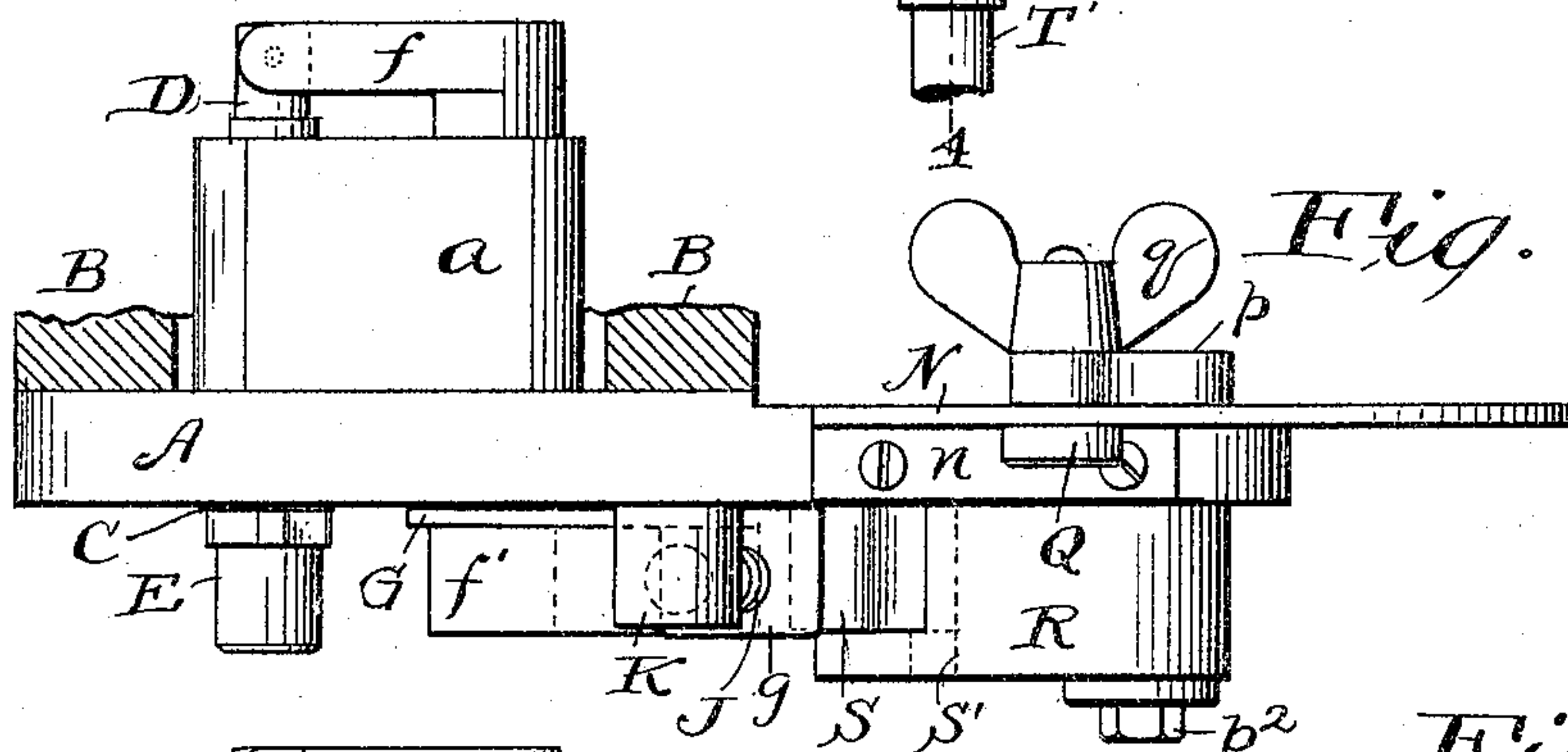


Fig. 2.

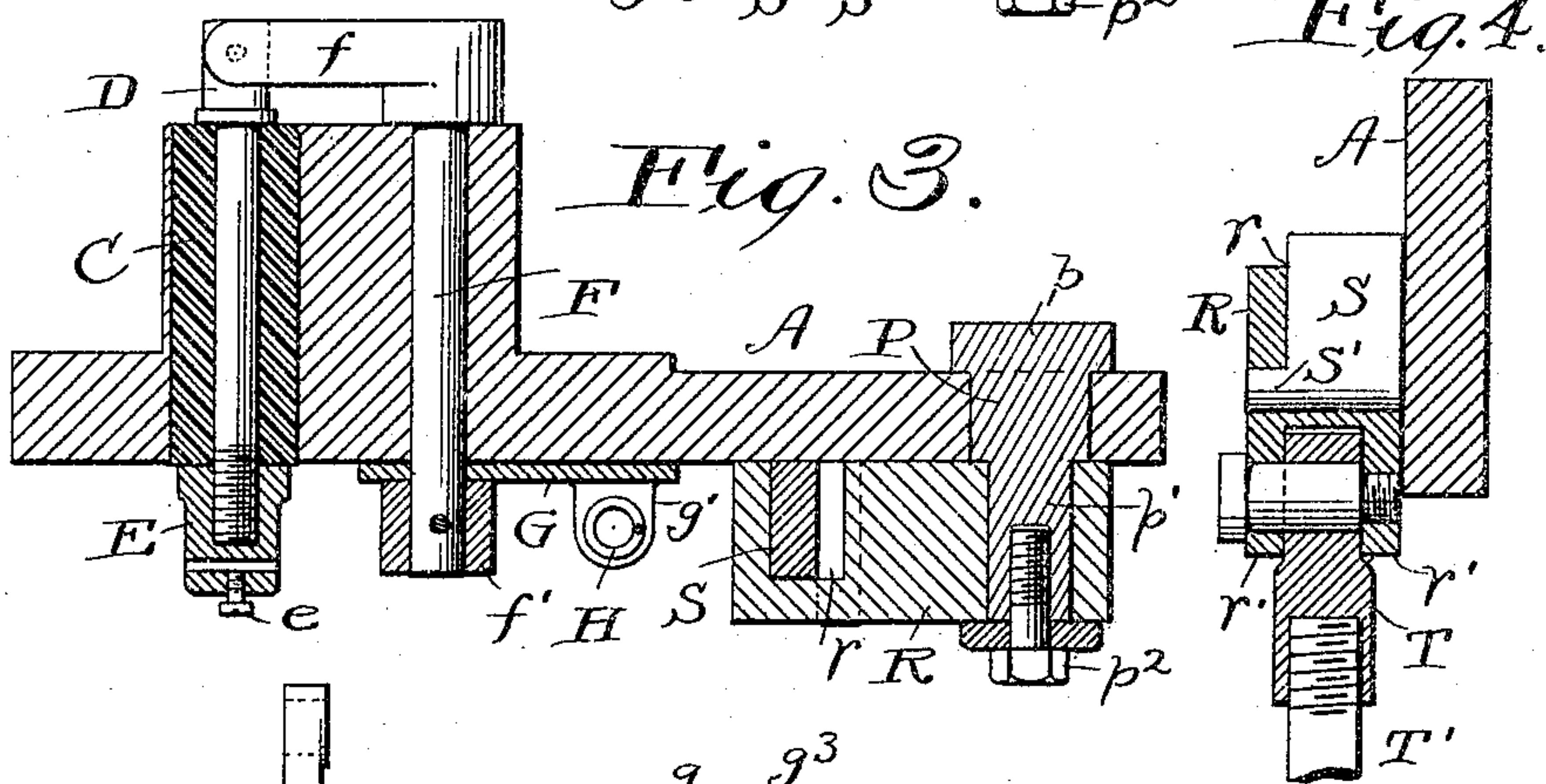


Fig. 3.

Fig. 4.

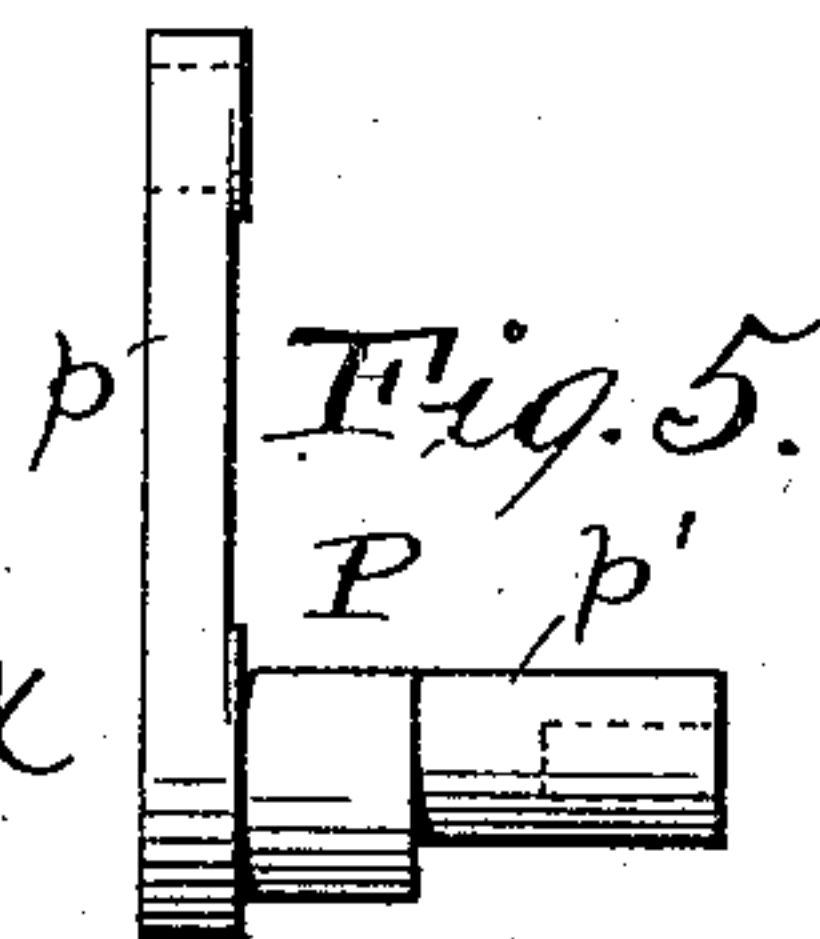


Fig. 5.

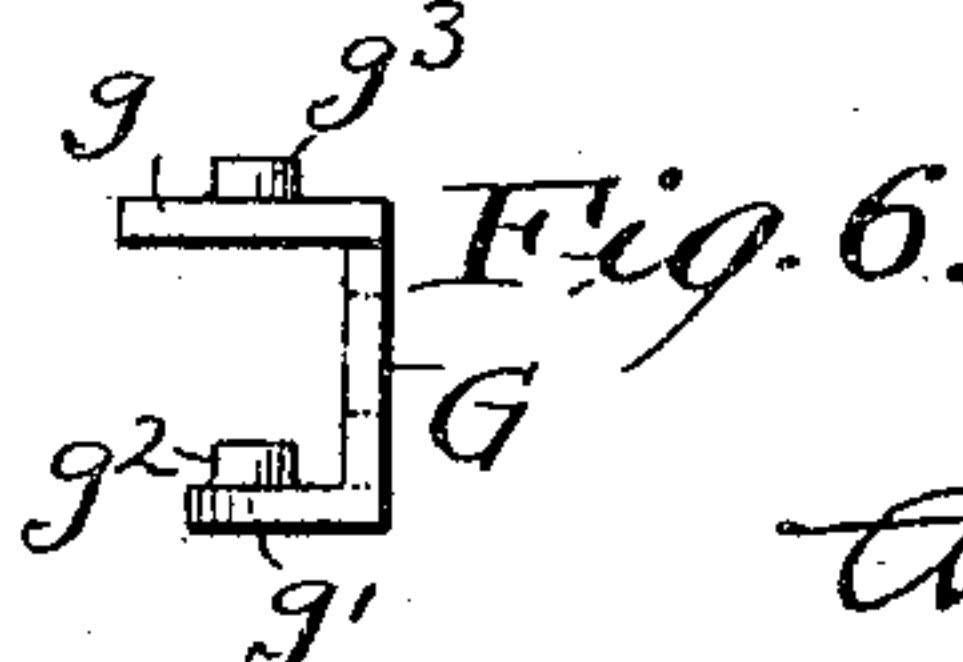


Fig. 6.

Witnesses.  
E. B. Gilchrist  
J. B. Hull.

Inventor  
Arthur E. Taylor,  
By his Attorneys,  
Hurst & Bates.



# UNITED STATES PATENT OFFICE.

ARTHUR E. TAYLOR, OF ELYRIA, OHIO, ASSIGNOR TO THE ELYRIA GAS ENGINE COMPANY, OF ELYRIA, OHIO, A CORPORATION OF OHIO.

## SPARKING IGNITER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 783,158, dated February 21, 1905.

Application filed July 9, 1903. Serial No. 164,788.

*To all whom it may concern:*

Be it known that I, ARTHUR E. TAYLOR, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented a certain new and useful Improvement in Sparking Igniters for Explosive-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide for explosive-engines an igniter which shall be cheap in construction and efficient in service, being made of easily-constructed parts, being positive in action, and easily adjustable.

The invention is best summarized as consisting of the combinations of parts to the above ends, as hereinafter described and claimed.

The drawings clearly disclose my invention.

Figure 1 is a front elevation of the same. Fig. 2 is a top plan thereof, a portion of the wall of the explosion-chamber being shown in section. Fig. 3 is an approximately horizontal section, being taken on the line 3 3 of Fig. 1. Fig. 4 is an approximately vertical section, being taken on the line 4 4 of Fig. 1. Fig. 5 is a detail of the adjusting arm and stud, and Fig. 6 is an end elevation of the trip-arm.

A represents a plate which forms the frame of the igniter. This plate is adapted to be secured to the cylinder or the explosion-chamber, as desired. Thus Fig. 2 shows at B a wall of the chamber with which the igniter-plate coöperates, the plate being held thereto by suitable bolts and nuts *b*.

Extending inward from the plate A is a boss *a*, preferably made in the elongated flattened form shown. In this boss is mounted an insulating-sleeve C, which is occupied by the stem of the stationary electrode D. Screwed onto the outer end of this stem is a nut E, which forms the binding-post for one of the electric conductors, a set-screw *e*, projecting into an opening, being provided for this purpose. Journaled within the boss *a* is the shaft F of the movable electrode. This shaft is provided at its inner end with an arm *f*,

which may make contact with the stationary electrode or be moved by the turning of the shaft F to break such contact.

Rigidly secured to the outer end of the shaft F of the movable electrode is the arm *f'*, and confined between this arm and the face of the plate A is a hammer G, which consists of a plate loosely surrounding the shaft F and having a pair of wings *g g'*. The arm *f'* normally bears on its upper surface against the under face of the wing *g*, being pressed in this position by a spring H, compressed between the arm *f'* and the under wing *g'* of the hammer. To effectually hold the spring in place, a stud *g<sup>2</sup>* extends upward from the wing *g'* and a recess *f<sup>2</sup>* is made in the lower face of the arm *f'*.

On the upper face of the wing *g* of the hammer G is a stud *g<sup>3</sup>*, around which takes the lower end of a compressed spring J, the upper end of which seats in a recess *k* in a block K, stationarily carried by the plate A. A suitable pin L projects from the plate A in position to normally engage the under surface of the wing *g'* and limit the downward movement of the hammer.

From the construction so far described it will be evident that the spring J will tend to hold the hammer G in its lowermost position with the wing *g'* engaging the stop L and the spring H will tend to hold the arm *f'* in its uppermost position against the wing *g*. In this position of the parts the inner arm *f* of the movable electrode is out of contact with the stationary electrode. It will be apparent that if the hammer G is swung upward on its pivot, compressing the spring J, the arm *f* will be moved toward the stationary electrode, the arm *f'* moving with the hammer until the arm *f* engages the stationary electrode. Then the arm *f*, and hence the arm *f'*, is prevented from further movement, and any further movement of the hammer G results in compressing the spring H as well as the spring J. If in such position the hammer be suddenly released, the parts will spring back to their normal position, the arm *f* will be suddenly removed from contact with the stationary elec-



trode; and the spark will be produced. Mechanism for causing such contact and sudden release of the electrodes will now be described.

A thin plate N is secured by a wing *n* and screws to the upper edge of the plate A. Journaled in the plate A is a member composed of the stud P, which has extending upward from it on the inner side of the plate N an arm *p*. Through the plate N is an arc-shaped slot *n'* concentric with the stud P. In this slot stands a headed bolt Q, which passes through the arm *p* and has on its end a thumb-nut *q*. By this means the stud P may be adjusted in any angular position desired, the slotted plate forming a guide and with the bolt and nut a clamp for the arm. Extending forward from the stud P is a similar stud *p'*, located eccentrically of the stud P. On the stud *p'* is journaled a tripping device consisting of an arm R, the pivot being thus adjustable by moving the arm *p*. Occupying a recess *r* in this arm R is a pawl S. The recess *r* extends forward from the inner side of the arm R, and near the base of the recess it extends still farther forward in the form of a round hole. This hole is occupied by a stud *S'*, formed integrally on the lower end of the pawl S. This allows the pawl to be inserted from the rear side of the arm R in assembling the parts, and after they are in place the arm is held by a washer and screw-bolt *p''*, screwing into the stud *p'*, and this retains the pawl S in place.

Extending downward from the operating-arm R are a pair of ears *r'*, between which is pivoted a head T, in which screws a suitable operating-rod T'. The operating-rod T' may be connected in any desired manner with some moving part of an engine adapted to raise and lower it at the proper time. When it is raised, the pawl S, the nose of which normally stands below the wing *g*, engages the latter, swinging the trip-arm G and causing the electrodes to contact. This movement of the hammer causes the wing *g* to gradually slide toward the point of the pawl S. When the wing slides off the pawl, the electrodes are suddenly separated by the spring J, and thereafter when the rod T' is lowered and the arm R returns to its normal position the pawl S, engaging the upper corner of the wing *g*, swings idly backward and passes beneath that wing in position to again elevate it. By moving the arm *p* the stud P, forming the journal, the operating-arm R is adjusted toward or from the hammer G, thus regulating the time when the pawl S releases the wing *g*. The spring H allowing independent movement between the wing *g* and the arm *f'* obviates the necessity of an absolutely accurate adjustment of the time of tripping; but it is desirable to regulate the operation within close limits, and this is provided by the eccentric stud *p'* and the arm *p*.

I claim—

1. In an explosive-engine igniter, in combination, a pair of electrodes one of them being mounted on a movable shaft, a block in which said shaft is journaled, an arm rigidly secured to said shaft, a hammer-plate loosely surrounding the shaft and held in place by said arm against the face of said block, a pair of wings both on the same side of said hammer-plate, said arm being adapted to engage one of said wings, a spring compressed between the arm and the other wing, and means for moving said plate to cause the electrodes to contact and thereafter suddenly release them, substantially as described.

2. In an explosive-engine igniter, in combination, a head, a stationary electrode carried thereby, a movable electrode having a shaft journaled in said head and carrying a contact-arm on the inner side of the head, and an arm on the outer side of the head, a hammer in the form of a plate journaled on said shaft on the outer side of the head and on the inner side of such outer arm, a pair of projections on said plate extending onto opposite sides of said outer arm, a spring between one of said projections and said outer arm tending to force the arm against the other projection, and means for operating the hammer, substantially as described.

3. In an explosive-engine igniter, in combination, a head, a pair of electrodes, one of which is mounted on a movable shaft, an operating-arm rigidly secured to said shaft, a hammer-plate loosely surrounding the shaft and held in place by said arm, a pair of wings extending from one side of said hammer-plate and including between them said operating-arm, a spring compressed between said arm and one of said wings whereby the former is forced against the other wing, a stop carried by the head and against which said hammer-plate may abut, a projection carried by the head, a spring compressed between said projection and said hammer-plate whereby it may engage said stop carried by the head, and means for tripping said hammer-plate, substantially as described.

4. In an explosive-engine igniter, in combination, a plate, a pair of electrodes mounted therein, one of them being movable and having a shaft journaled in the plate, an arm rigid with the outer end of said shaft, a hammer pivoted on said shaft and engaging the outer face of said plate and having a pair of wings taking onto opposite sides of said outer arm, a spring between one of said wings and said outer arm, another spring acting on said hammer, an operating-arm pivotally mounted on said plate, and a pawl carried by said operating-arm and adapted to engage one of said wings and thereby move said hammer, substantially as described.



5. In an explosive-engine igniter, the combination of a plate, a pair of electrodes mounted therein, one of them being movable, a hammer for operating the movable electrode, an operating-arm contacting with the front side of said plate, and suitably pivoted thereto, said arm being formed with a recess opening rearward and upward and undercut at its lower end, a pawl occupying the said recesses, and confined between the arm and plate, and having an extension taking into said undercut portion of the recess, said pawl being adapted to engage and operate said hammer, substantially as described.

6. In an explosive-engine igniter, a plate, a pair of electrodes mounted therein one of them being movable and having a shaft journaled in the plate, an arm rigid with the outer end of said shaft, a hammer pivoted on said

shaft and engaging the outer face of said plate and having a pair of wings taking onto opposite sides of said outer arm, a spring between one of said wings and said outer arm, another spring acting on said hammer, an operating-arm on the outer side of said plate, a pawl carried by said operating-arm and adapted to engage said hammer, a stud eccentrically mounted in said plate and forming the pivot of said operating-arm, an adjusting-arm rigid with said stud, a stationary guide, and means for clamping said adjusting-arm thereto in various positions, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ARTHUR E. TAYLOR.

Witnesses:

CHAS. C. LORD,

J. J. TUNNINGTON.