(No Model.)

D. BEST.

GAS ENGINE IGNITOR.

No. 496,718. Patented May 2, 1893.

Fig. 1.

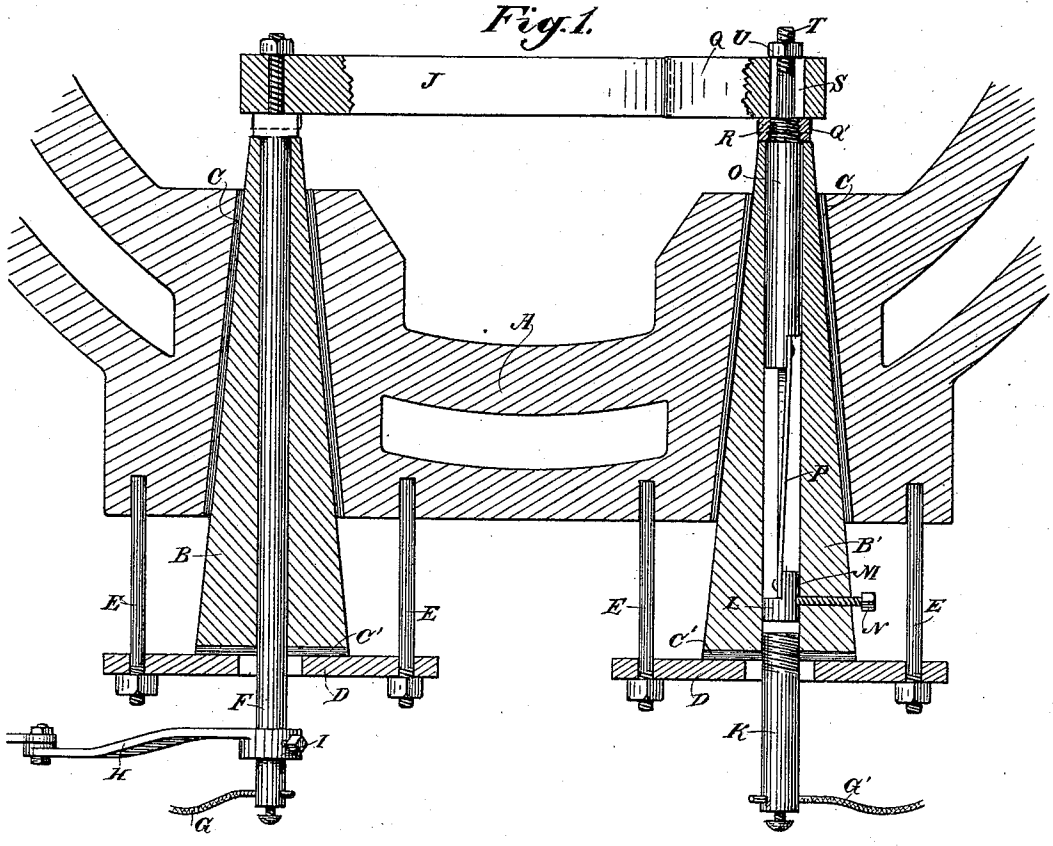


Fig. 2.

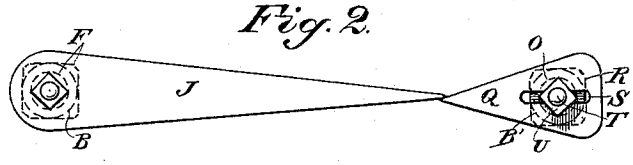


Fig. 3.

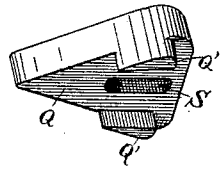
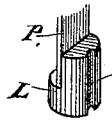


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL BEST, OF SAN LEANDRO, CALIFORNIA.

GAS-ENGINE IGNITOR.

SPECIFICATION forming part of Letters Patent No. 496,718, dated May 2, 1893.

Application filed December 27, 1892. Serial No. 456,474. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BEST, a citizen of the United States, residing at San Leandro, Alameda county, State of California, have invented an Improvement in Gas-Engine Ignitors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel igniting device for gas engines.

It consists in details of construction which will be more fully explained by reference to the accompanying drawings in which—

Figure 1 is a transverse section of the end of the cylinder showing the ignitor and connected parts. Figs. 2, 3 and 4 are enlarged details of separate parts of the device.

A represents a section of the end of the chamber in which the igniting devices are contained.

B B′ are two pieces which fit into correspondingly shaped openings in the lower part of the chamber A, extending through these openings from the outside to the inside of the chamber. In the present case, these pieces are shown of conical form, but they may be differently shaped if desired. Each of these cones is surrounded by an insulating material C which prevents all contact with the chamber A. Beneath the bases of the cones are supporting plates D which are connected with the lower part of the chamber and adjusted with relation thereto by screw-bolts E having nuts upon the lower end which adjust the plates D and hold them in position. Between the bases of the cones and the plates E are the insulating plates C′ which prevent any contact of the cones B with the metallic surroundings. The cone B has a central opening within which fits a shaft F, the lower end of which passes through a hole in the plate D, which hole is sufficiently larger than the shaft to prevent any metallic contact therewith. To the lower end of the shaft is connected one of the wires G from the battery or other source of electrical energy, and a lever arm H is also connected to it by means of a collar I which is adjustably fixed to the shaft F. The lever arm H is caused to oscillate by any suitable connection with other parts of the machinery. It may be effected by means of an eccentric upon the main or some counter-shaft, and a rod connecting the eccentric with the end of the arm H.

Upon the upper end of the shaft F and within the cylinder is fixed a rigid arm J, which is made of any suitable metal which will serve as a conductor, and this arm is oscillated in unison with the oscillations of the shaft F.

The cone B′ is bored through its axis longitudinally in the same manner as the cone B, and into the lower end of the cone is screwed the short piece K having at its lower end a means for connecting the scond wire G′ of the battery or source of electrical energy. From this the current is conveyed through the piece K into the cone B′. Just above the piece K is fitted the short cylindrical piece L having an extension at one side with a groove or slot made vertically in it as shown at M. A set screw N passes through the side of the cone B′ and its point enters the stot M, and thus prevents the piece L from rotating within the chamber, but allows it a certain amount of movement up and down, in which movement it is guided by the screw N. In the upper part of the cone B′ is a short shaft O having an extension at one side similar to that shown upon the piece L. Between these two pieces L and O a spring P extends and its two ends are bolted respectively to the piece L and the shaft O as shown.

Upon the upper end of the shaft O is mounted a rigid contact piece Q. This piece is formed, as shown in Figs. 2 and 3, having the lugs Q′ upon each side which are intended to clasp or fit over a nut or head R which is fixed upon the upper end of the shaft O, and thus unite the contact piece with the shaft, so that it will move in unison therewith. The contact piece has a slot S made through it, and a screw-bolt T passes through this slot and into the upper end of the shaft O. Upon this screw-bolt is a nut U which, when screwed down, locks the contact piece Q firmly to the upper end of the shaft O. The contact piece may be adjusted by loosening the nut U and moving the piece backward or forward, which the slot S allows. The point of this contact piece is adjusted so that as the arm J oscillates from side to side, it just makes contact with the point of the piece Q. The shaft O turns freely within the bore of the cone B′

and it will be manifest that when the point of the arm J touches the point of the contact piece Q, it will turn the latter and the shaft O so as to allow the arm J to pass the piece Q with but little force. This rotation of the shaft O is allowed by reason of the flexibility of the spring P which unites the shaft O and the piece L, as before described, and by reason of the slight vertical movement of the piece L moving on the guide pin or screw N, any shortening or lengthening of the spring P by reason of its twisting movements is compensated. The tension of the spring is, however, sufficient to immediately return the point of the contact piece Q to its normal position, and when the arm J moves back in its oscillation it again forms a contact with the point of Q, moving it in the opposite direction and releasing it as before described. By this construction I avoid the objectionable feature of a spring contact arm oscillating within the explosion chamber.

By reason of the water jacket which is formed around the cylinder and the explosion chamber, and the length of the cone B′ within which the spring P is situated, it will be manifest that the latter may be removed from the influence of the heat caused by the explosions to such an extent that there will be little or no danger of its losing its temper and becoming useless. At the same time, the tension is so gentle that the points of the rigid arms J and Q are allowed to pass each other with but little resistance, and the result is that the life of these parts is very greatly increased. Both parts may, if desired, be made of chilled iron or of any other suitable material which will resist the tendency to wear by reason of constant contact.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An igniting device for gas engines consisting of a rigid arm projecting within and insulated from the explosion chamber and connected outside the explosion chamber with one of the electrodes and with a mechanism by which it is oscillated from side to side, a second rigid arm similarly insulated mounted upon a shaft with its point adjustable with relation to the oscillating arm so that contact is formed at each oscillation of the first arm, and a spring connected with the shaft of the second arm only whereby it is allowed to yield when the first arm forms contact, and to return to its normal position when the contact is broken, substantially as herein described.

2. In a gas engine, an electrical igniting device consisting of two parallel shafts extending into the explosion chamber and connected exteriorly with a device for producing an electric spark, sleeves within which said shafts are fitted to turn and within which they are oscillated from the explosion chamber and other metallic contact, a rigid arm fixed to one of the shafts within the explosion chamber and extending toward the other, and mechanism connected with the exterior end of the shaft by which it is caused to oscillate, a rigid contact piece Q adjustably fixed to the second shaft O so as to be engaged by each oscillation of the oscillating arm of the other shaft, whereby the shaft O is rotated within the sleeve, a spring P connecting the shaft O with a piece L movable longitudinally within the sleeve and a guide pin N whereby the piece L is allowed to move to compensate for the twisting of the spring, substantially as herein described.

3. In a gas engine, an electrical igniting device consisting of two rigid arms fixed to the ends of parallel shafts within the explosion chamber and extending toward each other so as to make contact when passing, a mechanism by which one of the shafts is caused to oscillate about its axis, and a torsional spring extending approximately parallel connected with the second shaft exterior to the explosion chamber, whereby said shaft is oscillated about its axis by contact of the two arms, and is returned to its normal position when released, substantially as herein described.

In witness whereof I have hereunto set my hand.

DANIEL BEST.

Witnesses:
HORACE HAWES,
FRED BRYANT.