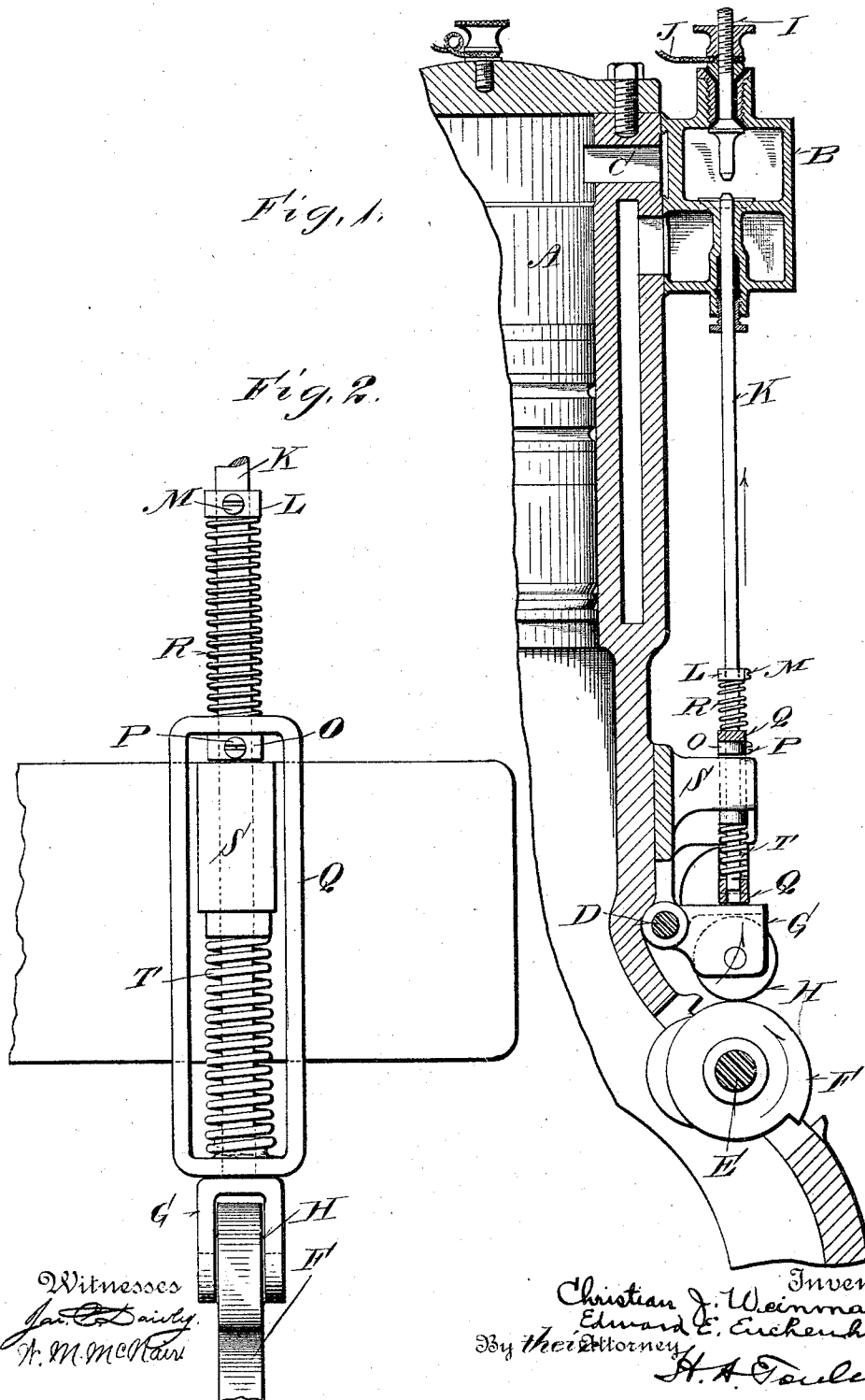


(No Model.)

C. J. WEINMAN & E. E. EUCHENHOFER.
GAS ENGINE.

No. 537,512.

Patented Apr. 16, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

CHRISTIAN J. WEINMAN AND EDWARD E. EUCHENHOFER, OF DAYTON,
OHIO.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 537,512, dated April 16, 1895.

Application filed June 15, 1894. Serial No. 514,651. (No model.)

To all whom it may concern:

Be it known that we, CHRISTIAN J. WEINMAN and EDWARD E. EUCHENHOFER, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Gas-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in spark producing mechanism for gas, gasoline and vapor engines.

The principal objects in view are, first, to prevent injury to the points of the electrodes by providing a spring appliance which acts to lift the movable electrode when actuated by the cam mechanism and then to yield to the further movement caused by the remaining portion of the cam, such yielding preventing the cam from forcing the movable electrode into injurious contact with the stationary electrode, and, second, to combine with such compensating devices means for quickly breaking the contact of the two electrodes so as to efficiently produce the necessary sparks.

In the accompanying drawings on which like reference letters indicate corresponding parts: Figure 1, represents a vertical sectional view of a portion of a gas engine and igniting chest with our improved spark producing mechanism applied thereto; and Fig. 2, an enlarged detail elevation of the compensating and striking devices which are combined with a movable electrode.

The letter A designates a gas, gasoline, or vapor engine cylinder of any approved type, and a mixing or exploding chest B attached thereto, the latter, as also the port C being preferably of the type set forth, claimed and illustrated in our application for improvements in gas engines filed on the 11th day of January, 1894, Serial No. 496,456. The shaft D, which in practice is preferably a rock shaft, and the shaft E and cam F are also of substantially the same type and arrangement, together with the arm G which is carried by the shaft D and the roller H, as set forth and illustrated in our said application. This cam-shaft E with its cam F is ro-

tated by suitable mechanism, and the roller H with its arm G is raised by the cam and drops down by gravity, together with the action of the spring, to be hereinafter mentioned.

The letter I designates the fixed electrode which forms one terminal of the electric circuit, a portion of which is indicated by a wire J, the electrode terminating within the post B.

The letter K designates the movable electrode which is adapted to reciprocate in the chest B as illustrated. This electrode K carries a collar L fixed thereto at a convenient point, by a set-screw M. It also carries a collar O fixed thereto by a set-screw P. It further carries a yoke Q which is free to move on the electrode and which rests, normally, on the collar O. Between the upper end of the yoke and the collar L is a spiral spring R which fits over the electrode. The lower end of the yoke Q rests upon the arm G so as to be raised by the cam F acting on the roller H. The lower portion of the electrode K is fitted so as to slide in a bearing or guide S formed on or attached to a part of the engine frame. Between the guide S and the lower end of the yoke is placed a spiral spring T encircling the electrode. Now when the cam F passes under the roller H it will lift the arm G and then the yoke Q, which in turn will lift the electrode K through the action of the spring R. Any further movement of the cam as it passes under the roller H will therefore merely further compress the spring R without crowding the two electrodes together or the movable one against the fixed one. It is very difficult in practice to get a cam of just such pitch and to get the electrodes just so relatively adjusted that the cam will always cause the movable electrode to just make good contact with the fixed electrode and nothing more. Again, the wear of the points of the electrodes, the readjustment of the fixed one through its screw-threaded mountings, and the wear of the cam and the roller, and the incidental lost motion between the parts, all act as causes which prevent the proper contact of the two electrodes, either causing the pressure between them to be too severe or the contact to be insufficient, or to

fail altogether. Hence the necessity for the compensating arrangement here described. When the cam F shall have passed far enough from under the roller H to permit it to drop
 5 down to the concentric surface of the cam, then the spring T, having been compressed in the first movement, will cause the movable electrode to quickly descend and break the contact. The first of the springs T is to de-
 10 press the yoke Q, which in turn strikes a blow on the collar O and thus effects a very quick separation of the electrodes. Thus we have combined in one device a compensating and a contact breaking appliance.

15 Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a gas engine, the combination with a fixed and a movable electrode, a reciprocating yoke carried by the movable electrode, a
 20 spring between said yoke and a shoulder on the electrode which lifts the said electrode when the yoke is moved in one direction, another spring between a fixed point and the
 25 yoke which acts to press downward to break the contact between the electrodes, and mechanism to lift the reciprocating piece and to permit it to descend when the contact is to be broken.

30 2. In a gas engine, the combination with a fixed and a movable electrode, a guide for the lower portion of the latter electrode, a reciprocating yoke and two shoulders or collars on said electrode, a spring between one shoulder
 35 or collar and the yoke and another spring between the guide and the yoke, the first spring being adapted to lift the said electrode when

the yoke is lifted and the second spring to depress the yoke against one of the collars or projections and so depress the said electrode,
 40 a pivoted arm carrying the roller, and a cam to actuate the roller to cause the arm to lift the yoke.

3. In a gas engine, the combination with a movable electrode, a reciprocating piece car-
 45 ried thereby, a spring between said piece and a collar or projection on the electrode, and another spring bearing against the reciprocating piece at one end and adapted to be
 50 resisted at the other end, whereby when the reciprocating piece is actuated in one direction it actuates the electrode through the first
 55 named spring and whereby through the second named spring the reciprocating piece is operated in the opposite direction, and a collar or projection on the electrode engaged by the reciprocating piece when operated in the latter direction.

4. In a gas engine, the combination with a suitable guide, a reciprocating electrode fit-
 60 ted thereto, a yoke fitted to slide on the electrode, a collar beneath one end of the yoke and another collar above said end, the collars being carried by the electrode, a spring be-
 65 tween the yoke and the upper collar, and a spring between the guide and the lower end of the yoke all for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHRISTIAN J. WEINMAN.

EDWARD E. EUCHENHOFER.

Witnesses:

E. J. FINKE,

W. H. H. ECKI.