

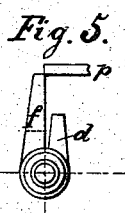
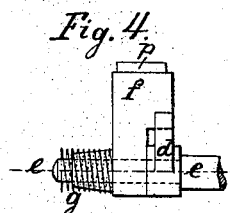
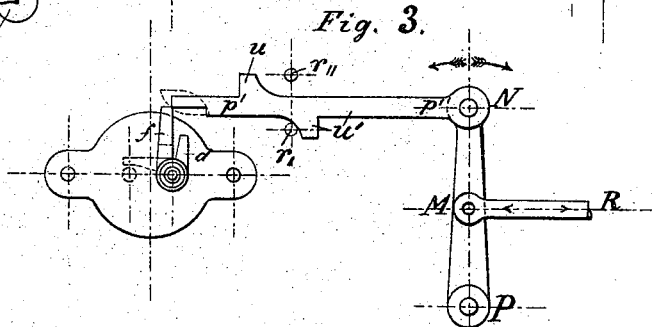
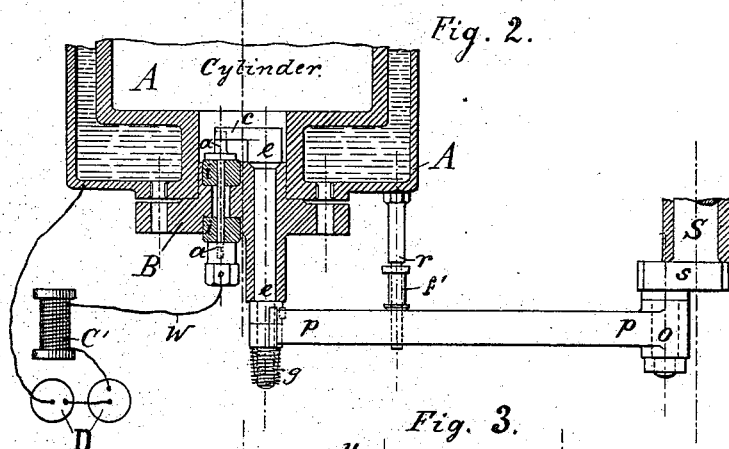
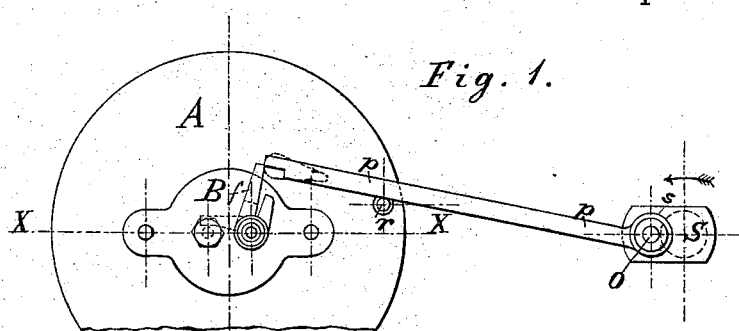
(No Model.)

P. A. N. WINAND.

ELECTRICAL IGNITER FOR GAS OR HYDROCARBON ENGINES.

No. 525,828.

Patented Sept. 11, 1894.



WITNESSES:

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UNITED STATES PATENT OFFICE.

PAUL A. N. WINAND, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
MESS, SCHLEICHER, SCHUMM & CO., OF SAME PLACE.

ELECTRICAL IGNITER FOR GAS OR HYDROCARBON ENGINES.

SPECIFICATION forming part of Letters Patent No. 525,828, dated September 11, 1894.

Application filed July 26, 1893. Serial No. 481,568. (No model.)

To all whom it may concern:

Be it known that I, PAUL A. N. WINAND, a subject of the King of Belgium, but now residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Electrical Igniters for Gas or Hydrocarbon Engines, of which the following is a specification.

My invention relates to that class of engines in which a charge of gas or other combustible mixture employed as the propelling force having been introduced into the cylinder of the engine, is ignited by an electric spark, and to that class of igniters in which a circuit is broken inside the cylinder, or combustion chamber, and a break spark is thus produced thereby causing the ignition of the gas or combustible mixture. In pending applications filed by me March 10 and 14, 1892, and numbered respectively, 424,442 and 424,923, I have described some devices and methods for accomplishing this object.

My present application is an improvement on the above mentioned inventions, and the result is attained of breaking the electric circuit quickly and securing an efficient igniting spark with a minimum amount of current.

Referring to the accompanying drawings:—Figure 1, is a rear end elevation of a sufficient portion of an engine to illustrate my invention. Fig. 2, is a detached sectional plan view on the line $x-x$ of Fig. 1. Fig. 3, shows a detached rear end elevation of a modified form of my device. Fig. 4, is a detached side elevation, enlarged, of details of construction and Fig. 5, is an end elevation of the parts shown in Fig. 4.

S , is a shaft driven from the main driving shaft of the engine. At one end of this shaft is a crank arm s , upon which is mounted the pawl p , secured by the crank-pin O . r is a supporting rod upon which rests the free end of the pawl p .

Secured to the rear of the cylinder A , is a cap B . Extending through the cap B at one side and entering the combustion chamber is a fixed contact piece a which is insulated from the cap by blocks of suitable non-conducting material i, i . This contact piece is connected to one terminal piece of a battery

or other source of electrical energy, by the wire w , which passes to the spark coil c' , thence to the battery D or other source of current supply, the circuit being completed by contact with any metallic part of the engine through the arm c . To the right of the contact piece a , is a spindle or shaft e , which passes through the cap B and enters the combustion chamber having secured to it at its inner end, the arm c . At the outer end of the spindle or shaft e , is an arm f which is free to oscillate upon said spindle or shaft.

g is a spiral spring one end being secured to the shaft e and the other end to the arm f . This spring normally tends to force the arm f against projection d , which is secured to the spindle or shaft e .

The operation of these parts is as follows: As the shaft S revolves it imparts a motion to the free end of the pawl p as shown in dotted lines in Fig. 1. As the pawl p moves forward it comes in contact with the arm f and carries it against the action of the spiral spring g . This causes the shaft e to oscillate and brings the arms c , in contact with the fixed contact piece a . After the arm f has been carried forward a certain distance it is disengaged from the pawl p , and under the action of the spring g , is carried rapidly back against the projection d , which causes the shaft e to turn, thereby breaking the contact between the fixed contact piece a and the movable contact piece or arm c . Upon the supporting arm r , (see Figs. 1 and 2) I place a sleeve f' which when moved outwardly and placed under the pawl p , will elevate the same and cause the pawl to be disengaged sooner from the arm f , and consequently the ignition will occur earlier.

In Fig. 3, I have shown a modified form of device in which R is a lever driven from the main driving shaft or from any reciprocating part of the engine. This lever R is pivoted to a rocking lever M , fulcrumed at P . The upper end of the lever M is connected to a pawl p' having formed upon its upper and lower sides two cam surfaces u, u' which are adapted to engage with fixed or stationary pins r', r'' . The frictional connection between the lever M and pawl p' , at the point N is

such as to prevent the pawl p' , when carried upward or raised by the engagement of the cam surface u' , with the pin r' from dropping again by gravity until it is carried to its normal position by the engagement of the cam u with the stationary pin r^2 . The path described by the end of the pawl p' , is shown in dotted lines Fig. 3.

The mechanisms shown in Figs. 1 and 3 are preferred by me by reason of the noiselessness of their operation and the convenient manner in which they can be applied. In the constructions described, in Figs. 1 and 3, the end of the pawl takes up and releases piece f without touching it again in its backward motion. With the construction Fig. 1, if the engine happens to be turned backward, as the pawl is free to yield in one direction, it does not interfere with the piece f when it strikes it. In the case of Fig. 3, the end of the pawl describes the same curve whether the engine be turned backward or forward. It is obvious however that the operating of piece f can be effected by a variety of mechanical devices using rotating or reciprocating cams or pawls. I also prefer to pivot piece f on shaft e and to use only one spring attached to these pieces but the principle of the invention would be the same if more springs were used and if f was not pivoted to e .

Instead of the sleeve and stop device hereinbefore described and illustrated in Fig. 2, whereby the end of the pawl is raised the same result can be attained by shifting the stop or by adjusting the end of the pawl laterally in any suitable way.

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

1. An electric igniter for gas or hydro-carbon engines consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into the same space and provided with an arm adapted to make contact therein with said piece, a body, f , free to rotate on the shaft until it strikes a stop on said shaft, a spring urging the body against the stop, means driven by the engine to cause the shaft to make contact inside the cylinder and also for separating the body f , from the stop and then releasing it and a source of electricity having one terminal connected to the insulated piece, the other to the shaft, substantially as described.

2. An electric igniter for gas or hydro-carbon engines consisting of an insulated piece reaching into the cylinder, or space connected therewith, a shaft reaching into same space and provided with an arm adapted to make contact therein with said piece, a body f , free to rotate on the shaft until it strikes a stop on said shaft, a spring attached to body and to shaft and urging the body against the stop, means driven by the engine for separating the body from the stop and then releasing it and a source of electricity having one ter-

minal connected to the insulated piece, the other to the shaft, substantially as described.

3. An electric igniter for gas or oil engines consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into the same space, and provided with an arm adapted to make contact therein with said piece, a body free to rotate on the shaft until it strikes a stop on said shaft, a spring urging the body against the stop, a rod or pawl moved at one end by a crank or eccentric and guided at another point by a stop or link so as to withdraw the body from the stop on shaft and then release it, substantially as described.

4. An electric igniter for gas or oil engines consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into same space, and provided with an arm adapted to make contact therein with said piece, a body free to rotate on the shaft until it strikes a stop on shaft, a rod pivoted at one end to an oscillating piece and guided at another point with a certain lateral motion and by means of curved surfaces; whereby an elongated curved motion is imparted to the rod so as to withdraw the body from the stop on shaft and then release it, substantially as described.

5. An electric igniter for gas or oil engines consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into the same space, and provided with an arm adapted to make contact therein with said piece, a body, free to rotate on the shaft until it strikes a stop on said shaft, a spring urging the body against the stop, a rod or pawl moved at one end by a crank or eccentric and guided at another point by a stop or link so as to withdraw the body from the stop on shaft and then release it, and means for changing the position of the guiding stop or link so as to change the time of release, substantially as described.

6. An electric igniter for gas or oil engines, consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into the same space and provided with an arm adapted to make contact therein with said piece, a body, free to rotate on the shaft until it strikes a stop on shaft, a rod pivoted at one end to an oscillating piece and guided at another point with a certain lateral motion and by means of curved surfaces, whereby an elongated curved motion is imparted to the rod so as to withdraw the body from the stop on shaft and then release it, and means for changing the limitation of lateral motion of rod so as to change the time of release, substantially as described.

7. An electric igniter for gas or oil engines, consisting of an insulated piece reaching into the cylinder or space connected therewith, a shaft reaching into same space and provided with an arm adapted to make contact therein with said piece, a stop or arm on the shaft

outside of cylinder, a body, urged by a spring
against said stop and a piece movable with
the engine in such a manner that its end
withdraws the body from the stop and then
5 releases it, substantially as described.

8. An electric igniter for gas or oil engines,
consisting of an insulated piece reaching into
the cylinder or space connected therewith, a
shaft reaching into same space and provided
10 with an arm adapted to make contact therein
with said piece a stop or arm on the shaft
outside of cylinder, a body urged by a spring
against said stop and a piece movable with

the engine in such a manner that its end
withdraws the body from the stop and then 15
releases it, and means for adjusting the po-
sition of the end of the piece so as to change
the time of release, substantially as described.

In testimony whereof I have hereunto sub-
scribed my name, in the presence of two sub- 20
scribing witnesses, on this 6th day of July,
A. D. 1893.

PAUL A. N. WINAND.

Witnesses:

GEO. W. REED,

CHAS. C. COLLIER.