N° 20,409 A.D. 1899

Date of Application, 11th Oct., 1899
Complete Specification Left, 11th July, 1900—Accepted, 11th Aug., 1900

PROVISIONAL SPECIFICATION.

An Improved Ignition Apparatus for Explosion Motors.

I, WILHELM MAYBACH, of Cannstatt, in the Kingdom of Württemberg, German Empire, Engineer, do hereby declare the nature of this invention to be as follows:—

In explosion motors with magneto-electric ignition the spark effecting the ignition of the gas mixture compressed within the cylinder is produced in a well known manner by the sudden interruption of two contacts arranged within the compression chamber and shunt in the circuit of a small magneto-electric engine.

The induction current produced by the magneto-electric engine not being a constant one, but increasing firstly and decreasing afterwards, it is evident that for obtaining ignitions of equal intensity, the above mentioned interruption of the contact always must take place in the same moment of the oscillating or rotating movement of the circuit exciter. In order to employ the greatest intensity of the current for the ignition, the contact must be interrupted in that moment, where the circuit exciter has attained its greatest rapidity.

I attain these conditions by rendering dependant from another both the circuit exciter and the circuit interrupting device, for which purpose I employ the shaft of the motor or an intermediate shaft, the revolution of which is dependant of the revolutions of the motor-shaft.

In order to make my invention more clear I beg to refer to the accompanying drawing in which:

a illustrates the shaft of the engine or an intermediate shaft rotated from the same. Upon this shaft *a* is mounted a cam *b* which by a lever *d* imparts an oscillating movement to the armature of the magnet *c* arranged between the legs of this magnet, but which is not illustrated in the drawing. A connecting rod *e* is movably fixed to the lever *d* and at its top extremity is provided with a projection *k*.

A pin *g*, insulated against the motor casing, projects into the explosion chamber of the cylinder. The said pin is connected with the circuit exciter by means of connecting wires *f*. The second contact piece is formed by a lever *h* rotatably arranged within the explosion chamber. The axis of the latter projects through the wall of the casing and at the outside of the same is provided with a second lever *i*, which by means of a helical spring constantly is pressed against the adjustable pusher *k* of the rod *e*.

The shaft *a* rotates in the direction of the indicated arrow, thereby the cam *b* raises the rod *e* contrary to the action of the spring *m* surrounding the rod *e*. Simultaneously herewith the armature of the electro-magnet *c* is rotated and the excited current passes through the wire *f*. Owing to the form of the cam *b*, the lever *d* and the rod *e* effect a rocking movement under the influence of the helical spring *m*. Owing to this rocking movement the pusher *k* fixed upon the rod *e* meets the lever *i* and thereby draws the lever *h* away from the pin *g*. The induction current coming from the armature, thereby suddenly is inter-

[*Price* 8*d*.]

rupted and owing to the spark thus produced, the explosion mixture is ignited. Owing to the adjustability of the pusher *k*, the moment, at which the ignition shall take place, exactly can be predetermined.

From the drawing it can be seen that the cam *b* is of such a form that it also might be rotated in reverse direction, without any mechanism of the engine being injured thereby.

Dated this Eleventh day of October 1899.

JENSEN & SON,
77, Chancery Lane, London, W.C., Patent Agents.

COMPLETE SPECIFICATION.

An Improved Ignition Apparatus for Explosion Motors.

I, WILHELM MAYBACH, of Cannstatt, in the Kingdom of Württemberg, German Empire, Engineer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In explosion motors with magneto-electric ignition the spark effecting the ignition of the gas-mixture compressed within the cylinder is produced in a well known manner by the sudden interruption of two contacts arranged within the compression chamber and forming part of the circuit of a small magneto-electric engine.

The induction current produced by the magneto-electric engine not being a constant one, but increasing firstly and decreasing afterwards, it is evident that for obtaining ignition sparks of equal intensity, the above mentioned interruption of the contact must always take place at the same moment of the oscillating or rotating movement of the circuit exciter. In order to employ the greatest intensity of the current for the ignition, the contact must be interrupted in that moment, where the circuit exciter has attained its greatest rapidity.

I attain these conditions by rendering dependant upon each other both the circuit exciter and the circuit interrupting device, for which purpose I employ the shaft of the motor or an intermediate shaft, the revolution of which is dependant of the revolutions of the motor-shaft.

In order to make my invention more clear, I refer to the drawings filed with my Provisional Specifications, in which:

a illustrates the shaft of the engine or an intermediate shaft rotated from the same. Upon this shaft *a* is mounted a cam *b* which by a lever *d* imparts an oscillating movement to the armature of the magnet *c* arranged between the legs of this magnet, but which is not illustrated in the drawing. A connecting rod *e* is movably fixed to the lever *d* and at its top extremity is provided with a projection *k*.

A pin *g*, insulated against the motor casing, projects into the explosion chamber of the cylinder. The said pin is connected with the circuit exciter by means of connecting wires *f*. The second contact piece is formed by a lever *h* rotatably arranged within the explosion chamber. The axle of the lever projects through the wall of the casing and at the outside of the same is provided with a second lever *i*, which by means of a helical spring constantly is pressed against the adjustable pusher *k* of the rod *e*.

The shaft *a* rotates in the direction of the indicated arrow, thereby the cam *b* raises the rod *e* contrary to the action of the spring *m* surrounding the rod *e*. Simultaneously herewith the armature of the electro-magnet *c* is rotated and the excited current passes through the wire *f*. Owing to the form of the cam *b*,

the lever *d* and the rod *e* effect a rocking movement under the influence of the helical spring *m*. Owing to this rocking movement the pusher *k* fixed upon the rod *e* meets the lever *i* and thereby draws the lever *h* away from the pin *g*. The induction current coming from the armature, thereby suddenly is interrupted and owing to the spark thus produced, the explosion mixture is ignited. Owing to the adjustability of the pusher *k* the moment at which the ignition shall take place, exactly can be predetermined.

From the drawing it can be seen that the cam *b* is of such a form that it also might be rotated in reverse direction, without any mechanism of the engine being injured thereby.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. In an electro-magnetic ignition device for explosion engines the employment of apparatus substantially such as is herein described whereby the spark is produced in the combustion chamber at the moment of greatest intensity.

2. In a magneto-electric ignition apparatus for explosion-motors, the combination with a cam *b* located upon the engine shaft or upon a shaft dependant from the same, a lever *d* linked to the axle of the armature, a pusher *k* adjustably fixed upon the rod *e*, a contact-pin *g* connected with the circuit exciter by means of wires *f* and arranged to project into the explosion chamber of the motor, an ignition lever *h* being in contact with the pin *g*, a lever *i* mounted upon the axle of the lever *h*, the pusher *k* influencing the lever *i*, the cam *b* effecting the rocking movement of the mechanism, so that when the lever *h* is displaced from the pin *g* a spark is produced causing the explosion of the mixture, as set forth.

3. The complete electro-magnetic ignition device substantially as described and illustrated in the accompanying drawing.

Dated this 11th day of July 1900.

BOULT, WADE & KILBURN,
Agents for the Applicant.

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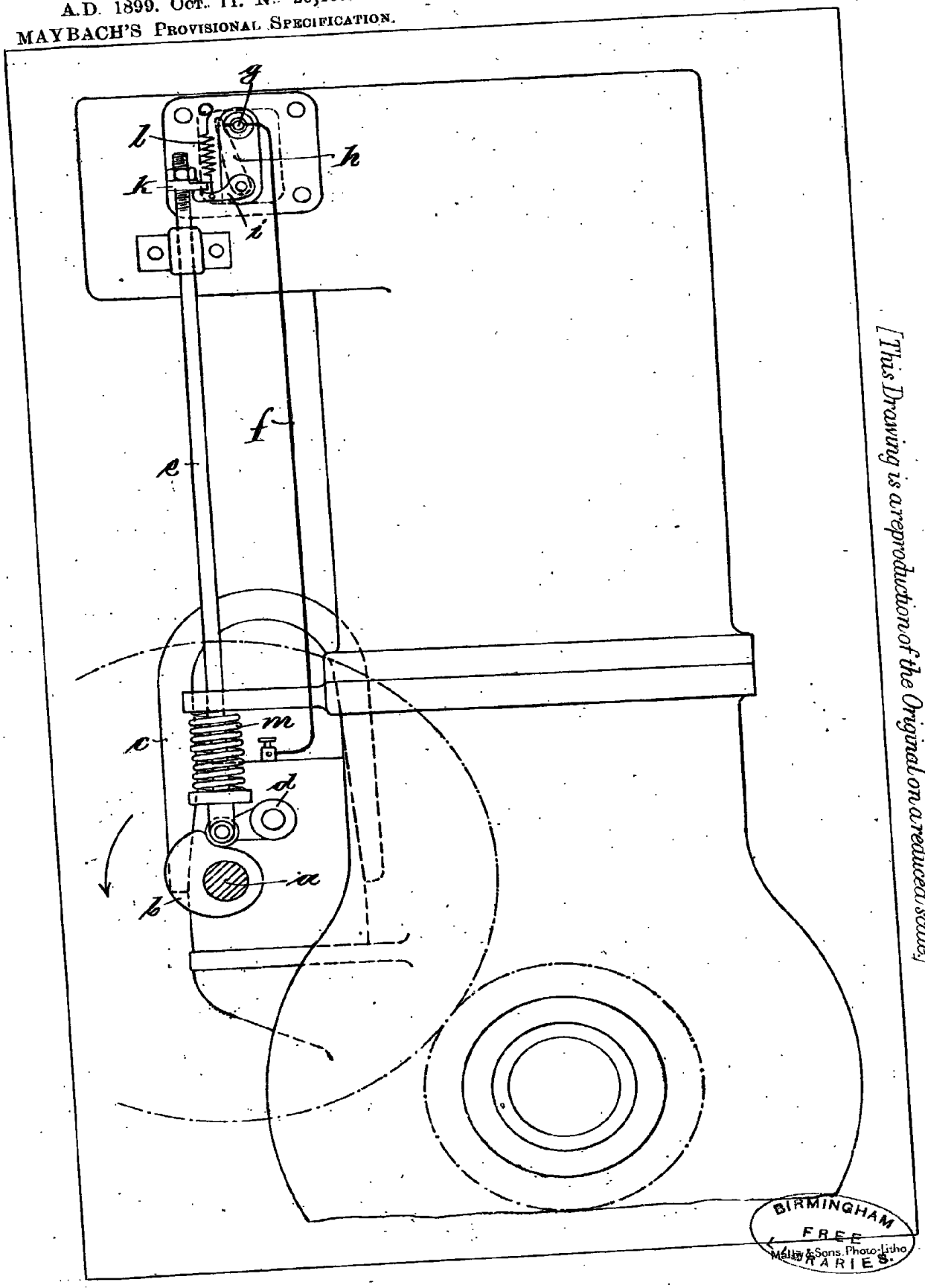
A.D. 1899. Oct. 11. N° 20,409. (1 SHEET)

MAYBACH'S PROVISIONAL SPECIFICATION.



[This Drawing is a reproduction of the Original on a reduced scale.]