

1,205,010.

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IGNITION APPARATUS.

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To all whom it may concern:

Be it known that I, CARL E. PEARSON, a citizen of the United States, residing at Lansing, county of Ingham, State of Michigan, have invented a certain new and useful Improvement in Ignition Apparatus, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to ignition apparatus for internal combustion engines and a special object of my improvements is to provide an improved apparatus to be used with internal combustion engines on automobiles.

In the accompanying drawing: Figure 1, is a view, mostly diagrammatic, of an apparatus embodying my invention and so much of an automobile as is necessary to illustrate its connection therewith. Fig. 2, is a detail view partly broken away, a part being in section on the line B—B Fig. 1.

a represents a part of the intake passage to the engine.

b is the dash, or instrument board, of an automobile.

c represents the charging dynamo.

d is a storage battery.

e is the primary, and *f* the secondary coil, of a sparking-coil.

g is the interrupter and *h* is a condenser connected across the gap in the interrupter.

v is an arc or stationary support.

i is a U-spring secured at one end at the center and inside of the support *v*. The free end of the spring *i* is provided with a contact piece *j*.

r is a hollow casing inclosed upon one side by a resilient diaphragm *q*. The casing *r* is air tight except as hereinafter specified.

k is a standard, or projection, securing at the center of the diaphragm *q*, extending outward therefrom, and having its outer end extending parallel to the surface of said diaphragm and provided on its outer surface with a contact piece *m* and on its inner surface with a contact piece *n*.

o is a tongue extending from a conducting ring *o*² (Fig. 2) and bearing at its outer end a contact piece *p*.

*c*² is a brush, or pole, of the dynamo *c*.

2^c is a conducting wire leading from the

pole *c*² and in electrical connection with the diaphragm *q*.

*c*³ is the other brush, or pole, of the dynamo *c* and *3*^c is a conducting wire connecting said pole to the spring *i* and contact piece *j*.

*d*² is one pole of the storage battery connected by a wire *2*^d with the ring *o*² and tongue *o* and contact piece *p*. *d*³ is the other pole of the storage battery *d*.

3^d is a wire leading from the pole *d*³ connecting with the wire or conductor *3*^c then leading through the interrupter *g* to and through the primary coil *e* and connecting with the conductor *2*^c.

s is a pipe, or air conduit, connecting with the intake *a* and with the interior of the casing *r*.

t is an air pipe, or conduit, connecting with the interior of the casing *r* and leading to the dash, or instrument board, *b* of the automobile where it may open to the atmosphere through a channel *z* or otherwise.

u is a valve adapted to close the end of the conduit *t* and held yieldingly on its seat by a light spring.

w is a push rod located at a convenient point to be manipulated by the operator and adapted to force the valve *u* from its seat to open the pipe *t* to the outer atmosphere.

The operation of the above described device is as follows: When the engine is not in operation the diaphragm *q* is at its outer position and there is a connection between the contact pieces *j* and *m* so that the dynamo *c* is short-circuited through the conductor *2*^c, the diaphragm *q*, standard, or projection, *k*, contact pieces *m* and *j*, spring *i* and conductor *3*^c. When the engine is in operation, a partial vacuum is drawn in the passage *a* and the air is therefore drawn from the interior of the casing *r* so that the diaphragm *q* is forced inward by the pressure of the outer air, breaking the above described short-circuit and bringing the contact piece *n* into electrical connection with the contact piece *p* so that the circuit is established from the storage battery *d* through the conductor *2*^d to the tongue *o*, contact piece *p*, contact piece *n* and thence through the projection of the standard *k* to the diaphragm *q* and thence through the conductor *2*^c and *3*^d through the primary *e*, interrupter *g* and back to the pole *d*³ of the battery *d*. When the engine is in operation

and the circuit is established, as above described, if the storage battery *d* becomes inoperative the ignition will still be operated by the current from the dynamo *e*. When-
5 ever the engine stops the above described operative circuit is automatically broken, and the dynamo is short-circuited, by the diaphragm returning to its first position. If it is desired to throw the apparatus out
10 of operation when the engine is in motion, the valve *u* is forced from its seat by the push rod *w* or otherwise thus permitting air to enter the chamber *r* through the conduit or passage *t* and permitting the dia-
15 phragm *g* to return to the position first above described.

What I claim is:

1. In combination with an internal combustion engine, an apparatus adapted to be
20 operated by an electrical current, a storage battery, a dynamo for charging said battery, and means for throwing said storage battery and dynamo into charging circuit with each other and into circuit with said apparatus,
25 said means for completing said circuit being adapted to short-circuit the dynamo when it is not in position to complete the first mentioned circuits.

2. The combination with an internal combustion engine provided with an igniting apparatus having an electric circuit, a casing,
30 a resilient diaphragm closing said casing, a contact piece carried by said diaphragm, a passage connecting the interior of said casing with the intake passage of said engine,
35 and a second contact piece adapted to be contacted by the first named contact piece on the inward movement of said diaphragm whereby the inward movement of said dia-
40 phragm shall complete said electric circuit.

3. The combination with an internal combustion engine, a casing, a resilient diaphragm closing said casing, a passage connecting the interior of said casing with the
45 intake of said engine, and means whereby the inward movement of said diaphragm shall complete an electric circuit, and means adapted to open said casing to the atmosphere at will.

50 4. The combination with an internal com-

bustion engine provided with an igniting apparatus having an electric circuit, a casing, a resilient diaphragm closing said casing, a
55 contact piece carried by said diaphragm, a passage connecting the interior of said casing with the intake passage of said engine, a second contact piece adapted to be contacted by the first named contact piece on
60 the inward movement of said diaphragm whereby the inward movement of said diaphragm shall complete said electric circuit, a second electric circuit and a third contact piece arranged so that the outward movement of said diaphragm shall complete said
65 second circuit through said third contact piece.

5. The combination with an internal combustion engine provided with an igniting apparatus having an electric circuit, a casing, a resilient diaphragm closing said casing, a
70 contact piece carried by said diaphragm, a passage connecting the interior of said casing with the intake passage of said engine, a second contact piece adapted to be contacted by the first named contact piece on the
75 inward movement of said diaphragm whereby the inward movement of said diaphragm shall complete said electric circuit, and an apparatus adapted to put the interior of said casing into communication with the outer
80 air at will.

6. The combination with an internal combustion engine, a casing, a resilient diaphragm closing said casing, a passage connecting the interior of said casing with the
85 intake of said engine and means whereby the inward movement of said diaphragm shall complete an electric circuit, and means whereby said diaphragm completes a circuit when in its outer position, an ignition appa-
90 ratus and a storage battery in said first mentioned circuit, a charging dynamo for said battery in both of said circuits.

In testimony whereof, I sign this specification in the presence of two witnesses.

CARL E. PEARSON.

Witnesses:

CLIFFORD L. SMITH,
GLADYS STEVENS.