J. A. HEANY.

AUTOMATIC IGNITION AND LIGHTING SYSTEM.

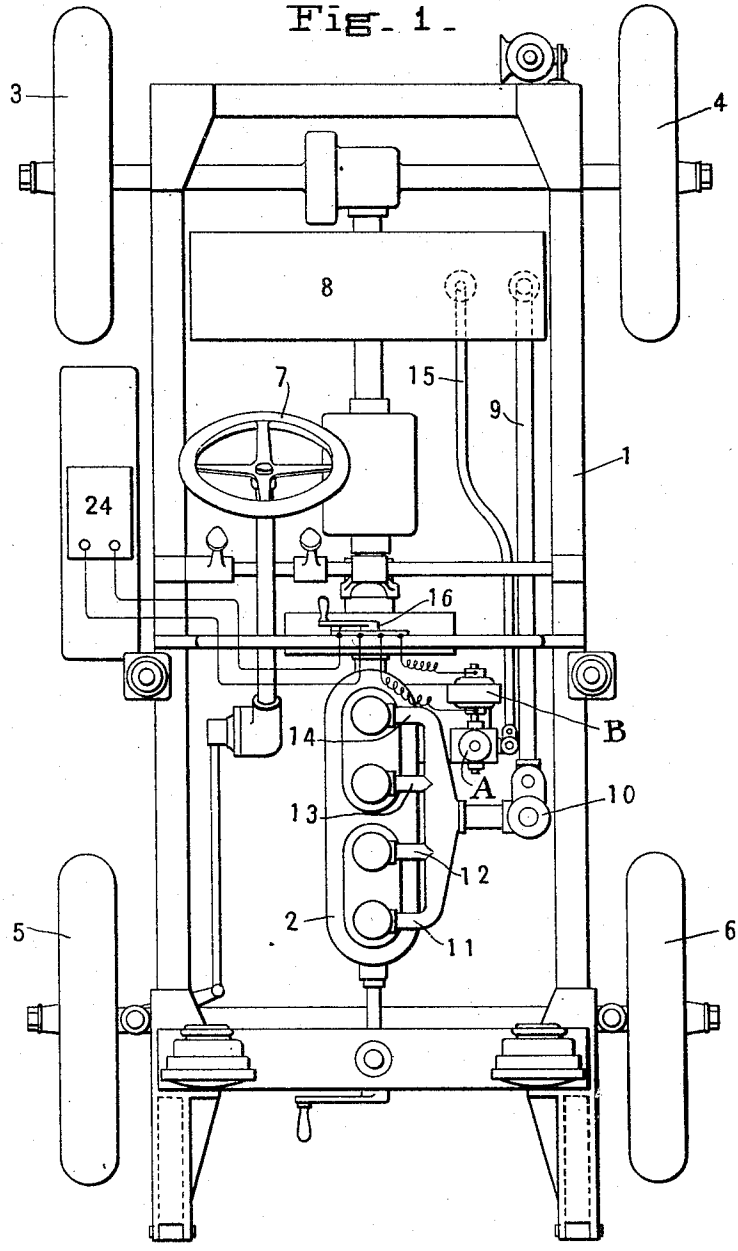
APPLICATION FILED NOV. 24, 1909.

1,139,521.

Patented May 18, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

J. Clyde Ripley.

Kate E. Brenner

INVENTOR

John Allen Heany

BY

C. A. Barber

ATTORNEY

J. A. HEANY.

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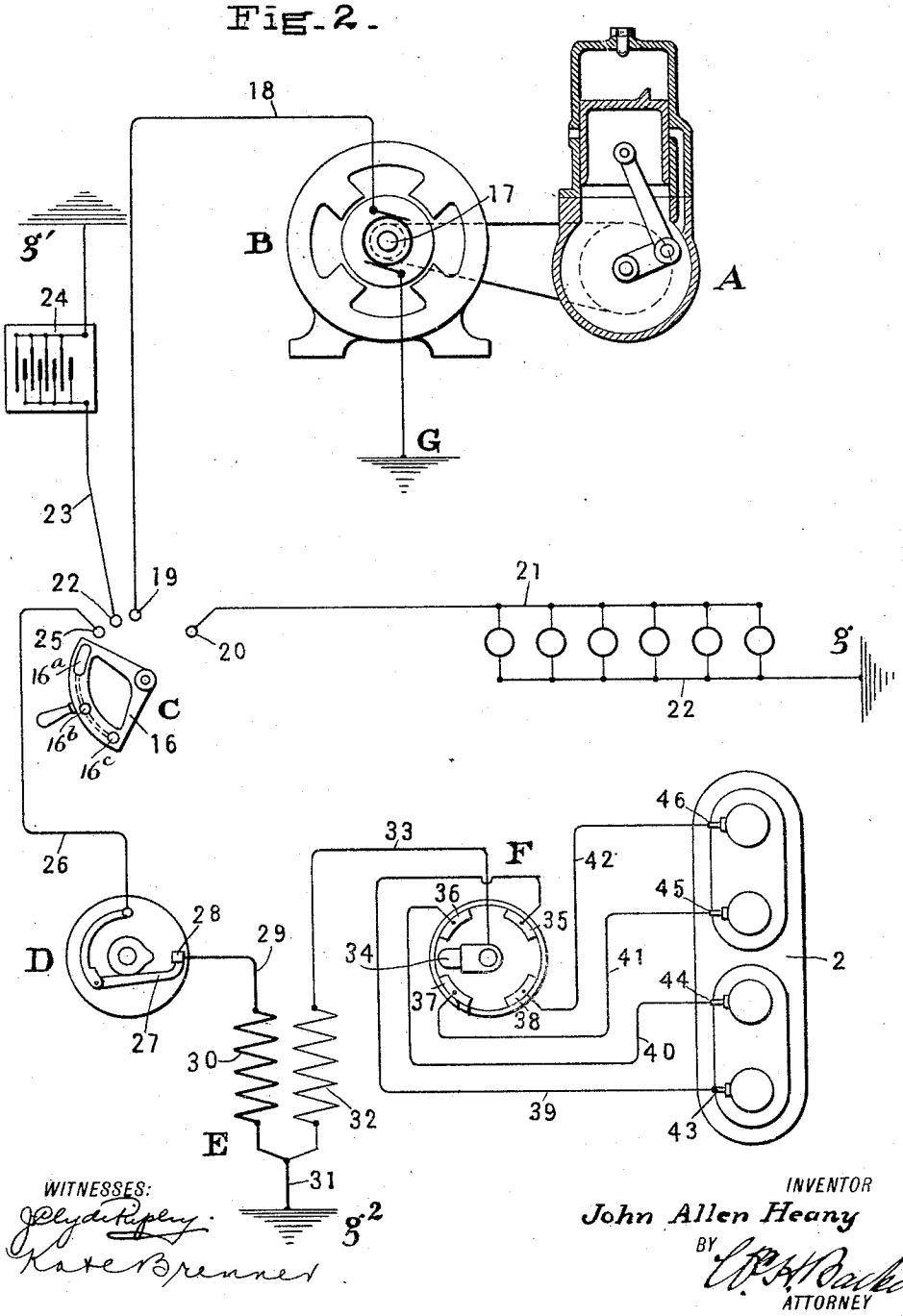
2 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

J. Clyde Ripley.

Kate E. Brenner.

INVENTOR

John Allen Heany

BY

U. P. Baker.

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN ALLEN HEANY, OF YORK, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO A. E. L. LECKIE, OF WASHINGTON, DISTRICT OF COLUMBIA.

AUTOMATIC IGNITION AND LIGHTING SYSTEM.

1,139,521. Specification of Letters Patent. Patented May 18, 1915.

Application filed November 24, 1909. Serial No. 529,695.

To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, and a resident of York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Ignition and Lighting Systems, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

The invention relates primarily to the ignition device of a gas engine combined with apparatus for furnishing lights in conjunction with the ignition circuit. It is particularly well adaptable for use in connection with vehicles, wherein there is a prime mover for operating the vehicle, which, in the case of a liquid hydro-carbon or gas engine, must be supplied with a current of electricity for ignition purposes.

The objects of the invention are to provide a simple and compact mechanism which, as a unit, may be applied to or removed from the main engine or prime mover of any given system of mechanism and which will operate entirely independent of said main prime mover, except in so far as it furnishes the necessary current for ignition purposes.

It is a further object to so arrange the mechanism that the operator may at will and by very simple operation, utilize the current being generated for ignition purposes, for lighting purposes or for both.

Referring to the drawings: Figure 1 is a plan view of a vehicle chassis, merely illustrative of an advantageous application of the invention. Fig. 2 is a diagrammatic view indicating the various devices employed and the wiring system therefor.

In a co-pending application there has been described an ignition current producing device comprising a unit applicable to any form of engine, in which an explosive mixture is employed, and where an ignition circuit must be used. The objects and advantages of such a unit arrangement as described in said application, are mainly as follows: First of all the objections of variable speed of the engine which is ordinarily used for operating a dynamo electric machine or magneto for producing current for the ignition system is completely obviated. Secondly, the prime mover of the ignition apparatus may be actuated from any primal source and with any desired power, through steam, compressed air, or be a turbine or hydro-carbon engine or gas engine, as may best suit the exigencies of any particular case. In any event, the current producing mechanism considered as a unit and including a prime mover and dynamo electric machine, may be operated without regard to the main prime mover and source of power for which the produced current is used. In fact, it is a unit in itself, so correlated with the main prime mover as to always operate under uniform conditions and produce the proper current tension either for the ignition system or a lighting system or the ignition and lighting systems combined.

In the accompanying drawings and for convenience, the proposed mechanism is shown in connection with a road vehicle or automobile of ordinary type, employing for its prime mover a liquid hydro-carbon engine.

Referring to Fig. 1, the numeral 1, denotes a chassis frame, which supports a motor 2, and is provided with driving wheels 3, 4, and steering wheels 5, 6, the latter controlled in their directional position by a steering wheel 7, through suitable connections not necessary to describe herein. The driving mechanism from the engine to the rear driving wheels 3, 4, is also immaterial as to its details and need not be described specifically.

The engine 2, receives its fuel supply from a main tank 8, through a conduit or tube 9, which leads to a carbureting mechanism 10, and from said carbureting mechanism through suitable connections 11, 12, 13, 14, to the individual cylinders of the engine 2. Obviously, each cylinder must be provided with an ignition device for firing the charges of explosive mixture within the cylinders.

Heretofore, it has been common practice to use batteries, magnetos connected directly with the engine, and complicated electrical mechanism for producing a sufficient spark within the cylinder to fire the charges of explosive mixture.

Where magnetos and dynamo electric machines have been employed the variations in speed conditions of the main prime mover have necessarily affected the ignition devices

and it has been difficult to provide governing mechanisms, which would satisfactorily compensate for the wide variations in speed and secure uniform and proper tension of current in the ignition system.

To overcome these objections as far as possible, the present invention contemplates the arrangement of a fixed unit which includes a prime mover A, and a dynamo electric machine or current producing device B. These two devices are connected directly together so that a rotation of the shaft of the prime mover will cause the rotation of the moving part of the dynamo electric machine. Both devices are coalesced into a single structure, which may preferably be mounted upon the engine frame, following the general practice of mounting a magneto on the frame of the engine where it may be directly driven from the engine shaft or cam shaft. In the present case, however, the isolated movement comprising the prime mover A, and dynamo electric machine B, receives its supply of fuel as illustrated herein, from the main tank 8, through a suitable pipe or conduit 15, which terminates in a suitable carbureting or other mechanism appurtenant to the prime mover.

The terminals of the dynamo electric machine are connected with a switch mechanism 16, conveniently located upon the dash of the vehicle and controlling not only the ignition circuit, but a lighting circuit and so arranged that the prime mover of the generating system may be started at will from the driving seat.

The various elements and wiring connections of the system are illustrated in Fig. 2, where A, indicates the prime mover, herein illustrated for convenience, as an engine of two cycle type, which, in lieu of belt-driven, as illustrated in diagram in Fig. 2, is directly connected to the shaft 17, of the dynamo electric machine B as illustrated in Fig. 1. This mechanism is to be adjusted to run at a constant speed and to develop the necessary current for the lighting and ignition circuit. One terminal of the dynamo electric machine B, is grounded as at G, which may very conveniently be the frame of the chassis. The opposite terminal 18, is led to a contact 19, of the switch C, which has a contact point 20, controlling a lamp circuit 21, 22, the latter grounded as at g; the second contact point 22, controlling the circuit 23, of a battery 24, one side of which is grounded as at g'; and a further contact 25, controlling a circuit 26, which forms the ignition circuit of the system. The lead 26, is connected to one terminal of a make and break device D, which may be of any well known type. As illustrated herein, it has a movable contact 27, coöperating with a stationary contact 28, the latter connected through a lead 29, with the low tension side 30, of a transformer E. A lead 31, of the transformer grounds as at g^2. The high tension side 32, of the transformer is connected through a lead 33, with a movable contact 34, of a distributing device F, which, through coöperating contacts 35, 36, 37, 38, distributes the current through corresponding leads 39, 40, 41, 42, with the insulated terminals of the spark plugs 43, 44, 45, 46, of the engine cylinders. The coöperating contacts of the spark plug are, of course, grounded in the engine and therefore in the common ground of the system.

With the above arrangement of parts, it is apparent that the first position of the switch C, will connect the battery 24, with the ignition circuit 26 through the contact piece 16^a, and the engine of the vehicle may be started. The second position of the switch C, gives the contacts 22, and 19 through the contact piece 16^a. Thereupon the current of the battery is directed to the dynamo electric machine B, which, becoming a motor, starts the prime mover A, of the igniting unit. This movement of the switch C, cuts out the connections from the battery 24, to the ignition system 26. A further movement connects the terminals 19, and 25, through the contact pieces 16^a, 16^b, which are interconnected, thus furnishing the ignition circuit directly from the generating unit. A further movement of the switch C, cuts in the lighting circuit 21, by connecting the terminals 19, and 20 through contact pieces 16^a and 16^c, which are interconnected.

With this arrangement, it will be seen that the battery may be temporarily used for providing current to the ignition system of the main engine, and may also be used for starting the generating unit. Thereupon, a current from the generating unit may be utilized in the ignition system and may, at will, be used in the lighting system. With such an arrangement, the entire current for the lighting and ignition systems may be secured and may be controlled from a single switch upon the dash of a vehicle or any other convenient location and either or both of said circuits may be used with the assurance that there will be no such fluctuations in current condition as to materially interfere with proper ignition or proper lighting.

Obviously, the exact details and connections might be varied to suit the exigencies of any particular case, and, if desired, the switch C, may be so arranged that the battery could be utilized in any temporary emergency for the lighting system, as well as for the ignition system. The main object, however, is to provide an individual unit which may be started at will by the operator, from the battery or other source of supply and will operate continuously without reference to the operation of the engine, to which it may be furnishing current for the ignition system.

What I claim as my invention and desire to secure by Letters Patent is:—

In combination with an engine, a lighting and ignition system therefor embodying a unit consisting of a prime mover and a dynamo electric machine, a fuel supply for the prime mover whereby the unit may be operated independently of the engine, a storage battery for driving the dynamo electric machine and thus starting the prime mover, a lighting circuit and an ignition circuit and a unitary switch device for directing a flow of current from the battery severally to the ignition circuit, the dynamo electric machine or the lighting circuit or from the dynamo electric machine to the ignition and lighting circuits jointly or severally.

JOHN ALLEN HEANY.

Witnesses:
FRED. B. MCLAREN,
MAXWELL G. BODE.