C. L. VANNORT.

AUTOMATIC ELECTRIC IGNITER SWITCH.

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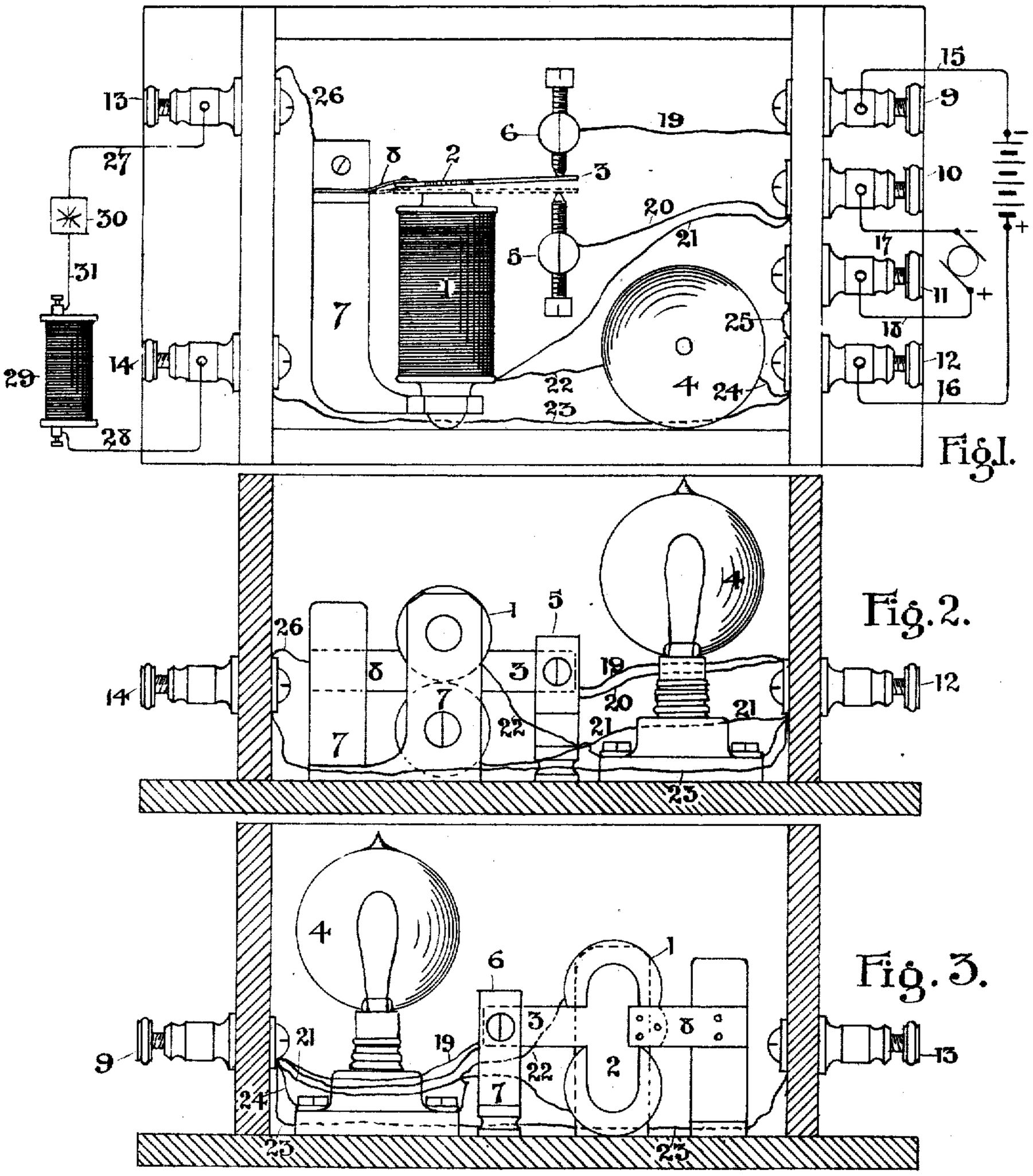

Fig.1.

Fig. 2.

Fig. 3.

WITNESSES:

J. A. Martin-Cooke.

Anna L. Walter.

INVENTOR

Bromy Lee Vannort.

BY

Abraham Knobel,

ATTORNEY

UNITED STATES PATENT OFFICE.

CROMY LEE VANNORT, OF LOUISVILLE, KENTUCKY.

AUTOMATIC ELECTRIC IGNITER-SWITCH.

No. 914,537. Specification of Letters Patent. Patented March 9, 1909.

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To all whom it may concern:

Be it known that I, CROMY LEE VANNORT, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Automatic Electric Igniter-Switch, of which the following is a specification.

This invention relates to automatic electric switches or current controllers.

It is customary to ignite the explosive mixture of gases in the cylinder of gas engines by means of an electric spark. For this purpose it is customary to provide both a primary or a secondary battery and an electric generator called a sparking-dynamo, and the current from these is controlled by means of a manual switch. When the engine is to be started, the battery circuit is closed by means of the manual switch, and when the engine has acquired sufficient speed so that the dynamo driven thereby has attained the required voltage the manual switch is thrown to cut out the battery circuit and close the dynamo circiut. This requires the attention of an attendant. Some engines, such as marine, for example, are not proviedd with a governor and their speed varies greatly. When such an engine slows down to such a speed that the dynamo no longer supplies the current at the required voltage, unless the attendant quickly throws the switch to close the battery circuit, the engine stops. It also sometimes occurs that the dynamo fails to operate, when the engine stops unless the attendant at once cuts in the battery current.

The objects of my improvement are, an automatic switch or controller that will attend to these exigencies without the attention of an attendant, simplicity of construction, and comparative inexpensiveness of manufacture. These objects I attain by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view; and Fig. 2 and Fig. 3, side elevations.

Similar reference numerals refer to similar parts throughout the several views of the drawings.

The electromagnet 1, the armature 2 and the switch member 3 constitute the body of the invention. An incandescent lamp, 4, is placed near the magnet 1, and two contact posts, 5 and 6, are placed one on either side of switch member 3, and provided with adjustable contact screws. Magnet 1 is mounted on a metal bracket, 7, which in turn is mounted on the bottom of the box which contains the apparatus. Switch-member 3 is integral with armature 2, and the entire piece 2—3 is attached to the metal bracket 7 by means of a flat spring, 8. Binding-posts 9, 10, 11, 12, 13, 14 are provided on the ends of the box. The spring 8 presses switch member 3 normally against the contact member 6, and, when magnet 1 is energized, switch member 3 is drawn out of contact with member 6 and into contact with member 5.

29 represents the conventional spark-coil, and 30 the igniting-apparatus of a gas engine.

A primary or secondary battery is connected with binding-post 9 by wire 15 and the binding-post 12 by wire 16. A dynamo is connected to binding-post 10 by wire 17 and with binding-post 11 by wire 18. Wire 19 connects binding-post 9 with contact-member 6, wire 20 connects binding-post 10 with contact-member 5, wire 21 connects binding-post 10 with magnet 1, line 22 connects lamp 4 with magnet 1, wire 23 connects binding-post 12 with binding-post 14, wire 24 connects binding-post 12 with lamp 4, wire 25 connects binding-post 11 with binding-post 12, wire 26 connects binding-post 13 with the metal bracket 7, wire 27 connects binding-post 13 with the igniter, 30, of the engine, wire 28 connects binding-post 14 with spark-coil 29 and wire 31 connects spark-coil 29 with igniter 30.

The operation of my switch or controller will now be understood. When the engine is being started, switch member 3 is held by spring 8 in its normal position in contact with member 6. It will be seen that this closes the battery circuit, and the current flows through wire 16, binding-post 12, wire 23, binding-post 14, wire 28, spark-coil 29, wire 31, igniter 30, wire 27, binding-post 13, wire 26, bracket 7, spring 8, switch-member 2—3, contact member 6, wire 19, binding-post 9 and wire 15 to the battery. As soon as the engine has attained sufficient speed to cause the dynamo driven by the engine to produce a current of the required voltage to operate the igniter, the dynamo current will flow through wire 18, binding-post 11 and wire 25 to binding-post 12. Here the current is separated or shunted and a portion flows through wire 24, lamp 4, wire 22, magnet 1, wire 21, binding-post 10

and wire 17 to the dynamo. This will light lamp 4 and energize magnet 1 so that the magnet draws armature 2 and consequently switch member 3 into contact with contact-member 5. It will be understood that the lamp, 4, offers considerable resistance to the current and therefore a portion of the current has a tendency to flow through wire 23, binding-post 14, wire 28, spark-coil 29, wire 31, igniter 30, wire 27, binding-post 13, wire 26, bracket 7, spring 8, switch-member 2—3, contact-member 5, wire 20, binding-post 10 and wire 17 to the dynamo. Lamp 4 also serves the purpose of indicating whether or not the dynamo is producing the required current.

It will be understood that while the dynamo is running at sufficient speed the igniter will be operated by its current, and the battery circuit will be open, but as soon as the dynamo fails to operate or is allowed to slow down below the speed necessary to furnish the voltage required to operate the igniter, the magnet 1 ceases to be sufficiently energized to draw armature 2 against the resistance of spring 8 and the switch-member 3 flies over against contact-member 6, closing the battery circuit. This is done instantaneously, and the igniter continues to operate, and the engine need not stop for want of ignition. But as soon as the dynamo resumes its speed sufficiently to furnish the required current, magnet 1 is again energized and switch member 3 is brought into contact with member 5 so that the dynamo circuit is closed.

I am aware that mechanism has been made for cutting out the battery current as soon as the dynamo has attained the required speed in order to save the battery and avoid running the battery down if the attendant should fail to throw off the manual switch.

Having thus described my invention so that any one skilled in the art pertaining thereto may make and use it, I claim—

1. In an automatic switch and current controller, the combination of a spring-actuated switch-lever and magnet armature, an electromagnet in proximity to said armature, a contact member on each side of said switch-lever, an electric lamp in series with said electromagnet in a permanently closed dynamo circuit, all so disposed, arranged and coöperating as to open a normally closed battery circuit and close a normally open dynamo circuit by means of said permanently closed dynamo circuit, and automatically open said normally open dynamo circuit and close said normally closed battery circuit when said permanently closed dynamo circuit ceases, and indicate by said lamp whether said battery circuit is working or not, substantially as specified.

2. An electric current-controller, comprising in combination a switch-bar which normally closes a battery circuit, an armature on said switch-bar, a magnet so disposed and arranged in proximity to said armature and said switch-bar that it may draw said switch-bar and break the battery circuit and close a dynamo circuit, a closed shunt circuit of the dynamo circuit, a combined indicator and resistance-member 4 in the shunt circuit, said magnet in the shunt circuit in series with said combined indicator and resistance-member, and a normally open dynamo circuit.

3. An electric current-controller, comprising an electrically operated switch, a battery circuit normally closed by said switch, a dynamo circuit, normally open, a permanently closed shunt circuit of said dynamo circuit, and an electric signal-lamp in said shunt circuit to indicate when said dynamo circuit is operating by being alight and that it is not operating by being extinguished, substantially as specified.

CROMY LEE VANNORT.

Witnesses:
JAMES E. WATKINS,
ABRAHAM KNOBEL.