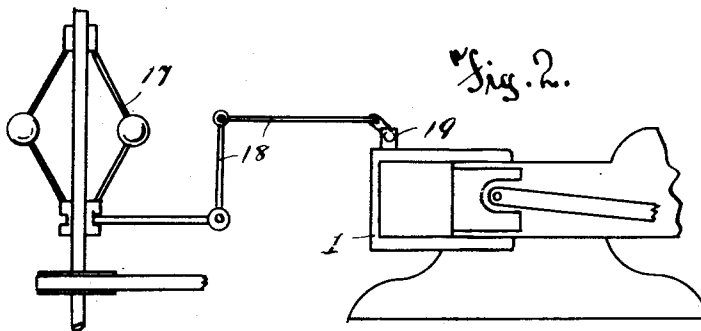
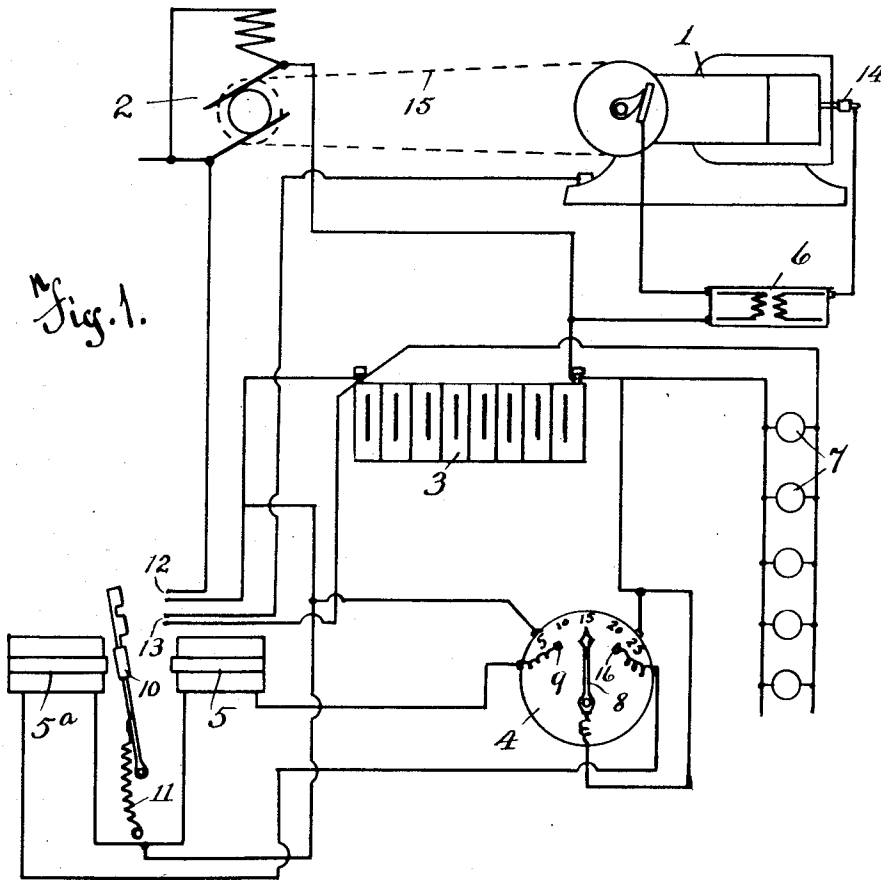


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AUTOMATIC ELECTRIC GENERATING SYSTEM.
APPLICATION FILED NOV. 20, 1908.

955,984.

Patented Apr. 26, 1910.



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AUTOMATIC ELECTRIC-GENERATING SYSTEM.

955,984.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed November 20, 1908. Serial No. 463,509.

To all whom it may concern:

Be it known that I, MALCOLM A. NEWSTETTER, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Electric-Generating Systems, of which the following is a specification.

This invention relates to an automatic electric generating system (as distinguished from automatic controlling and circuit breaking devices) using an internal combustion or explosive engine as a prime motive power in connection with a suitable electro-magnetic machine and electric storage battery or accumulator.

The objects of my invention are, not only to provide means for charging the battery (the current from which may be used for any purpose) but to make this means entirely automatic in its operation, also, to employ no other prime units to obtain this result other than the units of the plant, viz: the explosive motor, the electro-magnetic machine and the electric storage battery; in other words, to make the above units automatic in their operation and able to care for themselves, without the assistance of an attendant, starting, of course, with the battery at least partially charged.

A further object is to provide an arrangement wherein the battery is always connected to the circuit in the building where the current is to be used and to provide means, in the form of a voltmeter whose needle will close circuits at high and low voltage, through the medium of magnets and a movable pivoted arm, for automatically starting the engine and also the electro-magnetic machine at such times as the battery may be in need of charge and automatically stopping the engine and electro-magnetic machine when the battery is fully charged.

A further object is to provide means for automatically releasing the compression in the cylinder of said explosive engine, when the engine is about to start, until such time as the fly wheel has attained sufficient momentum to carry itself over the compression point.

A further object is to provide means whereby the said electric storage battery is prevented from discharging below a certain predetermined point without starting the engine and dynamo to replenish said battery,

and to automatically stop said engine when it has attained a certain predetermined voltage.

The invention is more fully described in the following specification and clearly illustrated in the accompanying drawing, in which:—

Figure 1 is a diagram of my system. Fig. 2 shows the compression releasing apparatus for the engine.

The numeral 1 designates the explosive engine; 2 the electro-magnetic machine; 3 the storage battery; 4 the voltmeter; 5 and 5^a the electro magnets; 6 the transformer or ignition coil and 7 the lights or equivalent.

Assuming that the plant is at rest, and the voltage, by reason of the burning of lights or other cause, is reduced until the needle 8 of the voltmeter reaches the predetermined point where it contacts with the electric terminus 9, this contact of the needle and the point 9 will close the circuit leading from the battery, through the voltmeter to the magnet 5 and this action will cause the said magnet to draw toward it the pivoted arm 10. This arm 10 is provided with a spring 11 so placed that it will keep the arm in either position placed by the magnets. When this arm moves toward the magnet 5 the free end will contact with the terminals 12 of the main circuit and close said circuit; simultaneously with said action, the arm will also contact with the terminals 13 of the transformer circuit and produce the initial spark in the combustion chamber of the engine to which it is connected at the spark plug 14. It will be seen that in this manner the electro-magnetic machine will first operate as a motor, and inasmuch as it is connected by belt 15 with the engine, it will start the said engine and permit it to draw a charge and begin its action. When the engine has thus been started, it in turn will give motion to the electro-magnetic machine through the same belt connection, and thus convert it into a dynamo (*i. e.* the source of electric current) and this dynamo will begin to charge the battery.

It is a positive fact, though perhaps not universally understood, that a shunt wound machine runs either as a dynamo or motor without changing direction of rotation or changing armature or field connections, and this feature is peculiar to the shunt wound machine.

When the voltage has attained a predetermined point, the needle on the voltmeter will contact with the terminus 16 which action will close the circuit on which the opposite magnet, 5^a is located and cause that magnet to draw the arm 10 away from the magnet 5 and toward it, thus breaking the current at terminals 12 and 13 and through this, stopping the engine and the dynamo.

10 In Fig. 2 I have shown how the compression is released in the engine cylinder. In this view, the numeral 17 designates a governor connected by a crank arm and rod 18 to a pet cock 19 in the cylinder.

15 When the engine begins to move, there would not, with the cock closed, be sufficient power to draw and compress the first charge. In this construction, the cock is open and remains so until the engine gains sufficient speed to throw out the governors which also, through the crank rod and arm will close the pet cock 19 and by that time the engine has also gained sufficient momentum to draw and compress the charge.

20 It is evident that my system comprises an automatic means for operating a plant of the class described, as the circuit for starting the engine through which the battery is charged by means of the electro-magnetic machine, is automatically closed by the discharge of the battery as indicated on the voltmeter and in like manner the circuit by means of which the engine is stopped, is closed by the voltmeter needle

25 arriving at a point showing the predetermined maximum voltage of the battery.

It is evident that the engine might possibly be started at times when the battery is discharging heavily and being overworked, and in such cases my arrangement is particularly advantageous as the dynamo will serve to keep the line voltage up until such time as discharge from the battery will be lighter and the battery therefore will absorb at this time most of the charging current.

30 This system must not be confounded with systems wherein the explosive engine is started by an attendant and the dynamo started and stopped at suitable times or connected and disconnected with the battery at suitable times from a constant source of power; in my system the means for charging the battery and the battery itself are

35 utilized as a means for starting the engine to charge the battery.

Having thus fully described my invention what I claim and desire to secure by Letters Patent is:—

1. In an automatic electric generating system, an explosive engine, an electro-magnetic machine, an electric storage battery and means responsive to the condition of the charge of said battery to start and stop said engine.

2. In an automatic electric generating system, an explosive engine, an electro-magnetic machine, an electric storage battery, an electro-magnet controlling a circuit between said electro-magnetic machine and said electric storage battery and also an ignition circuit for the engine, in combination with an instrument responsive to the electric condition of the battery, means thereon to complete a circuit to said electro-magnet when the electro-motive force of said battery is below a predetermined point whereby said electro-magnetic machine is put into operation; a second circuit having means therein controlling said main and ignition circuits, means on said voltmeter to complete said second circuit when the electro-motive force reaches a predetermined high point and thus break said main and ignition circuits.

3. In an automatic electric generating system, an explosive engine, an electro-magnetic machine, an electric storage battery, an electro-magnet controlling a circuit between said electro-magnetic machine and said battery and an ignition circuit for the engine, in combination with a voltmeter, connected to the battery, means thereon to complete a circuit to said electro-magnet when the electro-motive force of said battery is below a predetermined point whereby said electro-magnetic machine is put into operation; a second circuit having means therein controlling said main and ignition circuits, means on said voltmeter to complete said second circuit when the electro-motive force reaches a predetermined high point and thus break said main and ignition circuits, and means for automatically releasing the compression in the cylinder of the engine until it has attained sufficient speed to carry the fly wheel over the compression point.

In testimony whereof I affix my signature, in presence of two witnesses.

MALCOLM A. NEWSTETTER.

Witnesses:

ED. A. KELLY,
J. WILLIAM FREES.