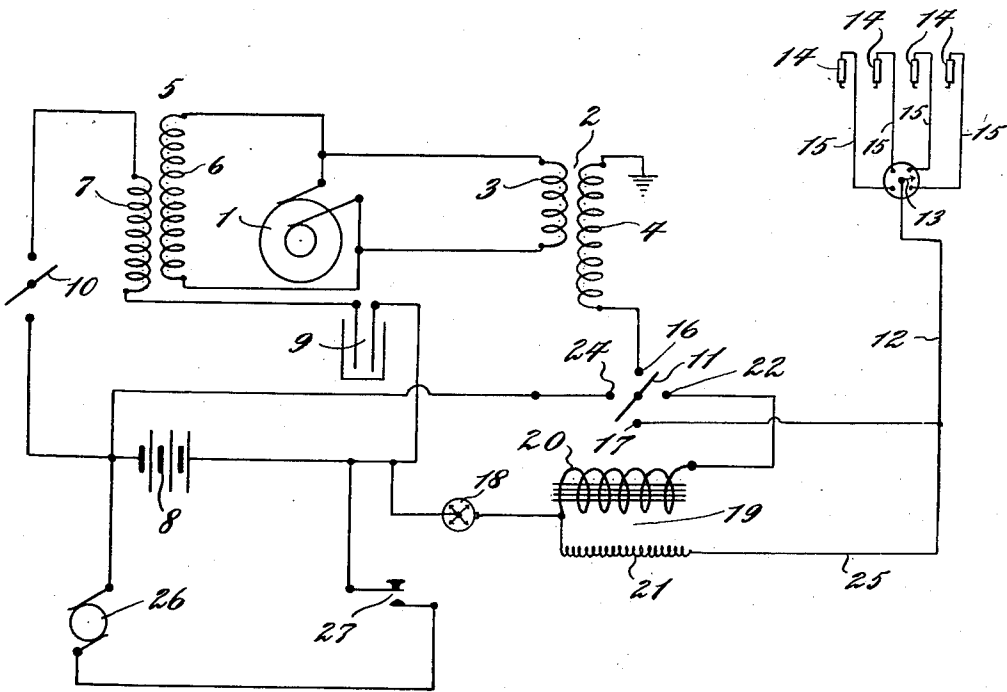


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W. S. GOULD
SYSTEM OF DISTRIBUTION

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UNITED STATES PATENT OFFICE.

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SYSTEM OF DISTRIBUTION.

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My invention relates to systems of distribution and particularly to starting, lighting and ignition systems for automobiles and similar purposes.

5 Experience has demonstrated that better results are secured in internal combustion engines by the use of an alternating current for the ignition than by the use of pulsating current therefor. Furthermore, the construction of alternating current generators is much more simple than that of direct current generators and the maintenance is also less due to the fact that in the use of alternating current generators there is no commutator and the brushes therefore, have a much greater life than they do in the direct current generator.

I have, therefore, devised an arrangement by the use of which direct current may be used for starting the engine and furnishing ignition during the starting period. After the engine has been started the ignition is switched to an alternating current source and disconnected from the direct current source. I have also provided a means between the alternating current generator and a battery whereby the battery may be automatically charged during the operation of the engine.

30 My invention will be better understood by reading the description taken in connection with the accompanying drawing which shows one embodiment of my invention.

Referring to the drawings, the alternating current generator 1 is connected to a transformer 2 having a primary 3 and the secondary 4, so related as to step up the voltage of the generator to ignition voltage. The generator 1 is also connected to a transformer 5 having a primary 6 and a secondary 7 so arranged that the voltage of the generator is stepped down to a suitable voltage for charging the storage battery 8 through the rectifier 9. The switch 10 is placed in the circuit of the secondary 7 leading to the battery. The battery 8 may be of any well-known construction. The rectifier 9 is preferably of the electrolytic type and specifically I prefer to use a tantalum rectifier.

50 The secondary 4 of the transformer 2 has one side connected with a switch 11. From the switch 11 a wire 12 leads to the rotating

element 13 of a distributor which in a well-known manner distributes ignition energy to the spark plugs 14 of an engine. The ignition circuits 15 are, therefore, connected with the alternating current source when the switch 11 closes the contacts 16 and 17.

Between the battery 8 and ignition circuits 15 is interposed an ignition coil or transformer 19 having an interrupter 18, a primary coil 20, and a secondary coil 21. The other end of the primary 20 connects with contact 22 of the switch 11, and a wire leads from a contact 24 of the switch 11 to the other side of the battery 8. The secondary 21 of the ignition coil 19 is connected with the wire 12 by a wire 25. When the switch 11 is in engagement with contacts 22 and 24 the ignition circuits 15 are connected with the battery 8.

A starting motor 26 is connected to the battery 8 and a starting switch 27 is provided for operating the motor 26. The various parts of the system may be of any desired construction as my invention is not limited to the particular construction of any of the elements.

From the foregoing, it will be evident that by the use of my invention direct current from the battery may be used to start the engine and furnish ignition during the starting period. After the engine has been started the ignition voltage from the transformer 2 may be impressed on the ignition circuits 15 by moving the control switch 11 into engagement with contacts 16 and 17.

If it should be desired to use an alternating current generator having normal running voltage high enough for ignition purposes, the transformer 2 may be omitted and the relation of the primary and secondary of transformer 5 so modified as to step down the generator voltage to a voltage suitable for charging the battery.

Many changes may be made in the arrangement of the apparatus without departing from the spirit of my invention.

I claim:

1. In a system of the character described, the combination of an alternating current generator, a battery, an ignition circuit, a low ratio step-up transformer for impressing alternating current voltage from said gen-

erator on said ignition circuit, a high ratio step-up transformer for impressing ignition voltage on said ignition circuit from the battery, and means for charging said battery from said alternating current generator.

2. In a system of the character described, the combination of an alternating current generator, a battery, an ignition circuit, means for stepping up the voltage of said alternating current generator to ignition voltage, means for impressing said alternating current voltage on said ignition circuit, means separate from the first means for impressing ignition voltage from said battery on said ignition circuit and means for charging said battery from said alternating current source.

3. In a system of the character described, the combination of a source of alternating current, a battery, an ignition circuit, a transformer for stepping up the voltage of the source to ignition voltage, a transformer for stepping down the voltage of the source suitable for charging the battery, a rectifier connected between said second transformer and the battery, means for stepping up the voltage between the battery and the ignition circuit, and means for impressing alternating

current or direct current voltage on said ignition circuit.

4. In a system of distribution, the combination of an alternating current source, a battery, an ignition circuit, a step-down transformer between the source and the battery, a low ratio step-up transformer between the source and the ignition circuit, a high ratio step-up transformer between the battery and the ignition circuit and a switch for optionally connecting the two last-mentioned transformers to energize the ignition circuit.

5. In a system of distribution, the combination of an alternating current source, a battery, an ignition circuit, a step-down transformer between the source and the battery, a low ratio step-up transformer between the source and the ignition circuit, a high ratio step-up transformer between the battery and the ignition circuit, a switch for optionally connecting the two last-mentioned transformers to energize the ignition circuit, and a rectifier in the circuit between the first-mentioned transformer and the battery.

WILLIAM S. GOULD.