GASOLINE ENGINE IGNITION

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BY
E. J. WILLIAMS

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PREFACE.

From observations made in the marine gasoline engine field, the purchaser of an outfit is usually his own operator, and with him alone rests the responsibility of understanding the different phases attendant with its successful operation. Very few books have been written which render assistance to the marine gasoline engine operator, and those few do not deal pointedly with the ignition system.

Numerous little difficulties are mastered in the general equipment, but occasionally information is wanted regarding the electrical outfit, its installation or principle of operation. With this end in view, the author has endeavored to treat this work in a simple and non-technical manner, basing its contents on the assumption that the reader is a novice in every sense to which the word implies, and trusts its perusal will meet with a favorable reception.

E. J. WILLIAMS.

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CHAPTER I.

MAGNETISM.

The average person naturally understands nothing regarding electricity, and the only accessory about a gasoline engine in which he has no confidence is this particular part.

A wire, when charged with an electrical current, contains a property adverse to the natural state of the wire when not electrified. When a wire has an electrical current flowing through it, magnetic lines of force surround it to a distance consistent to the strength of the current. If the wire is wound in a circular form, in layers, forming a coil, the magnetic lines of force are increased in strength, and if wound around a bar of soft iron an additional increase is gained.

If a bar of soft iron is wound with several turns of insulated (covered) copper wire, and a current of electricity passed through the wire, either from a dynamo or battery,

the bar becomes saturated with a property called magnetism, and is capable of attracting particles of steel as long as the electricity flows through the wire, and ceases immediately, when the wires are disengaged and the current flow stopped. When the bar of iron is magnetized, one end will attract steel while the other end will repel it.

Induction or jump spark coils and any electrically operated mechanism such as dynamos, magnetos, etc., are based on the principles or phenomena of electro magnetism as above stated.

A permanent magnet is a piece of special steel, stored or saturated with magnetism for an indefinite time. It will perfrom the duties of an electro magnet in many instances. Permanent magnets are utilized for the construction of magnetos, and the magnetism contained in the metal lasts generally from 5 to 10 years, according to the grade and work the magneto performs.

In order to first saturate the steel with magnetism, it is necessary to lay it on a direct current dynamo or motor, or rub it on what was originally called a load stone (another permanent magnet). When the

magnetism becomes weak the same method of charging is again repeated.

Electric current requires some standard of measurement, therefore it is expressed in volts and amperes. A volt is the unit of pressure or strain, and is similar to the pressure of steam in a boiler, or air in a tank expressed in pounds.

An ampere is the unit rate of flow or amount backing up the volt, and compares with the amount drained from the above referred to boiler or air tank. If a tank or boiler had 100 pounds pressure and discharged the whole contents at once, the rate of flow would correspond to the flow from a battery on short circuit, and to discharge at a low rate for a length of time, would correspond to the drain from a battery through a coil or otherwise.

The drop in pressure during this operation corresponds to the drop in volts when using a battery.