

MOTORS AND MOTORING:

A Page Full of Interest to the Owner or Prospective Owner of an Automobile.

HOW POWER IS GENERATED

Power is developed in the gasoline engine by taking a charge of fuel mixed with air into the cylinders, compressing it and igniting it so that it will burn, produce heat and pressure. This pressure is exerted on the generator and led to the spark plug and, through various connections, to the rear wheels.

The ignition of the mixture is obtained universally today through the use of an electric spark. To produce this spark at a desired point in the cylinder a spark-plug is employed. Practically all automobile engines use the jump spark. In the jump spark type of plug there are two metal points projecting into the cylinder. These points are insulated from each other electrically by means of a porcelain or mica sleeve, and the ends of the points are set so that there is a space of about 1-32 of an inch between them.

A very high electrical pressure is generated and led to the spark plug by means of a wire which is attached to the terminal communicating with one of the points. The pressure is sufficient to cause the electricity to jump the small gap separating the two points, causing an electric spark. It is this spark which ignites the explosive gas in the cylinder.

High Tension Magneto

To generate this high pressure, or high voltage current, there are two general systems employed: First, the high tension magneto which is entirely self contained and generates current only when the engine is running. This system is used on very few cars today. The second system, the battery ignition system, has come into general use because the battery is required for lights and starting and is, therefore, present for ignition purposes.

In the battery system a low pressure current, usually of six volts, is supplied by the battery to an induction coil. The induction coil is so constructed that it transforms or changes this low pressure to the high pressure required by the spark plug. In order to obtain the spark, it is necessary to have the low pressure primary current that flows from the battery through the coil interrupted and for this purpose interrupter points are provided. These are included in the igniter, which also has provision for distributing the higher pressure secondary current to the different cylinders, as a spark is required by each.

The action is somewhat as follows: When the switch is turned on at the dash the current may flow from the battery through the primary winding of the induction coil, then to the interrupter and from the interrupter to the switch and thence back to the battery. This gives a complete circuit and current will continue to flow as long as these conditions remain the same.

What Causes the Spark

When the crank shaft of the engine is revolved a shaft in the igniter, which is geared to it, revolves also. When the crank shaft has reached a position where it is desirable to have power applied to it, a cam on the shaft in the "igniter" causes the interrupter points to separate and stop the flow of current in the primary circuit. When the current stops flowing in the primary winding of the coil certain magnetic changes take place in the coil which energizes the secondary winding of the coil. This creates the high tension current which travels to the spark plug and causes the spark which ignites the gas.

In order that this high tension current may be delivered to the proper cylinder it is led from the induction coil to the igniter, where it enters the distributor, which is really a revolving switch, and directs it to the proper spark plug. The spark plugs of all cylinders are connected by wires to the distributor which delivers a spark to each in its turn. When it is

desired to stop the engine the ignition switch is turned to "off" position, which causes a break in the primary circuit, consequently no current can flow from the battery to the coil and no secondary current will be generated to supply the spark plug.

Overheating Induction Coil

It sometimes happens that the operator forgets to turn off the switch when the engine is stopped, through stalling or otherwise. The result is that the current may continue to flow, which will discharge the battery and overheat the induction coil. To prevent this some systems are supplied with a resistance unit to limit the amount of current that can flow so that little damage can be done.

Other systems employ an automatic switch, which is operated by a thermostat. With this device, when the switch is left on after the engine is stopped, the current flowing heats the thermostat. This operates a mechanism that automatically opens the primary circuit.

In the modern battery systems the current drawn from the battery for ignition is replaced by a generator when the engine is running. As a matter of fact, when the engine is running at normal touring speed the generator produces enough current to the battery to make up for that which was drawn from the battery for starting, lights and ignition when the engine was not running. Thus, generally speaking, when the engine is running, the battery system of ignition draws its current from the generator. When the engine is idle or turning at very slow speed its current is drawn from the battery.

USE EYES AND SAVE CASH

Many a car owner could repeat the jobs I do to his car if he would just watch me work. Instead of trying to learn—so that they won't have to be towed home some day—most of my customers start raving over the conditions of the roads and other things that have no bearing on the repair work.

A man came in here the other day with the complaint that his engine overheated. Said he drained off the water and poured in fresh. Proved to me that the fan belt was tight enough. Had enough of the right kind of oil in the crank-case. The brakes were not dragging. And, in general,

everything seemed to be all right—except the engine kept right on overheating.

I knew what the trouble was and started remedying it. The timing was a little late. I told him so. But oddly enough, the moment I removed the distributor head and started adjusting the position of the breaker cam he struck up a conversation with one of my men about the cost of having his radiator rechecked.

All I was doing was changing the position of the breaker cam so that the points would break an instant sooner. To turn the cam it was first necessary to loosen the screw that locks the adjustment. After making the necessary change I locked the adjustment again, but I must admit I was strongly tempted to leave the screw a little loose—just so that in a few days the owner would be caught on the road with his timing all upset.

It would be a lesson to him to learn how to do a simple job like this himself. He may never have to depend upon his own brain for a job like this, but the knowledge of "how to" is a habit that saves many an hour of worry and many a dollar on repairs. Repairers are always handing out this information to any motorist who'll take the trouble to keep his eyes and ears open.

Some women have such a keen sense of humor that they take their husbands as a joke.

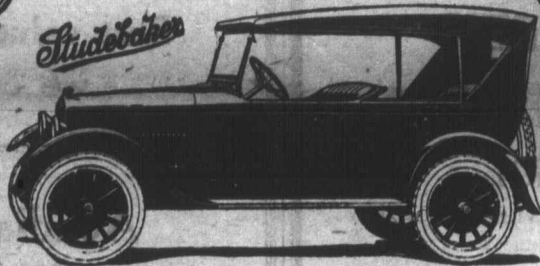
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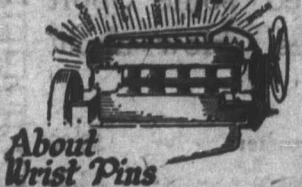
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CANADA is endeavoring to regain her after-the-war stride in the midst of many difficulties. — debt, deflation and depression being some of them.

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Some are leaving Canada hoping to escape taxation, only to find there is no escape anywhere. In seeking for easy remedies too many of us overlook the fact that the greatest remedy is honest, hard work faithfully and intelligently performed, accompanied by old-fashioned thrift.

It takes time, it takes patience, it takes grit. But every Canadian knows in his heart that Canada is coming through all right.

Our Experience Proves It

Look back over the path Canada has trod. The French Colonists, cut off from civilization by 3,000 miles of sea, faced a continent—a wilderness—without the aid of

even a blazed trail. They had to fight savages, frosts, scurvy, loneliness and starvation.

The United Empire Loyalists subdued an unbroken forest in one generation, growing their first wheat amid the stumps and snags of the new clearing.

The Selkirk settlers came to Manitoba when the prairie was a buffalo pasture, and grew wheat where none had grown before and where those who knew the country best at that time said wheat would never grow. Today the Canadian prairies grow the finest wheat in the world.

In proportion to population Canada stands to-day among the wealthiest nations in the world, with average savings on deposit per family of \$800. Canada's foreign trade per head of population stands amongst the highest of the commercial nations, being \$192 per capita in 1922-23, as compared with \$135 in 1913-14, the "peak" year before the war.

New Opportunities for Canada

In Canada, although prices in the world markets fell below war level, our farmers reaped last autumn the largest grain crop in Canadian history, and Canada became the world's largest exporter of wheat, thus in large measure making up for lower prices.

Last year, Great Britain, after an agitation extending over thirty years, removed the embargo on Canadian cattle, and a profitable and practically unlimited trade is opening up for Canadian stockers and feeders.

"The 20th Century belongs to Canada"—if Canadians keep faith.

The next article will suggest practical opportunities for profit making on our Canadian farms.

Have Faith in Canada

Authorized for publication by the
Dominion Department of Agriculture
W. R. MOTHERWELL, Minister. Dr. J. H. GRISDALE, Deputy Minister.

