denser in this instance is placed across
ct points of the interrupter and in the
r, one end being connected with the
stationary contact and the other end
to the frame of the interrupter. The
could be in the coil, which it is, in some
in such cases it must connect directly
contact points, as explained on page 189.

condary circuit and distributor: One
grounded. The other leads to the center
the distributor, and makes contact with
spring on the insulated rotating distribu-
also called the "rotor."

r end of the spring on the rotor passes
ut not touching, the metal distributor
f the distributor head (made of insulated
which leads to the spark plugs (termed
utor gap"[1]); thence through the center
the spark plug; it then jumps the gap
k-plug points, thence to the shell of the
engine, back to the grounded connection
dary.

ibutor rotor, of course, is synchronized
at the rotor spring makes contact with
lug in the cylinder to be fired; at the
the interrupter cam opens the circuit.

on switch of course is supposed to be
n the engine is idle. However, the
y not always think to open the ignition
therefore an **ignition resistance unit** is
ries with the primary winding on very
closed-circuit battery and coil-ignition
take care of any possible damage that

Ignition Resistance Unit

se of the ignition resistance unit is
being to protect the battery from dis-
k through the primary winding and
ting the winding and discharging the
e switch is left on and engine is not
nterrupter points are closed.

n resistance is made of iron wire,
ed on a porcelain spool on the ignition
s a cherry red when the primary cur-
ugh it for any length of time. When
offers resistance; thus the discharge
rimary winding is greatly decreased.
ft on for a long period of time when
lle, the resistance may burn out and
t and a new resistance unit becomes
is sort of thing happens frequently.

When the engine is running, the circuit is continually opened and closed and thus the heating effect is not as great.

In the instruction on the principle of the ignition coil (page 190), we learned that the coil core is slow in its action of "building up" lines-of-force, or in being magnetized, when the circuit is closed. This being the case, it would appear that at high engine speeds the interruption or opening of the circuit would take place before the iron core of the coil was fully magnetized, thus producing a weak spark. This is quite true and possible.

To overcome this, the coil is wound so that it takes an excess of current, or more than is required in order to compensate for this slow action of magnetizing the core. The question next to arise is, if the excess of current takes care of high speeds, what is the situation in the case of low speeds? At low speeds, the points are closed for a longer period and the excess of current would injure the coil.

The answer is, that the resistance unit heats when the circuit is closed for a longer period of time and offers resistance which cuts down the flow of current to normal. At high speeds it does not heat so much and the resistance is less, and the current is permitted to pass at full value through the winding at high speed, thus assisting in quickly building up magnetism in the core.[1]

High-Tension Safety Gap

Safety gap: The fact that the distributor spring does not make full contact with the distributor terminals leading to the spark plugs brings up the subject of safety gaps.

The safety gap on the ignition coil is always a "shunt" gap placed across the secondary circuit, usually on the coil. If the external secondary circuit is open, the safety gap provides another path to ground (see Fig. 6). It is used more on high-tension magnetos than it is on ignition coils. It is practically a safety valve for the high-tension current. The safety gap is usually set slightly farther apart than the spark-plug gap, or about 5/16". As long as the wires to the spark plug are connected, the safety gap is inactive, but if the spark-plug wire should come loose, then the safety gap becomes active by a spark jumping across its gap instead of trying to jump from the end of the loose wire to the engine. If this were a greater distance than ½", which it might well be, it might cause the high-tension current to force a circuit through its own insulated winding to its ground, thus damaging the coil, or cause sparking at interrupter points.

TICUT IGNITION, CLOSED-CIRCUIT SYSTEMS: MODELS 16, 14, AND 15

ple of an ignition system using a
nd a "thermostat resistance," the
ition system as used on the Dort
e "model 89" Willy-Knight six, is
6. The diagram represents that of
e Connecticut ignition system using
t automatic thermostat switch, is
clearly shown in this illustration. This ignition system is known as the model "16."

The purpose of the thermostat switch. It must be understood that the timer, or interrupter (Fig. 7) is a closed-circuit type; therefore if the engine is not running and the switch is left "on," a waste of current and heating of the ignition coil results, therefore this automatic switch is used to open the circuit.

There are **two types of Connecticut thermostat switches:** one which is operated by **magnet coils,**

n the distributor brush and the spark-plug
about .010". It may vary .003" or .004"

age of this gap is the fact that no rubbing
therefore there is no friction or wear.

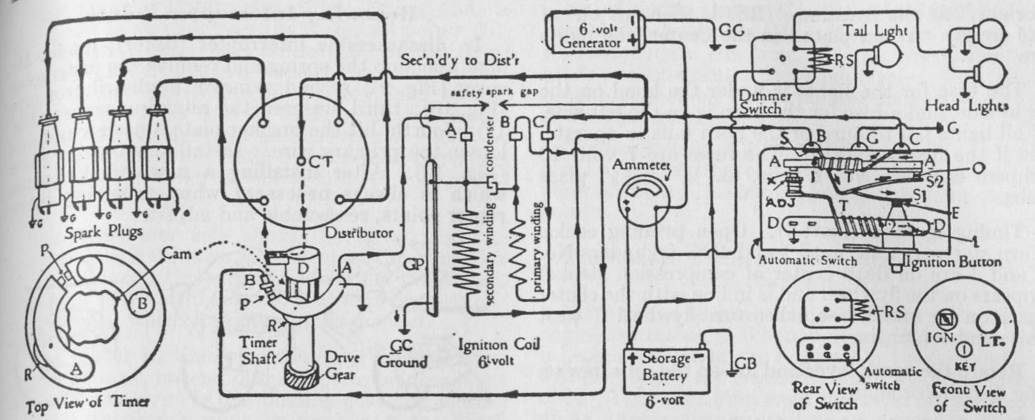


Fig. 6. The Connecticut model "16" high-tension non-vibrating coil closed-circuit ignition system. Note that a thermostat of the thermal type, termed "automatic switch," is used to open the circuit if the ignition switch should be left "on." Type "GA" coil is used in this system. Note that the interrupter is grounded at (A). (See page 232 for a later type coil.)

which is an early type described in Figs. 13 and 14, and a later model where a thermal, or **thermostat** blade (D), (Figs. 6 and 8) takes the place of the magnets. We shall describe the later model, using the thermal blade. "Thermal" refers to heat.

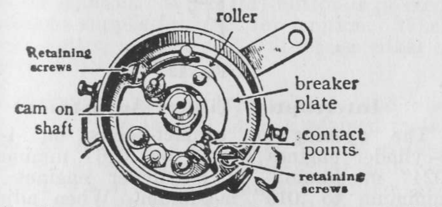
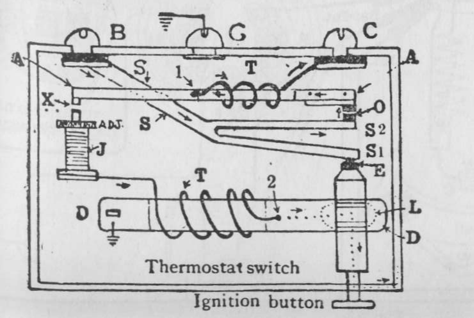


Fig. 7. Top view of Connecticut interrupter or contact-breaker. See also page 232 for later model 18 interrupter.

Thermostat action (see Figs. 6 and 8). The battery current flows from battery (+), to (B), then through insulated spring (S, Figs. 6 and 8). If the ignition button is pushed in, then an insulated plunger (E) on the switch button presses against spring (S1) causing spring (S2) to close points (O). The current then travels through (A) to (1), through resistance wire ribbon (T) (thermostat wire which is insulated from **A**, except where grounded to **A** at 1), to insulated connection (C), to (C) connection on the coil.

So long as the engine is running, the intermittent opening and closing of timer contact points prevents (T) from heating blade (A).



seconds the continuous current passing through resistance wire (T) heats spring blade (A), causing it to bend down, thus making contact with (J) at (X). The current then flows through (J) to (T) on blade (D), through (2) to ground connection of switch box at (G).

Blade (D) then becomes heated and bends up, releasing a wedge-shaped lug (L) which is attached to under part of (D), from a groove in the ignition button shaft. The spring (S1) then easily forces the ignition button "out," thus opening the circuit at (O) and (X).

The primary ignition coil circuit can be traced by starting at (+) of battery (Fig. 6) to thermostat connection (B) through spring (S) to connection (C) (when ignition button is "in"), thence to the primary winding of coil (C), through the coil, out coil terminal (B) to stationary contact (B) on model 16 timer, through points (P) to movable contact (A) (which is grounded), to the grounded terminal of the coil primary winding at (A), through ground plate (GP) to ground (−) of battery (type **GA** coil).

The secondary ignition-coil circuit is from the secondary winding to center terminal (CT) of the distributor, to distributor arm (D) which passes the secondary current as it revolves, to spark plugs, thence through center terminals of spark plugs across spark-plug gaps to the shell of the spark plug to the engine frame, thence back to ground plate (GP) on the coil to the grounded terminal of the secondary winding.

The safety gap is shunted across the secondary circuit of the coil, as shown in Fig. 6, and explained above.

The condenser (Fig. 6) is shunted across the contact points of the timer, but is located in the coil.

The lighting and ignition switch (type K.V.B.) is combined with the Connecticut automatic thermostat ignition switch; a front and rear view is shown in Fig. 6. It has two buttons.

When the button at the left is pushed in, the ignition is "on." **When it is pulled out,** the ignition is "off."