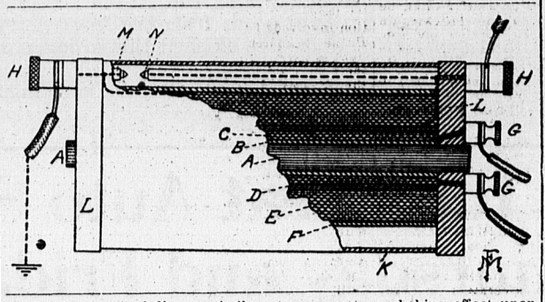
HINTS FOR The Motorist

BY ALBERT L. CLOUGH

IGNITION. THE INDUCTION COIL

(Continued)

The illustration shows a partial cross section of an induction coil of ordinary tubular form. Here A is the cylindrical bundle of fine wires of special alloy steel, forming the magnetic core. B is a cross section through a tube of mica or similar material, forming the insulation around the core. C is a cross section through the coil of heavy, well insulated copper wire, forming the primary coil. D is a tube of mica or hard rubber shown in section which performs the very important duty of insulating the primary from the secondary coil. E represents a sectional view of the secondary coil composed of very numerous turns of extremely fine copper wire, covered with an insulating coating of enamel. At F is shown a section through an insulating wrapping over the outside of the secondary coil. LL are heavily insulated conductor to the live end of the secondary coil which leads to the distributor and point M to the grounded end of the secondary. The gap between M. and N. is very much greater than that between spark-plug points, but still is small enough to allow the secondary current to discharge through it, without danger of damaging the coil insulation. If a spark-plug or distributor connection becomes detached the spark passes harmlessly at the safety spark-gap instead of at the usual place. The rate at which an ignition coil is required to deliver sparks is astoundingly high. For instance, in the case of an eight cylinder engine, capable of running as high as 3,000 revolutions per minute, a single coil is called upon to furnish 200 sparks each second, when the engine is at top speed, and thus the core of the coil must be capable of being magnetized and demagnetized with almost inconceivable rapidity. Unless it is fully magnetized at the time the primary circuit is broken there will be but little magnetism to be discharged there will be but a weak secondary current impulse and no spark will occur. The magnetizing effect of a current is proportional to the number of turns in the coil times the volume of the current passing through it, but it is impractical to use many turns of wire in the primary coil for the reason that a coil of numerous



heads of vulcanized fibre or similar material, fitted upon the core and in which the insulating cylinderical external casing of the coil is fastened. The ends of the primary coil C are brought out to screw terminals GG for connection to the battery-switch and to the timer and the ends of the secondary coil E are carried to the terminals HH. for connection to the distributor and to ground. In the operation of the coil current flowing through primary coil C from mthe battery magnetizes core A storing up within it energy in the eletromagnetic form. When this current is suddenly broken by the timer, the core loses its magnetism and the energy stored within it, acting upon the very numerous turns of secondary coil E. is transformed into the extremely high-tension, momentary current that is directed to the spark-plugs by the distributor. So high is the pressure of this current, that if it were not that it had the very short gap at a spark-plug, through which to discharge, it would be likely to force a path of discharging through the insulation of the secondary wire and ruin the coil. If a wire to a spark-plug becomes detached, the current loses its regular path of discharge and when no other is provided is likely to break down the coil insulation. Such damage is forestalled by the use of the safety spark-gap, represented by the metal points M and N fixed within the outside casing K; point N being connected by means of a turns exerts a choking effect upon the current and prevents it from promptly building up to its full value. In other words it makes the coil slow acting and thus in order to secure a quick acting coil, the primary winding must consist of but few turns of wire and a very considerable primary current must be used. In modern ignition systems the ability of the coil to deliver sparks with sufficient rapidity is assisted by the way in which the timer controls the flow of current, the timer being so constructed that it keeps the primary circuit closed almost continuously, the only interruptions of the current flow being at the exact instants when sparks are required. In this way the magnetism of the core is given the longest possible in which to build up, with the result that even at the highest engine speeds with the shortest periods of primary current flow, the core is able to attain a sufficient degree oil magnetization for effective spark production. The adoption of this so-called "closed circuit" system of ignition, with its rather large current consumption, has been made possible by the general introduction of the generator and storage battery system which supplies a practically unlimited supply of electrical energy.

Questions of general interest to motorists will be answerd in this column, space permitting. If an immediate answer is desired, enclose self-addressed, stamped envelope. Address Albert L. Clough, care of our office.

TEETOTAL WINE-TASTER.

One of the strangest occupations for women is that of professional wine-taster, a post held by Mll. Collinere, a young French girl who earns about £5,000 a year in California.

Strange as it may seem, she is a teetotaller. She cares nothing for wine and never swallows it. The testing is all done by taste in the mouth.

If she were to drink wine she would lose her subtle taste, which is so marvellously developed that she can discern from the first taste of a wine just where the grapes grew from which it was made, and whether they were raised in California or in the vineyards of France or Germany. She can even tell the vineyards in which the grapes grew, and whether they were raised on a hillside or in a valley.

Mlle. Collinere can instantly detect an adulteration of any sort. she has often found so-called wines with not a particle of grape juice in them, being made up of cheap fruit juice. The age of a wine is told almost to a day.

The professional wine-taster never eats chocolates, rich puddings, pastry, raw onions, lemons curry,, or pineapple. She uses no salt, does not drink tea or coffee, and lives on the simplest and most wholesome diet. She is rewarded in two ways, for not only does it preserve her wonderful taste, but it gives her a remarkable complexion.

HIS AFFLICTION.

He had been dining well, but not too wisely, and as he was staggering homeward a friend met him and suggested that perhaps it would be better if he were to sit quietly in a picture show for a time.

They accordingly went in together, but in a little while the friend found the inebriated one sobbing quietly to himself, although the picture then flickering across the screen was certainly not a pathetic one.

"What's the matter?" he hissed. "Why can't you sit quiet and look at the picture?"

"'Sno good, ol' man," sobbed the other. "I've gone stone deaf. I can't hear a single word they are saying."

Fish Poisoned by Industrial Wastes

Pollution of Stream Is Double Waste—Loss of By-products and Injury to Aquatic Life.

Dr. Victor E. Shelford, of the University of Illinois, has conducted a series of experiments to determine the effect upon fishes of various pollutions. His researches indicate the following conclusions:

(1) Pollution is likely to be most injurious during periods of low water or during winter when ice prevents aeration.

(2) The most sensitive period of a fish's life is probably just after hatching.

(3) The effect of poisons on the minute animals which form the food supply of fishes is as important as the effect upon the fishes themselves.

(4) Many wastes, e. g., sawdust, sewerage, etc., cover the river bottom and make conditions unfavourable for eggs.

(5) Fish will turn back from acid effluents and from sulphuretted hydrogen, but they sometimes show a preference for water polluted by tarry wastes and, of course, succumb.

(6) If, through extensive pollution, a river is depleted of its fish life, natural recovery will only be very slow even though the pollution be stopped. To re-stock with the fish only is not sufficient. The entire association of plants and animals must be revived.

Many of these effluents which destroy fish life could not only be rendered innocuous, but could actually be made beneficial, through the extraction of by-products. Yet, if it be suggested that this be done, one is frequently met with the objection that the by-products recoverable are not sufficiently valuable to cover cost of installing and operating the neccessary plant. But the real value of the by-products is their market value plus the value of the fish catch and other savings effected through the neutralization of the pollutions.

The principal wastes discharged into our streams are: Sewage and the wastes from gas plants, oil refineries, textile factories, paper mills, tanneries, chemical industries, etc.

Now sewage, for instance, can be made to yield considerable quantities of fertilizer and grease, as well as moderate amounts of ammonia and glycerine and, if the residual effluents be aerated, the danger to fishes would not be great, whereas untreated sewage gives rise to large quantities of carbon dioxide and ammonia, which are injurious to fish life. As sewage should be treated in any case, out of consideration for public health, the question of extracting by-products is not one of profit, but of great or less expense as compared with other methods of treatment.

The wastes from gasworks are especially important, including such substances as creosote, naphthalene, carbolic acid, benzene and ammonia. From these, again, are derived many valuable dyes, drugs, explosives, antiseptics, etc.

Financier's Wife Pawns Jewels

The young and beautiful wife of Matthias Borland was seen to enter a pawn shop, and then, Ben Bodet the business detective, discovered that she had pawned her jewels, although there would seem to be no reason for such an action, as Borland was wealthy enough to supply his wife with any amount of money for anything her heart craved.

Why then did she pawn her jewelry, and why, afterwards, did she visit a dingy lodging house, and why did she keep her movements secret from the world.

This is the theme of a remarkably interesting story by Will Payne in the current number of Cosmopolitan—the first of a series of detective stories which this writer is doing for Cosmopolitan.

There are many other strong novels, short stories and special features in this number of America's Greatest Magazine.

Among the numerous world-famous writers in this issue are, Peter B. Kyne, Gouverneur Morris, Rupert Hughes, Dana Gatlin, Arthur Somers Roche, Harvey O'Higgins, Jack Boyle, Robert W. Chambers, Harris Dickson, Meredith Nicholson, and Mary Corolyn.

Don't expect any man to have faith in your judgment if you call him a fool.