HINTS FOR The Motorist

BY ALBERT L. CLOUGH

THE "FROZEN IN" CAR

A Car With Locked Wheels Or Brakes Starts Hard

Sometimes it happens that a car is allowed to stand on a street deep with slush, while the temperature drops suddenly and the slush becomes firm ice. This usually occurs after winter rains, followed bycold waves or in the spring when melting conditions prevail by day and the temperature falls rapidly at sundown. The result often is that the tires freeze in solidly and the operator when he tries to start his car, finds that it will not "budge" when the clutch is let in. Repeated attempts to start by racing the engine and applying power are to be avoided, as the wear on the clutch and the strain on the transmission are then exceptionally severe. The tires should be freed before moving the car by its own power. Sometimes this can be done by persistently rocking the car forward and back and sideways, but in extreme cases the ice that has formed around the tires must be carefully removed by means of a bar or a hammer. When a car has been splashing through slush and then is left in a cold place, it may be found that the brake-linkages or bands are frozen in place and cannot be released or applied. Rapping the stuck joints with a hammer will usually release them, but attempts to drive until they are freed should not be made.

UTILIZING SPENT OIL

W. V. K. asks: Is there any use that can be made of the spent oil that is drawn off from engine crank-case? I understand that it is of no further use as a lubricant but it has occured to me that it might be used for other purposes, such as making soap, or that it might be refined and used over again. Do you know if there is any market for it?

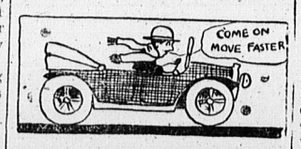
Answer: Certainly, the throwing away of all this used oil appears like a gigantic economic waste. Lubricating oil reclamation treatments consisting of filtration distillation and other processes are known, but we have not heard that the collection and treatment of such oil has become a commercial proposition, within the reach of the private user. Only animal and vegetable oils are of value in soap making and the only two uses of this material which we know have been made are burning it in heating apparatus and employing it as a dust layer. It is earnestly to be hoped that some general oil reclamation system may be organized.

BATTERY AUXILIARY FOR MAGNETO

J. A. C. writes: My 1916 car is equipped with a starter that will not crank the engine fast enough to make it start on the —— magneto that is used. Can I apply batteries for starting, using the distributor on the magneto

Answer: An auxiliary battery can be used in connection with this magneto, but you better consult the service station in regard to details, as we do not know which model you have. However, we do not think that you need the battery as this magneto, when in correct adjustment should give a good spark at an exteremely low speed. We assume that it worked properly when you first received this car and, if so, it can be made to do so now without dry-cells. This magneto is of the inductor type and requires a very close adjustment between the inductor and the pole-pieces and probably this adjustment has become faulty through wear. At the service station they can probably restore it so that you will have no further trouble. It will be inadvisable to install dry cells, if there is any other remedy, as they are rather a nuisance.

CAR LACKS RAPID "PICK UP"

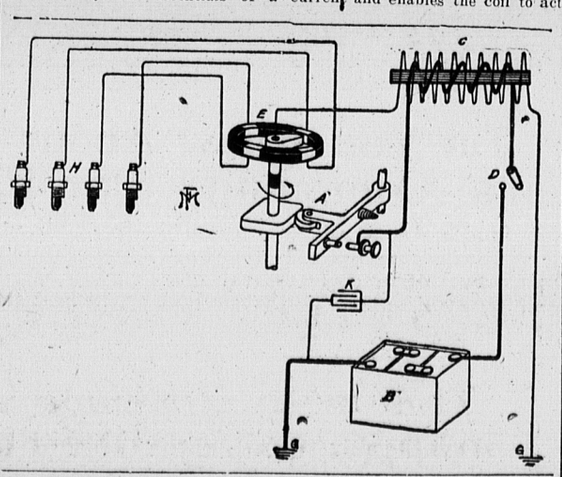


L. R. writes: In overhauling my light six I had new piston rings put in and a new carburetor of the original make installed, but since then it picks up slowly in high-gear and I have to close the choker a few times to make it accelerate. It also burns more gasoline than formerly and the carburetor seems not to give very good results. It has been driven 3,000 miles since overhauling and the valves have recently been ground. Have you any idea where the trouble is?

Answer: This seems to be a case of faulty carburetor adjustment perhaps coupled with faulty vaporization due perhaps to insufficient intake heat. Was the carburetor which you installed identical with the original one and supplied with the same means for heating the mixture If not this may be the trouble, apparently you have to supply excess gasoline in order to obtain enough vaporized fuel to accelerate upon We assume that in adjusting the carburetor, you have followed closely the directions accompanying it but still it would be well to visit a service station of this make of carburetor and see if they can detect anything wrong.

THE IGNITION SYSTEM IN GENERAL

In order to produce the sparks required by a gasoline engine quite a number of devices are required, which must work together to achieve the desired result and such a grouping of apparatus is known as an ignition system. The accompanying figure represents diagramatically the essentials of a timer-distributor battery system of the most largely used type, as applied to a four cylinder engine. There must be a source of electrical current and this is here represented by the storage battery B, although a set of drycells or a direct circuit generator or magneto might have been shown. Since the current that the battery can supply, although of considerable volume and heat producing power, is of very low pressure or voltage, it is incapable of jumping between the points of a spark-plug and of producing sparks directly. It must therefore be changed to a current of immensely greater pressure or voltage and smaller volume or amperage or in other words, into a high-tension current capable of jumping through the compressed gas between the points of a spark plug and of heating it to the ignition point. The device which accomplishes this is the induction-coil or spark-coil which is shown at C. Since the spark in each cylinder must occur when its piston is in exactly the correct point in its stroke, the actual production of the spark must be effected by some device which is mechanically coupled to the engine and thus follows its movements exactly, namely, the timer, interrupter or make-and-break device A, driven by a vertical shaft geared to the engine, and thus "grounded" or electrically connected to the power-plant. As the engine will continue to run so long as it is sparked and as sparks will continue to be produced so long as current flows through coil and timer, there must be a means provided for breaking the connection from the battery and the switch D (shown in the "off" position) accomplishes this. The names make-and-break and interrupter indirect the electric current and it is a fact that whenever an electric current is broken, for instance by the separation of two metal points, this current does not cease quite instantaneously but on the contrary, still flows for an extremely minute instant, through the air between the opening points in the form of a spark or a tiny arc. This arcing at the points not only roughens and wears them away so as finally to cause trouble, but it prevents the coil from giving a powerful spark and the condenser K is therefore included in the system to prevent these evil effects. In such a system as here shown, there is but one coil and timer to produce all the sparks required by the engine and, as the engine has four cylinders which must receive sparks in regular succession, there must be some device to direct the high-tension sparking current to each of the four cylinders in turn. It, as well as the timer, must be so arranged as to follow the movements of the engine and must thus be mechanically connected with it. This device is the distributor E which for convenience is usually mounted upon and rotated by the same shaft which carries the timer. It is, however, not grounded through this shaft, but carefully insulated therefrom as indicated by the black section of the shaft. The change of electrical energy into heat for the actual ignition of the gasoline-air charges in the cylinders takes place at the spark-plugs H, the sparking points of which are within the cylinder walls in the midst of the explosive mixture. Electrical connection among the different devices in an ignition system is effected by two sets of wires, namely, the primary and secondary conductors, but not all of these electrical circuits is through wires, for the metal of the engine (the so-called "ground") is utilized as a conductor. The primary circuit is the one which carries the so-called low-tension current, furnished by the battery and is here represented by the heavy lines. The light lines of connection represent the secondary circuit, which carries the high-tension current into which the low-pressure battery current is transformed by the spark-coil and which is capable of jumping between the points of a spark-plug. Referring to the diagram, the primary circuit (heavy lines) may be traced from the ground G on the engine frame, through the battery B, the switch D, the coil C into the timer A and thence, when the timer A and in certain relative positions through the timer shaft back to the starting point at ground. The secondary circuit may be traced from its ground connection by any one of four wires, each leading to one of the spark-plugs H, through any particular plug and to ground in the metal of the engine into which the plugs are screwed. The component parts of such an ignition system may be thought of in the following terms: The battery furnishes the electric current: the coil transforms the battery current so that it can jump the spark gap at the plug; the timer regulates the instant at which each spark occurs, the switch starts and stops the production of sparks, the condenser protects the timer against the burning effects of the battery current and enables the coil to act effectively, the distributor sends the sparking current to the cylinder where a spark is required at any particular instant, the spark-plug changes the high tension current into ignition heat within the gas to be fired, the primary circuit carries the low tension battery current and the secondary circuit conveys the high-tension sparking current.



TO AVOID "STALLING" IN TRAFFIC

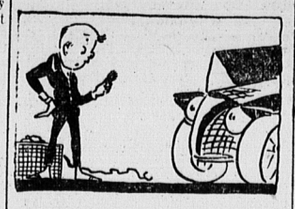
Second Speed Gives Controllability And Rapid Acceleration

Even though one has a self-starter, the stalling of the engine is annoying and in the case of a hand cranked car, it is exasperating. When an engine stalls in heavy traffic, it subjects the powerless car to the danger of a rear-end collision, the operator to harsh official words and the whole line of cars to irritating and wasteful delay. The stalling of vehicle engines on railroad tracks has been the cause of many serious accidents. Every motorist should take special percaution against this unpleasant happening, especially under the above named conditions, and the following are a few suggestions toward that end. The use of a very lean mixture makes an engine particularly susceptible to stalling when throttled very closely and therefore the dash adjustment may judiciously be set slightly richer than normal, when a car is in "close quarters." Too low an idling speed should not be attempted, as the engine then possesses but slight stored energy and is easily "killed," so it is good policy to open the hand throttle a little and increase the minimum speed. Some magnetos on old cars, fail to spark reliably at very low speeds and this calls for the maintenance of a brisk idling speed. Attempting to "pick up" the speed of a greatly slowed down car, without changing to a lower gear is perhaps the most common cause of engine stalling. This is done by slipping the clutch which in itself, is a bad practice, and all too often the engine is brought to an unintentional stop. Good judgment demands that when a car becomes greatly slowed down in traffic, second speed should at once be engaged not only as a safeguard against stalling, but in order that the utmost accellerative power shall be available when the time comes to increase speed. When a car has to be almost stopped it is best to engage low speed to "pick up" on. The action of the clutch has much to do with accidental engine stops. If it engages gently, it make such occurrences unlikely but if it acts harshly and brabs—especially if the operator is careless—it encourages them. Becoming bewildered or "flustered" and jamming on the brakes before releasing the clutch or engaging the clutch, without speeding the engine are common actions that naturally result is stalling.

GENERATOR TROUBLE

D. M. R. writes: I am having trouble with the third-brush generator of my car. It stopped working one day and I removed it and tested it, finding it apparently all right in every respect. When I run it from a motor it generates properly, but when I put it back on the car it will not build up. How do you explain this?

Answer: The only likely explanation that we can offer is that the generator as connected up on the car is short-circuited, possibly by some defect in its wiring. As you doubtless know, the fields will not excite, when a generator is under short-circuit. We suggest that you install the generator on the car without making any electrical connections, attach an artificial lamp load to the generator terminal and ground and run the engine slowly. If the lamp lights it is highly probable that the genreator is all right and that the trouble is in its circuit connections.



ENGINE MISSES WITH ADVANCED SPARK

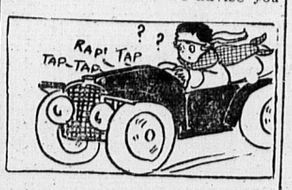
G. A. B. writes: I have a new four-cylinder car with compensating-tube carburator. When first started it jerks and thumps at low speed, but after becoming warmed it runs regularly with the spark retarded, but misses when it is advanced. The missing seems to be irregular and in all cylinders. Could too rich a mixture cause this?

Answer: If you find the spark plug insulation black with gasoline soot, an over-rich mixture is being used and may cause the missing. The fact that ignition is regular when it is retarded is an indication that the cause of missing with advanced spark is not wholly the fault of carburator, but there would be more tendency for the spark to short-circuit over the sooted ends of the plugs when compression was high (with the spark advanced) than when it was lower (with retarded spark). Are you sure that the spark plug gaps are not too wide and that all primary connections are in good order, especially the wire leading to the distributor head? The carburetor you are using should not fail to give a proper mixture. We presume that hot air is being supplied to it and that you do not keep the strangler closed unnecessarily.

RUNNING WITH LOOSE BEARING

J. W. W. writes: There is an almost constant knock in my engine, which appears to be due to looseness in a cam shaft bearing. Will it do any harm to run the car while the engine is in this condition?

Answer: With loose parts and the hammering action that accompanies them, wear increases at a greatly accelerated rate and there are exaggerated stresses placed upon all parts concerned so that, as a genral proposition the dealying of repairs involves the possibility of greatly increased expense and trouble in the end. If the trouble is very pronounced we advise you to have it removed at once, but if it is not and there is some great objection to laying up your car at this time, you can probably continue using it for a while, without serious results.



THE OBSCURED WINDSHIELD

The Misty Windshield Is As Bad As A Blind Driver

The dangers involved in driving in rain, fog or snow, with a clouded windshield, are seldom fully realized and it behooves every motorist to guard against them. "Rain-vision" shields are excellent, but do not conform perfectly to operators of different heights and under extreme weather conditions, the rain-vision feature involves such discomfort that it is not made use of. The application to the glass of liquids or other preparatons, designed to spread the moisture into a uniform film instead of permitting it to collect in lens like drops are of consderable temporary value but frequently their use is neglected or delayed too long. Nevertheless it is well to carry a bottle of liquid or one of the chemically prepared windshield cloths for use in case the shield has to be closed in extremely violent storms. In misty weather or light rain, the mere application of glycerine to the front of the glass forms a transparent film over it, with which the condensed moisture mixes and upon which drops do not form to disorm vision. A piece of flannel, saturated with glycerine, can be carried and by rubbing this over the shield sufficient liquid is left upon the glass to suffice for some little time. Repeated wiping or scraping away of the collected water drops of snow is however the most effective way of maintaining "good visibility," but this is an awkward proceeding when only a cloth and the operator's hands are available. However, windshield-cleaners of various kinds are upon the market which are permanently fixed in place and thus available at all times by means of which an area of the gass, in the line of sight, can be scraped clear, by operating a handle within easy reach of the operator.

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

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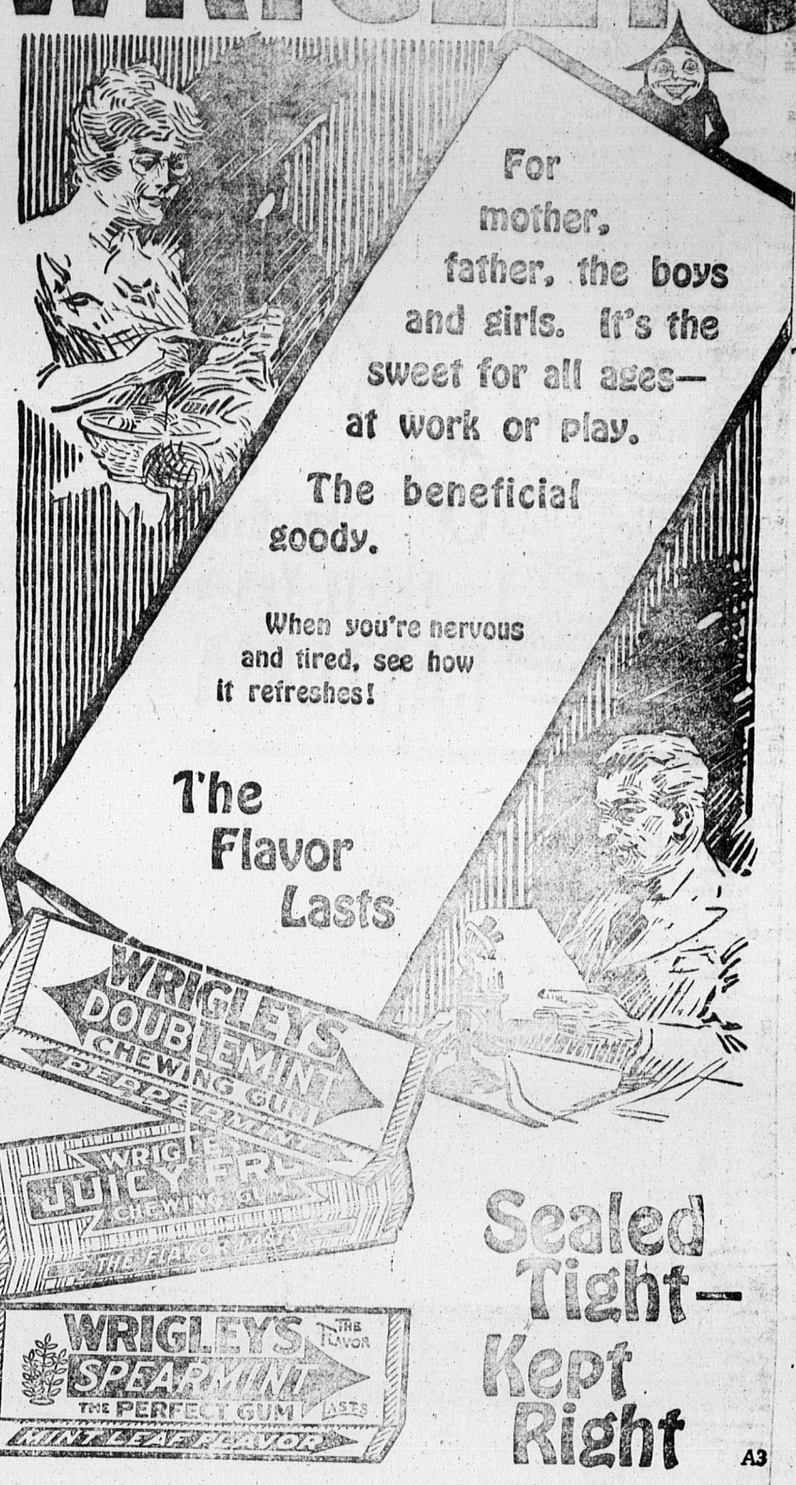
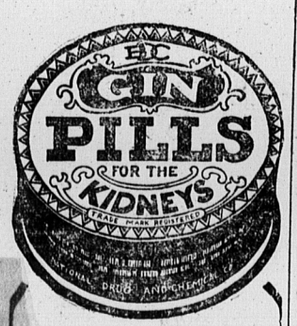
Use Bovril in your cooking. It flavours, enriches, nourishes more.

The Body-building Power of Bovril has been proved by independent scientific experiments to be from 10 to 20 times the amount of Bovril taken.

WRIGLEY'S





Help the Kidneys in Time

As soon as that warning backache comes, get a box of Gin Pills, which will promptly put matters right.

Neglect is criminal. It may result in an operation. Now is the time to help the delicate organs to regain strength. Gin Pills relieve pain and congestion like magic. Your druggist or dealer sells them at 50c. a box with money-back guarantee. Send for free sample.

Address: The National Drug & Chemical Co. of Canada, Ltd., Toronto

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Gin Pills FOR THE KIDNEYS 20

DR. DeVAN'S FRENCH PILLS Areliable Regulating Pill for Women, $5 a box. Sold at all Drug Stores, or mailed to any address on receipt of price. The Scobell Drug Co., St Catherines, Ontario.

PHOSPHONOL FOR MEN Restores Vim and Vitality for Nerve and Brain; increases "gray matter". Tonic—will build you up, $3 a box, or two for $5, at drug stores, or by mail on receipt of price. The Scobell Drug Co., St. Catherines, Ontario. SOLD AT FOSTER'S DRUG STORE

PUNY, AILING CHILDREN NEED VINOL

Because it Enriches the Blood, Makes Sound Flesh and Muscle Tissue, and Little Thin Limbs Round and Plump

Druggists Guarantee It

When a child is tired all the time no appetite, weak, sickly and ailing—no energy, no vitality, they need the strengthening elements of tonic iron, combined with the rare flesh muscle and tissue building elements of good old-fashioned cod liver oil as contained in VINOL. That is what makes them respond so quickly to its use.

VINOL is easily assimilated and contains no oil to upset their delicate stomachs like emulsions.

Just try it on our guarantee and you will get the same results as this mother who writes: "My little girl was weak, puny and tired all the time, did not want to do anything VINOL was recommended, and it built up her strength and made her healthy, and now she romps and plays like other children, and is robust and rosy."

If you have a sickly, ailing child do not wait another day, but get a bottle of VINOL and try it on the guarantee of your druggist to return your money if it fails to benefit.

SPEED OF RATTLESNAKE'S VIBRATING TAIL

How fast does a rattlesnake's tail vibrate when it is excited? Such was the problem that Mabel C. Williams, of the State University of Iowa, set herself to solve. Prof. H. R. Dill, curator of the natural history museum, let her experiment with the tail of a diamond back rattler from Texas with nine or ten remaining rattles others having been broken off. Miss Williams reports the results.

Two assistants kept the snake's head out of mischief and handled the recording apparatus, while Miss Williams held the tail as far back from the tip as possible and directed a wire she had fastened to it against a brass plate. The touching of the plate completed an electric circuit which recorded the vibrations upon a time indicator.

Then they made the snake angry and it began rattling. The speed of the vibrations of its tail varied from 28 to 30 hundredths of a second.

The rattling produces a tone which depends, not upon the vibration, but upon the natural resonance of the rattles themselves.

"The pitch of this tone," writes Miss Williams, "as determined by two musicians with a very keen sense of pitch, and checked with accurately tuned forks, is between C and C sharp; the tone is expressed changes in rate of tail, from the vibrations per second. Very marked changes in rate of tail, from the fastest that could be produced by marked provocation, to the almost quiescent state, did not cause a fluctuation of the pitch beyond this approximate halftone. The tone itself is exceedingly complex, however, and it might conceivably vary with the number and size of the rattles. It was possible to detect, but not to identify, certain over-tones.

"The popular impression that the ratller uses his rattles as a warning that he is about to strike is regarded by Mr. Dill as quite erroneous. This snake when striking normally does so first and rattles afterward, if at all. It will, for instance, strike at a bird placed in the cage, rattle, then strike again. It appears that the rattle is rather to terrify than to warn. It is also used as a defensive mechanism. The instinct to vibrate the tail is not peculiar to the rattlesnake, but is common to many other species, as, for instance, to the non-venomous king snake and the blue racer."

FOOTBALL IN 1583

In former times they did not regard football as a very elevating sport; if we are to believe a noted Puritan of his time, Philip Stubbes, who flourished about 1583. In his "Anatomie of Abuses" this straight-laced author denounces it as nothing less than a "bloody and murthering practice." "For," said he, "doth not everyone lay in for his adversaries, seeking to overthrow him and to picke him on his nose though it be on the harde stones? In ditch or dale, in valley or hill he careth not so long as he have him downe. And hereof groweth envie, malice, rancour, hatred, displeasure, enmitie, and what not else and sometimes brawling, contention, quarrel-picking, murder, homicide, and great effusion of bloode as experience teacheth." But we have made a great deal of progress since the days of Mr. Stubbes. Our playing fields are no longer stony

The Complete Ingredients for a Wholesome Meal are found in Every Grain of Wheat