

Hints for the Motorist

continued from page nine

...gasoline instead of getting too much. In the case of most carburetors there is a separate adjustment for idling and for working conditions and it is the latter that is important, if it is an adjustment difficulty.

CHARGING BATTERY FROM FARM LIGHTING PLANT

D. M. asks: How can I charge a six-volt battery from my farm lighting outfit? What is the best way to determine the positive wire of a generator?

Answer: Mount a number of receptacles on a board and connect them so that they are connected in multiple. This will leave two wires ends, one of which should be connected to one side of the lighting circuit, through a switch and the other to one terminal of your battery. The other terminal should be connected to the other side of the lighting circuit. Before connecting wires to the battery, test their polarity by immersing their ends in a tumbler of salted water, when current is on. The one that bubbles off the fewer bubbles is the negative and should be connected to the positive terminal of the battery. The current can be regulated by the number and size of the lamps used. With a 32-volt system, the current will be about 3 amperes each 100 watts of lamp capacity and with a 110-volt system it will be about one-third as much.

THE PISTONS OF AN ENGINE

has lain idle for a long time, especially in the cold, are likely to be found stuck in their bores, unless precautions are taken. The pistons in the engine should be freshly supplied, so there may be some water in it. A tablespoonful of engine oil may be sucked in through the carburetor air-intake, by running the engine, so that all parts will be left thoroughly coated with a little engine oil. It is possible to pack each cylinder with a little engine oil through the plug opening. The main thing is to have the pistons heavily oiled. If the engine is occasionally turned over by the hand-crank, it will probably not become "set". If there is no likelihood that the car will be required on short notice, the storage battery should be taken out and left on storage, at an electrical service station, or put in a fairly warm place, kept filled with water and put on charge if its gravity falls much below 1280. If the car is stored accessibly and may be occasionally required the battery should be left fully filled and fully charged, with its cable disconnected, tested at intervals and recharged if its gravity falls much below 1280. A discharged battery is likely to freeze and be ruined, but a fully charged one is proof against cold, all grease cups should be turned down and all joints in the brake and other operating linkages should be turned down and all linkages should be heavily greased with light oil, so that they may not become stuck. Painting the edges of the spring leaves with oil, tends to prevent their rusting. It is worth while to have a canvas cover, which can be draped over the entire car down to the floor, in order to exclude dust and shield the tires from intense light.

VALVES MAY BE HOLDING OPEN.

A. M. N. writes: I have ground the valves, adjusted the tappets and cleaned the carburetor of my engine, but when it is running it sometimes speed only when two out of the three valves are short-circuited. There is a hot spark on short-circuiting each of the valves and they all spark O. K. when out of the cylinder. Can you diagnose my trouble?

Answer: The fact that you have readjusted the tappets suggests that some of the valves hold open slightly, when they should be closed, which prevents a pure charge from being drawn into and compressed in four of the cylinders. In order to ensure valve closing there should be a clearance of about .004 inch between the rocker arm and the valve stem when the valve is in its closed position.

DOES MORE THAN STOP THE COUGH

NADRUCO Syrup of Tar with Cod Liver Oil Compound

...goes right to the seat of the trouble—to the irritated throat and inflamed bronchial tubes. It soothes and heals the air passages; loosens the phlegm; stops the tickling in the throat; and, almost before you realize it, you are rid of the cough for good.

NADRUCO SYRUP OF TAR WITH COD LIVER OIL COMPOUND is pleasant to the taste—is agreeable to the stomach—and is particularly suited to the use of children.

Get a bottle today. Sold by most druggists. Prepared by National Drug and Chemical Co. of Canada, Limited

HARD STARTING ON MAGNETO

D. F. C. writes: My truck has high-tension magneto only for ignition and I never had any trouble starting the engine on it until I recently had the magneto overhauled. Now it is very hard to get the engine going although it runs perfectly when once it is in operation. What do you think is the matter?

Answer: Quite likely the magnetos are weak. If they were removed and left without a bar of iron across their ends, while overhauling was going on, they would have lost their strength. We suggest you take the car to an electrical service station and have a magnetization performed. This can be done without removing the magnets, by the use of a temporary coil wound through the magnet arch and a heavy storage battery current. Be sure that the break-points are adjusted the right distance apart and that your spark-plugs points are not separated too much.

SMOKE FROM ENGINE CRANK CASE.

M. L. V. writes: I have had some trouble with oil-pumping, low compression and fouled plugs, due to the cylinders of my engine being out of round. Installing special piston-rings reduced oil consumption, increased gas mileage and gave very satisfactory results with the exception that now, every time that I stop the car a lot of blue smoke comes up through the hood, apparently leaking out from the oil pan. Why should this trouble have developed?

Answer: This is the vapor of oil removed from the cylinder walls by hot gases that blow down past the pistons. It would seem that your special rings were effective in wiping down the oil so that it does not pass into the combustion spaces, but that they were not entirely effective in preventing the blow-by of high pressure gases into the crank-case.

When cylinders are out of round, it is hardly to be expected that piston-rings can entirely overcome this defect. They may cause a slight improvement in gas mileage, but may not be able to confine the pressure during explosion so that there shall be no blow-by. Old oil and oil of low quality make more smoke than fresh high-grade oil does.

HOW THE CYLINDERS WORK IN HARMONY

In the accompanying diagrams a horizontal scale of 720 degrees is laid off to represent the two complete crankshaft rotations that constitute a complete cycle. Under this scale are lines upon which the performance of each cylinder of the particular engine referred to is indicated. The black areas above each of these lines, indicates the period in the cycle when each particular cylinder is active and it is laid off as 180 degrees to correspond with the period during which working pressure is acting upon its piston. On the left side of each diagram are consecutive figures denoting cylinder number, as counted from front to rear. In the case of the eight cylinder engine, the cylinders of one set are here numbered from 1 to 4 inclusive and those of the other set from 5 to 8 inclusive. The same method being used with reference to the twelve cylinder engine, the two sets being given numbers 1 to 6 inclusive and 7 to 12 inclusive, respectively. Below each diagram is a block arrow, which is a combination of the working periods of all the cylinders of the type of engine referred to. This should not be considered as any special quantitative meaning, but still gives some idea as to the degree of constancy of the torque produced. Diagram A relates to the four cylinder engine in which the crankshaft has all four cranks of its shaft in the same plane. The two middle pistons are thus away up, when the two outside ones are away down, and the cylinders miss fire at intervals of 180 degrees, the firing order being 1, 3, 4, 2 or 1, 2, 3, 4, the former being here shown.

The working stroke of each cylinder being 180 degrees and the interval between ignitions being 180 degrees, there are thus four equally spaced periods of 45 degrees each in each cycle, when no useful work is done by the gases on the pistons and during which the balance wheel is called upon for rotational force. This is shown by the lines beneath the diagram. Diagram B relates to the six cylinder engine in which the crankshaft has six cylinders to act in a period of 720 degrees of shaft rotation and since one sixth of 720 degrees is 120 degrees, the cylinders must fire at intervals of 120 degrees in order to have their effects equally spaced. The cranks are thus formed at 120 degrees angular intervals on the shaft. Since any particular piston is under

working pressure during 180 degrees and there is always another due to fire 120 degrees after it fires, there are six periods of 15 degrees each when two cylinders are doing useful work, as shown in the combined diagram. Six is the smallest number of diagrams which afford this overlap and the flywheel is only for energy to smooth out variations in existing torque. The firing order here represented is 1, 4, 2, 3, 6, 5 but it might have been 1, 5, 3, 6, 2, 4 or 1, 3, 2, 6, 4, 5. In diagram C the action of an 8 cylinder V type engine is illustrated. This is nothing more than two four cylinder engines, acting upon a single four cylinder crank shaft, one connecting rod of each set or block of cylinders being attached to each of the four cranks. One eighth of 720 degrees being 90 degrees, a cylinder must fire each quarter shaft rotation and in order to make this possible, the two blocks of cylinders are inclined one to the other at an angle of 90 degrees. As one cylinder fires 90 degrees after the preceding one, there are eight overlaps of 180 degrees—90 degrees equals 45 degrees each, during the cycle, as is clearly shown in the combination area, and the approach towards constancy of torque is closer than in the case of six cylinders. The cylinders of each set are fired in the 1, 3, 4, 2

order, but as each set fires one cylinder alternately, the order is 1, 3, 4, 2, 5, 7, 8, 6 in this instance. Diagram D relates to the 12 cylinder V type engine, which consists, in effect, of two six cylinder engines acting upon the same crankshaft, each of the six cranks receiving the power transmitted by two connecting rods—one being attached to each of the two sets of cylinders. In this case the cylinders fire at intervals of 720 degrees divided by 12 or 60 degrees, and in order to bring this about and to have the pistons at full top stroke at the uniform period, the axes of the two sets of cylinders are inclined one to the other at an angle of 60 degrees. It will be noticed that at all times during the cycle, two pistons are under working pressure and that there are 12 periods of 15 degrees each, when three pistons are in this condition. The fluctuation in torque is thus very slight and very slight flywheel weight is required to smooth out the relatively small variations in turning power that occur. As here shown the firing order in each block is 1, 4, 2, 3, 6 with each cylinder in one block firing between two cylinders of the other block.

CAN CARBURETOR AIR BE OVERHEATED?

D. K. asks:—Should all the heat possible be applied to the air entering the carburetor? Is it possible to have this air too hot? I notice that none of the cars that heat the intake air from the exhaust seem to use all the heat available.

Answer:—From the standpoint of complete vaporization of present day fuel, at least, we doubt if it is practically possible to overheat the carburetor air during cold weather, unless possibly the engine in question has means for fully heating the charge after it leaves the carburetor. From the standpoint of maximum power production it is at least theoretically possible to introduce the charge into the cylinder at too high a temperature and pre-expanded to such an extent as to reduce the weight of oxygen taken into the cylinders at each reduction, with a corresponding reduction of output. Furthermore, the charge may conceivably enter the cylinders so hot as to be prematurely exploded during compression with knocking and loss of power. These ill effects may be noticed in engines with overheated, intakes, but we think that you can go as far as you like in heating the entering air, with beneficial rather than objectionable results, unless the manifold is kept very hot.

ENGINE WASTES OIL

C. D. J. writes:—After having run my car 10,000 miles I found that I was using one gallon of oil to each 500 miles and getting lots of carbon, so I ordered new pis-

ton rings put in all around. I have suspicion that this was not actually done, for after 5,000 more miles of running, I am only getting 100 miles to the gallon. Would you recommend new rings or what? Would it do to put a valve in the pump delivery pipe, so that the flow could be regulated exactly?

Answer:—If all this loss of oil is up past the pistons, we would suggest that you use a special oil proof or scraper ring in the bottom groove on each piston. Are you sure that you do not need oversize pistons and how are the cylinders as to roundness of bore? Are you sure that you are not using a thinner bodied oil that should not advise you to install the heavy or one of a quality that will not stand heat properly? We should not advise you to install the valve that you suggest, as there is probably nothing wrong in the amount of oil circulated. Your trouble is doubtless in the piston and ring fit or in the quality of the oil used.

EVILS OF FROZEN OIL

Oil That Won't Flow Won't Lubricate The Grade of Engine Oil to be used during cold weather, especially with thickened lubricant, the oil pump may fail to operate, because such a pump is designed to handle a liquid that will flow into it and fill it positively and promptly and cannot handle a semi solid. Thus lubricant may fail to reach the bearings, especially if there is much small tubing or restricted drilled passages for it to traverse until the engine has become hot and there is a distinct possibility of worn or even burned out bearings, resulting from the temporary failure of oil to reach them. Now all this trouble and risk can be minimized by the use of an oil having a satisfactory "cold test" that is, an oil that will not lose its fluid properties at the lowest temperature attained by an engine. Many good oils, especially the heavier grades, thicken at Fahrenheit temperatures in the 20's, 30's, and even in the 40's and, as these temperatures are higher than those commonly met with in unwarmed garages, such oils solidify when used in cars thus housed. On the other hand, satisfactory oils can be obtained, which do not become stiff or at least dangerously so at zero Fahrenheit, and they are thus suited for winter use in cars kept in cold garages, where the temperature rarely falls to the extreme point. Fortunately it is an easy matter for the motorist to test samples of oil and to determine their cold resisting properties, for it is only necessary to place each sample in a bottle and place them out of doors, when the temperature is below zero and let them stand for a day or two and then such samples as are still capable of flowing in their bottles should be selected as having a satisfactory cold test and those that will not flow, should be rejected, so far as winter service is concerned.

RUNNING FAST ON MIDDLE GEAR

L. W. C. asks: Does it harm a car to run it fast on middle speed?

Answer: It is never well to run a motor on half as fast on middle gear as on the starting gear, to run on direct-drive, as at a higher speed the engine would be turning over fast. Some manufacturers advise never exceeding 10 or 15 m. p. h. on second speed, but this is probably out of consideration for the transmission. The "split bearing" between the clutch-shaft and the final drive shaft of the transmission operates at high speed, when other than the direct drive is in use and when a car is speeded up on "second" this bearing in the motor under the protruded services, unless lubrication is of the best. If there is any doubt as to the ability of transmission parts to withstand them, high speeds on second should be avoided and they should never be allowed to wear the pulley too hard to admit of the direct-drive being used.

CHOOSING OIL FOR WINTER USE

Cold Resisting Oils Can Be Had And Should Be Used. When the crank case is filled

WHEN BABY BUMPS

Her Head, Take Away the Pain with "ABSORBINE JR." When any of the children cut a finger, or bruise a knee, or burn a hand, or sprain a shoulder, soothe the swelling—by applying "ABSORBINE JR." Every home which is blessed with happy, active kiddies should have "ABSORBINE JR." always handy. When an accident happens, you need help quickly. "ABSORBINE JR." completely stops the pain, heals the injury—prevents cuts and sores from becoming infected. "ABSORBINE JR." is a vegetable geraniol that is absolutely safe and pleasant to use. In fact, it is often used as a mouth wash and gargle for sore throat, when properly diluted. \$1.25 a bottle, at most druggists or sent postpaid by W. F. YOUNG, INC., Lynch Building, Montreal.

Has Been Fine Thing for Wife

HUBLEY SAYS TANLAC RESTORED HIM LAST WINTER AND IS DOING HIS WIFE A WORLD OF GOOD

"You can tell them that Tanlac has certainly been a fine thing for my wife too, and we just think it's the greatest means in the world," said Robert Hubley, of Waverly, N. S., an employee of the Canadian National railroad, who at Kenley's drug store in Halifax, recently.

"My wife was in such a weak, run-down condition that she couldn't get out of bed without help, and for over three years she wasn't even able to walk about the house. She suffered terribly from stomach disorder and complication of other troubles. Indigestion and nervousness caused her no end of worry and she had no appetite whatever. She was so nervous an restless everything seemed to annoy her, and a good night's sleep was simply out of the question. Although we tried everything in the way of medicine we knew of, it didn't do her any good at all.

"Well, it's certainly wonderful what Tanlac has done for her. She has only taken three bottles so far, but even this has helped her so remarkably that she can get up without help and walk about the house and on pleasant days, even go out in the yard. Her appetite is greatly improved, and she is not troubled with indigestion a bit. She is so much improved in every way that I believe a few more bottles of Tanlac will restore her health entirely.

"Last winter I had influenza and lost my appetite altogether, but it only took Tanlac a little while to set me eating good and hearty again. It is certainly a great medicine."

Tanlac is sold in Charlottetown at Kenley's Drug Store, and by C. E. Pratt, St. Peter's.

ETHER AS A STARTING AID

W. E. R. asks: Why is ether good for starting a cold engine and how is it used?

Answer: Ether evaporates freely and produces an explosive mixture with air at very low temperatures, at which present day gasoline vaporizes, but very slightly, and thus it is easier to make an explosive mixture in engine cylinders with ether than with gasoline. A mixture of any one part of ether and two of gasoline, introduced in the amount of a teaspoonful into each cylinder, through the priming-cock, priming-plug or spark-plug opening is pretty sure to fire, no matter how cold it is or it may be used in a manifold primer, can also be used as follows: When the car is stalled in cold weather shut off the buxer supply from the tank, draw off the gasoline in the float chamber and fill it with the regular fuel supply. Then the engine is next started it will be on the ether mixture and the operation will be easy and quick. If the float chamber cover is readily removable this procedure is quite practicable.

THE ELECTRIC STARTER

The most usual way of applying the power of an electric motor supplied with current from the storage battery, to turn the engine over for starting purposes is by a gear connection, consisting of a pinion carried by the motor armature and meshing directly for induction, through intermediate gearing, with a large gear carried on the face of the engine flywheel. As the turning power of the electric motor is required only until the engine starts under its own power, there are four stages in the starting operation, viz: the mechanical connection of the motor to the engine, by meshing the gears, the supply of current to the motor is cut off, the engine over, the mechanical disconnection of the motor and engine and the cutting off of current from motor. These operations may all be performed by a pedal, moved by the operator, or they may be partly automatic.

When a motor is used in this way, the electrical effort is required to rotate the engine over, the electrical energy available is limited, the motor must be one designed for low speed and very high turning power or the torque which it produces must be increased by means of a speed reduction gear before being applied to the fly wheel. In the former case a motor with more than one pair of field poles and an armature and brush equipment to correspond is generally required, as motor speed is reduced and torque is increased somewhat in proportion to the number of times per rotation that the armature conductors pass field poles. In the latter case the ordinary two-pole motor can be used.

Unlike those of the generator, the field windings are series wound, that is, the whole current passes through both field and armature windings, in order to secure strong turning effect; by which connection the field magnetism increases with the current flow through the armature conductors and a very powerful torque is set up in the armature. In the two-unit starting and lighting system, to which this article refers, the starting motor is a machine entirely separate and distinct from the generator and is used in the starting operation only, while in the single unit system, generator and starting motor are, to a certain extent, combined in a single machine.

CHILLED ENGINE

The following conditions are essential to the prompt starting of a cold engine. An explosive mixture must be present at the sparkplug points, the ignition system must be at its best and the engine must be free to turn, so that a fair cranking speed can be obtained. Only a very small proportion of present-day gasoline will evaporate and form an explosive mixture in a cold engine and thus a great excess of fuel must be supplied the

Nothing To Equal Baby's Own Tablets

Mrs. Georges Lefebvre, St. Zenon, Que., writes: "I do not think there is any other medicine to equal Baby's Own Tablets for my little ones. I have used them for my baby and would use nothing else." What Mrs. Lefebvre says thousands of other mothers say. They have found by trial that the Tablets always do just what is claimed for them. The Tablets are a mild but thorough laxative which regulate the bowels and sweeten the stomach and thus banish indigestion, constipation, colic, etc. They are sold by medicine dealers or by mail at 25 cents a box from The Dr. Williams' Medicine Co., Brockville, Ont.

RIGHT SPRINGS HAVE SAGGED

A. B. S. writes: After two years

of service, my car became considerably lower on the right than on the left side. I had the springs reset, but this remedied the trouble but temporarily, as the right springs have again settled. What do you advise in such a case?

Answer: Resetting the springs is the only remedy for this trouble, but it would seem that the work was not done properly in your case. There are very few blacksmiths that understand how to do this properly, for unless the exact nature of the steel and its required heat-treatment are known and followed the results will be unsatisfactory. The factory that built your car could probably reset these springs so as to give good service or furnish you new ones and we suggest that you take it up with them. Perhaps their branch in your nearest large city, could do the same.

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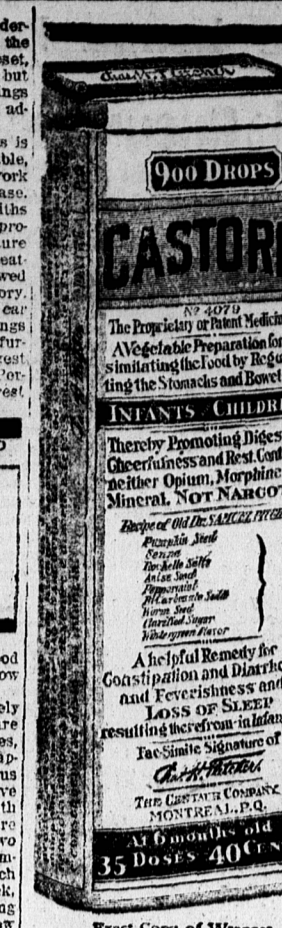
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A. B. S. writes: After two years



Exact Copy of Wrapper.

CASTORIA For Infants and Children. Mothers Know That Genuine Castoria Always Bears the Signature of Dr. J. C. Williams. In Use For Over Thirty Years CASTORIA THE CENTAUR COMPANY, NEW YORK CITY.

DRY CELLS PROVE UNSATISFACTORY

C. F. S. writes: The magneto on my Ford is so poor that I have to use dry cells for its ignition and as I use them on my stationary engine as well, it takes a great many of them and they do not last long. Can I use any of the material of old cells to make new ones? Do dry cells have to be charged by a dynamo?

Answer: When a dry cell is exhausted, there is nothing left that can be utilized to make new ones with. It would not pay you to try to make cells. Dry cells do not have to be charged by a dynamo, as the zinc carbon and chemicals used in them furnish the irregular action. You better have your Ford magneto repaired by having the magneto recharged or replaced, the coils inspected, the clearance between magnets and coils checked up and the contact springs cleaned. It would also pay you in the end to get a magneto or a generator for your stationary engine.

TWO CYLINDERS WEAK WHEN IDLING

E. A. J. writes: When I idle my engine and cut out the ignition of the cylinders with a screw driver, it makes no difference in the speed when the plugs in Nos. 2 and 3 are short-circuited. When the other two are open, these two cylinders do not fire as strongly as the other two. Do you think that this weakness is caused by leakage to the manifold, which I had changed some time since? The compression in all cylinders is practically the same, when tested by the hand crank.

Answer: If two of the cylinders are weak when the car is on the road, causing irregular action, you should suspect faulty ring action, but you do not mention this. So far as irregularity in action when idling is concerned, this is more likely due to the fact that all cylinders do not receive equally strong charges of a screw driver, if faulty distribution by the manifold or inlets there are air leaks on the inlet side of the two weak cylinders. If you wish to test the effectiveness of the rings in main-aining compression, you can do so by using a compression gauge. This should be connected into the spark plug hole of a cylinder and the engine run on one cylinder. After reading the pressure, the gauge can be moved to the other cylinders successively and their readings taken.

DISTRIBUTOR IGNITION FOR FORDS

J. M. asks:—Is there any ignition outfit on the market suitable for a Ford which does away with the timer and vibrator and has a distributor which can be readily installed on cars? Is it possible to get an outfit like this that will run from the Ford magneto?

Answer:—A number of the makers of single coil distributor battery ignition systems make special adaptations that can be readily installed upon the Ford car. In general, these are intended to run on storage battery current, but one outfit, recently brought out, is claimed to operate on the Ford magneto current. Your cylinder and system close self-addressed, stamped envelope. Address Albert L. Clough, care of our office.

FEEDING OIL WITH THE GAS.

J. L. B. asks: What is your opinion as to feeding oil in the manifold with the gasoline for lubrication purposes? How much oil should be used to each ten gallons of gas? Does it have any tendency to clog the gasoline line or carburetor?

Answer:—Two-cycle engines are usually oil fed in this manner, so far, at least, as their pistons are concerned, about 5 per cent by volume of cylinder oil being added to the gasoline. While there is not usually much reason for applying this method to a four-cycle engine having a good lubrication system, there may be engines in which the regular oiling system affords scanty lubrication for the upper part of the pistons and, in such cases, it may be good practice to add a pint of cylinder oil to each ten gallons of gas. As cylinder oil mixes perfectly with gasoline, there is no danger of clogging the fuel passages. There can be no danger in feeding

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FEEDING OIL WITH THE GAS.

J. L. B. asks: What is your opinion as to feeding oil in the manifold with the gasoline for lubrication purposes? How much oil should be used to each ten gallons of gas? Does it have any tendency to clog the gasoline line or carburetor?

Answer:—Two-cycle engines are usually oil fed in this manner, so far, at least, as their pistons are concerned, about 5 per cent by volume of cylinder oil being added to the gasoline. While there is not usually much reason for applying this method to a four-cycle engine having a good lubrication system, there may be engines in which the regular oiling system affords scanty lubrication for the upper part of the pistons and, in such cases, it may be good practice to add a pint of cylinder oil to each ten gallons of gas. As cylinder oil mixes perfectly with gasoline, there is no danger of clogging the fuel passages. There can be no danger in feeding

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