

THE AUTOMOBILE

WIDENING OF SPARK GAP WILL HELP OVERCOME SKIPPING.

Motors are like some men. When they are going at top speed their performance is excellent. But when compelled to travel slowly they sputter and knock.

Many drivers want to know why they cannot throttle down the engine. It goes all right at medium high speed, but skips at a low speed.

Where magneto ignition is used this often may be overcome by adjusting the interrupter points for a little wider gap. That makes the interrupter points a little earlier and causes the spark to occur when the magneto armature is in a more favorable position and a wider interrupter gap at the slower speed gives a spark with a little more kick in it.

Widening the gap of the spark plug also will help to overcome skipping. At low speeds a full charge of gas is not drawn in, and compression is low and temperature low in consequence. The mixture is not so near the self-ignition point when the spark occurs as it is at higher speeds, therefore a better spark is needed to ignite it. By widening the gap in the plugs the secondary current is held back until it acquires high enough potentiality to jump the greater gap, so that when it does occur an exceptionally powerful spark is obtained.

Spark Gap Attachments.

This may be demonstrated where the engine is equipped with a vibrator coil. Set one of the cylinders on top of the compression ready to ignite. Turn on the current, and, while the vibrator will buzz, the spark inside the cylinder is not strong enough to ignite the charge. Now detach the spark plug terminal and turn on the current. The extra gap will increase the strength of the spark in that cylinder, and it will ignite the charge, starting the engine. This has led to the use, in some cases, of outside spark gap attachments.

Widening the gap and getting a larger spark is not what ignites the charge. It is simply that the greater gap causes the current to build up to a higher pressure, or voltage, before it will jump the gap, so that when it does occur it is of greater intensity.

There are several other things about skipping not generally understood by the novice. The general opinion is that the greater insulating surface of a plug there is inside the cylinder the less likelihood there is of short circuiting and consequently the more certain will be the spark occurrence. This is only partly true. It is true so far as short circuiting is concerned, but where the surface is too great and too much carbon is deposited upon the insulator surface the carbon acts as a condenser and absorbs the secondary current. The effect is that it will not build up sufficiently high voltage to jump the gap. Very heavy insulation on the secondary wires absorbs current in the same way.

The fact that the spark jumps across the points of the plug when it is in the open air does not necessarily mean that it jumps when the points are under compression in running conditions. A current which will cause a spark to jump a quarter-inch gap in the open air will cause it to jump a gap of only one thirty-second-inch under normal running compression. Failure to appreciate this often results in a man thinking his ignition is all right, when there may be a break in the insulation so small that it scarcely can be seen with the naked eye when cleaning the plug, or there may be a porous spot in the porcelain, either of which would leak current

under compression. Many manufacturers test the porcelain to see if they leak, using a spark gap of three-quarters of an inch under a high voltage.

Short-Circuiting the Plug.

If there is carbon on the porcelain, the current very often will travel through this under high compression, because there is less resistance offered by the carbon than by the spark gap. It short-circuits the plug and there is no ignition. Yet, when this same plug is removed and tested in the open air, there will be a good spark; the resistance of the gap in the open air would be less than the resistance offered by a path through the carbon coating. If, on testing a plug in this way there seems to be a good spark, yet the cylinder will not fire, clean the plug thoroughly and try it out in the cylinder. If it still does not fire, try a plug which you know is all right and see if it fires. If it does, you may know that the old plug leaks current somehow and probably needs a new porcelain.

It is a common error with motorists when cleaning a spark plug to polish up the points and call it a job. What really is required is to remove all of the carbon, which is a fair conductor of electricity, from the porcelain or mica and get these back into the insulator again.

When battery ignition is used, skipping at low engine speed may often be overcome by charging the gap in the interrupter points the same as in the magneto. The points are usually set for normal running speed, and when trouble is experienced at either extreme high or low speed adjustment is necessary.

The gap at the spark plug points must be greater usually than when magneto ignition is used, because the spark given by battery systems is naturally of less volume than that given by the magneto. Therefore, the gap must be greater to intensify the current, as before described.

Keep Interrupter Points Clean.

The interrupter points sometimes become coated with an insulating glaze composed of oxides and dirt, hammered by the action of the movable interrupter point, or hammer. The points will have the appearance of being all right; there will be no pits or points; nevertheless there may be enough insulating material there to keep the current from flowing and no spark will occur in consequence. The points may be cleaned by inserting a very thin file between the points when they are open and then allowing them to close on the file, being held together with no more pressure than the spring exerts, and working the file back and forth until the glaze is removed. It is necessary to have a flat surface that makes contact across the entire face, so that care in using the file is needed and as little metal as possible should be removed.

The condenser is another point of possible trouble. The condenser increases the volume of the spark about twenty-five times. We often find that a very weak spark may be caused by a partial breaking down of the condenser, or occasionally to the fact that it is disconnected at the terminal. Condensers are usually hidden away so that the novice cannot locate troubles of this nature, but an extensive sparking at the interrupter or vibrator points, when they are clean, with a very weak spark at the plug points, indicates that the condenser is not working properly. When this sparking occurs have an expert examine the condenser for trouble.

Arms and the Woman!



Upper Insert—The back of the hand must not be neglected. A good cold cream well rubbed in will preserve it beautifully. Lower Left—Pay particular attention to the elbow joint and keep it well nourished. Lower Right—When one has shapely, pretty arms she will look charming in the most simple gown and should never hesitate to wear short sleeves.

WHEN arms can be so beautiful it seems a pity that more attention is not paid to them, for with regular care pretty arms can be made absolutely beautiful and unshapely ones attractive. Today, more than ever, with the mode prevailing of even shorter than "bow sleeves, the contour of the arm lays a most important part in one's appearance.

If it is too thin, which is very often the case, most beneficial results will be quickly accomplished by soaking some soft old linens in either sweet almond or olive oil. These should be placed firmly about the arms, but not so tight that the circulation is interrupted. Massage is also essential. Massage the arms every night using a little lanoline and work it in while kneading the flesh so as to bring the blood to the surface. With firm strokes, rub firmly from shoulder to elbow and elbow to wrist, upward and downward. Then begin at the wrist, using the finger tips, and massage with a circular motion up the arm, to the shoulders. If this is properly done it should make the skin glow and tingle and may precede the wrapping treatment. These exercises should

be gone through before the oil has been applied.

One whose circulation is poor from insufficient exercise will be inclined to have red arms though they may even be plump. The skin will be coarse, but much can be done to give softness and roundness of outline by using the same treatment as described above.

If the skin is rough (goose flesh) it should be thoroughly washed with warm water and plenty of good, pure soap of an oily nature and briskly dried with a rough towel. In the morning a little glycerine and rosewater should be well rubbed in after the bath, so that the texture will be refined. Massage is also essential. Massage the arms every night using a little lanoline and work it in while kneading the flesh so as to bring the blood to the surface. With firm strokes, rub firmly from shoulder to elbow and elbow to wrist, upward and downward. Then begin at the wrist, using the finger tips, and massage with a circular motion up the arm, to the shoulders. If this is properly done it should make the skin glow and tingle and may precede the wrapping treatment. These exercises should

most difficult parts to treat, for at this point it is not so fleshy and there is a tendency for the skin to become shriveled and the joints to protrude. Unshapely elbows will spoil the appearance of the best dressed woman and it is therefore positively ridiculous for one whose elbows are disfigured to wear extremely short sleeves.

A great deal can be done, however, to nourish the skin so that it will not wrinkle. Plenty of skin food should be used, wrapping the elbow in it if necessary at night, and after bathing in the morning douche the part well with cold water, followed by an astringent, which will close the pores and take up the superfluous skin. Rosewater, three parts to one part of elderflower water and a few drops of tincture of benzoin is a simple and inexpensive astringent that can be prepared in the home.

In treating the arms, don't neglect the back of the hands. If they have become scrawny or bony, rub in regularly a good cold cream and keep them soft. If it is necessary to have the hands constantly in hot water from household purposes, rub in an extra portion of cream before doing so and the hands will never become chapped or unsightly.

News From the Maritimes.

The potato yield of the Province of New Brunswick for 1921 is estimated to be 216% bushels to the acre, the highest in years and higher than any other province in the Dominion, according to the Provincial Department of Agriculture. Prince Edward Island is said to be second with an average acre yield of 201% bushels.

The port of St. John, N. B., is anticipating resumption on a substantial scale of the export of live cattle and accordingly work on the preparation of sheds for the purpose, approved by the Federal Department of Agriculture, is being rushed. Four hundred head of cattle this week constitutes the first shipment of the season.

A forest nursery, operated jointly by the Forest Service Branch of the Provincial Lands Department and the Forestry School of the University of New Brunswick, will be established at Fredericton, N.B., if present negotiations result satisfactorily. An initial grant of \$1,500 is being considered by the Crown Lands Department, it is understood.

It is reported that the Iona Gypsum Company, Cape Breton, is about to be taken over by Montreal capitalists. There will be extensive alterations to the plant and in the shipping facilities. For the past few years the output has been largely to Philadelphia, and was found to compare favorably with the best manufactured in the States.

It is estimated that 12,228,574 pounds of maple sugar were produced in the province of Quebec during the spring of 1921. In addition there were 1,375,635 gallons of maple syrup. The number of apple trees totalled 1,231,857, compared with 1,000,033 in 1920; plum trees 322,778, compared with 267,746; pear trees 22,550, as against 18,287; and 408,707 cherry trees as compared with 447,261.

Milch cows in the province of Quebec during the summer of 1921 totalled 1,039,389, as compared with 1,039,809 during the corresponding period in 1920, according to an estimate of the Provincial Department of Agriculture. Hogs totalled 883,920, compared with 836,431; hens and chickens 3,476,729 compared with 3,177,402; other poultry 356,456, as against 360,458.

The Umbrella Tree.

Queenslanders take special pride in the umbrella tree, which has almost as much honor with them as that bestowed by Canadians upon the maple. It looms largely in the history of the state. It was discovered by Banks and Solander at Cooktown while the "Endeavor" was undergoing repairs, and, therefore, belongs to the same scientific area as the kangaroo.

If the records are read right, the second report of the existence of the tree was made by Macgillivray and Huxley, who visited Dunk Island in the middle of last century. Its rayed leaflets varying in number, its sturdily flowers closely set on radiating stalks, its plenteous secretion of a mild form of nectar on which birds make merry, and, moreover, the originality of the tree not only in appearance, but habit, entitle it to the affection of those who claim it, as belonging to them, by right of discovery and territorial pride.

The tree speaks of the unresting life of the tropics, full, glossy, abundant, dripping life. All the hearty birds cannot exhaust the flow of nectar nor the swarms of butterflies quivering with excitement overeat themselves nor the blundering beetles stem the waste. It hangs from the red flowers in spangles and splashes down among the withered leaves for the refreshment of industrious and thrifty ants, prototypes of Lazarus, who ate of the crumbs falling from the table of the rich man.

Improvements in Detection and Identification Means.

Constantly the methods of human identification, and also the analysis of handwriting, are becoming more and more precise. In connection with the Bertillon method of identification by means of finger prints, several recent developments have occurred, one of the latest being the inclusion of the sweat pores as an element of identification. Experiments in this connection, in France, have shown that when these finger prints are examined under a microscope there are plainly seen a series of spots in single or double lines, which were formed on the print by drops of moisture from the sweat glands. The number of these dots varies from 9 to 18 to the centimeter (4 in.), and their position, and even their shape, which may be either round, oval or curvilinear, are absolutely characteristic in each individual.

As regards the detection of counterfeit handwriting a method has been worked out that is both mathematical and scientific. It has been applied to the detection of freehand forgeries—not those made by tracing or the changing of letters which are easy to detect. It is based on the hypothesis that everybody's handwriting shows certain constants that can be measured. This method is called graphometric, and on enlarged photographs reproductions measurements are made of the height of the letters, the trace of the curvature, the slope of the downstroke, and other details, and they are compared with standards that have been established by a study of the genuine handwriting.

Brisk walking will do as much to restore health as any form of exercise.

SIR A. PEARSON, FRIEND OF THE BLIND

FOUNDER OF ST. DUNSTAN'S HOSTEL.

A Glorious Monument to the Great English Newspaperman and Philanthropist.

Cyril Arthur Pearson was best known to Canadians as the founder of St. Dunstan's Hostel for blind soldiers in London.

Born in 1866, the son of a clergyman, he was educated at Winchester School. At 18 years of age he won a scholarship of 100 pounds a year in Sir George Newman's publication, *Tid Bits*, won it by answering ten searching questions a week for three months. Then young Pearson became manager of *Tid Bits*, and held that post for six years, when he started Pearson's weekly, which he followed this with several other weekly and monthly periodicals, and finally established the *Daily Express* in 1900. He acquired control of the *London Gazette*, the *Morning Standard* and the *Evening Standard*. But, in all these ventures swallowed up a large part of the fortune he had accumulated.

Then, a few years before the great war began, fate struck him a cruel blow in an incurable affection of the eyes. By the time the first British blinded in battle were sent home

from Belgium and France Sir Arthur had not only become totally blind himself but had made and won his own struggle with all the forces of doubt and despair that attack the sightless. As he was wont to say, "He had learned how to be blind," and he was eager to show these blinded soldiers how they might overcome their terrible handicap.

History of St. Dunstan's.

St. Dunstan's was established in the early spring of 1915. Set in the heart of London, this spacious house with its fifteen acres of beautiful grounds, gave to Sir Arthur, at the very beginning of his work, the establishment and the environment he sought.

He almost filled the gardens with workshops, class rooms, offices and other buildings; he made additions to the house itself. As the work grew a half dozen or more houses near by were loaned or taken over, and several large establishments at the seashore or in the country were given or loaned by individuals and associations to be used as convalescent or holiday resorts. "In days when I could see, Sir Arthur has written, 'I had the direction of some big enterprises, but St. Dunstan's became the biggest individual business that I have ever conducted.'

When the hospital was established there were only sixteen men to care for, but by the end of 1918 more than 600 men had, as Sir Arthur put it, "already learned to be blind and had returned to their homes." Then 700 were in training and 200 more still in the hospitals, were soon to go there—a total of 1,500 men, whom Sir Arthur

had enabled to put despair behind them, and to become busy, self-supporting, instead of the helpless dependents they had thought fate had made them.

Wonderful Range of Activities.

The men at St. Dunstan's are taught shorthand writing, telephone operating, massage, poultry farming, joinery, matmaking, boot repairing and basketry. Sir Arthur considered poultry farming to be a particularly



Sir Arthur Pearson, Founder of St. Dunstan's Hostel for the Blind, and himself a blind man, who was accidentally drowned in London. He was famous the world over for his works for the blind.

suitable occupation for the blind; he was proud that all who studied at St. Dunstan's proved successful in practice. Shorthand writing in braille, a difficult art, has been an important study at St. Dunstan's, and dozens of men have gone from there to their old places as private secretaries, or have found new ones; all of them have met every standard required. Some of them now earn higher salaries than they did before they were blinded. And this lends strength to Sir Arthur's contention that there are certain advantages in being blind, since it compels him who is thus handicapped to develop faculties that otherwise would remain dormant, and to train all his capacities to a higher degree of proficiency. As much importance is attached at St. Dunstan's to teaching the men to play as in teaching them to work. They learn to dance, if they do not already know how, and frequently dances are held; they even have fancy dress balls, which they enjoy immensely. They row and swim and wrestle and run and try to kick goals at football. They attend theatres, organize concerts among themselves, play chess and cards and dominoes, hold debates indoors and tug-of-war contests outdoors, go on long walks and weekend rambles in the country.

It is not too much to say that the great work that has been done for the blind throughout Canada since the early days to the war, owes its inspiration to Sir Arthur and to the Canadian soldiers who were his guests at St. Dunstan's.

That was the sort of thing Sir Arthur accomplished after sustaining an affliction which would have rendered many men almost helpless, and

which stands to him as a monument greater than all his financial and journalistic success.

Convictions for Starting Forest Fires.

Citizens must have been struck in the past few weeks in reading of the large number of prosecutions and convictions for, wilfully or by carelessness, setting fires to standing timber. There have been convictions also for refusing to assist forest rangers in putting out fires. In some cases this may seem hard on the individual, but, on the other hand there has to be considered the loss sustained, not only by an individual or company, but also by the whole country in the burning of forests. There is another consideration, also, namely the loss of life caused by forest fires. The record is not yet complete, but it appears that at least two men lost their lives in forest fires this season. Then there were the numerous families burned out of house and home this year, the members of which suffered in health as well as in property. Fines and jail sentences are not pleasant things. There is no one who does not feel sympathy for those so dealt with, but once the people make up their minds that forest fires must stop fires will come to an end, and these punishments are one way in which public opinion makes itself heard.

Of the American casualties due to gas in the Great War, only 1 1/2 per cent. were fatal.

The skin of the human palm is seventy-five times as thick as that of the eyelid.