

# THE AUTOCAR

A Journal published in the interests of the mechanically propelled road carriage.

EDITED BY H. WALTER STANER.

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An Index to Advertisements appears on page 5a.

## Notes.

### Under-tyred Cars.

As our older readers know, we have never hesitated to criticise motor car manufacturers who supplied cars with tyres too small for their weight.

At one time this practice was very prevalent indeed, but to-day it is not too much to say that all the better makers supply tyres which are large enough for the work they are called upon to do, and yet these very manufacturers who are supplying sufficiently large tyres are frequently accused of the reverse by tyre makers, when, as a matter of fact, the accusation is not true, though it may be true that a particular car is more or less badly under-tyred. This appears

to be a contradictory statement, but it is nothing of the kind. What happens is this: the car manufacturer supplies an ordinary chassis for an open body, but the buyer places upon it either a closed body or a much heavier and bigger open body than it is meant to carry. If the car maker had known that the car was to carry a heavy body he would have suggested to the customer that he should have larger tyres, stronger springs, lower gear, and so forth, and, of course, would have charged him extra for the larger tyres.

For various reasons into which we need not go—it will suffice to say that sometimes it is ignorance and sometimes misdirected smartness—the buyer elects to purchase the "open" chassis and then to overload it with the heavy closed body. The result is that he has tyre troubles very early in the career of his purchase, and, naturally, he complains to the tyre makers. They, on their part, are perfectly right in stating that the reason the tyres have behaved badly is because they are overloaded, and thereupon the owner blames the car manufacturer, quite forgetting that he himself is really to blame for putting too heavy a body on the chassis. At times the injustice goes even further than this, as in some instances the tyre makers not only point out to the owners that their cars are under-tyred, but they even suggest that the car manufacturers should have known better than so to under-tyre them.

### Misleading Comparisons.

This question of tyre size is one which is worth considering from another point of view. One of the reasons why makers even now are tempted to under-tyre cars is because of the question of price. To take a case in point: assume two cars, one with 810 × 90 mm. tyres and the other with 815 × 105 mm. tyres, the larger tyres cost nearly £7 more than the smaller, but if the car manufacturer who uses them only charges £5 more than his rival who uses the smaller ones, buyers are too often apt to compare the prices and not the specification. This does not apply to tyres only, but it goes further than anything else to account for the way in which some good cars are spoiled for the want of a little more being spent on them. It is all due to the prevalent habit of the purchaser comparing prices rather than value for money. Of course, directly there is a wide disparity between prices the matter is simplified; only the most foolish imagine that cars with a hundred pounds difference in price are really the same, but what is not generally realised is that of two makes, one costing, say, £10 or £15 more than the other, the potential purchaser will probably find it wise to look into the specifications carefully before he assumes that the lower priced car is really the cheaper. For instance: Have both four speeds; are both fitted with dual ignition; have both detachable wheels; and if so, what kinds? Is a spare wheel and tyre included with both, and what sort of tool kit is provided in each case? A maker can soon save £15 on half these items.

## Useful Hints and Tips.

### Running on Paraffin Mixtures.

THE following notes are based on several years' experience the writer has had with the running of stationary paraffin engines, chiefly for electric lighting work.

The engines in question ran continuously at a fairly high speed (800 to 1,000 revolutions per minute), and in their design bore considerably more resemblance to a motor car engine than to any other type, being, for instance, entirely enclosed as to their rotating and reciprocating parts, and lubricated by pump feed through drilled crankshaft, fitted with float feed carburetter and high-tension ignition. It is hoped, therefore, that the following hints may be of use to car owners who are contemplating experiments with fuel mixtures of paraffin and lighter spirit.

It is well to remember, right at the start, that paraffin can never by any stretch of imagination be called an ideal fuel for motor car use, or perhaps one had better say an ideal liquid to carry on a touring car, and any motorist who makes up his mind that it is worth putting up with slight inconveniences to save paying 1s. 9d. a gallon for petrol—or more—should at the outset take all precautions to minimise these inconveniences as far as possible.

Taps, unions, etc., that appear to be quite petrol tight will be found to be anything but paraffin tight; probably not because paraffin can find its way where petrol cannot, but because any slight petrol leakage at once evaporates as soon as it comes into contact with the air. With paraffin, however, this ready evaporation does not take place, and, instead, any leakage creeps over the surrounding surfaces and remains there, while the ensuing smell, rendered worse when the surfaces become warm with running, cannot be said to be pleasant. This can be easily noticed on a paraffin driven boat, and is probably one of the greatest drawbacks to the use of paraffin fuel. It is necessary, therefore, thoroughly to overhaul all tanks and pipes before trying a paraffin mixture, and to make sure everything is tight; also to take care when filling the tanks not to allow any of the mixture to spill over, especially if the tank be on the dashboard or under the front seat.

As to the actual mixture to be used, this will generally be paraffin mixed with petrol, at any rate until such time as benzole can be obtained in fair quantities and well distributed. A benzole-paraffin mixture is, however, quite as satisfactory as a petrol-paraffin one, and at the moment somewhat cheaper.

The actual proportions of the fuel will be a matter for experiment in every case, depending very largely upon the compression of the engine. The higher the compression the lower ought to be the paraffin content for satisfactory running, although as a starting point a mixture of one part paraffin to two parts petrol (both by volume) can be tried; a mixture of equal parts ought, however, to cause no trouble in a moderate compression engine with an efficiently warmed carburetter or air pipe.

Since the variety of carburetters is so great no hard and fast rules can be laid down as to the actual procedure to be adopted, but the two following points will need attention to a greater or less degree in well high every case:

- (a) Efficient warming of the mixture.
- (b) Smaller fuel volume per charge.

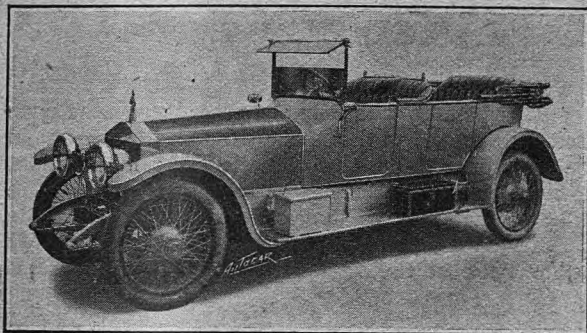
To deal with (a), if the carburetter have either an exhaust or hot water jacket, this, and all the pipes, should be well cleaned out and put in good order; if no jacket be fitted it is a matter that can hardly be altered, though there is a water-jacketed induction pipe flange now being sold which might be worth trying.

Whether jacketing is present or not, great care should be taken thoroughly to heat all, if possible, of the air taken into the carburetter. This should not present much difficulty as to the main air intake, but in the case of carburetters fitted with automatic extra air valves a certain amount of ingenuity may have to be exercised in heating the air that they take in. It is well worth while, however, taking a little trouble on this point, since the introduction of cold air into an already heated and partially gasified mixture can only result in the heavier components being condensed into liquid form again. This air heating can nearly always be arranged by fitting to the air intake a pipe with a flared end which laps round the exhaust pipe and draws its air over the surface thereof. The pipe should, if possible, be of greater internal bore than the air inlet orifice of the carburetter, and the end which laps round the exhaust pipe should be flared out to as large an amount as possible, so as to provide the necessary area for air intake when set at the minimum distance from the exhaust pipe, for the smaller this distance the hotter will be the air drawn in.

If the inlet pipe from the carburetter to the engine be at all long this should be wrapped with asbestos cord to prevent heat radiation from the mixture; it is best to use the plaited cord in preference to the more usual twisted string, for the former does not tend to fray like the latter, and can be bound on much tighter. The most convenient size is about  $\frac{1}{4}$  in. diameter, and it is easy to make a neat job when securing it by unfraying an inch or two at each end and binding these loose ends under the two coils immediately adjacent. A coat of good varnish paint over all will be found to bind the whole together and prevent the asbestos from crumbling off when handled, or becoming disintegrated by vibration.

To come to (b), the proportion of fuel to air will entirely depend on the design of the carburetter, and the actual fuel in use, and must, therefore, be a matter for individual experiment. It will nearly always be found that a smaller ratio of fuel to air will give a better mixture than is the case with the lighter spirits. This modification can be carried out in either of two ways—(1) by decreasing the size of the jet, and (2) by increasing the size of air passage round it, which creates less negative pressure or less vacuum, and so causes less fuel to be drawn in per stroke. The writer much prefers the second method, and his experience has led him to the opinion that it is best, when possible, to take the whole of the air supply past the jet and obtain control of the mixture by varying the total quantity of air admitted, which can be done by a hand operated throttle in the air inlet pipe, or by passing the whole of the air through a spring-controlled valve, the tension of the spring being adjustable by hand.

In any case, it is very advisable to have some method of controlling the mixture by hand, as paraffin is notoriously susceptible to varying conditions of temperature and load.



A 40-50 h.p. Rolls-Royce supplied through Messrs. Bradbury & Couchman, Ltd., 7, Victoria Street, London, S.W. The body makers, Messrs. H. J. Mulliner & Co., of Chiswick, W., have succeeded in making the tapering Rolls-Royce bonnet merge very satisfactorily into a nicely swept scuttle dash. The car is finished in pearl grey and upholstered in green leather, which forms a most pleasing contrast. The Kopalapso hood packs away with great neatness, being kept well below the top of the back seat. An Auster back screen is also provided. The car runs on Rudge-Whitworth detachable wire wheels, and a C.A.V. dynamo lighting equipment is fitted.

Complaints are often made as to pre-ignition or knocking occurring with the use of paraffin mixtures. The reason of this is somewhat obscure, since it will vary from day to day on the same engine. Strange to say, a weak mixture is often the cause; strange, because the weaker mixture should be slower burning and so minimise knocking. The fact remains, how-

*Useful Hints and Tips.*  
ever, that enriching the mixture will often put things right. If, however, enriching the mixture does not result in a cure then the ingestion of water along with the mixture can be relied upon to put matters right. The best method is to fit a separate small tank, and not draw the supply from the cooling system, leading the water through a small copper pipe to a conveniently placed screw-down valve, thence by a pipe so placed that the water drips on to the hot exhaust pipe just where the bell-mouth of the air inlet is fitted; by so doing the mixture is not chilled, since the needed moisture is supplied in the form of steam.

This water drip need be only brought into use when the engine shows signs of knocking which will not yield to a richer mixture, and the drip should be regulated so as just to stop any knock.

Starting from cold may cause trouble in some cases, but it is a simple matter to fit a small tank for petrol only, connecting this to the pipe from the main tank via a two-way cock so as to enable either tank to be drawn from at will.

When nearing the completion of a run the tap should be turned over so as to finish running on petrol only; the engine is then ready to start when wanted, and as soon as it warms up the tap can be turned over to the other side, cutting off the petrol and putting the mixed fuel tank into operation. It is not suggested that all the foregoing will require to be done in any one case; it is hoped, however, that individual owners will be able to select the details fitted to their own several cases.

F. BASS SUTTON.

## Royal Automobile Club Trial.

### The Atlas Impulse Tyre Pump.

THE following certificate of performance has been issued in connection with the trial on March 25th of an Atlas Impulse tyre pump:

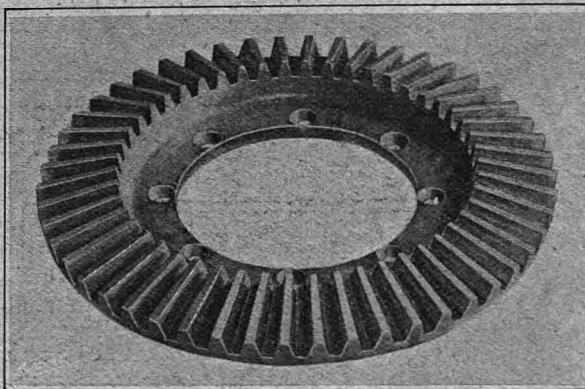
This is to certify that an Atlas Impulse tyre pump was entered for test by the Atlas Non-puncture Inner Case Syndicate, Ltd., of 124, High Street, Kensington, W.

*Description of Device.*—The device, which is permanently screwed into a valve cap of the engine, consists of two different size cylinders in tandem, from the smaller of which the air is forced through a non-return valve to the tyre. These cylinders are divided by a partition through which passes a hollow piston rod connecting the larger and smaller pistons. The lower end of this rod is closed by a non-return valve, while the upper end communicates with the smaller cylinder on the engine side of its piston. The larger piston is of the usual type with two rings, while the smaller is a leather cup. A suction valve allows air to be drawn into the engine on its down stroke, while to permit the displacement of the larger piston holes are provided close to the dividing partition already mentioned. The diameters of the two pistons are respectively 2½ in. and 1½ in. The weight of the device as entered, with gauge and 12 ft. of tubing (but not including the screw valve by which the pump was attached to the engine valve cap), was 6 lb. 6 oz. The overall length of the device (not including the connection to the engine valve cap) was 10½ in.

*Description of Trial.*—The device was tested on a 20.1 h.p. (R.A.C. Rating) Bianchi car, the dimensions of the cylinders of which were 90 mm. x 115 mm. The pump was fitted as a permanent attachment, lying transversely across the top of the front cylinder of the engine. The pump was connected to the engine valve cap through a screw-down valve, by turning which it was put into operation. The tyres used in the tests were 815 mm. x 105 mm.

The device was put into operation (without using a tool) twice, the times taken being 32s. and 28s. respectively, after the bonnet had been lifted. Two tyres were inflated to a pressure of 66 lbs. per square inch in 2m. 50s. and 3m. 21s. respectively, with the engine running at 640 revolutions per minute; the wheels of the car were jacked up during inflation. When the air passing from the tubing had been allowed

to impinge from a distance of 1 in. upon a piece of white blotting paper for 3½ m. (i.e., about the time taken to inflate one tyre), a slight mark of oil was just visible. This test was made 12½ m. after the two tyres had been inflated. During this test the engine was running at 688 revolutions per minute, but the pump did not seem to be working at its full stroke, which appeared to be caused by the fact that it was not doing any work. When the pump was in operation the engine cylinder was not firing, although no electrical connections were broken.



A crown wheel after 200,000 miles running. Many of our readers are no doubt familiar with the Worthington beer bottle car which was one of the first cars used for advertising purposes by carrying a body shaped to represent the speciality of a firm. This car we are told, has covered about 200,000 miles in its six and a half years' life, and it is a great tribute to the workmanship of the 20-30 h.p. Spyker chassis, to which the body is fitted, that the crown wheel showed very little signs of wear when the car was recently dismantled for overhaul.

## The Increase of Efficiency.

By Eric W. Walford.

WHAT motorist is there who has not, at some time or other, wished that his engine developed about 5 h.p. more to cope with some temporary condition, such as a strong head wind, an overload, or hilly roads? The desire of the motorist is to do as much driving as possible on the top gear, and if this be of such ratio as to give good results when under normal conditions, it is generally found that under abnormal conditions more power is wanted.

Of course, an obvious method is to enlarge the engine in some way, either by having it bored out to a slightly larger diameter, which means having new pistons, or at any rate new piston rings, or by fitting a new engine. The former gives a slight increase in the power, whilst the latter entails a radical alteration rarely justified by the expense. A car converted in this way is not always easy to dispose of, and it is better to "paint the car and sell it," and buy a new one.

However, without going to any great expense, one can generally increase the power of one's engine, or, rather, the resistances in the car can be reduced.

The following article is intended to indicate how power is wasted, why an engine does not always develop its full power, and how, for racing purposes, very high power can be obtained from engines. It is hoped thereby to give the motorist some advice applicable to his own case, and, at the same time, to supply some information which may be of interest without being directly useful to him. Thus it is not recommended in this article that readers should alter their engines in the various ways mentioned with regard to racing practice, as many of the expedients referred to may result in parts of the engine or transmission being over-stressed and possibly damaged. A manufacturer can cope with this, and his experience may give him warning that certain parts require strengthening or alteration, whilst the lay motorist may, through excess of zeal, damage his car. Hence it is not recommended that the compression should be considerably raised, the pistons lightened, or that other radical alterations be effected resulting in the engine speed being increased considerably.

Commencing first with the resistances, it cannot be too strongly emphasised that all four wheels must be

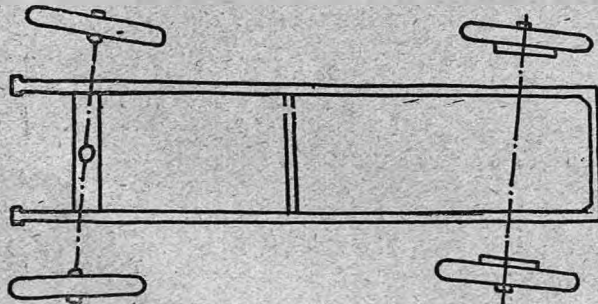


Fig. 1.—Exaggerated diagram of wheels out of line.

perfectly in track. The general tendency is for the wheels to come out of track, the front wheels spreading at the front, whilst the back axle, and often the front axle too, settles further back at the right-hand side owing to the fact that the right-hand springs generally take a permanent set. This arises from the fact that the car is often driven with the driver only

aboard, or possibly with only one passenger on the same side as the driver, so that the springs on the right-hand side are temporarily much overloaded; in addition, the right or off side springs permanently receive more load, as that side of the car is heavier than the left. Hence these springs push the axles slightly further back at the right-hand side. The result is

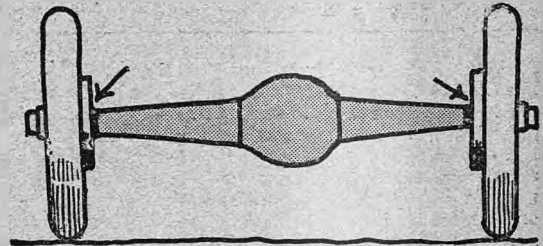


Fig. 2.—The arrows indicate the wheel bearings which wear most rapidly.

shown diagrammatically in an exaggerated form in fig. 1; all four tyres drag slightly, causing wear of the tyres and absorption of power.

Again, brakes often rub, particularly when the car is loaded. One may jack up the wheels and find that they will spin quite freely, but if the car be pushed along, rubbing of the brakes can often be detected, which passes unnoticed when the axle is jacked up. This is often due to the back wheel bearings being worn or loose, even in a new car, particularly in a case where the wheels run on bearings on the axle tubes, and it will be found that nearly always it is the bearings on the inner side, or those nearest to the centre of the axle, that are worn (see fig. 2). With actual constructions of this type, these bearings are enormously overloaded at certain times. Further, they are difficult to lubricate, and consequently run dry, and water and mud can often easily find their way into the bearings. The absence of lubricant and the presence of water cause corrosion, and rapid wear results.

Another point where unnecessary resistance occurs is in the gear box. In order to prevent the lubricant from leaking, grease is very often used. The churning of this has been found by tests to absorb 2 or 3 h.p. in itself. At Brooklands it is the custom to use a thin oil in the gear box and axle, and very little of it, but, of course, the low gears are there only momentarily used, so that this practice cannot be recommended for road work, unless care is taken to see that there is always oil present. The universal joints must be well lubricated, otherwise each of these—and in many cars there are four between the engine and the back axle—will absorb power, leaving still less for the propulsion of the car.

Rubbing brakes, dragging wheels, thick gear lubricant and unlubricated bearings may well absorb from 5 to 10 h.p. It is, therefore, important not only to consider how to increase the output from the engine, but also to reduce as much as possible the power lost between the engine and the road wheels.

It is almost impossible to attain high speeds with a car that is badly sprung for high speed work, or in which the weight on the driving wheels is insufficient. The result in either case is that the wheels slip considerably, so that the wheels are rotating at what might represent 50 miles an hour, and the car actually only

doing 42 m.p.h. In all Brooklands cars which are at all seriously prepared for the track, great consideration is given to this point. Many cars carry a great deal of ballast over the back axle, and most are fitted with auxiliary springs or spring dampers of one kind or another. For a somewhat similar reason each road wheel is often balanced, a balance weight being fitted to the wheel opposite to the tyre valve to prevent vibration.

In connection with springs, an important point is to see that the bearings of the radius rods or the equivalents are perfectly free, also the sliding joints in the propeller-shaft. Usually, as the axle rises and falls, one of the propeller-shaft joints must slide owing to the centres of the universal joint and radius rod (or the equivalent) not coinciding. Sometimes this sliding is permitted by means of square or splined shafts, whilst in other cases the universal joint is specially constructed. In the former case the lubricant is, under the high pressures of driving, squeezed out, and the joint is liable to bind and fail to slide. This interferes with the free rise and fall of the back axle, which in turn causes wheel slip and results in loss of speed. This shows how every single bearing on the car must be thoroughly lubricated and must work

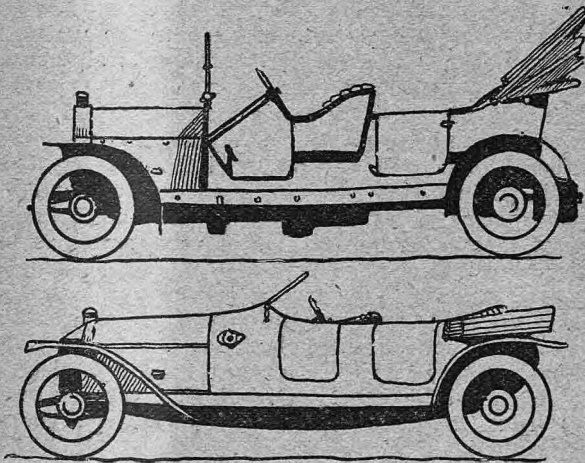


Fig. 3.—The top view shows a form of body and equipment which set up considerable head resistance. The lower sketch shows a flush-sided body with bulbous back, sloping wind screen and flat hood, which tend to reduce head resistance.

freely if high efficiency is to be obtained. Some bearings are more important than others, as is clear from the facts just mentioned. The spring leaves should also be well lubricated to allow free movement.

Another extremely important resistance is what is commonly called "air resistance." True, this is often of very little effect until one reaches a speed of 30 miles an hour, yet in a head wind it becomes of great importance even at comparatively low car speeds. For example, at a car speed of 25 miles an hour against a head wind of 30 miles an hour (which is only a moderate wind), the head resistance becomes as important as is the case at a car speed of 55 miles an hour in still air. It is impossible to deal at any length with streamline forms, etc., in this article, but, briefly, a body which has not flat surfaces projecting either to the front or to the rear of the car, which is narrow and smooth-sided, will not absorb very much power in head resistance. It is the broad car with the big flat vertical back and an overhanging hood and a large wind screen (as in fig. 3) that absorbs so much power at high speeds or in head winds. Of

course, the average motorist cannot cut his car about, but he can generally tilt his wind screen in windy weather and see that his hood sticks lie perfectly flat so as to reduce as much as possible the unnecessary eddy currents behind the car. It will probably be noticed that most high speed or "sporting" cars are provided with narrow bodies, tapering and somewhat drawn out at the rear, and fitted with sloping wind screens.

It is hardly necessary to say that the engine should be in perfect condition, *i.e.*, the compression must be good, the cylinders clean internally, valve tappets adjusted properly, and the ignition correctly timed. Assuming this, we will consider in what way it is possible to increase the power of the engine, and for this purpose I will give the result of some successful experiments made on a well-known Austin car which has raced very frequently at Brooklands under the name of "Pobble." This car was originally a touring car with a bore and stroke of 121 × 127 mm., and being built in 1903 it will be understood that it differed very considerably from the modern so-called "sporting" vehicle. During 1908 it was raced at Brooklands, and with the engine in the best possible condition, its average maximum speed was 58 miles an hour. Two years afterwards, as a result of improvements about to be related, it was covering laps at 88 miles an hour, and this without any very radical alterations to the engine, and without detracting in any way from the comfort and reliability of the car. This car was not converted into a racing freak, but retained its ability to travel at ten miles an hour on top gear, to start easily, and so on.

The only alterations were as follow:

1. White metal bearings were fitted to the crankshaft and big ends.
2. The flywheel was lightened slightly.
3. The pistons were reduced in size so as to be an easier fit.
4. The connecting rods were lightened slightly.
5. The forced feed lubrication system was increased in pressure.
6. New cams were fitted, giving quicker lift and drop to the valves.
7. A new carburetter was fitted.

1. It is known that less power is absorbed by white metal bearing surfaces than by the phosphor-bronze bearings with which this car was originally fitted. The latter, however, last very much longer than the white metal bearings. Further, for racing purposes, the bearings should have a good clearance. One engine manufacturer makes a practice of scraping down the crankshaft and connecting rod bearings of special engines to be used at Brooklands or for hill-climbs. The result is to give about the clearance which results from 5,000 or 10,000 miles of running.

2. The object of reducing the weight of the flywheel is obviously to give quicker acceleration. This carries with it a disadvantage that the engine will not run quite so slowly or so comfortably at low car speeds. However, quick acceleration is of great importance for racing but not so much so to the average touring motorist, who would probably do better to leave the flywheel alone. Moreover, it must be borne in mind that most flywheels are made of cast iron, and are only safe when used up to certain engine speeds. For example, a flywheel of certain dimensions will be perfectly safe up to 2,000 revolutions per minute, but if it be intended to increase the power, and thereby the engine speed, some precautions should be taken

*The Increase of Efficiency.*

to prevent bursting of the flywheel under the increased centrifugal stresses. The normal stresses due to high rate of revolution are, of course, added to by the bursting pressure of the cone clutch, where such is used. For engines which are to run at extremely high speeds it is usual to fit steel flywheels, which are, of course, very expensive in comparison with the cost of cast iron flywheels. An alternative is to shrink a steel ring on to the flywheel. This, of course, increases the flywheel weight and detracts slightly, very slightly, from the accelerating qualities of the engine.

3. Usually the pistons are made a good fit, but at very high speeds there is some slight chance of one or more binding, for which purpose the pistons in this case were reduced slightly. The power can also be increased by reducing the weight of the pistons. For this reason steel pistons can be used, or the cast iron ones can be lightened. (This, of course, is not a procedure recommended to the average motorist, but this article is intended partly to show the different methods adopted for increasing the power, some of which may commend themselves to the touring car owner.) Existing pistons can be machined inside, slightly reduced in length (although this carries with it certain disadvantages), or drilled or otherwise cut away beneath the gudgeon pin bearings. If the piston be drilled or cut away in this fashion it may possibly be found that consumption of lubricating oil is rather heavier and (though this is not always the case) carbon deposit, with its attendant evils, quickly created. With regard to steel pistons, they must be very carefully made, otherwise they are apt to seize. Sometimes they are made taper, smaller in diameter at the piston head, allowing six-thousandths of an inch clearance at the top, tapering to two-thousandths clearance from the gudgeon pin downwards, in this way allowing the top of the piston room to expand fairly considerably without any fear of seizing.

4. It is generally somewhat difficult to lighten existing connecting rods without rendering them too weak. It will be remembered that it is the reciprocating parts which must be reduced in weight as much as possible, so the lightening should be done at the upper end. Usually for racing and special engines very light connecting rods, manufactured of B.N.D. and other special steels, are used. These materials are wonderful with regard to their strength, but they are, of course, correspondingly expensive, and, therefore, not commonly used. Where the connecting rods are lightened the cutting away should be restricted to the web. Similarly the gudgeon pins can be drilled, but, of course, all similar reciprocating parts should be of exactly the same weight. It is an easy matter to get the pistons with their gudgeon pins to the same weight, but in weighing the connecting rods it is not sufficient merely to weigh each rod as a whole, but the distribution of weight throughout the length of the rod must be the same, otherwise the engine will be out of balance. Hence, in any attempt to improve the engine by reducing the weights of the reciprocating parts very great care must be taken, otherwise the last state of the engine may be worse than the first. Such alterations should not be effected by anybody who has not had considerable experience. Obviously the improvement obtained by reducing the weight of the reciprocating parts is hardly noticeable below, say, 1,200 revolutions per minute.

5. In the particular car in question, oil under pressure is supplied to the bearing surfaces. To reduce the friction of all the bearings, the oil pressure was

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increased in order to ensure the presence of a film of oil between the bearing surfaces at all times. It is partly for this reason that the bearing surfaces are often left a loose fit, as previously stated.

Under this heading, care must be taken to see that the lubricating system is working perfectly, and that none of the oil ways are choked. In many very high compression engines, where the presence of carbon deposit is most detrimental, castor oil is used as a lubricant. This, during compression, sets free a small quantity of oxygen, which combines with the carbon. The cost, as compared with ordinary oil, is rather heavy, and the odour of the exhaust when castor oil is used is very obnoxious.

6. To obtain high power, it is essential that the cylinders be very accurately filled and exhausted. Digressing a little, it may be stated with some accuracy that power and silent operation do not go hand-in-hand. It is not a difficult matter for an experienced manufacturer to turn out a very powerful or a very quiet engine, but the difficulty is to combine the two, with the result that the most comfortable engines to use are a compromise, being fairly quiet in running and not ultra-powerful. Hence what may be termed "quiet" cams and valve mechanisms are used on standard touring cars. The "power" cams referred to give a very quick lift and drop to the valves, so as to ensure a good supply of mixture at high engine speeds. With such "steep" cams it is necessary to use very stiff valve springs in most cases. In fact, I have known valve springs varying between a compression of 40 lbs. and 200 lbs., and the designer of one well-known racing car has shown me the results of experiments of his which indicate how much importance there is in the question of valve spring tension for very high speed engines. If the springs be too light the valves do not close sufficiently quickly. If they are too strong they absorb power in compression which is not all given back as the valve drops. Further, they impose heavy strains on the operating gear. Again, a valve spring of incorrect dimensions is liable to break at high speeds through internal stresses due to its period of vibration. It will be

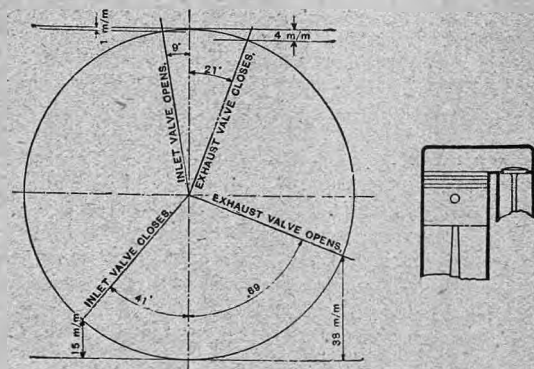


Fig. 4.—Valve timing diagram of a 20.1 h.p. Straker-Squire racing engine, which has all the valves on one side, as indicated by the small diagram on the right.

fully realised, therefore, that the selection of valve springs for a very high speed engine is a difficult matter, and one which is usually subject to much experimental work. The same applies to valve sizes.

In all probability, the new cams referred to altered the timing of the valves. The time of opening and closing is extremely important in high speed engines, but no hard and fast rule can be laid down as to

when an inlet valve should close or an exhaust valve open. Practice in this respect varies with different types of engines, as will be gathered from the accompanying diagrams, which represent different types of engines, and which recently appeared in the *Car Illustrated*, with the exception of that of the 25 h.p. Talbot. The diagram fig. 4 is taken from a 20.1 h.p. Straker-Squire racer, which has attained a speed of over ninety-six miles an hour. The bore and stroke of the engine are 90 x 120 mm.; the valves are all on the same side, being two inches in diameter, with the extremely high lift of half an inch. Naturally, very stiff springs are employed. From the diagram

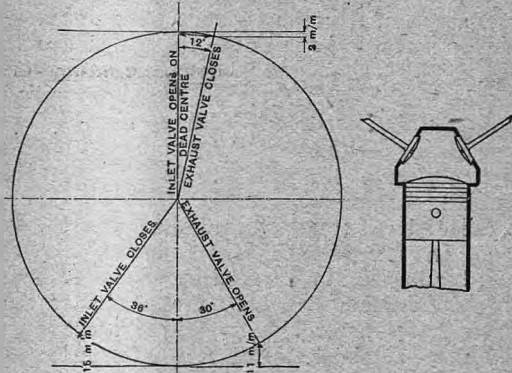


Fig. 5.—The valve timing of Hornsted's 27.3 h.p. Benz racing car. This engine had the valves arranged at an angle to one another in the cylinder head as shown in the small diagram.

it will be noticed that the exhaust valves open extraordinarily early, and that the inlet and exhaust valves are both open together during 30° travel of the crank pin. The second diagram, fig. 5, shows the timing of Hornsted's 27.3 h.p. Benz car. In this engine the valves (four per cylinder) are arranged at an angle to one another in the cylinder head, as shown alongside the diagram. Here again both valves are open simultaneously for a very short period, but this timing does not differ very much from that which ordinarily obtains on touring cars. As is to be expected from the position of the valves, the inlet and exhaust pipes are on opposite sides. The inlet valves are 2½ in. in diameter and the exhaust valves 2 in.

Another car in which a large inlet valve is employed is the Singer racer (the same applies to the standard Singer engine), and from diagram fig. 6 it will be seen that the exhaust valve shuts on the dead centre, and that there is an interval of 27° in which both valves are shut, the inlet valve then remaining open for

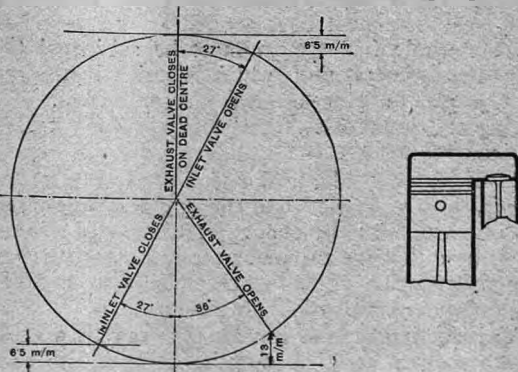


Fig. 6.—The valve timing diagram of the record breaking Singer. The peculiarity of this diagram is in the period during which both valves are closed between exhaust and induction.

*The Increase of Efficiency.* exactly half a revolution. In this engine the valves are all on the same side, and the general arrangement is the same as that existing in the Straker-Squire racing car, but the valve timings are very widely different. In the Singer racer the inlet valve is 1¾ in. in diameter, and the exhaust 1½ in., with a lift of 9 millimetres each. The bore and stroke of the engine are 80 x 130 mm., and those of the Benz car referred to are 105 x 165 mm.

Few cars raised the speed records as much as did the 15.9 Sunbeam racer, *Toodles II*. The valve tim-

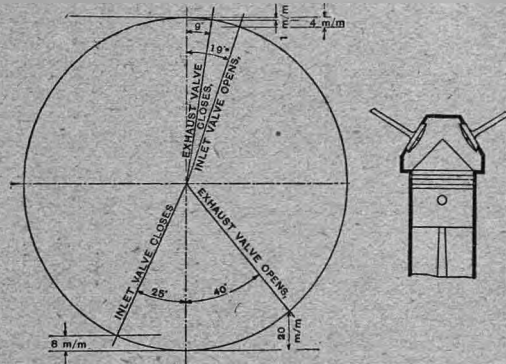


Fig. 7.—Valve diagram of a 15.9 h.p. experimental 1911 Sunbeam racing engine. The valve arrangement of the cylinder head is shown in the small diagram on the right.

ing of this car is shown in the diagram fig. 7. This is a fairly normal timing. The valves in this case are arranged at an angle in the cylinder head, being 2 in. in diameter with half an inch lift.

The diagram in fig. 8 shows the valve setting on the Austin racer *Pearley III*, and there is nothing very much out of the way to be noted. This car has

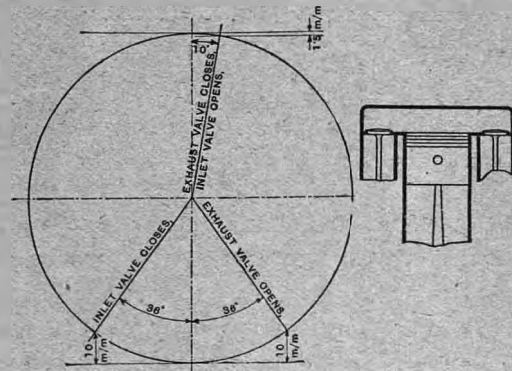


Fig. 8.—The valve setting of the Austin racer *Pearley III*. This engine has valves on opposite sides.

accomplished very high speeds at Brooklands, with a valve seating which closely approximates to that which obtains on a large number of touring cars, although many different settings were tried. The bore and stroke of the engine are 89 x 115 mm., and the valves are 51 millimetres (approx. 2 in.) in diameter with half an inch lift. The valves are on opposite sides of the engine, and the induction pipe is made in the shape of a figure 8, and will be referred to later.

These diagrams are taken from successful engines having the valves in various positions as mentioned, and it will therefore be gathered that no hard and fast rule determines the best setting, which depends on a number of different factors, the shape and freedom of the inlet and exhaust systems, shape of the cylinder ports, etc.

### The Increase of Efficiency.

The engine from which the diagram in fig. 9 is taken also has all its valves on one side. The car is the record-breaking 25 h.p. Talbot with a bore and stroke

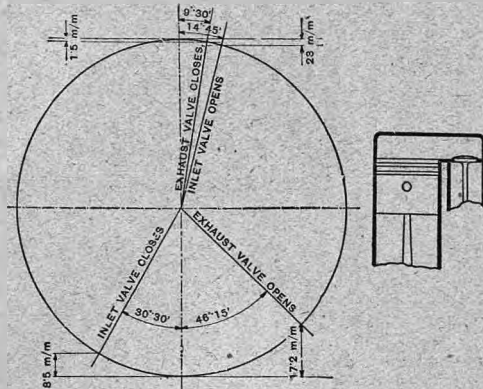


Fig. 9.—The valve setting of the record breaking 25 h.p. Talbot. This is another engine having all its valves on one side.

of 101.5 × 140 mm. The R.A.C. rating of this car is 25.6, but to show how misleading it is to consider this rating illustrative of actual power, the power curve of this engine is given in fig. 17.

In fig. 10 will be found a diagram showing the average of all the foregoing valve settings, and it is somewhat interesting to compare this with individual diagrams to ascertain the peculiarities of the latter.

7. It will be realised from the foregoing that one of the most important items is to fill the cylinders completely, and most carburetters vary in this connection. For instance, one carburetter may twist the air stream in two or more directions, and may restrict it at one or more points, whilst it may also create eddy and cross currents which prevent the gases travelling along the induction pipe at the maximum velocity. Other carburetters may only provide their maximum mixture passage under the influence of a partial vacuum in the induction pipe. If there be a spring-loaded valve which has to be sucked off its seating it requires a fairly considerable vacuum for the valve to be fully opened, and under this condition the cylinders cannot be filled at high speeds. Such carburetters may, of course, be extremely satisfactory under normal running conditions, but for track work, or when maximum power with the throttle wide open is desirable, a carburetter without moving parts or restrictions is usually the more successful. On the Austin car referred to a White and Poppe carburetter was fitted, which, when the throttle is wide open, practically comprises a pipe of large diameter into the centre of which projects a vertical jet with a large fuel outlet; there is a minimum of restriction in such a carburetter

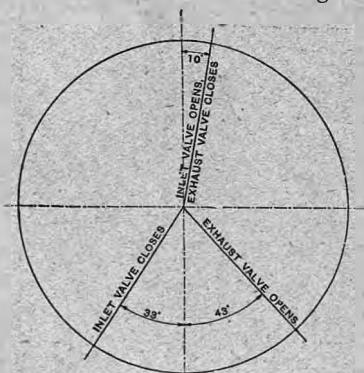


Fig. 10.—A diagram showing the average valve setting of the six preceding examples.

Again, a butterfly throttle valve is well-known to cause considerable obstruction at high speeds. Thus with throttle wide open the air passage through the

carburetter is barred, causing an obstructing eddy. The importance of this is borne out by the fact that few successful cars at Brooklands are fitted with carburetters having butterfly throttle valves, although there are exceptions. I believe Mr. Gordon Watney's Mercedes cars are nearly always specially fitted with carburetters having throttle valves of this type. The fact remains, however, that such valves do cause considerable obstruction, which is of importance at high engine speeds.

Some advantage is obtained by ensuring the complete atomising of the petrol as it issues from the jet, and by preventing it from condensing in the inlet pipe. For this reason benefit has sometimes accrued by fitting to a jet nozzle of the ordinary type some device which causes the petrol to issue in the form of a fine spray.

With a view to obtaining complete filling of the engine at high speeds some makers have relied on forced induction. In one case an air blower was arranged alongside the engine driven by a simple form of friction gearing, the ratio of which was capable of adjustment from the driver's seat. This blower sucked from the carburetter and forced the mixture into the engine. Its rate of revolution followed that of the engine, but it could be speeded up or slowed down by varying the friction gear. In the particular case in question I was never able to find out exactly what results were obtained, but I was informed that extremely high powers resulted, but that trouble was experienced with valve burning, etc. This was some four or five years ago, but probably modern knowledge would enable most of the difficulties then experienced to be overcome. Forced induction has also been used by other manufacturers, but more or less secretly.

At Brooklands it is quite common practice to fit a large funnel (as shown in fig. 11) projecting towards the front of the car, so that by the car's travelling through the air the carburetter can be supplied with air under slight pressure. There is a limit, of course, to the pressure under which the air can be supplied to the carburetter, as if it be slightly above the atmospheric pressure the fuel will not be drawn from the jet, unless the jet chamber is sealed from the atmosphere and connected with the spraying chamber by a balance pipe, in which case the same treatment must be extended to the petrol tank, i.e., the whole fuel system must be subjected to the same pressure as that which obtains in the spraying chamber, relying on the ejector action, the air passing the jet nozzle, for the supply of petrol from the jet.

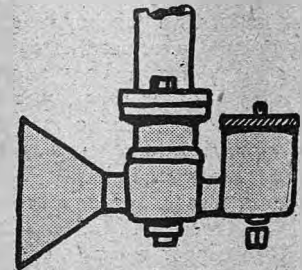


Fig. 11.—A carburetter with a funnel-shaped air intake as often fitted to Brooklands racing engines.

Reverting to Mr. Thomson's experiments with *Pobble*, it was found that the greatest improvement was obtained with the change of cams. It is interesting to note that the original gear ratio was varied, but only temporarily, for the best results were obtained with the gear ratio originally fitted.

An induction pipe or hot air pipe may unnecessarily absorb power at high speeds. The induction pipe should, of course, be of fairly large dimensions and have easy bends. It must be remembered that the engine fires in the order 1, 3, 4, 2, and that the gas,



therefore, goes first to the cylinder next the radiator, and then is immediately forced to travel to the cylinder next but one to the dashboard. After this No. 4 fires, and the gas must then flow to cylinder No. 2. There is, therefore, a pulsating effect set up in the inlet pipe, which at high speeds becomes a very important consideration, as it prevents two cylinders from

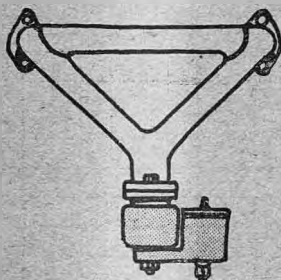


Fig. 12.—A carburetter with a Y-shaped induction branch connected by a cross pipe at the top.

being properly filled. If a Y-shaped inlet pipe fitted some improvement can be obtained by connecting together the tops of the Y which gives the gas a short cut, as in fig. 12. On many racing cars induction pipes of an 8 shape have been used, the inlet gases always circulating in the same direction as shown in fig. 13. When one considers that at very high engine speeds the gas is travelling at from 100 to 180 miles per hour in the induction pipe any change of direction in its flow must prevent the filling of the cylinders. In some cases very large induction pipes have been fitted, and these have been found to give high powers with rapid acceleration, but unless they are heated the petrol will condense inside them. In one car, alongside the cylinders, which were about 90 mm bore, was arranged a horizontal cylinder about 7in. in diameter connected with each of the induction ports and coupled to the carburetter. In this case directly any inlet valve opened there was a full cylinder volume of gas immediately opposite the valve ready, as it were, to "fall" into the cylinder.

The flow of air through the carburetter should be comparatively rapid, otherwise proper carburation will not result. Hence in the enlargement of the induction system one can over do the enlargement of the carburetter. The best maximum air speed through the carburetter varies with different types.

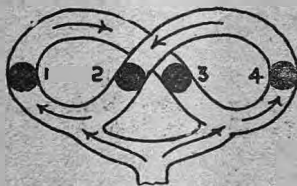


Fig. 13.—An induction branch in the shape of the figure 8. The special feature of this form is that as successive inlet valves open the mixture continues to travel in one direction. There is no reversal of the gases as in the usual form.

With regard to the hot air pipe, if this be long or of small bore, it is obvious that the cylinders will not receive complete filling at high speeds. Furthermore, the inadequate air supply will result in too rich a mixture, which in itself will reduce power. Hence the air intakes of high speed engines do not, as a rule, communicate with hot air pipes, but the carburetters are hot jacketed.

Regarding valves, it is not, as a rule, possible to fit larger ones, but if this can be done, particularly with regard to the inlet valve, the alteration should be made.

In some cases alteration has been made to existing engines, as shown in fig. 14. Here the same size valve is retained, but the aperture below the valve is enlarged by removing the shaded portions of the seating. Thus merely a very narrow face is left, which naturally would burn rather quickly, but, on the other hand, this method reduces the obstruction to the gas considerably.

The Increase of Efficiency.

Fig. 15 shows an inlet valve, whilst an exhaust valve is depicted in fig. 16. In both cases certain parts of the head may be removed as shown. This is following a suggestion made by Mr. R. W. A. Brewer in an article which appeared recently in *Internal Combustion Engineering*. In order to give the inlet gas

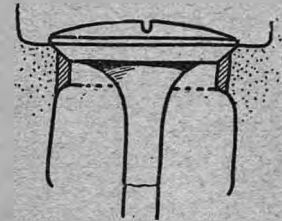


Fig. 14.—Sketch showing how the valve port area may be increased by cutting away a portion of the seating.

as easy a flow as possible, a part of the under side of the inlet valve is removed. The under side of an inlet valve requires most treatment, leaving only a narrow conical face for the proper seating. Mr. Brewer suggested that the valve guide should be correspondingly rounded off at its upper end, and that the neck of the valve be also reduced to minimise the obstruction on the under side, but it would seem that this weakens the valve considerably at a point where it receives its maximum stress, particularly with quick drop cams and strong valve springs. The exhaust valve, it is suggested, should for the most part be rounded off at the top. The exhaust valve stems can be reduced in their guides to prevent any chance of their binding.

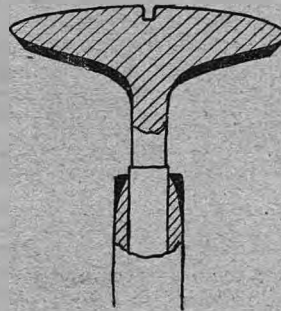


Fig. 15.—Sketch showing how the outline of an inlet valve may be improved and brought nearer to streamline shape. The top of the valve guide has also been rounded off. The solid black portions represent the metal cut away.

With regard to compression, this, as a rule, on racing cars is from 5 to 15% higher than that which normally obtains, in order to obtain best results at very high engine speeds. Such high compressions are disadvantageous at low and moderate engine speeds, particularly if the engine be prone to deposit carbon. However, on some racing cars the compression is considerably higher than that which normally obtains, and, to prevent trouble from pre-ignition, the valve caps are water-cooled. Each cap is formed with a hollow chamber, and the respective chambers are connected together by piping which is in communication with the pump or radiator. In other engines special water pipes are led from the neighbourhood of the exhaust pockets, so as to conduct away any steam which may form, and ensure water circulation at this important point.

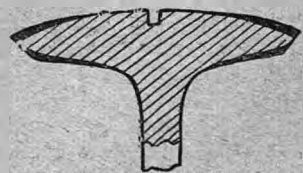


Fig. 16.—An exhaust valve treated to bring it nearer to streamline shape by cutting away the portions shown in solid black.

The exhaust pipe is of some importance, and, generally speaking, a pipe of large diameter with easy bends is used, the pipe extending as far back as possible. In fact, within reasonable limits the longer the pipe the better are the results, and in place of silencers with baffle plates, simple expansion chambers are generally used. The momentum of the exhaust gases passing through a long exhaust pipe has

### The Increase of Efficiency.

a slight scavenging effect, which is often found more advantageous than exhausting straight into the air, which is, of course, prohibited nowadays. Some makers have experimented with fans, or the equivalent, placed in the exhaust system with a view to drawing out the exhaust gases, but as a rule there is very little trouble nowadays in emptying the cylinders, the chief difficulty being in filling them.

Correct timing of the ignition is, of course, of very great importance, and in general for high speed work the timing of the magneto can be considerably advanced. Many very high speed engines are provided with two, or even four, sparking plugs to fire simultaneously, and in many cases two magnetos are used, the idea being, of course, to obtain much higher cylinder pressures than otherwise would result.

The location of the sparking plugs is of some importance, the best position varying in different engines. A short time ago I met an enthusiastic owner-driver whose engine cylinders were each fitted with three sparking plugs, two being fired simultaneously or otherwise by a two-spark magneto, whilst the third formed part of a distributor and accumulator coil system. He informed me that the best results were obtained, contrary to all expectations, when firing over the exhaust valves only. This was an engine with a single camshaft and side by side valves. With one engine which had valves on opposite sides I have obtained much advantage from fitting plugs over the inlet and exhaust valves. The difficulty was to prevent the sparking plugs in the exhaust pockets from causing pre-ignition, owing to the electrodes becoming incandescent.

It will be gathered that the wonderful powers obtained from special cars, particularly at Brooklands, are consequent upon considerable increase in engine speed, and that little can be done to increase the power of a fairly efficient engine at what might be termed "touring engine speeds," that is to say, engine speeds up to 1,500 r.p.m. If the driver care to do so he can

considerably increase the power of his engine, provided he is content to use a low gear and to run his engine at high speed. From fig. 17 it will be seen that the maximum brake horse-power of the 25 h.p. Talbot record-breaking car is 133, obtained at an engine speed of 3,750 r.p.m., really an astonishing speed when one considers that this is hardly a small engine. Corresponding speeds have fairly frequently been attained on

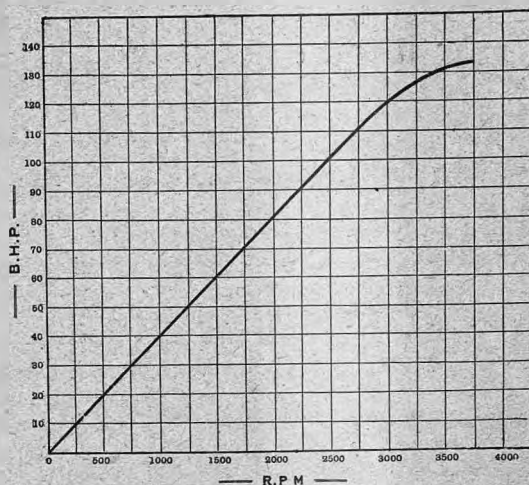


Fig. 17.—The power curve of the 25 h.p. Talbot racing engine. It will be noticed that the maximum brake horse power is 133, this being obtained at 3,750 revolutions per minute.

motor cycle and small car engines, but for an engine of 4in. bore to attain this speed and a corresponding horse-power is something exceptional, and is the result of having everything right from start to finish. Many motorists think there is some wonderful secret in tuning up and obtaining such results, where in reality the result is due to minute attention to a hundred and one details.

### A Suggested Use for R.A.C. Guides.

At a luncheon to mark the opening of the season of the Kent Automobile Club recently, the chairman of the club, Mr. R. W. James, of Bromley, said the increase in automobilism, particularly in Kent, where they had main roads which took passengers direct from London to the coast, made the question of public safety a matter of very serious moment, and as one travelled about the country one could not help feeling that there were many dangerous cross roads where it became an absolute necessity to have a point duty man. This, however, would mean a large increase in the county rate under the heading of police, and if he might throw out a suggestion for dealing with the matter in a simple and inexpensive way it was that they should avail themselves of the system of road guides which was started by the Royal Automobile Club last year. These men were put on the roads to assist motorists, and it seemed to him that if the Standing Joint Committee could see their way to come to some arrangement by which they would undertake the disposition of the road guides and otherwise control them, and would contribute something towards the cost of their maintenance, the county as a whole would greatly benefit. While the county would be able to use the guides for six months in the year, they might not want them in the winter, but it might be possible to come to some arrangement.

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### The Latexio Pneumatic Tyre.

One welcomes the consideration of anything new in the design of a pneumatic tyre, in the dim hope that it may be a step towards that perfection which all motorists desire. It is not for us to say whether the Latexio tyre is a move in the direction of the millennium or not. That must be left to test and time at the hands of the motoring public. The method adopted in the construction of this tyre can be very easily understood. In lieu of forming the fabric casing by many layers of canvas on the bias, as obtains generally, the Latexio casing is formed of two layers of flat strips or bands laid side by side tangentially across the cover. The upper layer crosses the under layer at an opposed and opposite angle. These flat strips are themselves formed of a series of specially prepared single strands, each strand being isolated in a coating of rubber laid side by side and having no crossing weft to provoke irregular tension.

It is claimed that by this method great strength is obtainable, and that in addition when the cover is cut the damaged portion of the fabric can be taken right out of the casing, and new strips incorporated without weakening the tyre. Many other claims are made for this tyre which seem justifiable from a constructional point of view, but of which the public will, of course, need to be convinced by sheer hard proof from use under normal conditions.

## The Studebaker Detachable Rim.

### A Special Tool provided to Contract a Transversely Split Rim.

**I**N the matter of a detachable rim, while the security when fixed and ease of detachability are necessary features, it is also desirable that the rim should be fashioned so that the mounting and dismounting of a tyre thereon is made an easy job, and, further, one by which the cover can be attached or detached without any undue stress. Many attempts, some of them quite successful and practical, have been made to achieve this end, but none in quite the same way as is adopted in connection with the Studebaker detachable rim.

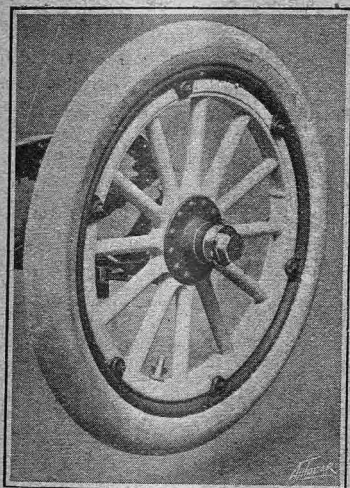


Fig. 1.—The wheel jacked up ready for removing the rim and the tyre by detaching the six nuts and plates securing the rim.

Fig. 1 is a photograph of a tyre and rim fully mounted on the wheel. The detachable rim itself is of the Michelin type, except that, when the nuts are unscrewed by means of the brace provided, the retaining clips come away with the washers, and the rim is left free to be withdrawn from the felloe. The rim itself is cut across at one point as shown in the illustrations, the butt ends being kept together by a hinge joint secured with a pin. This pin is driven out with a punch. Presuming it is required to remove the tyre cover from the rim, the power tool A, that is the segmental clip with operating rack B, is clipped on to the rim in the manner depicted in fig. 2. The rim is formed with a fulcrum piece C, and heel plates (not seen) which fit into catch plates in the base of the tool. The clamps D are caused to embrace the edges of the rim firmly by means of the thumb nuts

shown, and the pawl E is dropped down to engage in the notch in the power tool as shown. The rack is adjusted by means of a worm screw, and when this is operated by means of a brace, the rack B is carried to the right and in its travel draws the left-hand end of the rim over the right-hand end as shown in fig. 3. The lifting of the contracted end of the rim over the other is effected by the pawl E fitted to the rack, its operation and effect being clearly shown in figs. 2, 3, and 4. The rack is worked backwards until the rim assumes the position shown in fig. 4, where it is obvious the tyre cover can be removed from the rim without tools and with the greatest ease.

To replace the cover on the rim the operation is reversed, the rim being racked outwards until it assumes its normal position as in fig. 5. It can then be replaced on the wheel, and the clips screwed home

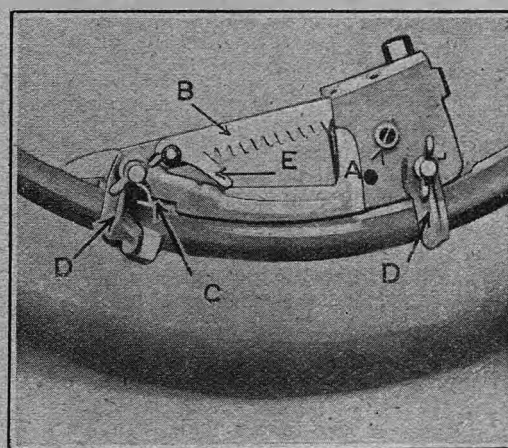


Fig. 2.—The details of the power tool.

A, body of tool containing worm gear actuating the rack. B, operating rack. C, fulcrum piece. D, clamps. E, pawl.

in the ordinary way. The operation takes very little time, and is performed with the greatest ease. The rims are made of such a material that the springing does them no harm whatsoever. The Studebaker Corporation, Ltd., 143, Great Portland Street, W., is now fitting all Studebaker cars with these rims.

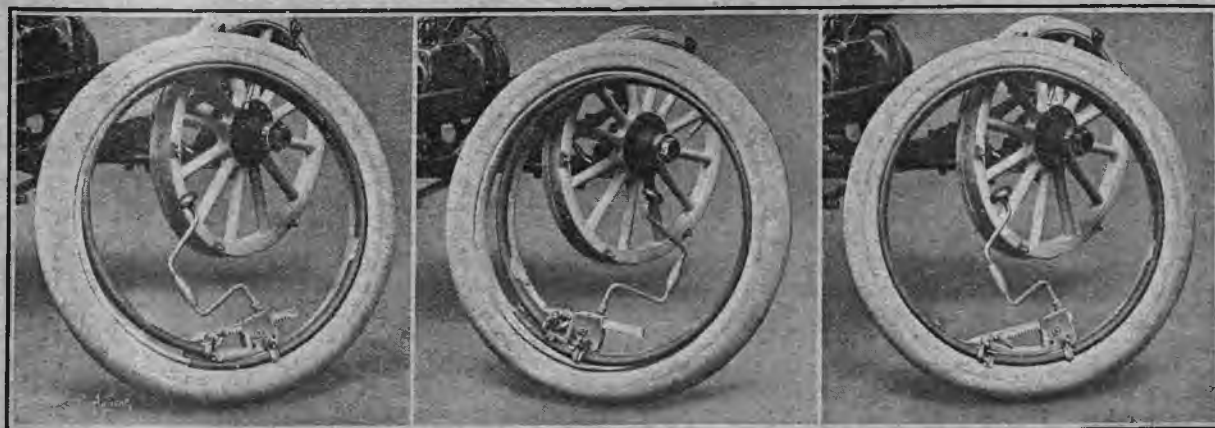


Fig. 3.—The power tool in use contracting the rim. The pawl lifts the left-hand end over and clear of the other. Fig. 4.—The rim fully contracted so that the tyre can readily be removed by hand. Fig. 5.—The rim expanded again and ready for the power tool to be detached, and the tyre and rim to be refitted to the wheel.

## Hands Off.

### A Test of Steering Design and Workmanship.

ONE of the last things which a rational motorist thinks of doing is to remove both hands from the steering wheel. It was, therefore, with some considerable surprise that we listened to Mr. J. D. Siddeley when he suggested to us that the Siddeley-Deasy back brakes and steering were now so good that he would like us to take out a car and to take both hands off the steering wheel and then apply the back brakes. Had a less reliable man made such a suggestion we should have, probably, made some retort which would at any rate have appealed to us as being equally futile, but we knew from what he had just said previously that Mr. Siddeley was not attempting a joke at our expense.

We took out an ordinary 18-24 h.p. Siddeley and found that it was quite easy to do as enjoined. We had no speedometer, but certainly at thirty miles an hour the experiment was perfectly easy and safe to carry out. In the middle of a road with ordinary but not excessive camber one could let go of the steering wheel with both hands and put the side brakes on so hard that the wheels all but skidded. In many cases the car did not deviate from a straight line at all; in others it ran a little to one side or the other, but with no sort of suddenness, and it was easy the moment one put a hand on the steering wheel again to bring it back to its original direction.

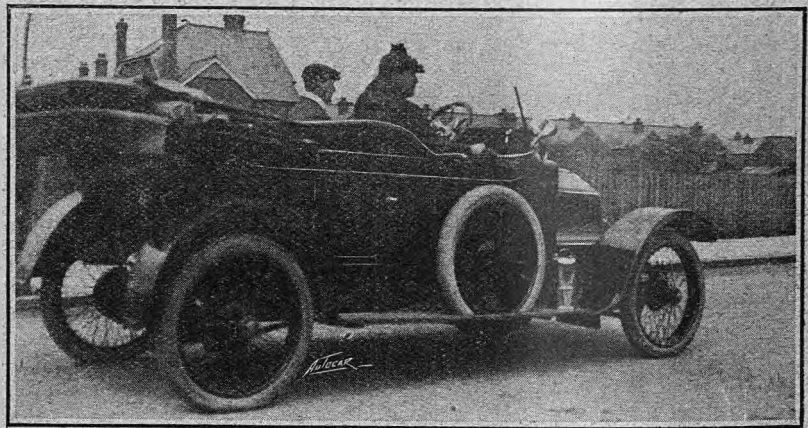
Naturally, we shall be asked how it was done, *i.e.*, what were the special features of the brakes and steering, and our reply will be disappointing, because we are able to point to no specific detail which made it possible. As a matter of fact, it is a combination of correct design and perfect workmanship both in the accuracy of all the parts concerned and in the fitting, assembling, and adjustment.

As to the steering itself, we may say that it was, as it has always been on the Siddeley-Deasy cars, exceptionally light and yet firm. While there is no effort required and the steering is what is expressively known as light, there is no tendency, as is often the case with light steerings, for the hand wheel to move back and forth in the hand: it keeps quite steady even when running over a rough pot-hole road, and never seems to hit back at the driver. Of course, any steering can be adjusted stiffly so that it will not deflect at the hand wheel under any ordinary road shock, but the point about the Deasy steering is that it is not stiff, though none the less irreversible.

The rear brakes are of the internal expanding type, Ferodo lined, and with a good compensating device, but we proved that the virtue was not in this alone, inasmuch as by selecting the road surface we could skid one wheel without the other. This, of course, is always possible if one wheel is on a less holding surface than the other. It does not do away with the necessity for proper compensation between the brakes, but, necessarily, it means that whenever one uses brakes, whether side or gearshaft, one must use reasonable discretion.

To return to the steering, it is, perhaps, well to add that the design of a Siddeley-Deasy gives wheels of very slight camber—that is to say, the road wheels are only a very little wider apart at the top than at the bottom—while the steering centres are inclined so that a line produced through them would strike the road at a point as nearly as possible at the centre of the surface of the tyre in contact with the road.

The test we made was certainly convincing, but we do not recommend our readers to make it on the average car. If they must, let them select a broad flat road with no other traffic near, and, above all, let them make it at very low speeds indeed to begin with. We think that in most cases they will be quite satisfied, and will have no desire to proceed to any higher speeds for the experiment. It is not merely leaving hold of the steering wheel, but putting on the side brakes quite suddenly and sufficiently hard to pull the car up as



**HANDS OFF.** The driver of a Siddeley-Deasy car with his left-hand raised, away from the steering wheel, and the right-hand applying the side brake, the car travelling at about 25 to 30 m.p.h.

quickly as possible without actual skidding of the wheels—when we skidded one of them we did it deliberately and as a refinement of the test—but we do want to make it clear that even with Siddeley-Deasy cars we do not recommend the letting go of the wheel with both hands at any time; in fact, we think, and always have thought, that when proceeding at any speed above a very moderate rate indeed one should always have both hands on the wheel. It should be understood that we do not infer that no other good cars will not keep straight on a decent road if the steering be let go, and we look on the performance as the equivalent to the old test of the steering of a bicycle. The rider tried it for a few yards “without hands,” not to show off but to satisfy himself that the steering was correct in design and workmanship.

At the inquest on Monday last respecting the fatal accident which occurred to a motorist (Mr. Stanley W. Barber) whose car collided with a telegraph post on the Brighton Road at Horley, not only killing Mr. Barber but injuring four others, the jury in returning a verdict of accidental death requested the coroner to call the attention of the authorities to the dangerous position of the pole, as motorists had previously complained of its presence so near to the roadway. The same remark would apply to hundreds and thousands of other telegraph and telephone poles.

## The 15-20 h.p. K.R.I.T.

Four Cylinders 94 × 102 mm. Unit System of Engine, Clutch and Gear Box.  
Three Speeds. Bevel Drive.

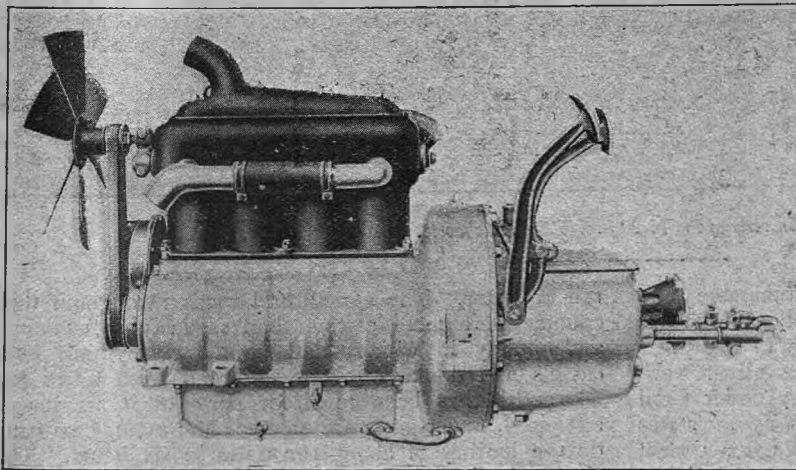
**T**HIS is a moderately low-priced American car, which has already gained a considerable reputation in this country, and is handled in Great Britain by the K.R.I.T. Motor Car Co., Ltd., of 127, Long Acre, London, W.C. From stem to stern it presents several features of interest, typifying the American construction of the medium powered car.

The frame is as usual of channel section steel, smartly inswept at the dashboard, and well cambered and upswept over the back axle. It has a splayed channel section cross member beneath the radiator, another centrally, while the rear member is doubly reinforced by stiff angle pieces.

The four-cylinder engine, 94 mm. × 102 mm. stroke and bore, is cast *en bloc* with all the valves on the offside, and an exhaust trunk with separate upswept leads secured, with the induction branch, to the cylinders by cross heads. The valve stems and tappets are encased by one easily detachable cover. The motor unit system is adopted, the flywheel and clutch casing being cast complete with the crank chamber, and the gear box taking the form of another casting bolted

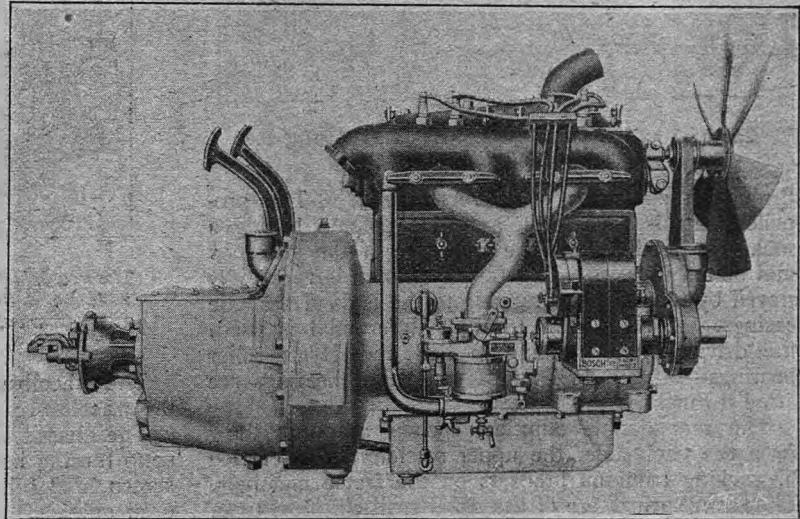
to the latter. The motor unit is three-point suspended, being carried by brackets from the flywheel casing, and at the front from the transverse member under the radiator. The under cover of the crank chamber forms an oil sump in communication with the flywheel pit by way of a short flanged pipe.

Thermo-syphon cooling is adopted; the cylinder cover embracing the four combustion chambers and maintaining a large head of water thereover. The intake and uptake leads are of large diameter, and the latter discharges into an overhang tank at the rear of the radiator, as indicated in the plan view.



Near-side view of the 15-20 h.p. K.R.I.T. power unit. In this view can be seen the oil connecting pipe between the flywheel pit and the crank chamber sump.

The camshaft is driven by helically cut gear wheels from the crankshaft, and the magneto by similarly toothed wheels from the camshaft. The crankshaft, which is of massive construction, rotates in two ball bearings of large diameter. The connecting rods are of substantial section, and the pistons are of excellent



Off-side view of the 15-20 h.p. K.R.I.T. power unit, comprising engine, flywheel, clutch and gear box.

length with three piston rings above the gudgeon pin, and a scavenger ring below.

The Stromberg carburetter is fitted; this has an adjustable automatic extra air inlet, and adjustments for air and petrol can be made without dismantling the apparatus.

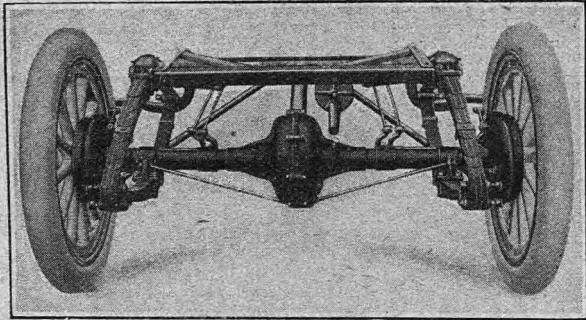
The Bosch magneto and the Stromberg carburetter are set on the off-side of the engine, with the adjustable parts made very accessible. The magneto is carried on a special bracket table formed on the crank chamber. The fan spindle is mounted in a double split bracket, with eccentric adjustment to take up the slack of the driving belt.

The oil fillers to the crank chamber, oil sump, gear box, and clutch are very accessible. A reciprocating pump driven off the camshaft supplies oil to troughs formed across the crank chamber, and into which beaks on the ends of the connecting rods dip and throw lubricant to the big ends and the rest of the engine parts requiring lubrication by splash. The pump also raises oil to a sight feed on the dash. Wash out and level cocks are fitted to the oil sump.

The drive is transmitted from the engine to the gear box through a ten plate multi-disc clutch, the discs being of saw steel hardened and ground. This clutch is operated by means of a sliding cone and rocking pawls.

*The 15-20 h.p. K.R.I.T.*

The gear box, which overhangs the flywheel casing as previously mentioned, contains gearing for three speeds, operated by a neat form of gate change. The drive passes from the gear box to the back axle



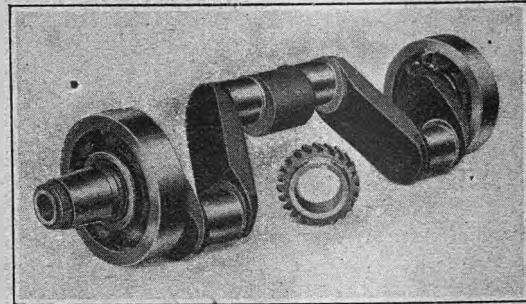
*The back axle of the 15-20 h.p. K.R.I.T. showing the underslung full elliptic springs.*

through a star type of universal joint. The propeller-shaft is encased in a torque column having a socket projecting from the rear face of the gear box and bolted thereto. This torque column is very stiffly stayed by tubular stays running to the ends of the axle casings. A bevel gear form of differential is used, the driving-shafts running in ball and Hyatt roller bearings—indeed, ball and Hyatt roller bearings are fitted throughout the chassis.

The rear double elliptical springs are underslung from the back axle, the upper sections being carried by rocking trunnion brackets on the frame members. The front springs are of the usual semi-elliptical type.

Both side lever and pedal applied brakes take effect upon the back wheel brake drums, which are entirely enclosed, the back axle being strongly braced by adjustable tension rods. The brake applied by the pedal is of the external contracting type, and that by the side lever of the internally expanding type.

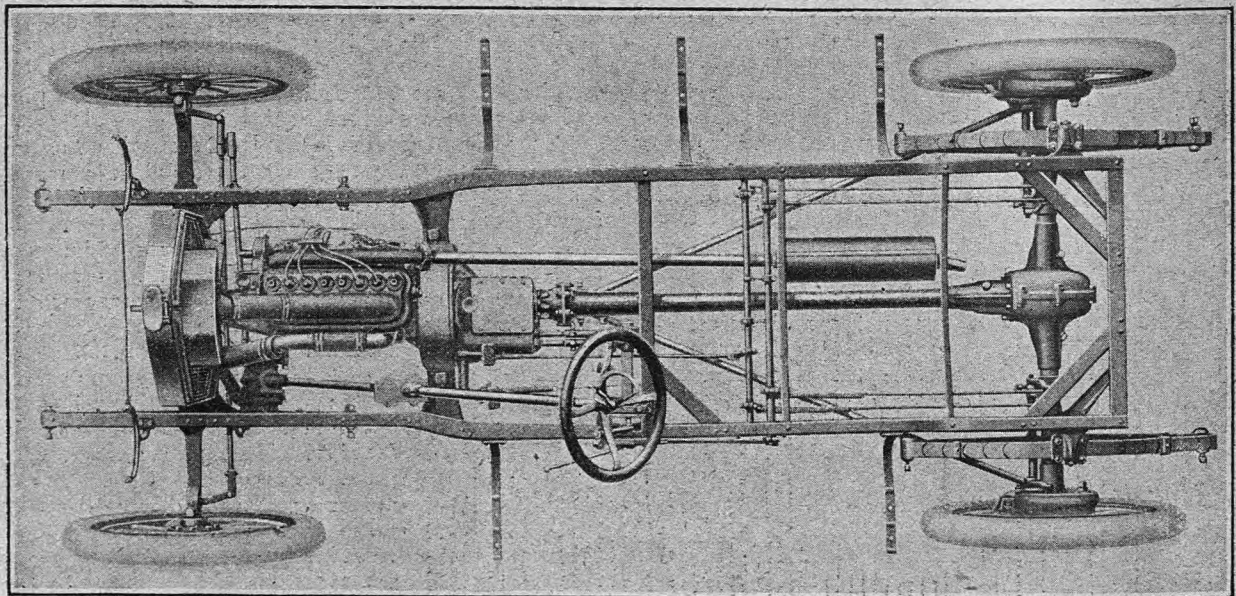
The steering is of the worm and full sector order, the steering standard being fitted with ball bearings adjustable for wear. Both distance rod and steering rod are kept behind the axle.



*The crankshaft of the 15-20 h.p. K.R.I.T. It will be noticed that this runs in two large ball bearings. The skew gear wheel driving the distribution gear can be seen detached.*

The wheelbase is 9ft., the wheel gauge 4ft. 6in., the wheels 810 x 90 mm., and the clearance 10½in.

The chassis is sold complete with a five-seated torpedo touring body, head lights, side lights, tail light, screen, and full equipment for the road, at two hundred guineas.



*Plan view of the 15-20 h.p. K.R.I.T. chassis.*

Mr. J. A. Todd, Professor of Commerce and Economics at Nottingham University College, who has recently returned to England after a stay of five years in Egypt, speaks very highly of the excellent work that has been carried on in that country under Lord Kitchener's régime. "Until two years ago," states Professor Todd, "there was practically not a decent road in Egypt, outside the large towns. Cairo, Alexandria, and Port Said were only approachable by

rail or water. The agricultural roads throughout the country were mere earthen banks, dusty in summer and muddy in winter, and unfit for anything but camels and donkeys. Now the road from Cairo to Alexandria has been repaired, parts of it are macadamised, finger-posts are erected, and motor cars can do the journey of about 120 miles in six hours. To those who know what motoring in the Delta was like even a year ago, the fact will speak for itself."

## The Late Sir Charles Rose, Bart., M.P.

WE regret to announce that on Sunday last Sir Charles D. Rose suddenly passed away in his 66th year. He died in his car as he was being driven from the Hendon flying ground to his town residence. A short time before he left Hendon he had made his first flight as a passenger in an aeroplane.

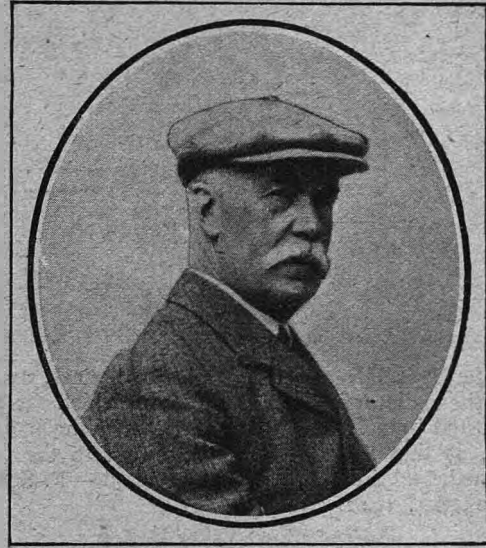
He was one of the most respected and valued members of the committee of the Royal Automobile Club, and was chairman of the Club prior to the election of the late Prince Francis of Teck. As a chairman Sir Charles Rose was remarkably capable, and there is no doubt that no one has ever occupied the position who has been better able to combine with the permission of full and free discussion a quick and easy despatch of business. In his personality he was beloved of all: his tall, upright figure was no less striking than his unvarying courtesy and natural distinction of manner.

By profession he was a banker, but he retired some sixteen years ago. Apart from his fame on the turf he was well-known as a yacht owner and as an enthusiastic tennis player; he also hunted in his younger days.

To motoring he has been a true friend, and has owned and driven many fine cars from the time he first joined the Royal Automobile Club in 1903, of which club he was a life member.

He represented Newmarket in Parliament, and, in addition to his parliamentary activities and his R.A.C. committee work, he was, also, chairman of the Royal Aero Club, a member of the Jockey Club and of the National Hunt Committee. In him motoring and sport have lost not only an enthusiastic votary, but

one whose intelligence and other gifts will make it hard indeed to replace, as Sir Charles was never idle, and the volume of voluntary work which he undertook on behalf of the subjects in which he was interested was extraordinary.

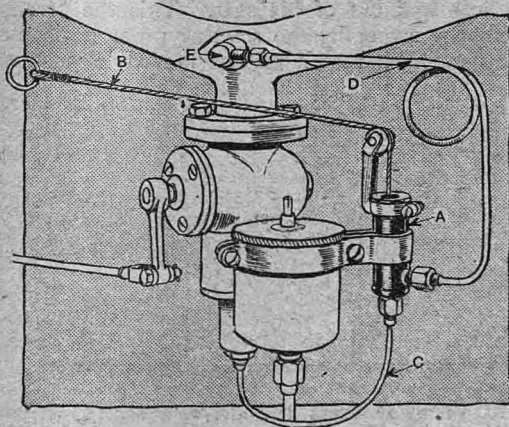


The late Sir Charles D. Rose, Bart., M.P.

He lost two of his sons in the South African War, another was killed in a motor accident in 1908, and he is succeeded by his son Frank Stanley, of the 10th Hussars.

## An Aid to Engine Starting.

This French invention for rendering starting easier consists of a small pump, which may be operated from the dashboard or neighbourhood of the starting handle, whereby a small quantity of petrol can be sprayed into the inlet pipe. The pump is indicated at A, and is



Sketch of the petrol starting pump fitted to a carburettor.

- |                                  |   |
|----------------------------------|---|
| A, pump                          | D petrol pipe between pump and induction branch |
| B, cord operating piston of pump | E, injector in induction branch                 |
| C, petrol pipe to pump           |   |

carried by a clip attached to the float chamber and adjustable round the float chamber to suit different engines. The pump plunger is actuated by a cord B, which when pulled outwards sucks petrol along the

tube C from the neighbourhood of the jet or actually from the float chamber. When the cord is released the pump piston is pushed downwards by a spring, and the petrol is forced along the tube D to the injector E. This is attached to the inlet pipe, and it comprises a pair of spraying outlets adjustable by a single needle valve and so set as to spray the petrol up both branches of the induction pipe when fitted, as shown, at the junction of the branches.

The induction pipe is in this way filled with vapour without one having to undo the bonnet to flood the carburettor or to inject petrol through the compression taps: This device somewhat resembles a device described by a correspondent on page 313 of *The Autocar* for August 17th last, and is made by Comptoir des Inventions Pratiques, 265, Boulevard Péreire, Paris.

## What is an Accident?

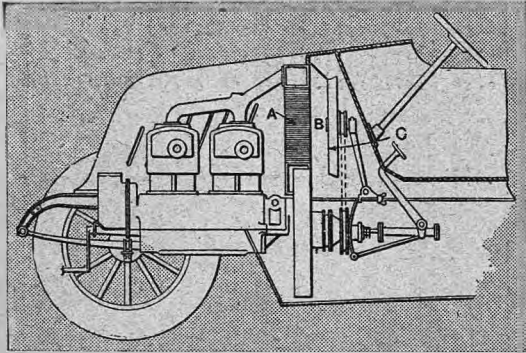
Some discussion recently took place during the hearing of a motor case in an American court as to exactly what constitutes an "accident." The judge elucidated the matter in a manner that left very little room for further controversy by defining an accident as "such an unexpected catastrophe as occurs without anyone being to blame for it; that is, without anyone being guilty of negligence in doing or permitting to be done, or omitting to do, the particular thing that caused such catastrophe."

# Some Recent Patents.

By Eric W. Walford, F.C.I.P.A.

## Improved Radiator Arrangement.

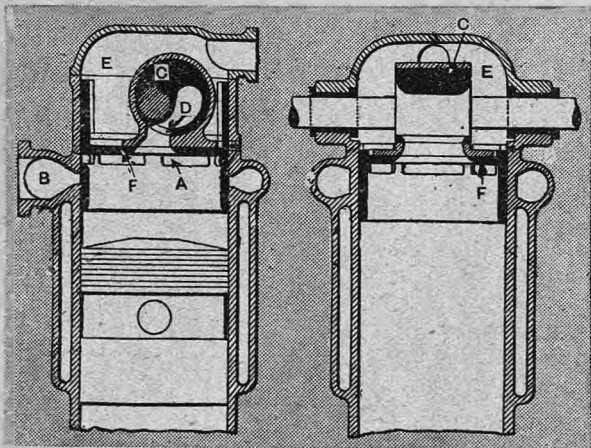
It has always seemed somewhat of a mystery why so little precaution should be taken to protect the engine and radiator from mud. In this case the



radiator A is located underneath the bonnet, and behind the radiator is a channel B from which the air is exhausted by a fan C. The bonnet and the body are flush, so that a perfectly smooth front to the car is obtained, and the radiator well protected.—F. Schultz, No. 25,304, 1912.

## An Ingenious Valve Design.

In this ingenious slide valve engine a vertically sliding sleeve member is moved endwise in the cylinder to bring the ports A opposite the exhaust outlet B at the right periods. This movement is effected through an eccentric C, and it will be seen that the eccentric is hollow and is formed with a slot D in its periphery which communicates with the combustion chamber, whilst the open ends of the eccentric are in communication with the chamber E to which the inlet gases are admitted. As the eccentric rotates the slot D comes opposite the port leading to the combustion

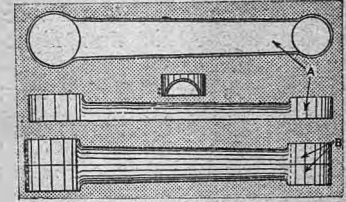


chamber and inlet is effected, whilst subsequently the sleeve is lowered by the eccentric so that exhaust takes place. One of the chief features is that the web F of the sleeve valve member, which constitutes the top of the combustion chamber, moves vertically so that the compression space varies during the cycle. At the end of the exhaust stroke the compression space is at a minimum, whilst during the suction period the web F rises so that a maximum volume of gas is drawn in.—H. Huckel, No. 15,994, 1912.

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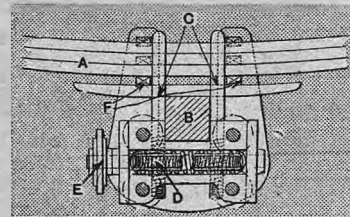
## Connecting Rod Construction.

Light hollow connecting rods are formed of stamped steel by knocking blanks to the shape shown at A. Two of these blanks are then put face to face as shown at B, and their abutting faces are joined together by acetylene or other welding. A bush is then inserted, and, if necessary, a tube for conducting oil to the gudgeon pin.—H. H. Patrick, No. 12,118, 1912.



## Spring Adjustment.

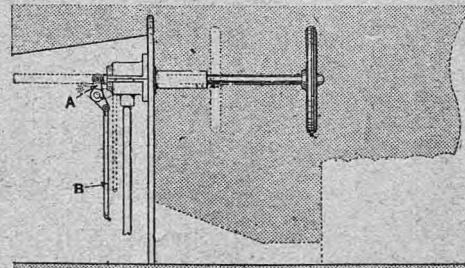
This device, although somewhat complicated, is interesting as being one of the few inventions which enable the main vehicle springs to be adjusted according to the load. The spring leaves A are held



down on to the axle B by the use of staples C, and the nuts on these staples are constituted by a pair of worm gears D, which, when actuated by rotation of the hand wheel E, causes the staples to rise and fall. Interconnected is screw gearing which forces wedges F between the spring leaves, starting first with the lower pair. Therefore as the hand wheel is turned in one direction the spring staples are slacked off and wedges F forced in between the two lower spring leaves so as to isolate the lowest from the remainder. Further operation slacks off the staples and brings another pair of wedges into the operative position.—Société Houdaille and Sabot. No. 6,390, 1912.

## Steering Gear.

One of the objections to the ordinary steering wheel and pillar is that it is in the way when the driver wants to get into and out of his seat. This the inventors overcome by arranging the steering pillar horizontally and so forming it that it can be moved telescopically



towards or away from the driver's seat. When in the position shown in dotted lines it, of course, renders access to the driver's seat very easy. This movement is permitted by a key and slot or splined connection with the steering gear proper, and the same movement is adapted through the rocking lever A and link B to apply the brakes so as to form a safety device when the car is left unattended.—J. E. Lees, J. M. Hewitt, and A. J. Drake, No. 3,904, 1912.



## The R.A.C. Road Guides.

### A New Scheme Proposed by Some Associated Clubs.

IN our issue of April 12th we published a letter from the Nottinghamshire A.C. on the subject of the R.A.C. road guides, this letter having been forwarded by the honorary secretary of the Nottinghamshire Club to all the clubs associated with the R.A.C. The letter may be summed up in the statement that the Nottingham Club did not require the road guides, and thought the scheme was superfluous. This expression of opinion had been brought out by a suggestion from the General Committee of the Royal Automobile and Associated Clubs to the effect that, in addition to the 5s. per annum per member paid by each associated club to the General Committee, an increase of 5s. 6d. per member should be guaranteed, so that the additional cost of the road guide scheme might be met; it was not proposed to call up the full sum of the extra 5s. 6d. unless necessary. It was also suggested by the General Committee that the associated clubs should give up the present commission, or grant, they receive of 5s. per member on each individual associate in their territory who joins the R.A.C. For instance, if a motorist living in the territory of the Nottinghamshire A.C. should become an individual associate of the Royal Automobile Club the Nottingham Club has hitherto received a grant of 5s. because it represents the R.A.C. in that district and, as its representative, does some of its work.

It will, therefore, be seen that the proposition from the General Committee of the R.A.C. and Associated Clubs was (1) that the payment to the parent club should be doubled, and (2) that the grant from the parent club to the provincial club on each individual associate should no longer be paid. The Nottingham Club did not consider the guides worth paying extra for, and, therefore, its committee decided it did not approve of any extension of the road guide scheme.

Since the Nottinghamshire A.C. letter was sent to the associated clubs a great deal of correspondence has taken place between them, and there have been meetings both of individual committees and of several of the clubs collectively, and the upshot has been that the Bradford Automobile Club has called a meeting of the representatives of associated clubs which is to be held in London immediately prior to the next General Committee meeting of the Royal Automobile and Associated Clubs, and which will take place on May 8th at 11 o'clock at the Criterion Restaurant. The idea is that the associated club delegates shall meet and decide there and then what they will do before going to the General Committee meeting in the afternoon.

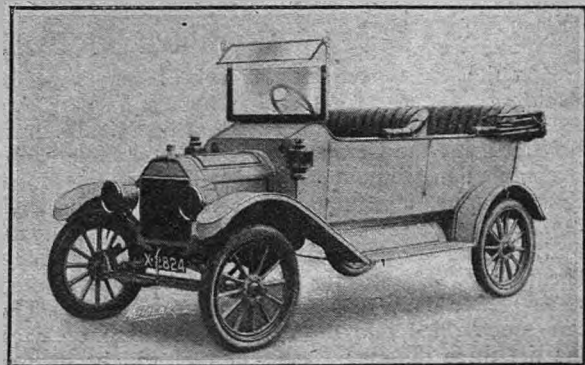
A number of schemes have been proposed by various clubs, but, so far as we can gather, with one or two exceptions the twenty odd clubs which have prominently associated themselves with the proposed alternatives are substantially in agreement with the Bradford scheme. It may be summarised in the statement that the associated clubs are ready and willing to pay five shillings a year as hitherto per member, but to dispense altogether with the touring guides, as they do not want them. It is suggested that the clubs will agree to forego the 5s. capitation fee, or grant, from individual associates. It is proposed, too, to bring the subscription of the associated clubs to one level; that is to say, while most of them pay 5s. per member per year to the General Committee, some pay considerably less; in fact, speaking broadly, it may

be said that as the distance from London increases so does the capitation fee decrease. This is not a hard and fast rule, but it is near enough.

It should be understood it is not proposed that the touring guides should be abolished, but simply and solely that the associated clubs should have nothing to do with them and expect nothing from them: they leave these guides to be run by the individual associated members of the R.A.C. and the R.A.C. itself.

There are other minor propositions, but these are the chief constructive suggestions that have been made. For instance, it is also suggested that the great bulk of the associated clubs do not want the *R.A.C. Journal*, and that money could be saved by not sending it to them, but the real kernel of the whole thing is, undoubtedly, the suggestion that the touring guides should be altogether cut off from the associated clubs, who paid 5s. per head before they were instituted, and who are willing to go on paying it in the future and to dispense with the touring guides' services. Among the clubs which appear to be more or less in agreement with the main principles of such a scheme are the Devon and Cornwall, South Wales, Norfolk, Bradford, Coventry and Warwickshire, Nottinghamshire, Hampshire, North Eastern, Doncaster and District, Halifax, Harrogate and District, Huddersfield, Hull and District, Lancashire, Liverpool, Manchester, and Yorkshire.

A good many clubs have not yet finally decided their policy, and others have declared themselves in favour of the propositions of the General Committee, but, no doubt, by the time of the preliminary meeting next month at the Criterion, every club will have come to a definite decision as to its general policy in the matter. The whole thing is somewhat difficult to follow, because so many people do not understand the differences between the full R.A.C. member, the individual associated member, and the associate club member. They would also find themselves unable to explain the difference between the Committee of the Royal Automobile Club and the General Committee. In regard to the latter, it may be well to explain once again that the General Committee is not the Club Committee, but a committee composed of representatives of the R.A.C. and all its associated clubs, and it is by this General Committee that the propositions which are not acceptable to many of the associated clubs were made.



A five-seater touring body which Messrs. George and Jobling, of Newcastle-on-Tyne, are fitting in large numbers to Ford chassis.

## The 10 h.p. Turner Light Car.

### An Appreciation of its Running.

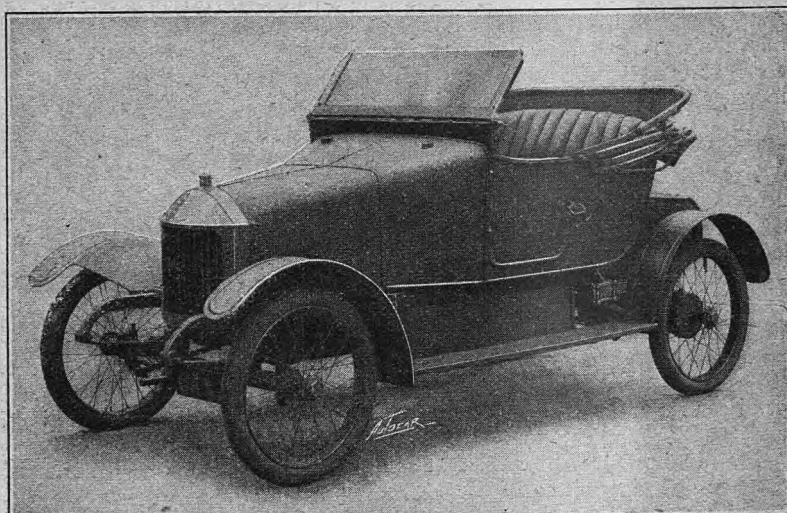
**O**WING to the great attention which is being paid at present to the development of the miniature car, the type a size larger has been rather lost sight of; the car which, for want of a better expression, might be characterised as more generously proportioned than the strictly miniature variety.

Such a car is the 10 h.p. Turner, which, while having several features more usually met with in small car practice than in that of larger cars, nevertheless has many attributes of the latter. We recently put a 10 h.p. Turner through its paces over a 100 miles route of average road including one or two steep hills, and, on the whole, we were favourably impressed by its performance.

Before proceeding to deal with its running it may be well to mention that it has a four-cylinder water-cooled engine in *monobloc* form with bore and stroke of 60 and 100 mm. respectively, and the inlet and exhaust manifolds cast integrally with the cylinders. All the cams are on one side, and are driven by silent chain gear, as also is the magneto. Lubrication is carried out by means of a pump driven off the camshaft delivering to troughs under the big ends, and cooling is on the thermo-syphon system. The clutch is of the leather cone variety, and the gear box provides three speeds and a reverse, operated through a gate change. The back axle is mounted with a worm drive, and is provided with a substantial torque rod. The tyres are heavy type 750 x 80 mm., and control is entirely by means of an accelerator pedal, the ignition point being fixed, a small button on the footboard providing a means of setting the slow running position of the throttle.

To return to the running of the car. The engine was flexible and pulled well on top gear at slow speeds, but we must say that we do not make a practice of over-driving small engines in this manner. At high rates of revolution the engine impressed us as being well balanced and free from any pronounced periodicity within the speed range of the car, which

approached 40 m.p.h. as a maximum. The clutch was smooth and took up the drive gently, an ample leverage to the pedal allowing a gradual engagement. The gears changed easily and without shock, and were up to the average in point of silence on second and the direct top, but the low gear was inclined to be other than quiet. The worm-driven axle was, of course, quiet. The springing was quite good, and the steering, although inclined to be rather quick, was



A view of the 10 h.p. Turner light car, dealt with in the accompanying letterpress. It is made in two types, with three and four speeds respectively.

not too much so, and was sensitive and handled easily. On steep gradients the engine pulled well on second gear with three up, and required first for only the last few yards of Stoneleigh Hill, between Coventry and Leamington, which is 452 yards long, and the steepest portion 1 in 9.34. At high speeds the car held the road well (wheelbase 8ft. 1in., track 4ft. 0in.), and showed no tendency to yaw suddenly when feeling the camber of the road. The brakes were ample as we proved on Edge Hill. The price of the car ready for the road, as shown in the accompanying illustration, is £212. A sporting model is made with four speeds, larger tyres, and detachable rims, and sells at £250.

### Comparative Fuel Tests in Germany.

That the keen interest which is being shown in seeking a substitute for petrol is not confined to this country is evidenced by the fact that on Monday last, the 21st inst., the German Imperial Automobile Club, in conjunction with the German Society of Motor Manufacturers, inaugurated a series of comparative road tests of petrol of a specific gravity of .710-.720, heavier spirit (.750-.760) and benzole (.880-.890). The trials will last nine days, each vehicle entered making three daily runs on each of these fuels. The cars are divided into three groups, so that on each day the three different classes of fuel will be in use. Thus the group using petrol on the first day used heavy spirit on the second and benzole on the third;

the group starting with heavy spirit followed with benzole and petrol, while the section starting with benzole used petrol on the second day and heavy spirit on the third. Those entering cars for the tests were allowed to provide three separate carburettors for use with the different classes of fuel, or, in the alternative, they might use and adjust a single carburettor. The trials are being conducted not so much as a competition between rival systems as for the purpose of procuring official data of the relative consumption and cost of the different fuels, based on the aggregate mileage of the total of cars in each group. The daily runs will be made over the same course.

## Endorsements upon Licences.

### Agitation by Chauffeurs for Automatic Cancellation.

**T**HE National Society of Chauffeurs has called a mass meeting at Caxton Hall for Wednesday, April 30th, which is to be followed by a petition to Parliament. The object of the meeting is to bring prominently to the notice of all paid drivers, whether in private or public service, the desirability of the Motor Car Act being so amended as to bring about:

(1.) The automatic cancellation of endorsements recorded upon motor driving licences.

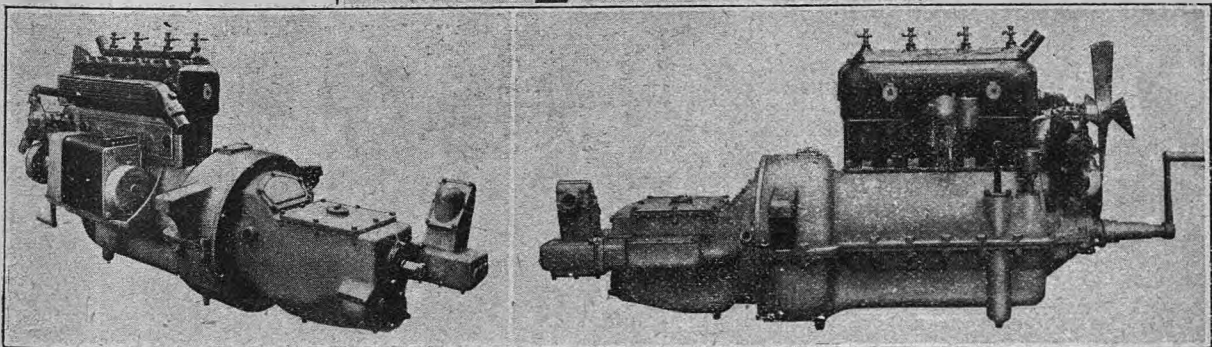
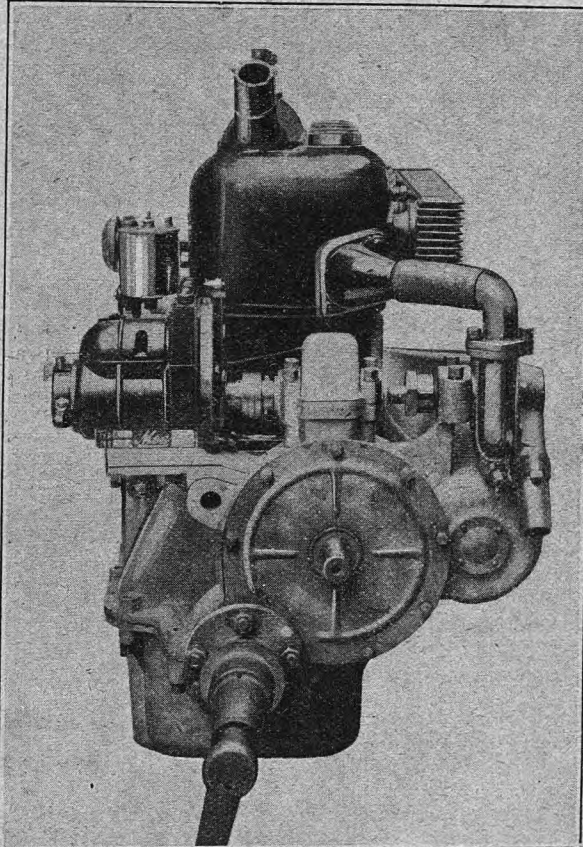
(2.) That only offences involving actual danger or injury to persons shall be endorsed upon driving licences.

(3.) That the owner of a car shall be held responsible for all excesses of speed committed by his servants, except in the event of the driver being the sole occupant of the car or of the car being lent or hired, in which case the person under whose orders the chauffeur is driving shall be held responsible.

We are entirely in sympathy with (1) and (2), as it seems reasonable that after a certain probationary period the endorsed licence should be automatically cleaned. It is also essentially reasonable that trivial infractions of the letter of

or to have a duplicate dial in the back of the car and some means of putting on the brakes or otherwise moderating the speed, it is absurd that the owner should be held responsible.

With a lent or hired car the case is even more difficult, as the hirer or borrower is very often entirely ignorant of speed altogether, and has not the faintest idea when the legal limit is being exceeded. At the same time, it is clear enough where the hardship to the paid driver comes in under the present system, as there are owners who instruct their men to drive fast and who would not keep them if they did not drive fast, and it is very hard that the chauffeur should have to pay the fines and have his licence endorsed in such cases, more particularly as cases have been known in which, after a driver has been fined for exceeding the legal limit at his master's instructions, he has been discharged and a fresh man taken on. Under the circumstances, we do not think that motor owners can be expected to cooperate with regard to No. 3, and, indeed, we are not by any means



*A NEW MODEL ITALIAN CAR. Known as the 20-30 h.p. Storero, it has four cylinders with bore and stroke of 95 x 130 mm., multi-plate clutch, four speeds with direct drive on third and two lay shafts. The gear box and engine are bolted up together on the unit system. The wheelbase is 10ft. The car will make its debut at the Turin Exhibition, and will be shown by Garages Storero, 55, Via Madama Cristina, Turin.*

the law, such as a dirty number plate or an extinguished back light, should not be recorded on the driving licence. On the other hand, with regard to (3), there are many difficulties in the way. For instance, we know a good many owners, particularly ladies, who have given strict injunctions to their drivers never to exceed twenty miles an hour, yet the drivers do exceed this speed, and, unless the owner is to sit beside the driver and watch the speedometer

certain that it would be to the advantage of the drivers themselves, as a good many people would drop motoring altogether under these conditions, and there would, consequently, be a considerable number of men thrown out of employment. The National Society of Chauffeurs can surely find some way of getting round the difficulty, a way that will be fair both to employer and employed; it seems to have been forgotten in regard to No. 3 that there are two sides to the question.

## British Motor Boats and Engines at Monaco.

### Many Successes in the 21-foot Class.

THE boats with Sunbeam and Wolseley engines which competed at the recent motor boat meeting at Monaco have been very successful; in fact, in their class they seem almost to have swept the board. In events for 21-foot boats, the Prix de Premier Pas was won by the Sunbeam, the Wolseley

being second; for the Prix de la Méditerranée the order was reversed, while in the Grand Criterium for 21-foot boats, a scratch event, three Sunbeam-engined boats were respectively first, third, and fourth, the second place being taken by the Wolseley boat *Angela II*. In another race, the Prix des Dames, the Sunbeams were first and third.

*Angela II*, was the only boat at Monaco fitted with Wolseley engines, and in the Coupe des Nations, the international event for unrestricted racing boats, it completed the long sea course of 94 miles in 3h. 13m. 20s., averaging nearly 25½ knots. Dr. Morton Smart, the owner, was awarded a special medal as a recognition of the boat's splendid running. As it ran against boats of from ten to twenty times its horse-power, it naturally had no chance of winning this event.

The Sunbeam engine was an eight-cylinder V type, identical with the Sunbeam aero engine except as to the water jackets, and its uniform running in all the boats in which it was fitted was little short of remarkable.

The Sunbeam success in the Grand Criterium almost equals the success of the Sunbeam cars in last year's Coupe de l'Auto.

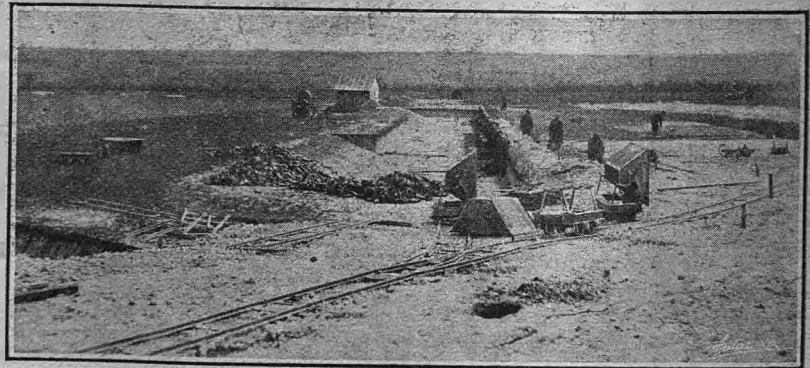


A Daimler car, the property of Colonel Lee, Crowood, Ramsbury, Wilts., which was driven into the river Kennet owing to the driver mistaking the river for the road at a sharp turn in the latter. The mishap occurred at Knighton, which is near Ramsbury on the Hungerford-Ramsbury-Marlborough Road. It required the services of a traction engine to release the car from its predicament, from which it suffered no harm other than broken windows and a cargo of mud.

### The 1913 Michelin Guide.\*

A COPY of the issue of this exceedingly useful and most commendable work is just to hand, and is found to have been thoroughly revised, with many additions and improvements. Ten new excursions and no less than fifty new town plans have been added, while special signs are appended to those garages which are open on Sundays and all night. Full details are given concerning 500 additional recommended hotels. In the wonderfully complete gazetteer a pile of information with regard to each place is packed into a wonderfully small compass by means of succinct and suggestive signs. We will take the familiar town of Guildford as an example. For instance, we find that imprimis, of course, there is a Michelin stockist in the town, that it is in Surrey, is to be found on map 29 in the book, is the county town, has a population of 23,823, has a market Tuesday and Saturday, and that Thursday is the early closing day. Then a block map of ½ in. to a mile scale is given, which shows the ways in and out of the town, with routes marked to refer to itineraries going to Croydon, Brighton, Leatherhead, Worthing, Portsmouth, Winchester, Basingstoke, and so on. The three best hotels are given with their tariffs, garage accommodation, telephone numbers, and telegraphic addresses. Then comes a list of repairers, the firms stocking Michelin tyres being, of course, specially noted. Double page tinted maps are given of Aberdeen, Birmingham, Cambridge, Edinburgh, Glasgow, Leeds, Manchester, Newcastle-on-Tyne, Oxford, and Sheffield. These maps are on a sufficiently large scale for their purpose. The town plans, to the already large total of which fifty have

been added, are too numerous to mention. Suffice it to say that practically a plan of every town in the United Kingdom with anything like a difficult passage is given. The sectional maps of the whole country are to a clear scale of fifteen miles to the inch, they are miled between points in figures, and serve admirably for main and main cross-road driving. Part III. is replete with useful touring information, a full



PREPARING FOR THE FRENCH GRAND PRIX ON JULY 12th.  
Clearing the ground for the supply pits, grandstand, enclosures, etc.

list of ferries being given; also complete information as to steamship communication and the water transport of motor cars. There are yet many valuable features of this astoundingly complete book, which we must leave to discovery by our readers. This work, which may almost be said to be worth its weight in gold to the tourist, can be obtained by motorists from Michelin stockists free of charge, or will be sent by the Michelin Tyre Company, Ltd., 81, Fulham Road, post free, on receipt of 1s. 3d.

\* "The Michelin Guide to the British Isles, 1913." The Michelin Tyre Co., Ltd., 81, Fulham Road, S.W.

## The Del Monte Process.

By Alex. E. Tucker, F.I.C.

THE attention which has, very naturally, been given to the prospectus and advertisements of this process, warrant me in adding such information and offering such opinions as may assist your readers in forming a proper appreciation of them. Cheap motor fuel has to and will come; its necessity increases daily, but the public, from this fact alone, should be circumspect. The original company to exploit the Del Monte process was formed in June, 1911, and seems to have been based on the applications for patents taken out by Mr. Del Monte in the island of Cuba. The claims in these are "for the obtaining of a new product with illuminating, lubricating, calorific properties, and many others suitable in art and industries which replace oils and other analogous products which are obtained from petroleum, and which possess all the same qualities and composition."

In the English specification of August, 1911, the claims are as follows, and from these the merit of novelty may be determined:

"1. In a process for the treatment of carbonaceous materials in which a pre-heated gas substantially permanent under the conditions of the process is employed as a carrier for the volatile matters, the heating of the said gas to a temperature equal or substantially equal to the temperature of the material at the point of contact prior to bringing the said gas into contact with the material.

"2. A process as specified in claim 1 in which the material is treated in the manner specified at gradually increasing temperatures.

"3. In a process as specified in claims 1 and 2, allowing the non-condensable products to act as, or together with, the carrying gas, as and for the purpose specified."

These claims are very difficult to understand, and they become more so when taken in conjunction with other details of the specification, thus I find the inventor states "the present invention refers to the fractionating of the products evolved from the material treated during the gradually increased heating of such materials." The advertisement lays stress on the fact that the fuel is continuously charged. It is, therefore, difficult to understand how the heat of the retort can be gradually increased. Later the inventor says he "finds ordinary coal gas suitable for the purpose of carrying off the volatile distillates." Apparently an ample supply of gas should not fail to be produced for such purpose.

However, there is one point in which the reader of the specification is not left in any doubt, as it is repeatedly referred to and claimed, *i.e.*, he insists that the gas entering the retort is to be at a temperature equal, or substantially equal, to the temperature of the material operated on. In the advertisement we have the advantage of a block sketch of the apparatus which substantially was that used at Redditch for practically testing the process. This was intended to treat from 4 to 5 tons of coal per day. It is stated that it is in no sense a plan of the retort itself as used in actual practice. This reservation is obvious to anyone familiar with such plant, because no details are indicated as to how the retort is heated. The heating was effected by means of an exterior furnace fed with coke. This heated a coil of piping surrounding the retort,

and through this coil gas could be passed to and through the coal treated. Now the amount of gas passing would obviously absorb a considerable amount of heat, and if the flow of gas were small it is also obvious that the coil could not be kept sufficiently cool to prevent rapid destruction. Further, if coal gas or any hydrocarbon gas is passed through red hot iron tubes it is decomposed with deposition of carbon. The coil would, therefore, in time get choked, while the metal of the coil would become super-saturated with carbon and become rotten. It is stated that the average coal distilled by this process yields from 6,000 to 7,000 cubic feet of gas, and that it is proposed to use this gas for heating the retort instead of using coke in the furnace previously referred to. The assumption here is that this gas would have a similar calorific value as coal gas, but it has nothing approaching this value. The elements providing the greater part of the heating value are left in the so-called coke; indeed, at Redditch it was difficult to keep the gas alight. I therefore question very much if the said 6,000 to 7,000 cubic feet would be enough to heat the apparatus and the ton of coal to the required temperature, although this is so low, and if it did so heat it, what is similarly to heat up the succeeding charge of coal?

The details of the retort are remarkable. It is claimed that the coal is charged continuously into it, the coke being withdrawn in like manner from the bottom, and it is stated that the difficulty of reaching the "centre of the retort is overcome by raising the whole of the coking mass to an equal temperature inside and outside by passing gas through the mass of coal being treated, thus maintaining equal temperatures throughout the entire section," and later, "the heat being much higher at the bottom than at the top of the retort, the coal cokes gradually, as it approaches the lower level, and by the time it reaches the bottom, is in a perfectly coked condition." This latter paragraph is extraordinary because it seriously implies that coke is made at considerably under a red heat; no portion of the retort can possibly be at even a red heat, because the plates of which it is constructed would collapse. Nothing short of a bright red heat will give a coke with any coal, and to call the product which would be obtained under such conditions coke is altogether mistaken. I have no hesitation in expressing the opinion that in the open market it would have considerably less value than the material it was made from. I notice its value is put at 24s., while the slack from which it was produced, and from which heat-producing products have assumedly been removed, is charged at 12s. 6d. Again, the yield of coke as shown is 75% of the slack; this yield is considerably higher than obtains in the coke industry, and if this figure has been obtained by the expert employed to report on the process it proves that a large amount of valuable volatile matter has been retained in this residue which in better designed plants would have been recovered in the form of valuable products. Reverting to the points of equal temperature of the coal operated on and the gas passed through it, on which the inventor insists so strongly, it needs little thought to decide that with the fuel being continuously fed from the top and from the back, that bare iron plates intervene between the coal and the furnace heating the coil, such equality of temperature is absolutely

*The Del Monte Process.*

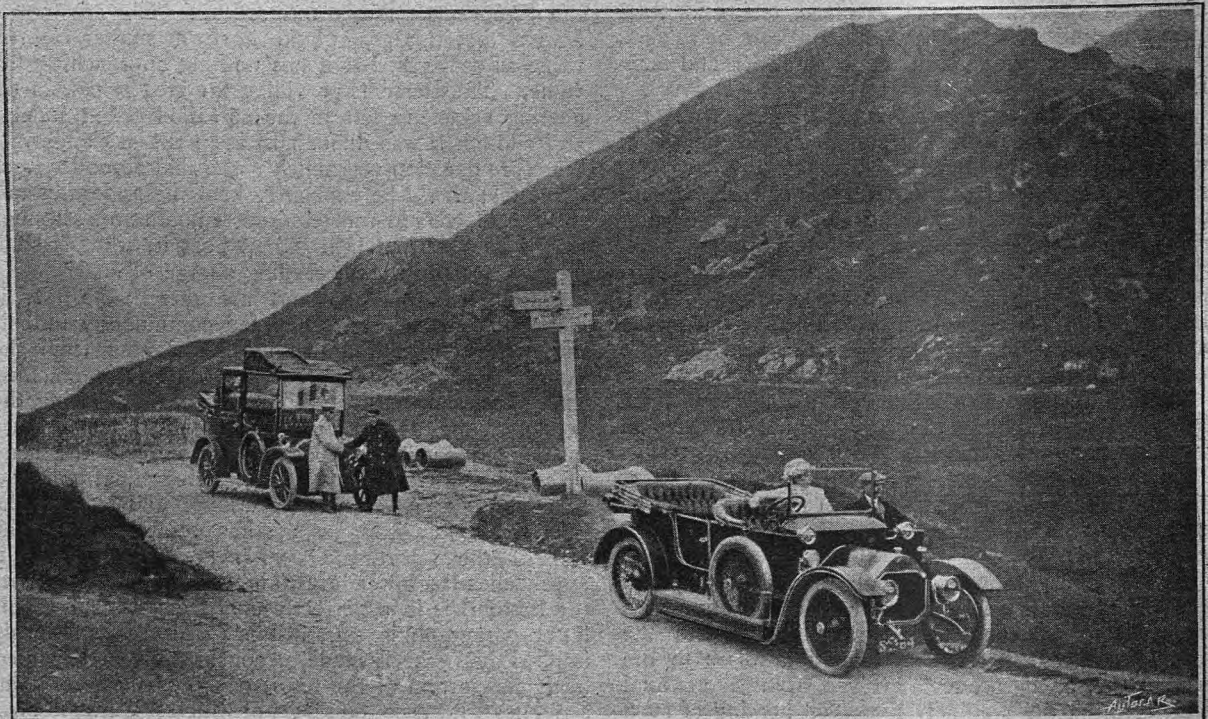
impossible of attainment. One might easily anticipate what actually occurred at Redditch, *i.e.*, that the material next the plates might be partially, though very partially, caked, while the centre, if continuously fed, or even if nobbled, would be comparatively cool.

Dealing with the immediately enticing claim of the promoters, *i.e.*, in respect to the process being a source of motor fuel, it will be apparent, from the block sketch alluded to and the specification itself, that there is no detail in the plant or process which would bring about a different result than that which would be obtained if the same fuel were put into an iron box externally heated and provided with a tube which allowed an inert gas to pass through the fuel. The temperature, according to Mr. Del Monte, to which coal would be raised must not exceed 760° Fahr. (say 405° C.) Such conditions would represent fairly those

carried out into practice by Mr. Del Monte with his Redditch plant. Benzole and other distillates are commercially produced by the destructive distillation of coal, and it is quite misleading to speak of petrol as a possible derivative of coal in the way so often stated.

Such derivatives were not produced at Redditch in the large scale test made there in March, 1912, except in quite minute quantity, although 25 cwt. of selected slack was treated and no less than 26 cwt. of coke was used in treating the retort.

In the face of these facts, the statements appearing in the advertisement, *i.e.*, that the plant fully justified every claim of its inventors, etc., and that "all the experiments," if they include that made at Redditch in March, 1912, "proved highly successful," are quite incomprehensible.



**MOTORING IN THE HIGHLANDS.** A Valveless car and a F.I.A.T. car at the top of Rest-and-be-Thankful hill, Glencroe, on the road between Arrochar and Inveraray, Argyllshire.

### Speed Limit Inquiries.

An inquiry was held by the Local Government Board at Barnes recently in connection with an application to revoke a portion of the existing ten-mile speed limit area at Barnes on the ground that the road in respect of which the speed limit was originally imposed had since been widened and straightened and rendered quite safe for traffic. Evidence was given for and against the revocation, and the matter is under consideration by the Local Government Board. This is the first inquiry of the kind ever held, although in one instance (Handcross) an order revoking a portion of a speed limit previously granted has been made without an inquiry, the applicants in that case being the East Sussex County Council. The decision of the Local Government Board will be awaited with interest, and may probably be regarded in the light of a precedent for future applications for the revocation of speed limits in places where they are unnecessary.

A Local Government Board inquiry was also held at Barnes into an application for a speed limit on a portion of the Lower Richmond Road, a portion of High Street, and a portion of Sheen Lane, Mortlake.

Prior to the inquiry the representatives of the applicants and the objectors effected a compromise the Surrey County Council withdrawing from the application a length of road which it was contended by the R.A.C. and the A.A. representatives was perfectly safe, and the objectors withdrawing their objection to the rest of the application.

A Local Government Board inquiry was held early this month at Letchworth into an application made by the Herts County Council for the imposition of a ten-mile speed limit for motor vehicles on certain roads in Letchworth and Norton village, and the matter is now under consideration by the Local Government Board.

## On the Road.

### East Anglia as a Touring District. Dangerous Tram Car Stopping Places.

HAVING taken of late a little tour in what is called "East Anglia," once more I desire to impress on motorists who want to see their country that it is a part of their native land that ought never to be missed. In fact, except that there are no hills to describe as such, it is as pretty as any other part, while there are some bits of it that might have come direct out of other countries.



Arrangements were made for stalling a great number of cars in the barrack yard of Wellington Barracks, Knightsbridge, on the occasion of the marriage of Capt. T. H. Rivers Bulkeley and Miss Evelyn Pelly in the Guards' Chapel on Saturday last.

To begin with, I drove myself in a little car by such a way as to miss London, and may I compliment Hertfordshire on its improved roads? The day was wet, there was mud about, and I had no non-skids. But not once was there any tendency to slide at all, although I cannot yet quite rid myself of the French habit of trying to pass other things on the wrong side of the road. I intended to fill up at Bishop's Stortford, but about a mile away I ran dry of petrol and had no spare tin. Therefore I pushed the Zedel I had on my own, being thankful that it was the smallest one of its kind, and because it was market day I had to endure all the jeers and sarcasms of returning farmers, as I have not done for years and years. But I am excellent at repartee when annoyed, and some of my replies quite cheered me up.

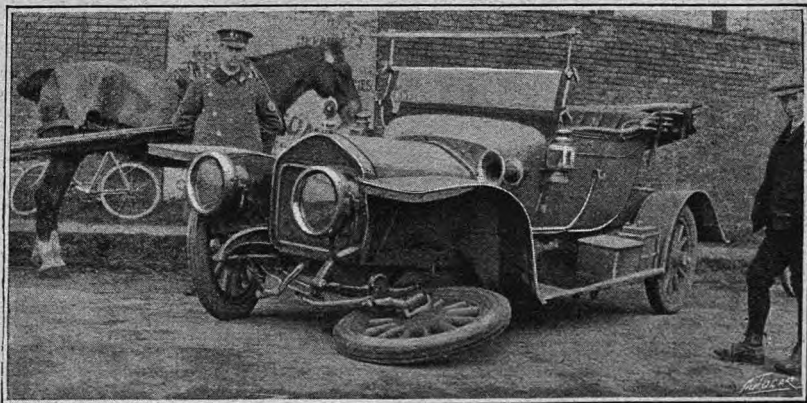
Then I went on to Cambridge, and I found at the Lion Hotel in Petty Cury a substitute for my dear old Hoop Hotel, now numbered with the past and desecrated by being turned into a motor garage. Surely that garage must be haunted by ghosts of the past if ever any place was! But at the Lion the food and quarters are excellent, and the surprise packet of all was the extremely moderate bill presented to me. Such moderation

amazed me because I am used to the charges made at many University hotels and the absurd excuses offered for them. There is also at the Lion a place to sit after dinner where one can smoke and watch the latest things in undergraduate socks.

I may be prejudiced, but I am of opinion that Cambridge is vastly more picturesque than Oxford. At Cambridge one can get into an atmosphere of colleges; at Oxford every peep or glimpse includes a sky-sign or a shop-window. Take, for instance, the view from the hideous Garret Hostel iron bridge just before the leaves come out on the Hall chestnuts. Can any other be more perfect and include so many glorious "bits"? Yet, even wonderful as it is, there is room for improvement. The powers at Trinity Hall should pull down its ugly high river wall and make it level with that of the Master's garden. Clare dons, too, ought to lay down their cabbage patch on the other side to grass; it is monstrous that a little economy like that should so grate on so much elegance. But, as we used to say, dons will be dons.

From Cambridge to Ely the road is dull but very fast, and, of course, at the latter town the cathedral has about the third best site of all English fanes. Just now it is perhaps at its best, because one can view it across orchards in blossom and the haze of many old chimneys.

After which I came to Downham and Kings Lynn, which latter place is one of the quaintest towns in England. I have written of it before and stayed in it many times, but there seems always some new old thing to find, and the wide grey river is as un-English as any part of it. After Lynn I went on to Hunstanton—of which I have spoken before—but for the



**A REMARKABLE SKID.** This car, a Wolseley, for no apparent reason (so we are informed) turned a complete circle, hitting the bank at the side of the road. Notwithstanding the severe strain on the steering joints and front axle, which it will be seen is bent almost to a right angle, nothing was broken or cracked, a circumstance that speaks well for the quality of the materials put into Wolseley cars.

*On the Road.*

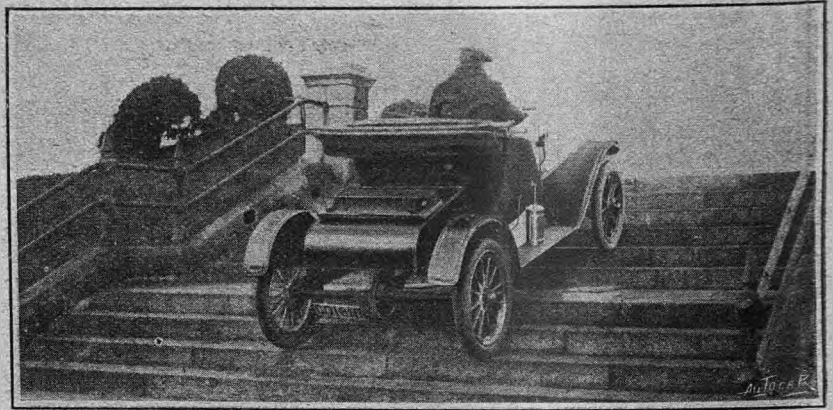
benefit of intending tourists let me tell of the excellence of Johnson's garage there and also of the delight of the Le Strange Arms Hotel, perched on the edge of two golf links and well out of the town and away from the noise of its summer trippers. Mr. Gray, who created it, is the type of the hotel-keeper we are going to get everywhere if we only keep on insulting the other type long enough. He knows what people want and what people dislike, and he is going to bring up all his nine sons to remove the reproach from English hotel-keeping. May he succeed, because success will mean the retention of thousands of pounds that motorists now spend abroad instead.

So much for Hustanton, although one could wish that it and its golf were ever at one's hand. From this haven I turned to Wisbech and lunched at that very old-fashioned hotel called the "Rose and Crown." Here there are vast cellars, and the landlord has gone in for making concrete telegraph posts. But the great object of interest in his hotel is the clock, and every year Mr. Tidman tells of the fabulous prices he refuses for it. I think it is the biggest grandfather clock that exists, though I know nothing about its interior economy.

Wisbech ought to have a society to boom itself. Holland, or the part of it that grows bulbs, sees to it that the world knows all about it. I believe special excursions are run to see the tulip fields in bloom; I know special posters of them all a-blowing and a-growing are scattered broadcast over all the stations. But at, and around, Wisbech there are fields of tulips and narcissi and many other flowers after their kind born to blush unseen while they are growing, all because there is nobody to tell how excellent and numerous they are.

I saw at Wisbech station some peculiar wooden and canvas packages. Curiosity led me to enquire and inspect, and I found that they contained new Darwin tulips from four to five feet each in height travelling up to London for exhibition at the fortnightly show

of the Royal Horticultural Society. The size of them amazed me, and I had not thought it possible that such enormous and odd-coloured ones could be grown or could look so well. Later on in the year Wisbech goes in for fruits, and I have seen huge strawberry fields covered with pickers, while equally large ones are given up to all other manner of vegetables. When I was there the inhabitants were in mighty dread of a frost, which the weather-wise regarded as inevitable from the portents; by this time I fear they have had it.



One of the standard type Ford cars used by Messrs. H. Andrew and Co., Ltd., of Plymouth, as a demonstration car, climbing the steps on to the Hoe at Plymouth. We are informed that the car has performed this feat on several occasions.

This Fen district is about the only flat area in Western Europe which makes little or no use of its waterways. If waterways are, as we are told by some, the most valuable means of transport that exist. Cambridgeshire and Huntingdon ought to be thriving places. But the boats that use the canals or "drains" are few, old, and small, and the River Nene that goes to Peterborough and beyond is often of no value at all. I can only put down the reason to the want of enterprise of the inhabitants, for they own every advantage that Holland has except the faculty to do things for themselves.

March, a little very flat town in the absolute middle of the Fens, is very dull and uninteresting, but the Griffin is—or used to be—an excellent hotel, and one where motorists were well looked after. Then comes Whittlesea, another place of departed glories with only the brick-making industry to keep it alive. Once upon a time its famous Mere was notorious for its insects, but now both are gone and only the names remain. Not but what last year's summer did not try to put back the old "Fen" régime, indeed much of the land around it has not even yet come back into civilisation.

Little towns like Ramsey, St. Ives, and St. Neots have all their interests, while, of course, to the north of Peterborough such places as Crowland, Boston, and Spalding need no advertising. Let me, then, again recommend tourists to visit this part of East Anglia, and if they incidentally want to find out how fast their cars can go they will have



MOTORS AND SPORT. The Cheriton (Wilts.) Otter Hounds. A hall at lunch time.



*On the Road.*

plenty of opportunities to let them out in perfect safety to themselves and the inhabitants.

So much for our empty districts, let us now pass on to the next tank and study a letter, signed "Pedestrian," written to a Scottish paper called the *Glasgow Herald*, a great journal which, I believe, sometimes has motoring articles in it, and also accepts advertisements of motors. It is too good to be dissected: I trust it may go in whole.

MOTOR DANGERS IN GLASGOW.

March 17th.

Sir.—I believe the magistrates of Glasgow are deliberating at present anent fresh legislation to minimise the slaughter of lawful pedestrians by the motoring snobocracy. Recently a distinguished lady citizen and an innocent school child

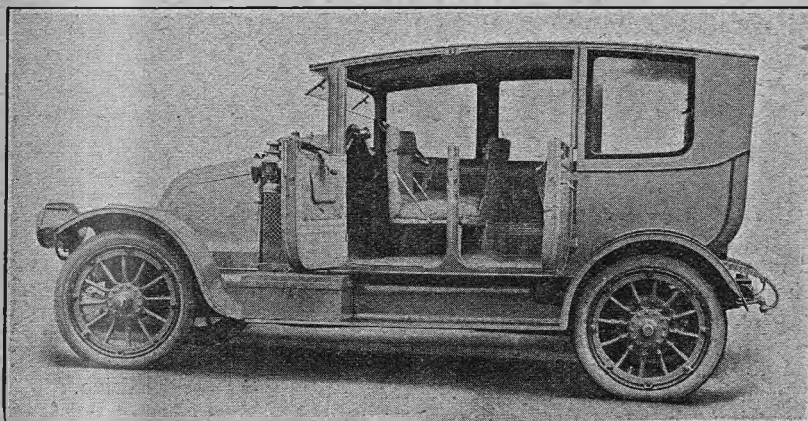
"Scots Wha Hae," etc., asserted its supremacy, and I realised it was once more a case of "do or die." So I did! I leapt a yard or so on to the car step and seized the rail, just in time to get a baptism of ink and stink as motor number two dashed past on the left of the car.

Here now is a concrete case of the motor danger in Glasgow, a sample of the wheeled hoodiganism that calls for immediate and drastic repression. The whole proceeding was a matter of a few moments. I am, fortunately, a man who has had various nerve-testing experiences, who has climbed Ben Nevis in a mist, and crossed the Carrick-a-Rede rope bridge many a time, and peered down the sulphurous throat of Vesuvius, so my nerves are fairly trained. But I have not the slightest doubt that if this experience had befallen a lady or a child, there would have been another "massacre of the innocents," and the driver would have blamed the pedestrian for "swithering," so that he could not pull up his car in time.

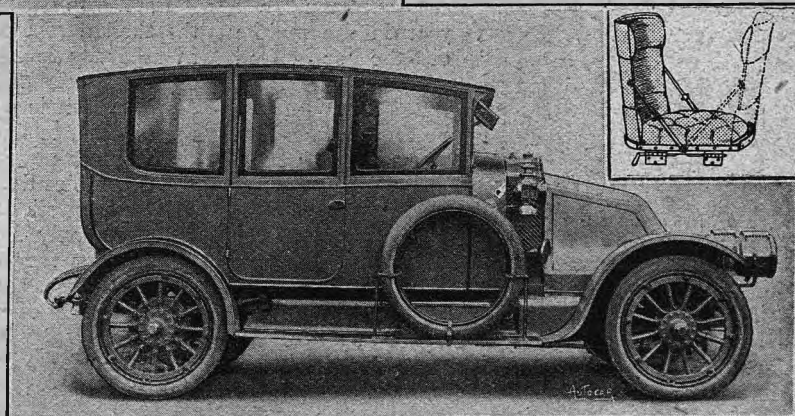
I appeal to all responsible parties to see to it surely and speedily that the assumed motor monopoly of public thoroughfares shall be brought to an end. The haughty motorist must be taught by the law—if he has not the grace to see it—that the humblest pedestrian has rights to the road as well as the car-de-luxe.

In particular, the Corporation car stopping places should be reserved first for the cars and their passengers. Motors (and other vehicles) should be prohibited from passing cars at rest, and law-breakers should be punished exemplarily. Then, and not till then, will municipal legislators discharge their primal duty to the vast majority of their constituents.

I am, etc.,  
PEDESTRIAN.



Two views of an ingenious body recently built by the Coventry Motor Bodies Co. The front seats, for which application for a patent has been made, are detachable, and in a most simple manner may be reversed or folded somewhat in the same way as a tram top seat is reversible. As the seat back is hollowed it is made rotatable about its centre to allow of it always being in the correct position. A small sketch of one of these seats is inset in the lower picture.



were needlessly sacrificed to the petrol juggernaut. Last week I had an experience which points the moral of one essential in such enactments.

It was a wet evening, and I stood in Sauchiehall Street at the westward car stopping place, opposite Treron's. The cars were crowded and some refused more passengers. At last my car appeared, and I prepared to mount it promptly lest I, too, should be repulsed "into the cold and driving rain." As the car slowed up I stepped from the pavement to enter, when my attention was arrested by a motor horn on the right. I looked eastward, and saw two motors approaching in line about a dozen yards off. Some people were preparing to come out of the car, so I could not well jump on, and I decided to jump back to the pavement, when, to my relief, the first motor wheeled round behind the car and passed it on the right. But my relief was short-lived, for the second motor did not follow suit, but hooted and continued coming on towards me. Sir, we have all heard of the fatal fascination that the serpent exerts with its basilisk eyes on its hapless victim. I venture to suggest that the fascination of a hooting motor tearing down upon you with dazzling head lights surpasses any animal magnetism zoology knows. For a moment (or scorable fraction thereof) I was rooted to the spot, fascinated by the impending peril, wondering what it would feel like to be pulverised. Fortunately, the next moment (or decimal thereof) the hereditary instinct of the

Is it not wonderful? Is not the writer a Hero in real life? Fancy a man who has "peered down the sulphurous throat of Mount Vesuvius," who has "crossed the Carrick-a-Rede rope bridge many a time," and last, but not least, has "climbed Ben Nevis in a mist!" What or where Carrick-a-Rede rope bridge is I do not know, but I have a distinct recollection of a party containing some children under twelve who climbed Nevis all on their own, and also of seeing a lady in a Sedan chair of sorts being carried to the top of Vesuvius from the "elevator" and surviving the same "sulphurous throat" without getting out of the chair.

Truly some men imagine themselves to be much braver than they really are, although, as a rule, kind Nature redresses the balance by making them coy of advertising their lack of intelligence.

I do not blame this poor fellow; I daresay his exaggerated terror comes from having to spend part of his days in Sauchiehall Street. But I do pity the readers of this paper for having to study this kind of

*On the Road.*

stuff as sense, and, as a journalist, I feel sad that an editor nowadays should allow it to be inserted.

Newspapers, we are told, conduct this life, and the proper place for a conductor, except in a tramcar, is in front. If "Pedestrian" were a man of any commonsense he would realise that the danger here came, not from the motors, but from the absurd positions in which the law permits tramcars to halt. Were he a motorist he would know that no traffic makes the hair of drivers grow whiter more quickly than the perils of passing stationary trams, and, if he were a statistician, he would know that a large number of motor accidents in towns happen entirely because the silly folk who imagine all the world is waiting on them as they leave or join their trams do not take the trouble to look where they are going.

Trams are an effete and costly stop-gap between ancient and modern forms of travelling. Very soon we shall look back with wonder that such cumbersome, unhandy, road-monopolising perils were ever permitted to use our highways and interfere with our lawful occasions.

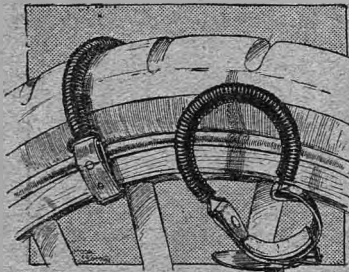
To those who study the question the reason why trams have not been abolished in favour of the handy motor bus is evident. A very large number of the tramway systems throughout the country are owned by local authorities, which also is the exact reason why we in England are the last folk in the world to use electric light universally instead of gas. Alas! It is not only in our bodies that the failings of our forefathers are visited on the children.

OWEN JOHN.

## The Kena Emergency Tyre Grip.

For Temporary Use on Soft Ground.

THE device illustrated herewith has been introduced by Kena, Ltd., Keynsham, Bristol, to afford a convenient means of enabling a car to pull itself out of soft or slippery ground into which it may have inadvertently or otherwise been driven or allowed to run.



*The Kena Emergency Tyre Grip. The sketch shows two of a set of five, one in position on a wheel. The purpose of these grips is to enable cars to be driven over grass-land or off road sides when the tyres by themselves will not grip the wet or soft surface.*

We have in mind an occasion last year in the middle of the so-called summer when, in the course of reversing to turn in a narrow road with a great deal of camber, we allowed the back wheels to run on to the grass at the side of the road so as to afford a wider space for turning.

Unfortunately, the heavy and continuous rains had rendered the ground soft and slippery, with the result that when we let in the clutch after putting in a forward gear the wheels would not grip at all, but merely spun round, burying themselves to a certain extent in the soft earth under the grass. We extricated the car after some delay with the help of our passengers, but if the ground had been a little

softer we might have been stranded there until outside help had been obtained.

No such delay need be feared, we are assured, if some such device as the Kena emergency tyre grip be carried on the car. A set of these grips numbers ten, and five are intended to be fitted to each rear wheel if necessary, though on some occasions only one wheel need be fitted up, *i.e.*, when the slip is by one wheel only and the differential prevents forward drive.

Each grip consists, as will at once be apparent from the sketch, of a helical spring curved in its length so as naturally to adapt itself to a tyre. The spring is secured to the wheel as seen on the left by a special strap, and it is only a matter of a minute, or two at the outside, to fix a set on one wheel. When in position the five grips afford a paddle-wheel-like effect which enables the car easily to be driven under its own power from slippery places such as we have referred to. Not only so, but with these grips the motorist should not fear to drive on to a wet field at horse race meetings, and similar open air events where made roads are not always available. It is obvious that unless these grips be used on hard-surfaced roads over some considerable distance no harm can accrue to the tyres: With fair use for the purpose intended no trouble need be anticipated, we should imagine. The set of ten takes up very little room, each five being sent out in a stiff box ready for packing in the toolbox or elsewhere. The set of ten is sold for 35s. by the firm mentioned, and three sizes are made for use with various size tyres.

## The Traffic Board Question.

In the House of Commons on Monday last Colonel Yate asked the Prime Minister whether, in view of the consensus of opinion expressed in support of the recommendations made by the Royal Commission on London Traffic in 1905 by such bodies as the London Society, the London County Council, the Institution of Civil Engineers, and others, and by many witnesses before the Motor Traffic Commission now sitting, he would take steps to appoint a traffic board and empower them to adopt a general road scheme for London while it is still possible to do so in connection with the town-planning schemes at present under consideration, or, if not, what steps he proposed to take to secure the necessary outlets for the proposed new main roads

at present available on the outskirts of London, which will be blocked by the various town-planning schemes in contemplation if the latter are allowed to mature independently.

Mr. Lloyd George, who replied, said the Prime Minister was aware of the situation referred to, and appreciated its importance. The main difficulties with regard to the adoption of a general road scheme were pecuniary ones, which would not be removed by the appointment of a traffic board. While the difficulties were serious, and he was not at the moment able to suggest a way of overcoming them, he could assure the hon. member that the question was not being lost sight of.

## The Victor Tyre Test.

### The Award of the Private Motorists' Committee.

WHAT is probably the last stage in the unofficial tyre test which has been in progress since July last was reached on Thursday, April 17th, when a meeting of the committee of private motor users supervising the test was held at the Holborn Restaurant for the purpose of making the collective award of the committee.

Colonel Harrison Hogge presided, in the unavoidable absence, through illness, of Mr. Marshall Hall, K.C., M.P. He said those present were familiar with the facts which had led up to what he might describe as an historic tyre test. It would be within their memory that the Royal Automobile Club were first asked to conduct that test, but after accepting had declined. The idea had been to test to destruction three types of the Victor tyre—a comparatively new cover—against the three best known tyres on the market. Rules were drawn up by the Royal Automobile Club for the contest, and others were suggested by members of the committee with a view to making them more stringent. Two committees took control of the contest, which was designed to run to destruction three types of the tyres of the four competitors. One of those committees was composed of twelve representatives of well-known magazines, newspapers, and journals, and the second was a general committee of private motorists. That was supported by 100 district committees in every part of the country, and numbered nearly 1,300. Among them were some of the great names in the Church, of the Nobility, in the Army and Navy, and at the Bar. The Press committee had already unanimously awarded their verdict in favour of the Victor tyres. The present meeting had been called together to consider and give its verdict.

Some hundreds of the committee had already given their award by letter in favour of the Victor tyre, and none, so far, had given the award to any of the other competitors. Moreover, all the letters he had before him from those members of the committee praised in the highest manner the scrupulously fair way in which the test had been conducted. The observer representing the motorists' committee had always been a member of that committee, and all that the Victor Tyre Company had had to do with the test since it started was to pay the bills. Those alone represented a matter of a little over £3,000, as he was informed. Accordingly, although the test was to demonstrate which tyre would stand longest and wear the best, the Victor Tyre Company had had nothing whatever to do with the observation of what took place. That had been in the hands of independent people throughout. The supervisor acting for the committee was a well-known automobile expert. He was the ex-manager of the technical department of the Royal Automobile Club. All the tyres used in the contest, which started in July last, and had continued to the end of the last month, had covered a distance of about 15,000 miles, and had been purchased for the committee by eminent members thereof quite unknown to the Victor Tyre Company. The tyres had been purchased at different times and from different sources, and having been duly identified by private marks, had been delivered to the *Financial News*, which kept them in its own possession until required for the test. The names of the gentlemen who had acted as purchasers for those tyres included such names as the Right Hon. Lord Denbigh, Lord Norbury, Lord De La Warr, Lord Kingsdale, and Lord Clifford. There were also Sir Thomas Lipton, Bart., Admiral Sir John Hopkins, and Admiral Sir George Neville. It was noteworthy that nearly 300 doctors had served on the committee. Unfortunately, Viscount Exmouth, the well-known amateur racer, and also a member of the committee, was unable to be present, as he was in America, but he had cabled his congratulations to the Victor Tyre Company on the result of the test. The Chairman then paid a tribute to the sportsmanlike conduct of the different manufacturers. The Dunlop Company and the Continental Tyre Company had been represented not only on the committee—the first named by Mr. E. C. Stewart, a member of their advertising staff, and the Continental Company by Mr. Alan Braithwaite Dickinson, a member of that company's general staff—but both those gentlemen had acted as observers. Mr. Dickinson, indeed, had acted for a longer period than any other save Viscount Exmouth, and both had proved themselves good sportsmen. It was safe to say that never before in the history of motoring had there been a contest which had caused one half of the interest which that tyre trial had evoked amongst all classes of motorists.

They had had over 600 letters, which were lying on the table for members of the committee to read. The names included the Bishop of Birmingham, Lord Deerpark, and so forth, while Royalty itself had been keenly interested. Their Royal Highnesses Prince Leopold and Prince Maurice of Battenberg, grandsons of the late Queen Victoria, had twice inspected the tyres at Kensington Palace, and had recorded their impressions of the condition of the tyres on the chart. Those observations were available for the meeting. The Earl of Lonsdale, President of the Automobile Association and Motor Union, had written that he thought the test was one of great interest and valuable for the purposes of information. They had also the intimation that Mr. Orde, the secretary of the R.A.C., had ungrudgingly stated that he believed, and always had believed, that it was a perfectly fair and splendidly organised trial. He thought all present would concur that the test had been splendidly organised and most fairly carried out. Referring to the lamentable accident which had arisen from a skid near the Punch Bowl on the Portsmouth Road just outside Hindhead, he said he was most pleased to tell them that all the sufferers were doing well. All the tyres used in the test were present in the room for examination, as were also several hundred signed charts which gave the speedometer readings, the position of the tyres at the time, and the observations of those who made the examination before signing. Two or more charts had been obtained each day of the test. It was, in his opinion, a great tribute to the Victor tyre, the only competing tyre on the car at the time it was wrecked, that it was in perfect order and in no way injured. It did not even lose pressure. At that time the aggregate mileage of the three Victor tyres exceeded the aggregate mileage of the second, the Dunlop, by about 400 miles.

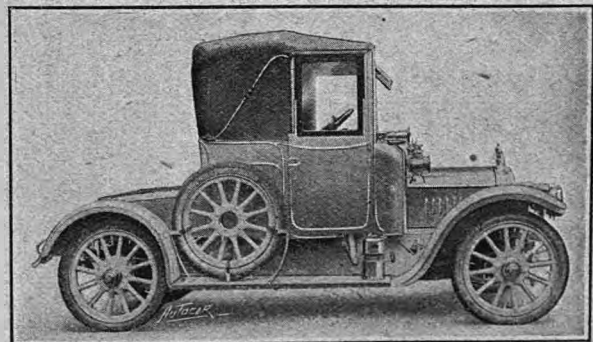
Lord Tenterden corroborated what the Chairman had said as to the fairness with which the test had been conducted and the open manner in which everything had been done. He, too, thought that the thanks of the motoring public were due to Mr. Yarworth Jones and the Victor Tyre Company for the plucky manner in which they had stuck to their guns. In face of opposition they had persisted in holding their tests, and that would be ultimately a benefit to the public. They had demonstrated that they had a tyre that was at least as good as, if not better than, any other tyre on the market, and one that was certainly deserving of the test through which it had been put. (Applause.)

Several members of the committee expressed their views as to the complete fairness with which the test had been carried out.

Mr. Samuel Barrow said that his personal experience of the Victor tyre was that the first set he had owned had run nearly 5,000 miles before "death," and he had a second set which had done over 4,000 and were still in use.

The Master of Sempill remarked that, having heard what Colonel Harrison Hogge had said, he thought they would all agree in giving the award to the Victor tyre.

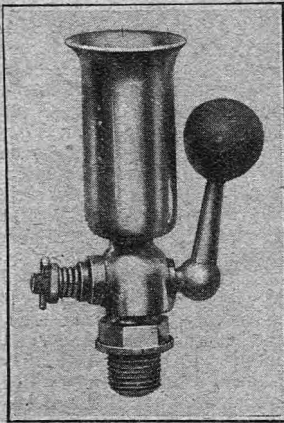
A resolution to that effect was put to the meeting and carried unanimously.



A neat coupe fitted to a 15.9 h.p. Vulcan chassis to the order of Mr. W. H. Chambers, of Conisbro', by Messrs. Smith and Son, of Doncaster. Access may be obtained to the interior by either door.

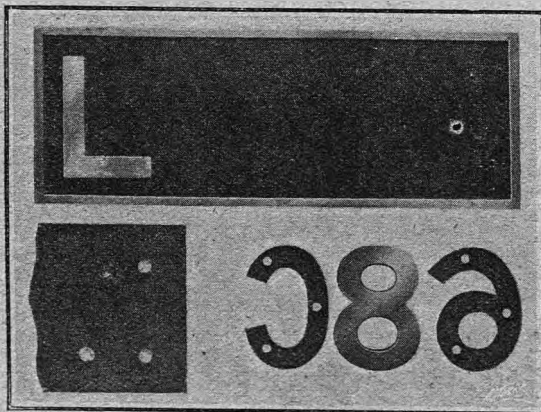
### An Engine Primer.

For those who are afflicted with an engine stubborn at starting the little device illustrated should prove exceedingly useful. It consists, as may be seen, of an ordinary tap with an extended, funnel-like top, which is intended to carry a fair amount of ether-petrol mixture, or petrol only. This tap or primer is screwed into a hole provided for it at the main branch of the induction pipe, and after having been filled the tap is turned to allow the contents to trickle in the induction pipe. In order to prevent the whole of the contents flowing rapidly away the hole through the tap is quite small, so that the engine may be turned over several times and the cylinders quite filled before switching on. The primer may be obtained from Messrs. Clifford and Co., Sidcup, London, S.E.



### Built-up Number Plates.

The advantages of the aluminium number plate are many and obvious, but a disadvantage of the usual type is the fact that the casting of the identification letters and number is a matter of time—twenty-four hours only maybe, but an appreciable time when one has just taken delivery of a new car and fretting to give it its first run. The arrangement illustrated herewith has been introduced by Messrs. G. T. Riches and Co., Ltd., 19, Store Street, Tottenham Court

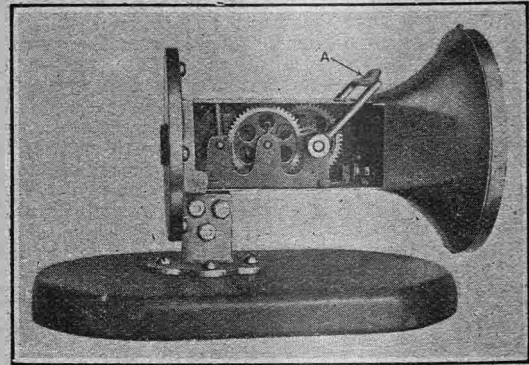


A new type of aluminium number plate. At the top is seen the base plate with one letter fitted, the back of the plate at this point being shown below. Three identification marks, two back views, and one front view, are also shown with their pegs for riveting to the plate.

Road, London, W.C., and consists of the usual cast aluminium plate with black ground and polished beaded edge, but the letters and numerals are stocked ready made with integral pegs at the backs. To fit up a pair of plates ready for use, therefore, it is only necessary to obtain the bare plates and a set of letters and figures and to drill certain holes in the plate and rivet the identification marks thereon. The complete plates are sold at 18s. per pair.

### The Reliance Horn.

The warning note emitted by this horn is similar to the well-known attention-arresting screech of the Klaxon, being produced by the rapid vibration of a steel diaphragm. But while in the Klaxon and most of the similar sound emitters the vibration of the diaphragm is performed electrically, in the reliance this is done mechanically through a double train of gearing—as shown in the dissected view. When the lever handle A is pulled back the train of gears is rotated, and a coarsely toothed ratchet wheel strikes



The Reliance mechanical horn, operated by the lever A.

a stud on the diaphragm many times a second and produces the warning note in proportion to the force with which the hand lever is drawn back. A ratchet and spring allows the hand lever to return to its forward position immediately. This horn has the special recommendation that it is easily, quickly, and positively operated by hand. It is sold by the Reliance Motor Horn Co., 89, Great Portland Street, London, W., at £3 15s.

### A Useful Accessory for Ford Cars.

In order to obviate the necessity for frequent stops for oil replenishment the funnel shown herewith is attached to the radiator stay on the near side, and the elongated flexible stem is inserted in the existing combined breather and oiler. The funnel holds half a pint of oil, and is provided with a gauze filter through which the oil slowly trickles to the crank case. This funnel is sold by Messrs. Clifford and Co., Sidcup, London, S.E., price 3s. 6d. post free.



We are informed that when the Peugeot car stopped in the 41st lap to change tyres during its record run, and after it had covered 106 miles 387 yards in the hour, as reported in the last issue of *The Autocar*, the removal of two Rudge-Whitworth wheels and the fitting of two new ones was accomplished in thirty-five seconds, this tyre change, as a matter of fact, taking less time than replenishing with petrol. The length of the stop, including tyre changing, replenishing petrol, and changing drivers occupied approximately 45 seconds. Of course, much more time than this was lost by the halt, for the slowing down, stopping, starting, and getting up speed again must necessarily waste considerably more time than the period of the actual stop. It is interesting to note, also, that the car was fitted with a Claudel-Hobson carburetter.

## The 8 h.p. Alldays Light Car.

**Two Cylinders 85 × 88 mm. Three Speeds, Segment Change. Under Worm Drive.**

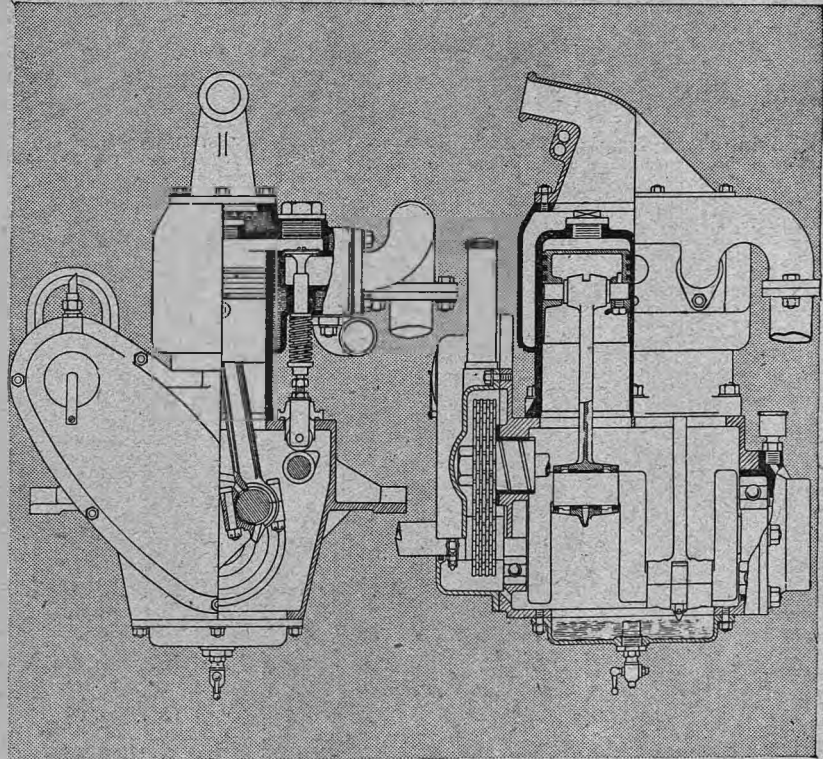
**A** PERUSAL of this description, and an examination of the illustrations by which it is accompanied, will show that the 8 h.p. Alldays is a light car, for the light pursued, into the design and construction of which features and material necessary to the stability and durability of a car twice its power, and three times its price, have been embodied.

For a car of this type the frame has been very strongly built. The longitudinals are of channel section steel kept parallel and swept round to approach each other beneath the radiator. The cross members are of tube, and a tubular underframe serves to carry the engine and gear box. The springing is by inverted laminated grasshopper springs, these being fitted fore and aft. Wire cycle built wheels are used, these giving the little car a light appearance.

The two-cylinder engine cast *en bloc* has bore and stroke 85 × 88 mm. Thermo-siphon cooling is adopted, with ample water spaces and a big head of water maintained over the combustion chambers. The valves are set on the left-hand side, the exhaust trunk being bolted to the face of the valve chambers and up-swept to give ready access to the tappets. The valve stems are held in guides of excellent length, and the cam attacks the tappet through a friction roller of large diameter.

The tappets are adjustable. The pistons are of excellent length, with three piston rings above the gudgeon pin. The camshaft and magneto-shaft are driven by a silent chain from the crankshaft. The journals of the camshaft are of unusual diameter, and the crankshaft bearings of good length. The chain case cover is separately detachable, and the crank chamber cast in one piece, with an under cover—bolted thereto.

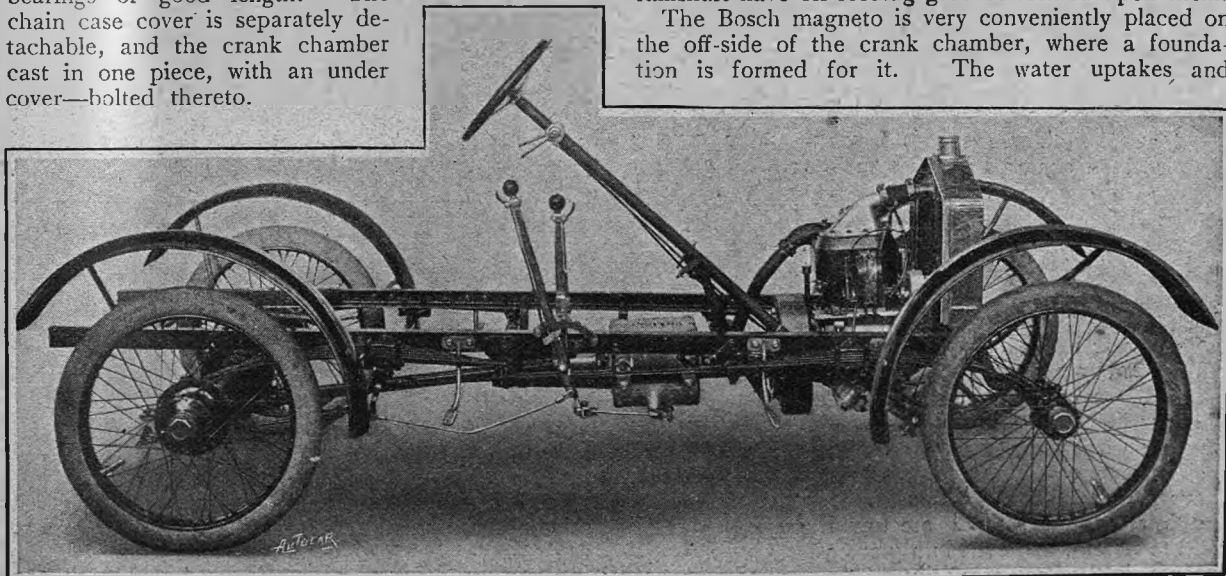
The supply of oil is kept up in the under cover by a pumped drip feed from the dashboard, and separate oiling provision is made to the distribution gear case.



Two part sectional views of the 8 h.p. two-cylinder Alldays engine.

The big ends of the connecting rods are formed with dipper beaks, which serve not only to furnish the big end bearings themselves with oil, but to throw the lubricant to all the other parts of the engine requiring it. It will be noticed that the journal bearings of the camshaft have oil feeding grooves formed upon them.

The Bosch magneto is very conveniently placed on the off-side of the crank chamber, where a foundation is formed for it. The water uptakes, and



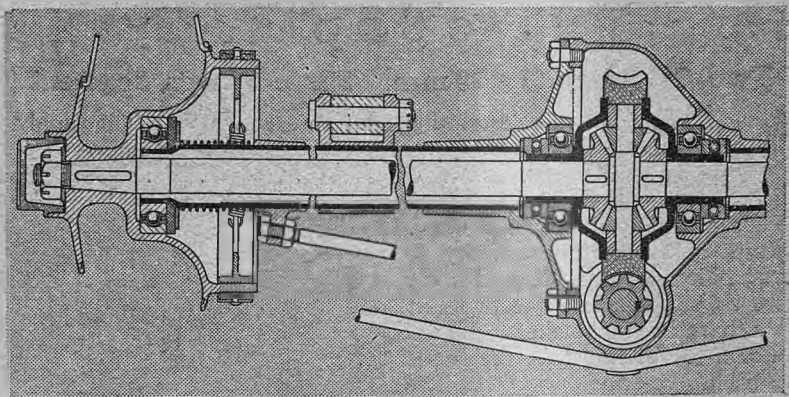
Off-side view of the 8 h.p. Alldays light car chassis.

The 8 h.p. Alldays Light Car. intakes to and from the radiator are short and of large diameter.

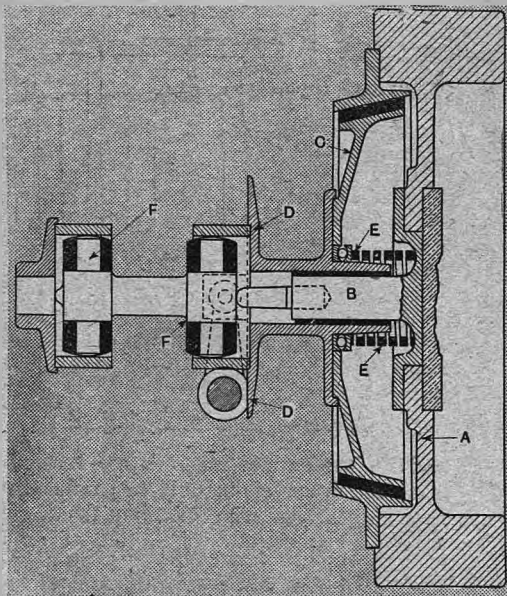
The drive is transmitted from the engine to the gear box through a neat internal leather-faced clutch. The spigot bearing is of good length and bushed, while a ball thrust bearing is fitted to take the thrust of the spring when declutching. The clutch is quite self-contained as regards end thrust, and the clutch ring being bolted to the flywheel is very readily dismantled. A double universal joint connects the clutch sleeve with the intermediate gearshaft, a comforting mechanical refinement which one would not expect to find in a car of this type or price, but which is desirable nevertheless.

The gear box has short shafts both carried in ball bearings, and castellated to take the sliding and the

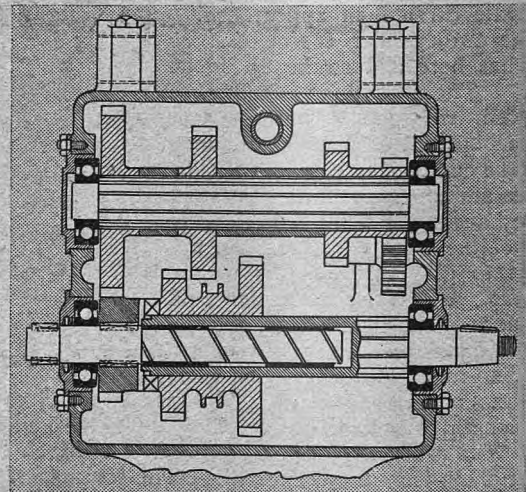
bearing in the propeller-shaft tubular casing, carries at its rear end the underhung driving worm between two running and two thrust bearings. The worm wheel is centrally bolted to the differential gear box, which contains a differential gear of the bevel type. The socket sleeves of this



Sectional elevation of the 8 h.p. Alldays back axle showing the arrangement of the worm drive.



The flywheel and clutch of the 8 h.p. Alldays.  
 A, flywheel  
 B, spigot end of crankshaft  
 C, clutch cone  
 D, clutch sleeve  
 E, clutch spring  
 F, double universal joint between clutch and gear box

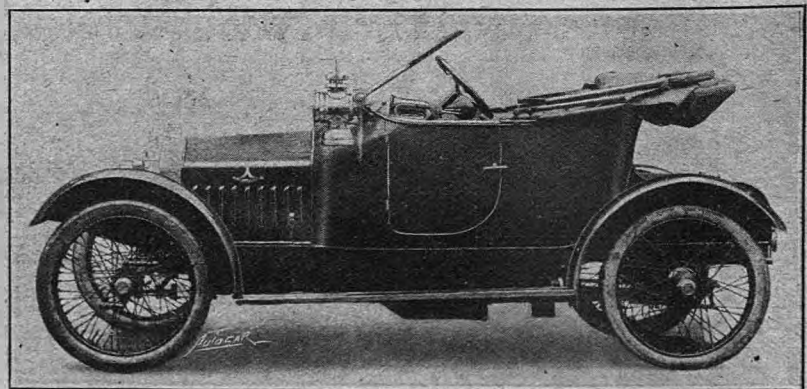


Part sectional plan of the 8 h.p. Alldays gear box.

fixed wheels. Three speeds forward and a reverse are provided operated by a segment form of change. A little departure from standard design is found in the fact that the intermediate gear sleeve is formed with a spigoted portion with two long bearings in the primary shaft. This should help to ensure a quiet gear box. The bearings are all capped to prevent the escape of oil, and the box is covered with an all-over lid giving full access to the interior when necessary.

The same care and thought which have gone to the production of the parts already described are found still to obtain, and even in a greater degree, in the back axle drive. The gearshaft connects with the propeller-shaft by means of a flexible joint, and after running through a steady

box rotate in ball bearings, and are both provided with ball thrusts. The live axles run right through the casings to a tapered keyed union with the road wheel hubs, which, however, rotate on large ball bearings carried on the reduced ends of the axle casings. The effect of running the road wheel on and delivering



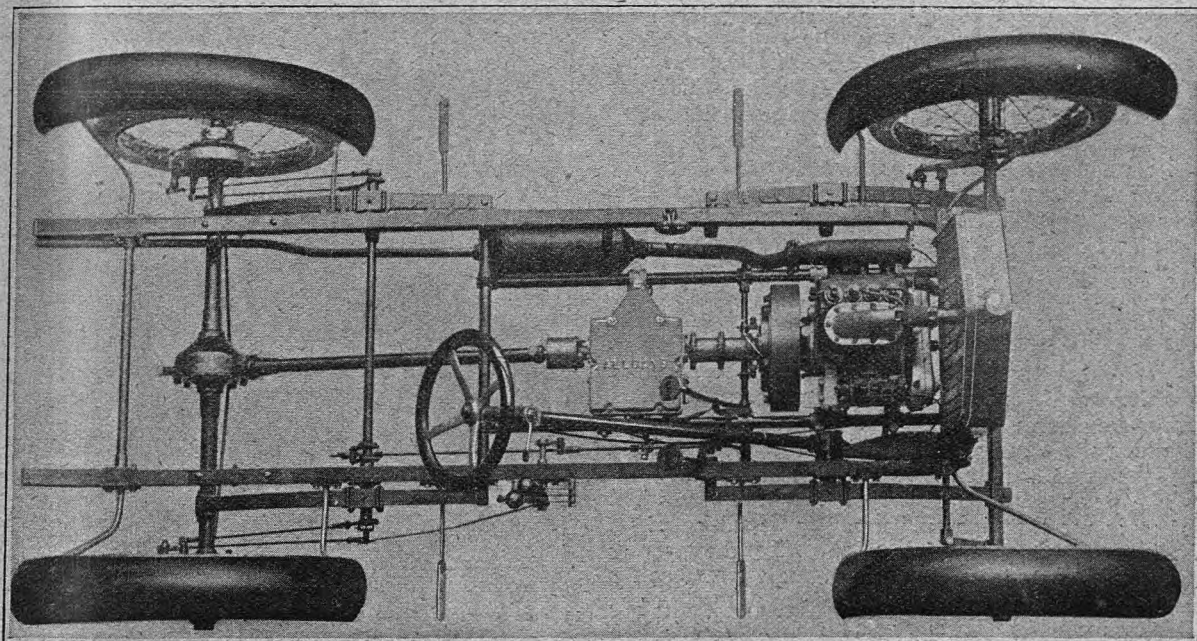
The 8 h.p. Alldays light car with a standard two-seated body, hood, screen, and lamps.

road shock to the axle casing instead of to the live axle is thereby attained in quite a neat manner. Care has been taken to prevent the issue of oil from the rear wheel bearings by the provision of thick felt and steel washers held up by helical springs as shown in the sectional view of the back axle given on the preceding page.

The pedal and side lever applied brakes both take effect on the brake drums which are formed with the wheel hubs. The pedal applies the internally expanding brakes and the side lever the Ferodo-lined encircling band brakes.

*The 8 h.p. Alldays Light Car,*  
The front axle is of H section, and the steering wheels run on adjustable ball bearings. The wheel-base is 6ft. 6in. and the wheel gauge 4ft., the wheels being 650 mm. x 65 mm. Ready for the road this car, with smart lineable tapered bonnet and comfortable two-seated body, hood and screen, running-board and valances, and practical mudguards, is sold at £138 10s.

The control is by throttle and ignition levers on the steering column just below the wheel actuating the throttle and magneto timing respectively through Bowden cables.



Plan view of the 8 h.p. Alldays light car chassis. In this view can be seen the arrangement of the inverted semi-elliptical springs which are fitted at the back and the front.

### A New Zealand Reliability Trial.

A very interesting reliability trial was held on March 7th and 8th by the Canterbury (N.Z.) Automobile Association. The route was from Kaikoura to Christchurch and back, and eighteen cars started. In the open class the winner proved to be Mr. W. B. Scott, who drove a Vauxhall, and was awarded the gold medal and certificate for reliability, and also the first prize for lowest petrol consumption. Mr. Scott made a non-stop run, and his petrol consumption of 44 ton miles and 29 car miles per gallon was the best in the trial irrespective of class.

In describing the contest, the *Lyttelton Times* remarks that only three of the cars returned to Christchurch with non-stop records, these being the Vauxhall, a Panhard, and a Cadillac. Many of the cars lost marks through being forced to stop while attempting to cross river beds. The account given of fording the Conway River in three different places conveys some idea of the difficulties which were encountered.

Teams of horses had been provided, but their assistance meant a loss of ten marks. The Vauxhall was the first to make the crossing, and it had a large and interested group of spectators for such an out-of-the-way place. It rushed the stream at top speed, making a big bow wave, but breasted the stream beautifully, and was soon shaking itself dry on the

sharp ascent on the other side. Very few had as fortunate an experience, and the horse teams were soon at work. The second ford was ticklish, owing to the soft landing, but the third was the worst. The Vauxhall, rushing the ford upstream, again got through in a regular geyser, the car resembling a hydroplane. Other cars that got through took the same ford as the Vauxhall, but most of them stuck.

The same paper points out that in view of the manner in which the cars were tried by river beds and hills, it was astonishing that so many had come through so well as they did, and particularly that any should have made non-stop runs.

An incident illustrating the utility of step lights on a motor car is related by a correspondent, who says he finds the S.A. step lights splendid. "Not only are they most useful," he adds, "but I have found that an investment of 30s. saved me a possible loss of over £25. Whilst my wife was getting out of the car a few nights back, she noticed she had lost a diamond hair ornament. We searched the interior of the car without success, but afterwards found it lodged between the running board and valance of the car. It certainly would not have been seen but for the light being thrown on the running board by the S.A. step lights. I should call them a good insurance policy."

## The Atlas Impulse Tyre Pump.

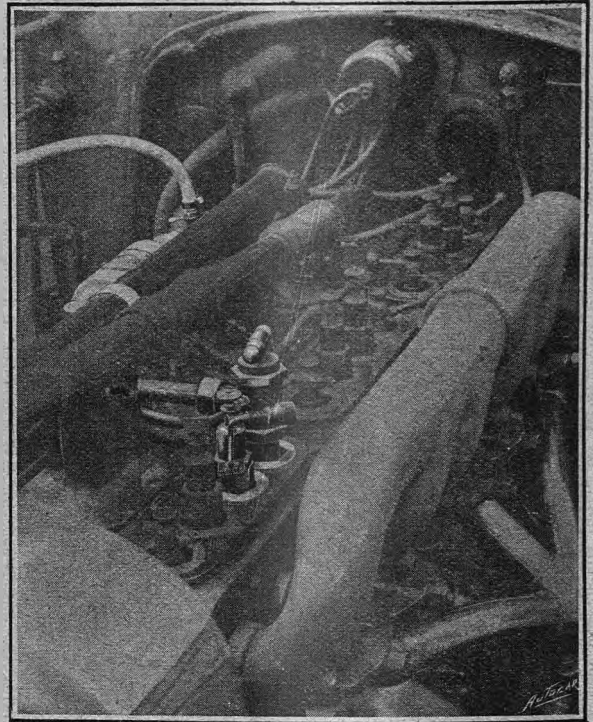
An Extended Test of this Simple yet Effective Labour-saving Device.

**E**LSEWHERE in this issue we give the substance of an R.A.C. certificate regarding an official test of an Atlas Impulse tyre pump, and if confirmation of the results shown by the test be required we are able to bear them out from our personal experience.

The photographs reproduced herewith are of a 20 h.p. six-cylinder Talbot engine, on which we have for some weeks had an Atlas pump in position. It will be seen that the only special fittings needed to secure the pump firmly in a convenient yet out-of-the-way position are a flat steel bracket, rising from one of the cylinder foot studs, and steady clip which we have passed round the light tube carrying the high-tension wires from the magneto. In addition we have had a slightly longer elbow pipe made to connect the pump and the screw-down valve shown in the near side view of the engine. This valve, as well as the pump itself and all its fittings except the long rubber tube to connect it with the tyres, are permanently secured in position on the engine. All that is necessary to be done, therefore, when it is required to inflate a tyre is to screw on the connecting pipe, start up the engine, and open the screw-down valve. An earthing switch is provided with the pump, and this is intended to be used on the sparking of the cylinder to which the screw-down valve is attached, that is to say, the cylinder which is connected to the pump.

The pump we have on the car in question has had far more use than it would normally be subjected to, for in the same garage is a 38 h.p. Lanchester with 935 × 135 mm. tyres, and one of these tyres has for some time had a minute leak, even as yet not located, which causes it to be insufficiently inflated in two or three days. The pump on the Talbot has therefore been brought into requisition for the tyres of the Lanchester as well as for those on the car to which

it is fixed, and the great convenience of the device has consequently been immensely appreciated, for it is no



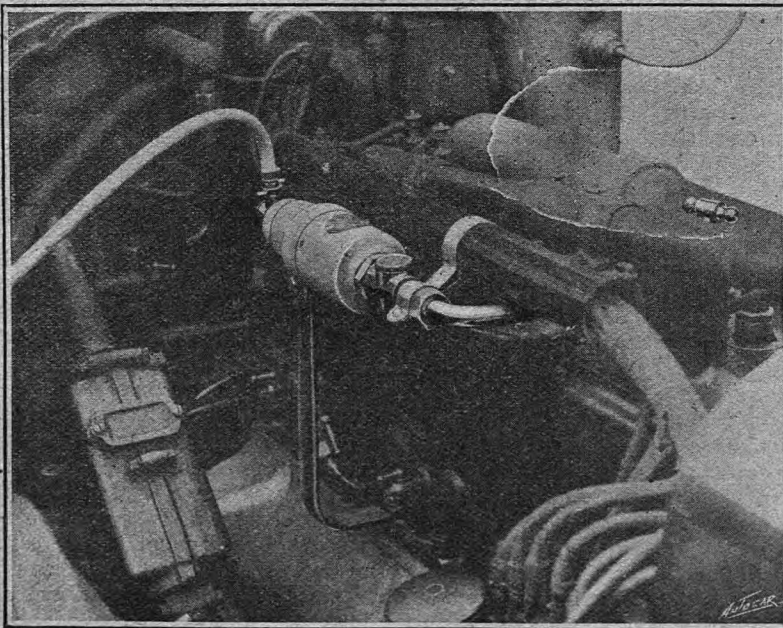
Near side of a 20 h.p. Talbot engine, showing the screw down valve of the Atlas pump outfit permanently fitted in an exhaust valve cap in lieu of a compression tap.

light job to inflate a 935 × 135 mm. tyre with the usual form of hand pump.

During the time we have had the Atlas pump it has given every satisfaction; on no occasion has it given any trouble or failed in the slightest degree.

It will be noticed that in the R.A.C. certificate a "blotting paper test" for oil is mentioned. That is a test in which the air expelled by the pump is caused to impinge directly upon a piece of blotting paper in order to note whether oil is expelled by the pump, and if so how much. The certificate states that a slight trace of oil was noticed, but we would point out that even the usual hand pump shows the same result on a similar test. The leather cup of a pump plunger must always be kept lubricated or it becomes hard and consequently leaks, so that a blotting paper test will always indicate the presence of a suspicion of oil. This, we take it, was the source of the oil noticed in the official trial of the Atlas, so it must not be discredited for this reason.

There is no knock or distressing sound apparent when



The Atlas Impulse tyre pump fitted to a 20 h.p. six-cylinder Talbot engine. The pump is supported by a flat steel bracket secured at the bottom on one of the studs at the cylinder foot, and steadied by a light clip encircling the tube carrying the high tension wires from the magneto.



the pump is working, but as showing that air is drawn in from the outer atmosphere the working of the suction valve is very pronounced. A pressure gauge, permanently coupled up on the long connecting tube, which, by the way, is long enough to reach any of the tyres, forms part of the equipment.

#### *The Atlas Impulse Tyre Pump.*

It may be remembered that the pump under review is supplied by the Atlas Non-puncture Inner Case Syndicate, Ltd., 124, High Street, Kensington, London, W. The price of the instrument complete with the permanent fittings, valve, 12ft. of rubber connecting tube, and gauge, is £5 5s.

## Roads Improvement Association.

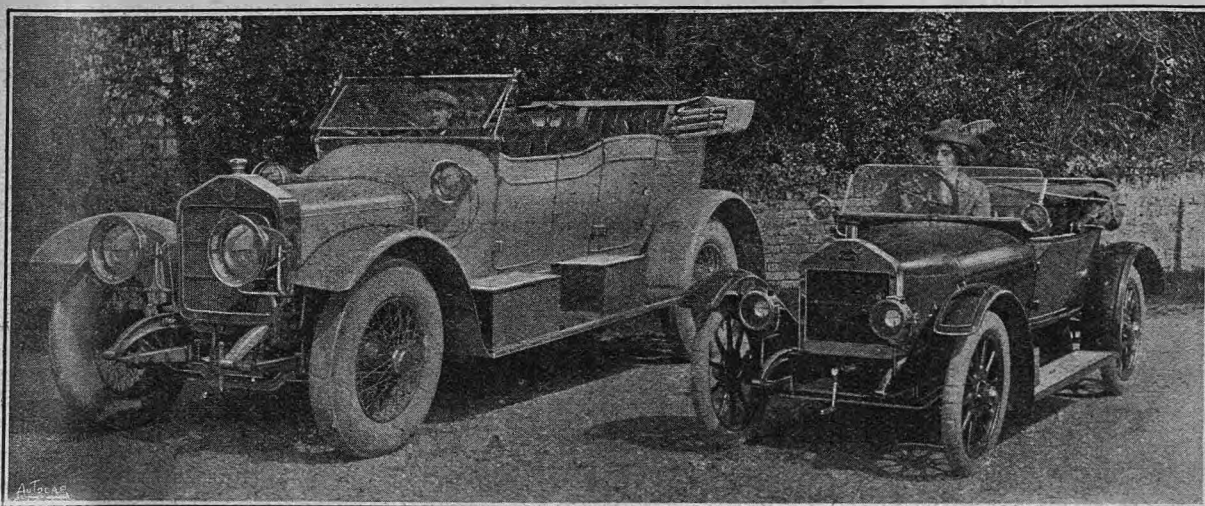
### The Year's Work Reviewed at the Annual Meeting.

THE twenty-sixth annual meeting of the Roads Improvement Association was held on Thursday last week at the new offices of that body, Dartmouth Street, Westminster.

The chairman (Mr. Robert Todd), who moved the adoption of the report, said that much good work had been done during the past year, and although their income was not great there was a balance of receipts over expenditure of £115. Additional expense had been incurred by their removal to new offices, which were of a more suitable and commodious character than the old ones; on the other side, they had to set a large increase in the subscriptions, which were approximately 46% in excess of those collected in the previous year. In the report it was pointed out that it was desirable that there should be a reclassification of the roads of Great Britain by a central authority

prize for a new type of horseshoe to meet the new conditions. During the past year the system of Roman roads in this country had been enquired into, with the object of bringing any not now in use into service again. Steps had also been taken to ensure the proper regulation of the tramway services, and many improvements beneficial to non-statutory users of the highways had been secured. The Association during the past year had been given a *locus standi* before the Committees of the House of Lords. It had continued its campaign for minimising the dust nuisance; it was responsible for the adoption of the scheme for the Croydon Corporation to shorten the road to Brighton, and it had been successful in securing the removal of tramway and lighting standards from the centre to the side of the carriage way in many places.

Lord Montagu of Beaulieu, in seconding the report,



On the left is a 25 h.p. Singer, the property of Mr. Warn, of Messrs. Warn and Co., of Poole; this is the car which accomplished the John-o'-Groat's to Land's End non-stop engine run last year. The 7 h.p. Palmer cord tyres then used are still on the car; they have covered over 12,000 miles and remain in good condition. The car on the right is the smallest of the Singer fleet. Mr. and Mrs. Warn appear at the wheels of the larger and smaller powered cars respectively.

on a definite principle, and a readjustment of the expenditure on them in accordance therewith, as laid down in the Association's new Highways Bill, which was being drafted. A number of small but important questions, such as the compulsory trimming of hedges where they obscured the view of the traffic, were included in the Bill. The problem now before the road authorities was how to construct a road suitable both for modern mechanical traction and for horse-drawn traffic. The modern smooth, hard road surface, suitable for mechanical traction, frequently failed to afford a satisfactory foothold for horses, and the calkins fitted into horses' shoes to give them a grip caused serious damage. The Association, as the representative organisation of all classes of road users, had held a conference on this subject with the leading horse owners, and, as a consequence, it proposed to offer a

said local authorities were realising more and more the importance of providing good roads, largely owing to the efforts of the Roads Improvement Association. The public were beginning to realise that a country nowadays could not have a better asset than good roads.

A number of members also spoke in support of the report. Mr. F. W. Stanley, a member of the Council, announced that the National Society for the Prevention of Cruelty to Animals would contribute £100 towards the expenses of the Association's proposed competition for a new type of horseshoe that would give horses a satisfactory foothold, and, at the same time, minimise the damage now caused to smooth water-proof road surfaces.

Prince Arthur of Connaught was re-elected president of the Association.

## Heavy Fuel Carburetters.

By J. W. Roebuck, Wh. Ex., etc.

THE interesting details of two well-tested systems of paraffin-using devices for internal combustion engines described in *The Autocar* last week, page 683, were of special interest to me because I am commercially interested in finding some cheap fuel to replace the expensive forms of spirit, of which petrol is the best known to the ordinary user of motor vehicles.

For a number of years I have kept in touch with the efforts of others to find a substitute for petrol, and also have done a certain amount of experimental work myself.

So long ago as January 18th, 1906, a series of articles on heavy fuel carburetters was written by me in *Motor Traction*, these articles extending over eight issues dating from January 18th to March 8th, and a large number of fairly satisfactory devices was illustrated and described in this series.

From later work done by many inventors and experimenters it appears to me that the principle, or theory, underlying the employment of heavy fuel for road work is not at all clearly grasped. As a preliminary, therefore, an extract from the first article of the series referred to, page 44 of *Motor Traction*, January 18th, 1906, will show what are the features to be kept in view in devising some heavy fuel device for use on internal combustion engines, in which the load and speed have to vary from moment to moment when such an engine is fitted to a touring or industrial vehicle. The extract is as follows:

### DESIRABLE FEATURES REQUIRED.

"We must first consider what are the requirements which a heavy fuel carburetter is asked to fulfil on a motor vehicle. First, it should allow the fuel to be used so that it is absolutely burnt, and gives off no offensive odour nor any visible exhaust. Next, it must not allow the paraffin vapour to clog the valves or make sooty or tarry deposits on parts of the engine. It must also—and here is the crux of the matter—so carburate the oil that whatever the load on the engine or its speed, perfect combustion of the vapour is attained. This is the most difficult problem of all. It is not a difficult matter to produce a carburetter which will fulfil the first two conditions in quite a satisfactory manner when the load is light only, medium only, or heavy only, and the speed is fairly constant; but when variable demands for power are made upon the motor, the carburetter invariably fails to function properly. These remarks are made in no disparaging spirit, and with no intention of finding fault with existing carburetters, but are made with a view to showing the requirements of the heavy oil motor, so that the problem may be attacked in the right way."

Now these features are such that to my mind any work done in the way of vaporising paraffin or other heavy fuel cannot produce an entirely satisfactory result, except under a given set of conditions which up to the present it has been found impossible to obtain in practice. There is one temperature only at which fuel of the nature of paraffin can be said to be correctly vaporised so that it can be mingled with air to form a perfectly explosive mixture which can be exploded in the cylinder, and the products of explosion ejected therefrom without causing offensive smell or smoke. In the majority of the systems of this nature in work, one invariably finds that the paraffin is vaporised in a heater, but no attempt is made to keep the temperature of the mixture the same as it may be at the moment of leaving the heater. Consequently immediately the mixture of paraffin vapour and air reaches a cooler surface it condenses; therefore when the engine is first started the mixture passing into the cylinder is weak and misfiring occurs with offensive

exhaust. After running a little time the condensed paraffin is mechanically drawn up by the engine suction into the cylinder, so that too rich a mixture is then obtained, and therefore incomplete combustion occurs with consequent offensive and coloured exhaust. Another point against the usual pot-heater is that it cannot be kept at a uniform temperature under varying loads. At one moment when the engine is working hard it is very hot, and when the throttle is eased off the vaporising surface is bound to become cooler.

Assuming for the moment that the pot-heating arrangement is to be the ultimate form, then it appears to me that if some device for the control of the heat of the pot could be employed, some advance in regulation of the correct working mixture would be made. A thermostat introduced into the path of the exhaust gases and acting on a throttle by-pass from the exhaust to the heating pot might form an effectual solution of the problem if it were practically worked out. I give this idea to those working on the heating pot system. Thermostatic regulation would undoubtedly get over a lot of the trouble of varying temperature of the heating pot owing to the variation of the power developed by the engine.

For several years past I have received many invitations to test paraffin carburetters. The claims made in a number of instances have been that a perfect device has been evolved, and there is no trouble in fitting it to existing engines. Invariably on making a test I have been disappointed: so much so, in fact, that now I hardly think it worth while to witness tests. Whenever the claims of some particularly good carburetter are brought to my notice and I find that a heating arrangement which simply vaporises the paraffin is embodied in the system, I feel sure beforehand that the problem—of obtaining complete combustion with absence of smell or smoke at the exhaust, good acceleration, and power equivalent to that developed on petrol—has not been solved.

To those actually interested in finding a suitable device for using paraffin—and by this I exclude those primarily interested in any special device—it is well-known that it is quite safe to use as an axiom the fact that if any device relies for its working upon vaporisation pure and simple it cannot be successful in the essential features referred to.

Some considerable time ago I had brought to my notice, and tested, the Southey system of using paraffin. At that time I tested this system on a vehicle, and it passed my tests in such a manner that I could say it was really a commercial success. This system did not depend upon vaporisation, but was practically equivalent to that of a suction gas producer. Instead of using anthracite fuel, as is usual for producer suction gas for ordinary gas engines, the Southey invention consisted in simply using crude paraffin within a small producer, where the paraffin was first chemically combined with the oxygen of the atmosphere in a lower proportion than was necessary for complete combustion. The final quantity of air necessary for the complete combustion was given to this partly burnt gas on its way to the cylinders wherein it was finally burnt. This system differs from all others, and in principle is absolutely correct. The gas made in the producer is a fixed gas, this being the great point of the idea. If the producer functioned properly as intended by the

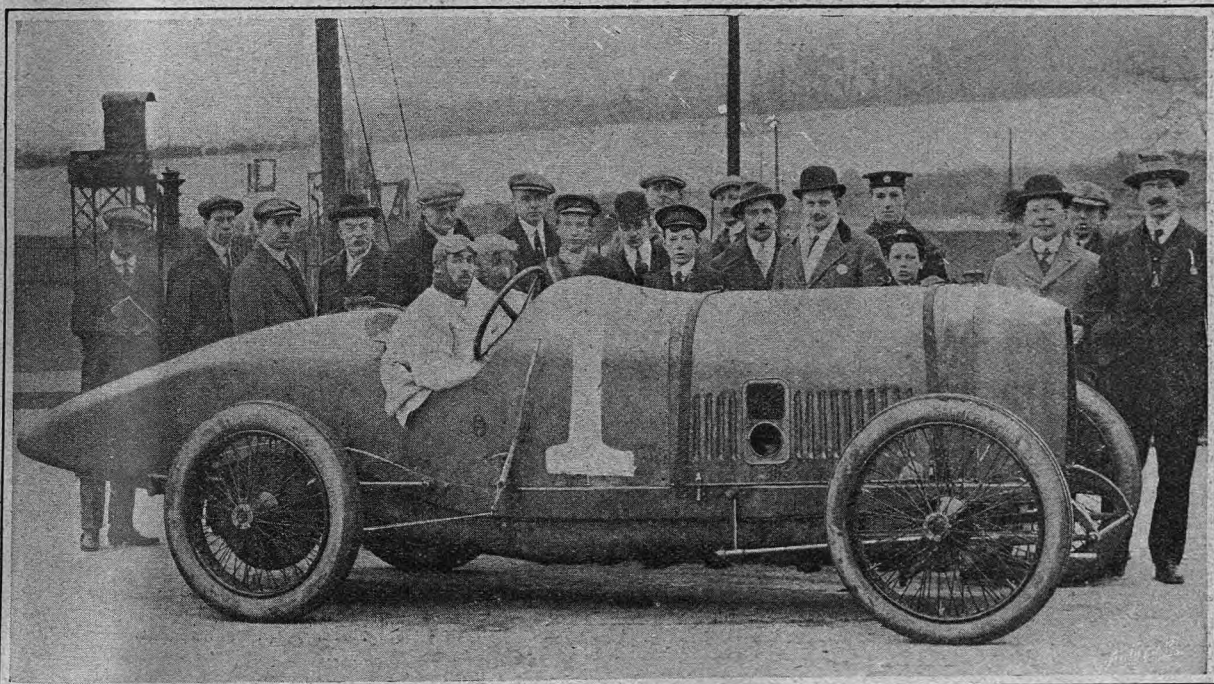
inventor the gas issuing from it would never condense again, but could be carried in pipes in the same way as coal gas for the domestic supply is carried. In the case of a fixed producer gas of this nature it would be obvious to anyone that it is only necessary to mix it with the right proportion of air to form a perfectly explosive mixture, and in consequence all trouble from smoking or foul exhaust would be avoided. Another great feature would be that no paraffin under any circumstances in liquid or vaporous form could get into the engine cylinders, an ideal which would be well appreciated by those practically engaged with the use of paraffin as a fuel for motor vehicles.

In all other devices which rely upon vaporisation it is found that if the engine works "up to the collar," as it is termed, a certain amount of thumping, or pre-ignition, invariably takes place if the ordinary petrol

ing the essential principles under which the Southey producer acts is now being put forward under the name of the Biddlecomb carburetter, and it appears to me that when certain proportions and mechanical details have been thoroughly investigated there is a very great future for the Southey and the Biddlecomb alternative devices.

In conclusion, I would point out to inventors or investigators that the main thing to be worked for is, primarily, absence of smoke or smell; next, and of practically equal importance, is the comparative efficiency of the paraffin fuel with petrol, and practically the same mileage and power should be developed on equal volumes of the fuels. There must be no mechanical knock or thump from the engine, no overheating, and next, there must be no alteration to existing petrol engine design. The device should

#### Heavy Fuel Carburettors.



*The Grand Prix Peugeot on which Goux and Boillot beat the fifty miles, one hundred miles, one hour, and one hundred and fifty miles records recently, as reported in our last issue. The car was fitted with Palmer cord tyres, the same applying to Mr. Percy Lambert's Talbot when the now historic one-hour record run was made in February last.*

engine compression be retained. To get over this it is necessary either to introduce water in a small quantity, or a very damp atmosphere. In the Southey system nothing of this kind is required, and the carburetter goes direct on to the ordinary petrol engine without alteration of compression or its control in any shape or form.

In actual practice in the production of any new device certain mechanical difficulties are, of course, almost invariably found, and the Southey device was not entirely free from these. A modification contain-

be so adapted that it could be fitted to the same inlet pipe flange as existing petrol carburettors and the same control used. The final point is that it should be cheap as to first cost, although this is not a particularly important point, as assuming that paraffin and petrol maintain their relative prices for some time to come, a few pounds more or less on a paraffin carburetter would not be a deciding factor as to whether it should be fitted or not, as the saving effected by a satisfactory fitting should very soon pay for the cost of the apparatus.

Giving evidence on Thursday last week before the London Street Traffic Committee, Mr. J. E. Davies, secretary of the Motor Cab Owner-drivers' Association, supported the view that all heavy traffic should be obliged to keep to the kerb on the near side. He did not consider it necessary that there should be fixed routes for the running of motor omnibuses. It was important in his estimation that drivers of all vehicles

before turning out of main roads into side streets should be obliged to give a signal by hand of their intention, and no vans or other vehicles in which the drivers had not full view of the traffic should be allowed upon the streets. He considered that the general speed limit should be abolished, but that certain places should be marked at which a specified rate of speed should not be exceeded.

## Correspondence.

**EDITORIAL NOTICES.**—No letters from members of the motor industry will be published when they deal with subjects which may be regarded as advertisements for the writers, or their business interests. At the same time as many of the most practical suggestions come from those engaged in the motor industry, their letters will be inserted when possible, though the names of the firms they represent may be expunged, and the initials of the writers substituted.

Letters of a personal nature will be withheld.

The Editor, although accepting no responsibility for the opinions expressed by correspondents, reserves the right to publish a portion of a letter, and to omit any part which he does not consider interesting or essential.

All communications under a *nom de plume* should be accompanied by the name and address of the writer, not necessarily for publication, but to assure the Editor as to good faith.

Enquirers who ask for the experiences of private owners with specified cars, parts, or accessories, are requested to enclose a stamped addressed envelope, so that replies which space will not permit us to publish may be forwarded to them. Circulars or letters from interested parties will not be forwarded.

### PREMIUM PUPILS AND REPAIRS.

[19465.]—Replying to your correspondent, H. C. Dart [letter 19457], I cannot say I agree with him. I served my apprenticeship with a firm of motor repairers (if I may be allowed to call them such), and I can assure your correspondent that I was never allowed to do any repairs whatsoever of vital importance to the car, let alone drive. In most garages I have visited, the mechanic (if only one be kept) thoroughly overlooks every point of repair before the car leaves the garage, and in ninety-nine cases out of a hundred your correspondent will find that the mechanic or some other capable man is the only one to drive it, and then only for testing purposes.

As to parents enquiring into the "management and make up of the concern," surely everybody has got to make a start, and all parents have not the means to apprentice their sons to a firm of motor car manufacturers.

Perhaps your correspondent may be "hung up" some day, and only a "premium pupil" garage near, and possibly one of their "premium pupils" may be able to help him out of his difficulties. Will he be so prejudiced against them then?

If your correspondent does not like sending his car to a garage, why not learn the trade and render himself capable of doing his own repairs? ANNOYED.

### WANTON DESTRUCTIVENESS.

[19466.]—While driving my car along the Brighton Road on Sunday evening at 6.30 p.m. near Coulsdon Station, the oil reservoir of my side lamp came off and dropped in the road. The surface was quite free from stones, and it was therefore an easy matter to see the brass reservoir. My passenger got out and went back, and just before reaching it he stepped to the side of the road to allow a big Nazzaro car to pass. The chauffeur of this car, however, apparently thought that this was a unique opportunity to show his skill, and, it seemed to me, deliberately ran over the reservoir and damaged it beyond repair. MURICE G. BLAND.

### PARAFFIN CARBURETTER EXPERIENCES.

[19467.]—Owing to the fuel question being at the present time so much before the motoring public, the following account of an Easter tour on paraffin may be of interest.

The car is a 10-12 h.p. Belsize (two-seater 1912 model) to which has been fitted a Morris paraffin carburetter exactly the same as the one which so successfully completed the R.A.C. 2,000 miles trial and traffic test last year fitted to a Pathfinder car.

Leaving Blackheath on Thursday, March 20th, at noon, Stratford was reached by the Blackwall Tunnel, where a friend was met. A fresh start was made at 2.30 p.m. for Brandon, Suffolk (about ninety miles). The route taken was *via* Epping, Harlow, Bishop's Stortford, and Newmarket (where a stop of forty-five minutes was made for tea). Brandon was reached at 6.15 p.m. after driving the last five or six miles through a terrific hail and thunderstorm. The whole journey was completed without a hitch or fault of any description, and, on examining the sparking plugs the following day, they were found to be quite clean and entirely free from deposit.

The car was driven about forty miles during the stay at Brandon, and the return journey was begun after lunch on Easter Monday and proved equally eventful. The same route was followed, the only stop being at Bishop's Stortford for tea. Blackheath was reached at 7.15 p.m.

Petrol was used for starting until the engine was warm, the total amount used being under one gallon. The rest of the journey was done on ordinary paraffin costing 7½d. per gallon, the consumption being about 35 m.p.g.

The carburetter is fitted in the usual position and a 3in. copper pipe is carried through the entire length of the exhaust

manifold (about eighteen inches), and acts as a heater for the paraffin. This was found to be sufficient for ordinary purposes, and the change over to paraffin could be effected in a few minutes, provided the engine could be worked fairly hard.

An extra coil of copper pipe is now being inserted in order to accomplish the change over more quickly when starting out in traffic.

The paraffin is carried in a tank at the rear of the car and the petrol in a small cylindrical tank on the footboard, both feeding to the carburetter by pressure.

The work was done at a local garage (Blackheath Motor Works), and was only completed the week-end before starting. L.G.C.

### CAMPHOR IN PETROL.

[19468.]—Mr. Ernest Smith's letter [19452] is, on the face of it, particularly interesting, but I notice he does not say how much camphor he uses per gallon. Would he kindly say, and also for how long he has tried the camphor and whether he noticed any ill effects in the engine in the way of sooting up or otherwise? My car is a 10-12 h.p. Belsize four-seater, and I have been endeavouring to get the best results I can out of it. My consumption for all purposes has worked out for nine months at an average of 24½ m.p.g., but I have got as much as 30 to 32 m.p.g. in runs of 70 to 100 miles, including various stops, with four up, with good dry roads. Before attaining this I had to increase the size of the two holes in the main jet from .75 mm. each to .9 mm. I also find that the carburetter gives trouble when starting, which I generally get over by flooding. D 7513.

### RUNNING COSTS.

[19469.]—Having run my car as a business proposition 10,000 miles in about six months, I write to give running costs:

370 gallons petrol at 1s. 6d....	...	...	£27 15 0
15 gallons oil at 2s. ...	...	...	1 10 0
Lighting materials ...	...	...	1 0 0
Cleaning materials ...	...	...	1 0 0
Insurance (third party and fire) ...	...	...	5 13 4
Licence and driving duty ...	...	...	6 11 0
Repairs (other than tyres) ...	...	...	3 8
Renewals—Plugs, 15s.; brake lining, 6s....	...	...	1 1 0
Tyres, 3½ sets and one one set tubes ...	...	...	20 3 2

Total ... .. £64 17 2

I have bought my petrol as low as 10d., and most of it not above 1s. 3d., but for ordinary owners' comparison put it at 1s. 6d. The mileage per gallon comes out at 23.6, but at the present time on a good day's run I get 26½. Yard work, wastage, short runs, and a motor bicycle in close proximity chiefly account for the difference.

The tyres ran over 7,000 miles, but I calculate them at this distance, putting the cost of repairs against the extra mileages. The tubes are going yet, so that in taking the cost for the 10,000 miles at 1½ set of covers and one set of tubes it is put on the high side. I am now using the Victor tyre.

The original intention was to buy a good second-hand car, but a partner in a leading English house, knowing the conditions, advised a Ford, with the caution to run it slowly, deluged in oil, for the first 1,000 miles. Being bothered with the plugs fouling, I tried the Sphinx at 2s. 9d. with adapter at 1s., and have had absolutely no trouble since. It is the "adapter" that does it.

Many ingenious devices have been recommended, which would turn the Ford into a Rolls Royce. I meant to try the lot; they were so palpably necessary, but decided first to run a few thousand miles, and the car is still without any of them. An extra air inlet (not a patent) was fixed, and

Correspondence.

served as a plaything for 2,000 miles. It is now discarded, and in the hole in the inlet pipe I am fixing a small oil plug through which petrol can be injected in very cold weather; it makes starting easier.

The engine is now running very much better than when new, averaging nearly 24 m.p.h. going about 30 m.p.h. in the open; usual load, three persons or the equivalent (two persons and luggage), travelling from the North of Yorkshire to the South of England and through Wales.

I have put down nothing for depreciation. The engine is running better than when new. The company offered to "flat" the paint for me for £1. Presumably, the carriage work costs about £20, and I am not a seller, so leave it an open question.

JOHN McDONALD.

[19470.]—The following record of a year's running expenses of a Flanders car (October, 1911-October, 1912) may be of interest:

ESTABLISHMENT EXPENSES.	
Flanders 20 h.p. ... ..	£195 0 0
Hood and screen ... ..	17 0 0
Extra for Michelin tyres ... ..	3 15 0
Stepney tyre and tube ... ..	8 5 6
Painting numbers ... ..	7 6
Speedometer and fitting ... ..	4 0 0
Non-skid cover ... ..	5 1 0
Two accumulators ... ..	2 15 0
Locker for back (behind front seats) ... ..	1 0 0
Registration ... ..	1 0 0
Dunlop tyre tester ... ..	10 6
Vulcaniser complete (Vulcan) ... ..	2 12 6
Extra gas tubing ... ..	4 6
<b>Total ... ..</b>	<b>£241 11 6</b>
ANNUAL EXPENSES.	
Licence ... ..	£6 6 0
Driver's licence ... ..	5 0
Insurance ... ..	9 12 6
<b>Total ... ..</b>	<b>£16 3 6</b>
RUNNING EXPENSES.	
248 galls. petrol (price 1s. 3d. and 1s. 7d.)	£19 19 9
4½ galls. oil ... ..	17 0
One tin of grease ... ..	5 6
24 lbs. carbide ... ..	14 3
Four accumulator recharges ... ..	4 0
<b>Total ... ..</b>	<b>£22 0 6</b>
REPAIRING EXPENSES.	
Repairs to generator ... ..	2 9
New burners to head lights ... ..	2 6
<b>Total ... ..</b>	<b>£0 5 3</b>

REMARKS.

I charge covers, vulcanise, etc., myself, and have had to use the Stepney twice only. Occasionally I have had covers changed at the garage, but have not put down that expense in the above as it was only laziness. The six covers look like many more miles. I drive myself, and the car is washed and polished by my gardener. I often follow the East Essex Hunt, and recently was in at the death and received a pad. The year's mileage was 5,200, mostly lanes and byroads. I discarded the original dry cells for an accumulator, because of the great difficulty in starting. The engine starts very easily on four volts, and I charge accumulator directly the voltage is less.

COUNTRY PARSON.

[19471.]—Your readers will be interested to know the cost of running an 18-24 Austin car 10,000 miles, weight 27 cwt., four seats, four cylinders 4½ x 5, fourth speed ratio 2.6 to 1.

I took delivery June 21st, 1911, and completed 10,000 miles March 31st, 1913. The total cost of running comes to £110 10s. 7d. This includes tyres, petrol, benzole, rates, taxes, etc., also £16 for new timing wheels owing to a mishap. It does not include garage costs, depreciation, wages, or insurance. Renewals cost 10d. for a new fan belt, and a defective ball race was renewed free of cost. Tyres are all non-slip Michels 880 x 120. I have had several burst with a liner in. They were partly on the back and partly on the front wheels as follows: 9,111, 9,700, 11,549, and 9,640 miles, and on the back wheels only 9,765 and 7,065 miles.

Fuel test, Polyrhoë carburettor and benzole: I made and fitted a special tank for this test marked at half a gallon. I started at a milestone and ran on until the engine stopped

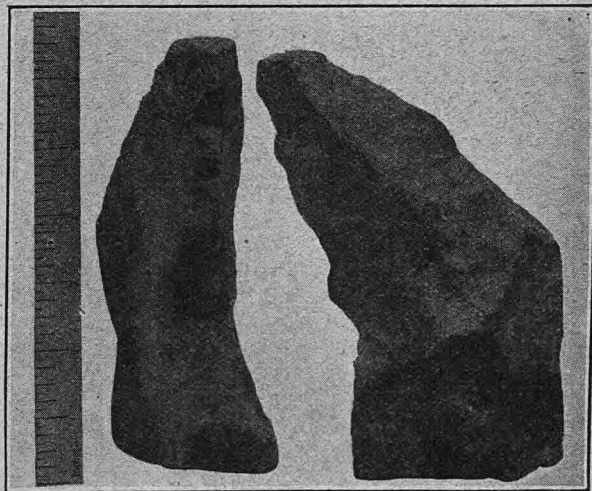
for want of fuel. The start was at the fifteenth milestone from Bridgwater (at Cross), and I ran towards Bridgwater (main Bristol and Exeter Road). The run down worked out at 28½ m.p.g. and the run back at 29 m.p.g., level road, one up, speed 22 to 25 m.p.h.; the usual checks for traffic and a stop for three minutes at Highbridge level crossing. A few weeks back I made an ordinary run of seventy-three and a half miles by speedometer over roads, lanes, and hills not at all favourable for a fuel test. I did nothing to save fuel; the tank was full of benzole at starting, and it took twenty-one pints to refill it. This works out at 28 m.p.g. I made no special preparations for these tests.

Will other Austin owners who are getting better results than this please give details, and say what carburettor they are using?

C. H. DAWK.

THE HOLYHEAD ROAD.

[19472.]—I am glad to see my letter [19316] in your issue of March 15th has elicited a little information on the state of the roads in the county of Merioneth. I note Colonel Mainwaring's reply to the above letter, and he is the very gentleman who can answer my question in the letter referred to, "Who is Responsible for the State and the Repairs of the Merioneth Roads?" I mean to say that all the roads in this county are bad. I am glad to see in your issue of April 5th that warning about the road referred to is given in the A.A. and M.U. Notes. When such a well-known writer as Mr. B. Hart-Davies complains, it is time something was done to put things in better order.



Two views of a stone picked up on a Merioneth road; said to be a fair example of the road material used in the district.

I am sending you two stones which I picked up on these roads on March 15th. Had I looked about I could have found larger ones, but those I have sent you are a fair sample of the size of road metal used. Can we expect good roads when this size of material is used and just run over once or twice with the steam roller? It is high time that something should be done to alter matters, as surely we are taxed enough and we ought to get a little in return for our money. I trust in your next issue some correspondent will give us the information asked for in my first letter, and then we shall perhaps have more attention to our roads. Why does not "Owen John" take a trip up this way and sample these roads? He would find a theme to keep "On the Road" going for the next few issues.

BERWYN.

THE WHEEL AND THE ROAD.

[19473.]—In reference to Colonel Crompton's valuable paper read before the Institution of Automobile Engineers, perhaps the difficulty of dealing with the wheels of motor lorries and other similar vehicles might be got over by increasing the width of the wheel tread instead of increasing the diameter of the wheel.

The permissible ratio of inches width of wheel tread to the ton of load on the wheel tread could easily be ascertained by Colonel Crompton's road testing machine.

If then this ratio were enforced, every steam traction engine or motor lorry would to a great extent act as a roller on the road, and presumably tend to the improvement of the surface instead of to its destruction.

E. H. STONE.

*Correspondence.*

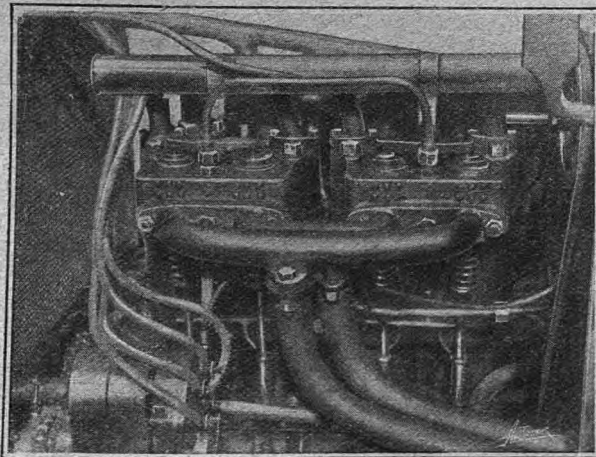
## FAMOUS CARS IN RETIREMENT.

[19474.]—Seeing accounts of the lives of several veteran cars published in your paper, the following may be of interest to your readers. The car, an 8 h.p. Panhard, is, we understand, the first four-cylinder 8 h.p. made, bore 80 mm., stroke 120 mm., and the original car which took part in the Paris to Bordeaux race. It left the Panhard and Levassor works in December, 1899. When we first acquired it we used it as a hire car, and then it was used to teach driving on. However, this work was rather too strenuous for it, especially as all the oil leads to the gear box had been removed. Lubrication for the bearings of that part being left entirely to splash, and owing to the sliding shafts being in the bottom half, the oil came out rather faster than anticipated, and consequently the bearings continually required renewing, and the car was ultimately practically consigned to the scrap heap, but, recognising the sterling value of old cars of this name, we considered it deserved a better end and was worth spending a small amount of



*The Old Paris-Bordeaux Panhard still in service.*

money on. We therefore considered the question very carefully as to what we should do. First of all we took the gear box down and rebushed it where required, and replaced all the oil leads. Then as to the engine, we turned out the valve seatings and put in much bigger valves, and cut out all the governor gear, placing long guides and tappets in the place of the trip gear with drip lubricators to each. In the place of the small two drip lubricator on the dash we fitted a six-way mechanical oil pump; also in the place of the old trembler coil and commutator we fitted a Bosch magneto driven by chain off the camshaft.



*The engine of the old Panhard racer.*

The old radiator and water tank behind the car and the water tubes were all removed, and a modern honeycomb radiator was fitted without a fan, fed by the old friction drive pump off the flywheel. A very curious point about this engine was that we found much distortion of the exhaust valves owing to heat, and we discovered by boring holes in the water jacket of the cylinder head that the sand

from the mould had never been removed from the jacket round the valve pockets. We cleaned all this out and covered up the holes by plates as shown, and led off subsidiary pipes from here to the top of the radiator. This effectually cured the trouble. The only other alteration was raking the steering.

The car, as now fitted, will easily climb Reigate Hill with eighty gallons of petrol, a forty gallon drum of oil, and two passengers. THE REIGATE GARAGE, LTD.

## ROAD CONSTRUCTION.

[19475.]—My remarks on road construction seem to have somewhat irritated Mr. Norman E. Box. If 20 ton locomotives with ribbed wheels cause no wear to the roads what does? Possibly it is bicycles and perambulators! Seriously though, even allowing for Mr. Box's anxiety to make the best of his case, I am rather surprised at him making such a ridiculous statement, because he cannot really hope to deceive anyone by it. Unfortunately, the damage done to the roads by these heavy locomotives is only too evident, and people are at last beginning to realise it. Just recently the Grimsby Town Council passed a byelaw closing several roads leading into the town to traction engine traffic, not only on account of the damage done to the roads themselves, but also the damage caused in the adjoining houses by the excessive vibration. C. W. NAINBY.

## INCONSIDERATE DRIVING THROUGH LYNDHURST.

[19476.]—On behalf of the Hampshire Automobile Club, I should be greatly obliged if you would draw attention to the fast and inconsiderate driving of some motor cars and motor cycles through the village of Lyndhurst, Hants.

For this reason and for the fact that several accidents have occurred, the Parish Council of Lyndhurst have on two occasions already discussed the advisability of applying for a speed limit through the village.

The Hampshire Automobile Club would therefore earnestly request motorists to proceed with the greatest caution through Lyndhurst so as to avoid the possible imposition of a speed limit in the future. CHARLES BRAUN, Chairman Hampshire A.C. (Southern Division).

## THE MOTORING ORGANISATIONS.

[19477.]—I and my friends warmly welcome the remarks of the Chairman at the annual R.A.C. meeting, which entirely disarmed expected criticism. As motorists we feel that the Club has now gone a long way towards meeting the objections which have been urged, and we gladly respond to the Chairman's invitation to "trust the Club." We feel that the R.A.C. will now do all in its power to tackle the points which have been raised, and, as ever, we only desire a united club with a strong forward policy. The only point upon which the remarks made might be held to be disappointing was that no hope was held out of the Club ever becoming a purely amateur organisation. As, however, this has only been advocated because it was believed that the lack of this was responsible for the mistakes made in the past, now that these mistakes are to be rectified it behoves all well-wishers of the Club to sink their demands in this respect and let the future conduct of the Club's business be the earnest of the Chairman's contentions, for nothing is surer than that "by their fruits ye shall know them."

May I take this opportunity of thanking those fellow motorists who responded to my appeal and wrote to the Club before the meeting? A. W. FARNSWORTH.

## GUARANTEES.

[19478.]—We are interested in the correspondence appearing in your columns regarding the question of makers' guarantees. We quite agree with your two "Disgusted" correspondents [19408 and 19424] that the form of guarantee issued by practically every manufacturer, including, up to three years ago, our own, does not protect the owner of a motor car against loss in the case of any mechanical breakdown due to any original defect in his car. This guarantee, however, at least so far as we are concerned, was issued for our own protection rather than owners, as it sometimes happens that in spite of the manufacturer's earnest desire to behave generously towards his customers, demands for free replacements are sometimes made on account of breakages which are in no way due to any fault on the part of the manufacturer. The customer, therefore, has to rely on the reputation for fair dealing, which every manufacturer who wishes to retain his custom is obliged to uphold. Realising the difficulties, however, of attempting to prove to some owners that a particular breakdown is due entirely to their own neglect, we instituted an insurance scheme

about three years ago, whereby every purchaser of an Armstrong-Whitworth car was insured by us for one year free of charge in conjunction with an insurance company against any loss where a breakdown occurred through accident, negligence, or any original defect in the car for the first year. Under our scheme, should an Armstrong-Whitworth car break down from whatever cause, not only is a new part provided and replaced in the car free of charge, but none of the consequential expense in connection with taking the car to a garage or to our own works falls upon the owner. No disputes as to liability can possibly arise, and we do not think a better scheme could be devised, both for our customers' and our own protection. As an instance of the way the scheme works, we may say that one of our customers was driving in France some time ago, and we heard that, from some cause or other, one of the big ends had run and was taken into a French garage for repair. An account was sent to us for fr. 690.90 = £27 12s., which, we must confess, appeared to us to be an extremely exorbitant charge. We were unable to verify the account, nor had we any opportunity of examining the car to find out whether the breakdown was due to any original defect, from dirty oil or want of lubrication. The car had been running and had been giving perfect satisfaction for about four months previously to this, and if only the usual manufacturer's guarantee had been in force, we should naturally have been inclined to make some enquiries before paying this large amount. The company with whom we effect our insurance, however, immediately sent the owner a cheque for the total amount without raising any question, and we doubt whether the owner could have obtained such complete satisfaction except under a scheme similar to our own.

SIR W. G. ARMSTRONG-WHITWORTH AND Co., LTD.

[19479].—We agree with the writer of letter 19408, which appeared in *The Autocar* of April 12th, that many motorists are induced to buy under the security of a guarantee. We do not, however, agree with him that such guarantees are useless. The fact that we are daily meeting claims arising under our guarantee is indeed conclusive proof to the contrary.

Guarantees are of the utmost value to private buyers, for the obvious reason that so very few have sufficient technical knowledge to judge quality by superficial examination. On the other hand, commonsense alone is required to judge the exact amount of security that any specific guarantee carries. Of course, a guarantee can be so worded as to afford no security whatever; or, again, it can be so worded as to give absolute security. It is, consequently, of the utmost importance to the buyer to obtain a written copy of the guarantee which is given with the article he proposes to buy. Having done so, he should read it in order to ascertain—

1. Whether it specifically relates to the article he proposes to purchase.

2. Exactly what it guarantees him against. The most liberal guarantee possible is, naturally, the guarantee which indemnifies against every contingency. That such guarantees are commercially possible is proved by the fact that since November 1st, 1912, we have guaranteed our motor tyres to accomplish a minimum distance of 3,000 miles. This guarantee holds good against everything except consequential loss. It is only commercially possible to give such a guarantee for the reason that although the loss under it in specific cases is often very large (such as when a cover is damaged utterly beyond repair owing to its being cut clean through by a glass bottle during its first day upon the roads), yet such losses amount to but a very small percentage of the total sales when the articles concerned are good. The burden of such losses is thus shared by the many instead of falling wholly on the few. The guarantees granted by many firms, however, are not by any means of this comprehensive nature, but either exclude certain specified classes of failure, or are only given against certain specified classes of failure. Of the two types the former is the more satisfactory to the buyer, as he then knows exactly what is excluded, whereas with the latter type he only knows what is included. Of the former type our tube guarantee is an example, as in such guarantee we specifically exclude mechanical damage. The most usual example of the latter type is the guarantee which is against defective manufacture only. Such guarantee gives practically no security at all, as it is in most cases impossible to ascertain whether the failure has been caused through defective manufacture or through some other cause. This is especially the case with motor tyre covers, the majority of which fail through no apparent cause.

3. The buyer must also see that the penalty the seller is prepared to pay in the event of the article purchased not fulfilling the guarantee is clearly set forth. If a guarantee does

not contain any penalty it is valueless, e.g., a guarantee worded "This article guaranteed not to shrink" is not worth the paper it is written on, whereas a guarantee worded, "This article guaranteed not to shrink. If it does we will replace it free of charge," gives absolute security to the buyer against that article shrinking, as it clearly states the penalty that the seller is prepared to pay in the event of it shrinking. Leaving out the words "free of charge," however, would render the guarantee valueless, as the seller could then make any charge he liked for the replacement. Again, if the replacement is only confined to the defective portion the guarantee is practically worthless, as the cost of the defective portion generally only forms a very small part of the total loss sustained. For instance, the breaking of a big end bolt often results in the crank chamber, crankshaft, connecting rod, and piston being badly damaged. The cost of replacing such a bolt would be negligible when compared with the cost of repairing the whole of the damage resulting from its breakdown.

4. The fourth point to ascertain is that the guarantee is of such a nature as to make it commercially possible for the seller to offer it. Sellers are not philanthropists. The buyers can always take it for granted that sellers are not in business for their health. Guarantees, then, which purport to give everything and take nothing should for that reason, if for no other, be looked upon with suspicion, and it will generally be found that in reality they give nothing at all. A practical guarantee of durability must necessarily always be limited. In the motor trade this limit is conveniently expressed as a period of time or a number of miles. When a time guarantee is given by a manufacturer the buyer should see it operates from the date on which he purchases the article, which is not necessarily the date on which the article was sold by the manufacturer. It may conceivably have passed through several hands, and a large proportion of the guarantee may thus have elapsed. In the case of mileage guarantees it is obvious that the maker must possess some fairly reliable means of ascertaining his liability from time to time. If, therefore, the maker requires to be informed regularly of the mileage run by the article he has guaranteed, it can generally be taken that his liability under such guarantee is considerable, whereas if he omits this precaution it is more than likely that the guarantee is practically valueless. An important point, this.

THE ST. ALBANS RUBBER CO.  
Grimston, General Manager.

#### ADVERTISING.

[19480].—I am afraid if your correspondent, "Puzzled" [19433], is serious he cannot read. If he is not serious he should not write. If he is interested as a tyre consumer he doubtless has price lists of all tyres on his reference shelf. If he is not interested as a tyre consumer he has no cause for complaint. If he does not know what R.A.C. stands for he is not a motorist. If he does know what R.A.C. stands for his question is fatuous. If he is unable to discover what the advertisements are about he is a case for commiseration. In short, the purpose of "Puzzled's" plaint escapes me. The only fairly obvious thing is his reason for withholding his name. If, however, he is honest in his desire to support home industries and will call here, we will show him an industry built up upon a very gratifying demand for Victor products that will enable him to gratify his desire to the full. W. YARWORTH JONES.

Managing director, The Victor Tyre Co., Ltd.

#### A SERVICEABLE CAR.

[19481].—I feel it a pleasurable duty to give you a few particulars of my experience with a 6 h.p. De Dion (Style 2) that was delivered to me in April, 1903 (ten years ago). I invested in it for commercial purposes and it has given splendid satisfaction, and although I have done 75,000 miles the car runs quite as well as at first. It does fifty miles to the gallon. I use only the best of oil and grease, and plentifully. Probably what will surprise you most is the fact that the crank case has not yet been taken down. When the cylinder is off I find no apparent wear at all in the gudgeon pin bearing, and cannot detect any up and down shake in the big end. The main bearings also show no apparent wear and do not leak any oil. I have recently put new fibres on the clutches, though the old ones were not nearly worn out, and as for the gear fifty years will not wear it out. The road wheels have never been rebushed and do not yet require to be. In fact I should like one of your experts to examine the car and have a trial run; it would prove how marvellously durable a good car is when properly taken care of.

## Correspondence.

My first repair was fourteen months after having my car. I had to have new driving axles and cardan-shafts (the original ones would not have worn out so soon had I known how to exclude grit from them). I got them made by the Crescent Motor Engineering Co., of Whitehead Road, Aston, Birmingham. They greatly improved on the original ones, making them stronger, and especially the cardan-shafts, which they made thick in the middle, tapering down to the regular size at the ends. I think they called them "fishbacked"; these never twist. All were beautifully made and case hardened, and when assembled long leather sleeves were made to connect the gear box and driving axle ends together and filled with grease. They are in the car to-day and in perfect condition, and they did not cost any more than genuine De Dion parts. At the same time they fitted a metal protecting case—a great boon in saving the change-speed mechanism, etc. Two years ago a taxi charged me broadside with serious results. Again I put the repair in their hands, and it was done admirably and very reasonably. I have recommended several of my motoring friends to these engineers for extensive mechanical repairs, and they have all been as invariably satisfied as I have been. The usual disclaimer.

J.J.F.

## STEAM CAR DESIGN.

[19482.]—In reply to "Engineer" [letter 19448]. Surely he has made a mistake in giving the consumption of water as forty miles per gallon on, I presume, the 15 h.p. White steam car, which, assuming the water tank holds twelve gallons, gives 480 miles?

Also I cannot understand why he should wish to replace the very simple Pearson-Cox burner and generator with the much more complicated White system. In my humble opinion, Messrs. Pearson and Cox have eliminated the worst features of the White, and have evolved an infinitely simpler and cheaper car for the average owner to maintain in running order and repair. Usual disclaimer.

M.S.T.

## CHANGED OPINIONS.

[19483.]—The matter below shows the change of feeling towards motorists that is gradually taking place amongst all sections of the community, especially in country districts. If we had not behind us in the past enterprising and determined business men, combined with the assistance of the motor press, the trade would have taken years longer to develop. The majority of the British public are slower than any other nation to change their habits, and they look with suspicion on any new invention or innovation, but once satisfied of its benefits they are not slow to take advantage of it.

The Rev. G. E. Park, vicar of North Burton (East Riding of Yorkshire) and a member of the Bridlington District Council, at a meeting of that body about two years ago referred to motors as an affliction, and called them "prowling, pestilential, petrol-propelled, pachydermatous, pile-botomising parchers."

At another meeting in Bridlington recently a reference was made to the bad state of the road in his district, and he stated the road was very bad for motor traffic. (Laughter.) The Chairman said that he was rather surprised to hear the Rev. G. E. Park speaking on behalf of motor traffic when they remembered his definition of a motor car as a "ton of iron and a big stench." The Rev. G. E. Park replied, "Like other men I have changed my mind." (More laughter.)

I might mention that the reverend gentleman apprenticed his son to the motor trade.

F. G. PURDON.

[We congratulate the reverend gentleman on the courage shown in avowing so drastic a change of opinion.—Ed.]

## LONDON TRAFFIC CONGESTION.

[19484.]—It has been borne in on me for many months past that the chief cause of the increasing congestion of inner London street traffic is directly traceable to the ever-increasing number of motor omnibuses appearing on our streets.

I do not propose to argue as to the number necessary for travelling requirements, but from the point of view of the motorist, coupled perhaps with the general safety of our London thoroughfares, for the lack of which, as a general rule, we owner-drivers and private motorists are not to blame, as our good free British press (or certain sections of it) would from time to time try to lead the public into imagining.

The present motor omnibus is at the best a lumbering, top heavy, clumsy vehicle, and still very far from perfection. One can certainly not see over, neither can one usually see round, it.

Of the ordinary signs and customs of the road its drivers and conductors are still, alas! too often ignorant: one does not perhaps like to say wilfully. They have to keep time and all that, and when all is said and done theirs is the last thing on the road likely to suffer the most damage from either their own or others' faults.

To argue, however, that they should be allowed to multiply without restriction is pure idiocy.

I drive out from the West End in fine weather perhaps three or four times a week for a run of, say, sixty to eighty miles round London, and usually depart and arrive *via* Hammersmith Bridge, which might well be styled "The only way, for motorists," to the west and southwest of London. Now, no one can tell me that I can get from the West End to Barnes (a distance of six miles in my case) in the same time that we could a year ago, because it is not so! Whether *via* Notting Hill Gate or whether *via* High Street, Kensington, the result is the same.

High Street, Kensington (off the church) is sometimes blocked by 'buses, which draw up practically opposite the second refuge, six at a time. Notting Hill Gate stopping place (on the west side of the Tube Station going west) is another choice spot, and the Richmond Road turning at Shepherd's Bush is one of many others.

Probably owing to road camber, the 'buses persist in maintaining the centre of the roadway, and one often has to drive for hundreds of yards well throttled down in rear of one, any attempt to pass being dangerous, because one never knows when it will suddenly swerve right over to the off side of the road to avoid a too suddenly stopping *confre*, or to endeavour to rush past him.

I have recently returned home from a long Continental tour, and now find also to my horror that the Bath Road is being rapidly torn to bits by a constant service of these mammoths, running from Hounslow to Windsor Castle for 6d., and usually, as far as I can see, empty. A similar service runs on the Basingstoke Road to Staines, fare 4d.

The Bath Road, bad all last year from Colnbrook to Hounslow, is now immeasurably more so, though on a recent week-end one steam roller had a small section of it under repair. It is probably (this section) one of the worst main roads out of London at this moment, and would compare unfavourably with some of the execrable main routes of Northern France, which we are so constantly being told about.

In effect, one thing is certain—if motor omnibuses are to increase indefinitely, properties must come down and our streets be increased in proportion. Failing this, there is only one outcome—an utter *impasse*.

Why, in the name of fortune, can we not have one central authority for the control of all traffic? We pride ourselves on being a businesslike nation, and yet, in this respect, we resemble an army of apes in a primeval virgin forest.

WANDERER.

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## Flashes.

As in Coventry and Wolverhampton, town gas is now being used in the engine testing departments of several of the motor factories in Detroit, U.S.A.

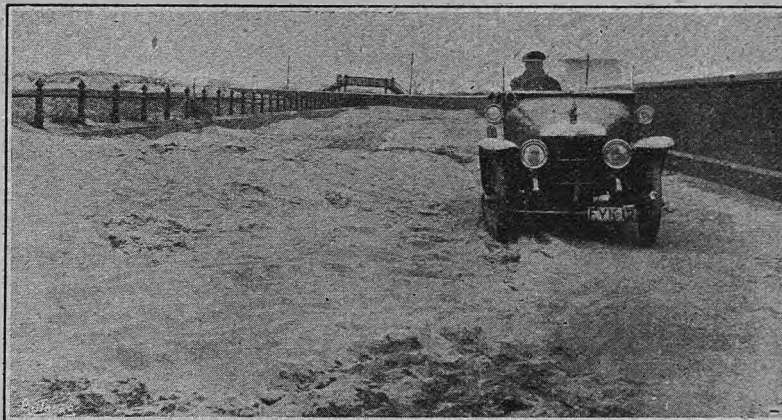
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The accompanying photograph shows an official of the Vulcan Motor and Engineering Co., Southport, testing a new 10-12 h.p. model Vulcan car on a road which, locally, is considered impassable to vehicular traffic. The drive is the Birkdale esplanade, made only twenty years ago, and which was for many years the pride of the neighbourhood, but now, alas! covered by thousands of tons of blown sand. For years a continual fight has been going on with the sand in this neighbourhood, but although a vast quantity has been removed, revealing ruts in the road beneath to the depth in places of nearly a foot, it continues to accumulate, and the sandhills or dunes on the left of the picture have entirely shut out the sea view from the drive. In this neighbourhood—between the Estuaries of the Mersey and the Ribble—some 10,000 acres of land have been "established" through these sand accretions during the last thirty years. Now that Southport has taken over the Birkdale district, it is expected the Birkdale esplanade will shortly be made one of the attractions of the place once more.

\* \* \*

It is satisfactory to find that British cars are meeting with an increasing sale in France. Evidence of this is found in the fact that, while the total imports of foreign cars and chassis into France during the two months ending with February last showed an increase of £29,904 (the exact figures being £86,316 and £56,412), no less than £12,000 was in British cars. Germany was second with an increase of £8,000, followed by Italy with one of £5,200. It comes as a surprise to find that, notwithstanding the strenuous

efforts American manufacturers are making to introduce their cars into France, they have only increased by £2,800. An increasing trade is also being done in British cars in Egypt. During last year the value of the total imports of complete vehicles into the country amounted to £72,400, as contrasted with £55,000 in 1911. Although France has the principal share of the trade, the imports from that country only advanced



A new 10-12 h.p. Vulcan on the sand-covered Birkdale esplanade (Lancs.), referred to in the accompanying paragraph.

from £28,400 to £30,600, while those from Great Britain increased from £11,200 to £26,000.

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Four Rolls-Royce cars—three of which belong to the makers themselves and one to Mr. James Radley—have been entered for this year's Austrian Alpine tour.

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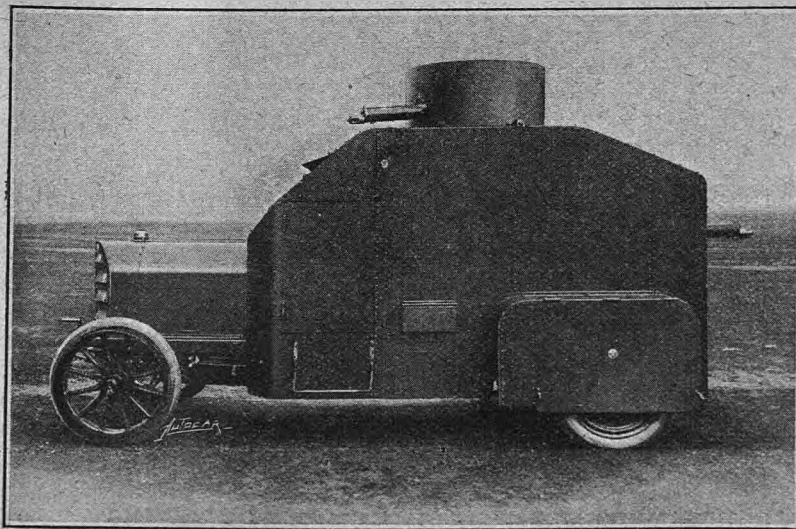
There are some low-lying parts of the road between Egham and Windsor which are subject to floods, and at the instigation of the Royal Automobile Club the Highways Committee of the Urban District Council of Egham has decided to recommend the Council to exhibit a notice when the road is under water warning motorists that it is impassable, and suggesting another route.

\* \* \*

A complaint has been made regarding the excessive speed of motor cars passing through Bearsden, near Glasgow, and the committee of the Scottish Automobile Club hope that motorists will drive slowly when passing through the village in future to avert unpleasant consequences.

\* \* \*

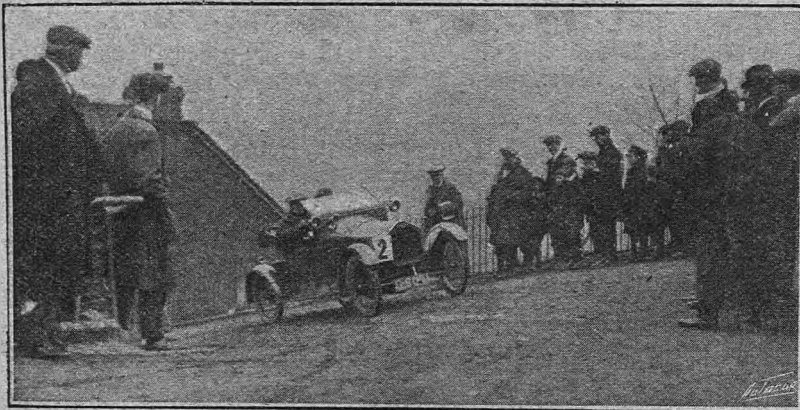
The Chief Constable of Lanarkshire has again found it necessary to draw attention to complaints of inconsiderate driving by motorists on the Carlisle Road in the neighbourhood of Elvanfoot. Last week a ram, valued at £25, was killed by a motor car. Motorists are requested to use great care when passing along this road, which runs through sheep-farming country and is largely unfenced, as any further complaints will probably lead to police action, which it is hoped motorists will try to avert by driving carefully.



A specially built Isotta-Fraschini car for the Italian Government. It is armoured and carries two Maxim guns, one being mounted in the turret.

*Flashes.*

In the interests of motorists, the Hampshire A.C. (Northern Division) and the R.A.C. General Committee are defraying the cost of the improvement required at a dangerous corner at Yateley.



A passenger motor cycle and cycle car trial was held in the Midlands recently, organised by the Birmingham M.C.C. The steepest hill was the old road to the Wyche cutting at Malvern shown in the photographs on this page. Above, F. H. Southam (Humberette) is safely over the 1 in 3 section.

The secretary and manager of the Richmond Royal Horse Show, which will be held on the 13th and 14th of June, states that whilst there is a special enclosure for motor cars, and a further special enclosure for cars belonging to members of the Royal Automobile Club, there is no restriction placed upon the drivers of cars as to the position they occupy round the rails. They are at liberty to take up positions wherever they think proper within the limits arranged for cars and carriages, and every care is, and will be, taken to give the best accommodation to motor cars.

\* \* \*

Last week we described the Cox stream-line carburetter. Since then Mr. Cox has furnished us with particulars of some results which he has obtained on his Riley car. First of all, with benzole he did 10.2 miles on two pints at an average speed of twenty-two miles an hour over a fair give-and-take road, the car with its passengers weighing  $26\frac{3}{4}$  cwt. With petrol over the same road, with the same load and as nearly as possible at the same speed, he got nine miles on two pints. With the same setting but, of course, not during the consumption test, he obtained a maximum of forty-eight miles per hour on the level road, the speedometer showing no appreciable difference between the two fuels, though with careful timing on Brooklands some slight difference might have been shown. On a run of ninety miles, with a total load of 25 cwt. at an average speed of about thirty miles an hour, consumption worked out at 29.9 miles per gallon on petrol. Of course, with benzole the consumption mileage would have been a little better. As adjusted for these tests the carburetter gave the same immunity from popping, choking, or stumbling when the throttle was opened or closed suddenly as we found when testing the carburetter ourselves.

B36

Following the example of the Automobile Club of France, the Russian Automobile Club has decided to organise a Grand Prix motor race. The event, which will probably be run off in June next, will be held on a circuit in the neighbourhood of St. Petersburg.

\* \* \*

The theft or burgling of cars is not an unknown class of crime, and when perpetrated is particularly irritating to the robbed. There are few private garages which could not be broken into at night by experienced thieves, whence the car could be pushed away a safe distance and the engine started by hand in order not to awaken anyone sleeping in proximity. It would appear that the proprietors of the Klaxon horn can protect the users of their instrument by fitting a secret electrical attachment which brings the Klaxon into immediate and constant operation directly the side brake is released sufficiently to permit the car to be moved. As the car

burglar must necessarily take off the side brakes before he could effect his nefarious purpose, the sudden and unexpected blare of the Klaxon as he did this would not only arouse the neighbourhood, but would scare him and put him instantly to flight.

\* \* \*

It has now been decided that the second Excelsior car entered in the Grand Prix, which will be run off on July 12th on the Picardie Circuit, will be steered by Mr. Hornsted, M. Christiaens steering the other. Both cars will be fitted with Palmer cord tyres.

\* \* \*

The police are working a trap starting three miles east of Lewes on the Eastbourne-Lewes Road and extending ten miles to Brighton. Cars are stopped when travelling well within the speed limit, and drivers are asked to produce their licences. All motorists passing this way should drive very carefully.



A Singer and a Morgan runabout on the steepest stretch, of the Wyche cutting at Malvern. See other illustration on this page.

# Some Queries and Replies.

Readers seeking the experience of users of specified cars, parts, or accessories are invited to insert their queries in these columns, and their fellow readers are invited to reply.

Querists are asked to enclose a stamped addressed envelope, so that replies may be made direct if the subject is not considered of sufficient general interest to publish.

Letters should be addressed to the Editor, "The Autocar," Hertford Street, Coventry, and replies to querists should bear the number of the query to which they refer.

Editorial advice is at all times willingly given to our readers.

## REPLIES.

### No. 2616.—Carburettor for 14-16 h.p. Belsize.

I have a 14-16 h.p. Belsize, 1911 type, which was recently doing only about 12 m.p.g. I have fitted a Zenith carburettor and a Mills economiser, with the result that on a 155 mile drive recently I got just about 22 m.p.g. on a petrol-benzole mixture, and the car pulled better than ever it had done before.—R.W.

### No. 2571.—Scout Cars.

No fears need be entertained about the carburettor fitted to the 15.9 h.p. Scout car. No matter how slow the car may run, or how wide the throttle be opened, the engine will not choke and stop. This is a thing unknown to me during my 25,000 miles running. The extra air is admitted by a suction valve, and the whole carburettor is a very simple device. It is made by the Scout Co. at their works at Salisbury.—D. J. BISS.

### No. 2617.—Brake Lining.

We notice your correspondent "Crossley Owner" has put the brake lining on the drum, and not on the brake shoe. We think this method of fixing a brake lining does not give satisfactory results, as the radius of the brake drum alters by the wearing of the lining, and the brake shoes will not come in touch over all its surface, and for this reason more pressure would be required to stop the car. We think this will probably be the reason why "Another Crossley Owner" complains about his brakes not stopping the car promptly.—THE HERBERT FROOD CO., LTD.

### No. 2562.—20 h.p. Ford.

I have had a 20 h.p. Ford five-seater for over a year, and have run 5,000 miles up to date. The consumption of petrol has varied from 25½ to 24½ m.p.g., except for a distance of 500 miles run during the rains between July and September, when it fell as low as 17 m.p.g., chiefly due to heavy roads and excessive rain. I run the car entirely myself, and am not dependent on a chauffeur. There must be something radically wrong with "Owner's" car if he can only get 9 m.p.g. The jerkiness alluded to is probably due to misfiring in one or more cylinders. "Owner" should inspect commutator and see whether the roller or the commutator fibre is worn. I have a Kingston carburettor as supplied on the 1911 model.—D. O. WITT.

### No. 2627.—Carburettor for 19.6 h.p. Vulcan.

I have a 19.6 h.p. Vulcan with a two-seater body which was delivered to me six or seven months ago. At first on a run of some hundred and fifty miles not more than 17 m.p.g. was done. The Longuemare carburettor was taken down and a "25" mm. choke tube was substituted for the "24" supplied with the car. This change gave 19½ m.p.g. With the rise in the price of petrol I decided to use one of the cheaper grades of spirit, and after some time and

difficulty a 27 mm. choke was used with this result. The petrol tank was emptied and a measured gallon of Crown spirit was put in, and it was decided to run the car until the engine stopped. After setting out with the mileometer at zero it was found that the car covered, on an ordinary give-and-take road, twenty-four and one-seventh miles before the engine stopped. I may mention that in this set run we missed our road, and the car had to be turned round, so what was the exact mileage was not known. The car in question is a touring car, and, without touring kit, as in the above trial, it scales 25½ cwts. My chief complaint in regard to the carburettor is the unfortunate noise it makes as the air is sucked through the intake pipe, which is attached to the exhaust by an aluminium bracket. To a great extent this has been remedied by taking down this bracket and cutting out a good sized square of the front half, which is perforated by some four or five holes, and carefully rounding off all edges, then cutting away the two ends so that this grips the exhaust pipe only in eight places—four points on each half. Further, I have entirely stopped up the three extra air ports in the base of the jet chamber, and so makes all air reach the carburettor through the intake pipe only. In conclusion, since the carburettor scarcely gets a chance of becoming warm, and, of course, doing its best, owing to the large fan, the big open space between the bottom of the radiator and the engine, and last, but not least, the large and many louvre openings on each side of the bonnet, I have discarded the fan entirely, at least for the present, until the weather gets very much warmer. The results are quite satisfactory.—VRILYA.

### No. 2642.—Spyker Cars.

I have had nine years' experience with Spyker cars. The one I drove and looked after has been on the road severally per week for nine and a half years, and during that time the car was overhauled once, when it was found that it required two new ball races—one in front of the gear box and one in the bevel wheel case—and five new piston rings. Every part is as good to-day as the day it was delivered in England. The car runs on an average 20,000 miles per year, and can be seen running every day in the suburbs. It has ordinary poppet valves. I am in no way connected with the Spyker firm.—P. SYONARD.

## QUERIES.

### No. 2653.—Carburettor for 14-18 h.p. Aildays Car.

WILL any reader who has fitted a carburettor other than a White and Poppe to a 14-18 h.p. Aildays car, early 1912 model, kindly give name of it and state the result?—J.E.B.

No. 2654.—11.9 h.p. Arrol-Johnston. CAN any of your readers tell me how many miles an Arrol-Johnston 11.9 h.p. will run to the gallon? Do tyres



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* 6 h.p. JACKSON, semi-racer	£35
* 12 h.p. FORMAN, 4-cylinder	£20
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* 12 h.p. CLEMENT-TALBOT, 4-cylinder	£75
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* 15-20 h.p. JUNIOR, fine lot	£70
* 18-22 h.p. BELSIZE, long chassis	£30
20 h.p. AUSTRIAN-DAIMLER	£20
10-12 h.p. DARRAGO, with torpedo body	£100
16-20 h.p. CROSSLLEY	£15
10-12 h.p. PEUGEOT, long chassis	£40
* 40 h.p. MERCEDES, superb car	£150
14-20 h.p. MINERVA, requires overhaul	£25
30-40 h.p. LEGROS AND KNOWLES	£85
8-10 h.p. DARRAGO, hood, screen	£75

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* 30 h.p. SPYKER double landaulet	£75
16-20 h.p. ROVER landaulet	£100
20-32 h.p. DARRAGO double landaulet	£100
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* 12 h.p. LANCHESTER limousine	£15

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15 h.p. HUMBER, with van body	£60
15-20 h.p. ARIEL, with van body	£60

### CYCLE CARS.

* 8-10 h.p. 1912 DUO sociable	£85
8-10 h.p. 1912 DUO tandem, hood, screen	£70
5½ h.p. 1912 BEDELIA, shop-soiled	£75
4½ h.p. 1912 BEDELIA, nearly new	£50
3½ h.p. 1912 BEDELIA, nearly new	£45
6-10 h.p. 1913 AUTOMOBILETTE, new	£120
8 h.p. sociable cycle car	£25
* 5-6 h.p. A.G. sociable	£50
5-6 h.p. BEDELIA, with box body	£80
* 8-10 h.p. SABELLA, 1911, J.A.P. engine	£45

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**Some Queries and Replies** (Continued).

wear well? Is upkeep generally economical, and is this machine good on hills? What is about the actual horse-power? I see the stroke is 120 mm. I can manage it myself.—COUNTRY PARSON.

**No. 2655.—Motor Trade Openings in Canada.**

I WOULD be very much obliged for any advice as to the prospects of the motor trade in Toronto, Canada. I am thinking of going there. What would be the best means of getting a situation before I go?—S.B.

**No. 2656.—Running Costs.**

I AM contemplating the purchase of my first car, a 20 h.p. Singer landaulet, and am anxious to know the cost of running such a car a year. I hope to do about 3,000 miles in the year, and will keep a chauffeur. Any hints from users of this type of car would also be appreciated.—NOVICE ON UPKEEP.

**No. 2657.—Tour in Scotland.**

I AM thinking of taking a trip to Scotland towards the end of July, and should be greatly obliged if any of your readers can recommend me a good motoring route from Glasgow for a week or ten days, taking in Loch Lomond and the district. Any information as to the best or rather most comfortable hotels will be appreciated.—H.A.B.

**No. 2658.—Test for Loss of Magnetism.**

CAN any reader tell me of a simple test for loss of magnetism in magneto? My Bosch magneto type D.U. 4 will not support the little spanner, weight  $\frac{1}{2}$  oz., which is supplied with it when placed against the lower side of the magnets. I am inclined to think that these weak magnets cause my engine to run irregularly at low speed, owing to the spark not being intense enough.—PADDY.

**No. 2659.—Carburetter on 14-20 h.p. Renault.**

MAY I ask if any of your readers can give me their experiences of the carburetter on the 1912 14-20 h.p. Renault and means of reducing petrol consumption? I can only get eleven miles to the gallon. The steering wheel control to the carburetter gives "air closed," "hot air," and "cold air." I simply leave control at "cold air," for if I alter it when running it makes no difference whatever.—S.J.S.

**No. 2660.—Polyrhoe Carburetter for Crossley Engine.**

I RECENTLY fitted a Polyrhoe carburetter on a 15 h.p. Crossley engine, but cannot effectively heat it. The makers of the carburetter cannot suggest how I can do this, and I should like to hear from any user who has overcome the difficulty. My last attempt has been by constructing a hot box in the form of a copper cylinder, about 4in. diameter and 6in. high, into which a branch from the exhaust has been led, which is then allowed to exhaust below the under screen. The hot box contains a coil of copper  $\frac{3}{8}$ in. pipe which is included in the hot water circulation. The circuit is as follows: A branch is taken from the cylinder jacket to the carburetter, and from this through the hot box coil and to the main discharge of the thermosyphonic system. The carburetter is still cold and always contains liquid petrol. Notwithstanding this, I find

no difficulty in starting, and over several hundred miles of test runs, the consumption has averaged 21 m.p.g. and has never been below 19 m.p.g. But the pick-up is not satisfactory, and on suddenly closing the throttle liquid petrol is ejected from the carburetter. I feel sure the carburetter would be very satisfactory if only I could heat it. As it is I can run on top gear at 8 m.p.h. and up to 40 m.p.h., but the carburetter is "moody."—M.I. MECH. E.

**No. 2661.—Rover Instruction Book.**

I SHOULD be pleased to know if any of your readers have a book of instructions for a 20 h.p. Rover five-seater, four speed, gate change, made 1907 or 1908; the book would be given with the car when new. If any reader could oblige, I should be pleased to purchase it, and at the same time should be greatly indebted to him. I have enquired from the makers and they have not one left.—20 H.P. ROVER.

**No. 2662.—Partially Irreversible Steering.**

CAN any reader suggest why a steering gear should be irreversible in one direction only? When my front wheels are jacked up, I can move them in one direction, but not in the other direction without operating the steering wheel. I have also noticed that the car tends all the time on a near side camber of the road to run to the left, whereas no such tendency is noticed if the car be on an off side camber.—B.

**No. 2663.—10-12 h.p. Delage and Nilmelior Magneto.**

I HAVE had one of these cars for about three years. It is fitted with a Nilmelior magneto. I noticed a certain amount of loss of power; it occurs to me that the magneto may require remagnetising. Can any reader who has had a magneto of this make remagnetised inform me what the results have been? I had my car thoroughly overhauled recently and have run about 400 miles since.—S 8107.

**No. 2664.—20 h.p. Austin Car.**

I SHALL be glad if any readers of *The Autocar* can tell me if the new 20 h.p. Austin car has proved to be satisfactory when tested. I had thought of getting one, but have heard that, although delivery of these chassis was promised in February, no chassis has yet been delivered, and I have been wondering if any defect in the chassis had been overlooked when it was exhibited in the Paris Show. I thought of making enquiries at the works, but was told that people who had ordered a 20 h.p. could get really no satisfactory reason for non-delivery.—NORFOLK, J.P.

The Austin Motor Co., Ltd., to whom a proof of the above query was sent, say in reply: "There are no difficulties whatever in connection with this model except our inability to deliver it quickly enough. In common with most factories building automobiles, we have had for some time the greatest difficulty in getting material. The 20 h.p. cars which we expected to be sending out in January are only just commencing to leave the works. It seems rather strange to us that 'Norfolk, J.P.' should take the trouble of writing to you for information which he only thought of asking for from the works, where it is surely reasonable to suppose that the information would be best obtainable."

## Week-end and Touring Notes.

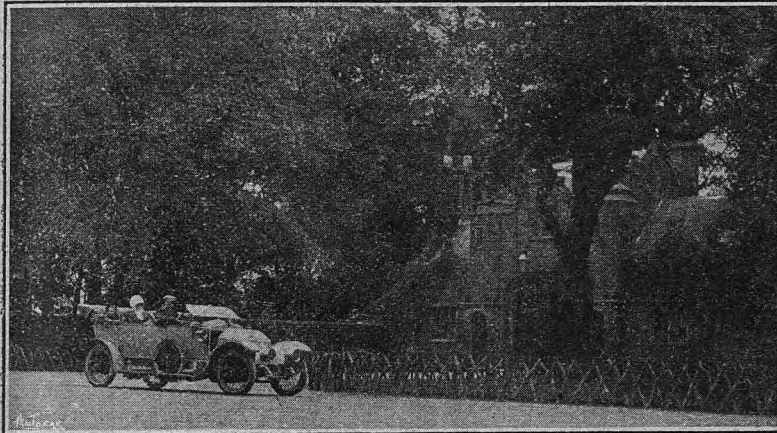
A Run to Erbistock and the Borders of Wales.

By Harry Wade.

On a really fine day—one of the few last summer—a Siddeley-Deasy car, under the guidance of Mr. C. H. Wallwork, the Manchester agent, and

Knutsford, and Manchester, where the first photograph was taken.

Then through Northwich, where a detour had to be made on account of



Mere Corner, between Aitrincham and Northwich on the Manchester-Chester road.

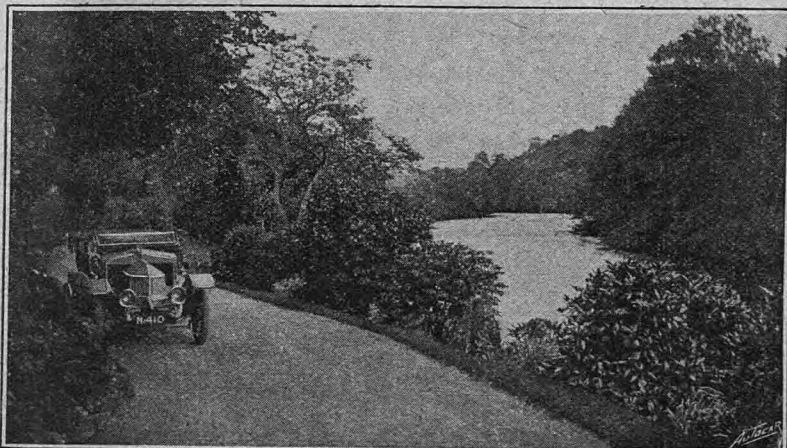
loaded with passengers and cameras, set off in search of the picturesque. The Chester Road was taken out of



Cottonopolis, and the first halt was called at Mere Corner, at the junction of the roads for Warrington, Chester,

the work in connection with the raising of the main street with the accompanying shops and houses on either side, the pumping of the brine having caused the ground to sink. The town passed, and while running through the forest of Delamere, a short but sharp shower compelled a halt under the trees, rather than have the trouble of putting up the hood. The shower was, however, of short duration, and the city of Chester was soon reached. Time was allowed for a visit to the Cathedral and the Rows, and for a few more photographs to be taken.

Crossing the Grosvenor Bridge, said to be the largest single span stone bridge in the country, we observed the fine gateway to Eaton Hall, but a notice warning motorists that they are not allowed on the approaches to the park, under a heavy penalty, prompted us to move quickly on. It is a long, straight road from Saltney, but the car made short work of its dreariness, and we were soon in the pretty village of Hawarden, well known to devoted admirers of the famous Prime Minister as the residence of the late William



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## Week-end and Touring Notes (Continued).

Ewart Gladstone. The castle is situated in beautifully-wooded grounds, and its well-grown timber reminds the visitor that it was amongst these stately beeches that Mr. Gladstone was so often found displaying his prowess as a woodman.

Mold to Chester highway is crossed at right angles.

The question of lunch having been quietly raised by the youthful member of the party, no time was lost in running through Hope and Caergwrie, with its ruined castle on the hill top,

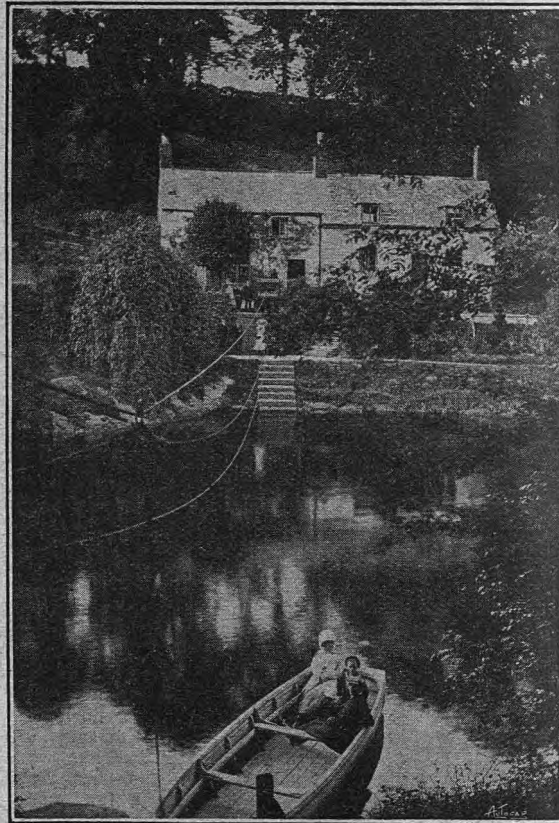
to the town of Wrexham, where we were soon having a capital lunch at the Wynstay Arms Hotel.

Being familiar with the town of Wrexham, there was nothing to detain us, and we were soon running smoothly along the fine Shrewsbury Road through Marchwiel to Overton Bridge. Here is a glorious prospect of the River Dee, and it is a pity that photography does not convey an idea of the beautiful colouring of sky, foliage, and water as then seen.

A signpost on the right points to Erbistock, which was the Mecca of our pilgrimage; none of us had previously visited the district, and consequently were not prepared, when, after descending a steep hill, to find ourselves in nothing short of a veritable paradise. The road drops to the side of the River Dee, which is here of quite a respectable width. On either side of the road were banks of

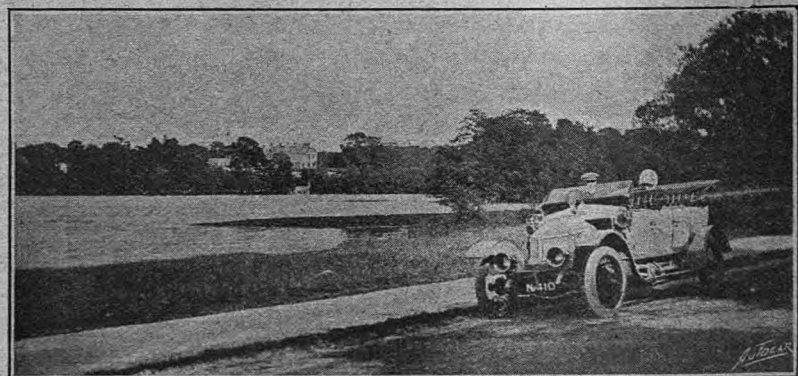
beautiful and many coloured flowers, while nestling in the trees were picturesque arbours overlooking the river. Opposite the inn is the ferry, the motive power of which is obtained by means of a windlass and a rope on pulleys, the current of the river turning the boat round so that the nose comes to the bank as the boat approaches either side.

The road here comes to an end, but by crossing the ferry to the opposite shore there are some delightful walks to be obtained along the river side. Subjects for the artist or the camera



The cable ferry at Erbistock

The old castle, of which only the tower remains, was dismantled by Cromwell after the siege of Chester; the new castle having been erected in the middle of the eighteenth century. In the village outside the castle gates is a fine monument and fountain, erected by the inhabitants to commemorate the golden wedding of Mr. and Mrs. Gladstone; it embodies medallions of the famous man and his devoted wife. A sharp turn here took us along a winding but beautiful road by the park plantation, until we emerged into open country where the



The lake at Ellesmere.

**Week-end and Touring Notes** (Continued).

are everywhere; at every turn a delightful vista of river and woodland presents itself.

When tea had been partaken of in one of the rose-covered arbours, the car was turned in the inn yard, with none too much room to spare, and our tracks were retraced to Overton Bridge, which crossed we ran through Overton village to Ellesmere. Still continuing along the Shrewsbury Road we passed the Mere, a fine sheet of water on which a number of wild fowl were sporting themselves. After a sharp turn on the Whitchurch Road was taken, several other lakes were seen, and at Fork, three miles from Ellesmere, the left-hand road was again taken. This road on either hand was a mass of wild roses and honeysuckle, the scent being so sweet and heavy as to be almost overpowering.

After passing through Whitchurch the Peckforten range of hills was seen

on our left, with the commanding ruins of Beeston Castle perched on the edge of a precipitous rock, standing out clearly and boldly. A halt was called in the quaint old-fashioned town of Tarporley as the tank had to be replenished with fuel.

As evening approached we were treated to a series of magnificent views of the sunset as we ran sweetly along the road through Cotebrook, until finally emerging on the main Chester Road we joined the stream of traffic returning Manchesterwards. It was with a sigh that electric trams, shops, setts, and other signs of town life were met. The car had run without a murmur, no tyre troubles had been sent to try us, and Erbistock had proved delightful. For those who have not as yet visited this sylvan beauty spot, and yet are within convenient distance, it can only be said that an early opportunity should be taken of doing so.

**Flashes** (Continued).

We have received from the Siddeley-Deasy Motor Car Co., Coventry, a coloured reproduction of a charming drawing by Mr. Charles Sykes, depicting an incident during the King and Queen's visit to India for the Durbar. The Siddeley-Deasy car in which Their Majesties are shown conveyed them from Nagpur station to the fort, and was the property of Mr. Craddock, the Chief Commissioner of the Central Provinces.

The Atlas Inner Case Syndicate, 124, High Street, Kensington, W., inform us that they have just received an order to supply the Royal Flying Corps with a number of their "Empty-quick," a neat device for emptying and economising the contents of a two-gallon tin of petrol, which we described and illustrated in our issue of March 29th. This firm also inform us that at the recent motor exhibition in Brussels the King of the Belgians was so struck by the ingenuity of the "Empty-quick" that he ordered one on the spot, and the next day a further order for 600 was placed for use in the Belgian Army.

An interesting and well illustrated pamphlet, entitled "Motor Upkeep and How to Reduce It," is issued by the County Chemical Co., Bradford Street, Birmingham, in which they illustrate and describe the numerous motor "notions" they offer to the public. It should be noted that they are responsible for what we may describe as special specialities; for instance a drip-lamp carbide is provided for generators with drip feed, and a special clutch oil and a special magneto oil. The G.B. graphite grease is a fine motor chain lubricant, and in the matter of tyre repair, the Chemico stiff-back patches go far towards making a permanent repair. We have used both the Chemico car-shine and the Chemico metal polish with most satisfactory results, and the Chemico leather restorer will be found to give an aspect of fresh life to faded upholstery. Then there is the tyre stopping and sun proof tyre paint. This firm also make the C.T. vulcaniser and sell plastic rubber or vulcanising compound and sulphur emulsion for use therewith.

Under the title of "A Historic Motor Run," Messrs. Clément-Talbot, Ltd., have issued an album of reproductions of photographs constituting a pictorial record of Mr. Percy Lambert's achievement in covering 10 3/4 miles in one hour on a 25 h.p. Talbot car at Brooklands on February 15th last. Although Mr. Lambert's record has since been beaten by a much larger engine, his run still retains its historic feature of being the first time a vehicle of any kind has travelled over one hundred miles within the hour. The album is intensely interesting, one or two pages being devoted to reproductions of a series of cinematograph films of incidents of the run. A copy of the album may be obtained by any reader on writing to Messrs. Clément-Talbot, Ltd., Barby Road, Ladbroke Grove, London, W.

Messrs. Donne and Willans (1909), Ltd., 29a, Gillingham Street, South Belgravia, London, S.W., send us a well-prepared and interesting catalogue describing the 1913 Piccard-Pictet cars in considerable detail. Illustrated particulars are also given of the Piccard-Pictet form of the Argyll sleeve-valve engine.

Motor Schools Training Institute, of Heddon Street, Regent Street, W., garage and works at 21a, Loudoun Road, St. John's Wood, N.W., who claim to be the first institution of the kind officially appointed by the Royal Automobile Club, send us a copy of their pamphlet containing particulars of their tuition system. Those desirous of receiving a thorough, comprehensive, and conscientious course of instruction in driving and the mechanical knowledge necessary to the conduct and upkeep of a car cannot do better than to take one or other of the courses at this well conducted and well established school. It is true that the fees are somewhat higher than those of some other establishments, but to impart good sound instruction, capable instructors have to be engaged, and as we know from experience only capable instructors are employed by this institution. Courses of instruction in driving and mechanical knowledge can be obtained at fees from six guineas upwards.

**THE NUMBER QUESTION.**



**TAYLOR'S PATENT NUMBER PLATE** is of high-class make and finish. Polished Aluminium Letters fixed on back enamelled Copper Wire Panel. Specially suitable for fixing across radiator—as it does not interfere with passage of air.



Easily fixed in three minutes. Readily cleaned — rustless.

Its pleasing appearance improves your car. When ordering, send width across cooling surface of radiator.

Price, carriage paid. Including screws for fixing. 7/6 each.

Supplied same day.

Also makers of Solid Aluminium Number Plates for rear of car. 7/6 each, carriage paid.

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WOLVERHAMPTON.

**J. M. ROBERTS**

12 and 14, SEMLEY PLACE, S.W.;  
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\*Phones: Victoria 6094, Chiswick 1135.

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- 12 h.p. DARRACQ, 1911-12 model. Semi-torpedo... £100
- 14-20 h.p. SIDDELEY-DEASY 1911 model, Torpedo... £300
- 20 h.p. JUNIOR Torpedo... £125
- 12 h.p. DARRACQ Torpedo, as new... £175
- 20 h.p. STANDARD, six-cylinder 5-seater, brand new... £250
- 12 h.p. ROVER 1912 Torpedo... £290
- 15'9 h.p. STAR Torpedo... £160
- 12 h.p. DARRACQ, 4-seater, 1912, Torpedo, new... £285
- 14-16 h.p. DARRACQ Semi-torpedo... £155
- 12-16 h.p. SUNBEAM, late 1911, Torpedo... £295

**TWO-SEATERS.**

- 12-14 h.p. DE DION Torpedo... £195
- 9 h.p. DARRACQ... £65
- 12-20 h.p. RENAULT Torpedo... £190
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- 10 h.p. DARRACQ, Sports type, soiled... £180
- 12-14 h.p. METALLURGIQUE, 1910 model, Torpedo... £210

**LANDAULETTES.**

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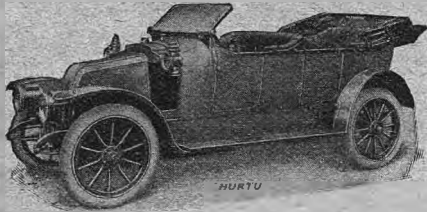
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Chassis from £215.

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May we send you a catalogue and arrange a trial run?  
Sole Concessionaires:

**ARIEL & GENERAL REPAIRS, Ltd.,**

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**CARBURETTOR**

Don't change yours—fit **BADCOCK'S BY-PASS** carburettor as good as the best. Use jet 20% to 40% smaller. Wonderful in its Simplicity & Effectiveness. Makes a good Fortnight's Free Trial. Price 12/6. one better. **SURREY WORKS, 110, Woodville Rd., Thornton Heath.**

**BOROUGH OF BARROW-IN-FURNESS. MOTOR AMBULANCE VAN.**

The Corporation invite tenders for the supply of a Motor Ambulance Van, particulars of which may be obtained from the Borough Engineer's Office, Town Hall, Barrow-in-Furness. Sealed tenders, endorsed "AMBULANCE VAN," to be delivered at the Town Clerk's Office, not later than twelve o'clock noon on Monday, the 5th May, 1913. The lowest or any tender not necessarily accepted. By Order, L. H. WLETT, Town Clerk. Town Hall, Barrow-in-Furness

**MOTOR TRACTION**

The Business Paper for Business Men

EVERY SATURDAY ONE PENNY Of all Newsagents.

**"The Autocar" Share List.**

The following table of some of the companies connected with the motor, motor cycle, and allied trades, is not published for the benefit of speculators, but for the information of investors. The speculative buyer is referred to the daily financial press.

Issued Capital.	Amt. of Share	NAME OF COMPANY.	Present Prices.	Last Year.		This Year.		Last Div.	Div. Payable
				Highest	Lowest	Highest	Lowest		
£ 2,520	1/-	Abingdon-Ecco, Ltd. ....	2/6 3/6	3/-	2/3	3/6	3/-	% Nil	Nov.
45,000	75	Alldays & Onions (£3 paid)	35 34	41	35	34	35	1/6	Ap/Dec
50,000	75	" " 6% Cum. Pref.	51 51	54	54	54	54	2/6	Ap/Dec
200,802	10/-	Argylls, Ltd. ....	5/3 5/9	6/-	4/-	6/-	4/9	Nil	Dec.
150,000	10/-	Belsize Motors, Ltd. ....	21/3 23/3	28/14	25/-	27/6	26/-	12	My/Nv
100,000	10/-	" " Cum. Pref.	20/5 sellers	20/9	20/-	20/3	20/-	6	Fb/Au
14,771	10/-	Bowden Brake, Ltd. ....	3/- 5/-	7/-	3/14	5/-	3/-	1/-	Dec.
766,982	10/-	Birmingham Small Arms, Ltd.	47/6 48/-	53/3	46/3	50/-	47/9	20	Mr/Sp
203,159	75	" " Cum. Pref.	51 51	54	51	52	54	5	Mr/Sp
75,000	10/-	Brampton Bros. Cum. Pref.	33 4	43	34	34	34	6	Oct.
100,000	10/-	Brooks, J. B., & Co., Ltd.	36/- 36/6	37/6	31/-	36/6	35/-	15	My/Nv
100,000	10/-	" " Cum. Pref.	51 buyers	51	51	51	51	5	My/Nv
109,000	10/-	Brown Bros. Cum. Pref.	4 5	4	4	4	4	6	Ap/Oc
380,000	10/-	Charron Par. Pref. Ord. ....	13/- 13/6	11/6	8/-	14/-	7/9	7	Ju/Dec
200,000	10/-	Clement-Gladiator ....	4/11 4/6	3/-	1/6	6/-	2/11	Nil	Dec.
100,000	10/-	" " 6% Cum. Pref.	14/- 16/-	11/9	10/4	15/-	12/6	6	Ju/Dec
55,000	10/-	Components, Ltd. ....	6/9 7/3	6/9	4/-	7/9	6/11	Nil	Dec.
25,347	10/-	" " 7% Cum. Pref.	12/6 13/6	15/-	11/11	13/-	12/-	7	Dec.
275,000	10/-	Darracq, A., & Co., Ltd.	12/6 13/-	18/11	8/9	15/-	9/9	Nil	Ju/Dec
375,000	10/-	" " 7% Cum. Pref. Ord.	14/6 15/3	19/14	11/10	16/-	13/-	7	Ap/Oc
159,229	10/-	De Dion-Bouton, 7% Ord.	9/3 9/6	11/3	8/9	9/3	7/6	0	Dec.
1,000,000	10/-	Dunlop Rubber ....	36/6 37/3	56/9	27/6	39/6	35/6	12 1/2	Ap/Oc
200,000	10/-	" " Cum. Pref.	18/6 19/6	21/-	17/-	20/-	18/6	6	MJSD
812,785	10/-	" " Income Stock	17/3 17/6	19/-	15/6	19/-	17/6	5	Ju/Dec
624,995	10/-	Dunlop Parent Co. 8% Ord.	15/6 16/-	18/7 10	18/-	13/9	10	10	Ju/Dec
994,990	10/-	" " 5% Cum. Pref.	13/- 13/6	16/9	10/6	15/11	12/7 1/2	5	Ju/Dec
199,962	10/-	" " Deferred ....	9/9 10/3	15/-	6/3	10/11	8/-	Nil	Ju/Dec
99,977	10/-	Enfield Cycle ....	21/6 21/0	19/9	13/9	21/9	18/-	5	Oct.
24,985	10/-	" " Cum. Pref.	21/- buyers	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	10/-	Humber, Lt. (New) ....	11/3 11/6	7/6	3/7 1/2	11/-	6/9	Nil	Nov.
331,495	10/-	" " 6% Cum. Pref.	16/11 16/3	11/-	6/9	17/9	10/11	Nil	Nov.
50,000	10/-	James Cycle ....	12/6 sellers	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	10/-	Lucas, Joseph, Ltd. ....	9 10	9 1/2	9	9 1/2	9 1/2	15	Ap/Nv
100,000	10/-	" " Cum. Pref.	51 51	51	51	51	51	5	Mr/Sp
73,385	10/-	New Hudson Cycle Co. ....	25/3 25/6	21/6	14/6	28/-	21/6	10	Nov.
18,033	10/-	" " Cum. Pref.	18/6 19/6	20/-	18/-	19/6	19/6	6	Mr/Nv
50,000	10/-	Premier Cycle ....	5/14 5/3	5/-	3/-	5/6	4/11	15	Sept.
125,000	10/-	" " Cum. Pref.	8/4 8/6	8/9	6/9	8/6	7/3	7 1/2	Sept.
31,000	10/-	Riley (Coventry), Ltd. ....	6/3 6/9	8/9	5/3	7/14	5/3	Nil	Feb.
200,000	10/-	Rolls-Royce ....	44/- 45/-	47/3	36/3	48/6	44/6	30	Ju/Ju
138,662	10/-	Rover ....	39/- 39/3	31/3	12/6	40/-	30/9	10	Nov.
100,000	10/-	Rudge-Whitworth, Ltd. ....	24/- 24/6	24/-	15/-	25/3	22/6	5	Oct.
100,000	10/-	" " 6% Cum. Pref.	31 31	31	31	31	31	12	Oct.
11,621	6/-	Siddelev-Deasy ....	10/6 11/6	10/6	6/-	10/9	8/10 1/2	8 1/2	Dec.
50,000	10/-	Singer & Co., Ltd. ....	19/- sellers	19/6	6/6	19/1 1/2	16/-	Nil	Oct.
70,000	10/-	Star Engineering, Ltd. ....	14/- 14/6	18/6	19/6	17/-	13/6	5	Mar.
69,157	10/-	" " Cum. Pref.	17/9 sellers	18/-	15/1 1/2	17/6	17/-	7	Mar.
87,550	10/-	Stepney Wheel ....	29/6 30/6	35/-	30/-	32/6	31/-	20	Mr/Oc
120,000	10/-	Sunbeam Motor Car ....	56/- 57/-	59/-	37/6	56/6	52/-	25	Nov.
30,000	10/-	" " 6% Cum. Pref.	22/9 sellers	23/3	20/1 1/2	22/6	22/6	6	Ap/Nv
80,000	10/-	Swift Cycle ....	21/9 sellers	21/9	13/-	21/-	20/9	6	Dec.
100,000	10/-	" " 6% Cum. Pref.	16/- 17/-	17/3	14/10	17/3	16/3	6 1/2	Ju/Dec
80,000	10/-	Triumph Cycle ....	80/- 80/6	71/6	43/9	82/-	68/-	30	Nov.
50,000	10/-	" " 5% Cum. Par. Pref.	21/- sellers	23/6	20/7 1/2	24/6	21/6	6 1/2	Nov.

\* Including all arrears.  
The feature of the market has been the strength of Charron preferred and deferred ordinary and Triumph ordinary. The Directors of the Charron Company have declared a dividend of 4 1/2 per cent. on the preferred shares, giving a total return of 8 per cent. for the past year (against 7 per cent. for the previous year) and 18. 5d. per share on the deferred shares. It may be explained that for every £9,500. of profits distributed in excess of £26,000, 1 per cent. goes to the preferred shareholders, and 15. 5d. per share to the deferred. At the present price of 14s. the preferred shares yield 12 per cent., whilst at 12s. the deferred yield is 13 per cent., on the basis of the distribution just announced. Triumph ordinary, after dealings at 82s., have reacted slightly. De Dions, Sunbeams and Singers are better. Humber ordinary and preference, James Cycle and Rudge-Whitworths are easier.

**"The Autocar" Diary.**

- May. 3.—Lancashire A.C. Hill-climb. 8, 11 and 12.—A.C. de la Sarthe et de l'Ouest. Le Mans Meeting.
- 11 and 12.—Targa Florio Race.
- 18.—Opening of the Russian Automobile Exhibition.
- 24.—Cardiff M.C. Annual Hill-climb.
- June. 4 and 6.—Tourist Trophy Races, Isle of Man (see *The Motor Cycle*). 7.—Shelsley Walsh Hill-climb. 10-17.—Austrian Alpine Tour. 19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly.
- June. 21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Porthcawl. July. 17.—Grand Prix Race. Picardie Circuit. 19 and 20.—R.A.C. of Belgium Grand Prix Race. 28.—Grand Prix de France and Coupe de la Sarthe. Le Mans.
- August. 10.—Mont Ventoux Hill Climb. September. 21.—Goups de l'Auto, Boulogne Circuit. 25.—International Stock Car Race, Isle of Man.

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