

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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“The Autocar League.”

An Attempt to Band together the Whole of the Motorists of the United Kingdom.

MOTORISTS are now a very strong and influential body in the country, but it cannot be said that, as a whole, they have used their strength advantageously, because at periods of serious difficulty or opposition they have not been unanimous. Divided counsels and divided policies have resulted in their interests being most seriously damaged, and we are afraid there is no denying the fact that on account of all this automobilism has suffered seriously. For instance, the Chancellor of the Exchequer himself referred to the divisions in the ranks of motorists, and made them the excuse, if not the reason, for both the increased car tax and the petrol tax, and, what was still more regrettable, for some time after the Budget was declared there was no united opposition, and even in the House of Commons itself motorist voted against motorist. What we propose to do if our readers will give us their whole-hearted help is to form a league of practically all the motorists in the United Kingdom, so that when really important matters arise the League can speak definitely as the representative of the whole of the motor world, and not of a section of it.

Past Difficulties.

Much of the difficulty in the past has arisen from the fact that the associations have not really known what their members wanted. A certain number of leading members may decide that some particular thing is right or wrong, but their opinion may not necessarily represent the views of the majority. What we want to do is to be in a position to state definitely at all crises what the opinion or the desire of the motor world really is, and the only way this can be done is to take a referendum, and this is possible only by having the names and addresses of all users of motor cars. We already have our postal subscribers' names, but the vast majority of the readers of *The Autocar* buy it through the ordinary channels with their other week-end papers, and we do not know their names or their addresses, and there is no means of finding them out unless they will send them to us.

There is no idea of asking for subscriptions; all we want is the name and address of every motor car owner

so that at any crisis we can at once take a referendum. We need not say that the names and addresses will be used for no other purpose whatever, and neither for advertising ourselves or anybody else. All we want is the name and address of each one of our readers and an assurance that when we appeal to them on any vital issue they will send us their vote yea or nay. It should be clearly understood that nothing is further from our thoughts than to form a new association or to oppose the present organisations.

Future Possibilities of the Scheme.

Indeed, if our readers think well to co-operate with us in this simple scheme it will be seen at once that we shall be in a position to strengthen the present organisations enormously, as we could then put them into possession of the definite information they so often lack. Their great trouble is they do not know the opinions of the majority of their members, and as there are always two opinions on every question, it is more than likely they may take up what is a non-representative attitude, but with *The Autocar* referendum to guide them they would never have any doubt as to what the majority of the motor world wanted. We include an inset form in each copy of *The Autocar* to-day, and shall be glad if our readers will fill in the necessary particulars and post to us, so that their names may be enrolled on our referendum register. If they see fit to co-operate in this simple way, we shall be able to weld motorists together and to give them a strength and weight which they have hitherto lacked, because they have not been united.

We shall not only ask their opinion from time to time on vital matters, but we shall ask them to take united action which will result in the removal of certain injustices from which they now suffer. For instance, an undertaking from 40,000 or 50,000 owners of cars that they would never if they could possibly avoid it spend a penny in any place in which ten mile limit traps were set would soon bring certain boroughs to their senses, as they would be notified of this decision. This is but one example of what *The Autocar* League may do, and will do, if the motorists of the United Kingdom will work together.

In the Dundee Sheriff Court the other day Sheriff Campbell Smith made some pointed and sensible remarks respecting the manner in which motorists are prosecuted and fined for merely technical breaches of the law. It would be well if all who administer the Motor Acts would take his remarks to heart and act upon them. He said there were two kinds of breaches of the law as regards motor cars. One was the driving of a motor car in such a way as to cause serious injury to some individuals, and perhaps their deaths, and in such cases as that he was of opinion

that the amount of damage done by a motor car owing to reckless driving should be paid for by the motorist just as he had to pay for all other kinds of damage. In regard to a breach of the regulations of a specific and legal kind which are made to enforce good manners rather than to protect human life and property, he did not see the reason for imposing heavy penalties on account of what was nothing less than grandmotherly funk on the part of people who ought to be superior to that kind of thing. Would that certain county benches could be inoculated from this worthy sheriff.

Notes.

Surrey and Sussex.

There is no doubt that, speaking generally, Surrey and Sussex are still the worst counties in England. That is to say, their police traps are usually more numerous and their benches among the most prejudiced and the most easily convinced against the motorist. Usually this is put down to the fact that so much motoring is done in these two counties, owing to their proximity to London. We are, however, more than inclined to doubt this, for the reason that thirty years and more ago, when the daring riders of high bicycles commenced to explore Surrey and Sussex as well as other parts of the country they were subjected to more bitter persecution in these counties than anywhere else.

If anyone had time to investigate the origin of this deep local prejudice to the new means of locomotion it is highly probable it would be found to be due to the fact that there are a large number of private residents in both counties. These people are chiefly those who have retired from a professional life or business; people who in many cases have led strenuous lives and who desire to live in peace in one or other of these beautiful counties. They have chosen more or less remote spots, and just when they think they have retired far enough out of the world, and at the same time within easy call of it, their seclusion is invaded. Three decades ago it was invaded by horrid people on bicycles, and now the invasion is accentuated by still more horrid people on motor cars. It is bad enough on ordinary days in their opinion, but at week ends it is worse, as people who ought to be sweltering in London dare to come within their sacred Surrey and Sussex to enjoy its beauties with them, the elect.

Of course, it is rather annoying for the lover of seclusion to see a trail of dust along a road which he desires to see monopolised by nothing faster than a cow. And then so many of these retired people are magistrates. Having stated this truism we need not go any further except to say that our little theory to a large extent accounts for the many unjust convictions and the many needless traps which have been set in Surrey and Sussex. It should be clearly understood that in saying this we are perfectly well aware there has been some reckless and objectionable driving which the magistrates were right in putting down, but too many of them have not troubled to discriminate, and the expression of the counties as a whole may be taken as a desire to exterminate, not to regulate, motor traffic. Its opponents are more or less of another generation, and they cannot reconcile themselves to the changes which time must bring, and because they object they seem to think that they can by methods of repression and extortion prevent the motorist from coming into their midst. If they were not so much out of touch

with the times they would not be so foolish or so prejudiced.

On the other hand, there is a very serious side to the matter—one which has not received the attention it deserves. In the person of motorists the average bench is dealing with an entirely new class of offender. The majority of people who are brought before the benches of the country are of a lower class and lower intelligence than motorists, and are often unable to employ a solicitor. Now if one thing has been made plainer than another, it is that the anti-motorist benches throughout the country do not scruple for a moment absolutely to disregard evidence for the defence whenever it marches with their prejudices so to do. The motorist with the soundest defence, a good lawyer, and a determination to spare no expense to clear his character stands no chance before a prejudiced bench. Therefore one naturally asks how much less must be the chance of fair treatment to those of the average class who come before these prejudiced benches? Of course, we know these benches regard drunkenness, wife beating, and worse acts with a lenient eye, but when we see how they ignore the evidence in motor cases we can only assume that in many other cases they have sent innumerable innocent people to gaol.

The Autocar.

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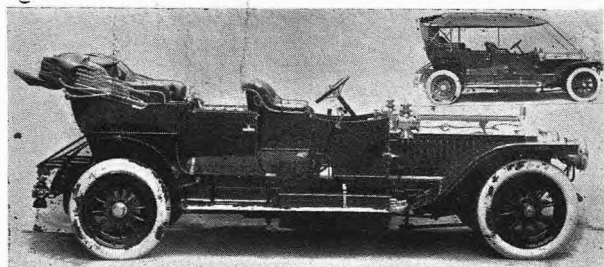
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Mr. Andrew Carnegie's 15 h.p. Napier with five-seated open body and Hopper folding hood.

Useful Hints and Tips.

Gears Loosening on their Flanges.

MANY a car has certain parts—gearwheels for instance—bolted up to flanges. Sometimes these will persist in coming loose time after time—generally through the bolts stretching or “matting” the surfaces. One of the best ways to deal with this is to “tin” all the surfaces of both flange and wheel. Tin the bolts (screw threads as well), the inside of the nuts, wipe the tinned parts smooth whilst hot, and screw the lot together moderately tight. Then warm up and unite the whole chock-a-block solid, giving a final screw up with a short spanner. This has never been known to fail, and it is the simplest matter in the world to undo. You merely have to warm it and soften the solder. We all know it is the *accepted* idea to assemble gears and put split pins in to secure the nuts, but even these little split pin ends may get adrift and do damage. Spring washers are altogether inadmissible inside anywhere; they are hardened and may break. Many a timing gear has been ruined by a taper pin coming out and getting in the teeth. These require very honestly riveting over. These taper pins do not do the driving; they are used to prevent the wheels (and cams when also used in the latter) moving endwise or axially. Woodruff keys are generally used to transmit the “drive.”

To Prevent Oil Leaking Out.

Oil may be permanently kept from leaking out in the easiest possible way. It will be remembered by many that the little Clément-Garrard motor cycle engines had outside flywheels, and not one ever had a drop of oil leak out on to the flywheel, yet the bearing had no packing, or gland, or felt, or anything to stop it except the spiral groove on the spindle. The oil was conveyed to the extreme outside end of the bearing, and a spiral groove started on the spindle and acted like a screw propeller, drawing the oil back towards the crank chamber. The same thing can be applied to any and every kind of bearing, and while they are rotating no oil will ever come out. The groove may be either in the outer bearing or in the revolving shaft, or in both. Several repair shops who know of this device so treat every car that comes in, and make quite a reputation for stopping this trouble. The spiral groove is made quite shallow say, 2 mm. wide by $\frac{1}{2}$ mm. to 1 mm. deep, like an ordinary oil groove. Care, of course, is necessary to avoid getting the spiral the wrong “hand,” as it must screw the oil back into the crank case, not outwards.

Valve Treatment.

Many a difficult case of missing at very low speeds has been accounted for by the valve stem being a loose fit in the valve guide. Most valve guides are of cast-iron. If, however, it is necessary to bush them an excellent bush may be made out of mild steel, provided it is carbonised, *i.e.*, soaked in carbonising material such as bone, burnt leather, or scintilla, for an hour or more at a bright yellow heat closed up in a pot. Thus treated, mild steel will replace (more advantageously) cast-iron anywhere, and has remarkable anti-friction properties. This same treatment can be applied with great success to all valves. Care is necessary not to attempt this to nickel steel valves, or any but mild steel valves of .18% carbon content or less. They then have the virtue of not pitting, and the stems practically never wear at all. The Talbot Company's valves were always case hardened all over.

and corrected by grinding after hardening, and it is well known that up to the end of 1908 that company had never changed a valve whatsoever.

Speaking of valves, another mysterious cause of apparent misfiring hard to locate was when the valve stem was too good a fit in the valve guide, and occasionally stuck up instead of coming down.

Another discrepancy has been found in many repair shops. The part of the cam which should have been truly circular was not so, and a bump or prominence left on the back sometimes lifted the valve slightly off its seat, and often caused the carburetter to ignite.

Misfiring.

Mysterious missing has often been found to be due to the insulation of a low tension wire being damaged by a clip or other fastening where the wire is led along the frame, or fastened on to the dashboard. One of the best plans in all these cases is to take a fresh piece of insulated wire, or even ordinary wire, and skip the regular circuit. This will generally show where the fault lies.

Many cars have very faulty return at the commutator. Some cars, for instance, have the commutator under the footboard. A car would come in for misfiring. The first thing a smart repairer would do would be to clean a place on the shaft driving the commutator, and put a temporary metal brush rubbing on this clean place, and fastened to the frame with a hand vice. This almost always cured the missing straight off. Of course, to make a permanent repair a more correct return could easily be devised, but the chief point is to find out exactly where the fault lies.

Over-gearing.

There is something pathetic about the calm resignation with which most owners accept the ratio of gearing provided by the makers of their car as the absolute ideal for their needs and locality. There is not a firm of any standing which does not offer a choice of gear ratios. Many owners omit to specify their special needs when they place an order, and certain firms are too short-sighted to write and ask for instructions. It follows that quite a number of cars are either over or under-gearred for the districts in which they are running and for the loads they have to carry. This especially applies to chassis delivered in a naked condition for the body-maker in a distant town. Few people complain about under-gearing, although the owner of a medium powered chassis who can start on top gear and do all his traffic work without a change down need not brag, for most men in his position would prefer a higher top gear ratio—not that I agree with them. Over-gearing is manifest in two respects:

(1) If there is any hill which the car cannot negotiate on bottom speed when in good tune, the car is over-gearred.

(2) If the car always labours and threshes a little when accepting its top gear on the level, it is over-gearred, and, instead of trying to look as if he were totally unconscious of his pounding engine and threshing exhaust, the owner should apply to the makers for a smaller tail pin bevel. I believe this fault is rather common, and is due to the desire of many owners of small and medium powered cars to obtain a higher maximum speed on the flat than is fair to the mechanism of the chassis.

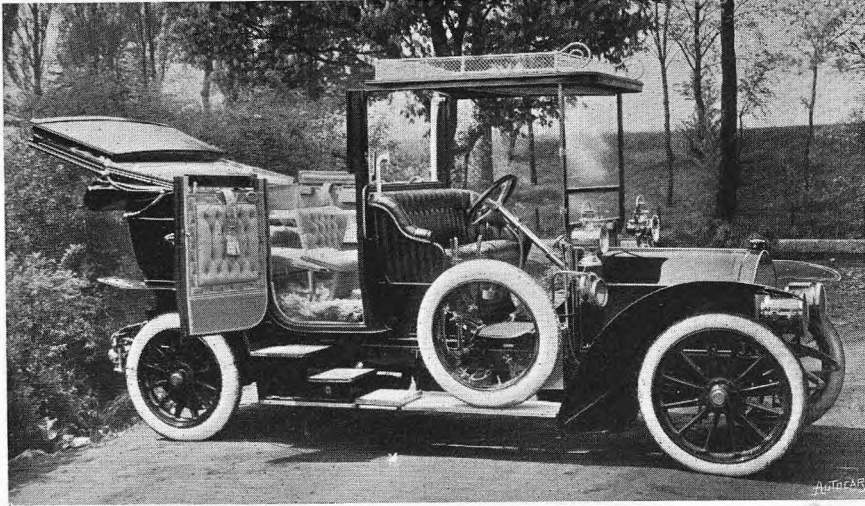
B. H.

Body Design and Construction.

A Body Specially Designed for Invalids.

THOUGH motorists as a body are, *ipso facto*, a particularly robust and healthy section of society, nevertheless there are, perhaps, more amongst them than is generally believed who cannot,

extra occasional seats. At the back of each chair, and hinged to the top of its back, is a panel which, on being lifted, automatically supports itself and forms a convenient table for the occupants of the ordinary back seats of the car. For use as a couch the backs of the chairs fall back on special hinges, meeting the front edge of the rear seats, and giving sufficient length for the lower limbs to be rested horizontally. The first photograph shows a side door opened and one of the chairs arranged as a couch. The whole fitment folds up very neatly, and can be fitted to any body large enough to give a comfortable side entrance door. From the second illustration of the car it will be seen that there are no outward and visible signs of the special interior fitments. The vehicle presents very pleasing lines, and in consideration of the space in the rear of the body there is no undue overhang.

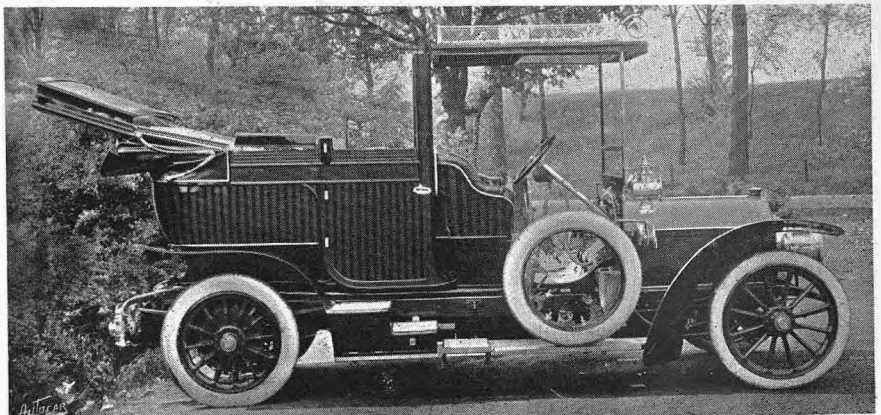


The wide side door opened showing one of the couches extended.

unfortunately, be classed amongst the robust. That one should suffer ill-health or any disablement does not necessarily prevent their sharing in the enjoyments that can be derived by the use of a car when vehicles particularly adapted for the purpose can be constructed. As an example, we give two illustrations of a body built by the Relyante Motor Works, Ltd., Walthamstow, on to a 35 h.p. Mercédès chassis to the order of Mr. Francis Luscombe. It is necessary that Mr. Luscombe should have at his disposal a means of being able to recline at full length on occasions, and the means whereby this end can be achieved are found in the Ascot chair-table-couch fitment.

The extension or closing up of the chair-table-couch arrangement can be accomplished by anyone of ordinary dexterity in less than a minute. Altogether the arrangement seems to have been well considered and well carried out.

The Ascot arrangement is a simple device consisting primarily of a chair folding up into the back panels of the front seats. This can be fitted in duplicate, so as to afford two



This view shows that the ordinary outside appearance of this body gives no indication of its internal arrangements. It will be observed that the lines are distinctly graceful for this type of vehicle.

An All-round Sporting Car.

Shooting brakes are an accepted type of vehicle throughout the kingdom, and those who have experienced their usefulness in more remote shoots are not desirous of reverting to the older methods of attaining the moors. In a fishing car, however, we have something of a departure, particularly when due provision is made for gun as well as rod.

In our report of the North-Eastern A.A. Gymkhana in our last issue we gave a small illustration of an all-round-sporting car, and now we are able to give two larger illustrations of the same vehicle from photographs sent to us by Messrs. Armstrong-Whitworth

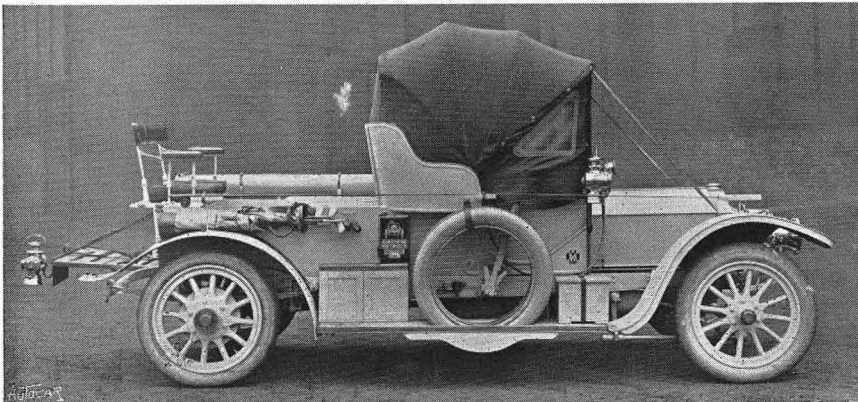
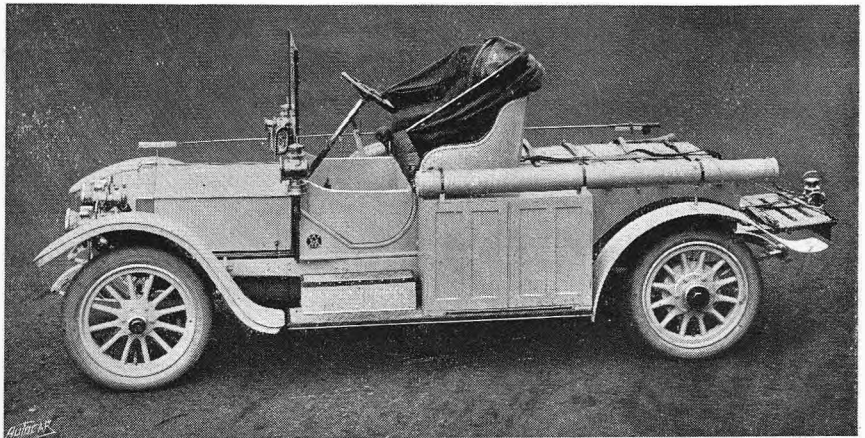
and Co., Ltd., of Elswick Works, Newcastle-on-Tyne.

The chassis upon which this body is built is a standard 25 h.p., with four-cylinder 4in. engine, and although, as a rule, the makers do not build car bodies, this one in particular was entirely constructed in the Elswick Works.

On the left-hand side of the car is a long tube for carrying salmon rods; there are also cupboards for lunch and cartridge bags. On the right hand side are three rests on which lie trout rods, and provision is also made for carrying golf clubs. Beneath the luggage carrier is a space for gun cases, and in the back part

of the body is a tip-up seat for two passengers, and here also are two chains and collars for dogs. Spares and tools are carried in a cupboard near the spare tyres, which, it will be noticed, are sunk into the floorboards. The car is painted grey, and is unvarnished—a most serviceable finish, as we know by experience. The cushions and upholstery are fitted with two covers of material similar to that from which Cape cart hoods are made, so that if one set becomes wet it can easily be changed for the other.

A similar car has been made

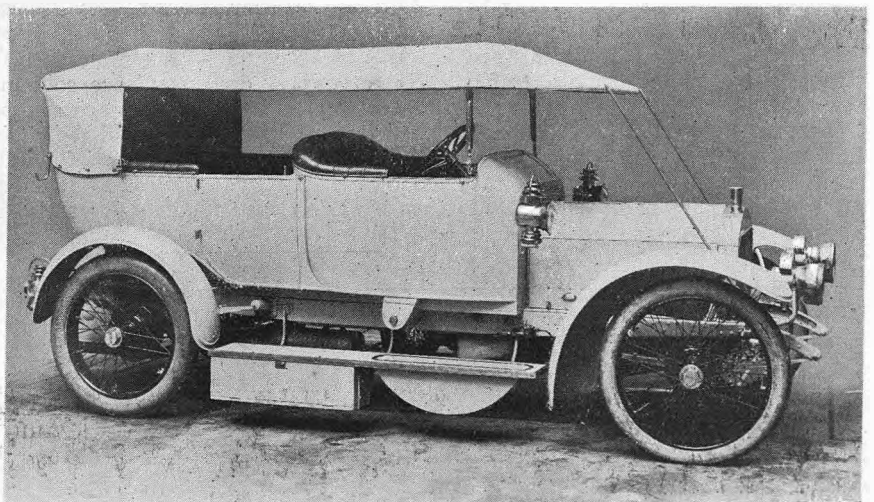


for Sir Andrew Noble for use on his estate at Arrochar, N.B., and Lady Watts, wife of Sir Phillip Watts, Chief Constructor of the Navy, has also ordered a car on these lines. In this case, however, there will be an almost entire rearrangement of detail, as the car will not be used for sporting purposes, but for general Continental touring, and it would appear from the general fittings which are to be provided that Lady Watts intends to tour off the beaten track. We hope to have permission to deal with this car in detail at a later date.

A Two or Four-seated Body.

The high-sided door body, with, as far as possible, straight lines and plain panels, is becoming very popular, judging from the large number of photographs of this type of body which are coming to hand. Many of these bodies present features not to be found in their predecessors, and this is the case with the vehicle by Cann, Ltd., a side view of which we give here and a front view of the same on page 307. Here we have a very finely-designed body complete in every detail, even to its conversion to a two-seater by the removal of the rear part of the body. It is difficult to believe that this conversion is possible, as in its complete form there is no appearance of any division in the body. The chassis is a 30 h.p. six-cylinder Napier, and the whole of the body work is by Cann, Ltd., 13-14, Miller Street, Camden Town, N.W., who have constructed quite a

number of these smart and useful bodies on a variety of chassis. Messrs. Cann have several bodies of interesting design now constructing, and these we hope to be able to deal with shortly.



Godalming is a town to be avoided by motorists at all costs. The attitude adopted by the local bench towards automobilists in connection with their ten mile speed limit is inconsistent in every way, and the sooner the town is denuded of tourist traffic by motor car the

sooner will these prejudiced people come to their senses. We note that the *Surrey Advertiser* says "the talk about motorists boycotting the town is absurd." We shall see! What proved sauce for Leamington should be an equal condiment for Godalming.

The Worthing Bench and Motorists.

Sussex, Like Several Other Counties, is Now Closed to Motorists.

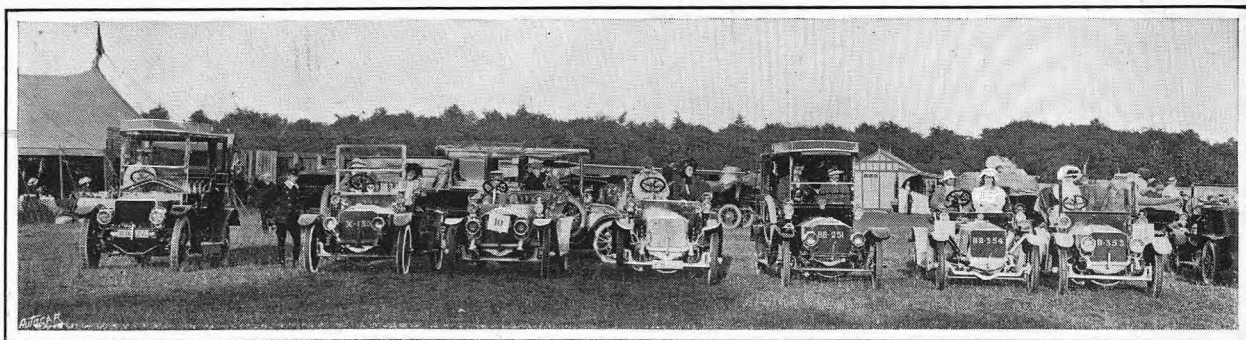
AS the result of extensive police timing operations forty motorists appeared before a special sitting of the Worthing (Sussex) magistrates on Friday, August 13th, to answer charges of exceeding the legal limit during Goodwood week. "Speaking as an individual magistrate," said the Mayor of Worthing, Councillor J. G. Denton (presumably in excusing himself and his fellow magistrates), "I believe I express the feeling of the Worthing bench when I say that nothing is further from their wishes than to act in a vindictive or hostile manner towards motorists. In every case which was dealt with on Friday the speed limit had been exceeded by at least six miles an hour, and no other course was open to the bench than to impose penalties as laid down by the statute. In the absence of previous convictions the fines imposed were calculated on a regular scale, beginning at £3 and costs for driving at twenty-seven miles an hour, and increasing by £1 for each two miles of additional speed. The highest fine imposed was one of £8 in a case of three previous convictions. The roads in this neighbourhood are often no more than narrow lanes with frequent sharp turnings, and it is essential for the police to ensure the safety of the other users of them. Findon, where a ten-mile limit has been imposed by the local authorities in conjunction with the Local Government Board, is a village between Worthing and Horsham, on the London road, which passes down its narrow tortuous main street. In addition to the usual reduced speed limit signals, large warning boards have here been put up at the expense of Mr. Warne, of Warne's Hotel. In normal times there are not more than two motoring convictions a month at the Worthing Petty Sessions."

In view of the concluding remarks of the Chief Magistrate it is difficult to understand the reason for so many motorists having to appear to answer one week's summonses. Possibly the temptation to levy heavy toll on motorists for the relief of the local exchequer afforded by Goodwood week could not be resisted. Apparently the police devoted themselves exclusively to timing motor traffic. No attempt seems to have been made to warn motorists not acquainted with the county of the tortuous nature of the roads in the locality. The motorists were allowed to drive at their own pace and were then ambushed and fined, the Worthing

bench hoping by this means "to ensure the safety" of the other users of the roads. Have motorists, then, no claim to police protection? A man travelling in a horse-drawn vehicle is protected, but the same man transferring himself to a motor car is outlawed, waylaid, and robbed. He is selected from amongst other kinds of traffic on the road and subjected to special treatment, as though he were an enemy and not one of the public whom the police are in duty bound to protect. This is a curious way of "ensuring the safety" of the "other traffic." Assuming for the moment that the motorist is a dangerous person, it would not seem to be the height of wisdom for people who really believed this to let him go unchecked without pulling him up at the earliest possible moment. Instead of doing this the police allow him to fall into traps which they set, regardless of the danger he may cause to the "other traffic," for the "safety" of which they profess to be so very solicitous.

That the extreme precautions in the case of Findon are unnecessary is evidenced by the fact that on a busy day cars were able to travel without accident through the ten-mile limit at Findon at speeds up to 27 m.p.h.—by police timing, of course. We suppose that the Sussex police have not the same sublime confidence in their road measuring that the police of some of the other counties have, so they allow ten yards grace in the measured furlong—an error of, roughly, $4\frac{1}{2}$ per cent. On the same principle, why should they not allow a possible (indeed very probable) error of $4\frac{1}{2}$ per cent. in their timing of the cars over the measured distance, and a further possible error of $4\frac{1}{2}$ per cent. due to the personal point of view—the eagerness of the men to secure convictions and obtain promotion? No doubt other four and a half per cents. could be allowed for other reasons, but ignoring these we have a total error of $13\frac{1}{2}$ per cent. in the final speed of the car—no doubt sufficient to acquit many of the culprits.

The opinions of several of our correspondents on the methods of the Worthing bench are expressed in our correspondence columns this week. Our own opinion is that the bench are somewhat ashamed of themselves, or why should the chairman explain? We also venture to say that the inhabitants of Worthing, especially those who earn their livelihood by catering for visitors, do not endorse the action of the police and magistrates.



A variety of Armstrong-Whitworth cars which foregathered at Gosforth Park on the occasion of the North-Eastern A.A. Gymkhana.

A 12-16 h.p. Sunbeam Model.

The Latest Live Axle Production of the Sunbeam Motor Co.

FOLLOWING the general practice nowadays of fitting small cars with the propeller-shaft form of power transmission, the Sunbeam Motor Co. have produced a vehicle of 12-16 h.p. which from a study of the illustrations will be seen to embody several interesting features in design. As may be seen, the engine has four cylinders cast in pairs, with a bore and stroke of 80 mm. by 120 mm., this proportion of bore to stroke being in accordance with the growing

pump and fan driving gear are mounted on the opposite side of the engine, and driven off the timing gear in a similar manner to the magneto. Incidentally, the piping arrangements are not without interest.

From the engine the drive is transmitted to the gear box through the medium of a leather cone clutch, much of the ordinary type, hand adjustable, and with no end thrust on the crank or gearshafts. First intention springs are fitted under the clutch leather to give smooth engagement.

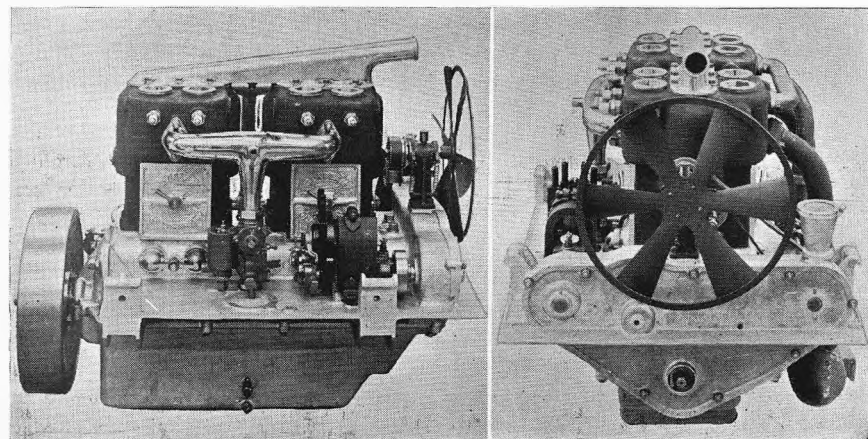
The gear box provides for four forward speeds and a reverse, the high gear being a direct drive. The casing, which is of clean outline, is three-point suspended, and carries the whole of the gear and brake operating mechanism, the latter being of substantial design carried on the rear end of the gearshaft, and encased in an extension of the casing.

The back axle is of usual design, running on ball bearings entirely, the road wheels running on the outer sleeves in the usual manner.

Very powerful metal-to-metal brakes are fitted, the pedal being connected to the gearshaft

and the side lever to the road wheel brakes of the totally enclosed internal expanding type. A compensating device is, of course, fitted between the hand lever and the rear brakes. The wheels are of artillery pattern, detachable or otherwise to specification, and shod with 810 x 90 mm. tyres. A four-seated body is fitted.

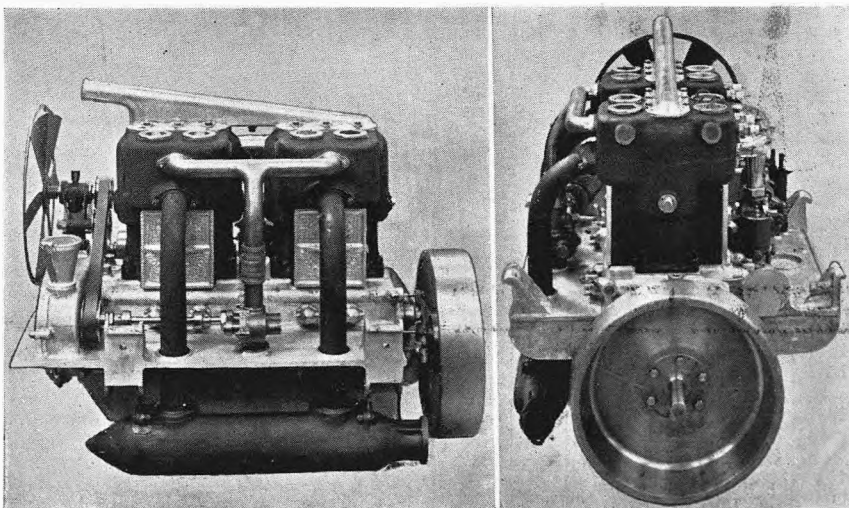
We have up to the present not had an opportunity of examining this car or of testing its qualities upon the road, but hope to do so at an early date, when we shall doubtless be able to report favourably thereon.



The carburettor and magneto side view and the front end view of the 12-16 h.p. Sunbeam engine.

practice of having a considerably longer stroke than diameter of bore. The crankshaft is hung from brackets cast on the upper half of the crank case, the lower half of the crank case being merely an oil well and dust cover. Dust is prevented from smothering the engine by the thin plates cast on the upper half of the crank case between the carrying brackets, these plates extending to the frame and thereby forming a dustproof under cover. All the valve stems are enclosed, as may be seen, by easily detachable cover plates.

Oiling is effected automatically, the oil being forced through a sight feed fitted on the dashboard, which also is arranged so that the oil pressure to the bearings can be easily regulated. Cooling is carried out by means of a pump in connection with the usual radiator and fan, the fan being carried on a ball bearing spindle to which a neat spring device is fitted to maintain a constant and even tension on the wide flat driving belt. The carburettor is of a new type, which heats the petrol before it enters the jet, and it is claimed that it gives a correct mixture for practically all speeds of the engine. A Bosch high tension magneto is fitted for ignition purposes, and is driven off the front timing gear, the photograph showing that a substantial flywheel is fitted to the magneto spindle. The



The exhaust and pump side and the back end view of the 12-16 h.p. Sunbeam engine.

The New Car Licences.

We have had so many enquiries from motorists as to what licence they will have to pay upon their particular cars next year if the Budget proposals are carried that we have compiled a table showing the licence fee to be paid upon every make of car included in the Spring edition of the Autocars of 1909.

THERE is still slight doubt as to the actual form of measuring horse-power which will be adopted by the Treasury, but the Chancellor of the Exchequer in his Budget speech made it very clear that what was known as R.A.C. rating would be employed. He said, "The horse-power will be determined by regulations, and in the case of petrol cars with reference to the bore of the cylinders." The R.A.C. formula, it will be remembered, is diameter of cylinders in inches squared multiplied by number of cylinders and divided by 2.5. We have omitted steam cars from our list, as no information is at present available as to how they will be rated, but no doubt it will mean that steam cars of an approximately equal power will be charged the same licence as petrol cars. The proposed increased licences for petrol cars are as follows:

Not exceeding 6½ h.p.	...	2 guineas
" " 12 h.p.	...	3 "
" " 16 h.p.	...	4 "
" " 26 h.p.	...	6 "

Not exceeding 33 h.p.	...	8 guineas
" " 40 h.p.	...	10 "
" " 60 h.p.	...	20 "
Above 60 h.p.	...	40 "

It will be seen that there is a very wide class between 16 and 26 h.p. This will undoubtedly be sub-divided, as it is obviously unfair that the engines of 85 mm. bore should be subject to the same licence as engines of 102 mm. bore. Therefore owners of cars of about 90 mm. bore may regard it as tolerably certain that their car licence will not be six guineas, but somewhere midway between four and six, as the Chancellor of the Exchequer has been apprised of this matter and has promised to give it consideration. We must still hope that the system of taxing per unit of horse-power will take the place of the proposed classification, as it would be less unsatisfactory in every way to pay so much per horse-power, as there would then be less injustice to present owners of cars, and no temptations to makers to build, or motorists to buy, what for want of a better term may be called tax dodging cars.

H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Tax in Gns.	H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Tax in Gns.
			mm.	mm.	h.p.					mm.	mm.	h.p.	
10	Adams	1	120	152	8.9	2	16	Bell	4	90	114	20.0	6
12-14	Adams	2	105	120	13.6	4	20	Bell	4	102	127	25.8	6
14-16	Adams	4	86	92	18.3	6	30	Bell	4	117	149	33.9	10
16-18	Adams	4	84	110	17.5	6	14-16	Belsize	4	90	108	20.0	6
30	Adams	4	105	140	27.3	8	20	Belsize	4	101	114	25.3	6
7	Adler	2	75	100	6.9	3	28	Belsize	4	114	127	32.2	8
12	Adler	4	75	88	13.8	4	40	Belsize	6	114	127	48.4	20
15	Adler	4	80	100	15.8	4	11	Bentall	2	100	95	24.8	6
20	Adler	4	95	115	22.4	6	16	Bentall	4	90	95	20.0	6
30	Adler	4	110	120	30.0	8	18	Benz	4	80	120	15.8	4
40	Adler	4	130	140	41.9	10	28	Benz	4	104	130	27.3	8
16	Albion	2	124	127	19.1	6	40	Benz	4	120	135	35.7	10
24-30	Albion	4	108	114	28.9	8	60	Benz	4	135	150	45.0	20
10-12	Albruna	4	62	120	9.5	3	8	Berliet	2	80	120	7.9	3
10	Alldays	2	95	114	11.2	3	12	Berliet	4	70	100	12.2	4
14	Alldays	4	86	108	18.3	6	15	Berliet	4	80	120	15.8	4
20	Alldays	4	95	114	22.4	6	22	Berliet	4	100	120	24.8	6
12-14	Argyll	4	80	100	15.8	4	40	Berliet	4	120	140	35.7	10
14-16	Argyll	4	90	120	20.0	6	40	Berliet	6	100	140	37.4	10
40	Argyll	4	120	140	35.7	10	60	Berliet	6	140	140	73.0	40
20	Ariel	4	100	115	24.8	6	14-16	Bianchi	4	90	110	20.0	6
20	Ariel de Luxe	4	100	120	24.8	6	20-30	Bianchi	4	110	130	30.0	8
30	Ariel	4	112	135	31.0	8	40-50	Bianchi	4	130	150	41.9	20
40	Ariel	4	135	150	45.0	20	70	Bianchi	4	150	160	55.6	20
50	Ariel	4	155	150	59.5	20	25	Brooke	6	92	120	31.4	8
18-22	Armstrong-Whitworth	4	95	120	22.4	6	40	Brooke	6	108	120	43.4	20
30	Armstrong-Whitworth	4	127	100	40.0	10	20-22	Brown	4	100	120	24.8	6
40	Armstrong-Whitworth	4	127	152	40.0	10	25-30	Brown	4	100	130	24.8	6
12-15	Arrol-Johnston	2	109	166	14.7	4	40	Brown	6	100	130	37.4	10
16-25	Arrol-Johnston	4	105	125	27.3	8	7	Brush Runabout	1	102	102	6.4	2
24-30	Arrol-Johnston	4	109	127	29.4	8	14-18	B.S.A.	4	90	102	20.0	6
8	Aster	1	105	120	7.8	3	18-22	B.S.A.	4	100	120	24.8	6
10-12	Aster	2	88	140	9.6	3	25-33	B.S.A.	4	115	130	32.8	8
12-14	Aster	4	75	100	13.8	4	15-20	Buick	4	95	95	22.4	6
16-18	Aster	4	84	110	17.5	6	10	Cadillac	1	127	127	10.0	3
15	Austin	4	89	102	19.6	6	20-30	Cadillac	4	102	115	25.8	6
18-24	Austin	4	105	127	27.3	8	10	Calthorpe	2	93	120	10.7	3
40	Austin	4	121	127	36.2	10	16-20	Calthorpe	4	93	120	21.4	6
60	Austin	6	121	127	54.5	20	25	Calthorpe	4	102	130	25.8	6
15-20	Austrian-Daimler	4	85	120	17.9	6	8-10	C.G.V.	2	90	120	10.0	3
20-30	Austrian-Daimler	4	105	130	27.3	8	16	C.G.V.	4	80	120	15.8	4
35-40	Austrian-Daimler	4	115	130	32.8	8	22	C.G.V.	4	95	130	22.4	6
50-60	Austrian-Daimler	4	140	150	48.5	20	30	C.G.V.	4	110	130	30.0	8

The New Car Licences (continued).

H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	1ax in Gns.	H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	1ax in Gns.
			mm.	mm.	h.p.					mm.	mm.	h.p.	
40	C.G.V.	4	120	150	35.7	10	18	Dennis	4	85	110	17.9	6
50	C.G.V.	4	140	160	48.5	20	24	Dennis	4	100	120	24.8	6
75	C.G.V.	4	160	160	63.5	40	28	Dennis	4	110	130	30.0	8
8	Chambers	2	85	106	8.9	3	40	Dennis	4	127	130	40.0	10
10	Chambers	2	95	113	11.2	3	*30	Dolphin (two stroke)	4	102	102	34.0	10
10-12	Chambers	2	102	113	12.9	4	*15	Dolphin (two stroke)	2	102	102	16.3	6
12-14	Chambers	4	85	92	17.9	6	10-12	Enfield	2	95	114	11.2	3
12-16	Chambers	4	85	106	17.9	6	18-24	Enfield	4	95	115	22.4	6
8-9	Chenard-Walcker	1	100	120	6.2	2	25-35	Enfield	4	120	135	35.7	10
10	Chenard-Walcker	2	86	130	9.2	3	12-14	F.I.A.T.	4	80	100	15.8	4
12	Chenard-Walcker	4	75	120	13.8	4	15-20	F.I.A.T.	4	90	120	20.0	6
14-16	Chenard-Walcker	4	86	130	18.3	6	20-25	F.I.A.T.	4	105	130	27.3	8
20	Chenard-Walcker	4	100	120	24.8	6	28-35	F.I.A.T.	4	110	130	30.0	8
30-40	Chenard-Walcker	4	120	130	35.7	10	35-40	F.I.A.T.	4	125	150	38.7	10
10-12	Clément	2	102	111	12.9	4	40-50	F.I.A.T.	4	130	150	41.9	20
14-18	Clément	4	85	102	17.9	6	90	F.I.A.T.	4	140	129	48.5	20
18-28	Clément	4	102	111	25.8	6	45	F.I.A.T.	6	110	130	45.0	20
25-35	Clément	4	105	140	27.3	8	70	F.I.A.T.	6	125	150	58.2	20
35-45	Clément	4	115	140	32.8	8	8-12	F.N.	4	70	90	12.1	4
6½	Clyde	1	88	110	4.8	2	14-18	F.N.	4	84	90	17.5	6
8-10	Clyde	2	80	90	7.9	3	15-18	Ford	4	95	86	22.4	6
12-14	Clyde	3	80	90	11.9	3	20-24	Ford	4	95	102	22.4	6
16-20	Clyde	4	80	90	15.8	4	18	Gaggenau	4	85	115	17.9	6
20	Coltman	4	102	114	25.8	6	28	Gaggenau	4	100	128	24.8	6
10-12	Cottin and Desgouttes	4	70	100	12.2	4	14	Germain	4	92	110	21.0	6
15	Cottin and Desgouttes	4	80	120	15.8	4	18	Germain	4	102	110	25.8	6
22	Cottin and Desgouttes	4	100	120	24.8	6	28	Germain	4	120	130	35.7	10
40	Cottin and Desgouttes	4	120	140	35.7	10	100	Germain Grand Prix	4	155	165	59.5	20
50	Cottin and Desgouttes	4	140	140	48.5	20	20	Germain	6	86	110	25.9	6
20	Cottin and Desgouttes	6	80	120	23.7	6	30	Germain	6	92	110	31.4	8
45	Cottin and Desgouttes	6	120	140	53.5	20	40	Germain	6	102	110	38.7	10
20-25	Crossley	4	100	125	24.8	6	60	Germain	6	120	130	53.5	20
40	Crossley	4	121	153	36.2	10	12-14	Gladiator	4	80	110	15.8	4
8-10	Darracq	2	90	120	10.0	3	18-24	Gladiator	4	105	127	27.3	8
10-12	Darracq	2	100	120	12.4	4	18-28	Gladiator	4	95	130	22.4	6
14-16	Darracq	4	85	100	17.9	6	25-35	Gladiator	4	105	140	27.3	8
4in.	Darracq	4	100	120	24.8	6	35-45	Gladiator	4	115	140	32.8	8
25-35	Darracq	4	120	120	35.7	10	40	Gladiator	4	120	127	35.7	10
50	Darracq	6	120	120	53.5	20	60	Gladiator	6	120	127	53.5	20
22	Daimler	4	96	130	22.8	6	15-20	Gobron-Brillié†	4	75	150	27.0	8
38	Daimler	4	124	130	38.2	10	28-40	Gobron-Brillié†	4	92	180	42.0	20
48	Daimler	4	140	150	48.5	20	40-60	Gobron-Brillié†	4	110	200	60.0	20
57	Daimler	6	124	130	57.2	20	70-90	Gobron-Brillié†	6	110	200	90.0	40
15	Deasy	4	90	120	20.0	6	8	Grégoire	2	80	110	7.9	3
25	Deasy	4	110	130	30.0	8	16	Grégoire	4	80	110	15.8	4
35	Deasy	4	127	150	40.0	10	12-15	Hillman-Coatalen	4	89	96	19.6	6
12-16	Decauville	4	90	105	20.0	6	25	Hillman-Coatalen	4	127	127	40.0	10
16-20	Decauville	4	100	105	24.8	6	40	Hillman-Coatalen	6	127	127	60.0	20
8	De Dion	1	100	120	6.2	2	15-20	Hispano-Suiza	4	85	110	17.9	6
9	De Dion	1	100	130	6.2	2	20-30	Hispano-Suiza	4	100	120	24.8	6
10	De Dion	4	66	100	10.8	3	30-40	Hispano-Suiza	6	100	130	37.4	10
12	De Dion	4	75	100	13.8	4	40-50	Hispano-Suiza	4	130	140	41.9	20
18	De Dion	4	90	120	20.0	6	60-75	Hispano-Suiza	6	130	140	62.9	40
25	De Dion	4	100	130	24.8	6	12-16	Horbick	4	80	90	15.8	4
30	De Dion	4	110	130	30.0	8	20-24	Horbick	4	108	114	29.0	8
6	Delage	1	90	110	5.9	2	30-40	Horbick	4	120	130	35.7	10
8	Delage	1	100	120	6.2	2	18-24	Horbick	6	80	90	23.8	6
9	Delage	1	100	130	6.2	2	8½	Horley	2	80	90	7.9	3
10	Delage	4	62	120	9.5	3	16-20	Hotchkiss	4	95	110	22.4	6
12	Delage	4	65	120	10.4	3	20-30	Hotchkiss	4	110	130	30.0	8
14	Delage	4	75	120	13.8	4	30-40	Hotchkiss	4	120	140	35.7	10
8-10	Delahaye	2	80	120	7.9	3	40-50	Hotchkiss	6	120	140	53.5	20
10-12	Delahaye	2	92	110	10.5	3	8	Humber	2	90	120	10.0	3
9-11	Delahaye	4	62	100	9.5	3	12	Humber	4	90	95	20.0	6
12-16	Delahaye	4	75	110	13.8	4	16	Humber	4	90	140	20.0	6
18-24	Delahaye	4	92	110	21.0	6	20	Humber	4	105	130	27.3	8
20-30	Delahaye	4	95	130	22.4	6	30	Humber	6	102	114	38.7	10
10	Delaunay-Belleville	4	85	120	17.9	6	12-14	Imperia	4	75	100	13.8	4
15	Delaunay-Belleville	4	98	130	23.8	6	16-20	Imperia	4	90	110	20.0	6
20	Delaunay-Belleville	4	110	130	30.0	8	20-30	Imperia	4	106	130	27.9	8
28	Delaunay-Belleville	4	120	130	35.7	10	50-60	Imperia	4	150	140	55.6	20
40	Delaunay-Belleville	4	134	140	44.5	20	25	Iris	4	108	133	29.0	8
10	Delaunay-Belleville	6	72	105	19.2	6	35	Iris	4	127	133	40.0	10
15	Delaunay-Belleville	6	85	122	26.8	8	16-20	Itala	4	90	110	20.0	6
25	Delaunay-Belleville	6	98	130	35.7	10	30	Itala	4	115	130	32.8	8
40	Delaunay-Belleville	6	115	130	49.2	20	45	Itala	4	130	140	41.9	20
70	Delaunay-Belleville	6	134	140	66.8	40	60	Itala	4	155	145	59.5	20

The New Car Licences (continued).

H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Tax in Gns.	H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Tax in Gns.
			m.	mm.	h.p.					mm.	mm.	h.p.	
60	Itala	6	130	140	62.9	40	9	Motobloc	1	100	120	6.2	2
80	Itala	6	140	140	72.8	40	14-16	Motobloc	4	80	100	15.8	4
8	Jackson	1	100	120	6.2	2	18	Motobloc	4	90	110	20.0	6
9	Jackson	1	100	130	6.2	2	25	Motobloc	4	100	120	24.8	6
14	Jackson	4	75	90	13.8	4	35	Motobloc	4	120	120	35.7	10
25	J. and B. Vertex	4	102	127	25.8	6	45	Motobloc	4	130	130	41.9	20
16-20	J. and B.	4	89	114	19.6	6	70	Motobloc	4	165	140	67.5	40
25-30	J. and B.	4	114	152	32.2	8	16	M.P.	4	80	100	15.8	4
45	J. and B. Vertex	6	133	127	65.6	40	30	M.P.	4	112	140	31.0	8
20	Junior	4	102	127	25.8	6	14-18	Nagant-Hobson	4	90	110	20.0	6
40	Junior	4	130	150	41.9	20	20-30	Nagant-Hobson	4	106	130	27.9	8
12	La Buire	4	75	120	13.8	4	35-40	Nagant-Hobson	4	125	140	38.7	10
18	La Buire	4	100	130	24.8	6	10	Napier	2	82	127	8.3	3
28	La Buire	4	120	140	35.7	10	15	Napier	4	82	127	16.6	6
15	La Buire	4	98	120	23.8	6	26	Napier	4	101	127	25.3	6
16	La Buire	6	80	120	23.8	6	45	Napier	4	127	127	40.0	10
24	La Buire	6	92	120	31.4	8	30	Napier	6	82	127	25.0	6
30	La Buire	6	102	130	38.7	10	40	Napier	6	101	101	37.9	10
40	La Buire	6	120	140	53.5	20	45	Napier	6	101	127	37.9	10
20	Lanchester	4	100	75	24.8	6	60	Napier	6	127	101	60.0	20
28	Lanchester	6	100	75	37.4	10	65	Napier	6	127	127	60.0	20
15	Lancia	4	90	100	20.0	6	90	Napier	6	155	127	89.3	40
20	Lancia	4	95	110	22.4	6	20	New Engine Car	2	114	114	16.1	6
30	Lancia	6	90	100	30.0	8	30	New Engine Car	4	114	114	32.2	8
10	Laurin-Klement	2	90	110	10.0	3	40	New Engine Car	4	127	114	40.0	10
10-12	Laurin-Klement	4	75	88	13.8	4	14-16	New Pick	4	90	120	20.0	6
14-16	Laurin-Klement	4	84	110	17.5	6	16	Nordenfelt	4	80	100	15.8	4
10	Lorraine-Dietrich	4	65	100	10.4	3	20	Nordenfelt	4	90	120	20.0	6
10	Lorraine-Dietrich	2	80	120	7.9	3	30-35	Nordenfelt	4	112	140	31.0	8
15	Lorraine-Dietrich	4	90	120	20.0	6	10	Northern	2	100	112	12.4	4
20	Lorraine-Dietrich	4	110	130	30.0	8	20	Northern	4	100	112	24.8	6
30	Lorraine-Dietrich	4	120	140	35.7	10	10	Opel	4	64	85	10.1	3
40	Lorraine-Dietrich	4	130	150	41.9	20	12	Opel	2	90	120	10.0	3
60	Lorraine-Dietrich	4	146	180	52.8	20	8-14	Opel	2	105	120	13.6	4
15	Lorraine-Dietrich	6	80	120	23.8	6	14	Opel	4	64	120	10.1	3
70	Lorraine-Dietrich	5	130	150	62.9	40	18	Opel	4	90	100	20.0	6
10-12	Lotis	2	95	95	11.2	3	22	Opel	4	100	120	24.8	6
12-18	Lotis	2	102	127	12.9	4	30	Opel	4	112	120	31.0	8
18-24	Marca-Tre-Spade	4	100	120	24.8	6	40	Opel	4	120	140	35.7	10
12	Martini	4	63	90	9.8	3	45	Opel	4	130	150	41.9	20
16	Martini	4	80	110	15.8	4	60	Opel	4	140	140	48.5	20
20	Martini	4	90	120	20.0	6	25	Orleans	4	102	115	25.8	6
25	Martini	4	110	130	30.0	8	34	Orleans	4	118	128	34.6	10
40	Martini	4	126	150	39.4	10	46	Orleans	4	136	150	45.9	20
60	Martini	4	134	140	44.5	20	45	Orleans	6	110	120	45.0	20
6	Mass	1	90	110	5.0	2	20	Owen	4	102	120	25.8	6
8-10	Mass	2	85	100	8.9	3	40	Owen	4	115	165	32.8	8
15	Mass Special	4	95	120	22.4	6	60	Owen	6	115	165	49.2	20
20	Mass Special	4	110	130	30.0	8	8-10	Panhard	2	80	120	7.9	3
24-30	Mass	4	110	130	30.0	8	10-15	Panhard	4	81	120	16.5	6
28-32	Mass	4	125	140	38.7	10	15-25	Panhard	4	91	130	20.5	6
40-50	Mass	4	135	140	45.1	20	18-30	Panhard	4	100	130	24.8	6
25-30	Maudslay	4	114	127	32.2	8	25-35	Panhard	4	110	140	30.0	8
35-45	Maudslay	4	127	127	40.0	10	35-45	Panhard	4	125	150	38.7	10
60	Maudslay	6	127	127	60.0	20	50	Panhard	4	145	160	52.0	20
35-40	Mercédès	4	110	140	30.0	8	30	Panhard	6	90	130	30.0	8
45-50	Mercédès	4	120	150	35.7	10	65	Panhard	6	135	140	67.8	40
65	Mercédès	6	120	140	53.5	20	9	Peugeot	1	105	120	6.8	3
75	Mercédès	6	120	150	53.5	20	10	Peugeot	2	90	90	10.0	3
14	Métallurgique	4	75	110	13.8	4	12	Peugeot	4	80	110	15.8	4
18	Métallurgique	4	85	130	17.9	6	16	Peugeot	4	90	120	20.0	6
26	Métallurgique	4	102	150	25.8	6	20	Peugeot	6	80	110	23.8	6
40-50	Métallurgique	4	127	152	40.0	10	22	Peugeot	4	106	130	27.8	8
14-16	Miesse Petrol	4	80	110	15.8	4	35	Peugeot	4	130	140	41.9	20
24-30	Miesse Petrol	4	110	120	30.0	8	60	Peugeot	6	130	140	62.9	40
35-40	Miesse Petrol	6	100	120	37.4	10	8	Phœnix	2	80	80	7.9	3
15	Minerva	4	85	110	17.9	6	10-12	Phœnix	2	90	100	10.0	3
18	Minerva	4	102	115	25.8	6	12-16	Piccard-Pictet	4	90	100	20.0	6
25	Minerva	4	106	115	27.9	8	18-24	Piccard-Pictet	4	100	120	24.8	6
38	Minerva	4	124	130	38.2	10	28-50	Piccard-Pictet	4	130	130	41.9	20
40	Minerva	6	105	120	41.0	20	28-40	Piccard-Pictet	6	100	120	37.4	10
10	Mors	4	80	90	15.8	4	18	Pilain	4	90	120	20.0	6
15	Mors	4	85	120	17.9	6	24	Pilain	4	100	130	24.8	6
20	Mors	4	95	130	22.4	6	35	Pilain	4	124	140	38.2	10
30	Mors	4	114	150	32.2	8	9	Pilgrim	2	86	76	9.1	3
45	Mors	4	125	150	38.7	10	32	Pilgrim	4	114	127	32.2	8
50	Mors	6	114	150	48.4	20	14-18	Porthos	4	90	110	20.0	6

The New Car Licences (continued).

H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Max in Gns.	H.P.	Name of Car.	No. of Cyls.	Bore.	Stroke.	R.A.C. Rating	Max in Gns.
			mm.	mm.	h.p.					mm.	mm.	h.p.	
20-25	Porthos	6	90	110	30.0	8	16	Singer	4	85	110	17.9	6
24-30	Porthos	4	110	120	30.0	8	20-25	Singer	4	100	110	24.8	6
35-45	Porthos	6	110	120	45.0	20	8	Sizaire-Naudin	1	120	110	8.9	3
14	Rapid	4	80	105	15.8	4	12	Sizaire-Naudin	1	120	130	8.9	3
20	Rapid	4	90	120	20.0	6	16	Standard	4	89	108	19.6	6
25-30	Rapid	4	110	120	30.0	8	20	Standard	6	89	108	29.4	8
35	Rapid	4	130	140	41.9	20	40	Standard	6	102	127	38.7	10
40	Rapid	4	130	160	41.9	20	8	Star	2	89	114	9.8	3
50-70	Rapid	4	140	160	48.5	20	10	Star	2	102	114	12.9	4
8	Renault	2	75	120	6.9	3	12	Star	4	82	114	16.6	6
9	Renault	2	80	120	7.9	3	15	Star	4	89	114	19.6	6
10-14	Renault	4	75	120	13.8	4	20	Star	4	102	127	25.8	6
12-16	Renault	4	80	120	15.8	4	25	Star	4	108	127	29.0	8
14-20	Renault	4	90	120	20.0	6	40	Star	6	108	127	43.5	20
20-30	Renault	4	100	140	24.8	6	16-20	Stella	4	90	120	20.0	6
35-45	Renault	4	130	140	41.9	20	14-16	Straker-Squire	4	87	85	18.7	6
50-60	Renault	6	120	140	53.5	20	16	Sunbeam Station Cart	2	120	140	17.8	6
10	Reo	1	120	152	8.9	3	14-18	Sunbeam	4	95	120	22.4	6
18-22	Reo	2	120	152	17.8	6	20	Sunbeam	4	105	130	27.3	8
16	Rex-Remo	4	86	110	18.2	6	35	Sunbeam	4	120	140	35.7	10
20	Rex-Remo	4	90	110	20.0	6	10-12	Swift	2	102	111	12.9	4
9	Riley	2	86	89	9.1	3	15-18	Swift	4	85	102	17.9	6
10	Riley	2	96	96	11.4	3	18-24	Swift	4	102	111	25.8	6
12-18	Riley	2	102	127	12.9	4	12	Talbot	4	80	120	15.8	4
12-16	Rochet-Schneider	4	80	120	15.8	4	15	Talbot	4	90	117	20.0	6
16-20	Rochet-Schneider	4	100	120	24.8	6	25	Talbot	4	105	120	27.3	8
24-30	Rochet-Schneider	4	105	140	27.3	8	35	Talbot	4	120	120	35.7	10
30-35	Rochet-Schneider	4	120	160	35.7	10	18	Thornycroft	4	95	114	22.4	6
40-50	Rochet-Schneider	4	140	180	48.5	20	30	Thornycroft	4	114	127	32.2	8
70	Rochet-Schneider	4	160	160	63.5	40	45	Thornycroft	6	114	127	48.4	20
30	Rochet-Schneider	6	104	140	40.2	20	6	Torpedo	1	102	114	6.4	2
45	Rochet-Schneider	6	120	160	53.5	20	10	Torpedo	2	95	108	11.2	3
40-50	Rolls-Royce	6	113	113	47.5	20	12	Torpedo	4	76	87	14.3	4
20	Rothwell	4	102	127	25.8	6	10-12	Unic	2	102	100	12.9	4
25	Rothwell	4	102	127	25.8	6	12-14	Unic	4	75	110	13.8	4
6	Rover	1	97	110	5.8	2	16-20	Unic	4	87	110	18.8	6
8	Rover	1	114	130	8.1	3	24-30	Unic	4	102	115	25.8	6
12	Rover	2	97	110	11.7	3	25-35	Unic	6	85	120	26.9	8
15	Rover	4	85	110	17.9	6	*25	Valveless Two-stroke	2	133	140	28.9*	8
20	Rover	4	97	110	23.3	6	16	Vauxhall	4	80	102	15.8	4
18	Roydale	4	92	120	21.0	6	20	Vauxhall	4	90	120	20.0	6
25	Roydale	4	102	120	25.8	6	16	Vinot	4	80	110	15.8	4
14	S.C.A.T.	4	85	120	17.9	6	30	Vinot	4	102	130	25.8	6
22	S.C.A.T.	4	102	140	25.8	6	40	Vinot	4	120	140	35.7	10
12	Scout	2	102	115	12.9	4	10-12	Vulcan	2	102	120	12.9	4
14-16	Scout	4	85	115	17.9	6	14	Vulcan	4	89	108	19.6	6
18-22	Scout	4	90	115	20.0	6	16	Vulcan	4	92	120	21.0	6
24-28	Scout	4	102	115	25.8	6	20	Vulcan	4	102	120	25.8	6
30	Scout	6	90	115	30.0	8	25	Vulcan	4	108	120	29.0	8
40	Scout	6	102	115	38.7	10	40	Vulcan	6	102	120	38.7	10
45	Sheffield-Simplex	6	114	114	48.4	20	25	Weigel	4	110	120	30.0	8
10	Siddeley	2	102	114	12.9	4	40	Weigel	4	130	140	41.9	20
14	Siddeley	4	91	102	20.5	6	60	Weigel	6	130	140	62.9	40
18	Siddeley	4	102	114	25.8	6	20-30	Westinghouse	4	100	130	24.8	6
30	Siddeley	4	118	127	34.6	10	35-40	Westinghouse	4	120	140	35.7	10
40	Siddeley	4	127	130	40.0	10	14	Withers	4	84	110	17.5	6
40	Siddeley	4	133	127	43.8	20	4	Withers	4	95	130	22.4	6
20	Siddeley	6	91	114	30.8	8	30	Withers	4	110	140	30.0	8
50	Siddeley	6	118	127	51.7	20	40	Withers	4	120	130	35.7	10
16	Silent Staines-Simplex	4	86	92	18.2	6	10-12	Zedel	4	70	110	12.2	4
20-25	Simms	4	105	125	27.3	8	15	Zedel	4	80	120	15.8	4
30-35	Simms	6	105	125	40.9	20	12	Zust	3	75	130	10.5	3
7	S.K. Simplex	1	102	127	6.4	2	25	Zust	4	100	130	24.8	6
8-10	S.K. Simplex	2	89	115	9.8	3	40	Zust	4	130	140	41.9	20
7-9	Singer	2	80	90	7.9	3	70	Zust	4	150	160	55.6	20
12-14	Singer	4	80	90	15.8	4							

*R.A.C. rating x 1.32. †Two pistons per cylinder.

Although the Local Government Board some time ago sanctioned a ten miles per hour limit in certain roads at Redhill and Reigate, the warning signs have not yet been erected. Indeed it would seem, if what we hear be true, that some of the tradespeople who took an active part in the agitation for the imposition of the limit are beginning to repent. They find out

that they are marked men, and that they stand to lose many of their old customers. The consciousness of this may have had some influence in the delay which has occurred in the putting up of the posts. At any rate, we have good reason to believe that some of the agitators would be glad if the matter were allowed to lapse.

My Ideal Car. By The Autocrat.

IN the spring of last year (March 7th) I gave some particulars of my ideal car for an owner-driver. I may remind my readers who were good enough to take considerable interest in my suggestions that the car was one of moderate power, not smaller than 90 by 120 mm. or larger than 102 by 127 mm. I then went on to outline my other requirements, such as mechanical lubrication with easily accessible filter, simple leather cone clutch, four-speed gear, and so on. For some months I have owned a car which both as to chassis and body practically conforms to my ideal, and the car has given me the greatest satisfaction and enjoyment. There is only one defect in it, and that is it is an ideal which has been attained. Now I want something which, as a true ideal should be, is unattainable at present, and for all I know to the contrary may long remain so, except in the case of some wealthy purchaser who may feel sufficiently interested in the ideal I am going to set forth to procure such a car, but I should not like to say how much it would cost him. My new and at present unattainable ideal is shortly as follows: I would take a Lanchester or New Engine chassis and commence operations by removing the engine. I should then fit a 22 h.p. Daimler slide valve engine in the Lanchester position—that is, between the occupants of the front seats or, to be more accurate, in the centre of the footboard. I had better say at once that I expect the makers whose names I am taking in vain will regard me as a dangerous visionary, and to save them the trouble of writing to say so I admit at once that I deserve their bad opinions. My reasons for desiring this combination are that with the Lanchester or New Engine arrangement one gets a perfectly sprung chassis which, so far as I know, is unequalled for comfort by any other cars made, and at the same time they enable one to have a comfortable five-seated body, with

plenty of leg room fore and aft, a comparatively short wheelbase, and no body overhang at the rear. As I showed in my article last year, one was practically bound to have at least a 10ft. wheelbase to combine absence of overhang with a roomy, comfortable body and the ordinary engine position. The reason I want the Knight engine is because with comparatively small alterations of the positions of the magneto, pump, and inlet and exhaust pipes, one can have a very narrow engine in what always appears to me to be a somewhat inaccessible position. I am now referring to the Lanchester, and not to the New Engine car, as in the N.E.C. the engine is under the seat, and, good as it may be, that position does not appeal to me. Another advantage of the slide valve engine is that the valves never require attention till such time as the engine is in need of a general overhaul, and then it might just as well be taken out of the chassis as not. Therefore any difficulty of access which may exist in the Lanchester position of the engine does not matter, but, above and beyond all things, the great point in favour of the slide valve engine for the type of car I want is its extraordinary narrowness, owing to the absence of the ordinary valve pockets. Of course, the suggestion I make would necessitate a very different engine from the present Daimler engine, because it would have to be designed for the Lanchester position, but the fact remains that it would be comparatively easy to redesign it so that the part above the footboard would be very narrow indeed. The ideal fascinates me, as it abounds in possibilities, and, although, as I have said, I am prepared to be taken to task by the makers for offering such a wild suggestion, I am certain that a car offering the combination I have outlined would be a most delightful vehicle to drive and to use, because the advantages I have named are very real.

Feminine Perplexities in Choosing a Car.

We are thinking of buying a motor car.

At first sight this is a perfectly simple matter, for one has only, it seems, to walk round three or four showrooms, try the seats, criticise the paint, and perhaps go for a trial run. But as soon as he learns of our preference for any particular car, the inevitable male friend—who has forgotten more than most people know about motoring; at least that is what he says—dashes our hopes to the ground. "Didn't you notice what a bad lock those cars have?" he asks. "They would never do for town use." Or another time it is, "The ignition is so inaccessible that it will be an awful nuisance presently." "Oh, bother the ignition," we remark, "the paint is just too lovely. Besides, such a comfortable car is sure to run well!" But alas! the M.F. (horrid thing! especially if he be a relation) overcomes our eloquence by his logic, and we give in—for a time.

Soon we find another car, which we know is just *the* thing, especially as it hasn't got the faults the M.F. complained of. We asked the makers point blank and they said so, and they ought to know! The M.F. admits this grudgingly (isn't it difficult for a man to yield gracefully?), but says the car is much too powerful for people of moderate means. At last, however, we have come down to four cars, but still the final choice seems as far off as ever. There are

things one car has and another hasn't, and *vice versa*; and we can't agree as to which are the best, and meanwhile the summer is slipping away and we are still motorless!

If only the makers would put all the good points into one car! But it can't be done the M.F. says; why, I don't believe he really knows. "People want such different things," he remarked the other day, "and so there can never be a standard to suit everybody." But I have made up my mind. I will draw lots and we will get whichever wins.

Oh, dear! I have muddled it and drawn every single one! How very unlucky. I don't think I'll try again. Besides the B cars are *so* comfortable.

Yet Juliet liked the delicate French style of the R, while as for the M.F., he is quite gone on the M car.

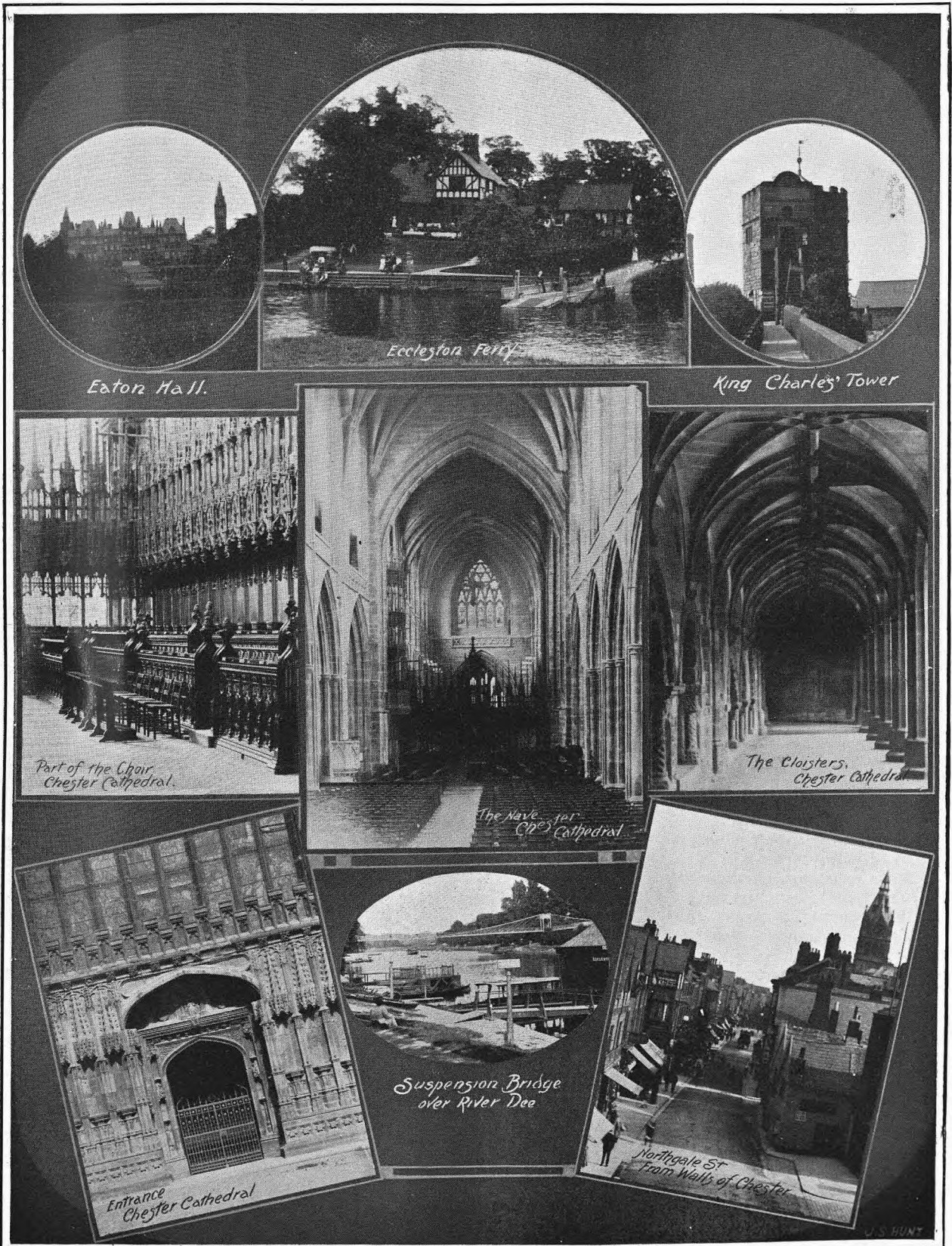
Good gracious! Another week gone and still we are undecided.

What car shall we get?

THE AUTOCAR MAP FOR MOTORISTS.—Invaluable when touring or contemplating a tour. This map is supplied in three styles, *i.e.*—(1) varnished and with roads marked in red; (2) on suitable materials for marking in the roads traversed or to be traversed; (3) folded in case, suitable for carrying in car. Size of map, 4ft. 8in. × 3ft. 9in. Price 8s. 10d., carriage paid, in any one of the three styles, obtainable at the offices of *The Autocar*, 20, Tudor Street, London, E.C.

Round about Chester.

A Brief Itinerary of the District will be found under Week-end and Touring Notes, on page 27.



The 22 h.p. Cottin-Desgouttes Car.

A French Built Car which has gained Numerous Successes on the Continent.

A MAKE of car which has for several years figured prominently in Continental motoring events but has hitherto been but little known in this country is the Cottin et Desgouttes, which has now been taken up by the Cambridge Automobile Co., of

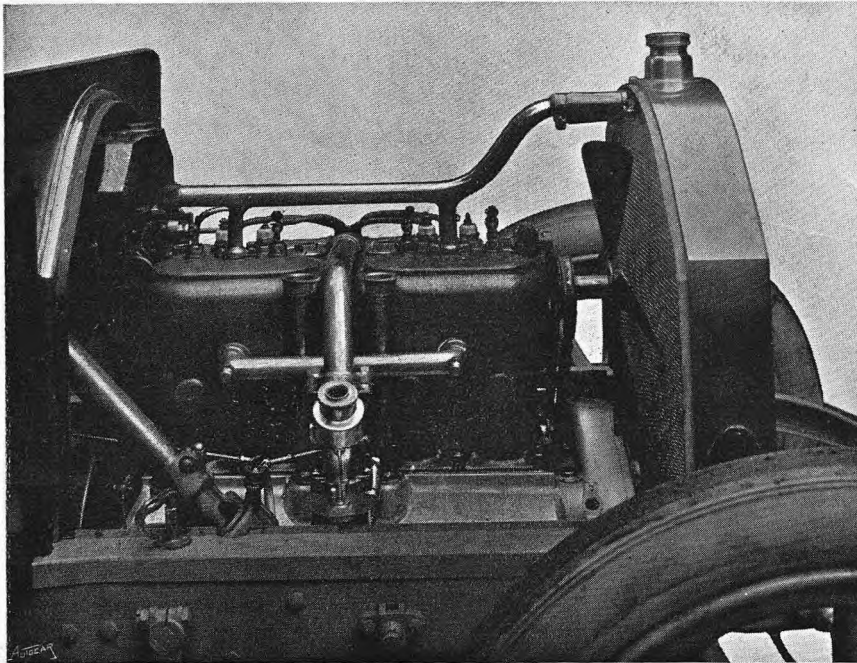
the magneto being very easily removed from its base plate. It is obvious that both the pump and magneto have been so positioned as to give free access to the valve springs, stems, etc. The carburetter is placed on the right-hand side, the induction pipe passing over and between the pairs of cylinders at their junction to the branch pipe leading to the centrally placed induction valve ports. The exhaust branch leads, from the outside valves in each pair of cylinders, are swept upwards into a large diameter receiving pipe leading away to the silencer.

The crank chamber casting of aluminium is of somewhat peculiar construction, the supporting arms being connected by a web which forms the platform for the magneto and pump and serves to form a dustproof shield for the upper works of the motor. The inspection doors are in the bottom of the crank chamber, and through these the pistons may be drawn complete from the cylinders.

The Carburetter

One of the most interesting features in connection with the engine is the carburetter, a sectional drawing of which is given herewith. This is of the two

jet type, but it functions in a very different manner from the usual run of two-jet carburetters. When the throttle valve B is allowed to close down towards its seating under the influence of the spring R as the accelerator pedal is released, the velocity of the air at the valve seating is so increased that a vacuum is



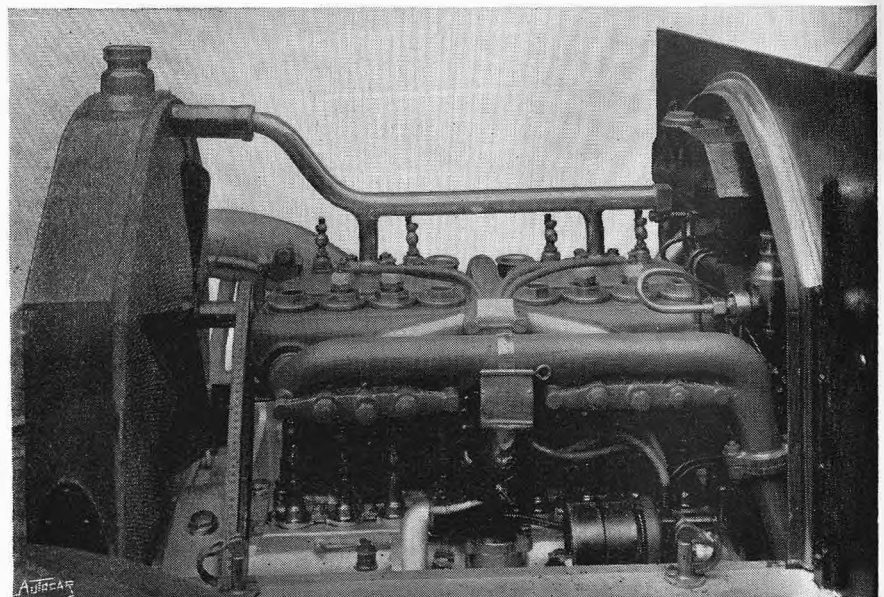
Right-hand side view of the Cottin-Desgouttes motor showing the carburetter.

9, Sidney Street, Cambridge. In 1908 these cars were "placed" either in the general classification or in particular classes in the following events: Hill-climbs.—St. Etienne, Montjeu, Antim, Val-Suzon, Planteurs, Oran, Mont Ventoux, and Gaillon. Speed events.—Flying kilometre, Autun, Course de la Faneille; Salon Meeting; Trials, Tunis and Melbourne. The powers of the cars concerned in these events ranged from 18 to 50 h.p.

In this article we are chiefly concerned with the 22 h.p. car which we examined and tried, but we should say that four-cylinder engines are made in the following powers: 10-12 h.p., 15 h.p., 22 h.p., 40 and 50 h.p., and, with six-cylinders, 20 and 45 h.p.

The Engine.

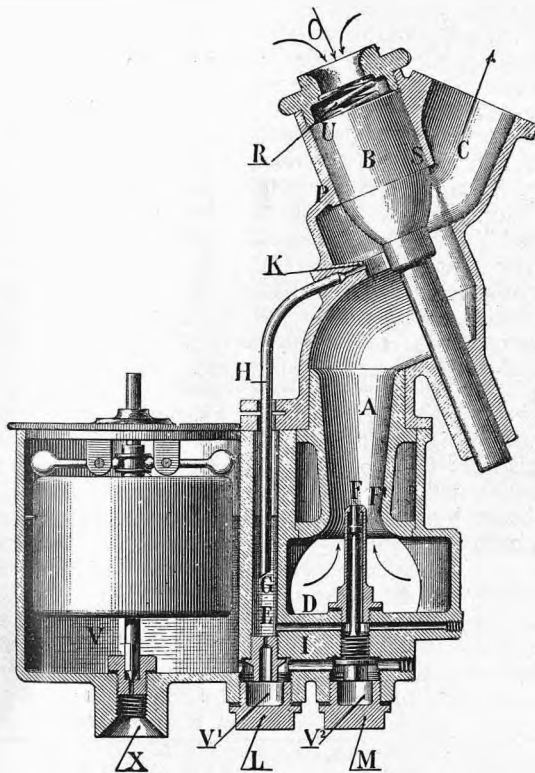
The 22 h.p. motor, of which two illustrations are given, has its cylinders cast in pairs; bore 100 mm., stroke 120 mm. The valves are all ranged on one side, and are easily accessible. On the valve side are the water circulating pump and magneto, the latter being driven off the end of the pump spindle. Though somewhat low in the frame, both are easily reached,



Left-hand side of the engine.

formed in the petrol pipe H to the extra jet K. As the lower end of the pipe H is immersed in a well of petrol G open to atmosphere, there being a vacuum in the pipe H and atmospheric pressure acting on the body of petrol in the well G, spirit will rise up to the jet K, and, mixing with the air passing the throttle valve B, will give a rich mixture to the cylinders through the pipe C. This rich mixture is used for starting and slow running. As the throttle valve is opened the velocity of the air past the extra jet is so reduced that it finally fails to draw petrol, but all the time the ordinary running mixture is maintained by the main jet F.

Particular attention should be given to the con-



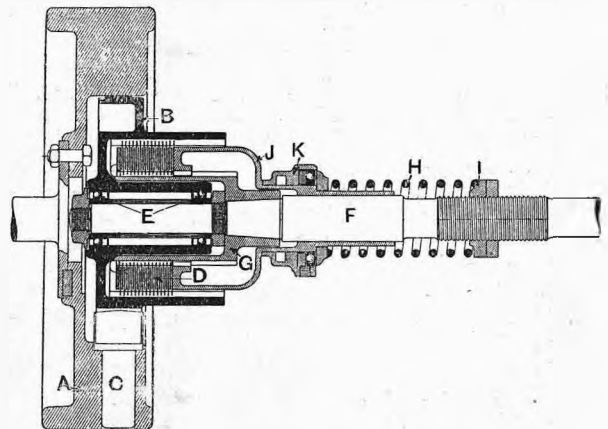
Section of the Cottin-Desgouttes carburetter.

- A, mixture chamber
- B, throttle valve
- C, induction pipe to engine
- D, air intake
- E, small orifice admitting petrol to G
- F, petrol jet in direct communication with the float chamber V
- F₁, annular petrol jet in connection with G
- G, petrol well supplied via E and open to atmosphere at top
- H, pipe to extra jet K
- I, petrol passage to jet F₁
- K, auxiliary petrol jet for starting and slow running
- L and M, screw plugs in base of carburetter
- O, pure air inlet for air brake
- P, U S, points of action of the throttle valve
- R, spring returning throttle to closed position
- V, float feed chamber
- V₁ V₂, petrol passages to the jets
- X, petrol entrance to V

struction and action of the petrol jet F, which in itself is really a double jet, the central jet F being centrally placed in the outer, or shell, jet F₁. If we trace out the passage of the petrol from the float feed chamber V to the jets F F₁, it is not difficult to comprehend their operation. The passage V₁ is common to all jets leading to F *via* the conduct V₂, and to the petrol well G and the jet F₁ by way of E and I. It should be particularly noted that there is a very free passage for the petrol to the central jet F, but the passage to the well G and the jet F is by way of a comparatively small hole at E, this hole being much smaller than

the passage I to the outer jet F₁. Now let us consider what happens at varying engine speeds. To start up the engine or to run slowly we want a mixture rich in petrol, but small in bulk, so we close down the throttle somewhat. This restricts the air passage and so increases its velocity as already explained. As the extra petrol jet K comes into operation petrol is drawn from the well G at a trifle faster rate than the petrol can enter through the orifice E, and as a result the level is lowered somewhat, and so petrol cannot be drawn through the jet F₁, which is in free communication with G, but as the jet F is in free direct communication with the float chamber V, its level is maintained, and so it can at all times give at least some spirit to the passing air and so maintain a running mixture.

Pure air can be admitted to the engine to act as a brake by closing the throttle right down. When this



Section of the Cottin-Desgouttes clutch arrangement.

- A, flywheel
- B, circular box containing the driving discs of the clutch
- C, one of two steel driving pins coupling A to B for driving purposes
- D, driven discs on the clutch-shaft F
- E, ball bearings carrying end of F
- F, clutch-shaft to gear box
- G, boss on F carrying driven discs
- H, clutch spring
- I, nut and lock nut to adjust tension of the spring H
- J, abutment piece acting on D to engage the clutch
- K, clutch actuating ring coupled to clutch pedal

is done the line of the throttle valve P S descends below the extra jet K, and so puts it out of action, but when the top line of the valve U drops below the points P S air is drawn in through O to the engine.

The carburetter functions most satisfactorily on the road, and no matter how the throttle is worked there is no snatching or staggering of the motor due to momentary upsetting of the mixture.

Ignition and Lubrication.

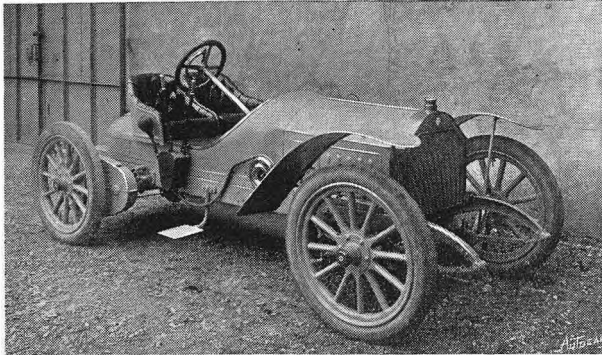
On this particular car the Bosch high tension magneto ignition alone was fitted, and there was not the slightest difficulty in starting. It may be said that the 22, 40, and 50 h.p. motors are fitted with either high or low tension magneto ignition.

The engine lubrication is carried on by gravity feed from a supply tank placed on the front side of the dashboard and beneath the bonnet. Oil, however, does not fall from the bottom of the tank, but issues by a pipe from the top, being forced thereto by pressure, the said pressure being led from the petrol tank. By this arrangement it is obvious that the petrol and oil feeds act simultaneously, and that should the oil supply cease pressure will escape and the car stop, so that no damage can be done by failure of lubrication.

The Clutch.

The next point of interest is the clutch, which is of the ordinary multiple disc type, but its method of

mounting in the flywheel is uncommon and deserves particular attention from the point of accessibility. Referring to the sectional drawing of the clutch, the flywheel A is recessed to receive the clutch box B, and



A 15 h.p. Collin-Desgouttes in racing trim.

is provided with two steel driving pins C engaging in slots cut in the flange of B. The clutch box B is freely mounted on the clutchshaft F by the ball bearings E. One-half of the clutch discs are mounted in this box in the ordinary way, the intermediate ones being carried on the driven boss G. The clutch is actuated by the abutment piece J acting on the discs D through the pressure of the spring H, which pressure is adjustable through the nut and lock nut I. The clutch is operated by the collar and ball thrust bearing K.

At the rear end of the shaft F is a screw collar secured by a spring pin, and it is only necessary to release the fork actuating K, take out the spring pin, and unscrew the collar, when the shaft and clutch complete can be taken right out.

The Transmission and Brakes.

In all the cars of 15 h.p. and upwards there are two types—live axle and chain drive—and as the car under notice was of the latter type, we confine our remarks thereto. There are four changes of speed, both

the third and fourth speeds giving a direct drive to the countershaft. The gears are operated through a side lever working over a very easy gate quadrant. The chains are enclosed in oil retaining dustproof gear cases, and a simple eccentric-type chain adjustment is provided.

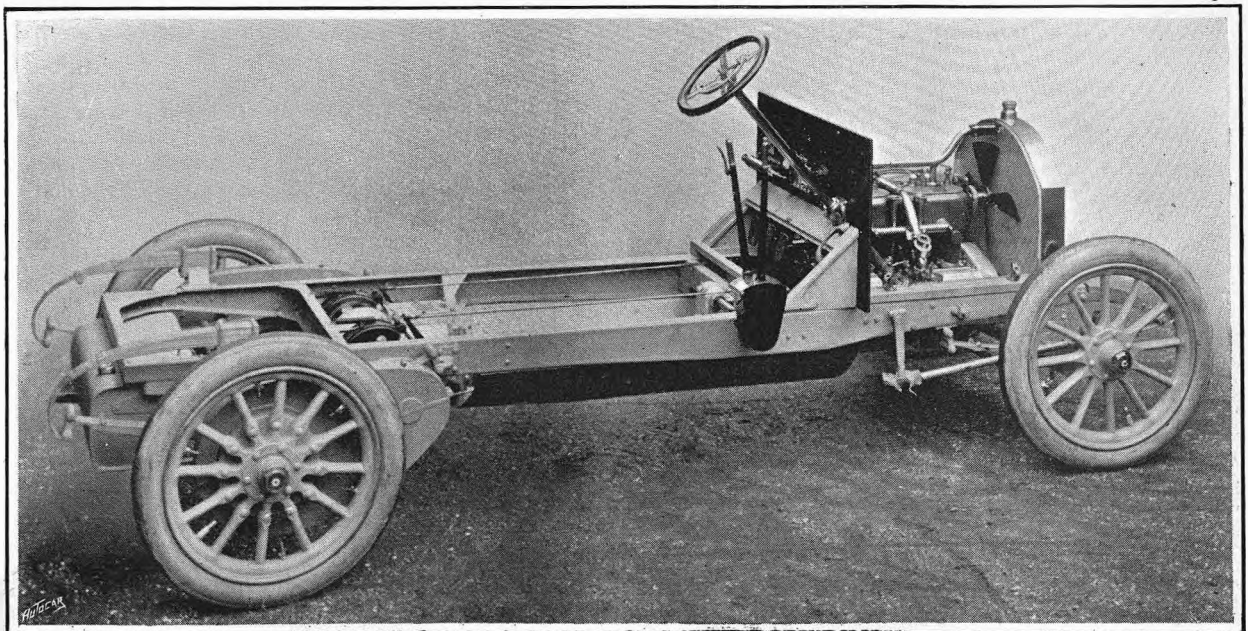
Ample braking power is afforded, for, in addition to using the engine as an air brake, there are two powerful drum brakes on the countershaft, either, or both, of which can be operated at once. Two other similar brakes are provided on the rear road wheels.

Some General Observations.

It is hardly necessary to say that the frame is of pressed steel, and the axles, etc., of steel forgings or stampings, for it may be safely assumed that a car with such a good record would not be lacking in any of these particulars.

We were given a run of some thirty miles or so, and were well pleased with the running of the 22 h.p. It has a good turn of speed, picks up very quickly, and checks admirably on any of the brakes. As to silence of running, it was difficult to judge with any nicety, as the fan developed a clanking noise and a mudguard rattled, but as these noises predominated it is safe to assume that the car would pass in the matter of quietude for present day use. The Cambridge Automobile Co. expect delivery of a 15 h.p. live axle chassis shortly, which, taking a line through the 22 h.p., should prove an excellent little car.

The following figures represent the amounts extracted from motorists in fines and costs in one week by the magistrates for the relief of local rates at the three places named: Horsham (five persons), £16 17s. 3d.; Pulborough (nine persons), £29 17s. 6d.; Arundel (ten persons), £66 1s. 9d. The Worthing magistrates at a special sitting on Friday last week dealt with a large number of motor cases, the result of timing operations conducted by the police on the Findon and Arundel roads during Goodwood week. Nearly fifty summonses, the fines and costs imposed amounting in the aggregate to £155.



Chassis of the 22 h.p. chain-driven Collin-Desgouttes car.

The New Central Road Authority.

Unjust Method of Financing the Proposal.

IT is the general opinion that there is necessity for a new Central Road Authority, if for nothing else, at least to ensure uniformity of road treatment and management. Roads are passing through a transition stage in regard to their use. They no longer serve merely for the accommodation of local traffic, but are used as national routes for through traffic by motor vehicles. Nevertheless it is not for the benefit of motorists alone that they are thus being more largely used. Motor vehicles have become indispensable adjuncts of the commercial and social life of the community, and are as much the necessity of one class as another. They are not the exclusive possession of a few, and no sharply defined line can be drawn between those who are benefited by motor traffic and those who are not. There is scarcely a man, woman, or child who does not profit in some wise by their use.

The observations made by Sir John H. A. Macdonald in *Chambers's Journal*, and reprinted in *The Autocar* of August 7th, are very significant. They show that horses and their attendant insanitary conditions are fast disappearing from the streets, and that their place is rapidly being taken by the more convenient and infinitely more sanitary motor. The roads of the country are now coming into general use again, and it is held that, as they were not originally intended for motor traffic, they are in some respects inconvenient, and stand in need of adaptation to their new uses at certain points. Hence the agitation for the Central Road Authority.

The reasoning adopted in regard to the New Central Road Authority by those who have brought it forward appears to be somewhat as follows:

(1.) The roads as at present existing were made for horsed vehicles, and are unsuited for motor traffic, which is rapidly making its appearance upon them.

(2.) Certain improvements are necessary in order to accommodate this new traffic.

(3.) Motorists want these improvements.

(4.) Therefore they must pay for them.

Statesmen of presumably high attainments follow this specious line of argument, but we venture to think that they would not be led to do so had they given the matter serious consideration. It is because they have not done so that they are thus led away. The flaw in the argument is only too apparent. The first and second propositions are self-evident, but the third is only partly true, and consequently the conclusion arrived at is likewise vitiated. It is not motorists alone who want these improvements in the roads; it is not motorists alone who will benefit by the improvements, nor is it in the interests of motorists alone that a Central Road Authority is required. The new speedier, more convenient, and more sanitary traffic runs on the roads in the interests of the whole community, and is opening up and making accessible to all classes districts which were previously more or less inaccessible.

With this rectification of the premises, the conclusion also stands in need of rectification, and should read:

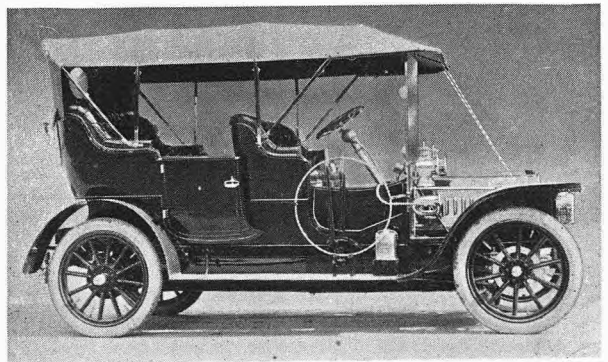
(4) Therefore the road improvements rendered necessary by the appearance of motor traffic must be paid for by the whole community.

To call upon the motor industry to find funds for this improvement is monstrous. Motorists, of course, realise that it is unjust, but, being as they are harassed

by so many persecutions and injustices already, they are in a timorous mood, and say in effect, "We had better submit to this injustice in the hope that it may be the means of delivering us from some of the more intolerable indignities and injustices under which we already suffer."

Suppose that a new and improved form of locomotion be introduced into a business house, rendering communication between the different departments easier than it was formerly, and that, in order that the new method of communication might be put to its fullest use, it was necessary to make alterations in certain narrow passages, and to widen certain doorways. Obviously the new system would be for the benefit of the whole establishment, and the directors would make the cost of any alterations a charge upon the whole concern. It might be that the working of the new system would be pleasanter for those who had to actually conduct it than the old method which it superseded, and the making of the necessary plant would bring some amount of prosperity to those who manufactured it, but that would not be a valid reason for calling upon them to pay for any alterations rendered necessary to accommodate the new means of communication. Now, if Mr. Lloyd George were the manager of this business concern he would charge the cost of the alterations against the boys and porters who enjoyed the fun of driving the new means of conveyance and the firms who made and supplied the apparatus.

It may be urged that the two cases are not parallel, as the motor cars which run upon the roads are not supplied by the Government in the same way that the means of conveyance in the business establishment are provided by the proprietors of the concern. Surely this would make the case of the motorists all the stronger, but we will not anticipate objections till they are made.



Sir Richard N. Rycroft, Bart., J.P., D.L., of Dummer House, Basingstoke, has just taken delivery of the new 12-14 h.p. De Dion illustrated above. Sir Richard is High Sheriff of Hampshire, Captain of the Hants Carbineers, and Master of the Vine Foxhounds. Last, but by no means least, he is a leading member of the Basingstoke Bench, whose anti-motoring views we have no doubt he does much to temper.

"USEFUL HINTS AND TIPS FOR AUTOMOBILISTS." Under this title "Useful Hints and Tips" have been reprinted from *The Autocar* in booklet form. The third edition now on sale has been thoroughly revised and brought up to date. The book can be obtained from *The Autocar* Offices, 20, Tudor Street, London, E.C., price 2s. 6d.; post paid, 2s. 10d.

Test of Headlights for Motor Cars and Motor Cycles.

Under the Open Competition Rules of the Royal Automobile Club.

AS has been previously stated, the test of headlights for motor cars and motor cycles, carried out with the greatest care at the Crystal Palace on 19th and 20th July, were undertaken by the Club at the request of the Local Government Board. The report upon these most interesting, instructive, and exhaustive trials, as presented to the Local Government Board and the public, was issued in the early part of the present week. It is complete, voluminous, and thorough, and although we are unable to give it entirely in detail, still we present so much of the report that the value and the result of the work performed can be comprehended and appreciated. It was realised that the unpopularity of motor cars was due, amongst other matters, to the use of dazzling headlights, and the opinion was held that this undesirable effect could be minimised while at the same time sufficient illumination of the road in front of the driver was obtained. While it was considered that the universal employment of back and front lamps on all vehicles, horse-drawn or otherwise, would be an effective way of reducing the demand for headlights of high power, it was hoped that the tests would bring out the necessary points to be considered in the building of a successful lamp. This hope the judges consider has been justified, and after a careful study of the report we feel that those of our readers who are interested in the subject will agree with them.

The Success of the Trials.

In addressing the Automobile Club the judges—Messrs. Mervyn O’Gorman (chairman), G. H. Baillie, A. G. New, the Rev. P. W. Bischoff (A.C.U.), Capt. R. K. Bagnall-Wild, R.E., Dr. W. Watson, F.R.S., and Professor C. Vernon Boys, F.R.C.—express pleasure at the response made by the various lamp makers to the Club’s invitation to submit their lamps to such searching tests, which were arranged to demonstrate their optical properties. By the very thorough investigations so carried out the tests proved that the dazzling effect of the headlights could be minimised while at the same time sufficient road illumination was available for all ordinary purposes. The firms entering lamps and the number and character of the lamps were as under:

	Acetylene.	Electric.
Badger Brass Manufacturing Co. ...	6	—
Blériot, Ltd. ...	1*	1
Brown Bros., Ltd. ...	2	—
Alfred Dunhill, Ltd. ...	1	—
C. H. Gentry ...	—	1
S. Hall and Sons, Ltd. ...	1	—
Howes and Burley, Ltd. ...	1	—
Motor Accessories Co. ...	1	—
Reflector Syndicate, Ltd. ...	1	—
Rotax Motor Accessories Co. ...	2	1
Rushmore Lamps, Ltd. ...	3	—
Salsbury Lamps, Ltd. ...	2	—
S. Smith and Son, Ltd. ...	2	—
Sylverlyte Electric Lamp Co., Ltd. ...	4	—
W. Tweer and Co. ...	1	—
Universal Motor Imports, Ltd. ...	1	—
C. A. Vandervell and Co. ...	—	5
Weill Bros. ...	5	—
Willocc-Bottin Motor Lamp Co. ...	1	—
Worsnop and Co., Ltd. ...	1	—
Wyncott and Son ...	1†	—

*Also one petrol-oxygen. †Also one paraffin.

The entrant was invited to set his lamp to the best advantage in every respect, both the height and the

angle of elevation being left to his discretion, and note was made of the height of each lamp above the ground (Table I., column *f*).

Tests and Conclusions.

The records referred to in the following paragraphs were taken in respect of each lamp, and Table I. shows in summarised form the certificates of performance issued in each case to the entrant.

THE RANGE (Table I., column *g*).—The distance at which the lamp gave a certain standard of illumination (one-tenth of a candle-foot) was measured down a line along which the entrant had centred the beam of the lamp.

THE HORIZONTAL DISPERSION OF BEAM (Table I., columns h_1 and h_2).—The width of the beam over which the illumination of the head lamp was not less than the standard was measured at half the above range, firstly, at 3ft. above the ground, and, secondly, at the eye level, assumed for the purpose of this test to be 4ft. 6in. from the ground. The width of the beam at 3ft. above the ground was taken, because a maximum of illumination obtained at this level is useful to the driver, and does not cause trouble from glare.

The standard of light upon which the photometric measurements were based was the same for all the lamps, viz., one-tenth of a candle-foot; that is, the illumination received upon a surface 1ft. from a source of light measuring one-tenth of a candle-power.

The judges adopted this standard as giving a range at which details could be distinguished, but it should be remembered that the useful range of the lamps, *i.e.*, that at which objects can be seen, is often substantially greater than that given in column *g* of Table I. The full effective range depends upon the nature of the object, *e.g.*, its size and colour contrast.

THE DAZZLING EFFECT (Table I., column *k*).—The distance in front of the lamp at which an observer could distinguish an object placed 6ft. to the side of and 6ft. beyond the lamp was measured. The object chosen was such that it could be discerned on a starlit, moonless, clear night at a distance of 100ft. in the absence of any headlight.

BACK REFLECTION (Table I., column *m*).—The term back reflection is used to denote the stray light thrown out rearwardly. Such stray light interferes seriously with the vision of the driver, and thereby operates to diminish the effectiveness of the lamp.

Prior to the tests the naked candle-power of the burners and bulbs was officially measured. These results and the corresponding consumption figures are shown in columns *a* and *b* of Table I.

For the sake of facilitating reference the acetylene and electric lamps have been arranged according to their candle-power, and the details of one lamp—the petrol-oxygen, which is a type of limelight—have been set out separately.

DESIGN AND GENERAL CONSTRUCTION (Table I., column *l*).—The lamps remained in the possession of the Club after the tests, in order that the design and general construction might be investigated; at the same time sketches were made of the optical arrangements of the lamps.

Under the heading of simplicity of design and general construction, the judges attach importance to

the following points: Weight for size, ease of cleaning, absence of liability to rattle, fewness of parts, quality of hinges, clasps, supporting sockets, etc., and general method of assembling the lamp. Many of the lamps examined showed that entrants had paid considerable attention to these points.

High Candle-Power Unnecessary.

The measurement of the candle-powers of the sources of light has brought out the fact that the generally accepted idea of the intense candle-power of headlights is erroneous. The naked light of a head lamp such as is usually employed is from 15 to 25 c.p., and this light is collected and directed by lenses and mirrors. Thus Table I., column *a*, shows only two acetylene burners exceeded 30 c.p., while in the case of electric lamps the number was the same.

In the opinion of the judges, so long as the optical arrangements of the lamps are efficient, ample illumination is afforded by about 20 c.p., which can be obtained in the case of an acetylene lamp with a consumption of about .7 cubic feet of gas per hour (about 2.8 oz. of calcium carbide), and in the case of an electric lamp, with a consumption of about twenty-one watts.

It is to be noted that the larger the mirror and the smaller the source of light, the easier it is to avoid undesired dispersion of the beam. Accordingly, when considering the advantages of a lightweight lamp the importance of the size of the mirror must not be overlooked. The weight of all lamps is given in Table I., column *e*. The lamps marked †† are self-contained, and were weighed with the generator empty.

From experiments made with regard to the relation of both pressure and consumption of gas to candle-power it was observed that the candle-power of an acetylene burner varied but little between pressures of 3 in. and 6 in. of water, but the consumption rose to an important degree. In the opinion of the judges, lamps and burners as now constructed require no pressure higher than 4 in., and the most economical pressure is 3 in. of water. Increasing the size of the burner has small effect upon the range unless the optical system is altered proportionately. Increasing the size of the burner tends to increase the width of beam, and in some cases the glare.

The effect of variations of voltage on electric lamps depends upon the substance of which the filament is made. For example, a 5% increase of voltage gives approximately a 31% increase of light in the case of a carbon filament lamp, and 23% in the case of one with a metallic filament.

Anti-dazzling Effects.

In certain cases the electric lamps were somewhat over-run, and if this practice became general it would lead to objectionable results, on account of the blackening of the bulbs and premature breakage of filaments. The candle-power of the electric lamps shown in Table I., column *a*, corresponds to the voltage at which the lamps were actually run during the tests.

A series of experiments were carried out to ascertain the effect on dazzle of varying the vertical angle of projection of the beam and the height of the lamp itself from the ground.

The figures given in the following Table II. represent in general the results of the tests made. The figures in feet in the different columns are the distances of the observer from the lamp at which he was no longer dazzled—a similar set of observations to those shown in Table I., column *k*.

TABLE II.—EFFECT OF HEIGHT AND ANGLE OF ELEVATION UPON DAZZLE.

Angle of Elevation.	Height of Lamp from Ground.				
	2ft. ft.	3ft. ft.	4ft. ft.	5ft. 7ft. 6in. ft.	6in. ft.
20 deg. up	39	—	—	—	—
10 deg. „	55	43½	42	28	55
5 deg. „	57½	46	46	33	—
0 deg. (horizontal)	57	45	39	22	59
5 deg. down	64	35	34½	23	—
10 deg. „	62	36	26½	24	51

This table shows that the least dazzle is obtained either when the lamp is very low down (2ft. from the ground), or when it is fixed above the canopy level (7ft. 6in. above the ground). When the lamp is at, or about, a height of 3ft. from the ground, a downward tilt increases the dazzling effect. The judges are of opinion that this is due in a measure to reflection from the surface of the road, although this was not as light in colour as is often the case.

Horizontal Position Best.

When the lamp was tested below the level of 3ft. from the ground, maximum dazzle was obtained with an upward tilt. Nevertheless, the effect on dazzle of tilting the lamp within reasonable limits is unimportant.

Undue tilt of the lamp causes considerable difference in the illuminating power, whereas height has an appreciable effect in diminishing the dazzle. The best position would appear to be at 2ft.

As regards illumination, the horizontal is the best position from the driver's point of view, except at a height of 7ft. 6in., when a slight downward tilt is desirable.

The automatic anti-dazzling devices other than specially-arranged mirrors or lenses appeared in every case to diminish the range, but in one case this effect was only slight.

Three lamps were provided with gold reflectors—a development which is expected in consequence of the colour to prove of advantage in time of fog. It was not possible to adjudicate, in this respect, upon these or other lamps with similar claims, owing to the absence of fog during the test.

Appliances can be added to almost any type of head lamp whereby the light may be reduced; for example, with electric lamps by a switch diminishing the voltage or inserting resistance, and with acetylene lamps by partly or wholly obscuring the light by means of hand-actuating shutters or screens. The advantage of such a hand-actuated device is that on entering a town the intensity of the light from the head lamp can at once be moderated.

The lamps have been tested singly, but in many, if not in most, cases users employ a pair of lamps. It should be noted that a wider beam is required from a lamp which is to be used singly.

In consequence of the time and labour which would have been involved had all the lamps which entrants wished to submit been tested, it was decided to accept from them only those lamps which were of distinct types, irrespective of candle-power. Accordingly, it must be remembered that in most cases the manufacturer of a high-power lamp also makes small and medium-powered lamps and *vice versa*.

The judges desire to express their thanks to Mr. Carl Opperman for the loan of electric apparatus; to Messrs. the Acetylene Illuminating Co., Ltd., for providing dissolved acetylene; to Messrs. Elliott Bros. for the loan of scientific instruments; and also to those who rendered assistance in arduous work that ran well into the small hours of the morning.

Table I.—Summary of Results Obtained.

Name of entrant.	a		b		c	d	e	f	g	h ₁		h ₂		k	l	m					
	Candle power of naked light.	Consumption.		Pres. sure.*						Diam. of front aperture of lamp.	Weight.	Height of lamp from ground.	Range.				Width of beam at half range.		Distance from lamp at which dazzle ceased at 4ft. 6in. from ground.	Remarks on design and construction.	Remarks on back reflection (stray light thrown out rearwardly).
		Cubic feet per hour.	Watts.														At 3ft. from ground.	At 4ft. 6in. from ground.			
1 Vandervell and Co.	3.9	-	.4	8.2	4 3/4	2 1	3 0 1/2	43 1/2	8 6	8 6	22	Good	No stray light.								
2 Badger Brass Mfg. Co.	4.2	.43	-	-	4 1/16	2 7	2 7	51	8 7	7 2	26	Very good	Light issued round rim of front, also reflections from the body of the lamp.								
3 Wyncott and Son	4.8	Paraffin	-	-	6 1/2	††5 8	3 8 1/2	30	7 0	6 10	15	Fair	No stray light.								
4 Vandervell and Co.	5.0	-	3.9	4.2	4 3/8	1 12	3 1	78	7 0	7 3	29	Fair	No stray light.								
‡5 A. Dunhill, Ltd.	7.9	.45	-	-	6 1/2	††13 15	2 10	69	7 3	5 11	35	Good	No stray light.								
5 Ditto (without screen)	7.9	.45	-	-	6 1/2	††13 15	2 10	93	9 5	9 9	30	Good	No stray light.								
†6 S. Smith and Son, Ltd.	11.3	.46	-	-	7 1/2	††13 9	2 10	81	5 8	5 0	37	Good	Light was visible through a row of holes partially hidden by the top of the generator.								
7 Rushmore Lamps, Ltd.	12.5	.63	-	-	6 3/4	7 15	2 3 1/2	87	11 8	10 8	31	Very good	No stray light.								
†8 S. Smith and Son, Ltd.	13.5	.64	-	-	6 1/2	††12 13	2 10	64 1/2	8 5	7 8	41	Good	Light was visible through a row of holes partially hidden by the top of the generator.								
9 Rotax Motor Accessories Co.	13.8	.69	-	-	6 3/8	††11 0	2 6 1/2	67 1/2	10 11	13 1	21	Good	Light issued from two ventilating holes in the cowl and from the rim of front of lamp.								
10 C. H. Gentry	16.2	-	16.8	8.4	7	4 5	2 5 1/2	189	5 5	4 8	12	Very good	No stray light.								
10 Ditto (half voltage)	7.5	-	8.3	4.2	7	4 5	2 5 1/2	22 1/2	4 5	3 6	21	Very good	No stray light.								
11 Weill Bros.	16.3	.66	-	-	6 7/8	††9 8	2 8	78	10 3	8 9	22	Fair	A very slight amount of light was visible from a row of small holes.								
12 Weill Bros.	17.8	.68	-	-	5 3/8	3 5	2 7 1/2	43 1/2	13 5	13 3	21	Fair	A small amount of light issued from the ventilating holes.								
13 Vandervell and Co.	18.9	-	13.7	12.4	6 3/8	4 2	3 0 1/2	126	26 4	25 6	7	Good	No stray light.								
14 Rushmore Lamps, Ltd.	19.1	.72	-	-	6 3/8	8 2	2 4	94 1/2	14 7	13 0	27	Very good	A very slight amount of light was visible from the rim of front of lamp.								
15 Rotax Motor Accessories Co.	19.2	-	21.4	12.1	6 3/8	5 13	2 7	81	15 3	15 3	5	Very good	No stray light.								
15 Ditto (second filament)	5.9	-	-	4.0	6 3/8	5 13	2 7	57	3 4	3 0	30	Very good	No stray light.								
*16 Salisbury Lamps, Ltd.	20.2	.76	-	-	7 1/2	11 4	2 3 1/2	84	13 9	11 6	35	Very good	Practically no stray light.								
17 Sylverlyte, Ltd.	20.8	-	21.0	14.1	4 3/4	7 10	3 1	85 1/2	14 10	15 0	16	Fair	No stray light.								
18 Salisbury Lamps, Ltd.	20.8	.72	-	-	7 3/8	8 13	2 4 1/2	93	18 0	17 0	27	Very good	A small amount of light was visible through a row of small holes.								
†19 Reflector Syndicate, Ltd. ...	22.5	.79	-	-	7 7/8	12 4	2 8 1/2	97 1/2	12 7	11 4	36	Fair	Slight amount of light issued from holes on the top.								
†20 Rushmore Lamps, Ltd.	22.7	.83	-	-	7 1/2	11 3	2 4	75	8 7	5 5	29	Good	No stray light.								
20 Ditto (half eclipsed)	22.7	.83	-	-	7 1/4	11 3	2 4	27	2 11	-	33	Good	No stray light.								
21 Badger Brass Mfg. Co.	23.6	.80	-	-	9	10 14	2 10 1/2	126	13 9	13 1	30	Fair	Light issued from ventilating holes in the cowl and from a row of holes on the top.								
22 Wyncott and Son	24.5	.82	-	-	6 1/2	††12 6	2 6	69	6 10	3 9	26	Fair	A small amount of light issued from the ventilating holes.								
23 Weill Bros.	25.0	.95	-	-	8 1/2	8 3	2 6	97 1/2	11 9	9 7	29	Good	Very slight amount of light issued from holes on the top.								
24 Weill Bros.	25.6	.85	-	-	8 3/8	9 6	2 8	93	9 11	10 2	27	Good	A large amount of light issued through a long narrow aperture.								
‡25 Bieriot, Ltd.	26.0	.81	-	-	9 3/8	16 0	1 10	132	21 6	19 2	27	Fair	A considerable amount of light issued from the top.								
26 Worsnop and Co., Ltd.	26.2	.91	-	-	8 1/2	12 2	2 6	54	18 11	15 6	12	Fair	A very slight amount of light was reflected from holes on the edge of front.								

Summary of Results Obtained (continued.)

Name of entrant.	a		b		c	d	e	f	g	h ₁		h ₂	k	l	m						
	Candle power of naked light.	Consumption.		Pres- sure.*						Diam. of front aper- ture of lamp.	Weight.					Height of lamp from ground	Range.	Width of beam at half range.		Distance from lamp at which dazzle ceased at 4ft. 6in. from ground.	Remarks on design and construction.
		Cubic feet per hour.	Watts.									At 3ft. from ground.						At 4ft. 6in. from ground.			
27 Motor Accessories Co.	26.3	.81	-	-	volts.	in.	lbs. ozs.	ft. in.	ft.	ft. in.	ft. in.	ft.	Good	A bright light issued from the ventilating holes.							
28 Howes and Burley, Ltd.	28.7	.95	-	-		7½	7 0	3 1	78	+21 3	4 1	7	Good	No stray light.							
29 Brown Bros., Ltd.	32.2	.95	-	-		9½	16 4	2 10	187½	22 9	22 3	7	Fair	Light issued from two ventilating holes in the cowl.							
29 Ditto (eclipsed)	32.2	.95	-	-		9½	16 4	2 10	24	16 11	16 10	7	Fair	Light issued from two ventilating holes in the cowl.							
30 Vandervell and Co.	33.0	-	22.3	12.4		7½	6 14	2 8	160½	20 3	20 10	9	Good	No stray light.							
31 W. Tweer and Co.	37.7	1.07	-	-		7½	8 0	3 0	93	16 7	16 8	11	Good	Light issued from round cowl, and there were reflections towards the wings.							
32 Blériot, Ltd.	76.9	-	63.3	13.0		9½	12 8	1 10	168	20 5	17 3	30	Fair	No stray light.							
32 Ditto (without louvre)	76.9	-	63.3	13.0		9½	12 8	1 10	216	25 7	23 7	7	Fair	No stray light.							
33 Blériot, Ltd. (petrol-oxygene)	181.0	-	-	-		10½	23.5	2.1	1032	31 10	30 10	10	Very good	Some light was thrown back from the cowl.							

* In the case of acetylene burners, the candle-power (a) and consumption (b) correspond to a pressure of 3in. of water.
 † This width was broken by two small patches where the intensity of the light did not quite reach the standard.
 ‡ Nos. 6, 8, and 19. Fitted with gold-plated reflectors.
 § Nos. 25 and 32. Fitted with fixed blackened horizontal slats behind front glass.
 ¶ No. 5. Fitted with flat blackened circular slats behind front glass.
 ¶ No. 20. Fitted with flat blackened horizontal slats behind front glass, movable by hand.
 ** No. 16. Fitted with front lens cut horizontally into a large number of sections, the adjoining faces of which are frosted.
 †† These lamps are self-contained; the weight, therefore, includes that of the generator.

Prejudice against the automobile has yet to be overcome in many parts of Switzerland, though it is an open question as to how far foreign invalids have incited this. Consul Dr. Huggard writes: "Among the internal affairs of the canton one is of interest to the British trader. The use of motor cars is prohibited throughout the canton, though special exemption is sometimes granted over a limited area and for a definite time. There has been a growing feeling in favour of removing the restriction altogether, and the question was put to the vote. The people, however, decided by 11,137 to 2,052 votes to retain the present law."

* * *

The Hampshire Automobile Club have approached the County Council of Hampshire in the form of a resolution divided into three sections, and passed

at the club's meeting on July 23rd. This reads as follows: "That having regard to the large increase of police controls in Hampshire, the Hampshire Automobile Club respectfully suggest for the consideration of the County Council—(i.) The abandonment of police controls save at the actual entrance to villages and towns or other exceptionally dangerous places. (ii.) That better facilities be arranged for giving notice to motorists of dangerous places or of villages through which a pace of over 15 m.p.h. is dangerous driving. (iii.) That motorists offending for a first time should be warned, as is the case in the county of Norfolk, and not prosecuted." The above resolution was brought before the council at its quarterly meeting on the 9th inst. by Lord Montagu of Beaulieu, who said that his club submitted them in their desire to assist the Council,

the Standing Joint Committee, and the police. The matter was strongly opposed by a Mr. Martineau, who was described by Colonel Stratton Bates as a consistent opponent of motor cars, and the forwarding of the items (i.) and (iii.) was strongly deprecated by the Marquis of Winchester, Lord Portsmouth, and Sir William Portal. Finally only item (ii.) was sent forward to the committee. It would appear that the County Council of Hampshire are not much inclined to reach out for the olive branch extended to them.

* * *

We are informed that the summit of Mont Blanc has been reached by a six-cylinder British-built Standard car, which started from London and accomplished the feat without a hitch or mechanical stoppage.

The Antarctic Motor Car.

ON Wednesday of last week Mr. T. C. Pullinger bade several motor press representatives to a view of the Arrol-Johnston car which the intrepid Lieut. Shackleton caused to be used with so much success in his great dash furthest South. This vehicle, with its wood block shodden wheels and ski-runners forward, was fully illustrated and described in *The Autocar* of March 27th, 1909, but its outward aspect then, in comparison with the presentment it made last week is an earnest of the stern service it has performed in the interests of science. A single seat only is mounted over the chassis, and a box for the portage of tinned food is attached to the back of the seat. The air-cooled engine has open exhausts, the combustion products from the fourth cylinder being taken through a large pipe and caused to encircle the carburetter. A small dish is placed below the throttle, into which petrol is poured and burnt for warming up when starting cold. The magneto ignition only could be used, as the accumulators were frozen solid. A lubricant called "Refrigator," supplied by Price's

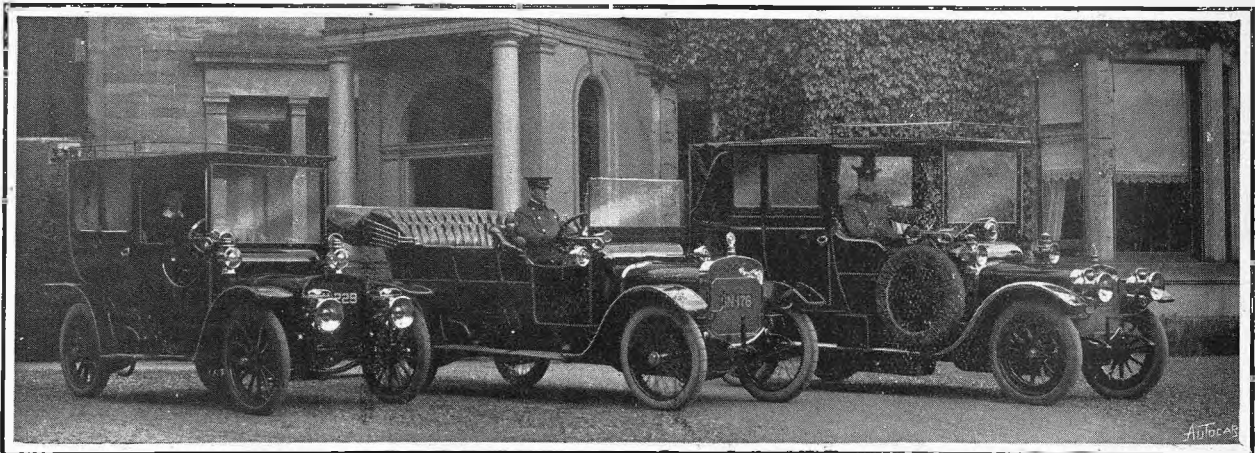
Candle Co., remained liquid to a temperature of 60° Fahr., after which it thickened, and had to be kept fluid by causing the exhaust to play upon a small tankful kept close to the open port.

It is interesting to learn that the wooden wheels with their shoe blocks were ultimately abandoned in favour of Dunlop cross-cut non-skid pneumatic tyres embraced with Parsons non-skid chains. These gave a most satisfactory driving grip on the ice. The four Dunlop tyres still look in good condition, and, we were informed, had not been repaired. The maximum load transported equalled 13½ cwt., carried on two towed sledges with three passengers. On the smoother ice a speed of from eight to nine miles per hour was easily maintained on second speed, but when travelling over snow the rate of progress fell to three to five miles per hour. It is freely admitted by all concerned that the car proved of the greatest service in laying food depots, these being established at much greater distances from the ship than could have been effected by any other means.

Stone Throwing and Assault on a Motorist.

A most savage and disgraceful incident was investigated at the Sevenoaks Petty Sessions on August 13th. Three labouring men were summoned for committing a brutal assault upon Mr. A. L. Bower, of Chiselhurst, a member of the Royal A.C. and an old amateur racing tricyclist, who instructed Mr. G. M. Kenyon to prosecute. Mr. Bower on Saturday, the 7th August, about 5 p.m., was driving with two ladies along the Westerham-Godstone Road, when a small boy picked up a large stone and flung it at the car. The stone struck the stays of the Cape cart hood, which was down, with considerable force, and but for that would probably have injured the lady who was sitting in the back of the car. Mr. Bower stopped the car and gave chase, calling out to some men who were approaching to stop the boy. The boy, however, threw himself on the ground, and Mr. Bower coming up with him gave him a slap. The three men who by this time had come up asked Mr. Bower why he was touching the boy, whereupon Mr. Bower explained what had

happened. Upon hearing the word "motor" the three men set upon Mr. Bower in a most brutal manner. An ex-policeman named Whiting stripped for fighting, while the other two advanced, striking out at Mr. Bower, who backed towards a cottage, dodging several blows which were struck at him. Whiting then sprang forward and struck a heavy blow at Mr. Bower's heart. The blow fell upon his ribs with great force. Another man aimed at his head without success. The third man stepped forward and said, "You have done enough." Subsequently Mr. Bower was able to obtain the assistance of a police constable and traced the men. He has since been attended by a doctor, who stated that had he not been an exceedingly strong man he would certainly have had his ribs broken. The two men who struck the blows were sent to prison for one month with hard labour. The charge against the third was dismissed. The defendants have since given notice of appeal. The boy who threw the stone, after being reprimanded, was handed over to his father.



Our illustration shows the three Sunbeam cars belonging to Mr. Peter Denny, a member of the famous Dumbarton shipbuilding firm. Mr. Denny is particularly satisfied with the reliability of his cars, which he also finds very light on tyres. He has only had one burst, and that was under rather peculiar conditions. The tyre, a Michelin non-skid, had run 4,500 miles, and this was so good that Mr. Denny was anxious to see how long it would run. When it finally burst the explosion happened when the defective part was at the top, and it blew the back of the mudguard about a foot up.

Motor Union Notes.

(Communicated by the Secretary.)

One important result of the recent Congress of the L.I.A.T., held under the auspices of the Motor Union, and of the tour which was arranged in connection with the visit of the foreign delegates to this country, has been the strengthening of the bonds of friendship which should exist between all motorists of whatever nationality. Unfortunately Englishmen in the past have acquired a reputation for insularity, and the bearing of individual Englishmen abroad is often taken to be representative of British character. The arrangements made on behalf of the delegates by the Motor Union, and the warmth of hospitality extended to them on all sides during their stay in this country, has removed any pre-conceived prejudices which may have lingered in their minds, and as they represent the most powerful Continental touring associations the effects will be far reaching. The letters that have been received from the delegates on their return to their own countries express their extreme gratification at the "delightful days which the members of the Congress passed under the auspices of the Motor Union." They will "all preserve the happiest recollections of the days spent in England." The President of the Allgemeine Radfahren Union closes his letter by saying, "I shall be particularly pleased if, when opportunity offers, you will kindly inform members of the Motor Union that we shall be delighted to assist them in any way when they visit Germany," and similar kindly sentiments are expressed by other bodies represented at the Congress.

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A conference was held at the Inns of Court Hotel, Holborn, London, W.C., on Monday, the 16th inst., between the Hertfordshire County Council and the objectors to the council's application for ten-mile speed limits at Bushey, Sawbridgeworth, and St. Stephen, with a view to seeing whether an amicable arrangement could be arrived at. The Secretary attended on behalf of the Union. A conference will also be held on September 17th with regard to the application of the town council of Berwick-on-Tweed for a ten-mile speed limit on certain roads. The Secretary will be glad of any information bearing upon this application.

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The Union wishes to impress upon members who take their cars to the Continent the importance of seeing that the triptyque is properly discharged by the Customs authorities before they finally leave the country for which it is issued. There have been two recent cases in which members failed to take this very necessary precaution, and until the discharge is obtained it is impossible for the duty deposited to be refunded. In the cases referred to the Union is endeavouring to obtain the refund of the duty through other than the ordinary channels, but the process is a very lengthy one, and members cannot rely upon being able to obtain the return of the deposit even if the Union is successful in these special cases.

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In conjunction with the Welsh A.C. the Motor Union is supplying a number of road signs for erection in the neighbourhood of Llandilo, Llanwrda, and Llandebie. These are chiefly for erection at dangerous corners in the district.

The Legal Department has been consulted this week by a member who garaged his car with a firm of repairers, and who on taking the car away found that his motor watch had been extracted from its case. The firm disclaimed responsibility for the theft on the grounds that a notice was exhibited to the effect that the company will not hold themselves responsible for anything missing, lost, or stolen from their premises. The Union is advised, however, that a person who holds himself out to accept the custody of goods must take the legal responsibility. It would not appear that this liability can be limited by the exhibition on the premises of a notice to the effect that the proprietor is not liable for anything lost or stolen, etc., if this notice is not seen by the person depositing the goods. A prominent notice or one brought to his attention might possibly have been sufficient, but this was not so in the present case, and the member's first knowledge of the notice was only received in a letter from the manager some days after the actual theft occurred. The case, therefore, resolves itself into one of ordinary liability, and proceedings are being taken to secure compensation.

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The past week has been a very busy one for the Legal Department, a great variety of cases having been submitted to it. These include a number of summonses for exceeding the speed limit, disputes between members and motor car manufacturers, third party claims, collisions and other accidents on the road, contraventions of lighting and registration regulations, and minor breaches of the Motor Car Act. In several of the more important cases the Union's local solicitors were instructed, and were instrumental in bringing the cases to successful issues. This department is of the greatest value to members of the Union, and the expert legal advice which is given free upon all matters connected with the use of motor vehicles effects a considerable saving to members in the course of a year.

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The Engineering Department is also working at considerable pressure at the present time. The fine weather has given an impetus to touring, and has encouraged many motorists to purchase new cars. The department is always willing to give expert advice as to the cars most suitable for the particular requirements of members or to advise upon the purchase of second-hand cars. Members will always be well advised to consult the department before buying second-hand cars, as such should be examined by an expert engineer before the purchase is completed. This department will also be very glad to assist members in obtaining the services of competent drivers.

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The Motor Union medal presented to the North-Eastern Automobile Association, in connection with the annual gymkhana held at Gosforth Park, has been awarded to Mr. F. Turvey, the winner in the speed-judging competition.

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The Union wishes to acknowledge the receipt of a bound volume of the *Motor Boat*, kindly presented by the publishers to the library in the members' room. The Union will be glad to receive as additions to this library any publications of interest to motorists. Publishers who desire to have books reviewed in the *Motor Union Journal* should address them to the Editor.

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The Motor Union. Chairman: W. Joynson Hicks, M.P.
Abemarle Street, London, W. "Speedway, London." 9090 Gerrard.

The Acer Dynamometer.

An Automatic Instrument for Testing the B.H.P. of Engines.

HITHERTO the possibility of arriving at the brake horse-power that is developed by an engine when fitted in a chassis has been so difficult a problem that few have cared to tackle it. With the appearance of the above compact and handy apparatus, which is fully illustrated herewith, a simple and rapid method of determination is afforded. The Acer brake horse-power tester has been designed by Mr. A. E. S. Craig, and is made by Acer, Ltd., of Grosvenor Road, Hanwell, London, W.

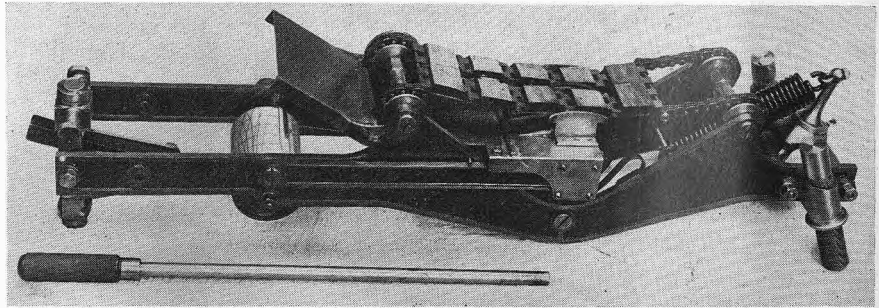
It may be used either for engines on the test bench or when in position in the chassis so long as a small portion of the flywheel periphery is exposed. The operation is perfectly simple, no calculation of any kind being required. The tester is placed under the flywheel, as shown below, and upon the engine then being run the result is immediately indicated on a special chart provided with the machine. This chart is attached to a revolving drum upon which are plotted a series of curves in accordance with the usual formula:

$$b.h.p. = \frac{\text{nett pull in pounds by feet per second}}{550}$$

Any portion of each curve represents a certain b.h.p., the entire range being from one to forty-eight, and these figures, being printed across the chart, are seen at a glance. If it be desired to know the pull in pounds and also the lineal speed, the figures are given for this purpose at the side and top of the chart respectively. The drum is so held as to be capable of movement by the frictional contact of a series of cork pads attached to endless chains carried on six pulleys. The total movement of the chains is 3in., which causes the drum to make rather less than

one whole revolution. The movement is controlled by a calibrated helical spring anchored to the chains already referred to.

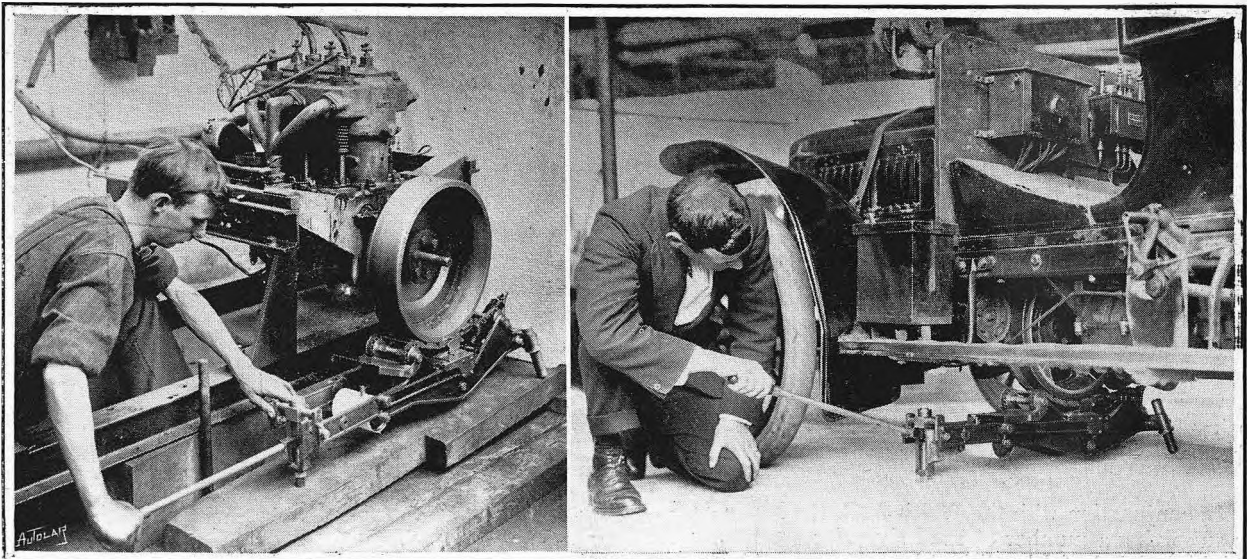
The speed indicator is attached by two swinging arms to the main frame of the machine, and is so arranged that the driving wheel comes up into action between the cork pads, which are divided to provide for it. The mechanism of this indicator operates on



The Acer Dynamometer showing the recording needle and chart drum.

the inclined disc principle, the disc tending to place itself at right angles to the shaft to which it is pivoted when rotated.

It is held normally by a spring at 45°, this angle increasing with the speed. The indicator operates a pencil which travels across the chart. The diameter of the flywheel of the engine under test is of no moment, as the lineal speed of its periphery in feet is ascertained, whatever its size. Mr. Craig, the inventor, has had much experience in engine testing, and by the light of that experience claims that his tester completely eliminates the human element, so avoiding errors which are so prone to occur when timing with a watch and reading a constantly fluctuating balance pointer. He further claims that the tester is automatic and impartial, and all variations of speed and pull are simultaneously recorded throughout the test.



Two methods of using the Acer Dynamometer. In the first view the engine is on the test bench, and in the second in position in the chassis.

Small Car Talk. By Runabout.

The Long Arm of Coincidence.

MR. A. J. WILSON, who will be known to many of my readers as a De Dion enthusiast from the days of the 1¼ h.p. tricycle, writes to tell me of a curious coincidence. His 12-14 h.p. had got well past its 9,000th mile without a moment's tyre trouble (I presume Mr. Wilson is excluding attention to the tyres in garage?), and he began to wonder whether it would reach 10,000 miles without a tyre stop. On the morning of Tuesday, July 20th, the car completed its 10,000 miles, and the same evening he found a tyre flat, with a huge nail flaunting its shameless head. Exactly 24h. 2m. later the occurrence was repeated—the same tyre picked up a similar nail within a mile of the same spot. The odometer nearly equalled the tyre record, but gave out after recording 9,902 miles.

The Closed Small Car.

Purchasers of small cars with closed bodies—more especially doctors—should not forget that a closed body acts as a sort of sounding board. Every tiny noise that a car makes is magnified perhaps ten times to the occupants by a Cape hood or a coupé body. How often one sees trial runs on second-hand cars taken with the hood down in wet weather, or the landaulet body opened, simply because the astute salesman knows that a series of creaks may escape notice with the car open, but would infallibly arise and smite the ear of the purchaser with the body shut. If the prospective owner is really susceptible to noise, he should insist on his trial runs being given him with a closed body, whether the car be new or old. Makers often say they regret they have not got a trial car with the closed type of body which the medico is going to order, but that he may take his trial on an open car, and they will afterwards construct a body to his requirements; then they show him a brougham or landaulet in the showroom, and regret they cannot afford to risk scratching it by taking it on the road. What seems to be a silent car when run with an open body proves to be quite otherwise when the buyer afterwards sits on a similar chassis under a closed body.

Motor Mountaineering.

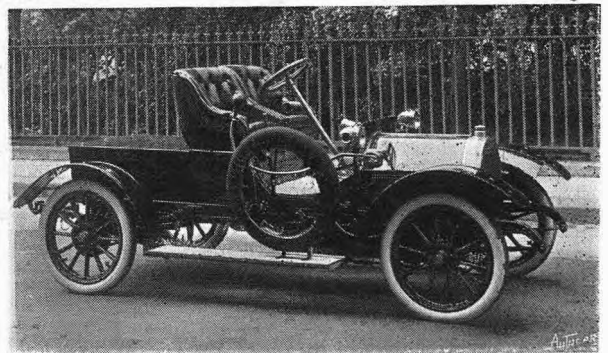
Hearty congratulations to Douglas Fawcett on his record mountaineering achievements on board the trusty little De Dion. He has sent me a perfect nightmare of a picture postcard, representing his car taking a breather on a hairpin bend halfway up a mile long mule track graded to 1 in 2 and paved with boulders as big as a good-sized calf. I am looking forward to the promised cinematograph representation in London this winter. My congratulations attach more to the man than to the motive. Mr. Fawcett always writes me (and delightful letters they are) as though his climbs put a special halo round the radiator nozzle of the single-cylinder, and sounded the death knell of the four and eke the six. He tells me lurid tales of the enormous multi-cylinder cars he has encountered stranded I forget how many thousand feet lower down an Alp than his single-cylinder has climbed. But the contrast is hardly a fair one, for it is contrast between a special car and standard cars.

I doubt not that were I bold and adventurous enough to be a motor mountaineer I could persuade some manufacturer to put through a six-cylinder for the job, incapable of touching legal limit on its top gear, and dogged enough to crawl the same tracks over

which Mr. Fawcett jolts so uncomfortably. I quite admit that a six-cylinder would need more faking for the purpose than a single. Both cooling and lubrication would need to be redesigned throughout, maybe, if the engine was expected to do 2,500 r.p.m. while the car progressed at four miles an hour. But the point is that a standard single-cylinder could no more do what Mr. Fawcett's car does than a standard six-cylinder could do it. Consequently I applaud Mr. Fawcett's extraordinary achievements without approving of the deductions he is pleased to make. And I like his spirit. The desire to do what no one has ever done before is writ large in the history of our breed, and has gone far to make England what she is. When I look at that picture postcard I rub my head and understand why De Dion cars share the reputation of Tennyson's brook—which goes on for ever. Only tough stuff could stand the strain of being driven over such a road.

Pace on Lower Gears.

The owner of a big car does not grumble if his vehicle is a trifle slow on its lower gears, because they are so seldom requisitioned, but it is far otherwise with a small car which has to negotiate the top half of every long rise on second speed, and calls for first near the foot of every really bad hill. Many small cars are regular crawlers when once the gear lever is brought back a notch, and in undulating country it is simply impossible to maintain a decent average with them. Other members of the small car class manage to emulate such medium size cars as the Talbots, and can easily incur police fines for beating legal limit on their second gear. For instance, a sample of the 12 h.p. Riley semi-racer which I have been out on this week can do 30 m.p.h. on second gear if the engine is ruthlessly raced. In practice, of course, these fast-running engines would normally be well-throttled down on their lower gears, but the possession of such an engine means that legal limit average can be maintained in any district, however mountainous. Any small car owner enthusiast who has legal limit average for his ambition, and resides in arduous country, should remember how cars vary in this particular.



A 10-12 h.p. Martini recently delivered to the Hon. Miss D. Whiteley, daughter of the Right Hon. Lord Marchamley. The car is very completely fitted with Stepnay wheel, electric lamps, clock, speedometer, and is in many respects an ideal ladies' vehicle. A dickey seat is arranged in the back, this folding away and leaving a clear platform at the back when not in use.

The Hobson Tyre Clamp.

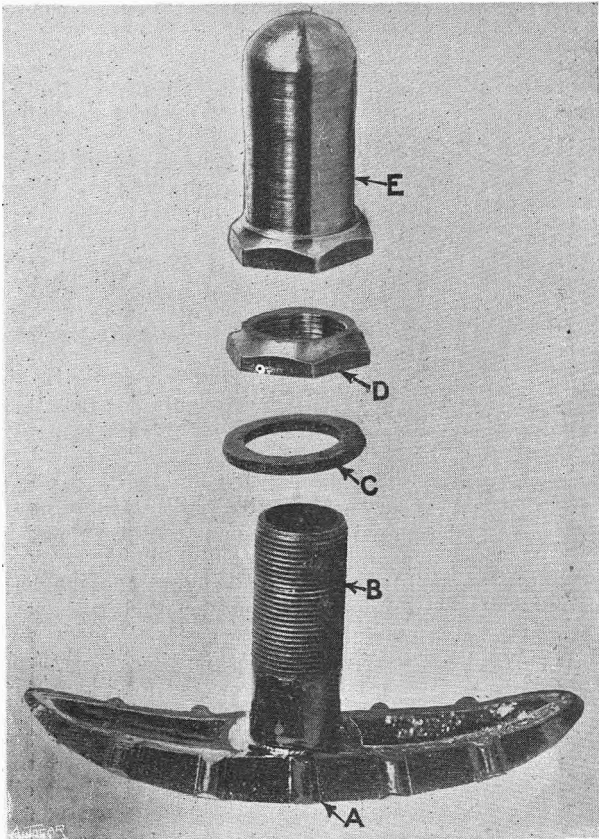
A Welcome Labour-saving Device.

IT is generally admitted by motor car owners who use pneumatic tyres and deal with them personally or vicariously that the abolition of the security bolts would, like certain well-advertised pens,

come as a boon and a blessing to men. Security bolts are a nuisance when attaching or detaching a cover, and they are equally a nuisance when inserting a new inner tube. One is always anxious about them, and never dead sure that sooner or later they won't mangle the inner tube. Some time since Mr. S. F. Edge suggested the inutility of security bolts, and announced that he was "going to do without 'em"; but we think he must have found this inadvisable, for he did not discard them for long. He, like many others, would welcome some simple substitute, and such a substitute would now appear to be at hand in the Hobson tyre clamp, which we illustrate herewith.

In the accompanying illustration it will be seen that the clamp A is formed with ridges to give a grip on the inside face of the bead, and a threaded tube B, which passes down through the hole in the steel rim and felloe, and through which the tyre valve passes in turn. No alteration is required in the latter. All that is necessary is to enlarge the valve hole in the rim to take the valve socket tube B, dispense with the security bolts, and plug the holes made for their accommodation. The valve is protected and encased by the cap E, which screws on to the threaded tube B. When tyres become deflated and the car runs on the rim for some distance both the cover and tube frequently creep, to the detriment of the valve seating and the tearing of the inner tube itself. By securely clamping and anchoring the cover to the rim the Hobson tyre clamp entirely obviates this and prevents any creeping. By the absence of security bolts the danger of nipping the inner tube when replacing is avoided. In fitting a cover, too, much of the onerous and troublesome fork lever work is avoided.

We confidently expect the Hobson tyre clamp to have a very large use. It is marketed by Messrs. H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, London, S.W.



The various members of the Hobson tyre clamp.

Competitions on the Highways and Police Controls.

Correspondence has passed between the Royal Automobile Club and the Chief Constable of Denbighshire on the subject of motor competitions on the public highway and the use of measured distances by the police. The Standing Joint Committee of Denbighshire recently had those two questions under consideration, and the Chief Constable reported to the R.A.C. that the committee, whilst recognising that legal powers to deal with such competitions ought to be exercised according to circumstances, had decided that the police were to discourage them, and that if they were continued a more stringent attention would be paid to the whole question. Clubs and associations were therefore urged to co-operate in the discouragement of the competitions. With regard to measured distances, it was hoped that motorists would appreciate the fact that they did not exist in Denbighshire, and would loyally support the authorities by careful driving; dangerous driving was not in any case to be excused.

The Chief Constable has been informed that the R.A.C. is entirely in agreement with the view of the

Standing Joint Committee on both questions. For two years the Club has refused to grant permits for open competitions unless their promoters have been in a position to assure the Club that the arrangements made have been considered satisfactory by the county and the police authorities, and that the legal limit of speed would not be exceeded. The Club has also discouraged closed competitions, namely, those confined to the members of particular provincial clubs. After explaining its position to the Chief Constable, the Club has expressed appreciation of the absence of timings from the county mentioned, and has undertaken to lose no opportunity of acquainting motorists with the courtesies extended to them in that area so long as they drive in a manner that is neither dangerous nor inconsiderate.

One of the largest benzine contract orders ever placed in this country was recently given to a Manchester firm. It was for 2,000,000 gallons, and the price of the contract, which comes through the P.G.R. Motor Spirit Company, is over £65,000.

Untaxed Fuel.

By Robert W. A. Brewer, A.M.I.C.E., M.I.M.E., M.I.A.E.

THE taxation of motor fuel, which has been imposed by the Budget of the present Chancellor of the Exchequer is a matter of very serious moment to all users of petrol at the present time, and more particularly does it concern the owner of industrial vehicles and large companies, such as those which control omnibuses and motor cab traffic. In France for some time fuel other than petrol has been in use for such work, and the writer has for a number of years been using other fuels than ordinary petrol for propelling motor cars. The importance of alternative fuels has now become so acute that in the following article the methods of using the same and the results which can be obtained will be dealt with in such a manner as to afford the necessary information and assurance to prospective users of untaxed fuels. These fuels may be dealt with under the following two heads: (1) The use of paraffin, either alone or mixed with petrol (and paraffin is unlikely to be taxed), and (2) benzol, which is a spirit derived from coal and is produced by distillation. Concerning the latter it seems somewhat indefinite as to whether this will be taxed or not, and it is the writer's opinion that it will be extremely difficult to tax benzol, because this may be produced at any gas works, and in order to supervise each and every possible source of benzol, the expense involved would be enormous. In the case of alcohol, for instance, the cost of excise supervision and denaturing amounts to 5d. per proof gallon, equal to nearly 8d. per bulk gallon. Now benzol itself can scarcely be considered a rival to petrol, because at the present time in this country the production of benzol is only carried out on a comparatively small scale.

The Total Production of Benzol.

The ordinary benzol which is obtainable is that which is known as 90% benzol, meaning that 90% of the total liquid comes over in the process of distillation at a temperature of 120° C. The total production of this fuel in England amounts to only about five million gallons per annum, and it is chiefly used for industrial purposes, and its use has been superseded for many of these purposes by petrol. It would be quite possible, however, to produce four times as much fuel per annum as this within the next few years, if necessity arose, but the plant which would be required for its recovery would have to be put down in place of the old-fashioned plant which has been generally used. Benzol in appearance is similar to petrol. Its specific gravity at 15° C. is about 0.885, and it has a boiling point at about 80° C. As ordinarily supplied at the makers' works, this benzol has previously been washed in order to remove certain proportions of foreign matter, but there is always a small amount of sulphur compounds in solution amounting to about 150 grains per gallon in the benzol as supplied. The presence of these compounds imparts an unpleasant odour to the benzol in the liquid state, and it may become offensive if too rich a mixture is produced by the carburetter.

Comparing again benzol with petrol we find that it is more nearly similar to Borneo spirit than to the American spirit, as its percentage of carbon is high, amounting to about 91.3% of carbon to 8.7% of hydrogen, and its formula is C_6H_6 . Borneo spirit comes under the Methane series, and its composition is of the order of 90% C. and 10% H. Its composition varies between C_8H_{18} , C_9H_{20} , and probably por-

tions of $C_{10}H_{22}$, giving a final boiling point at about 150° C. The writer's opinion as to the suitability of any particular fuel for motor car purposes is based upon the volatility, rather than the boiling point or any other property under certain conditions—that is to say, when a carburetter is employed which depends for its action upon surface evaporation it is the volatility that counts. Testing benzol and petrol for their relative properties in this respect, we find that there is very little difference between the two, and that under the conditions which prevail in a motor car engine the most careful tests show no difference in the preliminary or intermediate volatility stages of the two fuels. As far as distillation is concerned, however, it is obvious that the benzol being a more uniform fuel, the application of heat in ordinary distillation will show up the benzol to better advantage than the complex petrol. The thermal value or heating properties of benzol are about 10% higher than those of petrol when measured by volume, and as in this country liquid fuels are measured by volume and not by weight, the tests will be always considered on a basis of volumes. Owing to the higher specific gravity of benzol this shows in its favour, as there are more pounds in a gallon of benzol than of petrol by 10 or 12%.

Carburetter Considerations.

For use in a jet carburetter there are still further properties which must be considered. There is the specific gravity of the liquid which affects the buoyancy of the float, and the viscosity of the liquid which affects its rate of flow through the jet orifice. Taking first the effect of specific gravity, owing to the higher specific gravity of benzol the buoyancy of the float being affected causes the needle valve to cut off the supply of liquid at a lower level in the jet tube. It may be considered a somewhat curious fact that with certain shapes of jet tubes the height of the liquid in this tube has very little material effect upon the action of the carburetter. This may be attributed to capillarity. Although the writer has a number of figures prepared by Mr. J. S. G. Thomas and Dr. Watson upon the physical properties of fuels, ordinary 90% benzol is not included, but, judging from a figure given for a somewhat similar substance, it would appear that the surface tension which affects the capillarity is somewhat higher than in the case of petrol. The rate of flow of benzol is 10% to 15% slower than that of petrol when tested in the writer's apparatus, which practically resembles the ordinary carburetter. If any difficulty is, however, found, such as that of running the engine very slowly when using benzol, it is an easy matter to place a small weight in the form of a disc upon the float equal to approximately a tenth of the weight of the float itself. This should raise the fuel level to the same height as that to which it was adjusted for petrol.

When the use of benzol is contemplated probably the most important point to be observed is that a fairly weak mixture is obtained, as the least excess of fuel will, in all probability, cause a certain amount of trouble through the sooting of the plugs, which is occasioned by incomplete combustion of all the fuel. Any tendency to incomplete combustion will at once make itself known if the hand or a piece of paper be held over the exhaust pipe when the engine is running and thoroughly warmed up. The writer has, however,

found that, after a carburetter is properly adjusted for petrol, when given a really efficient proportion of mixture, say in the neighbourhood of sixteen of air to one of petrol by weight, such an adjustment will hold good for benzol, and the difference in the viscosity of the petrol and benzol will cause sufficient retardation of flow with the benzol in proportion to the increased thermal value of the liquid.

The Latest Tests.

The latest tests upon these fuels were made by the writer using a modern four-cylinder engine having cylinders of 100 mm. diameter by 105 mm. stroke. The total volume, therefore, swept out by the pistons per revolution = 1,650 cubic cm. That is at a thousand revolutions per minute 1.65 of a cub. metre was swept out. In working out the results Dr. Watson's curves for ratio of the volume of mixture in the cylinder to volume swept out were used, and in this case 70% is the figure taken for 1,050 revolutions per minute, and 63% at 1,680 revolutions per minute. The engine was tried first with a carburetter giving a nett area of 3.40 sq. cm., and, secondly, with one having an area of 4.13 sq. cm. Jets of various sizes were fitted in turn in order to obtain the consumption of the fuel, and the speed which was obtained by the car on Brooklands Track. Several fuels were tried—petrol, Borneo petrol, benzol, paraffin, and mixtures of paraffin and Shell petrol in equal proportions and in the proportion of two of paraffin to one of petrol by volume. As an indication of what was taking place in the carburetter, it may be of interest to note that the velocity of air through the carburetter under the different conditions as calculated on a 70% and 63% ratio respectively amounted to:

- 22 mm. carburetter at 30 m.p.h. = 193ft. per second.
- 22 mm. carburetter at 48 m.p.h. = 300ft. per second.
- 24 mm. carburetter at 30 m.p.h. = 160ft. per second.
- 24 mm. carburetter at 48 m.p.h. = 230ft. per second.

The subjoined tables show some of the results obtained, a careful study of which will bring out the following facts. That the maximum speed which can be obtained with benzol or with mixtures of paraffin or petrol are not appreciably less than those which can be obtained with petrol alone, and that the consumption rate with benzol is more efficient than with petrol, and that with mixtures of paraffin and petrol the consumption rate can be made not inferior to that of petrol at high speeds.

Relative Proportions.

The proportions of air to petrol aimed at were in the ratio of 10,000 to 1 by volume and 16 to 1 by weight. Assuming that the temperature of the air at the inlet was 60° C., the weight of air per minute at fifty miles per hour on a 70% basis is 7.85 lbs., and the weight of petrol consumed in the same time is 0.37 lb., giving a proportion of 21.2 air to 1 petrol by weight. If this be reduced to a 63% basis, the proportion falls to 19.2 to 1, which exactly agrees with tests at thirty miles per hour where 4.44 lbs. of air are admitted per minute to 0.224 lbs. of petrol in that time.

In practice, therefore, the best results were obtained with a weak mixture, which arrangement of carburetter (24 mm. diameter with 1.10 mm. diameter jet) gave the best results with all the fuels, except that the paraffin mixture required a size larger jet.

It will be noticed that during these tests the engine speed was never below about 1,050 r.p.m., and that in the high speed tests it sometimes was as high as 2,000 r.p.m. The effect of such high speeds when using a fuel only a portion of which is volatile is that some of the unvolatile portions are carried right through the engine and blown out of the exhaust. This accounts for what may be considered as rather a high rate of consumption when using paraffin. The following tables show the results of the tests:

Fuel Consumption Tables—Miles per gallon.

Brooklands Track Tests.

CARBURETTER, 22 MM. DIAMETER.					CARBURETTER, 24 MM. DIAMETER.		
AVERAGE SPEED APPROXIMATELY 48 MILES PER HOUR.							
Jet Diameter.	Shell Spirit.	90% Benzol.	Paraffin, 2 vols. Shell, 1 vol.	Paraffin, 1 vol. Shell, 1 vol.	Jet Diameter.	Shell Spirit.	Benzol.
0.95 mm.	17.5	—	—	—	1.05 mm.	—	17.8
1.00 mm.	—	19.6	—	—	1.10 mm.	16.1	18.7
1.05 mm.	16.0	15.9	15.4	15.0	SPEEDS ON LARGE BANK. MILES PER HOUR.		
1.10 mm.	15.0	—	—	—	1.05 mm.	—	48
1.15 mm.	13.5	—	13.1	—	1.10 mm.	55	50
SPEEDS ON LARGE BANK. MILES PER HOUR.					MOMENTARY MINIMUM SPEED ON SMALL BANK.		
0.95 mm.	45	—	—	—	MILES PER HOUR.		
1.00 mm.	—	45	—	—	1.05 mm.	—	40
1.05 mm.	47	47	45	45	1.10 mm.	48	45
1.10 mm.	50	—	—	—			
1.15 mm.	50	—	49	—			
MINIMUM SPEED MOMENTARILY ON SMALL BANK.							
0.95 mm.	40	—	—	—			
1.00 mm.	—	41	—	—			
1.05 mm.	43	42	38	38			
1.10 mm.	—	45	—	—			
1.15 mm.	45	—	44	—			

Touring and Traffic in London

Jet.	Shell.	Benzol.	Carburetter.
1.05 mm.	16.0	—	22 mm.
1.05 mm.	—	23.6	24 mm.
1.10 mm.	18.7	21.9 to 22.6	24 mm.

These results on the Brooklands track may be compared with previous tests which the writer carried out about two or three years ago, with a somewhat similar engine of rather smaller dimensions, on the road. In this case with the lower rate of revolution the paraffin was more completely burnt, and the actual mileage per gallon which was obtained was some ten per cent. greater in the case of mixtures of paraffin and petrol than in the case when petrol was used alone. The actual figures gave twenty miles per gallon with a mixture of paraffin and petrol in equal bulk, as against eighteen with Pratt's spirit as then supplied.

It is obvious, therefore, that if the fuel be treated by a suitable carburetter it can be completely burned in a mixture of this kind. The bulk of the carburation is due, first, to a mechanical disintegration of the fuel in the carburetter; the particles are then carried in suspension into the engine cylinder, where the rapidity of motion and heat acquired during the compression, complete the carburation and form a fairly homogeneous mixture.

The Proper Size of Jet.

Paraffin is a more viscous fuel than petrol, and, according to the proportions of the mixture, so must provision be made for allowing the proper size of jet orifice to be employed, in order that the correct proportion of fuel will flow through it under the same conditions of air velocity around the jet. We find that the thermal value of all the fuels of the paraffin series is approximately the same, and therefore if combustion is complete the same weight of fuel must pass through the jet in each case, but the weight per unit volume is greater for paraffin than for petrol.

The difficulties which may occur in the use of paraffin would be owing to variation in the homogeneity of the mixture when standing any length of time, and the writer has found that in some cases paraffin has found its way in undue proportion into the pipe leading to the carburetter. It has therefore been necessary before starting to draw off about a pint of the liquid and return the same to the tank. A small injection of petrol into the carburetter or into the engine cylinders will usually effect a start, and it is sometimes advisable to race the engine slightly at first, so that the carburetter can properly disintegrate the fuel before the engine gets hot enough to deal with it effectually.

In conclusion, it will be evident that, although we depend upon the volatility of a fuel at the present time when using certain carburetters, it is quite possible by means of some of the carburetters designed for petrol to use certain other fuels either alone or mixed with petrol. These fuels are not likely to be taxed, and even if their taxation were contemplated the difficulties in collecting such a tax would be so great that the practicability of their being taxed would be somewhat remote. The use of such fuels with ordinary care need not be accompanied by disadvantages, such as the deposit of carbonaceous or other matter in the engine cylinders. Accompanying the use of benzol there is sometimes deposited a slight powder, owing to the presence of sulphur, whilst the use of paraffin may be attended by the formation of some of the tarry residuals if too great a proportion of the fuel be used—that is to say, if the mixture be continually kept rich.

In the House of Commons.

Tuesday night.

A special memorandum has been issued to members of Parliament representing agricultural constituencies by the Land Taxation Committee of the Central Chamber of Agriculture in respect of motor taxes and the upkeep of roads. It is pointed out that by Clauses 64-70 of the Finance Bill duties are charged on motor spirits and increased duties on licences for motor cars. The amount of these duties, after making provision in respect of existing duties on motor cars, is to be carried to a separate account to be established under regulations made by the Treasury, and to be appropriated to the development of roads in the United Kingdom. The Chancellor of the Exchequer estimates that the amount to be placed to this separate account during the present financial year will be £600,000. The Finance Bill does not lay down any provisions as to the application of these duties; they are to be appropriated in such manner as Parliament may hereafter determine, the important point being that the amount is for "development of roads."

The memorandum states there is no doubt that some amendment is necessary in order to define what is included in the term "development of roads." An attempt will be made to restrict the money to the improvement and construction of roads, and not to expend it on maintenance which is still met by local authorities out of local rates. If this be done the Bill will not afford any relief to the rates, but, on the other hand, there may be a constantly increasing expenditure, owing to the increase in the road area making the cost of maintenance correspondingly high. If any further proof were needed that motorists

alone should not be made to bear the cost of the new scheme it is provided by this memorandum.

The memorandum expresses the opinion that the Finance Bill should be amended so that those duties might be applied, not only to defraying the cost of making and the maintenance of new roads, but also in aid of the cost of improvement and maintenance of existing roads. Further, a fair proportion of the fund should be spent from time to time in each county, and each County Council should prepare a scheme for their respective areas to be submitted to the Central Authority. It is admitted that the chambers of agriculture have frequently expressed a desire for the creation of a Central Road Authority, but that was only as a corollary to the cost of maintaining main roads being defrayed by the National Exchequer. That is as widely different from the present proposal as possible, and the memorandum protests most strongly against a Central Road Authority having uncontrolled spending powers.

It was stated in a London evening paper on Tuesday last that a renewal of the contract arrangements between Messrs. S. F. Edge, Ltd., and Messrs. Napier and Co., of Acton, is conditional upon a revision of terms. The resolution to take this action was, it is said, passed at an extraordinary general meeting held in the early part of the month. That such a re-arrangement was contemplated has been quite well-known to those concerned for some time past, and it is a curious phase of modern daily journalism that two business firms cannot reconsider their business relations without provoking paragraphs bordering on the sensational.

The R.A.C. Monthly Trial.

Certificates of Performance.

The 15 h.p. Star.

A 19.6 (R.A.C. Rating) Star car, entered by the Star Engineering Co., of Wolverhampton, took part in the Monthly Trial held on Wednesday, August 11th, 1909.

The following are the leading particulars of the car :
Bore and stroke of engine, 89 mm. × 114 mm. ; number of

cylinders, four ; weight of load, 347 lbs. ; weight of car—front axle, 1,206 lbs. ; back axle, 1,407 lbs. Total weight, 2,960 lbs. Wind resistance area of body, 16.22 square feet ; type of body, side entrance touring.

The day was fine and warm and the roads were dry.

THE ROAD TEST.

Running Weight.	Route.	Miles.	Involuntary Stops			Petrol Consumed.	Consumption, Miles per Gallon.	Consumption, Ton-miles per Gallon.
			No.	Duration	Cause			
2,960 lbs.	Ewell, Reigate, Limpsfield, Titsey, Westerham, Hartfield, Crawley, Horsham, Merrow, Brooklands	105½	0	-	-	4.6 gallons	22.8	30.1

THE TRACK TEST.

Running Weight.	Miles.	Highest Speed over 1 Lap (2.7668 miles).	Average Speed.	Petrol Consumed.	Consumption, Miles per Gallon.	Consumption, Ton-miles per Gallon.
2,960 lbs.	13.8	51.39 m.p.h.	50.97 m.p.h.	0.94 gallons	14.8	19.5

ACCELERATION TEST ON LEVEL.

Speed attained. 10 miles per hour	Time in which speed is attained from rest.	Distance in which speed is attained from rest.
10	1.46 seconds	5.68 yards.
15	3.03 "	15.09 "
20	5.53 "	36.50 "
25	8.18 "	65.70 "
30	12.66 "	118.32 "

Average acceleration for 197.174 yards, 4.09ft. per second per second.

HILL TEST (Standing Start).

Running weight, 2,813 lbs. Speed up hill, 12.028 miles per hour. Average gradient, 1 in 5.027. Length of hill, 117yds. 1ft. 3in. (Approximate, 105ft. of 1 in 8 ; 91ft. of 1 in 5 ; 150ft. of 1 in 4.)

The 40-50 h.p. F.I.A.T.

At the same time a 41.91 (R.A.C. rating) F.I.A.T. car, entered by Messrs. F.I.A.T. Motors, Ltd., of 37-B, Long Acre, W.C., took part in the Monthly Trial.

The following are the particulars of this car : Bore and stroke of engine, 130 mm. × 150 mm. ; number of cylinders,

4 ; weight of load, 661 lbs. ; weight of car—front axle, 1,573 lbs. ; back axle, 1,862 lbs. ; total weight, 3,435 lbs. ; wind resistance area of body 13.35 sq. ft. ; type of body, test body. [The weather conditions were, of course, the same as in the case of the 15 h.p. Star.]

THE ROAD TEST.

Running Weight.	Route.	Miles.	Involuntary Stops			Petrol Consumed.	Consumption, Miles per Gallon.	Consumption, Ton-miles per Gallon.
			No.	Duration	Cause			
4,096 lbs.	Ewell, Reigate, Limpsfield, Titsey, Westerham, Hartfield, Crawley, Horsham, Merrow, Brooklands	105½	0	-	-	11 gallons	9.6	17.5

THE TRACK TEST.

Running Weight.	Miles.	Highest Speed over 1 Lap (2.7668 miles).	Average Speed.	Petrol Consumed.	Consumption, Miles per Gallon.	Consumption, Ton-miles per Gallon.
4,096 lbs.	13.8	63.98 m.p.h.	62.47 m.p.h.	1.4 gallons	9.9	18.1

ACCELERATION TEST ON LEVEL.

Speed attained. 10 miles per hour.	Time in which speed is attained from rest.	Distance in which speed is attained from rest.
10	1.44 seconds	5.18 yards.
15	4.22 "	23.36 "
20	5.96 "	37.93 "
25	8.44 "	65.46 "
30	10.45 "	92.61 "
35	13.33 "	138.49 "

Average acceleration for 186.591 yards, 4.86ft. per second per second.

HILL TEST (Standing Start).

Running weight, 4,096 lbs. Speed up hill, 15.635 miles per hour. Average gradient, 1 in 5.027. Length of hill, 117yds. 1ft. 3in. (Approximate ; 105ft. of 1 in 8 ; 91ft. of 1 in 5 ; 150ft. of 1 in 4.)

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 or 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.

THE BODY POLITIC OF MOTORDOM.

[14573.—A suggestion recently made in *The Autocar* by "Owen John" has doubtless set many of your readers thinking. Your serio-comic contributor threw out the hint that a new motorist organisation was needed to carry out the work which was supposed to be done by existing bodies, but which those bodies for the most part failed to accomplish. He further drew up a code of ideal rules for his ideal organisation, which provided that it should be run *sans* officers, *sans* subscriptions, *sans* everything, in fact, except the community of interest which unites kindred spirits in pursuit of a common aim. One hardly knew whether to take the suggestion seriously or as a piece of sarcastic pleasantry. Nevertheless, upon turning it over in one's mind there seems to be more in it than meets the eye.

The course of events in regard to police trapping and new taxation on the one hand, and the call to join the Technical Territorials on the other, sets the average motorist thinking, and leads him to enquire whether his interests are being properly looked after by the numerous bodies which canvas him for his support and interest. Events show, indeed, the powerlessness of these bodies to exercise any influence whatever upon the course of events in the face of a real emergency. Their very existence in such numbers has a disintegrating rather than a consolidating effect upon the body politic of motordom.

Now, what I am leading up to is this, that, without our realising the fact, Motordom has already in its midst an engine capable of effective action in cases of necessity or emergency.

Take the matter of police trapping, for example. While the numerous motoring bodies are exerting their puny efforts to allay the terrors of the persecution—here offering to assist the police, perchance to curry favour, and there trying to set up a fight against them, hopelessly floundering all the time—we have *The Autocar* fearlessly killing with scorn the monster Persecution, and, by a system of road warnings and maps showing motorists which are the clean and which the unclean counties, so that the one may be encouraged and the other shunned.

In regard to the proposed new and increased taxation the same sorry spectacle of division amongst the motoring associations, etc., is presented. *The Autocar* is the only quarter in which to look for consistent, reasonable, and reasoning opposition to the more than threatened unjust impositions. Would it not be possible to have a federation, unostentatious, and yet real, of the readers of *The Autocar* on the lines suggested by "Owen John"? How it should be brought about I do not venture to say, but surely something of the kind is needed, with a strong head.

SIMPLICITY.

[This suggestion is editorially dealt with elsewhere in this issue.—Ed.]

NEW FORM OF HANDICAP.

[14574.—The Motor Cycle Union of Ireland (Ulster Centre) carried out an interesting hill-climbing competition at Magheramorne on Saturday last under rules as follows: (1.) Each competitor made a timed trial of the hill. (2.) In each section the competitor doing fastest time was placed on scratch, and the differences on the times recorded represented the handicap. (3.) Any competitor whose time in the hill-climb exceeded five per cent. of his time in the trial run was ruled out.

So far as I am concerned, I believe this to be the most sporting handicap on which to run a competition of this description, as it gives a gambling chance to the owners of cars who have not time or the facilities to tune up their

engines that trade competitors have. There is, however, a serious objection to it from the trade members' point of view, and, if considered, from the private owners' also. Trade members of the Union have the time and facilities to tune up their engines, but under above rules they get no reward, no matter how good their performance may be, and there is therefore no inducement for the development of the petrol engine. There is no doubt about the fact that competitions, and competitions only, have been the reason for the remarkable advancement of motor cars and giving us the wonderfully flexible petrol engine of

the present day. If all competitions in the past had been held on the same handicapping of competitors as that under which the hill-climb was run off on Saturday last, we might have had to-day practically the same heavy, lumbering, expensive petrol-eating engine of five years ago.

It is, of course, to the trade member, as well as an evening's sport, a matter of business, and in all fairness they ought to be considered. They have their chance of winning, but winning under these conditions would be on an exact par with the winning of a musical chairs competition in a motor gymkhana, and largely or wholly a matter of luck in taking full advantage of the time allowance.

They might also boast of making fastest time, but none of them would do this, as no other competitor may be bothering about fastest time, and also the making of fastest time may not be the most meritorious performance.

The difficulty could be got over so easily that there need be no unfairness to anybody, and therefore no hindrance to the progress of the petrol engine.

What I suggest is this, that prizes would also be given to the competitors who do the best performance on formula. The Union may not be willing now, owing to the number of entries, to increase the number of prizes, but I am convinced (from my knowledge of the fact that it is on account of the handicapping under which these competitions have been held in the past that there is not at least double the amount of entries for every competition now held) that the increase of entries would compensate for this twice over.

If the committee do not agree with me in this, then I would propose that in the next hill-climb they would also give the results on formula.

The average man reading a report naturally concludes the cars which win under the above rules are those making the most meritorious performances, whereas it may not be so; far from it. If I wanted to win any competition held under last Saturday's rules, without fail, I would enter a car which would take six times as long to make the ascent as a scratch man. Therefore, if he had five seconds' margin to come and go on, I would have thirty, and, running no risk, would decrease my time on that of trial run by twenty-five seconds, and win "hands down," unless someone else "worked the thing out by algebra," and tried on the same dodge. This idea, indeed, if carried to its natural conclusion, would result ultimately in transforming speed trials into a tortoise race. Fancy, for instance, the highly edifying spectacle of a 100 h.p. six-cylinder Napier crawling along on its lowest gear with five cylinders cut out and the throttle closed almost to minimum, so as to compete with a fifteen-year-old 2½ h.p. Benz car, in order that the number of seconds under the five per cent. margin it would have to come and go on would be increased to maximum.

I think the time limit of five per cent. is not enough to allow on a three-quarter-mile hill, as, apart from false starts and time lost through possible mistakes in gear-changing, etc., a sharp gust of wind meeting an ascending car would make more than that difference. The allowance of time in percentages is not fair in any case, as it gives the slow car a big advantage over the fast one, as already illustrated.

I have competed in nearly every hill-climb held by the Union during the last five years, and am quite certain that last Saturday's competition was more interesting to all the competitors than any previously held, and I heartily congratulate the Union on their efforts to popularise this form of sport.

H. G. FERGUSON.

[This letter raises a point which calls for careful consideration on the part of those who are responsible for the organisation of race meetings and the allotment of handicaps for the competitors.—Ed.]

Correspondence.

HORSE-POWER RATING.

[14575].—In your issue of last week the writer of letter D²SN No. 14543 claims to have devised the $\frac{12}{D^2SN}$ formula for horse-power about the middle of December, 1906. This formula appeared in the columns of one of your contemporaries some time in the winter of 1904-5, I believe. Certainly I have known it and used it for comparisons between engines since March, 1905. P. HENRY HOLT.

[14576].—There seems to be some little doubt as to who was the originator of the formula $\frac{12}{D^2SN}$. I contend that whoever formulated it based it upon the following formula:

$$\text{B.H.P.} = \frac{\text{Bore}^2 \times \text{stroke} \times \text{No. of cyls.} \times \text{revs. per min.}}{12,000}$$

$$\text{Bore} = \sqrt{\frac{\text{B.H.P.} \times 12,000}{\text{Stroke} \times \text{No. of cyls.} \times \text{revs. per min.}}}$$

$$\text{Stroke} = \frac{\text{B.H.P.} \times 12,000}{\text{Bore}^2 \times \text{No. of cyls.} \times \text{revs. per min.}}$$

$$\text{r.p.m.} = \frac{\text{B.H.P.} \times 12,000}{\text{Bore}^2 \times \text{No. of cyls.} \times \text{stroke.}}$$

The revolutions were assumed to be 1,000, this cancelling the three ciphers in the divisor. The ignoring of the revolutions I consider entirely destroys the accuracy of the formula.

Now as to the authorship, the portion $\text{Bore}^2 \times \text{stroke} \times \text{No. of cyls.} \times \text{revs. per min.}$ is as old as motors. The constant 12,000 was arrived at by myself in 1904 by striking an average in the brake h.p. tests of 500 engines. Late in the same year or early in 1905 I submitted the above formula to the editor of "The Mechanical World Pocket Book." It was accepted and published in the 1906 edition (page 160), which was issued at the end of 1905. This, I think, anticipates the claims of your various correspondents.

I might say in conclusion that if the dimensions are taken in millimetres, 200,000,000 may be substituted in the divisor for fairly accurate results. A. SPEIGHT.

FORCED INDUCTION.

[14577].—It is now many years since I have written you on experimental motor work. I fail to see quite how it is possible to get more power out of an engine by forced induction if it cannot get rid of the charge. What I think is really required is a really satisfactory vacuum pump for the exhaust pipe. The last pump I had made gave about 25% increase of power. The induction by this means becomes naturally forced. E. REGINALD WEBB.

[14578].—I must thank Mr. Gore for giving me a very pretty little holiday puzzle. I tried to work the thing out backwards, forwards, and sideways, but always with the same result. The letter "X" appears too often to allow any real headway to be made.

Now will Mr. Gore be kind enough to let the readers of *The Autocar* have the following items of information: The initial pressure of the working stroke, and the terminal pressure of same.

I dare not ask for much, Mr. Lindley [letter 14536] has been so very rude, but if Mr. Gore will only be good enough to supply the foregoing (in the shape of an indicator card preferred) I shall be more than obliged. R. H.

[14579].—Referring to Mr. Lindley's criticisms [letter 14536], I have an idea that these are quite uncalled for. I am not going to say at present whether I think there is anything in Gore's patents or not, but it looks to me as though there might be a very great deal more in them than can possibly be apparent to your correspondent. It is perfectly evident that he cannot read working drawings or even follow the lucid description given in your review.

I have a private opinion of my own that a great deal more can be done in relation to forced induction and starting from an air receiver than most people are aware of, and I think Mr. Gore's piston under the valve is most ingenious.

Mr. Lindley cavils at a ball being shown to lift the valves. It may interest him to know that this method is one of the

most successful ever adapted to motor cars, and although a cam is shown working the air compressor, I take it that that is merely descriptive, and I trust that Mr. Gore will let us have some further information about his system, which must be one of great interest; but, after all, there is not much encouragement for clever men to give their ideas if they are to receive annoyances from people like Mr. Lindley.

CHARLES BINKS.

COST OF TYRES.

[14580].—I am afraid your correspondent "E.M." [letter 14522] has not helped matters much. He declines to guarantee tyres himself, nor will the makers of the tyres, nor the makers of the cars; nor can tyres be insured by the man in the street at any price whatever. My business is not only to insure the tyres, but also the car, against damage of all kinds, irrespective of the cause, without making any charge whatever for the insurance, but it only applies to new cars bought through me, and the security is afforded by an institution known all over the world.

CHAS. F. VAUGHAN.

THE TERRITORIAL MOTORIST RESERVE.

[14581].—You invite motorists to write their opinions of the above proposal. The Government have selected one class of people to bear an undue proportion of the burden of taxation, and now they come to these very people asking them to lend their over-taxed property. I think if other motorists take the same view as I do they will say no; we will wait. C. E. MILES.

[14582].—Enclosed is form filled in. I must say I think that before such a scheme can be a real success some amendments will have to be made to the Motor Car Act so as to make the motorist's lot a happier one.

I have a very high mileage to my account, having had seven motor cars and motor cycles, and so far I have only one fine to my account, and that was for supposing to exceed twenty miles per hour when I was doing nothing of the kind. However, it is not so much what one has had to go through as what one may have to face any day. In going a journey one feels a certain amount of fear that there may be a trap here, or a measured distance there, and is on the look out all the time, and often looking out for such things when one's attention would be better employed on the road and traffic. I hope you will keep pegging away for all you are worth. Your journal has more influence than all the motor associations in existence. JNO. H. HALL.

WHEN PASSING CHURCHES.

[14583].—Though I believe I have noticed several letters in your correspondence columns during the past few years begging motorists generally to be more considerate with regard to sounding the horn when passing all places of worship on Sundays, I fear a periodical reminder is necessary to the more thoughtless.

A service at any church that may unfortunately be situated on a main road is punctuated by the unmusical blasts of passing motor cars to the, usually, unnecessary annoyance and disturbance of any in the church. Taxi drivers are, perhaps, the greatest sinners in this respect, but a line of appeal to all drivers of motors on Sundays (especially between 10.30 and 1 o'clock, and from 6 o'clock till eight in the evening) to recognise the existence of churches which they may be passing, may perhaps be forgiven.

Personally, though I drive a fast car with three different horns fitted, I endeavour as far as possible to pass any place of worship without disturbing those who are devoting their time more profitably than I am. If necessary, one should slow up rather than race by any temporary obstruction to the accompaniment of the usual toot-toot of the horn.

H.S.S.

A TWO-STROKE ENGINE.

[14584].—With reference to Mr. William Locke's proposed two-cycle engine arrangement in your issue of August 14th [letter No. 14554], like many other designs at first glance it looks nice and simple, and one might even think it feasible. But just consider the movements of the top or secondary piston. It has to be banged down its full stroke against the pressure of the escaping exhaust, and at once banged up again to the top of the cylinder where "it is prevented from going further by a flange" (no stethoscope needed to locate the knock). All this happens whilst the crankshaft is making approximately one-fourth of a revolution. Now assuming quite a modest piston speed of 1,000

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feet per minute for the working piston, the secondary piston would be sprinting up and down at the rate of 4,000 feet per minute. I imagine that the stresses would be somewhat high at times, but I haven't dared to think about the operating cam which would have to do the deed.

ROLAND W. EDMONDS.

THE RESULT OF POLICE TRAPS.

[14585].—I enclose you a cutting I got out of the *New York Herald* showing what harm this absurd system of trapping motorists is having on people crossing to England to spend their money. This latter no doubt will deter a lot of foreign motorists from coming over here, as the *New York Herald* has an extremely large circulation. I, living as I do in Sussex, fully sympathise with the writer, as I never go away from my home for a motor run with any confidence, especially if I strike a long straight road where there is no danger in going a little fast, as it is 100 to 1 that this is where the police trap, or "control" as they please to term it, will be placed. A police trap is rarely, if ever, placed on a twisty road, or round corners, or on cross roads, but always on a perfectly straight stretch where there is absolutely no danger, and if one is caught one is judged by absolutely prejudiced men who are called "justices." This is what is called English justice, and England's love of fair play.

SOMERSET GOUGH-CALTHORPE.

CANNOT STAND THE BRITISH ISLES FOR AUTOMOBILING.

Hyde Park Hotel, Knightsbridge,

London, S.W., August 11th, 1909.

Paris Edition *New York Herald*:

I advise all those intending to motor through England, Ireland, Scotland, and Wales to "cut it out" unless they are satisfied to run at, say, eighteen miles per hour, and even then be arrested if their watch does not correspond with the police spy.

I was five hours going from Dover to London—seventy odd miles. In the towns you are not allowed over a six miles speed, and there are about twenty between Dover and London. Could easily and safely have made it in three hours were it not for these traps. The automobile clubs are doing all they can to inform their members and have scouts all along the line, but even then they are not always able to say where the "trap" is located.

Do not think of coming here with your car. I had intended to spend two months here, but return at once. I am not fond of speeding, but eighteen miles (what a bore!) on a good road, particularly when there is nothing worth seeing!

C. J.

[14586].—I enclose you a copy of a letter which I have recently addressed to the clerk to the Cornwall County Council. Would it not assist matters somewhat if all who feel as I do took similar action?

W. E.

[Copy.]

Dear Sir,—I see from recent issues of *The Autocar* and other motoring papers that police traps are becoming very common in Cornwall. Last year I spent my holidays at St. Ives, and had intended doing the same this year, but have now changed my mind and intend patronising Devonshire instead, as Devonshire seems to be a county where motorists are welcomed and not harassed. Naturally, I have no respect for those motorists who drive to the danger of the public, but it must be remembered that police traps on the open road, such as Bodmin Moor, where there generally is a trap, do not in any sense affect driving to the common danger, and merely irritate careful drivers.

I find that many other motorists who used to patronise Cornwall for their holidays are going elsewhere on account of police traps, which are being set on the open road at points where it is hoped that motorists will go fast, and not at points where it is feared that if they do go fast they will do so to anybody's danger.

Such traps are therefore only used to levy toll on visiting motorists, the authorities overlooking the fact that each motorist so treated and turned away from the county means a far larger sum being spent outside that county.

Yours etc., ———.

[14597].—I have just received a reminder from the County Surveyor that my game licence expired on July 31st, and a statement that it is very desirable that I should renew it in Essex, as the amount will go in relief of the county rates, to which I have replied that as long as police

traps are set for motorists in Essex I shall not take out any licences in this county.

I suggest that you should now make an appeal to all motorists to take out their game licences only in "clean" counties, and that about the middle of December you should make a strong appeal to them to do the same as regards licences for motors, carriages, armorial bearings, dogs, male servants, etc.

Last year I had some intention of doing so, but I had no information as to which would be a suitable place to take out the licences in, or whom to address, and it ended in my getting them at the local post office, as being less trouble. A little later (I think about the middle of January) there were suggestions to the above effect in some of the motoring papers, but it was too late, and even then there was no information given as to whom to address.

COLONEL, R.E.

[Licences for dogs, male servants, armorial bearings, carriages (apart from the special duties for motor cars), game, and guns, may be taken out at any post office irrespective of the domicile of the person applying for them. With regard to motor cars, drivers' licences must be taken out in the place where the persons who take out the licences reside, but cars may be registered with any county council or county borough council irrespective of the place where the owners live. In view of the provisions of the Finance Bill it is particularly important that those counties which show antipathy to motorists by intolerant persecution should be avoided by motorists, not only when touring, but also when they are registering their cars, for although under the new conditions no county will be entitled to receive more in any one year than the amount it received from such duties during the year ended 31st March, 1909, it will only be entitled to the actual proceeds of the duties where they fall short of the amount received during the year just named. Motorists should therefore refrain from registering their cars with unclean counties and patronise only those counties that are clean." The following are the clean counties in England and the names of the clerks with whom registrations may be made: Bedfordshire, Wm. W. Marks, Bedford; Cumberland, C. B. Hodgson, Carlisle; Derbyshire, N. J. Hughes-Hallett, Derby; Dorsetshire, E. A. Ffooks, Sherborne; Durham, R. Simey, Durham; Gloucestershire, E. T. Gardom, Gloucester; Herefordshire, J. R. Symonds, Hereford; Leicestershire, W. J. Freer, Leicester; Monmouthshire, H. S. Gustard, Newport; Norfolk, G. C. Davies, Norwich; Northamptonshire, H. A. Millington, Northampton; Nottinghamshire, H. H. Copnall, Nottingham; Rutlandshire, B. A. Adam, Oakham; Salop, E. C. Peele, Shrewsbury; Somerset, G. Iliff Simey, Bath; Staffordshire, R. Eustace Joy, Stafford; Suffolk, A. T. Cobbold, Ipswich; Wiltshire, R. W. Merriman, Trowbridge; Worcestershire, S. Thornley, Worcester; Isle of Ely, C. E. F. Copeman, Wisbech.—Ed.]

[14588].—It is with great interest I have observed your remarks on this matter, and also those of your contributor "Owen John."

I am convinced that if motorists only hung together more and boycotted such districts as Surrey and Sussex the authorities would then be brought to their senses and stop this unfair and un-English persecution. I would add that of the twenty-nine cars I have owned I have never had any of them registered in Surrey or Sussex, or taken out a licence of any sort or description since the authorities of these counties have so religiously persecuted motorists.

I am also giving up my residence in the Surrey district, and am advising all clients of mine to on no account have anything to do with houses in Surrey or Sussex, and I am only dealing with tradespeople in London.

I would also add that I am not a prejudiced motorist in any way as I am an old "driving man," having been used to horses all my life, and still cycle, and I agree with the punishment of those motorists who drive carelessly on the road.

I have driven cars from the very first, and often drive to town, but my experience is that one only has to go to anything approaching the legal limit on the top of the Hog's Back, although it is an open road, and you will find three or four policemen engaged in setting a trap down a hill (such was my experience), which I proved by surveying to be forty yards short in a quarter of a mile, and although conclusively proving this I am charged with exceeding the

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speed limit, the magistrates making the remark that they did not think I was going at the speed alleged, but that I had committed a technical offence, as there seemed to be some dispute about the distance, and they should fine me the nominal sum of £3.

I am also informed on the most reliable authority that the police in Surrey and Sussex (more particularly at Handcross) pay particular attention to those motorists who fly the A.A. badge. This is undoubted spite, and the matter in question should surely be brought before the proper authorities.

I think if the Automobile Association would only enquire into matters they would find what I am stating is correct.

I would mention that for years I have been in the habit of spending my holidays at various seaside resorts in Sussex, but this year I have determined to spend my money elsewhere.

OLD SURREYITE.

[One of the objects of *The Autocar* League, which we are inaugurating, is to bring pressure to bear in such cases with a view to bringing local authorities to their senses.—ED.]

[14589.]—It is the earnest wish of all ratepayers dependent upon the motor touring traffic for a living that this vindictive and savage method of punishing innocent motorists shall be withdrawn. Is it not possible for us, as a body, to exert sufficient influence to force the present official attitude to change its present tactics? Our pleasure resorts are supported in the same degree as we are able to offer facilities for enjoyment, and to ensure future prosperity we must take steps to enforce such action that visitors may rely upon a warm welcome, with no danger of "trapping" or other persecution to reasonable users of the road.

I appeal for more just treatment to be meted out to those upon whom I am dependent, to a degree, for my income. Is it not possible to look at an early date for the replacement of the "enlightened" individuals who sit in the seats of the Mighty, and dispense "justice" at notorious Welsh justice factories with such Gilbertian humour?

I write with considerable feeling, as my prospects have been seriously injured by the short-sighted policy of our justices, and possibly owing to this I may be somewhat prejudiced; but I know that in previous years I have always let my furnished house for the summer term to a motoring party, who have always treated me handsomely, and my patrons have gone to Devonshire this year, solely on account of our Welsh police methods of driving money away from the Principality.

J. JONES.

[14590.]—In view of the interest displayed in this subject, I should be glad if you would publish the enclosed newspaper cutting.

I see that the R.A.C. is taking up this question, and to my mind it should have been taken up earlier. It is a great pity that motorists as motorists, and not as members of this or that faction or association, could not have made a more united move.

Finally, I think that boycotting a trap-ridden district, both by strangers and local motorists, is quite justifiable under the circumstances.

A RESIDENT IN BUCKS.

PENNY WISE AND POUND FOOLISH.

The Bucks Standing Joint Committee have issued such a small number of stop watches to the police that those in the Slough district are seriously hampered in the duty of timing motor cars as a consequence. It means that they cannot have two traps in this large district at one time, and the result is that the huge sums which more frequent traps and motor fires would provide are totally lost to the county, and the inhabitants suffer from excessive speed and dust. The Slough Council were crying out about the matter at their last meeting, and it was suggested that they should remonstrate with the standing Joint Committee, but their clerk told them that the committee only met once a quarter, and advised them to communicate with the Superintendent of Police at Slough. They then learned that he was doing the best he could under the circumstances, and they contented themselves by ventilating the matter. It would be a good thing if each sergeant, say, doing duty on the Bath or Oxford road, was provided with a stop watch. The chronometer would soon pay for itself a hundred times over.—Ex. the *Bucks Herald*, July 3rd, 1909.

[14591.]—I am writing to inform you that it will be well for all motorists to use great care when in the district of

Worthing, as if they get caught there they can expect very little mercy from the local Bench. I had to be in Worthing last Friday and went down by car, but did not dare go the main Worthing Road as the traps are too numerous (and having a large car I should have been considered a good capture) but went *via* Brighton, turning off at Horsham. On arriving at Worthing I found that the town seemed highly excited, and that the reason of this was that there was a special court sitting to hear nearly fifty cases against motorists. Not having much to do, and thinking I would like to see a sample of Sussex justice, I made my way to the court.

On entering I met our friends from Kingston, Putney, and numerous other places all waiting to do their little bit by proving previous charges. A gentleman also well-known as the Wag of Lewes was waiting to sound his horn when necessary. Need I say more. Cases were knocked down one after another at £3, £4, £5, etc., and I believe out of the lot only one escaped. How the hedgehogs grinned; more promotion.

The fines, I believe, came to over £155, and even a bobby remarked to me (he did not come from Sussex) that things were very hot. Surrey is bad for motorists, but they have a lot to learn to come up to Worthing and Sussex generally. The following seemed to be the nets that caught most:

The ten miles limit at Findon, and a trap about four miles from Arundel that you gave in *The Autocar* of last week.

One or two shopkeepers I spoke to on the subject in Worthing seemed bitter against cars, so I should suggest that Worthing be left alone by motorists until they know how to treat a class of traveller that no town can do without. There is only, as far as I can see, one man in that town who is a friend to motorists generally, and that is the proprietor of Warne's Hotel.

RENAULT DRIVER.

[14592.]—I enclose cutting from the Kendal local newspaper, from which you will see that timing is going on in Westmoreland in a particularly heartless manner. The road down Shap is very lonely, and it is almost entirely without cottages or buildings. It is not steep, and there is no reason whatever for this persecution by the police. Thirty miles per hour would harm nobody. It is a safe speed.

A. J. MONTGOMERY.

COUNTY PETTY SESSIONS.

SATURDAY.—Before Messrs. E. W. Wakefield (in the chair), J. G. Gandy, C. Walker, and J. J. Thomas.

FURIOUS MOTORING ON THE SHAP ROAD.—Edward Jas. Ballantyne, The Mound, Edinburgh, was summoned for exceeding the speed limit on the Shap road on Sunday, July 18th. Sergt. Miles stated that on the day in question he was on the Shap road, in company with P.C. Armstrong, timing motor cars between the sixth and seventh milestones. Defendant's car covered the distance in 1m. 50s., equal to a speed of 32 miles 1,280 yards an hour. As it was approaching witness signalled to defendant to stop. He pulled up, and witness told him that he had covered the mile in 1m. 50s. In reply, defendant said, "There must be some mistake. The car is only 9 h.p., and it couldn't do it. There are two cars behind coming at about thirty miles an hour; you should catch them." (Laughter.) P.C. Armstrong corroborated. The Chairman (Mr. Wakefield) enquired whether the distance had been measured, remarking that some of the milestones in this neighbourhood were a long way out of it. Defendant said he was not aware he was exceeding the speed limit, but he could not dispute the statement of the police officers. The road between the sixth and seventh milestones was rather hilly, and one was apt to increase the speed downhill on roads of that character. The Chairman said the evidence of any previous conviction against the defendant was not satisfactory, and the Bench had decided to treat this as a first offence. He would be fined £3 and costs—£3 19s. in all.

[14593.]—I see in your most useful map of traps, Sussex is only shaded. I think if you had witnessed what I have recently at Arundel you would black it with the deepest black. My own case was really mild in comparison with those I heard. I was timed over a quarter of a mile on a road which the constable admitted, in evidence, was a straight mile, with no traffic. The method of timing was as follows: At entrance of trap Constable A drops a handkerchief, while Constable B at the other end times with a stop watch. Constable C, a quarter of a mile further on, stops the car.

Constable A is at the back of a wood sixty-one yards away from the road. Between this man and the road there is thick bracken 6ft. high, as well as thick timber, and the road hedge 5ft. 9½in. high. Constable B, with stop watch, is ninety-nine yards away from the road. Between this man and the road is a large number of thickly planted fir trees.

Now, I was accused of doing this quarter of a mile at the rate of twenty-seven and a quarter miles per hour, and this on a 10-12 two-cylinder three-seated Swift car. I admitted and swore that I was doing twenty-three and a half miles per hour by a Stewart speedometer, but no more. (I had the speedometer tested, of course.) I told the bench that I had been motoring for four years in the County of Surrey and had never yet been in a police court (except at Epsom for having my tail light go out, in which case I was treated with fairness, my sworn evidence considered, and the case dismissed in five minutes). I was fined, including costs, £4 2s. 6d. There being no previous conviction to prove, and therefore no constable's railway expenses, as I went to Dorking and fetched the summons myself, I fail to see where these heavy costs of over £1 come in. Again, I fail to see the justice of fining me this amount for exceeding the legal limit by less than a man can walk, taking into consideration that it was my first offence in four years.

I see by your excellent paper that the boycott of Merioneth is having a very salutary effect. Also motorists of Godalming are beginning to get to work in the same direction. Sussex could be healed in the same way. I am afraid after seeing your map, and being so shocked by what I have seen and heard recently, my sympathy for motorists who go into Sussex and get trapped and fined will be *nil*, for they deserve it, in a sense, for their venturesome folly.

As Mr. "Owen John" truthfully states, "in our divided state we do not seem to be able to get the law amended. Could we not, even in this unhappy state, get a fixed universal scale of fines, the magistrates of all benches being compelled to stick to them? We should then know what we were in for, and non-motoring magistrates who are not capable, or who will not "judge righteous judgment" (if there be any such magistrates?), would not be able to vent their spleen on peaceable citizens. E. L. R. H.

BAD ROADS.

[14594.]—*Apropos* of the concluding remark in the note on road maintenance in *The Autocar* of the 14th inst. (page 234), to the effect that what is needed is not more money, but a great deal more intelligence, I may mention that on a portion of the Portsmouth Road—on the London side of Guildford—the road surface, after having been treated with tar, has been covered with broken flints, instead of sand. The flints were specially broken to size (apparently about 1½in.) for the purpose. I should think this about as senseless a waste of money as could well be imagined. K. REID.

THE TAXATION OF MOTOR CARS.

[14595.]—It is proposed to tax motor cars according to their horse-power. On the face of it, if taxation is to be accepted, the basis appears equitable. But what is the horse-power of a motor car? The rating of the Royal Automobile Club is admittedly tentative, and relates to the horse-power of the engine. The only horse-power which concerns the user or affects the roads is that delivered at the road wheels. Most people believe that a car rated by the makers at, for example, 20-30 h.p. is of considerably higher power. The present Royal Automobile Club rating encourages this idea, because in the recent trials in the Isle of Man cars of this nominal rating attained racing speed. The fact is exactly the contrary. Cars of the best make deliver, as a rule, from two-thirds to three-quarters of their rated horse-power at the road wheels. A 20-30 h.p. car, popularly credited with something nearer 40, gave at the maximum 17 h.p. at the road wheels, a 28-36 h.p. car about 18, a 14-22 h.p. about 12, a 40-50 h.p. 38 to 41. Examples might be multiplied, but it is evident that if horse-power is to be adopted as a basis for reckoning a tax, it must be the true horse-power on the road, and not a fancy value.

Criticism without construction is apt to be fruitless, and to avoid this fault I suggest that for Budget purposes all cars should be rated by the actual horse-power which they possess at the road wheels, and that this power should be determined by the Royal Automobile Club—of course, under official supervision. Any other method is haphazard and erroneous, and is inequitable alike to the motorist and to the national revenue. BERTRAM BLOUNT.

A CLERICAL VIEW OF THE MOTOR CAR.

[14596.]—I do not know if your attention has been drawn to some anti-motoring correspondence in the *Guardian*. Of course, occasional outbursts appear in all newspapers, but this seems a more organised attack on the part of the clergy, and more especially the Surrey clergy, to fan prejudice and class hatred to white heat.

The first letter appeared about a month ago, signed a "Surrey Vicar," in which the writer practically condoned threats of murder against motorists, and talked of fifty miles an hour and helpless police. This on Surrey main roads! The following week more letters from parsons, and in the meanwhile I had ventured on a letter of remonstrance which, to my surprise, was inserted, as the *Guardian* has been rather anti-motoring, and backed the agitation against clerical and episcopal motoring. This has brought a storm of abuse on me in consequence of my letter, and, seeing that the clergy have a good deal of influence with their less educated parishioners, I thought the matter should be brought to your notice.

The "stalking horse" is, of course, the safety of children. If children were taught the rules of the road and were strictly forbidden to play in roads, there would be no danger, but this does not suit socialist parsons and schoolmasters, and I am certain they deliberately encourage children to make nuisances of themselves, not only to motorists, but to every other road user. Ratepayers have to find playgrounds, landowners provide recreation grounds, but they are deserted, and road users, at certain hours at all events, have to run the gauntlet of an ill-mannered hooting crowd of hooligans of both sexes. (Mrs.) M. LANE.

THE GENUS ROAD HOG.

[14597.]—As an example of the genus road hog, I think the following is hard to beat. Last Sunday week I was motor cycling from Shrewsbury to Llangollen. On approaching a dangerous curve I slowed down and closely hugged the left side of the road. Much to my surprise, I met a large red (I think six-cylinder) car swinging round the curve, on the wrong side of the road. To save myself, I had to practically run into the hedge, and so tumbled off; even then my right-hand bar barely missed the right front mudguard of the car. When I got on my feet, I glanced back, and saw the people in the car looking back, but, all the same, they went on their way—no doubt grunting, in hog manner. They never stopped or came back to see if I had a broken leg or had in any way injured myself. If I could have obtained the number of the car I should have prosecuted the driver for driving to the public danger. Such drivers are a disgrace to motorism, and should not be allowed to steer a car.

Luckily, I was not driving a car or trap; if I had been, goodness only knows what the death roll would have been. M.D.

INEFFECTIVE ASSOCIATIONS.

[14598.]—I am pleased to see by your correspondence that motorists are beginning to realise how ineffective the existing motoring associations are in protecting the real interests of the motorist. It is delightful, of course, to know that you can put up through their instrumentality at certain hotels and be reasonably and comfortably catered for, but when one has to go in fear and trembling from one big town to another, including through ten mile speed limits, where cheeky urchins sit on your mudguards, break your Cape cart hood hoop by hanging on (this happened to us late one evening coming through Welwyn), then with the police skirmishing at measured distances on the high roads, one begins to ask one's self seriously what the poor members get out of these associations after all.

The hat-touching attentions of the scouts, and information regarding obstructions on the road in front of me, do not help me to escape the attentions of folks thirsting for money, lurking there in dignified state and majesty, behind trees and bushes, ready if I go at fifteen miles to put down twenty-five, and so on in increased ratio according to what they think I look able to pay.

I do not, as a woman, want a vote, but I do require some association to come forward who will take active measures to stop the police trapping, which is a disgrace to the country and an abomination to the decent private motorist.

(Mrs.) A. M. RESTELL-LITTLE.

Member of the A.A. and M.U.

ONE LUNG F. FOUR.

[14599.]—With reference to letter No. 14509 in *The Autocar* of August 7th, I should like to contradict one point which is raised by Mr. E. D. Fawcett. The De Dion Co.

Correspondence.

once raced four four-cylinder cars in the Paris-Madrid Race. These cars weighed 12½ cwt. each, and were rated at from 16 to 18 h.p., and if he wishes to see a photograph of them I will show it to him.

They also built a two-cylinder spider type racing voiturette some years ago, one of which cars was run at Brooklands at the mid-week meeting on June 30th. G.W.

[14600.]—I was very much interested in letter 14509 of your issue of August 7th re the advantages of "one lung versus four."

Hitherto I have been very pleased with my little 12 h.p. four-cylinder Star, but Mr. Fawcett's letter gives one, as the French say, "furiously to think." If I can get an 8 h.p. De Dion to do our station work, which consists of carrying four or five passengers, viz., my chauffeur and myself and one, two, or three people with their luggage eight miles on an average once a day, on a hilly and twisty road at the same speed and at a much lower cost, it is worth thinking about in these days of heavy taxation and expensive tyres. I do not want great speed, but am content if the car will carry five people for a hundred miles or so with light luggage at an average for the journey of twenty miles per hour. Of course, the car must carry a full complement of tools, hood, wind screen, Stepney wheel, and two gallons of spare petrol.

I have seen a 10-12 h.p. four-cylinder Humber which can do practically all this, but although some 8 h.p. singles, notably the De Dion and Rover, looked very nice indeed, they are smaller than my car, and if I remember rightly we seem somewhat more silent in running. Perhaps the new De Dion singles are more silent than our Star; if so, I could not hear them at all. I should like to go for a ride with a single-cylinder loaded up as I have suggested and test for comfort, appearance, silence, hill-climbing on top gear, easy starting, and speed.

MOBUN ASHFORDBY-FRENCHARD.

THE GORE FORCED INDUCTION ENGINE.

[14601.]—I am sorry to see that in your footnote to Mr. Johnson's criticism of above [14560] you seek to shelter yourself behind the statement that the drawings were not to scale. I had not omitted to notice that fact, but considering that the capacity of the compressor would have to be greater than that of the five working cylinders collectively, surely it is misrepresentation carried too far. This does not, however, in any way affect my criticism (or Mr. Johnson's) of this wonderful engine. H. LINDLEY.

AEROMOBILES: A SUGGESTION.

[14602.]—I was surprised that my article in *The Autocar* of August 7th (page 220) excited so little criticism from your correspondence columns, and I was sorry that what there was of it had such a meaningless title, was so much off the mark, and indulged so much in French worship.

I should have thought it obvious to all that in the competitions I suggested, the engine power of all competing vehicles should be the same, otherwise, of course, no data of much use and no good racing would result.

With regard to Mr. Goodchild's advice about copying successful experimenters, may I ask him why other less successful experimenters did not copy Wilbur Wright's propellers, and so solve the problem at once? I mention Wilbur Wright because at the time he was in France I believe his propellers were supposed to be the most efficient extant, and he told me himself that he got seventy per cent. efficiency out of them.

As a simile, I might mention the case of the motor car. In the early days our designers copied the French wholesale, but at the same time we could not turn out such good cars as they could.

In much the same way I am inclined to think that although copying may help us to a small extent, we will not score absolute success until a great deal more experimenting has been done, and it was with a view to hurrying on these experiments, and incidentally to provide a new form of sport, that I suggested aeromobile racing.

S. C. WESTALL.

[14603.]—Your correspondents on the above subject are evidently unaware of the method employed by Sir Hiram Maxim, Professor Langley, and others for testing the efficiency of screw propellers, etc., in which the propeller was caused to travel round in a circle at the end of a long

arm, an apparatus which Prof. Langley called a "whirling table." This is much simpler and more effectual than making them drive a motor car. But in view of such experiments I cannot see why we are counselled to go to France for the "best French experience," when we have a long record of good solid research work carried out in Great Britain. H. W. SYKES.

IMPORTANCE OF GOOD STEEL.

[14604.]—In connection with a letter headed "Importance of Good Steel," and signed "Motorist," in your issue dated August 14th, may I suggest that it would be in the interest of prospective motorists, and motorists in general, if in flagrant cases of faulty material, such as your correspondent mentions, the maker's name should be made public, together with the year in which the car was constructed.

One reads of the merits of nearly every car on the market at one time or another, but it seems a more difficult thing to obtain information from the motor press as to the weaknesses of any make. I suggest again that where a breakdown occurs simply and solely through thoroughly bad material the name of that car and the year of its make should be made public, and a plain statement of fact would be in everyone's interest.

I should be much obliged if you would insert this letter in your journal, as I am sure it would be interesting and instructive to have other readers' opinion on this subject, which appears to me to be an important one.

I should much like to hear from "Motorist," if not publicly through your paper then privately through you, the makes of cars in the two cases that he mentions.

C. C. P.

[The law of libel is the only obstacle in the way of carrying out our correspondent's suggestion as to publishing the names.—Ed.]

CATTLE ON THE HIGHWAY.

[14605.]—In reply to "*Lux in Tenebris*" [14542], as a farmer and motorist since 1900 I should like to point out there are other users of the road that have a right to the road at night besides autocratic motorists and cyclists. It is almost impossible to drive sheep long distances in hot weather except by night and early morning. At the same time, I certainly think the attendant should have some device to give warning of his approach to other users of the road; on the other hand, it is the motorist's own fault if he has an accident while driving quickly without a good head light. FARMER.

[The wayside wastes which were originally provided for the convenience of animals being driven along the highway, but which are now enclosed, should be opened up again. The roadway would then be free for vehicles.—Ed.]

LAW AND COURTESY

[14606.]—With regard to "Full Limit's" questions [letter 14514] it appears to me that:

1. A car has no right to pass another car going at 20 m.p.h.

2. A motorist would never prosecute another for not allowing him to pass when that other was going at 20 m.p.h. The reason is obvious.

3. Driving a motor car at whatever speed is not a felony, but only a misdemeanour. Therefore, allowing a car to pass when one is going at 20 m.p.h. is not compounding a felony. One can only compound an "offence" other than a felony by "entering into a bargain to abstain from prosecuting the offender." Therefore, merely allowing a car to pass when travelling at 20 m.p.h. is not compounding an "offence." MIDDLE TEMPLE.

SUMMARY OF OTHER CORRESPONDENCE.

A DISCLAIMER.—Mr. A. Carpmal, jun., writes pointing out that the statement made on page 230 of *The Autocar* for August 7th, that he was the winner of the gold medal for the Southern Motor Club hill-climb, is incorrect. It will be seen from the "Club News" in this issue that he was second.

CAMPAIGN AGAINST PERSECUTION.—We have received a most able letter on this subject from a correspondent signing himself "Dreadnought," of Sale, Manchester, who makes some valuable suggestions, but we are unable to publish it owing to the fact that it is unaccompanied by the name of the writer. Will "Dreadnought" therefore kindly favour us with his name, not necessarily for publication, but in order to comply with the conditions governing the publication of letters in *The Autocar*.

Flashes.

Motorists are strongly advised to make a point of spending no money in any district in which a ten miles limit is imposed. Places like Newmarket, for instance, have several short distance traps in the two miles. The plea that the limit was necessary here because of the horses is quite fallacious, as the police do not appear to trap at the hours when horses abound, but when motorists are plentiful and horses are scarce. All things considered, the only way is to boycott all places with ten-mile limits till the limit signs are taken down.

* * *

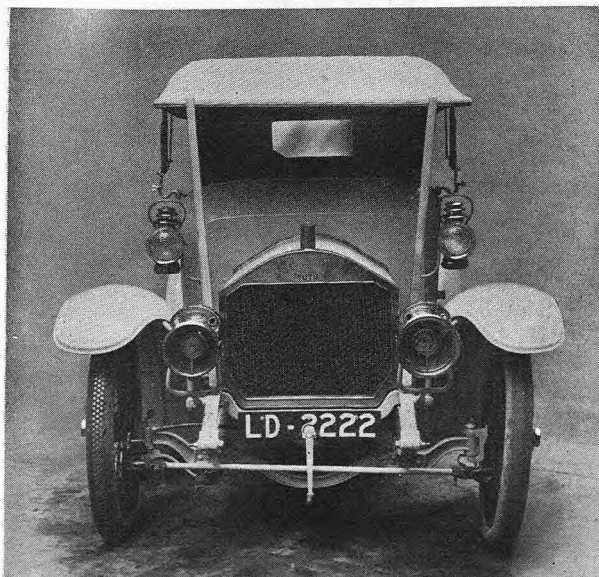
In the racing world a motor car is now looked upon as a necessity, and the list of owners, trainers, jockeys, and followers who own and drive cars is ever increasing, as may be seen at any race meeting.

* * *

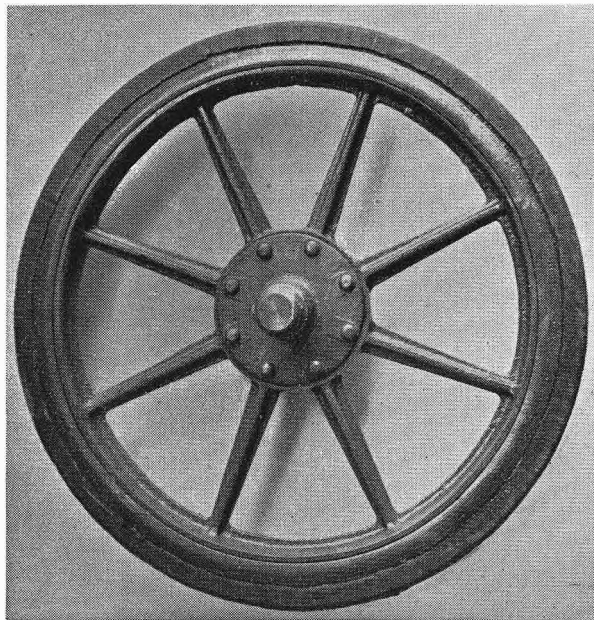
Dr. Campbell M'Call, of Cardiff, when motoring to Porthcawl saw a cart coming towards him on his side of the road. On meeting the cart he alighted and found a man and a boy asleep inside. Police court proceedings were taken, and the man was fined £1 and 10s. costs. At a Warwickshire court of petty sessions recently a sleeping driver of a horsed vehicle was only fined 6d. and costs.

* * *

A case of great interest to motorists was heard at Menai Bridge on the 9th inst. A member of the Automobile Association was summoned for refusing to give information leading to the identification of the driver of the motor car of which he was the registered owner, and which was alleged to have been driven at a speed dangerous to the public. He was defended by the A.A. Legal Department, and Mr. Taylor Parkes, appearing on behalf of the Association, took objection to the form of request for such information on the ground that it did not contain any allegation that an offence had been committed under Section 1 of the Motor Car Act, and contended that the summons must therefore fail. After considerable argument the magistrates dismissed the case.



A front view of a 30 h.p. Napier chassis fitted with a special body by Cann, Ltd., which is described on page 275.



A wheel of particular interest to Colonial motorists. It is an Atlas cast steel wheel fitted with Muir's shock-shifter hub and Muir's compressed leather tyre. The wheel is intended for a 2½ ton pleasure car. The hub is the well-known pattern in which a number of balls in a cavity in the hub absorb most of the road shocks. The tyres are the result of twelve years' costly experiments.

Tar spraying operations are in operation on the Sevenoaks Road at Polhill. The road surface is roughened before the tar is laid, in order that the liquid tar may penetrate thoroughly.

* * *

The secretary of the Society of Automobile Mechanic Drivers, U.K., informs us that the committee of the Society of Motor Manufacturers and Traders have granted the society free space at the motor show at Olympia in November next. This space will be used as an office in which private interviews with drivers may be arranged, and for the enrolment of new members. Stall holders at the exhibition itself will be able to engage drivers for cars sold during the show, either permanently or temporarily.

* * *

Following the new tax of 3d. per gallon for motor spirit imported into England comes information that a new tax is suggested upon the spirit imported into France. At present the French motor tax amounts to ten francs per hectolitre, but in addition to this tax there is usually a tax put upon it by the various local authorities. For instance, Paris levies a city tax of one franc for every five litres of spirit. The project of the new budget for 1910 recently presented to the French Chamber includes an increase of the tax upon the spirit, which tax will naturally fall very heavily upon motorists and the industry in general. Even now the cost of petrol in France forms only half of its retail price, the other half going entirely to cover the amount of the tax. In Paris the retail price of spirit is 3 francs 25 centimes per five litres, while the cost of it, plus the profit of the retailer, amounts to only about 1 franc 75 centimes. Thus 1 franc 50 centimes forms the State and city tax. The proposed increase in the taxation will be strenuously resisted by automobile organisations throughout France.

Flashes.



Sir John I. Thornycroft, the famous marine engineer, was in his element at the regatta of the Motor Yacht Club at Netley last week.

In view of the application by the Cheshire County Council to the Local Government Board for an order for the closing of a road at Taxal to motor traffic, the Royal Automobile Club has offered to supply a notice board intimating that the road is unsuitable for motor cars, and has at the same time asked that the application be withdrawn. In reply, the county council has expressed its willingness to accept the offer and to withdraw the application.

* * *

Our contemporary, *Motor Traction*, deals very cogently and interestingly with some overlooked aspects of the tax on utility motor spirit, which will well repay perusal by all who are more or less interested in the effect of the lately imposed taxes on light and heavy traction. In this able disquisition it is plainly shown that those responsible for the Budget proposals have fallen lamentably short in their purview of the effect which motor transport must have in the development of the country. It is suggested, and with reason, that those places which have been left more or less stranded by the trend of railway enterprise must now look, and do look, to the utility motor for any development which can come to them. Already certain of our more enterprising railway companies, particularly the London and North-Western and the Great Western Companies, have realised this, and have connected up many outlying villages and townships to their arterial and branch lines by motor traffic of one sort or other. Results having proved satisfactory in many of these cases, the companies were, prior to this devastating Budget, contemplating the extension and multiplication of such services with the addition of many new ones, but now, thanks to what is in some quarters

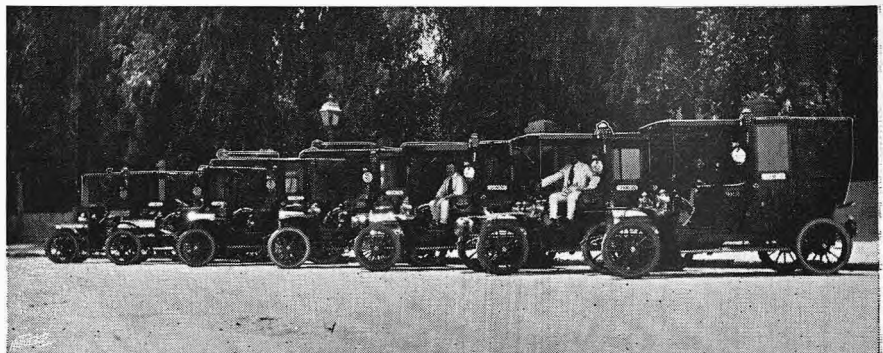
looked upon as progression, all this has been nipped in the bud. As our contemporary puts it: "All arrangements, however, have had to be held over, pending the passage of the Budget proposals, for if the tax on petrol becomes law the projects in question will be rendered commercially impracticable." Moreover, this would mean that existing passenger-feeding motor services will have to be dropped, and the conveniences which have become something of a habit with dwellers in rural districts where motor services have been long established will cease. Thus, "The tax on the petrol of motors used for business purposes is absolutely opposed to one of the essential principles professed by the present Government, for it constitutes a tax on the tools of industry." Further, it cuts off districts more or less remote from railway stations from the use of the poorer classes, forcing congestion upon them, and leaving the healthier and more sparsely populated districts to the motor-prejudiced well-to-do.

* * *

Messrs. G. A. Phillips and W. G. Tuck have each been presented with very handsome gold watches by the directors of Humber, Ltd., in appreciation of the excellent manner in which they drove the 16 h.p. and 10-12 h.p. Humber cars in the Scottish and Irish Trials of this year.

* * *

When the 4th Battalion of the Lincolnshire Regiment were in camp at Garendon Park, Loughborough, they invited the county automobile club, the Leicestershire A.C., to their sports. Probably Capt. Godfrey Lowe, the hon. secretary of the Lincolnshire A.C., was the originator of the idea, which strikes us as an excellent one. Unfortunately, the weather was very bad, so that the Leicestershire motorists who faced the elements did not have so good a time as they otherwise would have enjoyed. On the other hand, they received a warm welcome, and their hosts were so loth to part with them that four or five cars had great difficulty in leaving the camp, being forcibly detained by the deep mud, which nearly bogged them until they were rescued by the main force of the brawny arms of the 4th Lincolns.



A group of taxicabs which are now plying for hire in Cairo. In sending the above picture the Grands Garages d'Egypte tell us that there are now in Cairo some 400 cars, and 200 in Alexandria.

The Continental Tyre Co. are introducing a security bolt the head of which is covered with indiarubber, instead of leather as in the ordinary bolts. It is claimed for this bolt that it is easier to fit, as it does not fray or curl up, and that it will not nip or chafe the air tube. Before making this claim the makers have no doubt put it to the proof.

Club Doings.

Scottish A.C.

The Right Hon. Sir J. H. A. Macdonald, president of the club will represent the above club at the International Conference on International Touring to be held in Paris on October 5th next. Customs duties on touring cars, reciprocity of driving licences, and the like are among the important matters to come before the conference.

The Motor Club.

A special service of taxi-cabs has been inaugurated by the committee for the use of members of the Club, and several cabs will always be outside the club premises, while others will be obtainable at a few minutes' notice. A special tariff is being arranged for long-distance journeys to various towns, golf links, etc. These cabs will be painted in the club colours—black and yellow, and will have the club badge on the door panels.

Lowell A.C.

During the week commencing September 6th the American Automobile Association and the American Federation of Motor Cyclists, will hold a joint meeting on the Merrimack Valley Course at Lowell, Mass., at the invitation of the Lowell A.C. Drivers of several of the racing cars who are to enter the main events have been practising over the course for some time past.

Southern M.C.

At a committee meeting on Thursday last week the results of the club hill-climb (car class) were confirmed as under :

Name.	Place on Formula.	Fig. of Merit.
Mr. Pole's 8 h.p. De Dion ...	1	2.17
Mr. Cartmael's 10-12 h.p. Riley ...	2	2.03
Mr. Harrison's 9 h.p. Riley ...	3	1.5

It was decided to hold a second series of hill-climbs at the end of September, of which further notice and entry forms will be posted in due course. The hill-climb will be open to two classes of vehicles, *i.e.*, motor cars and motor cycles.

Sutton Coldfield A.C.

This club, which comprises motor car and motor cycle owners, held a closed hill-climbing competition on Saturday last at Coalport, near Shifnal. The hill selected for the competition is on a semi-private road, which is controlled at each end by tollgates, the road being the property of a syndicate at Ironbridge. To reach the hill, the River Severn must be crossed by an iron bridge controlled by one of the tollgates above mentioned. It is interesting to note that a charge of 6d. is made to pass the toll, which franks a car over the road and out at the other end, but competitors and spectators were all charged an additional 6d. if they returned the same way—not at all an excessive charge for the purpose of the hill-climbing competition, but somewhat annoying to a motorist who paid the toll and found he could not climb the hill and had to go back again. The hill-climb was supposed to commence at 3 p.m., but owing to some derangement in connection with the electrical bell which was to be used for timing, no competitor ascended the hill before 4.30, and finally it was decided to send each competitor's time up the hill by a motor cyclist. Naturally this caused considerable delay, but eventually all had climbed the hill by about 7 p.m. The hill is about 1,000 yards in length, with several nasty bends; one, about three-quarters of the way up, is a miniature Devil's Elbow, and is most difficult to negotiate at any speed. The actual steepest gradient does not exceed 1 in 7 or 8, but there are several long stretches of what appear to be 1 in 11 or 12. We understand that the record for the hill is held by Newton, who drove a Napier car in 1906, and accomplished 1m. 2s. for the same course as the one over which the competitors drove on Saturday last.

The positions in which the competitors finished on time were as follow, but a prize is to be awarded for the best performance on formula, the results of which were not announced on Satur-

day : J. L. Kirk, 15 h.p. Talbot, 90 × 117, 1m. 35s.; N. F. Bayliss, 14-18 h.p. Sunbeam, 95 × 135, 1m. 47½s.; F. Burnett, 24-40 h.p. F.I.A.T., 2m. 1¼s.; W. Pilkington, Talbot, 80 × 120, 2m. 14¼s.; —. West, 12 h.p. Sizaire, 120 × 130, 2m. 37s.; E. J. Dixon, 10 h.p. Alldays, 95 × 115.

Motor Yacht Club.

The annual regatta was held off the *Enchantress* on Friday, August 13th, and Saturday, August 14th. On Friday the first event was a race for the Club One-Design Sailing Boats. In the first heat Mr. H. Brickwood was first, and Mr. Footner was second. In the second heat Messrs. Moore-Brabazon and Duden were first, and Mr. F. P. Armstrong was second. The final heat, in which the above-named members took part, resulted in Mr. H. Brickwood being the winner and Mr. H. Duden second.

Race for auxiliary cruisers for the Johore Challenge Cup. Mr. N. S. Hind's *Fawn* and Mr. T. Sopwith's *Marjorie Dawe* competed. At starting *Marjorie Dawe* had the misfortune to get a large bunch of floating weed round her propeller. Mr. Hind in the most sporting manner waited for her. Mr. Hind's kindness, however, was not rewarded by good luck, as halfway to Calshot Lightship he burnt out his clutch leather and had to give up, leaving *Marjorie Dawe* to finish alone. Mr. Sopwith, however, generously agreed to sail the race over again. It is likely, therefore, to take place to-day (Saturday).

Handicap Sweepstakes (All-comers), under M.M.A. Rating and Time Scale. *Miranda III.* (7m. 33s.) won easily by 2m. 6s. from *Gyrinus II.*, which in turn was 2m. 9s. in front of *Dylan* (not rated).

A match between *Miranda III.* and *Gyrinus II.* resulted in *Miranda III.* being adjudged the winner on the post by 1s. only.

In the race for the M.Y.C. Hydroplane Class the Earl of Hardwicke's *Glisseuse* was left to go round the course alone.

The regatta was concluded on Saturday. An interesting race for thirty-six-footers ended in Mr. F. P. Armstrong's *Westra* being the winner and Mr. F. R. S. Bircham's *Flavia* second.

A handicap for cabin cruisers resulted in a win for *Marjorie Dawe*.

A handicap for motor boats under twelve knots resulted in a win for Mr. C. P. Foster's *Mynonie*.

A handicap for motor boats of fifteen knots and over was won by *Miranda III.*, which beat *Gyrinus II.* by 5s., with *Comely* third 1m. 21s. behind.

The last race of the day for a cup value £30, presented by Mr. M. Grahame-White, resulted in a win for Mr. E. H. Clift's *Roy*, with Mr. R. N. Fairbank's *Camilla II.* second, and Mr. F. P. Armstrong's *Solace* third.

On September 17th and 18th a further meeting promoted by the Motor Yacht Club will be held.



"July 25th, 1909. Presented to Louis Bleriot, by the Directors of Bleriot, Ltd., London, as a mark of appreciation of his the first flight over the English Channel, the greatest triumph of this century."

Road Maintenance in Northamptonshire.

The county surveyor of Northamptonshire, Mr. C. S. Morris, has issued his annual report upon the condition and maintenance of the county main roads. He states that, though the weather during the year was unfavourable, the roads on the whole have certainly improved. About £500,000 has been spent on the roads since the county council was formed, and if it had been expended in thoroughly coating and rolling sections year by year, instead of the patching system adopted, the roads would now have been in a thoroughly sound and efficient state, and would be costing far less to maintain. Of the 318 miles, about 190 have been coated and rolled, leaving about 128 miles yet to be done, and this work alone will require at least 100,000 tons of metal, which will cost approximately £50,000. The total cost of maintenance (exclusive of improvements) for the past year was £25,412, which is an increase of £2,151 over last year and £1,836 more than the average of the past three years. The cost of maintenance was the highest recorded during the past eight years, and was, Mr. Morris believes, the highest for the mileage since the county council was formed. With regard to motor car traffic, the surveyor sees no reason to alter his opinion that the total damage in this country is at present insufficient materially to affect the cost of maintenance, and that the damage—"the stripping of a track"—is to a large extent caused by a fault in the method of repair of the roads and to some extent by the metal used being of an inferior quality or broken to too small a gauge.—*The Surveyor and Municipal and County Engineer.*

The Motor Industry in Germany.

From Germany's Consular Reports we learn that whereas 1907 was a fairly good year, 1908 proved to be one of the worst on record. Times being bad people have given up buying motor cars, and owners, too, have thrown their cars on the markets. The result is that the market is flooded with bargains in motor cars; new cars are hardly bought at all, and prices have become entirely unremunerative. Only the very first-class motor car builders have been able to keep their works going and sell their best cars. Second-rate manufacturers have failed to make ends meet. The supply has grown tremendously and the demand has decreased daily. Whether things will improve depends entirely on how soon the general industrial and trade depression ceases. Ever since the new Government regulations making the owner of the car responsible under all circumstances for any damage done on the road by his car have become law, people have taken fright, and intending buyers have given up the idea of motoring owing to the risk of liabilities. The new laws for motor traffic are, of course, considered by motor manufacturers to be too severe and to have dealt a severe blow to the motor industry. All the trades and manufactures connected with motor cars and motor accessories are suffering equally. Pneumatics, benzine, oil, lanterns, etc., are all at a discount in consequence of the general depression in trade. If an object lesson were needed to bring home to our own Government the folly of hampering the motor industry surely it can now be found in Germany, where everything connected with the motor trade is stagnant.

Twelve Months' Trial.

For just over twelve months we have been using a De Dion sparking plug on a single cylinder 8 h.p. car. The car has accumulator ignition only, and we do not know of any better test for a plug than to put it into a single cylinder engine under these conditions, as of course any failure means instant cessation of power. During the whole of the year the plug has required no attention. It has got dirty once or twice from over lubrication and has missed a few times, but never sufficiently to necessitate it being taken out and cleaned, as the missing has always cured itself after a few moments' running. When we look back upon the old days when one rarely got a plug to stand much more than a month under similar conditions one cannot help realising how great is the advance that has been made, though the De Dion plug of to-day and its predecessor of say six or seven years ago looks precisely the same to the untrained eye. Nowadays good and bad plugs look much alike and the only proof is continuous use. Certainly the De Dion plug has proved itself.

The New 12 h.p. Vulcan.

The new model 12 h.p. Vulcan car has a bore of $3\frac{3}{8}$ in., and a stroke of $4\frac{1}{4}$ in., the R.A.C. rating being 15.6. The engine is three-point suspension, and the cylinders are cast in pairs with inlet and exhaust valves on opposite sides. The Bosch high tension magneto is used and the cooling is by thermo-syphon. The lubrication is by force pump from sump and the engine and gear box form a unit. The clutch is metal to metal running in oil and there are three forward speeds. Of course the transmission is by propeller shaft, but the back axle is worm driven, as it appears many of the lower powered models for next year will be. Many smaller cars are not fitted with sprags, but we are glad to note that a sprag is used on the 12 h.p. Vulcan, as it is a great convenience when restarting on steep hills. Special attention has been given to the axles both back and front, the front being a dropped steel forging, and the back cast steel with no brazing. The throttle control is by hand or foot but the firing point is fixed. The wheelbase is 8ft. 6in., and the overall length 10ft. 6in. 760×90 mm. Dunlop tyres are the standard fitting, and the complete car comes out at 15 cwt. 1qr., minus petrol, water, and tools, so this means that with a good kit of spares the car would be little if any over 17 cwt.

Cases Against Motorists.

The following table shows the number of charges against motorists heard at several police courts during the past week and the manner in which they were settled:

Court.	No. of Cases.			Fines and costs
	Speed Limit.	Public Danger.		
Little Bowden	...	0	1	£1 18 0
Godmanchester	...	0	1	2 6 0
Bourne	...	0	1	*5 0 0
Acock's Green	...	0	1	*2 0 0
Horsham	...	5	0	17 17 0
Perth	...	1	0	4 4 0
Worthing	...	40	0	155 0 0
Whitchurch	...	0	1	Adjourned.
Bridlington	...	0	1	1 0 0
Ingleton	...	0	1	Dismissed.
Totals	46	7		189 5 0

*Not including costs.