

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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Notes.

Inefficient Mudguards.

We often wonder what percentage of the cars on the road to-day are properly mudguarded. From what we experience ourselves, and what we see on other cars, we have come to the conclusion that the percentage must be very small indeed, and we believe one of the most useful investigations that could be made would be some carefully conducted mudguard trials.

Perhaps the most extraordinary aspect of the subject is the fact that the majority of mudguards on cars to-day absolutely ignore the most elementary precautions: the guards appear to be designed by people who never use cars, and fitted without the remotest

regard for commonsense. If anyone will examine a few illustrations in *The Autocar*, let him run through, say, four issues, he will see at once what stupid things are done on cars which are being turned out to-day, things for which there might have been some excuse ten years ago.

Everyone knows that the more important guards are the front: it is comparatively easy to make a satisfactory job of the back guards so long as some attention is given to the backward termination of the guard, but the wheels which throw dirt on to and into the car are the front; therefore, every effort should be made to prevent the guards from passing mud. With regard to the elemental and inexcusable error which is so common in relation to the front guards, it will be found on measurement that very few front springs permit more than three inches of movement as an extreme, and that if this full movement be caused by some sudden jolt the springs will bump the frame. Now, it is obvious that, if the springs can only move three inches, it is idiotic to give the front guards six or more inches minimum clearance. So long as the clearance is sufficient to make it impossible for the front wheels to touch the guards, and so long as it is sufficient to prevent them becoming clogged in very heavy mud, all additional space between the wheel and the guard is bad, because it lets the mud out, yet by examining actual cars or photographs of them one will often find many which have very much more clearance for the front wheels than for the back, though the amplitude of motion of the back springs may be anything from one to four inches more than that of the front. All this is so elementary that we should apologise for mentioning it were it not for the fact that it appears to be ignored time after time by modern body designers, whether they be coachbuilders pure and simple or the designers in a motor car works body department. Of course, we do not infer that they all err in this way, but we do infer that a vast proportion of them make the mistake we have mentioned.

Where the Mud comes from.

Then again, those who do not commit the elementary error more often fail to achieve success than not, for the inside front wing extension is nearly always too short, as it does not go far enough forward. The result is that the head lamps not only get smothered with mud on the sides next to the wheels, but a tremendous lot of the mud escapes and is blown back on to the car. Then on the outside the flanges are altogether inadequate in nine cases out of ten, and appear to serve rather as collectors of mud, which blows back on to the car. This is really the principal cause of the filthy state into which so many cars get when driven in mud: the mud collects on the front guard flanges and does not merely dirty the car but carries right back on the wind, and spatters the occupants of the back seats, absolutely smothers the front of the back mudguards, and effectually plasters up the car to the detriment of the car itself and the discomfort of the occupants of the back seats.

Notes.

So far as our experience goes the average flanged type of flat guard has been tried and found wanting. A compromise can be effected by having double flanges, but these are not easy to fit to existing guards, and so far as we are aware no one makes them as standard: the inner flange catches the bulk of the mud and the outer flange catches that which blows off the inner flange. But in principle and in practice there seems little doubt that the semi-circular or domed mudguard is vastly preferable: it provides the necessary vertical clearance, where it is most wanted, with the maximum of side protection, and when intelligently fitted, of sufficient width, and carried forward sufficiently far, it affords proper protection from mud.

Reasonable Requirements.

We fully realise that no mudguards, however good, can be reasonably expected to keep all the splashes from the car, but we do assert that it is not unreasonable to require that the occupants of the car should never be spattered by their own wheels, and that the driving screen should not be plastered up with mud, nor should the side lamps, the spare wheel, and the front of the back mudguards be encrusted with mud after every wet drive. In France tests of anti-splash apparatus are quite common, these devices being made to prevent the car from splashing people on the pavement or side walk. These things are much more necessary in France for reasons which all who know the country are well aware of, but we do not remember that any tests have been made of the efficiency of mudguards so far as the vehicle which they should protect is concerned, and we should very much like to see the Royal Automobile Club undertake some experiments upon the lines indicated.

A Simple Experiment.

A very important aspect of the mudguard question which is too often forgotten is the fact that a car which throws mud in wet weather is always unpleasant in dusty weather, because a stream of dust is escaping backwards from the front wings in just the same way as the mud escapes, and consequently the occupants of the car are breathing dust-laden air. A very simple way of demonstrating the truth of this statement is

to take a car which is bad in mud and run it after dark on a dusty night, holding an acetylene bicycle lamp or a small electric projector so that it throws its light upon the outer edge of either of the front guards: it is then quite easy to detect the column of dust pouring off the outer and upper edge of the guard like the tail of a comet. It sometimes happens that the ordinary side lights are in the right position to make this column visible, but more often than not it can only be seen by training a hand lamp on to it. It is very striking to see the dust pouring back from the outside of the front guards at or near the top, and, having once seen it, we do not think the owner will rest till he has effected some improvement in his guards.

The Isle of Man Race.

It will be remembered that over seven weeks ago the Society of Motor Manufacturers banned this race by advising its members that participation in it would be regarded as an infringement of the bond. This was when the conditions restricted the race to stock cars with engines not exceeding 90 mm. bore and 140 mm. stroke. Subsequently these conditions were altered, permitting entry of any dimension of engine provided the total capacity in cubic centimetres did not exceed 3,563 c.c., that being the capacity of a 90 x 140 mm. engine. It was thought that possibly the ban would be removed when the conditions were altered, but nothing more was heard from the Society about the race till a few days since, when the manufacturers were informed that it would not be considered an infringement of the bond if the cars were owned and driven by amateurs, and no assistance were given to them by the makers, directly or indirectly.

It is really difficult to understand what the Society is driving at, because, apart from the fact that the removal of the ban, so far as amateur-owned and driven cars are concerned, is too belated to be of much service, as entries close only a week hence, it follows that the manufacturers could not help themselves if any amateur chose to enter and drive his car. If a man has bought and paid for his car, surely he can do what he likes with it without the consent and approval of the Society of Motor Manufacturers.



Their Majesties the King and Queen returning from an inspection of the field operations at Aldershot recently.

Useful Hints and Tips.

The Order of Firing.

MOST motorists know that the cylinders of a petrol engine do not fire in sequence starting from either end, but few understand the reason of this, yet a clear comprehension of the subject is of importance in timing the magneto, etc.

When a four-cylinder petrol engine of the ordinary type comes to rest the crankshaft and pistons are nearly always in the positions shown in figs. 1 and 2. That is to say, the cranks are about horizontal, but

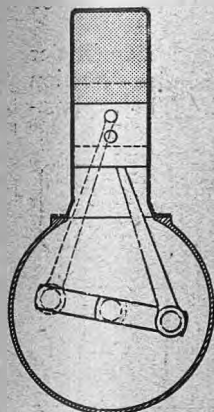


Fig. 1.—Diagram representing an end view of a four-cylinder engine, and showing the position in which the crankshaft generally comes to rest. The nearer piston and connecting rod are shown in full lines, the similar components in No. 2 cylinder being indicated by broken lines. No. 1 cylinder contains a charge of unexploded mixture.

often those on the ascending stroke are a little higher than those on the descending stroke. As a rule, the departure from the true horizontal plane is but small, but in the diagrams illustrating this article the ascending pistons are shown slightly higher than the descending ones for the sake of clearness.

When the ignition is switched off the engine rotates a few times under the momentum of its flywheel, each compression stroke exerting some resistance until gradually, as one piston is compressing, it comes to rest, generally with a compression stroke about half completed. Another factor which retards the engine when the current is switched off is the compression of the valve springs. Some of the power they absorb is given out during the drop of the valves, but not all, and an engine with very stiff valve springs, or with tight bearings, may stop with the pistons near the bottom and top of the strokes, in which case starting on the switch will be impossible, and, in fact, few of the self-starters of the compressed air and explosion types would be of much use in such a case. This explains the most important reason for failure to start on the switch when the engine is accidentally stopped in traffic.

To obtain good balance it is essential that the crank weights be equally distributed on opposite sides of the crankshaft. Hence the four cranks are arranged in pairs opposite to one another. Examining fig. 2, it will be seen that the general arrangement is to set the two central cranks alike, and the two end ones opposing them.

It is usual to number the cylinders 1, 2, 3, 4, starting from the radiator end, and this arrangement is adopted in the present case. We will now assume that the engine is running and that piston No. 1 is on the firing stroke, as is shown in figs. 2 and 3. Ignition has occurred in cylinder No. 1, so that when the firing stroke

in that cylinder is completed piston No. 1 enters upon the exhaust stroke, as shown in fig. 4. It will be seen that the right hand or exhaust valve E in that cylinder is open.

Ignition is now required in another cylinder, and it must, of course, take place in a cylinder in which the piston is descending. As will be seen from fig. 4, this is the case with cylinders 2 and 3, and either of these can follow No. 1. Usually No. 3 is selected, so that the order so far is 1-3. On the exhaust stroke of cylinder No. 3, cylinder No. 1 is drawing in fresh gas (see fig. 5).

The only cylinder available on the next stroke, therefore, is No. 4, as the piston of that cylinder is now descending (see fig. 5) and ignition takes place

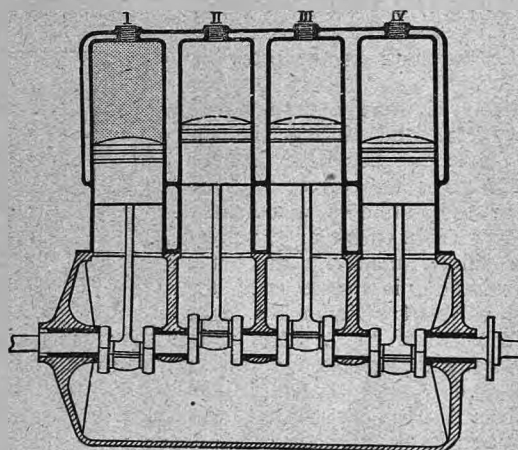


Fig. 2.—Diagram representing a side view of the engine shown in fig. 1. This shows the relative positions of the four pistons and crank pins when the engine has come naturally to rest after being stopped by switching off the ignition.

therein; the sequence up to this point is, therefore, 1-3-4. Finally the remaining cylinder, No. 2, fires on the next stroke, the relative positions of the pistons and valves being shown in fig. 6.

The complete order of firing is therefore 1-3-4-2, starting from either end and numbering the cylinders accordingly. As stated, sometimes cylinder No. 2 fires after No. 1, in which case the order of firing will be 1-2-4-3, but for each engine firing in the order last mentioned there are probably 500 which fire in the order 1-3-4-2.

In coupling up the high tension wires from the magneto to the engine this order of firing must be borne in mind, and the high tension wires connected accordingly. If the motorist be in doubt as to the

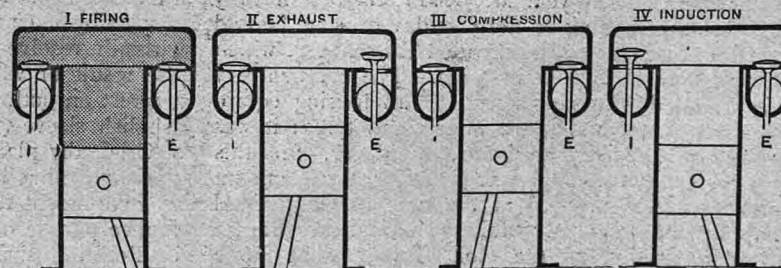


Fig. 3.—Showing cylinder No. 1 on its firing stroke, and the others at various stages of the cycle. The cylinders are numbered from the front end of the bonnet; inlet valves are indicated by I, and exhaust by E.

Useful Hints and Tips.

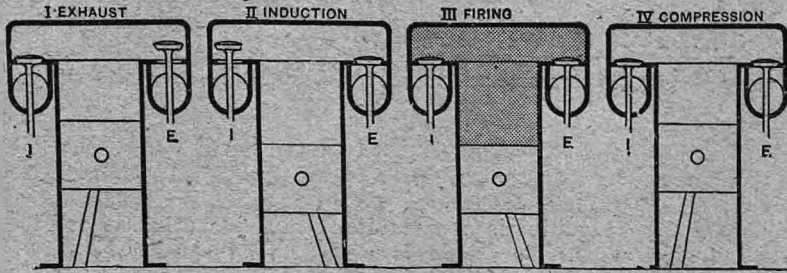
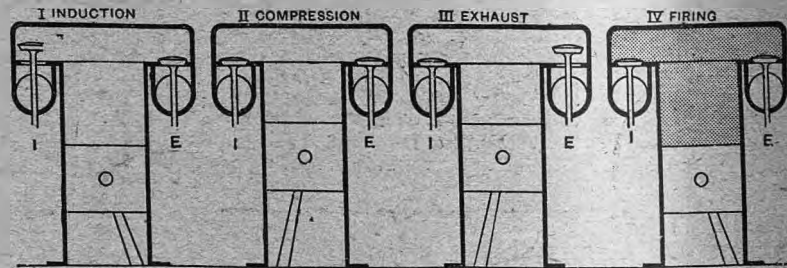


Fig. 4.—Cylinder No. 3 firing; this view represents the state of the cycle in each cylinder one-half revolution later than as shown in fig. 3.

particular order of firing in his engine he can ascertain this from the lift of the valves. On turning the engine round slowly he must watch for the inlet valve of cylinder No. 1 to lift. Then having seen this one drop he must see which inlet valve rises next. If this be the valve in cylinder No. 3, then his order of firing is 1-3-4-2, as naturally the order of lift of the valves is the same as the order of firing.

Similarly, if one have removed the magneto, and during the interval the engine has been rotated, a knowledge of the correct order of firing of the cylinders will render the proper replacement of the magneto a simple matter. Thus the starting handle is turned until the exhaust valve of cylinder No. 2 or the inlet valve of No. 4 rises, and as shown in fig. 3 this indicates that piston No. 1 is near the end of the firing stroke. The magneto is then fully retarded and rotated until it has just passed the firing position, and it may then be coupled up to the engine. On remov-



5.—One revolution completed. No. 4 cylinder on its firing stroke, the others as indicated.

ments so as to facilitate subsequent replacement of the magneto and high tension wires.

The order of firing in nearly all modern six-cylinder engines rotating in a right hand or clockwise direction is 1-5-3-6-2-4, starting from either end. The explana-

tion is somewhat similar to that described with reference to the four-cylinder engine, it being borne in mind that a six-cylinder engine is generally considered as being two separate three-cylinder motors arranged end to end. Of each of these separate three-cylinder engines, the cranks are set at a third of a revolution apart, and in the sequence of firing a cylinder of one engine is immediately followed by one of the other three-cylinder component. Cylinder No. 1 belongs to the three-cylinder element next to the radiator. No. 5, which is in the second element, follows, and so forth. In some types of engines, especially old models, the sequence is different, but the order 1-5-3-6-2-4 generally obtains. X.

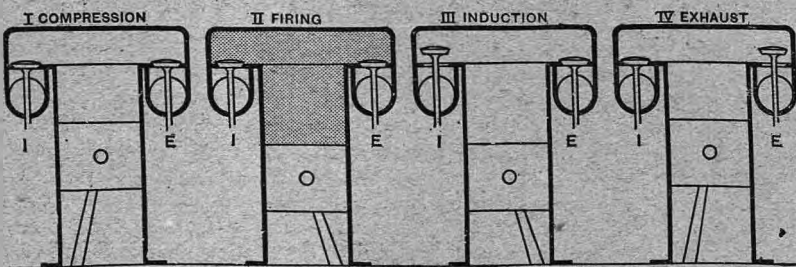


Fig. 6.—Cylinder No. 2 on firing stroke. At the end of the next half revolution, the relative positions become again as shown in fig. 3.

An Anglo-Austrian Duel.

We learn that Mr. James Radley, the well-known aviator who was among the early cross-Channel fliers, has entered a Rolls-Royce car as a private competitor in this year's Austrian Alpine contest. It may be remembered that last year Mr. Radley was technically put out of the running on the first day because he had to shed a passenger on the dreaded Katschberg, which has a gradient of 29% (1 in 3.45). The car was very heavily loaded with passengers, a full touring equipment of luggage, and spare wheels and tyres; it was in no way specially designed, moreover, for this strenuous competition. Nevertheless no small amount of comment was aroused at the time in Continental circles by the so-called "failure" of a car with so high a reputation as the Rolls-Royce, while more recently in England the incident has been revived and made the medium of considerable discussion.

The Rolls-Royce firm was naturally not disposed to

accept last year's incident as a criterion of the car's capabilities, and has entered three 1913 models for the approaching contest. As Mr. Radley himself, moreover, has come forward with a fourth, it is evident that the Rolls-Royce will have every opportunity of displaying its merits, and this year's competition will virtually resolve itself into an Anglo-Continental duel, the result of which will be awaited with exceptional interest on both sides of the Channel, especially as an English sleeve-valve Daimler has also been entered.

Originally planned for the dates June 10th to 17th, the contest has been put forward to the 22nd-29th out of compliment to the German competitors, as a great jubilee parade of cars is to be held before the Kaiser in Berlin during the first-named week. Meanwhile entries are coming in, and though the number will, fortunately, not be so inconveniently large as last year, the success of the contest is already assured.

"The Sweet o' the Year."

By Owen John.

"The far green westward heavens are bland;
The far green Wiltshire downs are clear
As these deep meadows hard at hand:
The sight knows hardly far from near,
Nor morning joy from evening cheer."

Heartsease Country.

I SUPPOSE, originally, the time of the London season was settled because the summer happened to be the only convenient part of the year when country folk could get up to town comfortably and back again home before the roads became impassible. Possibly, also, Parliament sat in those days then for the same reason because such things as winter and autumn sessions were unknown, and there being no hunting or shooting in the growing months, it was decided they might just as well be in London and attend to the affairs of the nation for want of anything better to do. So what was convenient became a habit, and we reap where our forefathers sowed simply because it is the custom.

But all of us are not concerned with the "Season"; indeed, to the majority it is merely a name, and to the minority an expensive bore. I have read that even from a match-making point of view it is a failure, and that such things as country house parties, yachting, and week-ends knock in endways as a means of "getting off" those of an age to be got rid of. But still the so-called "season" exists, and, because it is so, a large proportion of well-to-do folk spend their time in London and see and do things they could enjoy just as much at any other time of the year. That Parliament is sitting has nothing to do with it at all; the majority of Parliamentary folk are not in any society other than their own. But here habit has it again, and so we find that just when rural England is looking more refreshingly beautiful than any other part of the world can ever look, though perhaps not so grand or majestic, country houses are shut up, the river is a wilderness, and up flock to London all sorts and conditions of people who would be much happier, much wealthier, and much better in health if they remained comfortably in their pleasant rural homes. While, of course, Londoners themselves must not dream of being anywhere but in London, although before July is half through they are as eager as anyone else to get away and be out of it.

Why are so many people so keen to spend May and June in the Metropolis, people who do not go to smart

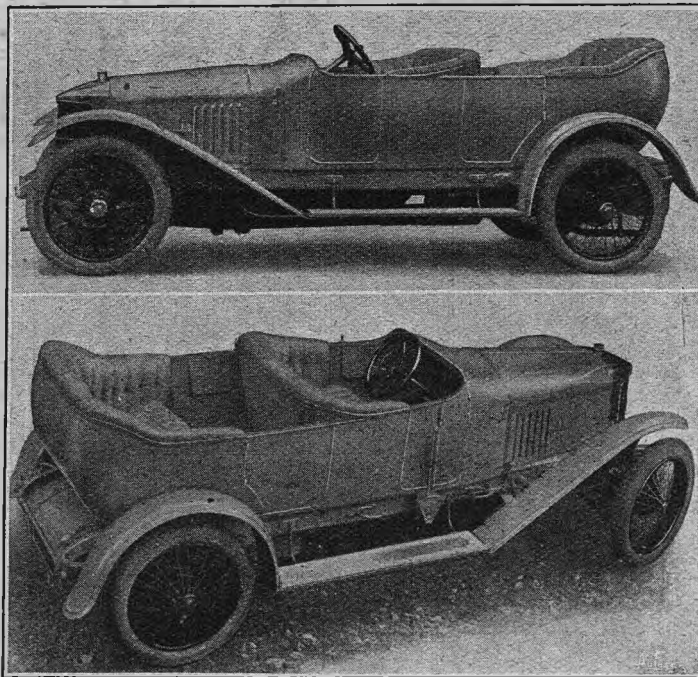
parties and whose names do not figure in the lists of "those present?" There can be no pleasure in looking on at much over-rated and over-advertised people "walking rapidly through the park," "looking beautiful in pink," "amongst those at Hurlingham," or "shopping in Bond Street." The folk who get noticed in the halfpenny press get into it for two reasons—one, because they can't help it; two, because they work to get there. What one class cannot escape the other class labours to participate in. Of course, everybody except those in—and those trying to get into—the second-class, knows quite well that the only people really in Society are those who are only in it because they cannot help it, and who would not be in

it on their own merits, which truism is so very galling because it is so hard on those who have attained its gilded portals by diligence or by merit.

But I have laboured this point at too great length; let me soothe my fellow men and women outside the pale by writing in my most joyous strain of the beauties we outsiders can delight in while our betters, or the more pushful rich, are hard at work seeing and doing nothing but the weary round of very expensive and artificial form of pleasure.

How wonderfully beautiful England is just now. If we want to know how

exquisite a country it is all we need do is to ask some American or Colonial friend who is visiting it for the first time. These folk know, and the difficulty for them is to keep the knowledge to themselves. They may find faults with some of it. They may say our roads are narrow, are winding, and are dangerous. They may say our habit of allowing five thousand separate authorities to look after our highways is ridiculous, they may remark that we spoil all our best views with advertisement boards and ruin our delightful old hotel fronts by plastering them with garish and preposterous automobile society plaques. But after they have made these perfectly justifiable criticisms they will give in and they will allow that there is no part of the earth they have seen that can be more perfect than the English countryside in the early summer. Even when the sun does not shine and the rain comes down the trees are the greener for it, and the sweet perfume from the drenched lilac and the miles of golden gorse need nothing but themselves to set off their perfection.



A sporting type body built by the Portholme Aerodrome, Ltd., Huntingdon, on a Prince Henry type Vauxhall chassis, to the order of Mr. C. L. E. Geach. The car was supplied by Messrs. Rawlence and Watson.

The Sweet o' the Year.

I have heard it said that England is more beautiful than other lands because we have hedges and they, as a rule, have not. Very likely there is reason in this, and although we do not boast about them we seem very reluctant to cut them down—even at our worst corners. But as yet our hedges are not in their fullest beauty. This state arrives in July, when the dog-roses and the honeysuckle clamber all over them, and from beneath out of the long lush grass rise the nodding foxgloves and a host of other flowers. But the thickset green of them is good to the eye, and through their gateways one looks at swelling acres of rippling mowing grass, at “long fields of barley and rye that clothe the wold and meet the sky,” while the may trees and the chestnuts shout beauty at one just as the old stone bridges over the clear streams bid one slow and stop to loiter on them.

Are the views that get photographed in colours or get put up as posters or in railway carriages anything to compare with the thousand “bits” one passes on a day's run through English counties? To lean on the parapet looking over the still clear water, to watch immediately below an old red-speckled trout, careless of intruders, indolently waving his tail between the end of a stickle and the thick weeds. To see higher up in the shadow young dabchicks playing about on the stream, to hear the plopping of a lazy rising fish, to take in the swelling bulrushes, to watch the dazzling kingfishers, and to note the happy content of idle cattle up to their knees in mud and silver as they swish their tails at the flies under the pleasant shade of the rustling alders. And above it all to look at the high elms, still noisy with the lamentations of mourning rooks, while amid their topmost branches the old grey spire of the village church looks out on its quivering reflection in the quiet river. This is no description of one place; there are thousands of such all through England all equal in their beauty. And what of our woods in the early summer? Poets have often written of them, but have never attained their loveliness. I came to-day through a big beech glade where the leaves were of a green that nothing else ever can have. Beech trunks, that look so grey in the rains and dull days of winter, seemed dead black against their vividness, and on the red carpet of last year's victims there were wide splashes of the azure of a spring sky in the prodigality of the lingering bluebells. Sometimes, where the wood lay on the side of a hill, their colour was as wreaths of low-lying hazy smoke among the

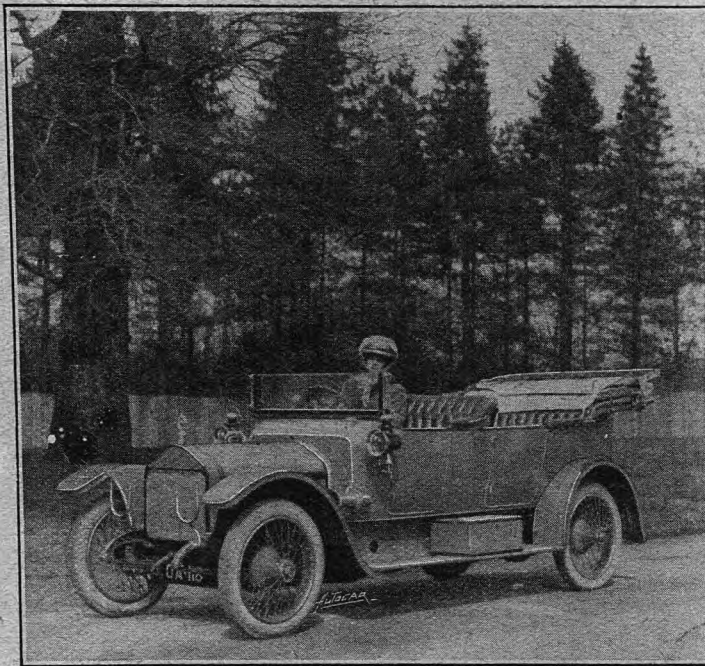
trees, and with them were white anemones, and, at times, the sable and red of intruding lords-and-ladies. Outside the wood in the big fields little plovers were learning to fly, mother hares were paying their never ending rounds of visits to their scattered leverets, young rabbits were pretending to eat grass, and all the pigeons were practising *vols planés* just as if there were no such things as winters or guns or angry farmers. I am praising English, not British, scenery at this time of the year, for though Scotland and Wales have plenty of places as lovely now as later, yet early summer suits England perhaps best, and later on her charms are not so evident and overwhelming. Added to which in Wales and Scotland the typical scenery has heather in it, and heather as yet is not at its best, and can be quite ugly and disfiguring.

Also some of the trees are not out, and it can be uncommonly cold in North Britain right up to July itself, while it is always considered wise to begin fires again in August. Besides, ecclesiastical scenery in Scotland is not good (except when ruined), while in Wales—but this is no place even to mention anything about churches in that country. All Welsh building of less than five hundred years of age is very bad for scenery, and I expect that is why Celtic artists invariably pick views for their pictures that have nothing human in them at all.

Of course I do not wish it to be inferred from my remarks either that all

London is bricks and mortar and no green trees at all, or that no Londoners ever visit the country until the bloom is off the rye. Those ideas are quite exploded; indeed, in May all our London parks are very gay and blooming, although some of us may not admire the studied prodigality and exuberance of the flower beds, nor the immaculateness of the paths and walks. But such a place as Hampton Court redeems much regularity, and one cannot have at one and the same time picturesque confusion and precise orderliness. London parks—because they cannot help it, I suppose—are much too well provided with paths, and it is quite painful to look from a height down on the mathematical patterns on the Green Park. St. James's Park is the exception, and long may it remain so, for undoubtedly there is no other pleasure ground in London to approach it in beauty.

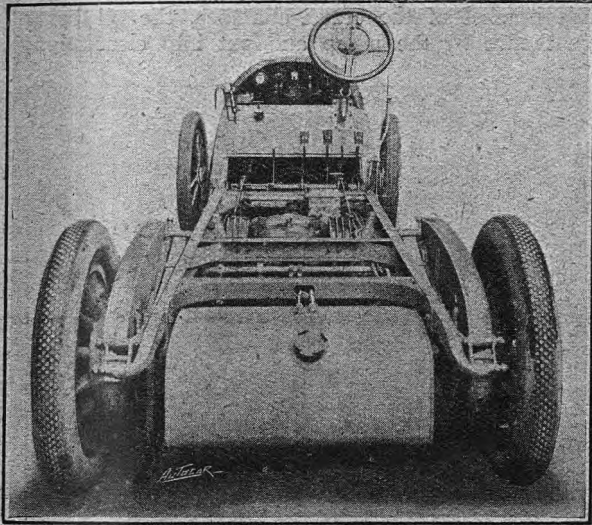
I am not writing this with a view to ending the present London “season” prematurely. Indeed, a week or so in the height of it affords me much pleasure, and I bear no one in it a grudge except a



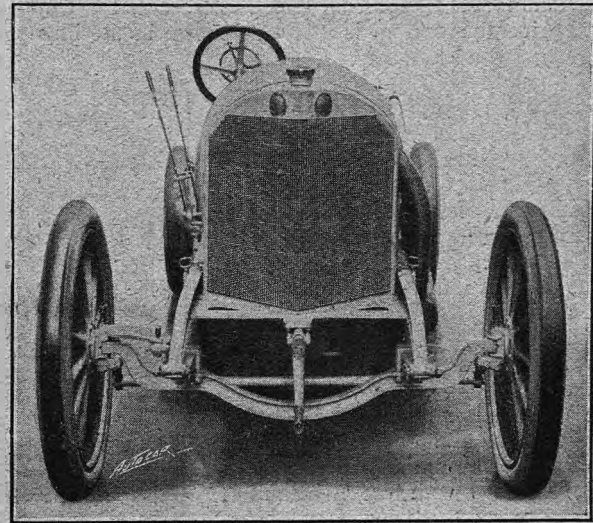
A 16-20 h.p. Wolseley just supplied to Mrs. Markham, Irlams-o'-th'-Height, by Mr. Max R. Lawrence, of Manchester. The car is fitted with a 20 gallon petrol tank behind, and an auxiliary tank in the dash; it is finished in smoke grey, with dark green lines and upholstery. Mrs. Markham drives herself, and looks after the running of the car (employin' only a washer). This is the second Wolseley car supplied to her.

low-born Zionist who sold me a set of Hamburg razor blades swearing that they were so much better than the original Americans that he had ceased to stock any other. (But I have learnt my lesson, though I should

The Sweet o' the Year.
pose, and that because of railways London sticks out on each side of them much further than it does away from them, then their eyes would be opened, and they would understand how much they miss by inhabiting a



Rear view of the 90 h.p. Mercedes chassis. Five pedals are fitted, two of these applying the counter-shaft brakes on each side of the gear box (see page 930).



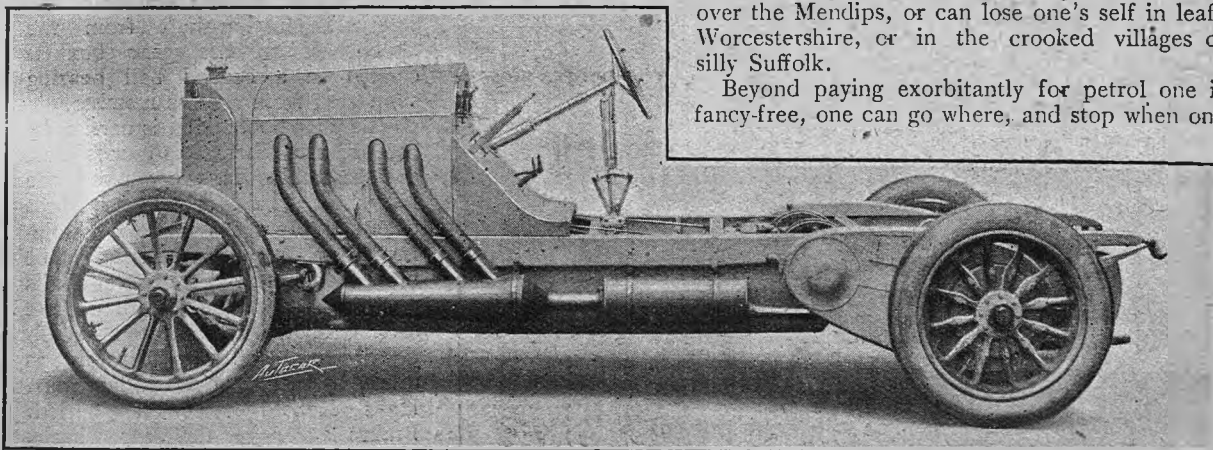
Front view of the 90 h.p. Mercedes (see page 930).

have known better from his appearance.) Yet I cannot help thinking that the hoarding of our Road Board millions is all a plot on the part of Londoners to prevent good roads being made in and out of their town, because they know that as soon as motoring in and out of London has become quite safe and simple no persons of taste will trouble to live anywhere—in the summer—but out in the beautiful country, and London rents and amusements will sustain a fearful shock.

wilderness made with hands instead of dwelling amid peaceful scenes of rural charm and beauty. That is, of course, at this time of the year, and also when the weather is fine.

Now for the moral, which otherwise might escape notice. Without a motor—or friends who allow one to use theirs—even the beauties of the country at this “top” of the year are hidden almost entirely. But, with one, all England is at your service, the seats of the mighty are open to inspection—unless the suffragette scare has had its natural effect—one can drive through Savernake, through Charnwood, over the Mendips, or can lose one's self in leafy Worcestershire, or in the crooked villages of silly Suffolk.

Beyond paying exorbitantly for petrol one is fancy-free, one can go where, and stop when one



Near side view of the 90 h.p. Mercedes, showing the chain cases and the exterior exhaust pipes. The latter, it will be noticed, are covered with flexible (brass) metallic tubing (see page 930).

I think that the railway has been a good friend to London. For some reason all of the local lines lie in the dullest parts of its neighbourhood, and one can come in from any point of the compass and by any line without seeing anything interesting or pretty at all for the last fifteen miles of the journey. Hence, say the Londoners, it is madness to live elsewhere. But did they all know—as many of them are beginning to find out—that railways run through ugly bits on pur-

pleases. Every county is equally beautiful, and if the average hotel is equally bad one can reflect with comfort how infinitely superior nature is to humanity and the accommodation provided for it.

“COMPLETE HINTS AND TIPS FOR AUTOMOBILISTS.” Under this title “Useful Hints and Tips” have been reprinted from *The Autocar* in booklet form. The fifth 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., post paid 2s. 10d.

The 90 h.p. Sporting Type Mercédès.

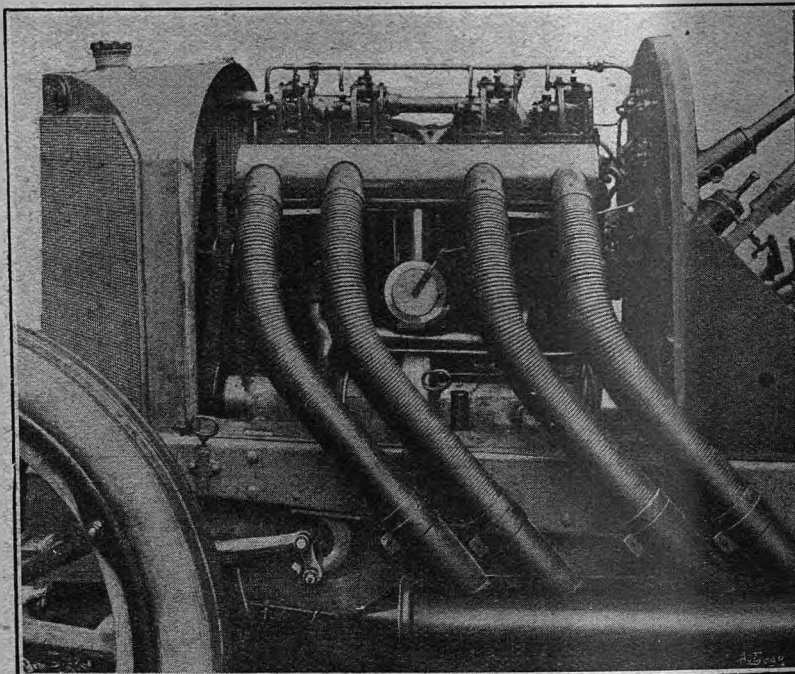
Four Cylinders, 130 × 180 mm. Three Valves in each Cylinder Head. Chain Final Drive.

THIS chassis, which is specially prepared for the motorist of sporting proclivities, and for continental touring, is fitted, as shown in the illustrations, with a smart V-shaped radiator and well tapered bonnet. It has a straight, narrow, parallel frame of channel section steel, well cambered centrally and stiffened by cross-members of similar section, including a flat perforated plate forward of the radiator.

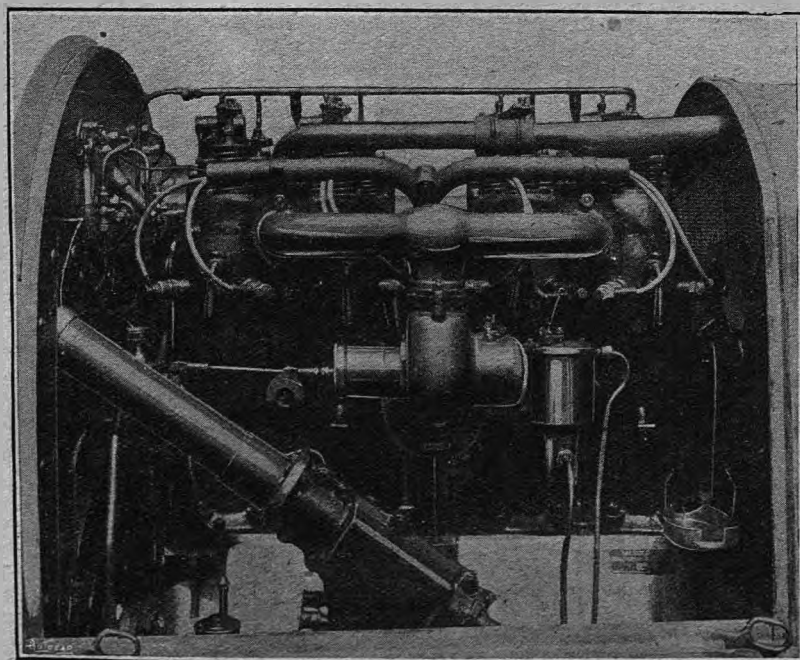
The four-cylinder engine, 130 mm. × 180 mm., is supported in the usual way by brackets from the longitudinals. The cylinders are cast in pairs with ample water jackets, and have the valves set in the combustion heads, there being two exhaust and one inlet to each cylinder. The crankshaft rotates in four bearings with the distribution gear between the two central bearings. The valves are all actuated by vertical tappet rods and rocking tappets. A Bosch magneto double spark ignition is provided, the plugs being placed in the sides of the cylinders.

The lubricating pump, which is of the plunger type, is driven off the water pump spindle, the oil being forced to the four bearings of the crankshaft, to the big ends, and to jets which play upon the rockers and tappets. Spray is depended upon for the lubrication of the gudgeon pin bearings, the cylinder walls, cams, and camshaft

bearings. An oil reservoir is formed in the back offside bracket of the crank chamber, the oil being taken thence by the pump and put into circulation,



Near side view of the 90 h.p. Mercédès engine.



The off-side of the 90 h.p. Mercédès engine, showing the carburettor and the two sparking plugs in each of the cylinders. It will be noticed that all the valves are of the overhead type.

as previously mentioned, while the engine is running.

The drive is transmitted through a leather-faced double cone clutch of large diameter, a central helical spring being common to both cones. The transmission-shaft from the clutchshaft to the gear box is carried in a central ball bearing supported from a cross member.

The gear box, which is carried by two cross members, has four speeds, and resembles in every point the four-speed chain drive gear boxes of other Mercédès models. Independently - applied external shoe brakes occur on the counter-shafts on each side of the gear box. The driving chains are encased in oil-tight cases, and are adjusted, as usual, by means of the radius rods. Hans Renold chains are used. Brakes occur on the rear wheels, these and the pair on the counter-shaft all being water-cooled. We are informed that, notwithstanding the enormous effort which this engine can exert, it is quiet and docile in traffic, and can be handled in a press with the ease of a small car, but obviously its especial forte would be Continental touring, *grand tourisme*. We hope to be able to deal with its running characteristics before long.

Leaves from a Sportsman's Notebook.

By J. Fairfax Blakeborough.

"There's Many a Slip," etc.

JUST as there is many a slip 'twixt cup and lip and 'twixt the saddle and mother earth, so are there many cases of slips from victory in the racing world owing to a variety of accidents. Delays of trains have lost many jockeys winning mounts, and caused them to miss rides which would have done them good professionally and financially. On the other hand, not a few jockeys have discontinued putting their faith in race trains, which so often continue to miss the first event, and have gone in for motors. The car, however, sometimes fails them, and a few days ago a well-known amateur jockey who "got the course" in the Grand National, and won a race at the York and Ainsty Hunt Races, was prevented from riding in the first race at an important hunt meeting owing to his car breaking down. He had another gentleman jockey with him who was also to have ridden, and they arrived in no sort of a humour to ask them for the loan of a "pony."

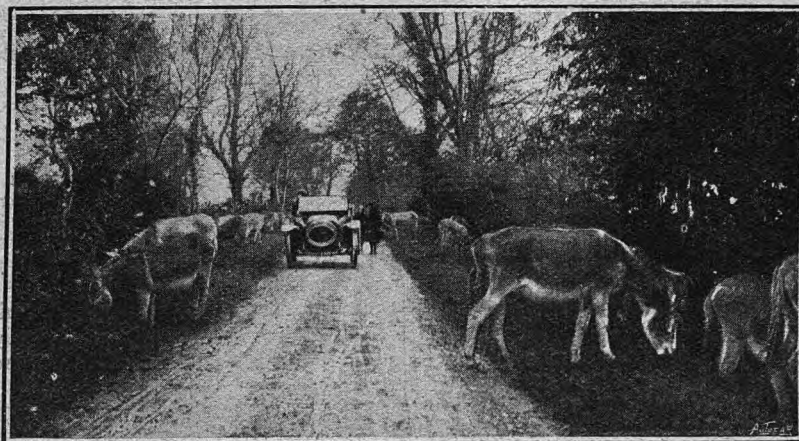
A Case in Point.

I remember on one occasion having a horse running at a Northern meeting which I thought was a racing certainty (I say racing certainty advisedly) and I set off prepared to back it (though I am not what is termed "a betting man"). A friend of mine offered to give me a lift in his car, and as the particular racecourse to which I refer is some distance from the nearest railway station, and the service of trains is vile, I gladly accepted his offer. Now he is that type of man who arrives for a train breathless and just in time to get his ticket and scramble into the first carriage he comes to as the whistle goes. The same with his car. He calculates to three minutes how long it should take to perform a journey, adding "bar accidents." I persuaded him to start a quarter of an hour earlier than his calculations so that I might see my jockey weighed out and get the best of the market for the crisp fivers in my pocket book. So we began our journey in respectable time. First we were held up for some minutes by some cross-road railway gates which had not entered into my friend's calculations. He anathematised railways, gates, and gatemen with much vigour, and the cool smile of the man in the box seemed to pile heaps of coal and gunpowder upon his temper. Still, the man never spoke, and one came to the conclusion that he had become inured to vituperation and invective. At last what seemed an interminable goods train slowly passed by, and the gates were opened. I looked nervously at my watch, but was reassured by my friend that he would make up for lost time. He certainly did send the car on, and I began to feel less fearful of being late, till there was a gunshot-like report which all too plainly told us a tyre had gone! To make a long story short we got to the course as the horses were just coming round for the last time, and I saw my own colours amongst the "also rans." I had prepared myself for losing the odds to a pony, and I found I was £25 in pocket

instead. I had cursed my luck that I had not backed my horse "S.P.," and now I blessed the tyre for bursting. So, I repeat, there are many slips in racing, and for some of them the motor car is responsible.

The Motor in the Paddock.

At the York and Ainsty Hunt Point-to-point Races only motors belonging to members of the hunt were allowed standing room. This fact was announced publicly. The late Squire Jack Bell, of Thirsk Hall (who always used to get up from his squirearchical pew in Thirsk Church and walk out when the Vicar began his annual tirade on racing on the Sunday before the local summer meeting), once said, on someone chaffing him about not jumping a fence when with hounds, "Thank God, in this land of freedom and liberty, there is no law to make a man jump a nasty place if he doesn't want to." So many of those who went to see the Ainsty Hunt Races said unto themselves, "There is no law against us driving our cars to some coign of vantage on the sward at the road side and watching the races from there, even if we cannot go to the centre of operations."



A 10 h.p. Riley car passing through a drove of donkeys near Clara, King's County. The drove was about 150 strong, being driven about from town to town by a party of itinerant dealers.

I fully expected this flat-race season to see some enterprising meetings advertising free stands for motors, but as yet my expectations have not come to pass. This will come as competition grows, for, after all, it is rather an imposition that at many, if not most, meetings a charge ranging from 5s. to 7s. 6d. is levied upon those driving on to the course in cars. Beyond a few railings round a motor enclosure the executives of race meetings have no extra expense in connection with those employing this form of locomotion, whilst in nine cases out of ten the motorists are those who pay the top price to the paddock. If it were made a *sine qua non* that the owner of the car *did* pay to enter the paddock, his car might well be given standing room free. Every encouragement is given at many meetings to those entering horses, and herein lies a peculiar position. If I enter a horse at Redcar, say, or Wetherby, or several other meetings, he is stabled free and fed free; at Blackpool my horse will be given free stabling, free food, and his attendant free lodgings and "grub," but if I go to the meeting in my car I am taxed for it, though it costs the executive nothing.

Leaves from a Sportsman's Notebook.

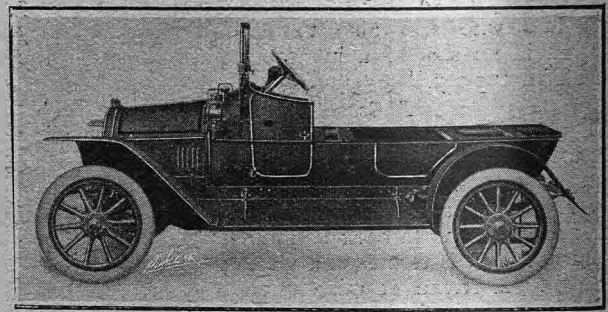
Now it is as important to cater for the spectator as it is to get a big entry—the one is essential to the other—and in these days when racing fixtures are so numerous and cars becoming more and more popular as a means of "travelling the meetings," it will soon become imperative to remove the tax from them. At many racing centres cars are not allowed "inside" at all. At York they are left on the Knavesmire, at one of the egresses from the saddling enclosure, and at Stockton they are grouped on land off the Thornaby and Middlesbrough high road. I never heard of anyone driving away in someone else's

car, though the possibility has often suggested itself to me, as chauffeurs usually put their livery under the car seat and enter one of the cheaper rings to watch the racing. The policemen on duty near the cars might question suspicious folk removing anything from any of them, but they would have no thought of preventing anyone, apparently vested with authority, from driving away with any car. It is said that a person can disguise a cycle and make a horse so that his owner would not know him, but that a car is the easiest thing in the world to trace. Herein probably rests the explanation of the honesty aforementioned:

Interchangeable Half Bodies.

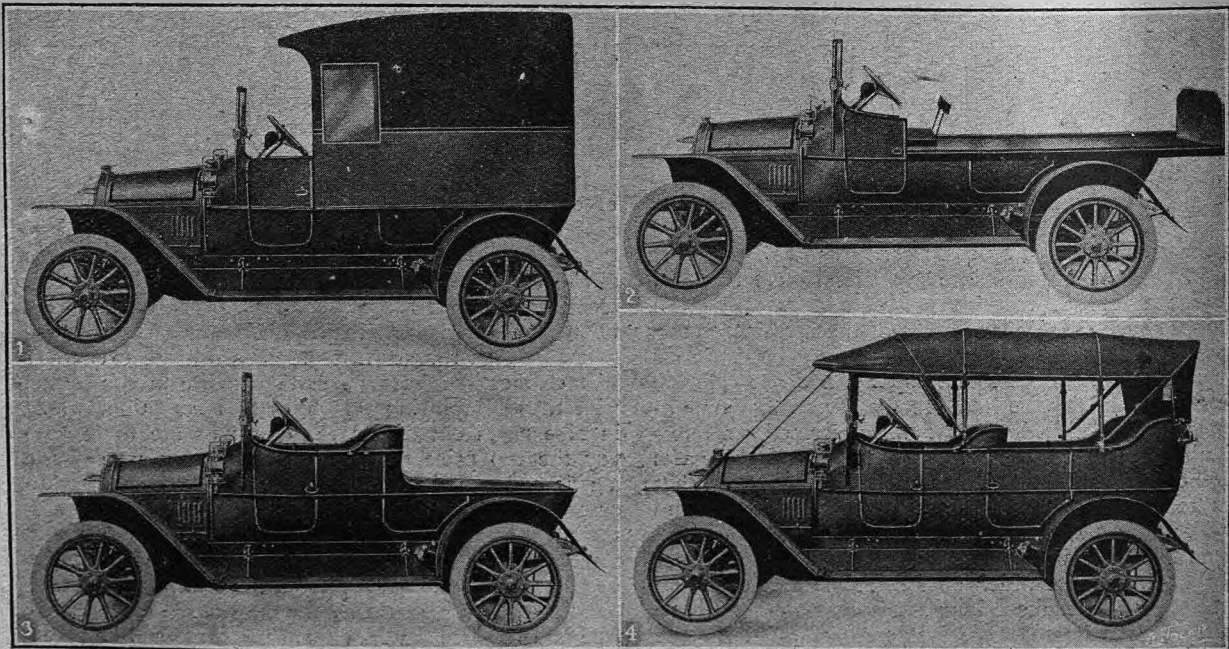
NO one will deny that there are sometimes advantages to be derived from being able to transform a car from a touring vehicle into a waggonette or shooting brake, or from a pleasure car into a commercial van or light lorry. A method of obtaining this desirable end has been introduced by Messrs. R. H. Hopkinson and Son, 376, Thornton Road, Bradford. The arrangement in this case consists of permanently fitting to the chassis of the car the lower half of a body. Various kinds of upper halves can be easily and quickly attached to this in turn, as shown in the accompanying illustrations. In one of these a view is given showing a chassis with the permanent lower half-body only in position. It will be observed that the sides of this structure are joined together by means of stout transverse bevelled members, the positions of which coincide approximately with the seats of a touring car. Further reinforcement is provided in the form of suitable longitudinal members. The transverse members coincide with similar ones built into the lower portion of the upper half-body, and the two systems are firmly secured together by means of easily removable bolts. The join between whatever upper half-body is used and the lower half is neatly concealed by means of beading. The great advantage

of this system of construction lies in the fact that, as only half bodies have to be handled in order to change, no very great labour is required. Further,



The Hopkinson half bodies. In this view is seen the chassis of the car carrying a permanent lower half body. The transverse and longitudinal members to which the upper half is attached can be seen in the open portion from the front door to the rear of the car.

half-bodies should not be so expensive as complete bodies, and lastly, not so much room is required in the garage to store whatever half-bodies are not in use.



The Hopkinson detachable half bodies. (1) A light van body in position. (2) The car as a light lorry. (3) As a two-seated touring body. (4) Equipped with a five-seated touring body.

The Grand Prix Itala.

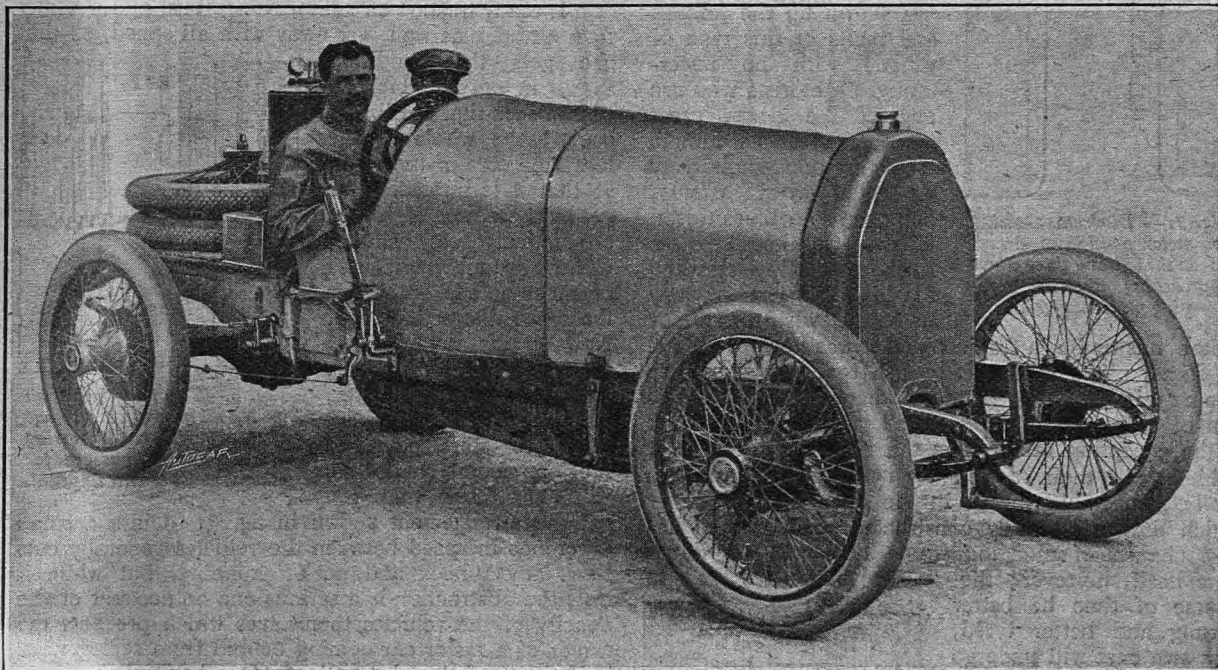
Some Particulars of the Rotary Valve Engine and Chassis. Tests at Brooklands.

THERE has been an engineers' strike in Italy, and, naturally, the automobile centre, Turin, has been involved. This made it very difficult to finish the Itala Grand Prix car, and it was almost decided to ship the parts to Weybridge and to have them assembled at the Itala workshops which are within the Brooklands grounds, but the time required for the transport of the parts, twenty-one days, eventually decided the matter in favour of finishing construction at Turin.

Last week the car was brought to England and a number of tests were made on Brooklands under the supervision of Mr. Bigio, the managing director of the Italian firm. These were of a most varied character, and occupied several days. For instance, one test consisted of running two laps all out on the third speed

(96 kilogrammes), as the designers recognise the importance of keeping the unsprung weight as low as possible. The wheelbase is 9ft. 10 $\frac{1}{8}$ in. (3 metres), the track 4ft. 5 $\frac{1}{8}$ in. (1.35 metre), and the weight of the complete car empty 1 ton 2 qrs. 14 lbs. (1,050 kilos.). It was shipped to France at the end of last week, and will be taken over by its driver, the famous Nazzaro, fresh from his Targa Florio victory.

Of course, the great interest of this car is the fact of it having the Itala rotary valves. We understand from Mr. Bigio that with the fuel limit the horsepower obtained is approximately 110, though as much as 150 h.p. can be obtained with unlimited fuel. This is interesting, inasmuch as, while the capacity of the engine is approximately 8,344 c.c., we believe that the smaller Sunbeam engine, which is 4,524 c.c., gives



Nazzaro at the wheel of the Grand Prix Itala. The vertical tank behind him is for measuring petrol consumption.

with a careful record of consumption. Then a series was made to determine the relative economy of time and petrol in changing a wheel with the engine running and with it stopped.

It will be remembered that the Grand Prix regulations this year are based on a fuel limit of fourteen miles to the gallon, and it is interesting to note that the Itala engineers have adopted the policy of a rather big engine under-fed. The four-cylinder engine has the Itala rotary valves. The bore is 125 mm. and the stroke 170 mm. There are four speeds with a direct fourth, and the gear ratio with 895 × 135 mm. driving wheels will be a fraction higher than 2 to 1. The front wheels are 880 × 120 mm. They and the back are of the latest Rudge-Whitworth detachable pattern, and the tyres selected are Continentals.

The lower portion of the crank case is cast with cooling flanges so as to assist in keeping the lubricating oil reasonably cool. The back axle casing is of stamped steel, as is the case with all the latest Italas, and the whole axle with brakes only weighs 211 lbs.

almost precisely the same h.p. (110 on the fuel limit), though, of course, it is relatively well fed.

Undoubtedly, one of the most interesting technical features of the race will be the comparison of the performances of the large engines more or less under-fed, like the Itala, and those of the smaller engines, more or less well fed, like the Sunbeam. Regarded as stationary engines running at constant speed, the fuel consumption per h.p. developed should be in favour of the smaller engine working more nearly up to its maximum, but a motor car engine cannot be regarded in this light, as the problem is complicated by so many other variable factors.

It will be remembered that the Itala rotary valves are remarkable for their simplicity and for the completeness of their water-cooling and lubrication. They run at only one-quarter crankshaft speed, so that compared with the ordinary valves they have a leisurely time, and are absolutely noiseless in working. On the score of simplicity, too, they stand alone, as only one rotating valve is required for each pair of cylinders.

Motor Omnibus Development.

The Obstruction to other Vehicular Traffic at Fixed Stopping Places.

IT is to be supposed that most motorists are more in favour of the self-contained motor omnibus than of the tram, whether they base their hostility to the latter vehicle on the score of its lack of dirigibility or on the fact that it ruins roads and causes congestion at narrow points, or on the score that it is noisy or that it is expensive, or even because sympathy is extended to the motor omnibus simply for the reason that it is only an overgrown type of motor car. Now

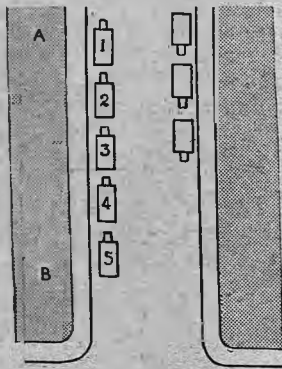


Fig. 1.—Diagram showing five motor omnibuses drawn up on the left and three others approaching a corner stopping place on right.

the continuous increase in numbers which the motor omnibus has undergone in London during the last few months has been really extraordinary, and one regrets to find that this has shown up the failings and faults of this type of vehicle with no uncertainty. Motorists who use any of the dozen great main roads which radiate from London know very well that within twenty, and even sometimes thirty, miles of Charing Cross the surface is being steadily, surely, and not by any means slowly ruined by motor 'bus traffic, a traffic which it was never designed to stand. The same destructive tendency is not so apparent in the bustle of towns, where a straightforward run of as much as one hundred yards without check is the exception rather than the rule, but these great vehicles with their 140 mm. by 150 mm. engines attain really respectable speeds in the open country under which only a specially constructed road surface has any chance of standing up. This will no doubt cure itself, however; the 'buses themselves will in course of time be better sprung and better tyred, our own cars will undergo the same improvement, and the evil, if not removed, will at least be mitigated. There is, however, an even greater trouble which has been brought about by the greatly increased number of motor 'buses now operating in London, and the fact that this trouble exists when, with very few exceptions, all of these vehicles are operated by one company, makes it of all the more importance.

The fact of the matter is that it is now becoming a matter of greater difficulty to drive a private car, or any other car for that matter, in London. It is not that a long chain of motor 'buses such as one gets along Oxford Street, Regent Street, Piccadilly, Edgware Road, Finchley Road, etc., impede traffic, for so long as they are all on the move it is all right, the trouble occurs when one comes to one of those stopping places which are, apparently, arbitrarily fixed

either by police regulations or by mere custom. The diagrams accompanying this matter make the whole thing clear.

Fig. 1 shows how a 'bus arriving at, say, Chapel Street (where one may frequently see as many as six or seven drawn up in a line on either side of the road, which, so far as other traffic is concerned, is thus reduced in effective width by about 50%). Between points A and B a number of passengers are waiting. As human beings they observe the time honoured rule, "first come, first served," and the majority of them, therefore, hurry on to 'bus No. 1. 'Bus No. 2 also gets its share, but 'buses Nos. 3, 4, and 5, having come up whilst the earlier numbers were being filled, do not get so much patronage. With a view to equalising matters at the next stopping place, and as soon as it is ready to start off again, No. 3 'bus, and possibly Nos. 4 and 5 as well, get away with all speed, so that

one gets the condition shown in fig. 2. Here it will be seen that the 'buses occupy the whole of the left hand side of the road, so that it is impossible to get by them, although they are moving very slowly, without running the risk of meeting the traffic on the other side of the road. Now by the time Nos. 3 and 4 are level with Nos. 1 and 2, these latter, having loaded up, are ready to start off, and they immediately do so, with the result that you

get the arrangement shown in fig. 3. Quite a small difference in speed between the vehicles generally cuts short any "neck and neck" running, but while it lasts the obstruction is a serious one on account of the opacity of the vehicles themselves which prevents the driver of a faster car coming behind from seeing what is in front of the obstruction. One has only to drive a car constantly in London to realise that the objection raised is not a mere paper one but a very material actuality. This is especially so because, referring back to fig. 2, when No. 3 'bus first "pulls out" he cannot easily see if there is a car in the act of attempting to pass him. He has to consider the steering of his own 'bus, and he has also to give some attention to the mirror which indicates whether the passengers are all aboard. The conductor is likewise generally too busy to hold out a warning hand.

It is difficult to say how this trouble can be averted, because the rights of those who use the motor omnibus have to be considered as much as those of drivers of motor cars. To make the obvious suggestion that 'buses should be compelled to leave the stopping places in the same order as they reach them would be either to make the journey from point to point much slower in the aggregate or to encourage racing between the 'buses between the fixed stopping points. Yet if the present state of affairs can arise when there is no real competition between one line of vehicles and another, how much worse will it be when, as one may suppose is inevitable, other companies come along in opposition to the present ones.

W.G.A.

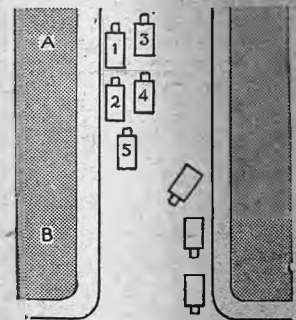


Fig. 3.—The five 'buses on the left all moving ahead; one of three on the right drawing out so that the passage for other vehicles is still impeded.

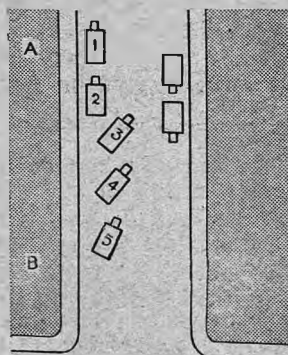


Fig. 2.—Three of the five 'buses on the left drawing out to pass the others in front, so blocking the roadway.

On the Road.

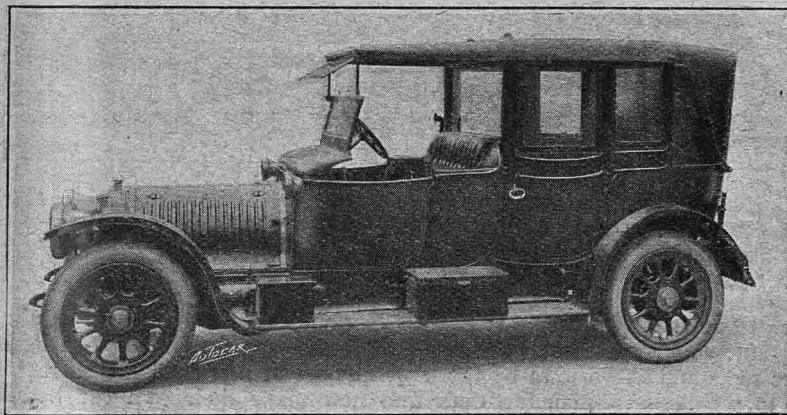
Coachbuilders and Cars. The False Economy of Small Tyres. French Roads.

EVERY month there comes to me by post a little-known magazine of much interest to motorists called *Cooper's Vehicle Journal*. I suppose its principal circulation is among carriage builders, but its contents entitle it to a much wider scope, and ordinary amateurs can learn a great deal both from the reading matter and from the advertisements in it. There are also an invariable half-dozen of coloured plates of the latest things in motor body work; these make excellent pictures for one's children to play with and to cut out. But during even the last

Door handles to motors have, during my experience of cars, often been provocative of much language. Very often we have blamed them unjustly, because how can one expect doors always to fit when large heavy men use them as helps to get in and out of cars by, lean on them when open, and generally treat them in every way exactly as they should not be treated. When door handles began to be put in on the tops of doors they collected in their slots all the rain water that was about and ran down the hood sticks. Was it to be wondered, then, that they rusted, stuck up, and finally refused to fulfil their ordinary functions? Now this has been cured, and every proper door handle ought to open by downward pressure and afford no slot for the weather to get in by and play annoying tricks.

Of course, also, there is the inevitable page—or pages—of new inventions, culled from all the world over, because I believe, the circulation of this paper is by no means confined to its native land. Indeed, an interesting article on technical education in carriage building on the Continent shows us that once again we are behind in training the young idea, and how America is taking the trouble to find out the best way to teach her own rising generation.

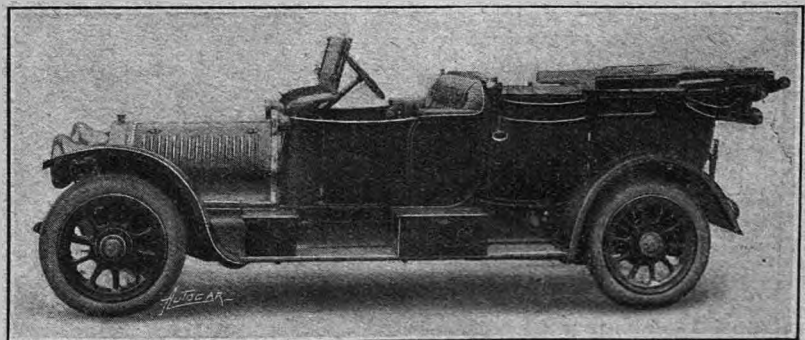
Then come some hints on advertising, showing how old-fashioned firms are often still content to waste 70% of the space they pay for. As yet we, as apart from advertisement agents, do not fully appreciate the value of good and well-placed "ads." May I, without making an "ad." of it, tell a little tale to illustrate my point. A relative of mine invented a "slug trap"—the name explains its use—and for a few years was quite pleased to sell it to his friends and neighbours. He then dashed out into a large advertisement of the traps in a gardening journal. He is now almost ruined from buying stamps to return the thousands of postal orders for traps he is quite unable to supply owing to the demand. However, this is such a splendid year for slugs that he hopes to be able to retire as a millionaire after another rainy



A 20-30 h.p. Hotchkiss with a three-quarter cabriolet by Hamshaw, of Leicester. This car was recently supplied to Lord Tredegar, by the London and Parisian Motor Co., Ltd., 87, Davies Street, London, W.

three years I have noticed a great change in this journal. Although, of course, three years ago it dealt to a very large extent with motors, yet ordinary horse carriages and accessories loomed large in its columns.

In the latest issue I think there is one picture of a governess cart (with a Cape hood to it, by the way), but all the rest is motors, motors all the way, and all the advertisements follow suit. A study of the latter is very instructive, for here we can learn much as to the art and nicety of *carrosserie*, how very many parts there are, the difference between good and bad, between cheap and expensive, and between imitation and genuine. One can also learn other things, but this is no place to discuss those matters. An article on leather and leather substitutes is of much interest, and it is good to read how leather substitutes are becoming almost as good as the stuff they copy, though, of course, they can never hope to equal it for wearing qualities. Then there is much on how to judge leather and what to look for and to look out for. Also a new and wonderful machine for measuring hides has just been invented and come into common use, whereby, in order to avoid certain Transatlantic dodges and ideas, the owner can see he gets what he pays for and what he imagines he is getting. Next to this is an extremely enlightening article on motor door handles, and until one studies the subject one can have no notion of the different kinds there are.



Another view of the 20-30 h.p. Hotchkiss, supplied to Lord Tredegar, in which it will be noticed that the head folds down quite neatly. A C.A.V. dynamo lighting set is installed, and Sankey detachable steel wheels are fitted.

On the Road

spring or so. Short and sweet, but to the point, is it not?

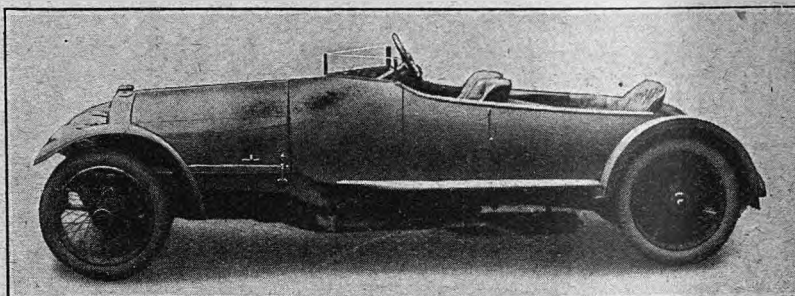
Another article is on the subject of "tyre repair for the garage," and there is much information to be got out of this, while the following one deals with the vexed question in industrial motor circles of how to fit removable bodies to a chassis so that the engine may be hauling one load while another is being prepared at the works, the brewery, or the railway station. Horses, till lately, have in this matter somewhat scored over motors; now apparently the obstacle is removed, and the last excuse for the employment of horses has vanished.

After which, to my great surprise, I came across a most instructive and well-written article on *Heraldry*—of all things!—with illustrations, and now the derivations of all sorts of coats-of-arms and crests are clear to me. Truly, there are lessons to be derived everywhere and in everything.

Now I have by no means exhausted the interesting contents of the number, nor have I dealt with the pictures and the diagrams that abound in it. But I have written enough, because my notion originally was to point out to my readers how many-sided a thing automobilism has become, and how far and wide go its roots and its branches. One could also moralise as to the limitations of prophecy. Not ten years gone the coachbuilders were yapping and writing to their members of Parliament to interfere with motor cars because they were threatening to destroy their businesses and take away their means of livelihood. I remember, as late as 1903, hearing tales of woe from them, and certainly it did not seem before that time that much high-class coachwork could be put into the oily, ramshackle, noisy cars that then represented motor bodies and machines. I will not ram home the argument, for everyone knows that for one expensive horse carriage then built there are fifty even more expensive motor bodies made, while the proud proprietors who own and run the works are without doubt the most comfortable-looking and prosperous body of gentlemen to be

found throughout the world. Which nobody will deny.

Indeed, so successful are some coachbuilders that they even go so far as to have special chassis built for them, and the combined result is known by their name and not that of the motor builder at all. Whether or not these are satisfactory I have no means of knowing, except that certain cars that answer to the names of their body builders go and prosper, and their users are loud in their praises. Again, certain body makers



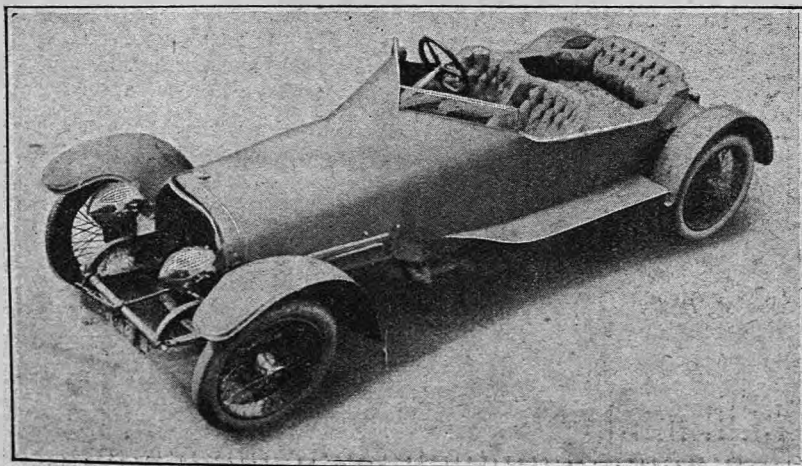
AN EXPERIMENTAL BODY. Built by Messrs. Chas. G. Imshaw and Sons, Sunderland, on a new 30 h.p. Sheffield-Simplex chassis, for the dual purpose of testing the V-shaped screen and scuttle for back draughts and for evolving a light neat body easily produced in a few days for testing and demonstration purposes.

become specialists to some cars with excellent results, while how fine a business carriage building can be is shown by the large number of first-class British motor manufacturers who now make their own car bodies and turn out work that can compete with the best of that of old-fashioned coachbuilders who do nothing else.

With chassis and body manufacturer, perhaps, lies my hope of further improvement by more or less radical change in design. Where there is no union between body and chassis maker we are not likely to diverge far from the accepted type of modern enclosed or semi-enclosed body. But where the chassis maker is his own coachbuilder he can experiment, and it is from this class that we must look for adaptations or copies of the Lanchester or N.E.C.-type of car, success in which will quickly "scrap" for many reasons the present cumbrous and wasteful style of *carrosserie* we now all admire only because we are "used" to seeing it.

Yet fashions can change quickly, and just as rapidly what we once admired can seem extraordinary and awkward. Feminine fashions, for instance, are types of this; male fashions, except in hats, do not alter, except slowly in decades, and even then invariably in the direction of extra comfort. (For which Heaven be thanked and which forms another argument for keeping all voting power in our own hands.)

But I am wandering, although by confining myself to my original subject I am in danger of repeating arguments I used only a few short weeks ago. Which reminds me that at about that time there was an editorial article in this journal on the folly of being under-tyred and on the even more egregious stupidity of buying a chassis for an open



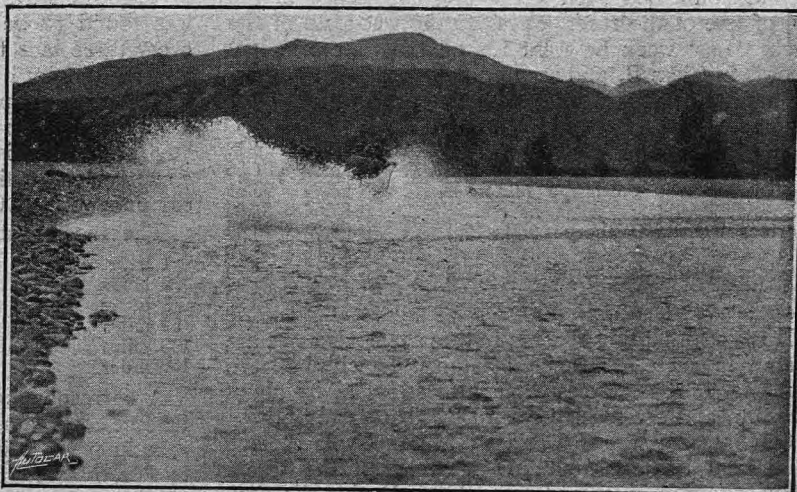
AN EXPERIMENTAL BODY. We understand that the low V-screen and V-scuttle are a decided success, as there is no back draught to the front seats, and considerable protection is afforded to the occupants of the back seats. The wings, as shown, are merely temporary.

body for the sake of apparent economy and afterwards overloading it with a type of body it was never built to carry. This practice is bad enough, but when, in addition, tyres are fitted of a size that ought never to have been put on, the two evils are past praying for. Nor is there even an apparent economy, for nothing makes a car look worse than being under-tyred, while the whole appearance of a handsome body can be spoilt by weight that flattens out the springs, and, in conjunction with under-sized tyres, brings the whole conveyance much too close to the ground. Many cars are made cheap looking by cheap tyres, and no one knows better than the owner-driver how economical it is to have as good things in tyres as one can on one's car.

To revert for a moment to my original text, my sole complaint against the coloured plates in *Cooper's* is that in every case the cars they represent appear to be under-tyred, though possibly this is a survival of horse-carriage drawing where it was always *de rigueur* to make the spokes and rims of the carriage wheels look almost spider-web-like in their airiness and elegance. With motors, however, the same idea only spoils the effect. Big tyres are a wonderful comfort—except when one has to change them on the road. Before the days of spare wheels and rims this was always occurring, so perhaps there was some sense in having them of such a size that one could change a cover if need be without help. But now that no one

ever dreams of going out without one or other of these contrivances—or at least a Stepney—this trouble is not contemplated, and so, except on the score of a foolish economy, there is no reason for running on tyres which are unsuitable, and, in addition, are far more uncomfortable than larger ones.

On the Road.

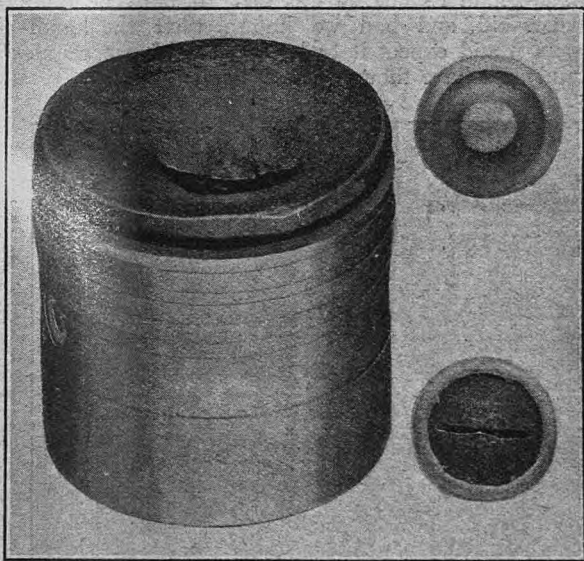


Neither a hydroplane nor a motor boat, but a Vauxhall car crossing the Conway River during the course of the Canterbury (New Zealand) A.A. Reliability Trials, held recently, in which the Vauxhall made a non-stop run and the best fuel mileage.

I came across a sad case of a similar error of judgment a few weeks ago. A car was sent with an entirely English *chauffeur* to the South of France by road, and its owner was to join it there. Unthinkingly new tyres were not provided on the car with the result that half-way across France all those on the wheels and all the spare ones were used up, and the driver, having spent all his money on the purchase of others, had to abide where he was till more cash reached him by telegraph. Troubles, of course, never come singly, therefore no one was surprised to hear that the money was telegraphed to quite another town in another part of the country, and so it was days before ever the car could get away.

For a foreign tour it is well to start with new tyres, for not only does it save a lot of bother and worry, but also when one gets home it is pleasant to boast of one's entire freedom from trouble of all sorts and kinds. Mention of tyre troubles abroad—I have strayed from my topic so far that I shall not attempt to return to it—reminds me that I have smiled much at the noble army of motor journalists who tore to the South of France by the usual roads, and have come back to complain of their shocking state. Of course, these roads are bad because everybody of like kind in making for the same destination uses them. But to say all French roads are shocking because the big *routes nationales* to Monte Carlo are worn out is as absurd as to say that all London streets are overcrowded because one gets blocked outside the Mansion House between ten and eleven o'clock in the morning during the customary congestion consequent upon the simultaneous entrance of so much traffic into the city. I have travelled on many big roads in France which are off the main runs between Paris and the South; these are still as good as they can be, and to complain, because the highway between Lyons and Avignon is shocking, that France, in so far as the state of her roads is concerned, isn't what she used to be, is to display a dreadful lack of experience and power of deduction.

OWEN JOHN.



A damaged steel piston and two views of a broken valve head. The cause of this condition of affairs was the breaking of the valve head, which fell into the combustion chamber. As the driver was in a hurry he relied on the toughness of the steel piston to enable him to get home on three cylinders without having to wait to dismantle his engine. The makers of the piston, the Oxygen Welding Works, 42-44, New Summer Street, Summer Lane, Birmingham, suggest that this procedure would have been impossible with cast iron pistons, which would probably have been smashed to splinters.

On the Track.

Records fall to the Credit of Humber, Singer, and Argyll.

FRIDAY last week saw Mr. Tuck on the track with the Humber (70.4 × 130 mm. = 2,024 c.c.) car that did so well at the Whitsun Meeting, when he had such a thrilling experience at the end of one of the races, owing to the wet state of the track. Last week he went for all the four principal records in Class B, and secured them all. The following are the official figures with the previous ones for comparison:

	m. s.	m.p.h.
Half Mile	0 22.07	= 81.56
Previous record, Calthorpe (69½ × 125)	0 23.79	= 75.66
Kilometre	0 27.44	= 81.52
Previous record, Calthorpe (69½ × 125)	0 29.63	= 75.49
Mile	0 44.56	= 80.79
Previous record, Calthorpe (69½ × 125)	0 48.46	= 74.29
Ten laps	21 42.89	= 76.45
Previous record, D.F.P. (70 × 130)	24 51.66	= 66.78

It is not often that records in these junior classes are beaten in such handsome fashion. It will be seen that the short distances are improved upon by about 6 m.p.h. and the ten lap record by about 10 m.p.h.

On Saturday the Brooklands Motor Cycle Racing Club held its third monthly meeting on the track, being favoured by splendid weather. During the time trials Mr. B. Haywood on the Singer cycle car made excellent times for the kilometre (flying start) and mile (flying start), beating the previous records put up by the Morgan by about seven miles an hour.

The actual figures are as follows:

4-CYL. SINGER (63 × 88 = 1,096 c.c.)		
Mile record	54.67s.	= 65.85 m.p.h.
Kilometre record	33.64s.	= 66.5 m.p.h.
PREVIOUS RECORDS BY 2-CYL. MORGAN (90 × 76 = 966 c.c.)		
Mile record	61.16s.	= 58.86 m.p.h.
Kilometre record	37.95s.	= 58.94 m.p.h.

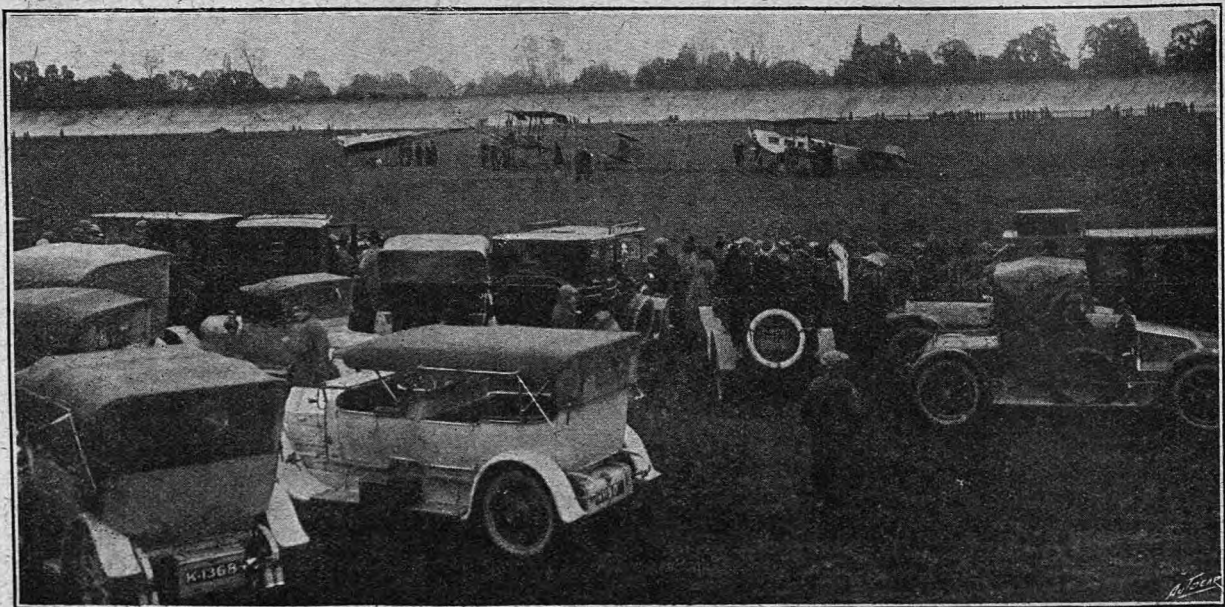
We have not hitherto devoted much space to the joings of cycle cars on Brooklands, but progress such as is indicated by these figures cannot be ignored. Only so recently as last Saturday week (the 10th inst.) the same car put up records for the longer distances,

leaving most of them at well over a mile a minute! On this occasion Mr. B. Haywood drove for the first two hours, after which Mr. G. Baker took his place. It was when the change was made that the radiator was found to be leaking badly, necessitating a stop every three laps to replenish the water, and dropping the mileage per hour considerably. The official figures indicate the complete weight of the machine, including a gallon of petrol and half a gallon of oil, to be 764 lbs., which is just 20 lbs. under the maximum of 7 cwt., which entitles the car to be classified as a cycle car under the A.C.U. rules.

The records secured on May 10th are as follows:

1 hour	62 miles 1,136 yards	= 62.64 m.p.h.
2 hours	122 miles 519 yards	= 61.14 m.p.h.
3 hours	173 miles 1,240 yards	= 57.9 m.p.h.
50 miles	0h. 47m. 50½s.	= 62.7 m.p.h.
100 miles	1h. 37m. 51½s.	= 61.31 m.p.h.
150 miles	2h. 32m. 47½s.	= 58.9 m.p.h.

A correspondent asks how we can name a possible favourite for a race before the handicap is out, the case in point being the Grand Prix F.I.A.T. entered by Mr. Mayer and driven by Mr. Macklin. Looking back to our notes which appeared on the 10th inst. we see that we roughly classed most of the cars entered for the Private Competitors' Race into two main groups—a thing not very difficult to those who watch the cars and the handicapping methods closely. Then we said we rather fancied the F.I.A.T., if only because it was to be driven by Mr. Noel Macklin, and, we might have added, "supposing it receives a fair chance at the hands of the handicappers." The car was known to be fast, and Mr. Macklin has a good record as a driver, but as it was subsequently put upon the same mark as the six-cylinder Sunbeam and the Rolland-Pilain its chance was nil! It must be quite six years old, and had we known what the handicappers would expect it to be capable of, we should certainly not have thought it a "likely" car.



FLYING AT BROOKLANDS. The start of an aeroplane cross-country handicap. On the right is seen the winner, the 80 h.p. Gnome-engined Sopwith biplane. Next is the Ducrocq Farman biplane, and in the rear the 120 h.p. Austro-Daimler Martin-Handasyde biplane.

The Argyll World's Record Run.

1,016 miles 437 yards in 14 hours (72.59 m.p.h.) with the 15-30 h.p. Argyll Single Sleeve Valve Engine and Parallel Worm Drive.

A very fine fourteen-hours' record performance was put up by the single sleeve valve Argyll car on Monday last, breaking new ground in Class D, in which hitherto only the shorter records have been essayed, and which are held by the Straker-Squire. The following are some particulars of the car and its equipment. The engine has four cylinders 80 x 130, giving a cubic capacity of 2,614 c.c. The ignition is Bosch high tension, the plugs are Bosch, and the carburetter is a Zenith. The final drive is by worm gearing, the ratio being 3.25 to 1. Wheels 820 mm. fitted with plain Dunlop tyres and Dunlop detachable wheels. The car has a single-seated racing body tapering almost to a "fish tail."

It has often been remarked upon and regretted that, although sleeve valve engines and worm drive have become quite common in touring use, hitherto no important record performance has been accomplished with either if we except the original Daimler test shop run which, though wonderful enough in its way, was not quite the same thing as the sustained speed work on road or track. Realising this, the Argyll Company have for some time been preparing to do some work on Brooklands, and they were successful last Monday in beating the world's record for fourteen hours, and setting up new times for the Brooklands capacity rating Class D.

The start was made very early, actually taking place at 6.22 a.m., only a very short preliminary canter being indulged in. It was the intention of the competitors to adhere as closely as possible to an average speed of about 72 m.p.h.

The first man to take the wheel was Mr. W. H. Scott, and he got into his stride very rapidly, despite the decidedly chilly atmosphere. Thus the 50 miles were covered at the rate of 72.83 m.p.h., comparing very favourably with the final average of 72.59 m.p.h. for fourteen hours.

For three hours there was no special incident whatever, so there was good opportunity to observe the extremely painstaking arrangements which had been made to ensure the greatest possible continuity of running. We have never seen a depot better arranged—not only had innumerable tools been spread out in such a manner that any one could be seen and found instantly, but there were spares for almost every part of the running gear. Amongst these was a replacement copper pipe for every one on the car. Each of these pipes was covered with rubber tubing to guard against chafing, and each was labelled to indicate its exact purpose. As good fortune prevailed none of these spares were required; in fact, the day as a whole was decidedly uneventful, there being only two or three involuntary stops, and those of very brief duration.

Undoubtedly on runs of this description it is absolutely essential to keep the driver well informed as to what he is doing as regards speed, and it may be remembered that on the occasion of the Sunbeam twelve hours' run every lap time was indicated to the driver as he passed a given spot. The Argyll Co. had extended this idea and showed the actual speed for the previous lap on very large boards, so that to miss them was an impossibility. Further, as lubrication is an extremely important matter, Monsieur Perrot, the designer of the Argyll car, had provided himself with

white and blue flags. When there was no sign of oil smoke as the car passed, then the white flag was exhibited as a hint to the driver to pump in some more from the reserve tank. If, on the other hand, too much smoke was shown, then the blue flag told him to stop the supply. There were no ignition troubles throughout the whole run, and possibly this was to some extent due to the care taken in the matter of lubrication.

The first stop occurred about half past nine, just after Mr. L. C. Hornsted (the second driver) had commenced his first turn at the wheel, the car running into the depot in the 80th lap. It seemed that the petrol was not reaching the carburetter properly, and a small air lock was diagnosed as the cause. This was cured in a very few seconds, and the car went off again, continuing to run quite regularly until the drivers were again changed in the 157th lap.



The Argyll designer, M. Perrot.

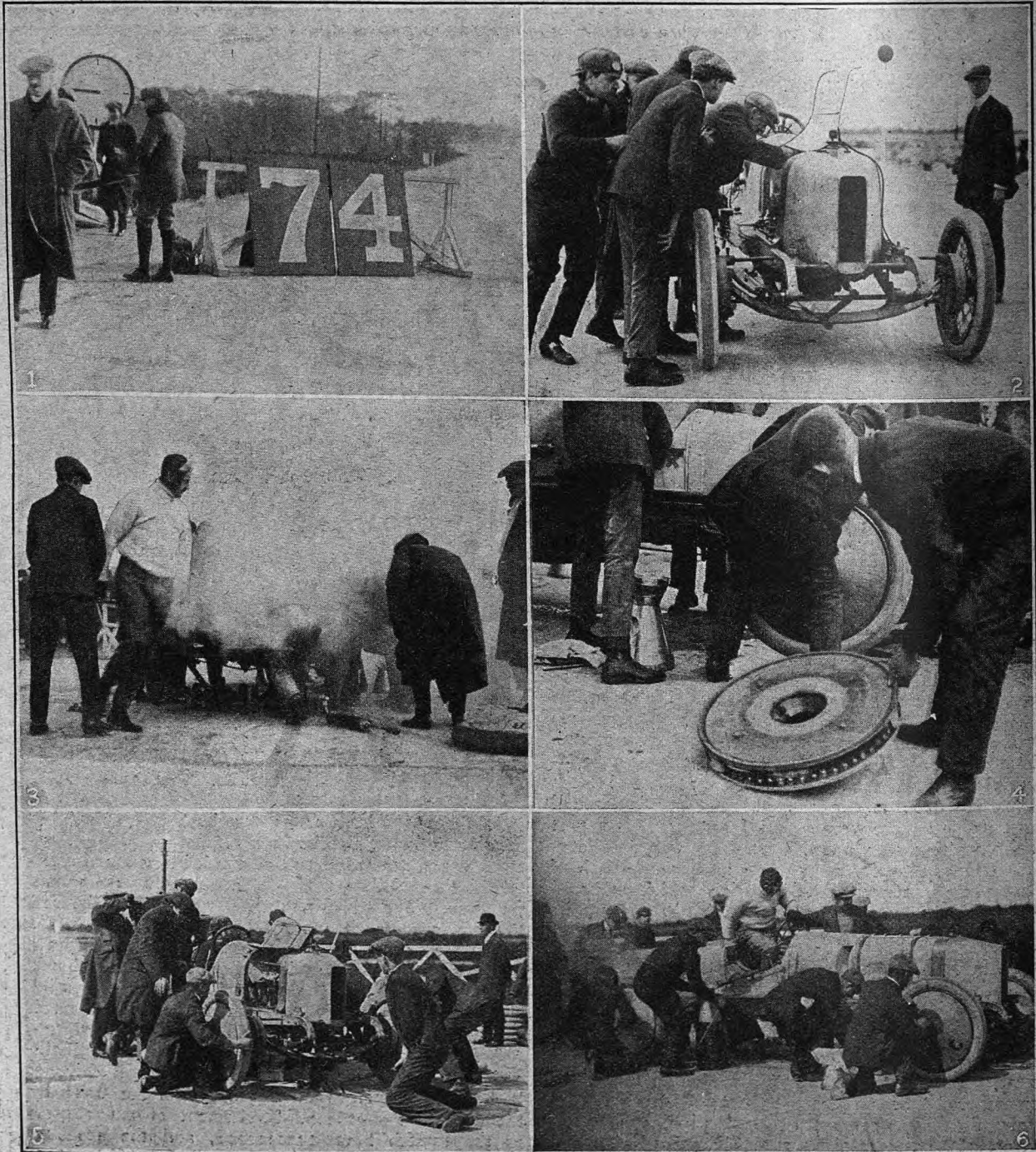
In the 193rd lap Scott lost a back tyre completely somewhere near the commencement of the railway straight and ran round on the rim, it being found afterwards that deflation had been caused by a nail puncture. The wheel was changed very rapidly, and the drivers changed again with four new tyres on the car at the end of lap 210, the car having run in on a flat rear tyre, which was in such a fearful state that it was difficult to find the original injury in the tube, although the cover did not seem to be hurt so much as one might have expected.

Thenceforward nothing unusual happened until the end of the run, except a regular change of drivers; both Scott and Hornsted began to feel the strain by the end of the afternoon. Excitement, of course, grew as the twelfth hour approached, and the schedule mileage being completed it seemed somewhat weary waiting for the completion of the fourteen hours and the thousand miles.

All day the weather was favourable except for an occasional shower and a considerable wind, but the

evening light held good, and Scott was able comfortably to maintain his speed until the very end. The tables on the next page show how extremely small was the variation in speed, and we believe it is correct to say that a run of this length has never been made at anything like so steady a speed. For this as much as for the actual speed itself we think the Argyll Company as well as the drivers of the car are to be heartily congratulated.

We understand that the engine complete with its carburetter and ignition had not been re-adjusted in any way since it left the test shop. Throughout the trial not a single nut was touched other than on the wheels, and no water whatsoever was added to the radiator. Another particularly striking feature of the car was its unusual quietness, it being scarcely possible to hear it on the railway straight while standing at the fork, despite the fact that the wind was that way.



THE ARGYLL WORLD'S RECORD RUN. 1. The number boards by which means the driver was notified of his speed in even miles per hour during the previous lap. 2. A short involuntary stop caused by a partial failure of the petrol supply. 3. Adding oil to the back axle and making other adjustments. The back axle replenishment was carried out by means of the large pump seen on the ground in the photograph. 4. Changing a wheel after a tyre had been lost through a nail puncture. 5. A depot stop. All hands at work. 6. Almost ready to start again after a depot stop.

Figures of the statistical order do not convey a great deal, but there is one which is perhaps worth giving as showing the really strenuous nature of such a run. The engine capacity being under the three litres, the gear ratio on top 3.25 to 1, and the rear wheels 820 mm., allowing for free running during the short stops, the total amount of mixture burnt in the engine during the twelve hours was approximately two and a quarter million litres, this, of course, being equivalent to double that amount of gas displaced.

The Argyll parallel worm drive was used as previously intimated, the rear axle being kept filled with castor oil by means of a huge squirt employed at each stop. As a matter of fact it is to be doubted if this was necessary, since the axle case kept perfectly full, and was never more than just warm to the touch.

As we have already mentioned, there were no records previously standing in Class D (which is limited to cars with an engine capacity of 2,868 c.c.) for a greater distance than ten laps, but it may be of interest to recall the performance of the Sunbeam in Class E last year. This had an engine of 80 x 149 mm. (2,996 c.c.), and covered 910 miles 1,738 yards in the twelve hours, an average speed of 75.92 m.p.h. The world's record beaten by the Argyll was that set up by Mr. S. F. Edge on the Napier in 1907, *i.e.*,

938 miles 480 yards in fourteen hours, which was equal to a speed of 67.02 m.p.h.

The following are the official figures for the run :

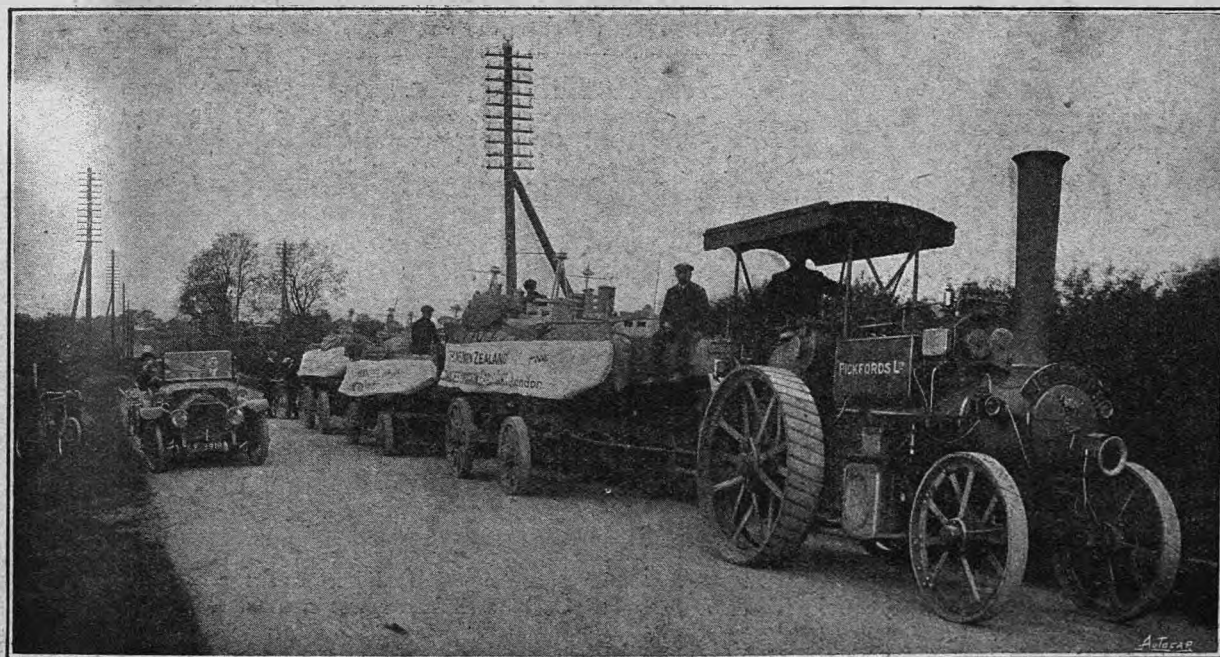
				h.	m.	s.	m.p.h.
50 miles	...	...	...	0	41	11.62	= 72.83
100 "	...	...	...	1	22	9.58	= 73.03
150 "	...	...	...	2	3	4.35	= 73.13
200 "	...	...	...	2	43	47.03	= 73.27
300 "	...	...	...	4	9	9.33	= 72.24
400 "	...	...	...	5	29	11.38	= 72.91
500 "	...	...	...	6	53	46.95	= 72.5
600 "	...	...	...	8	18	29.7	= 72.22
700 "	...	...	...	9	38	23.87	= 72.6
800 "	...	...	...	11	0	24.33	= 72.69
900 "	...	...	...	12	23	44.6	= 72.61
1,000 "	...	...	...	13	47	5.43	= 72.54

			Mls.	Yds.	m.p.h.
1 hour	...	...	72	1,326	= 72.75
2 hours	...	...	146	524	= 73.15
3 "	...	...	220	49	= 73.34
4 "	...	...	288	298	= 72.04
5 "	...	...	363	1,191	= 72.74
6 "	...	...	436	1,196	= 72.78
7 "	...	...	508	429	= 72.6
8 "	...	...	581	394	= 72.65
9 "	...	...	652	804	= 72.49
10 "	...	...	726	1,702	= 72.7
11 "	...	...	799	1,000	= 72.68
12 "	...	...	870	1,679	= 72.55
13 "	...	...	945	360	= 72.71
14 "	...	...	1,016	437	= 72.59

The Late Mr. J. Van Toll.

Last week one of the pioneers of the motor industry passed away in Mr. J. Van Toll. Of late years little has been heard of him in the motor industry, but in 1896-7 he was one of the very few men in this country who knew anything about motor cars at all, and when the Daimler Motor Co. was formed in 1896 he joined it. Many of the old Daimler clients will remember that his practical advice and help were in constant demand in those days, and, unlike some of his contemporaries, he not only had the knowledge but was willing to impart it. Later on he established himself

at Twickenham with Mr. H. G. Burford to manufacture the New Orleans, which we suppose was really the first small car ever made in England. At a later period the business was sold, and Van Toll ceased to take any prominent part in the industry, but the fact remains that, although not a few who have come later, equipped with far less practical knowledge, have apparently gone farther, and, perhaps, made more profit out of the motor industry, there is no one who did more genuine or more useful pioneer work than the genial big-hearted Van Toll.



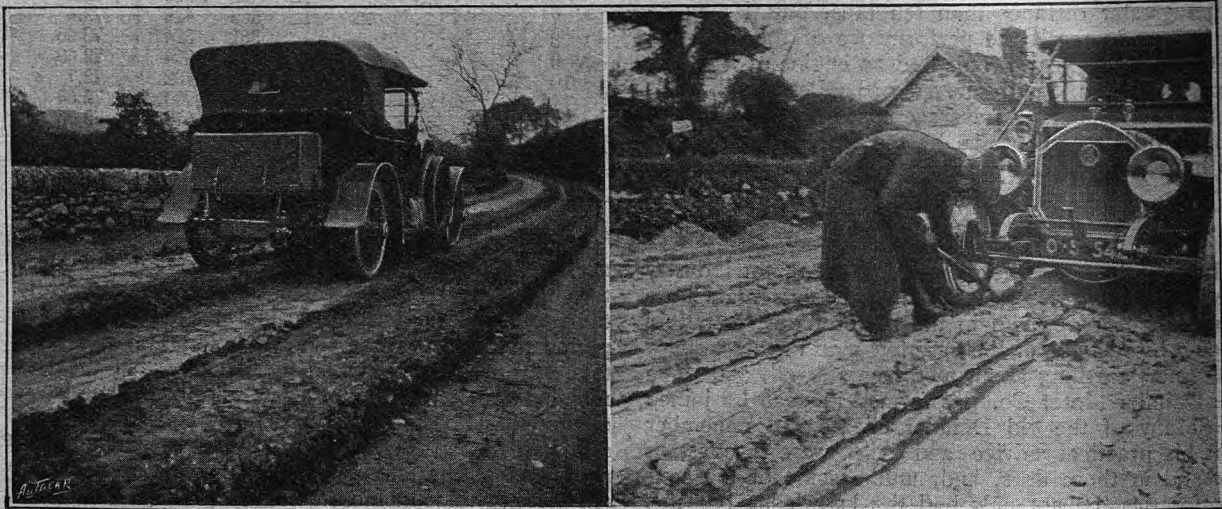
A few days ago motorists on the Holyhead Road were somewhat surprised to meet model battleships and cruisers in tow of traction engines. On enquiry it was found that nine or ten of these models were being sent from Northampton to the Earl's Court Imperial Services Exhibition. The larger models were 25ft. long.

The Main Holyhead Road

I TRAVEL over the road between Cerrig-y-Druidion and Corwen about ten times a year, and have for several years noticed it has been very bad in consequence of much traction work. On Wednesday, the 14th inst., I found this road absolutely unfit for any vehicle or motor car to travel over it without risk of injury. The channels that had been made by the traction engines had resulted in ridges quite a foot high, the worst part being nearer to Corwen. At one point I became absolutely stuck with the steering embedded in the hard mud of the ridge. I had to borrow a spade, and it took forty minutes to get going again and to pass over the next 150 yards. The two photographs which I took at the time will bear out my statement. I had another car that same day passing over this road, and both cars were injured.

It has been a matter of great surprise to me that a section of this great highway from London to Holyhead (for Ireland) should for years be allowed by the district authorities to continue in such a dangerous, disgraceful condition. Has not the Local Government Board power to insist on local authorities keeping the road in at least a passable condition?

On the day that I speak of a number of other cars were in serious trouble as well as mine. I have no hesitation in saying that I have never met any road as bad during my motor experience of sixteen years. To miss this section of road means a *détour* of twelve miles extra through Bala, or a mountainous road from Fflangollen through Ruthin or Denbigh to Pentre Voelas, which is distinctly inconvenient to many.—C. H. PALETHORPE.



Two photographs showing the disgraceful state of the main road from London to Holyhead, between Corwen and Cerrig-y-Druidion. The steering of the car became embedded in the hard ridges of mud, in places twelve inches high, and had to be dug out. Forty minutes were occupied in clearing the obstruction and travelling one hundred and fifty yards.

The Indianapolis Grand Prix.

The following is the list of entries for the 500 mile race at the Indianapolis Motor Speedway on the 30th inst. It will be noticed that, although the majority of the cars are of American manufacture, Europe is represented by Sunbeam, Mercedes, Isotta-Fraschini, and Peugeot.

Driver and car.	No. of cyls.	Bore and stroke.	c.c.
Anderson (Stutz)	4	—	—
Merz (Stutz)	4	—	—
H. Endicott (Nyberg) .. .	6	102×127	6227
Burman (Keeton)	4	129×140	7320
Evans (Mason)	4	110×153	5817
Tower (Mason)	4	110×153	5817
Herr (Stutz)	4	—	—
Guyot (Sunbeam)	6	90×160	6107
Knipper (Henderson)	4	110×153	5817
Wilcox (Fox)	4	121×140	6440
Adams (Smada)	4	89×127	3161
Goux (Peugeot)	4	112×183	7212
Zucarelli (Peugeot)	4	112×183	7212
Liesaw (Amel)	4	114×127	5186
Jenkins (Schacht)	4	124×140	6763
De Palma (Mercer)	4	122×157	7343
Bragg (Mercer)	4	122×157	7343
Wishart (Mercer)	4	111×127	4916
Pilette (Mercedes-Knight)	4	100×130	4084
Pennabaker (Stearns-Knight)	4	130×137	7274
Clark (Tulsa)	4	121×140	6440

Driver and car.	No. of cyls.	Bore and stroke.	c.c.
Mulford (Mercedes)	4	112×181	7134
Grant (Isotta)	4	117×153	6581
Tetzlaff (Isotta)	4	117×153	6581
Trucco (Isotta)	4	117×153	6581
Disbrow (Case)	4	170×140	7432
W. Endicott (Case)	6	110×127	7243
Nikrent (Case)	4	170×140	7432
Haupt (Mason)	4	110×153	5817

On account of their reliability the Hobson-Pognon plugs are used in almost all Continental races and competitions. A notable instance was the Targa Florio, when Nazzaro used them on his victorious car.

In the cycle car competitions at the Brooklands Motor Cycle Racing Club's meeting on Saturday last the Calthorpe miniature car finished second to the 10 h.p. Singer, attaining a speed of 61.32 m.p.h. in the kilometre speed trial and 61.17 m.p.h. in the mile trial. The little car was a standard type with standard two-seater body, and carried a second occupant beside the driver. In the twenty-six lap race it averaged 57.55 m.p.h., despite the engine being stopped twice by the petrol tap being turned off by vibration, and the last four laps being run on a flat tyre.

Motor Fuel From the Gas Companies.

Suggested Removal of the Candle Power Standard to Provide More Benzole for Fuel.

ON Wednesday evening of last week Lord Montagu of Beaulieu invited a number of motor journalists and others interested in automobilism to dinner at the Savoy Hotel in order to afford them an opportunity of listening to an address from Mr. Henry L. Doherty, an American engineer and gas expert, who made some suggestions with regard to the production of motor fuel by existing gas companies. In view of the fact that, in Mr. Doherty's opinion, it was possible that the price of petrol would double within the next two years, he thought serious attention should be drawn to the possibility and the practicability of obtaining motor fuel in the direction to be indicated.

After reviewing many of the methods of obtaining motor fuel, which have already been put before the public, and discussing the much wider range of fuel which would be afforded by using the Diesel engine, Mr. Doherty suggested that considerable relief could be obtained by using benzole obtained from scrubbing town gas with heavy oil. He pointed out that at the present moment the illuminating power insisted upon by the authorities, both in America and this country, was more or less of a dead letter, that is to say, more or less unnecessary, as all but 95% of the gas manufactured for lighting purposes was employed for its heating properties, and not for its illuminating character. [We presume this applied to the United States.] The illuminating properties of the gas depended very largely upon the benzole it contained as sent out to the customers, and, it was suggested, it would be quite feasible to abstract this benzole without deteriorating the service now rendered by gas to the public generally. Mr. Doherty stated that in his

opinion no less than twelve million gallons of benzole were being passed annually into the gas mains of London alone, and this benzole could be scrubbed from the gas at an estimated cost of 1s. per ton of coal carbonised, or in other words per 10,000 cubic feet of gas, which would give two and a half gallons of benzole. The abstraction of benzole would not be a great deterrent, as 95% of the gas for lighting was used in mantle lamps. As the consumption of gas in London was one-fifth of the total consumption of Great Britain, it would mean that the total gas plants of this country could produce in round figures 60,000,000 gallons of benzole, representing 60% of the present consumption of petrol. Mr. Doherty thought that those interested in this important question should spare no pains to obtain the entire repeal of the candle power standard, so that all gas could be washed clean of benzole, which could then be sold as motor spirit. This would make a new epoch in the gas manufacturing world and bring about an enormous and profitable development.

In following Mr. Doherty, Professor Butterfield dwelt upon the effect of removing benzole vapour from gas, and said that to do so would be to abstract from 6 to 7% of its heating power, and that would require 7% more gas to be sent to the consumer to replace it.

Professor Vernon Boys followed Dr. Butterfield, and more or less endorsed the views of Mr. Doherty.

The Chairman of the Manchester Committee (Mr. Kay) said that Manchester was unhampered by any candle power regulations, and that the Manchester gas had some years ago been stripped of its benzole, but that was when benzole fetched 10s. per gallon.

Some Comments by Dr. W. R. Ormandy.

In an article written for *The Autocar* some time ago (March 1st, 1913) on the subject of motor fuels, when referring to the possibilities of obtaining benzole from the existing gasworks in much larger quantities than had hitherto been the case, it was assumed that the gasworks manager had to provide the public with a product satisfying existing statutory requirements. It was pointed out that in an ever-growing degree our coal gas supply depended on the benzole and similar constituents for its light-giving properties. Of course, if we assume the possibility of a radical alteration in the laws of the country regarding the necessary candle-power of our public gas supplies the whole subject must be reviewed from another standpoint.

Coal Gas and Candle-power.

In the early days of public gas supplies iron retorts were used for containing the coal to be subject to distillation. These of necessity limited the temperature employed, and in those days high candle-power gas with comparatively little sulphur—suitable for use in fish-tail and Argand burners—was the common supply.

With the introduction of fireclay retorts the gas managers were able to use higher temperatures, and so to increase the yield of gas, so that Parliament imposed limitations of candle-power to protect the user who might otherwise have been forced to take gas almost unfit for use in the burners then available. To keep up the candle-power and at the same time to get high yields of gas, cannel coals were largely employed in spite of the low grade coke resulting. With the

increased cost of cannel coal, due to the working out of the larger and more easily-worked seams, came the use of water gas enriched with oil which was cracked to yield illuminating gases.

Then came the period of the incandescent mantle, resulting in a general appeal to Parliament for the right to supply gas of lower candle power suitable for incandescent work, but not so poor that it would not give reasonable results with the now almost obsolete flat or fish-tail burner.

Now it has been proposed to ask Parliament that even this lower standard of candle-power shall be removed. If the proposed alteration in the law simply consisted in removing this restriction without the imposition of something in its place, and we assume that the existing gasworks proceed along existing lines, except that they wash out the benzole, what will be the position of the general public?

A small proportion of the gas employed at present (estimated at 5%, I notice) is used in the old type burners, generally in places where there is great danger of mantles getting damaged, as in engineering shops, warehouses, or where a small light is required over long periods, as in passages, etc., and in the houses of the very poorest people. Probably there is nothing in all this that can justify stopping a movement which in other directions can be shown to be of general benefit to the community.

It is a matter of great interest, and happens most opportunely, that of all the light-giving constituents in

Motor Fuel from the Gas Companies.

coal gas benzole is the one which exerts the greatest light-giving influence in proportion to its heat-giving powers. The laws of simple proportion are set at naught in the gas and photometric world. The addition of known quantities of high lighting power gases to a bulk of gas of lower lighting value does not act as might be thought in direct proportion, but in a degree which varies for every individual gas. The accompanying table, taken from Prof. Lewes's book on the carbonisation of coal, illustrates this point:

	B.T.U. gross per cubic foot.	Candle- power per 5 cubic feet.	B.T.U. gross per candle.
Hydrogen	725	nil	nil
Methane	1,024	5.2	985
Ethane	1,870	35.0	267
Propane	2,682	53.3	253
Ethylene	1,603	70.0	115.
Benzene	3,718	820.0	23

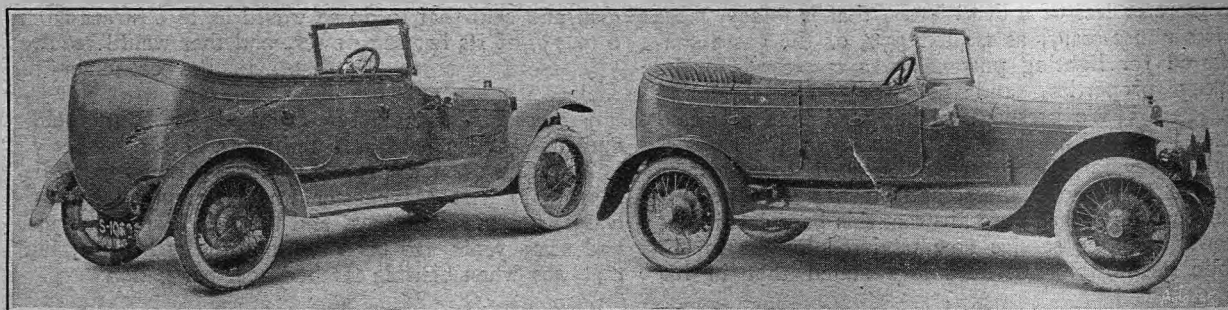
Assuming that the figure which has been given is correct, and there is about two and a half gallons of benzole per 10,000 cubic feet of coal gas, then it can be calculated out that its removal would reduce the heat value of the remaining gas by about 6%, which is the figure mentioned by Mr. Butterfield in the discussion following the delivery of Mr. Doherty's address. Further, we may safely take an average price of 2s. 6d. per 1,000 cubic feet of coal gas, equal to

is only 5%, and whether these adherents to the methods of the past are too powerful to be ruled out of court.

Needless to say, the position is by no means the simple one assumed above. Once do away with the candle power limitation, it will be absolutely necessary to introduce a heat value standard with or without a limitation as to the allowable proportion of the poisonous carbon monoxide. Once the gasworks manager realises that so long as he supplies a gas of, let us say, 500 B.T.U. gross per cubic foot—he can disregard all else—he will begin to amend his method of manufacture.

If anything can be read out of the present tendencies in gasworks methods, it points to the introduction of continuous vertical retorts, and if the candle power limit be replaced by a thermal standard, then the development would seem likely to proceed along the lines laid out by Professor Lewes, viz., the introduction of the maximum amount of water gas into the retorts, with the threefold object of increasing the ammonia yield, increasing the total gas yield, and retaining as much of the carbon of the coal in the gaseous form as possible.

These conditions, however, tend towards the production of paraffinoid hydro-carbons in the place of benzole-like bodies, and these paraffinoid bodies with



An Argyll sleeve valve engined car, equipped with a torpedo body, with adjustable front seats and spare wheel locker in the rear of the bodywork. The chassis is fitted with the Argyll four-wheel braking system.

25s. per 10,000 cubic feet. The public will receive a gas having 6% less heating value, and will for the same work have to consume 6% more. That is, pay roughly 1s. 3d. per 10,000 cubic feet extra to the gasworks to enable the latter to extract two and a half gallons benzole. It is further stated that the cost of washing out this benzole will cost the gasworks 1s. per ton of coal, equal to 1s. per two and a half gallons of benzole to be sold at 1s. per gallon.

If these figures are correct, the gasworks will have a credit of 1s. 6d. per 10,000 cubic feet of gas made, due to the increased value of benzole over the cost of obtaining the same, but they will owe it to the consumer to reduce the price of gas 1s. 3d. per 10,000 cubic feet to compensate for the reduction in heat value. In all this benzole is valued at 1s. per gallon at the gasworks. Will the gas consumer be satisfied with what is change for a shilling so far as he is concerned as regards heat value, with a few minor disadvantages thrown in?

If Mr. Kay has no light limitations in Manchester legally imposed, then he is in an excellent position to study this matter thoroughly. If he can offer his customers a gas of equal heating power, or even slightly higher, no richer in sulphur—I work in Manchester—and can at the same time win benzole from the gas at a profit, there remains only a canvass of the consumer to find out whether the 5% really

a comparatively low light-giving capacity have a very high heat value, and will be required in the gas to give it the necessary heating value. In other words, the removal of the candle power restriction may, and probably will, bring about such alterations in the methods of gas manufacture as prohibit the production of benzole or even of a substitute therefor.

I am aware that a certain section of my critics will again refer with anger, or may be sorrow, to what will be called my pessimistic attitude, and I hope to be able in a subsequent article to refer to the opinion of some leading authorities in the gas world, but in any case nothing is to be gained by looking at a subject from one point of view. Wild and ignorant enthusiasts for a cause often do more harm than good.

In the address given by Mr. Doherty and in the subsequent discussion certain figures were produced—that the possible benzole production of our gasworks was 60,000,000 gallons, presumably from the gas alone, and not including the amount from the tar now extracted. Allowing two and a half gallons per ton, this gives 24,000,000 tons of coal carbonised, somewhat above the figure generally accepted, which, speaking from memory, is about 15,000,000 tons.

The general position is hereby in no wise altered, and I have merely endeavoured to put the matter as it occurs to one interested in the subject from many aspects.

The Sunbeam Cars for the Grand Prix.

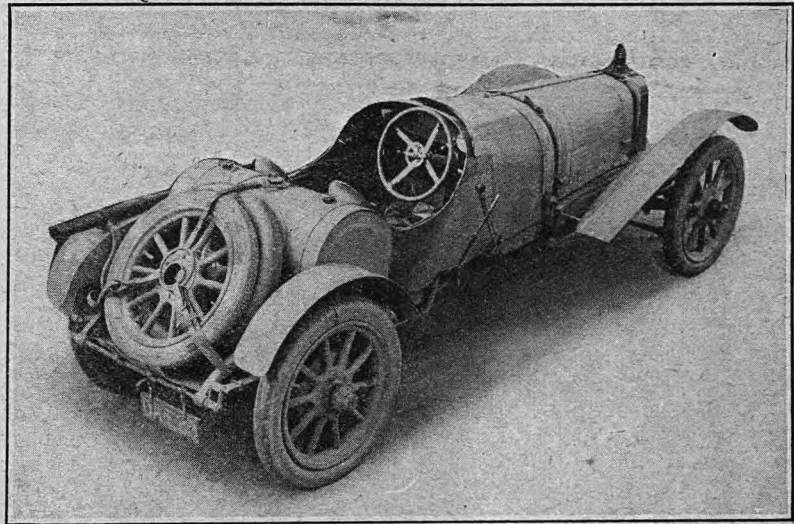
Detail Particulars of the Engine and Chassis.

RECENTLY we were afforded an opportunity of a close inspection and a run on one of the four 85 x 150 mm. six-cylinder Sunbeam racers, prepared for the Grand Prix, to be run on July 12th.

An interesting point in connection with this engine is the fact that a very high compression is used; a compression considerably in excess of that used on the four-cylinder engine of the same bore and stroke, in fact. The designer incorporated this feature with a suspicion that it would have to be modified in order to gain the powers of acceleration necessary in a road race, but, to his satisfaction, he found that the six-cylinder, with the high compression, ran even more satisfactorily than the four-cylinder with the lower compression.

In the racing engine, B.N.D. pistons and connecting rods are used. Each piston with pin, but without rings, weighs .875 lb. The sparking plugs are not set in the valve caps, but in special holes provided for them, so that the points are approximately central in the combustion chamber. A noticeable point in the induction manifold is the large reservoir in the centre, which is water jacketed in parallel with the rest of the water system. From the upper branches of the inlet manifold, pipes are taken to an extra air port, which is situated in the scuttle close to the driver's hand. The carburetter is a Claudel-Hobson. There is a by-pass fitted to the lubrication system, so that the normal pressure for racing of 40 lbs. per square inch can be lowered for ordinary running. An

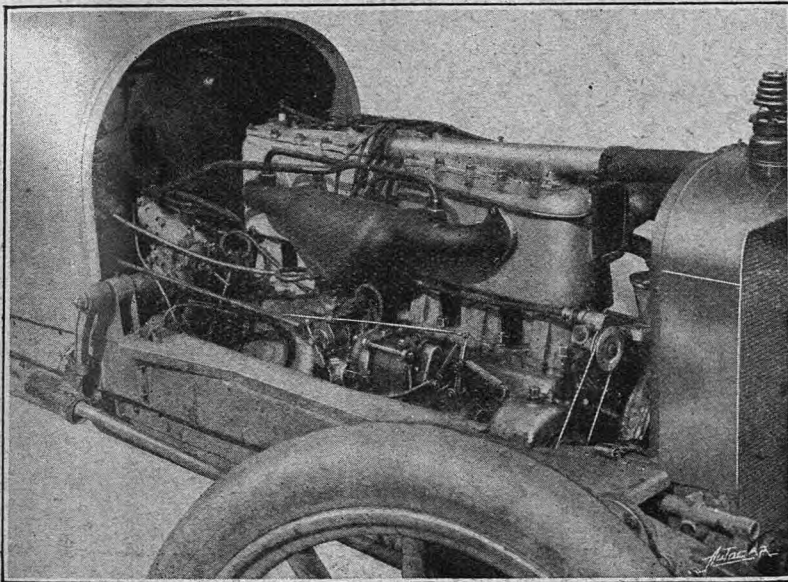
extremely light conical flywheel is used, the lightness being due to the desire for quick acceleration and high engine speeds. The gear box is of standard pattern. The gear change quadrant and the side brake lever are not mounted upon the same centres,



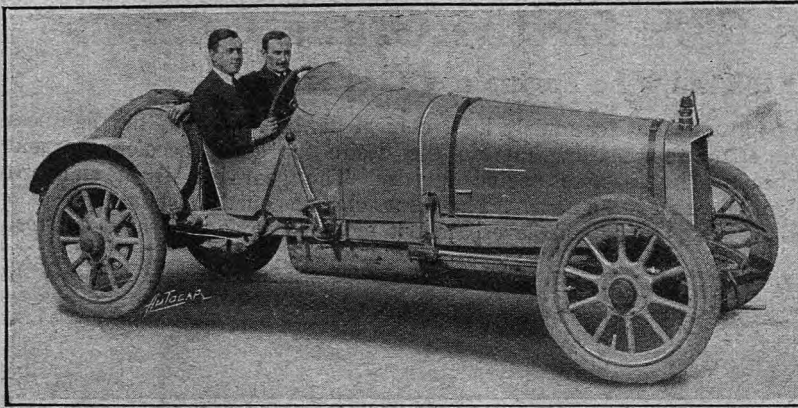
Rear view of the Sunbeam Grand Prix racer.

the side brake lever having no ratchet and pawl device to lock it in any one position, so that it can be instantly released if necessary. A hole is cut in the floorboards, conveniently at the driver's right hand, through which it is possible to adjust the pedala' brake without stopping the car.

With certain exceptions, the chassis design of these cars is identical with a standard Sunbeam touring type. The chief difference is to be found in the fact that a differential gear has been dispensed with. It is claimed that by this means a considerable reduction in tyre wear is obtained, and the gain exceeds the loss brought about in turning, that is, so far as a very fast car is concerned. When a car is travelling at high speed over a normal road, it continually happens that one wheel leaves the ground without the others, owing to the effect of some irregularity in the surface. In the case of one back wheel leaving the ground, the action of the differential is such that there is a tendency for the wheel to be rotated at an increased speed in the same direction as that in which it was previously travelling. The effect of this during the short space the wheel is off the ground results in its speed being accelerated, so that when it once more strikes the road the tyre is submitted to tremendous grinding effect. The abolition of the differential gear, it is claimed, prevents this undue tyre wear and economises power. On

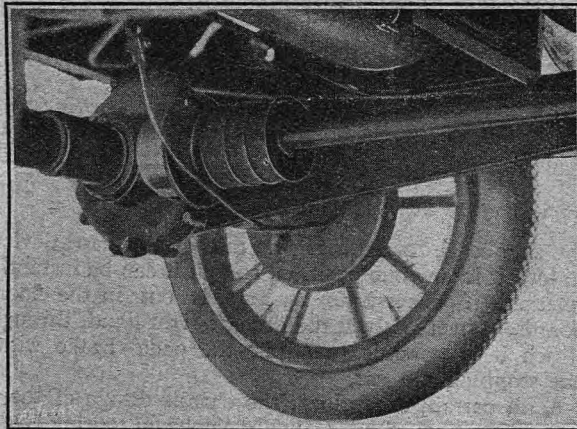


Off-side view of the six-cylinder engine in the Sunbeam Grand Prix racers. An interesting feature is the large water jacketed central portion of the inlet manifold.



Mr. Louis Coatalen, the designer, at the wheel of one of the six-cylinder 80 x 150 mm. Sunbeam Grand Prix racing cars.

the other hand, when turning sharp corners at a low speed there is a considerable wrench on the tyres, but this is not so great as might be expected. Furthermore, racing cars do not frequently turn corners at



The rear axle, bevel drive case, propeller-shaft, and torque member of the Sunbeam Grand Prix racer. View from under the side of the chassis.

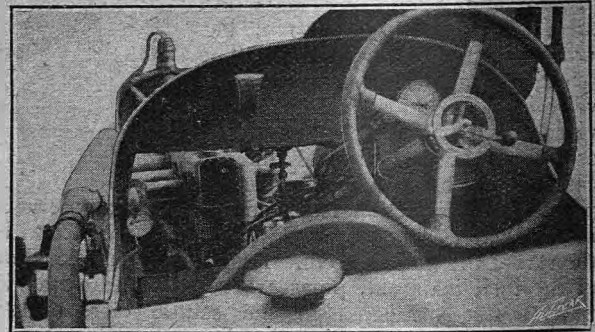
low speeds, the normal practice being to skid round the corners at high speed, differential or no differential, so in such case the tyres suffer the same amount of wear with or without the differential gear.

The Sunbeam rear axle (of which an illustration is given which has been obtained from a photograph taken from underneath the car) consists of a stout chrome nickel steel tube, to the ends of which the wheels are fixed. This steel tube rotates in substantial ball bearings inside the spring pads. At its centre it carries a crown bevel gear meshing with a bevel pinion driven by the propeller-shaft. This gear is contained in an aluminium case carried on bearings on the tubular axle-shaft, and prevented from rotating thereon by means of an I section torque rod. Light aluminium tubes surround the axle from either side of the central bevel gear case to the spring pads, with the object of keeping out dust and wet. Beyond this they have

no other work to do, as they take neither load nor torque.

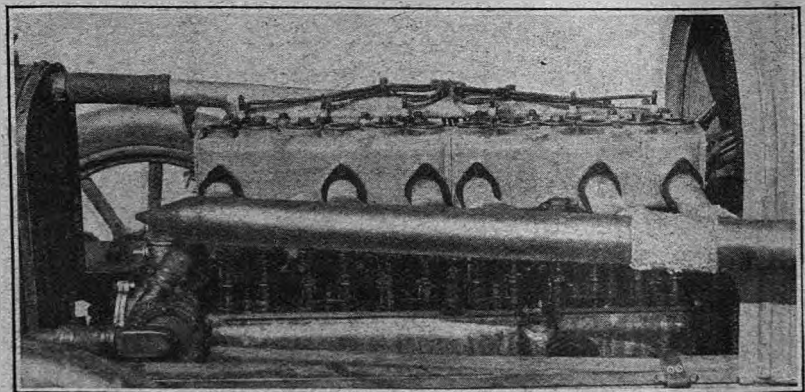
The springs are similar to those used on the standard touring car. B.N.D. shock absorbers are fitted to all four springs; Goodyear detachable wheels and Dunlop tyres are used. The weight of the car is barely over 18 cwts. The engine is capable of developing 110 b.h.p., and the car has attained a speed of 103 m.p.h. The petrol consumption is in the neighbourhood of 14 m.p.g.

With regard to the running of the car, the most remarkable feature is the manner in which it holds the road. At all speeds one is unconscious of any but a forward movement so well is the springing arranged in combination with the shock absorbers. Although the car is comparatively light it rides like a 2 ton car running slowly on extra big tyres, a quality most difficult to convey in words and equally difficult to apply in imagination to a car travelling at ninety miles an hour.



View from behind the mechanic's seat of the Grand Prix racing Sunbeam.

The absence of a differential was absolutely unnoticeable as regards steering effort at high speeds, but the remarkably straight path kept by the car is doubtless due in some measure to the equality of the drive to both wheels under all conditions. The steering is extremely light; the wheel, although of large diameter, has a rim unusually small in section and wound with cord.



Near side view of the six-cylinder engine in the Sunbeam Grand Prix racers. When the bonnet is in position the water pump is outside it. It will be noticed that the sparking plugs are specially placed in the centre of each combustion chamber.

Aston Open Hill Climb.

The Full List of Entries for the Above-named Event, which takes place to-day (Saturday), on Aston Hill, near Tring, is as follows:

CLASS I.—FOR CARS UP TO 10 H.P. BY FORMULA.

No.	List H.P.	Car.	No. of Cyls.	Bore and Stroke.	Entrant.	Driver.
1	7	De Dion Bouton	2	66 × 120	J. W. Stocks	W. B. Boyle
2	8-10	Mathis Babylette	4	58 × 90	A. E. White	Entrant
3	10	Turner	4	60 × 100	J. R. M. Crawford	Entrant
4	10-16	Mathis Baby	4	65 × 100	J. W. Lenanton	Entrant
5	10-16	Mathis Baby	4	65 × 100	E. E. C. Mackenzie Martin	Entrant

CLASS II.—FOR CARS OF OVER 10 H.P. AND UP TO 16 H.P. BY FORMULA.

6	13.9	Stoewer	4	75 × 88	W. Turner Smith	Entrant
7	10.9	Stoewer	4	65 × 118	H. Booker	Entrant
8	12-20	Brenna	4	70 × 102	C. A. Macrae	Entrant
9	12-14	Vinot	4	70 × 110	H. Ramoisy	E. W. Brooks
10	10-12	Métallurgique	4	75 × 96	Oscar Cupper	B. Brown
11	10-14	Grégoire	4	65 × 130	S. C. Westall	Entrant
12	12	Laurin and Klement ..	4	70 × 115	H. K. Chambers	Entrant
*13	11.9	Arrol-Johnston	4	69 × 120	F. G. Warwick	Entrant
14	12-15	D.F.P.	4	70 × 130	W. O. Bentley	Entrant
15	14	Windhoff	4	75 × 118	L. Fishwick	Entrant
16	14-18	Adler	4	75 × 120	Morgan and Co., Ltd.	E. Brandt
17	15	Iris	4	80 × 114	H. F. Hodges	Entrant
*18	12	Rover	4	75 × 130	W. J. Wainwright	Entrant
19	14	Humber	4	75 × 130	W. G. Tuck	Entrant
20	14	De Dion Bouton	4	75 × 130	J. W. Stocks	E. V. Fielder
*21	12	Rover	4	75 × 130	W. Young	Entrant

CLASS III.—FOR CARS OF OVER 16 H.P. AND UP TO 25 H.P. BY FORMULA.

22	12-16	Sunbeam	4	80 × 120	E. Genna	Entrant
23	15	Crossley	4	79.4 × 123.8	W. M. Letts	C. Bianchi
24	15-20	Vinot	4	80 × 130	Gordon Usmar	Entrant
*25	15.9	Shelsley-Crossley	4	80 × 130	H. O'Hogan	Entrant
26	15-18	Bedford-Buick	4	95 × 95	General Motors (Europe), Ltd.	C. Catlin
27	15.9	S.C.A.R.	4	80 × 140	C. J. C. Street	W. H. R. Walker
28	18	Florio	4	85 × 130	E. Gillett	Entrant
29	16.9	S.C.A.R.	4	82.5 × 140	McL. Staight	C. J. C. Street
30	16-20	Vauxhall	4	90 × 118	P. C. Kidner	L. Munro
31	16	Ariel	4	80 × 150	E. Herington	H. A. Hale
*32	12-16	Sunbeam	4	80 × 150	Miss Laura B. Starkey	Entrant
33	20.1	Vauxhall	4	89.6 × 120	J. Barber Lomax	Entrant
34	15-18	Hupmobile	4	83 × 140	C. R. Clark	Entrant
35	16-24	Grégoire	4	80 × 160	Donald Cohen	Entrant
*36	16-24	Unic	4	90 × 130	Mrs. Punnett	Entrant
37	15	Talbot	4	90 × 140	Earl of Shrewsbury and Talbot, K.C.V.O.	H. G. Day

CLASS IV.—FOR CARS OF OVER 25 H.P. BY FORMULA.

*38	25	Vauxhall	4	95 × 140	G. D. Pearce Jones	Entrant
39	25	Paige	4	102 × 127	T. F. Gillett	Entrant
40	30-98	Vauxhall	4	98 × 150	J. Higginson	P. C. Kidner
41	30-98	Vauxhall	4	98 × 150	A. J. Hancock	Entrant
*42	25	Clément-Talbot	4	101.5 × 140	S. S. Barber	Entrant
43	20-25	Crossley	4	101.6 × 140	G. H. Woods	C. Bianchi
44	26	De Dion Bouton	8	75 × 130	J. W. Stocks	Entrant
45	27	Métallurgique	4	105 × 165	Oscar Cupper	Entrant
46	25.6	Hutton	4	102 × 178	F. R. Samson	Entrant
47	48	Rolls-Royce	6	113 × 119	Miss Lena Cooper	R. Jenner
48	38-80	Métallurgique	4	125 × 150	Oscar Cupper	B. Brown

*Indicates entrant for Jay Cup for private members of the Herts. County A.C.

It may be remembered that the h.p. formula mentioned in our issue of the 10th inst. is engine capacity in cubic centimetres ÷ 150.

A further development has to be recorded in the French foreign motor car trade. The exports during the first quarter of the current year were valued at £2,305,776 as compared with £1,785,300 in the corresponding three months of 1912. Although the United Kingdom is still the best customer, the exports to this country are not equal to those of last year, being

only £514,685, as compared with £571,872; decreases are also recorded in the shipments to the United States, Turkey, and Switzerland. On the other hand, it is noticeable from the latest returns that an increasing trade is being done with Belgium, Argentina, Algeria, Brazil, Germany, Italy, Spain, and Russia.

Petrol and Petrol Substitutes.

Lecture by Mr. Robert W. A. Brewer, A.M.I.C.E.

A LECTURE upon the above subject was given by Mr. Robert W. A. Brewer, A.M.I.C.E., before the Institute of Inventors on Thursday last. In his opening remarks the lecturer pointed out how important it became at the present time to utilise the largest proportion possible of the crude fuels of nature for use in the automobile engine. Although it was generally supposed that only the lightest benzines were suitable for this purpose, Mr. Brewer pointed out the effect of the admixture of lighter with heavier fuels, enabling the heavier fractions to be consumed almost as efficiently as though they were heat treated. It was shown that, in spite of the fact that petroleum in any commercial form, either as petrol or paraffin, was a very complex substance, it was possible and highly vital for the purpose of economy that the explosive mixture entering the engine cylinders should be homogeneous. This was only possible by the use of a carburetter which sprayed the fuel into its finest possible particles, and in which the air stream was intimately intermingled with the fuel vapour. Several important characteristics of petrol were explained, such as its volatility and viscosity, and stress was laid upon

the variation of viscosity with temperature. Mr. Brewer showed that it was only possible to obtain the maximum efficiency of combustion by so arranging the fuel orifice or other measuring devices that the amount of fuel or the quantity of air flowing to the engine could be adjusted to compensate for the rise in temperature of the apparatus when working. Treating of the surface tension of liquid fuel definite figures were given for the effect of this as regards the efflux of fuel from the orifice.

The lecturer briefly referred to alcohol and mixtures of this fuel with benzole, and suggested that alcohol was not at the present time a suitable fuel for further experiment in view of the great restrictions placed upon it. Benzole, on the other hand, was shown to be eminently suitable. His own work seven years ago upon the fuel question was referred to, and comparisons were made with later experiments showing that his contention all along in favouring an increase in the specific gravity, accompanied by the production of a suitable carburetter, was the crux of the fuel problem and the question of the supply of sufficient motor fuel to meet the ever increasing demand.

The Del Monte Process.

A few hours too late for publication in our last issue we received the following letter from Oil and Carbon Products, Ltd., the name of the new company recently formed to work the Del Monte process.

37, Walbrook, London, E.C.,
13th May, 1913.

To the Editor of *The Autocar*,
20, Tudor Street, London, E.C.

Dear Sir,—With reference to the article in your issue of the 10th inst. commenting upon the adverse criticism of the Del Monte process by some of your contributors, I am instructed by my directors to inform you that hitherto they have not seen fit to reply to adverse comments in your columns, or elsewhere, as such comments, with a single exception, have been traced to a common origin in the prejudice and jealousy of two individuals.

My directors are satisfied that the Del Monte process is thoroughly sound, and they prefer to direct their energies toward the establishment of the business of successfully working the process upon a firm foundation, rather than to engage in journalistic polemics. They do not need to invoke the assistance of any journal to "check" the working of their plant, but, at the same time, if you are genuinely interested in the process, they will be very pleased to afford you at any time an opportunity to thoroughly examine its working in every detail at your convenience when the plant is disengaged. At present it is being worked overtime in making tests of English coals and shales and material sent from the colonies and foreign countries.

I am, dear sir faithfully yours,

PAUL O. PILLION.

Secretary, Oil and Carbon Products, Ltd.

We do not understand our correspondents' reference to the motives of those who have commented on their process. Surely it is the comments which matter and not the motives of the writers, though we have no knowledge of any prejudice or jealousy on the part of our two contributors who have criticised the process.

With regard to the statement that the company will be pleased to afford us an opportunity to examine the working of their plant when it is disengaged, we shall be pleased to undertake to verify the results which can be obtained by their process provided they will give us reasonable notice to enable us to arrange for a proper and systematic observation of its working and results.

Races on Rosslare Strand.

The Irish Automobile Club purpose holding a series of motor car races at Rosslare Strand on the 8th July. The conditions governing the events have been issued as follows: Cars will be classified according to their weight and horse-power on the following formulæ: Weight of car in lbs. + 150 lbs. allowed for driver

h.p.

$$\text{h.p.} = \frac{D^2 SN}{180,000}$$

D = diameter of cylinder in mm.

S = stroke in mm.

N = number of cylinders.

The classes will be: No. 1, up to and including 70 lbs. per h.p. No. 2, 70 lbs. and over to 100 lbs. No. 3, 101 lbs. and upwards. The committee reserve the right to alter, omit, subdivide, or amalgamate any of these classes. Standard bodies, mudguards, and footboards must be carried by competing cars. There will be an open section and a private owners' section. A handicap allowance in seconds will be given in the private owners' section for age of car, and in all classes for the difference within the limits of the classes. Length of race, nine miles. Entry fee, £1 1s. per car for private owners and £2 2s. for open classes. Challenge cups (200 guineas and 100 guineas), prizes, or medals will be awarded to the winners of the different classes as the committee shall determine.

Rosslare is in Co. Wexford, on the most south-eastern point of Ireland. There is a service of steamers from Fishguard to Rosslare, a crossing of 62 miles.

Entries must be received by the Club Secretary, 32, Dawson Street, Dublin (from whom forms can be obtained on application), not later than Saturday, the 31st inst.

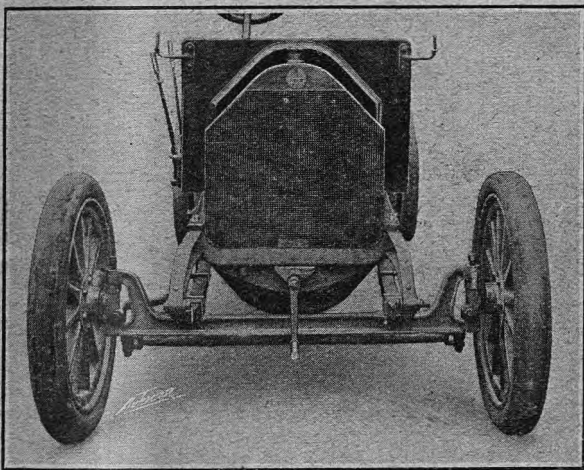
The A.A. and M.U. is informed that the Danish Government has given its adherence to the International Convention, and that the International pass will be introduced into Denmark on July 1st.

The 18 h.p. Florio.

Four Cylinders, 85 × 130 mm. Bore and Stroke. Four Speeds. Bevel Drive.

THE 18 h.p. Florio is a car which reaches us from Italy through the agency of Florio Motors, 170, Brompton Road, London, S.W., and presents several of the features which have gained cars of Italian manufacture so good a reputation in this country.

By the side view of the chassis, it will be seen that the frame is as usual of channel section steel, cambered centrally, inswept and very well flared at the dashboard, and upswept over the back axle. A down-swept channel section cross member occurs beneath the radiator, and another cross member of triangular form carries the rear of the gear box. The rear member is of very strong channel construction, with



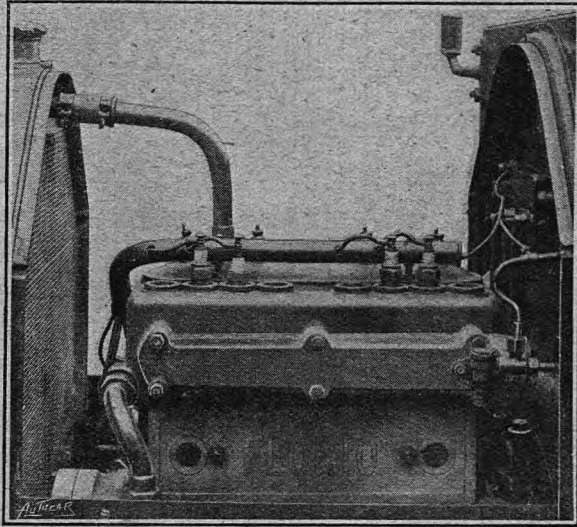
Front view of the 18 h.p. Florio.

flared angles and produced top and bottom flanges to take the butt ends of the three-quarter elliptical springs.

The four-cylinder engine, 85 mm. bore by 130 mm. stroke, is cast *en bloc*, having all its valves on the near side, with valve stems and tappets enclosed by one easily detachable and very accessible cover plate. The exhaust trunk is bolted to the face of the same side of the cylinder casting, the air pressure valve for the petrol tank being at the rear end thereof.

The magneto and water pump are set across the front of the engine, the magneto to the off side, and the water pump to the near side, being driven by skew gearing off the camshaft, which in its turn is gear driven from the crankshaft.

The Zenith carburetter is placed on the off side of the engine, the inlet leads passing through the water jackets, with a spherical shaped elbow piece at the head of the induction pipe. The crankshaft rotates in three bearings of good length. The pistons are



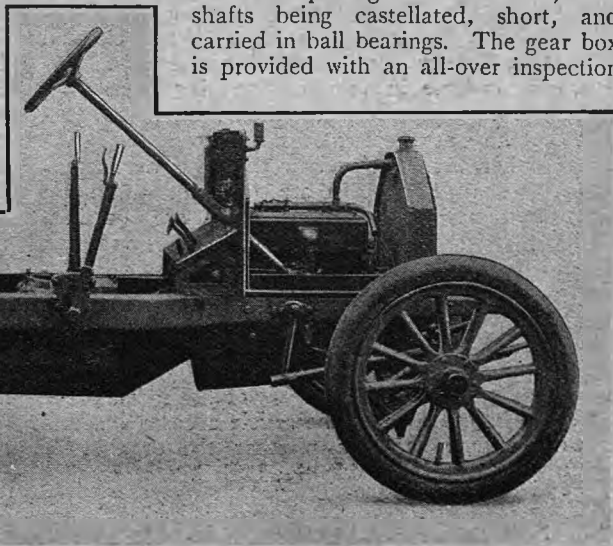
Near side of the 18 h.p. Florio engine.

also of good length, and have four rings above the gudgeon pin.

The lubrication of the engine is by a toothed wheel pump secured to the outside of the crank chamber at the back end, and driven directly off the end of the camshaft. The oil is drawn by this pump from a filter protected sump formed below the crank chamber, and forced through suitable leads to the crankshaft bearings, crank pins, and up ducts provided on the connecting rods to the gudgeon pin. An oil filler and level cock are provided to the sump.

The drive is conveyed to the gear box through a multi-disc clutch, carried in a vaned flywheel, which disposes of the necessity for a radiator fan.

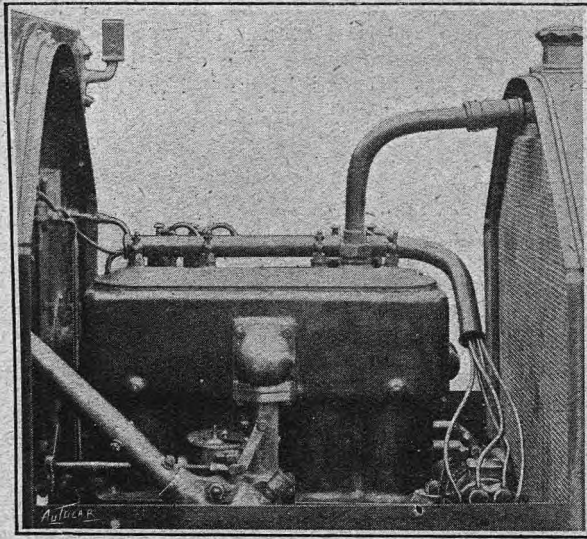
A four-speed gear box is fitted, both shafts being castellated, short, and carried in ball bearings. The gear box is provided with an all-over inspection



Off side view of the 18 h.p. Florio chassis.

The 18 h.p. Florio.

lid, which gives the easiest possible access to the gear-shafts and gears. The rearward projecting end of the primary shaft carries a large brake drum and the forward portion of the universal joint. The propeller-



Off side of the 18 h.p. Florio engine, showing the spherical elbow at the head of the induction pipe.

shaft passes through a taper torque member with webs formed integrally top and bottom. This member is practically part and parcel of the very stiff and strongly webbed rear axle casing, and has a crutch head carried on rocking pivots in transverse alignment with the universal joint. The propeller-shaft is carried in ball bearings in the head of the torque member.

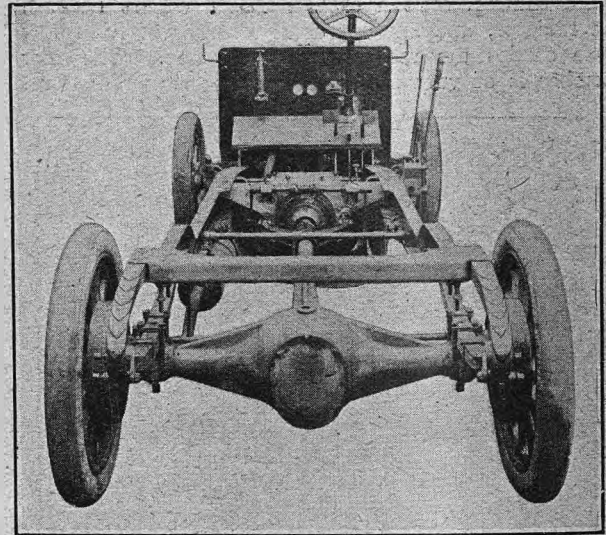
The drive to the back axle is by bevel gearing in the usual way, the live axles rotating the road wheels through dogs. The road wheels rotate on ball bearings set on the ends of the live axle casings. A large oval inspection door at the back of the rear axle casing provides means for withdrawing the differential gear.

Both brakes are very powerful, particularly the external shoe brake fitted to the rear of the gear box,

the shoes being applied to the drum by the side lever. The rear wheel brakes, which are of the internal expanding order, and take effect on wide drums of large diameter, are actuated by the pedal, and are compensated by a large rocking cross head.

The threequarter elliptical springs at the rear are carried on rocking spring tables on the axle casings, which are provided with lubricators.

The engine is controlled by an accelerator pedal with a limit throttle fitted on the dash. The steering gear is of the worm and wheel order, with outside steering arm, the steering rod being above and steering distance rod behind the front axle.



Rear view of the 18 h.p. Florio chassis, showing the peculiar construction of the back axle and the propeller-shaft casing.

The radiator is of the honeycomb type. The front axle is straight, and of stiff channel section. The steering wheels rotate on ball bearings, and the steering pivots have ball thrusts. The wheelbase of this car is 9ft. 3in., and the wheel gauge 4ft. 6in.

The Storage of Benzole.

IN our issue of May 3rd (page 776) we called attention to the fact that the London County Council officials were on the look-out for cases of motorists storing benzole in vessels containing more than two gallons each contrary to the regulations. Our article seems to have conveyed the impression, by inference rather than suggestion, that the regulations for the storage of benzole are different within the Metropolitan area from what they are outside. This is not the case, as the same regulations apply to the whole country, the only difference being in the manner of their administration. The L.C.C. appear to exhibit an overweening desire to interpret and administer literally all regulations affecting motorists, while most other authorities are satisfied to secure a reasonable observance of the spirit of the regulations.

Since the appearance of the article a correspondent has written to us to ask whether the regulations (if any) which apply outside the L.C.C. area as distinct from those within, would allow him to store fifty gallons of benzole (in a drum furnished with a tap), provided he put it at a distance, say, of fifty yards from a dwelling house, in the garden by itself, bricked

round. He adds that he was just about ordering a drum, but our article made him undecided what to do. In reply to his request for information on the subject we wrote him as follows:

"There are no special regulations applying to areas outside the L.C.C. The regulations in force apply to the whole country. Under these regulations a motorist may store benzole without a licence up to the amount of sixty gallons, but it must be kept in vessels containing not more than two gallons each. The storehouse in which the benzole is kept must be situated at least 20ft. from any other building or any inflammable materials, and must also conform to other requirements set forth in the regulations. You cannot legally carry out your wish to store fifty gallons in one drum, even though the storehouse be fifty yards from a dwelling, in the manner you suggest. Even though you obtain a licence from the local authority, those particular parts of the regulations will still apply which prohibit the storage of benzole by motorists, except in vessels of a capacity not exceeding two gallons." A retailer's licence might meet the case, subject to the approval of the local authority.

To Linz and Vienna.*

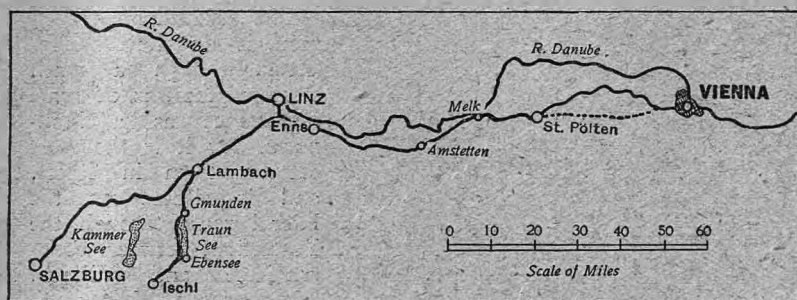
Through the Traunthal. In Touch with the Danube. A Useful and Necessary Tip.

By Chas. L. Freeston, F.R.G.S., Author of "The High-roads of the Alps," "The Passes of the Pyrenees," etc.

IT must be conceded that the routes already described in the previous articles of this series have afforded an abundance of variety. We have crossed in imagination the lofty Arlberg Pass; visited the two most striking towns of north-west Austria—Innsbruck and Salzburg to wit; explored the little-known north-eastern corner of Tyrol; entered Bavaria for the sake of lovely Berchtesgaden and the

steep rise must be breasted, and opens up still wider prospects; the backward views, over Gmunden and the lake, are very impressive. At the village of Laakirchen we turn to the left, and then immediately to the right; a big sign says "Lambach," and is the plainest and most welcome route indication that has been seen since Salzburg was left behind.

The road undulates to Steyrer Mühle, and shortly afterwards a sharp, rough turn occurs in another village, but a plaque indicates the road, while further warning is afforded at Traunfall, where there are two turns to the left. There is a nice view of the river Traun beyond, emerald-hued itself and flowing beneath a grassy slope, with a wood behind. The going generally has been pretty good, but the roads are inclined to be somewhat greasy in wet weather. While the scenery is not striking throughout, there are



Königssee; and, finally, have roamed at will among the charming lakes of the Salzkammergut.

All these districts have been worth doing for their own sakes, whether on a main route or off; but we have now to consider a stage which is chiefly to be regarded as a means to an end—that end being the reaching of Vienna by road, which was the object with which we set out from the Austro-Swiss frontier at Feldkirch. The high road to any capital is important in itself, whether it be good or bad, picturesque or unromantic; that to Vienna is not to be classed by any single one of these adjectives alone, but merits each and all in turn. Personally, I should prefer to deal with something more liberally satisfying in the way of scenery and surface alike; but I conceive it to be even more my duty to be practical than to confine myself to the congenial task of introducing new beauty-spots to the notice of those who have not yet been able to make their acquaintance.

Vienna being our objective, therefore, we must e'en take the rough with the smooth, the dull with the delightful, and sally forth from Gmunden, where we ended our tour of the Salzkammergut lakes. In the first instance we have to effect a junction with the main road at Lambach, 27½ kilometres away. After crossing the bridge, therefore, at the head of the lake, we must look out for a sign which says "Linzer Strasse," and follow that thoroughfare out of the picturesque town. Then we rise above the town, and get on to a road which runs through more open country than has been encountered for some time past. By and by a short,

well-wooded hills near at hand and glimpses of distant mountains. A feature of the peasant life of this Traun valley is the unconcerned way in which burly matrons, who know no Mrs. Grundy, walk on the high road in short skirts and bare-legged.

Just outside Lambach the Ager river is crossed, and then we reach the junction with the main road coming in from Vocklabruck. After passing through the town, where there is a Benedictine abbey, a turn downhill to the right must be taken. The highway is now wider, and faster travelling is possible than through the Traunthal. In fifteen kilometres we are at Wels, an interesting old town, and the best on the whole route at which to halt for a meal or stay the night, for anyone who has not begun the day at Gmunden.



Franz Josef Platz. A fine thoroughfare in Linz.

* All rights reserved.

To Linz and Vienna.

I found the Hotel Greif comfortable, if plain, with an English-speaking porter. At Wels the road becomes broader still, and is nearly straight for two dozen kilometres or more.

At length one comes to an important junction. If in a hurry, the through tourist must turn to the right, and drive across to Kleinmünchen, and so proceed to Enns; but in that case he will lose the opportunity of making his first acquaintance with the glorious river Donau, or Danube. By keeping straight on at the fork named, he will find himself, in about five kilometres, within the precincts of the handsome and once fortified town of Linz, the capital of Upper Austria, and one of the chief places on the Danube. Town and river alike are worth visiting. The former has fifty thousand inhabitants, and a number of good hotels. Prominent among its buildings is the modern museum, which contains, *inter alia*, a remarkable frieze, no less than 200 yards long, illustrative of the "progress of culture in Upper Austria from the earliest times down to its occupation by the House of Hapsburg." Another modern feature of Linz is the Gothic cathedral, which has a very beautiful tower.

Admirers of panoramic landscapes—and what touring motorists are not?—should drive up to the Freinberg, above the town, by way of the Kapuzinerstrasse, and there obtain the spacious view depicted in the accompanying illustration. Their opportunities do

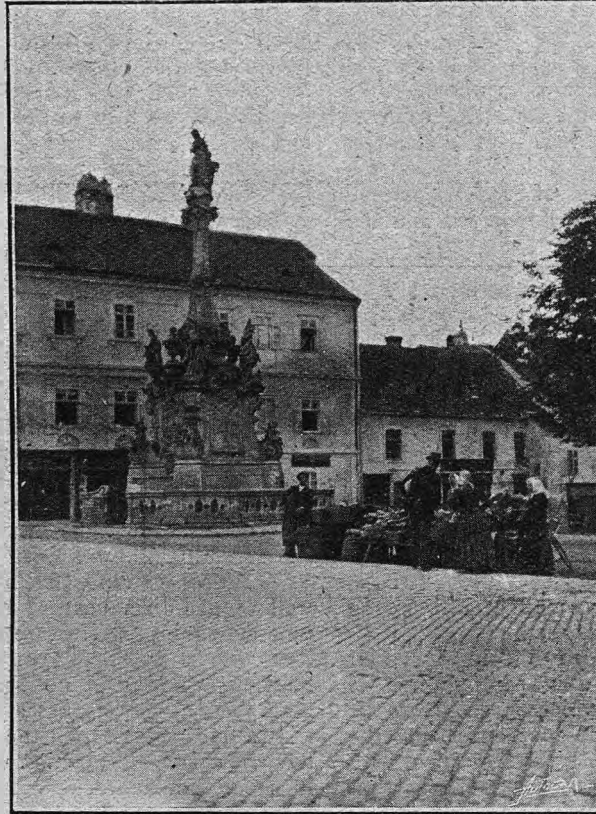
not end here, however, as several other view-points are within easy reach, and particularly fine is that from the Franz-Josefs-Warte, on the Jägermayer. The welcome practice is followed by the town authorities of displaying a white flag on the Landhaus tower to indicate when the view from the Franz-Josefs tower is clear.

Perhaps I may usefully refer at this juncture to the confusion that often exists in the minds of tourists as to the identity and *locale* of Austrian towns of somewhat similar name.

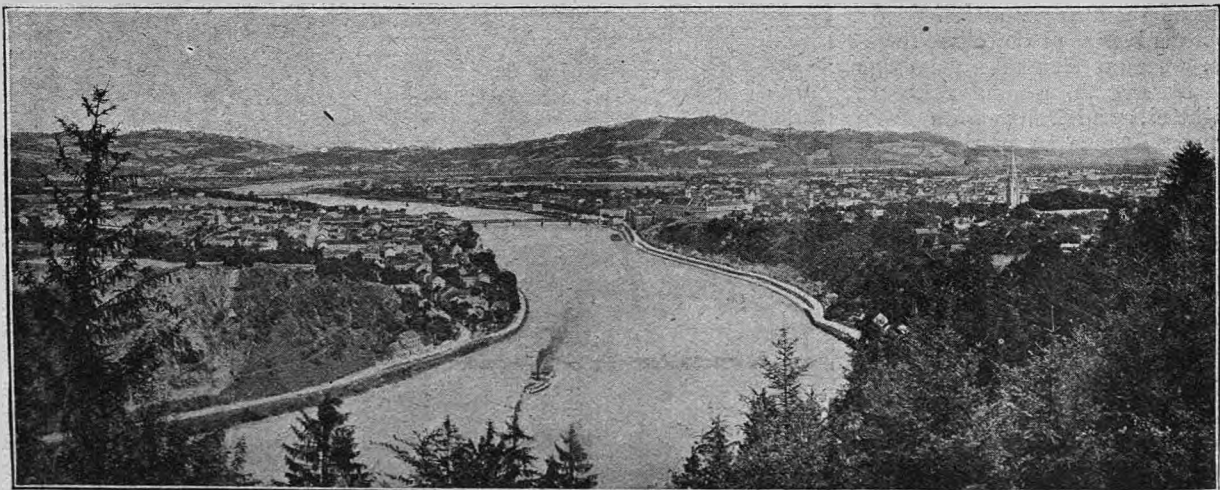
Linz, as will have been seen, is on the Danube. Lienz, though a much smaller place, is of some importance as a landmark, for it is the most easterly town in Tyrol, and is situate on the lateral route through the Pusterthal, between Franzensfeste and Villach. Then, again, due south from Linz, there is a Lieten, which is at the junction of several routes. It is just as well to have these facts clearly impressed upon the mind before undertaking an Austrian tour.

A run of twenty kilometres from Linz, or rather less from the junction mentioned above, brings us to Enns, by a good, poplar-lined road.

The approach to the town, however, must be taken with care, as the way is narrow; and, incidentally, I may point out that if the road now being described be followed in the reverse direction, it is not only necessary to enter Enns with circumspection, but also to take particular pains to find the right way out. In



In the Market Place, Enns. The fortifications of this town are said to have been paid for by Richard Cœur de Lion's ransom.



A view of Linz and the Danube from the Freinberg.

the middle of the square one must turn sharp to the left up a narrow street, and on the descending road which follows a look-out must be kept for the road to Linz.

Enns, by the way, has associations of peculiar interest to Englishmen. Its fortifications are said to have been constructed with the money paid as ransom by England for the release of Richard Cœur de Lion! The castle of Dürrenstein, now a ruin, where he was

bridge at the top of a rise being under repair, and the road being strewn with heavy logs in disconcerting fashion. However, this sort of thing must be borne with philosophically, and is encountered in every country alike; but I must confess to feeling thankful that I had not reached the spot an hour or two later, by which time it would have been dark.

At Melk the road touches the Danube for the first time—if Linz be not included, and a striking object here is a very large Benedictine abbey, standing high above the river. According to Baedeker there are 30,000 volumes within its library, a famous organ in the church, and various other items of note. The town, it is added, is mentioned in the Nibelungen-Lied.

Beyond the town, however, road and river are soon widely separated, the former turning south-east for a time and the latter veering to the north-east. The road continues to be mostly of "main" character, though with varying surface, and eventually brings us to St. Pölten, where for a special reason I must invite the reader to pause.

Never in the whole of my touring experiences have I seen a spot where one could so easily do the wrong thing! Never have I known a position where the advice of the man who has bought his experience by driving over the route is of so great a value to the man

To Linz and Vienna.



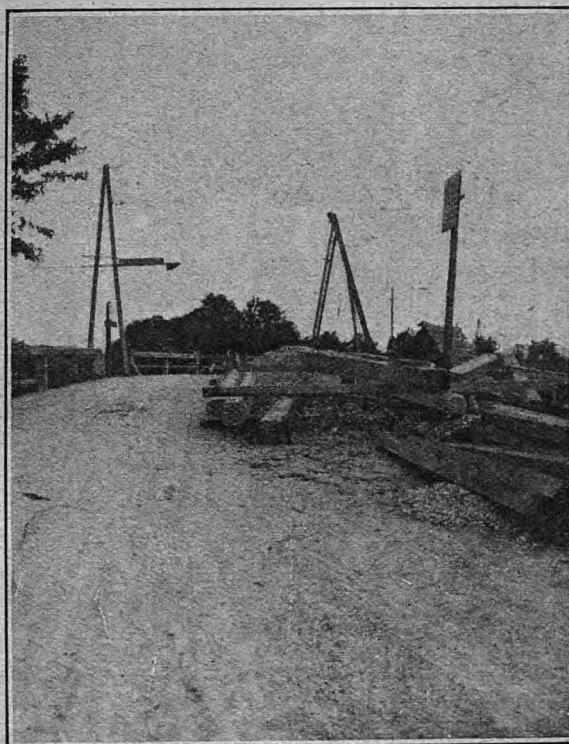
The exit from Enns.

held captive until discovered by Blondel, stood near Rossatz, some distance further east along the Danube.

One could wish that this highway to Vienna adjoined the Danube, but though the two are always within measurable distance of each other they only meet at one or two points.

From Enns to Amstetten (36 kilometres) the road winds and undulates, with several steep rises and falls through woods, and with varying surface. Five kilometres out from Enns there is a very sharp turn to the right in a village. It is advantageous to note that the road has kilometre stones throughout, the figures being progressively numbered from Vienna. At 167 kilometres from the capital there are two level crossings, and care is required at a village by the stone marked 155.9 kilometres. It is here, by the way, that the steep pitches begin. The road becomes the more picturesque in consequence, and there succeeds to the broad plain which has hitherto been crossed a series of fine views, the best of which is at the 146th kilometre stone.

Amstetten, which one enters by a short descent, has no particular claims to notice, but I hope that future tourists may benefit by the extensive road repairing which was in progress each time I passed through the town last year, and which necessitated a diversion from the main thoroughfare. Still further along the road, moreover, near Neumarkt, I met on the return journey from Vienna a particularly awkward obstruction, a



A bridge under repair; an awkward obstruction on the Vienna road.

who has not. The maps, most of them, indicate the wrong road; the right road, even if indicated on the map, is easily overlooked in actual driving, and altogether I am glad to be able to give a particularly useful tip to all who read these lines and may meditate a road journey to Vienna.

Reference to various maps will show that from St. Pölten to Vienna there is a comparatively straight road, and this, on the majority of maps, is coloured as the main route and the one to be followed. Map-

To Linz and Vienna.

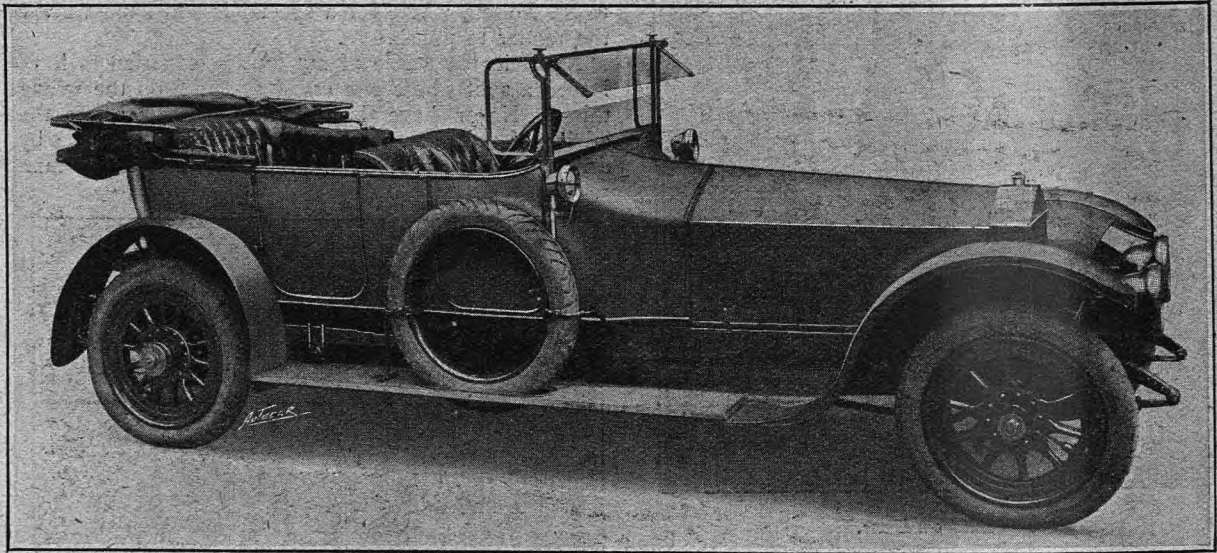
colouring, by the way, is mostly folly, but it is even worse when the colouring is absolutely wrong in its basis. Now few people, on seeing this straight road specially coloured, would trouble to note that at St. Pölten another road strikes north-westwards, and then rejoins the direct road at Purkersdorf, not far from Vienna.

This apparently alternative road is, as a matter of fact, emphatically *the* road! The straighter road is almost wholly bad, and scarcely maintained at all in parts. So rutty is the surface that for miles the car can only be driven at a crawl. The road is flat, moreover, and wholly unpicturesque.

The road proper, on the other hand, has almost every good quality that the wrong one lacks. The surface is good, the road is mostly broad and pleasantly undulating, and the scenery is attractive; and all this is avoided by the cartographers because this road is 49 kilometres long as against the 45 kilometres of the

At St. Pölten, nevertheless, the landlord of the roadside hotel looked as if he understood, and yet did not understand, the request for tea, but eventually nodded an assent. After a time it was brought—in a tumbler, with an accompaniment of rum! I have had black tea offered me without milk in the cafés of Touraine and elsewhere in France; in Spain the first words of Spanish I acquired were *leche fria*, because every waiter would bring hot milk with my tea; in Portugal I had to repeat the process of learning how to ask for cold milk; but never, save at St. Pölten, have I been served with tea and rum in a glass, and it was evident enough that not many Englishmen had visited that particular hostelry.

At one point of the route *via* Ratzersdorf, Mitterndorf, etc., which is so much to be preferred to the one through Böheimkirchen and Neu Lengbuch, the road rises to 1,312 feet by sweeping bends, with an attractive outlook towards the Danube. This minor serpen-



A Cann body on a London-Edinburgh type Rolls-Royce chassis, which has been supplied to the Midland Counties Garage. The front seats are adjustable fore and aft. The front screen is a Beatson-Hermes with side wings, and the hood a Kopolapso. The finish is uncommon, and is known as "copper-bronze." The trimming is brown leather to match.

direct but bumpy abomination. I speak feelingly because I have sampled both routes, and know the vital differences between the two.

To leave no room for error, therefore, let me say that just outside St. Pölten there is a bridge over a river. The moment this is crossed a turn should be made to the left at right angles, along what merely looks for the moment like a by-road. There is a signpost there which makes the matter clear enough if one is on the look-out for it, but it would be quite ignored otherwise, especially as the letters are very small, and the road over the bridge runs on in a perfectly straight line.

I have another memory of St. Pölten, by the way, of a more amusing kind. At the hour of the afternoon which at home is sacred to the serving of tea my inner man always craves for the cup that cheers, whatever part of Europe I may find myself in at the time, and in the indulgence of this weakness, or virtue, as the reader may choose to think, I invariably cast around for a place of refreshment and ask for tea on the chance of getting it. Times without number have I been rewarded in the most unexpected places; indeed, to draw an absolute blank is nowadays a rarity.

time is between Ried and Allhang, not far from Purkersdorf.

From the junction with the alternative road to the heart of Vienna is another thirteen kilometres, mostly of tramlines. At the first fork it is better to keep to the left, but at the next diversion the right hand road should be followed. Entering Vienna, however, is not much easier than with any other capital city, and it is advisable to determine beforehand the name of one's hotel, the street it is in, and its nearness or otherwise to some prominent thoroughfare like the Ringstrasse, so that one's enquiries by the way may not be lacking in definition. A preliminary study of a street plan is also to be recommended.

We are informed that the C.A.V. lighting system and equipment have been adjudged first on all counts in competitive trials for lighting sets organised in connection with the Turin motor exhibition, which came to an end on the 11th inst. Almost all the leading makes were entered, and the tests imposed were thorough and severe; the result, therefore, furnished conclusive proof that the claims made for the C.A.V. system are based upon a solid foundation.

A.A. and M.U. Notes.

Communicated by the Secretary, The Automobile Association and Motor Union.

Whitcomb Street, Coventry Street, W.

Touring Facilities for City Members.

Members chiefly occupied in the City of London are reminded that it is unnecessary for them to take a special journey to the head offices at Fanum House, Whitcomb Street, to make the necessary preparations for tours abroad. The City offices of the Association, situated at Guildhall Annexe, Guildhall Yard, E.C., are provided with the necessary staff and facilities for arranging all the preliminaries of a tour at short notice. Further to assist touring members, an office has been opened in the heart of Paris, at 39, Rue de la Chaussée d'Antin, where every assistance is afforded to members.

Ireland as a Touring Ground.

Members who have not yet visited Ireland with their cars should note that since the Association established branch offices in Dublin and Belfast a considerable amount of road improvement work has been accomplished, and that the reproach which Irish roads, in certain districts, merited in former days is hardly deserved to-day. By consulting the Irish A.A. and M.U. manager at 12, College Green, Dublin, members may rely upon receiving much useful information and advice regarding tours in Ireland. Upon request, special trips, embracing interesting districts and good road surfaces, will be issued promptly to all members contemplating going over with their cars.

Special Road Warnings.

Members touring in Inverness-shire should note that the local authorities are averse from prosecuting motorists unless cars are driven inconsiderately. The speed limits imposed on cars passing through villages, however, will be most rigidly enforced.

A number of complaints have been made regarding the inconsiderate driving of cars through Shepperton, where a ten-mile speed limit is enforced. Motorists are therefore asked to drive very carefully through the place, otherwise the local authorities, at present friendly to visiting motorists, may change their views owing to the lack of care and courtesy by the few.

Damaging Road Signs.

There are occasionally reported of stone-throwing at the A.A. and M.U. road signs, and whenever possible steps are taken with a view to punishing the delinquents, especially when they are old enough to realise the damage done. The Association has just prosecuted three culprits responsible for damaging a sign in the Penarth district. On the 14th inst. they were convicted by the local bench. They were fined £1 and costs, 15s., and in default of payment seven days' imprisonment. Members who observe cases of malicious damage to road signs, and are able to identify the offenders, will greatly assist the Association by communicating with the Secretary.

Latest Road Information.

CHESHIRE.—Northwich-Altrincham Road: Members are warned to slow through Lostock Gralam, which is about two and a half miles from Northwich. Under repair half width for the laying of pipes at Lostock Gralam.

GREAT NORTH ROAD.—Tarring near Witham cross roads eleven miles south of Grantham. Under repair full width between Morpeth and Felton; no lights at night.

LANCASHIRE.—Blackpool-Poulton Road: Special care is necessary through Poulton-le-Fylde and district. Preston-Garstang Road: Members are warned to drive with caution between Wither Trees and Broughton village, also through

Garstang. Preston-Wigan Road: Very rough surface and frequent holes between Bamber Bridge and Wigan. Preston-Blackburn Road: Full width in rough condition on Brockholes Hill, two miles east of Preston. Preston-Liverpool Road: Special care is essential between the Windmill and Tarlton Bridge. Controls likely to be working at Burton, ten and a half miles north of Lancaster, also at Milnthorpe in the ten-mile limit.

YORKSHIRE.—Otley-Bradford Road: Special care should be taken on entering Otley by the Bradford Road owing to repairs to main water supply being still in hand on a very dangerous bend of the road; lights at night. Leeds-Harrogate Road: In bad condition owing to large holes and ruts; care should be taken on the hill between the 5th and 6th milestones from Leeds.

COVENTRY ROAD.—In bad condition owing to loose metal in many places. Timing likely to be in progress at any time in High Street, Dunstable. Members are warned to slow when driving through Redbourne, Fenny Stratford, and Stony Stratford.

TEWKESBURY-WORCESTER ROAD.—Open half width at Kempsey, sewer pipes being laid; lights at night.

BIRMINGHAM-WORCESTER ROAD.—Widening in progress and foundations being laid at Martin Hussingtree, two miles south of Droitwich. Road in bad condition between Droitwich and Worcester.

WARWICK-STRATFORD ROAD.—Roller working between the 1st and 2nd milestones from Warwick, full width.

NORWICH-YARMOUTH ROAD.—Two rollers are working between the 6th and 8th milestones out of Norwich; full width.

NORWICH-AYLSHAM ROAD.—Temporary bridge at Hevingham. Tarring through Aylsham village. Ingworth Bridge under repair.

NORWICH-IPSWICH ROAD.—Broken bridge at Newton Flotman; lights at night. Roller working between the 5th and 6th milestones; full width.

ESSEX.—Rabbits Road-Wanstead Road: Remetalling full width for a quarter of a mile; alternative route, Station Road, Forest Drive or Forest View Road and Forest Drive.

SHREWSBURY DISTRICT.—Hereford Road: Remetalling full width three and a half miles from Shrewsbury.

NORTH WALES.—Llandudno-Colwyn Bay: The surface of the road is in bad condition, especially between Colwyn Bay and Deganwy.

EXETER-OKEHAMPTON ROAD.—In very bad condition; new road in hand between Tedburn St. Mary and Okehampton.

LAUNCESTON-BIDEFORD ROAD.—Road is in rough condition between Holsworthy and Clawton, twelve miles north of Launceston.

EXETER-BRISTOL ROAD.—Foundations are being laid full width two miles north of Bridgwater; lights at night.

BATH ROAD.—Road is in bad condition from Colnbrook to Slough. Tarmac being laid one mile east of Slough; half-width: clear at night. Patching in hand at Pont Hill, Maidenhead, and members are warned to drive slowly. Control likely to be working between Colnbrook and Hounslow.

BRIGHTON ROAD.—Roller working between Kingswood and Reigate; between Reigate Station and Wray Park to Gatton Point; tarring between Redhill and Horley, and from Redhill to Woodhatch.

HERTS.—London-Aylesbury Road: Remetalling in the High Street at Berkhamstead; also tarring at Aston Clinton half-way between Tring and Aylesbury; also at King's Langley, towards Watford.

HUNTS.—Members are warned to drive slowly through Huntingdonshire as controls are likely to be worked.

LONDON DISTRICT.—Controls likely to be working at Anerley Hill; Crystal Palace Parade; Beckenham; Bromley; Wickham Road; at Elmers End; Morden; Sutton; Bantstead; Figg's Marsh, Mitcham; Staines-Sunbury; Bedfont-Staines; Putney High Street.

SOUTHAMPTON-BASINGSTOKE DISTRICTS.—Winchester-Bournemouth Road: Members are warned to slow up when passing along the Hundred, Romsey, especially past the school, as complaints have been received as to the speed of cars. Basingstoke District: Remetalling full width on the Salisbury Road between the 4th and 5th milestones from Basingstoke. Under repair on Star Hill, Hartford Bridge; no lights at night.

Correspondence.

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

Letters of a personal nature will be withheld.

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

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

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

WORM GEAR CHALLENGE.

[19554.]—Messrs. David Brown and Sons, replying to my letter 19485, make a statement which I think requires correction. They say, "May we point out that he (Mr. Lanchester) appears to have overlooked the fact that when a worm gear is doing its hardest work, namely, climbing hills on low gear, the cooling effect he refers to is reduced to a minimum."

I would like to point out to Messrs. David Brown and Sons that the biggest power transmission by a worm or other transmission gear does not in general take place when a car is climbing hills on low gear. Firstly, it may be pointed out that when on low gear the power transmitted by the worm is less than the full power developed by the engine owing to it being taxed on transmission through the gear box; that is to say, the horse-power that it is possible to transmit when climbing on hills on low gear is only about 90% of that which may be transmitted when on high gear. Secondly, any experienced motorist knows that his engine is opened out to its fullest extent far more frequently and for longer periods when on the direct drive than on low gear. Under these circumstances I think it is evident that Messrs. David Brown and Sons have misstated the case in the paragraph quoted. Beyond this, Messrs. David Brown and Sons' argument as a whole misrepresents the facts. Even if on low gear we assume the whole of the air cooling to be removed from a worm gear box, the maximum rise in temperature of the gear box and its oil content in climbing 1,000 feet altitude (which is an exceptional hill even in the North of England) would only amount to 20° F. The truth is that, when climbing such a gradient at, say, half-speed, the air cooling due to wind circulation is only reduced to about half its ordinary value, and the actual temperature increase is less than 10° F., and is within the limits of the temperatures taken in the National Physical Laboratory efficiency tests.

Messrs. David Brown and Sons appear also in their present letter to accuse me virtually of bad faith in not stating that the efficiency tests of the National Physical Laboratory report were conducted with regulated temperatures. I must tell Messrs. David Brown and Sons that they are not justified in making any such suggestion. As a matter of fact, in some of the National Physical Laboratory's tests, more especially those mentioned in Table 5 of the report, the temperatures were regulated not by artificial cooling, but by the artificial heating of the worm box, as the power transmission alone was insufficient to raise the temperature to the extent required. Messrs. David Brown and Sons ask me why artificial cooling was not mentioned in the National Physical Laboratory's report. I can only say that the National Physical Laboratory's report is drawn up by the staff of the National Physical Laboratory, and signed on every page by the director, and the National Physical Laboratory decide for themselves what is the wording of their report, and what facts it includes. The report as published is an exact photographic facsimile, and if Messrs. David Brown and Sons have any grievance on account of any omission in the report they are wrong to lay their complaint at my door. My own view is that the scientific method of testing worm gear is to test it at a known temperature and state the temperature in the report. This also appears to be the view of the staff and director of the National Physical Laboratory; Messrs. David Brown and Sons appear to think otherwise. They are, of course, at liberty to have their own opinion, and they might even differ from every scientific man in England if they wish, but on that account they are not entitled to refer to the report or to the supposed defects of the report as "most misleading" or otherwise indirectly to suggest bad faith.

As stated in my last letter, I have confined myself to dealing with such items in Messrs. David Brown and Sons' communication as appear to me to be misleading. There is much that I might add, but I think my present letter shows that my accusation of "painful ignorance" is not without justification.

F. W. LANCHESTER.

SPRINGS.

[19555.]—A great deal of your valuable space has been devoted of late to the springing of cars. I have the misfortune to be a person particularly susceptible to vibration. I had to give up motor cycling on account of this drawback. When I took to cars, although I found great improvement, I was unable to sleep after a long run, say of 100 to 150 miles. But for some years past I have been using a car, the Lanchester, which absolutely does away with discomfort from the road. I cannot understand why this system of springing should be ignored in a discussion on the subject. It appears to me that all the difficulties enumerated have been solved in practice, if not in theory.

I am not commercially interested in the Lanchester or any other motor company.

F. ALCOCK.

THE EIGHT-CYLINDER V ENGINE.

[19556.]—An apparent anomaly exists in the engineering world, at all events to one lay mind, as suggested by the contribution to your valuable paper of the 3rd inst. on "The Eight-cylinder V engine." What strikes one so much, to put it in colloquial phraseology, is this: That to-day in order to go to the railway station with a friend or two and a bit of luggage, in the best, the latest, the most up-to-date style, the journey must be undertaken in a motor car, the engine of which has no fewer than eight cylinders. One arrives at the station and finds a luxuriously appointed train with twelve or thirteen coaches, weighing hundreds of tons, and at one end an engine with only one pair of double-acting steam cylinders. The whole dead weight of the engine and train is lifted, and, in a few minutes the whole train is gliding along at the rate of 60 m.p.h., and that without any manipulation of gears or anything of the kind, by simply moving a lever over a quadrant some three or four inches.

Why, may it not be seriously asked, are engineers of internal combustion engines scheming their brains out in the endeavour to perfect what will always be an imperfect system from a scientific point of view? Freedom from the trammels of a thread-worn system and real initiative it would seem is what is wanted in the motor world to-day. Is steam a failure for motor car work? Who shall pronounce it so until it has been more widely developed—more brains and money spent on it? Surely steam cannot be pronounced a failure whilst engineers can only offer to the public an internal combustion engine with no fewer than eight cylinders, as the best they can do under the present system, plus all the compensating gear and the rest of the paraphernalia. The fact is that to get somewhere near the torque, the acceleration, the smoothness, and the power of steam, the designers of petrol engines have to keep on multiplying their cylinders, and even then fail to eliminate altogether, at its best, the clumsy arrangement of a gear box. And so designers go on *ad infinitum*, perfect slaves to what always will be an imperfect system. At the very bottom of it one is apt to think there is the largely invested interest and capital in the one and only recognised system and anything outside it is apt to be greeted with "*Il est impossible!*" "*Non possumus!*" And so the public must put up with what it can get, and the real genius, the inventive mind of something really new is tabooed.

PRO BONO PUBLICO.

P.S.—I am running a 1904 steamer to-day—no clutch, no starting handle, no gears of any kind to manipulate, always on a silky direct drive—but, alas! the makers have succumbed to the petrol mania. The unfolding of the tale would be interesting.

EIGHT CYLINDERS OR SIX?

[19557.]—"An Old Motorist" whose letter [19531] appears in *The Autocar* of May 17th must surely have overlooked the excellent article on this topic, by Mr. W. G. Aston, appearing on pp. 777-9 of your issue of May 3rd.

Mr. Aston reviews the relative merits of "eight" and "six" thoroughly, disinterestedly, and therefore informa-

tively. In my opinion this article is one of the most valuable which has appeared for quite a long time in your best of motoring weeklies.

A YOUNG MOTORIST.

LONG V. SHORT STROKE.

[19558.]—The letter of "Mass Cars" [No. 19524] is illuminating. It seems to show that their 75×100 mm. engine gives 1 h.p. for every 110 c.c. of capacity, while the 75×140 mm. gives 1 h.p. for every 92 c.c., roughly, on the brake. That is one for the long-stroke, and is evidence that engines of the same cubical capacity, differing in length of stroke, are not equally efficient. If we could have the trial suggested by Mr. Percy Kearne [No. 19520], it would be of immense value. In the meanwhile much might be learned if those who have either used on the road, or tried on the bench, long and short-stroke engines of about the same powers or capacities, would tell us what they have found. We can never get something for nothing. What has to be paid for the greater power of the long-stroke? We, ordinary users, could go into such matters as gear ratios and the size of wheels afterwards, and they must, of course, be considered when comparing the performances of cars in which different engines are fitted. First, we want to find out the characteristics of the two kinds of engine as to pulling, acceleration, vibration, petrol consumption per h.p., and those other qualities which are of importance and in which they must surely differ.

SMALL MAN.

[19559.]—Could any of your readers give a rule for deducing the brake h.p. of a car from the bore and stroke and number of cylinders? They might, for instance, compare the 16-20 h.p. Sunbeam with its four cylinders of 90 × 163 mm. with the 16-20 h.p. Wolseley with its four of 90 × 121 mm.

Will your correspondents Mass Cars [letter 19524] explain how they arrive at the statement that their 75×100 mm. gives off 16 b.h.p., while their 75×140 mm. gives off 27 b.h.p.? One would have expected the latter to be about 22.4 h.p.

ENQUIRER.

ACTUAL HORSE-POWER.

[19560.]—It is quite obvious that Mr. Dendy Marshall's formula [letter 19534] is the simpler, and, since it gives practically the same results, it is certainly the better of the two. Previously I did not know of its existence.

Incidentally, here is a technical question on which some of your readers may be able to enlighten me. I am under the impression that, given definite cylinder dimensions, definite valve dimensions, and lift, engine speed, and actual power developed are in inverse ratio; that speed must be sacrificed to power and power to speed. Then I am given to understand that by altering the valve setting alone, I can increase both power and speed. Is not this incompatible with the theory of the inverse ratio?

LA TOUR.

ACCELERATOR V. DECELERATOR.

[19561.]—With reference to the letter [19533] of Mr. A. W. Keep in your issue dated May 17th, I think that gentleman will have to wait a long while for any statement of real reasons against the universal adoption of the decelerator system of control, as used on De Dion cars.

I am a writer upon motoring topics, and drive an average of four dozen different cars in each year. Ninety-nine per cent. of them have accelerator pedal control, so that, presumably I should be a *pro-accelerator* enthusiast. I must confess, however, that, both theoretically and from actual road experience, I favour the decelerator.

The arguments for it were most ably set forth in a letter [19372] printed in your issue of March 29th last, to which I would refer Mr. Keep.

The arguments against it do not exist. At least, I can think only of one, and that will not bear discussion. It is that if one suddenly jams down a decelerator pedal, beyond the limit of reason, one stops one's engine. That is true.

But I have yet to meet a car whose carburettor will be proof against a sudden and complete depression of the accelerator pedal. What would starve the engine of the decelerator fitted car would choke that of the accelerator fitted one, so that argument will not hold water.

No; I am afraid that Mr. Keep will never get any sound arguments against the decelerator, and I am equally afraid that he will not for many years get designers and manufacturers as a class to admit that they have been on the wrong tack for ten years.

GOVERNOR.

[19562.]—In reply to the letter [19533] of Mr. A. W. Keep, a disadvantage of decelerator control is experienced when attempting to start a car from rest on a stiff rising

gradient. If when the clutch is being gradually engaged it be desired to accelerate the engine before the engagement (and this is, of course, always essential) it is necessary to release the pedal brake before the throttle can be opened, so that, unless the car be allowed to run back slightly while the engine is being speeded up, it is necessary to hold the car on the hand brake and gradually release the latter as the clutch and decelerator (brake) pedals are raised. The same objection applies to the accelerator system if there be no throttle lever on the steering wheel, for in either system it is impossible to accelerate the engine before the pedal brake is released. But whether or not the decelerator system has also a steering wheel control, the pedal overrides the hand control and the throttle cannot be opened until after the pedal brake has been entirely released.

Possibly it will be said that there is no greater difficulty in carrying out the following three movements simultaneously:

1. Engaging the clutch with one foot.
2. Opening the throttle with the other foot.
3. Releasing the brake with the right hand as the engine takes up the drive

than there is in making the necessary movements of the other system, viz.:

1. Engaging the clutch with one foot.
2. Releasing the brake gradually with the other foot.
3. Opening the throttle by operating the lever over the wheel.

Personally, however, I cannot nearly so easily cause the releasing of the hand brake to synchronise with the engaging of the clutch in the one system as I can simultaneously engage the clutch and release the brake pedal in the other.

In other words, when starting with the decelerator system on a hill, I am always in doubt (as the result of experience) as to whether I shall stop the engine by letting the clutch in before the hand brake is right off, or run back a little way, stop, and be obliged to try again because the brake was taken off a shade too early. Under similar conditions with the accelerator control I feel not the slightest doubt that I shall start first time, and I always do.

There are two minor objections to the decelerator system. The first is the height of the pedal plate from the floor when the throttle is fully or nearly fully open. Allowing that the braking portion of the pedal movement is as long as that of a brake alone (and there is no reason why it should be less), it means that the throttling portion of the movement is comparatively high off the floor. With the accelerator system, which employs a small separate pedal, the latter can be arranged at a suitable and comfortable position and will not be tiring to control on a long run. The second minor point is the greater stiffness of the decelerator pedal movement, owing to the heavier pedal requiring a much stronger recall spring than that necessary for the small accelerator pedal. This also causes additional fatigue on a long day's run.

I have not criticised the decelerator system without some experience of it, for I have owned two cars so fitted. Although I fully realise there is a point in its favour (it is a more natural form of control to a novice), I am still a firm adherent of the more usual system of control. As to the objection put forward against the latter, that there is always a risk that in an emergency the accelerator pedal will be depressed instead of the brake pedal, I do not think there is any more reason why such a mistake should arise, in the case of a driver with more than a month's experience, than there is of anticipating trouble because the gear lever might be mistaken for the brake lever in a similar emergency.

1893 1913.

[19563.]—May I add my appreciation of the decelerator principle to that of Mr. A. W. Keep? As the previous owner of five cars, I certainly would not go back to the accelerator, as I consider my 12 h.p. De Dion the most comfortable car of the lot to drive, particularly in heavy traffic, when I can keep my feet on the two pedals and have my hands free for wheel and horn.

If anyone has a doubt in the matter and cares to give me a look up at Hither Green, I should be delighted to meet him.

H. E. SERCOMBE.

SILENCERS.

[19564.]—Some months ago I wrote you asking if any of your correspondents had found a silencer that would silence the exhaust of a 5 h.p. Wolseley car. I have had two of these cars in use since 1904, the last year I think any of them were made. I had spent a good deal on various types of silencers for them all to no purpose—all failed to quieten the very noisy exhaust, which I am told is due to the high compression.

Correspondence.

Some readers were good enough to reply, and one advised Dunlop. With considerable misgiving I gave the order for one, and the results have been so entirely satisfactory, especially when a flattened exhaust pipe is fitted, that I have just ordered another. I think when one gets a good thing it is only fair to acknowledge it. M.D.

MOUNTING NEW TYRE COVERS.

[19565.]—Having just had a severe struggle in mounting a new cover on a rim, it has occurred to me that it would save much trouble if the makers, before sending out a cover, mounted it on an expanding rim and inflated it to the maximum pressure recommended.

There is an enormous difference in the size of new covers; some makes seem to fit well to start with and never get too loose afterwards, while others, which at first seem absurdly small, become loose enough to blow off on a hot day.

I have mounted and inflated a new cover without undue exertion in twenty minutes, while the one I have just done took three hours' hard work, though it had been well warmed. When one bead had been mounted, the cover was so tight that it was quite difficult to force the inner tube under the loose head. Covers up to 100 mm. section never seem so tight as those of 105 mm. and 120 mm. section. H 7946.

THE GORDON-BENNETT CUP.

[19566.]—May I enquire what has become of the Gordon-Bennett Cup? The races for this international trophy were most keenly contested, and, judging from all accounts, aroused more enthusiasm and interest than does any present day event.

Now that road racing is becoming more and more popular, surely it would be possible to compete for the cup at the same time as, for instance, the Grand Prix, without in any way interfering with the latter. The struggles in the old days when Napiers and Wolsaleys represented England against Panhard, Mors, and De Dietrich (France) were terrific; but surely no one could wish for a more interesting event than a contest between an English team of, say, Sunbeam, Vauxhall, and Talbot, and similar teams from other countries.

As, in the original Gordon-Bennett Rules, the race would be run in the territory of the holders of the cup, to-day we have to rely on our excellent friends the French to provide the big race of the year; this is not as it should be, but seems inevitable at the present time. Is not this a proposition for the R.A.C.? G. R. N. MINCHIN.

THE FOUR-INCH DARRACQ.

[19567.]—I feel I must just write a few lines with reference to the article written by Mr. Minchin, regarding the 4in. Darracq cars, which appeared in *The Autocar* of May 3rd. I fully endorse all his remarks regarding these cars' wonderful capabilities, both for speed work and touring, but am surprised he has always experienced such difficulty in starting up his engine, and imagine his magneto must be at fault, as my 4in. Darracq—which, by the way, finished second in the Isle of Man race in 1908—starts up instantly, and as I have had Bosch dual ignition recently fitted it most often starts on the switch when warm. In any case, it never backfires, unless, of course, the ignition is too fully advanced, and I have never had to resort to pushing to get the engine to start.

I have at different times owned quite a number of Darracq racing cars of various types and horse-powers, from the 4in. of 24.8 h.p. to the 59.6 h.p. Grand Prix racer. My big car, the "Blue Bird," starts always on the first pull over, and will throttle down to about 18 m.p.h. on top speed, yet it is geared $1\frac{1}{2}$ to 1 on top, and is capable of a very high rate of speed when going all out. On this car also I fitted an S.U. carburetter, which partly accounts for the wonderful flexibility of this big engine.

As regards the quality of material that was used in building these cars, it must have been the very best obtainable, as when last August I lost two wheels off the "Blue Bird" during a race at Brooklands, through colliding with the edge of the cement kerb on the track, and travelled all the way down the straight on two wheels only, there was hardly any damage done to the car, although I did have all parts renewed afterwards for safety, and the car is now running better than ever.

I am indeed sorry Messrs. Darracq have given up building racing cars, but I believe they signed a bond some years ago with some of the leading French firms whereby they agreed not to take part in any further races. M. CAMPBELL.

CLIMBING EDGE HILL.

[19563.]—I am much amused at letter 19374 in your issue of March 29th. I think that most people will agree with me that it would be a pretty poor performance if a 20-40 h.p. could not climb Edge Hill on second speed, so I do not see that there is much to make a song about in the case of the 20-40 h.p. *Métallurgique*.

The winter before last I had a 20-40 h.p. Lancia with an ordinary touring body, in Warwickshire, which I frequently drove up Edge Hill. On two or three occasions I climbed the hill on third speed with one passenger up, and on second speed it would simply roar up the hill. On one occasion, indeed, with six full-grown people up (including myself), it took the first half of the hill, *i.e.*, for some distance beyond the first bend, on third; I then changed down to second, and the car raced up the remainder of the way, the speedometer needle never falling below 25 m.p.h.; in fact, I had to keep it throttled down a bit, as I was afraid of racing the engine too much. On the level this car could just do about a mile a minute. With the usual disclaimer. BUFF.

Roberts' Heights, Transvaal.

[It is as well to point out that the 20-40 h.p. *Métallurgique* engine is 90×140 mm., while the Lancia is 100×130 mm., a difference of approximately 500 c.c.—Ed.]

CLIMBING PEN-Y-BALL HILL, HOLYWELL.

[19569.]—In regard to the letter of "Rolls-Royce" [No. 19525] in your issue of the 10th inst., and also No. 19495 of the 3rd inst., I may say that I took my 10 h.p. Darracq two-seater 1912 model, with a passenger, up Pen-y-Ball Hill, Holywell, on September 13th of last year. I also took this road in mistake for the main road to St. Asaph. It would be interesting to know what is the lowest-powered car that has climbed this hill. F. J. HERBERT.

DANGEROUS CORNER NEAR CAMBRIDGE.

[19570.]—There is an exceedingly dangerous double corner—that is not marked at all as such—just beyond the fifteenth milestone from Cambridge on the Cambridge-Bedford Road. Anyone driving a car fast at night has a nasty time getting round. TRINITY UNDERGRAD.

MOTORISTS AND MOTOR CYCLISTS.

[19571.]—Might I suggest that your contributor, "Fair Play" [letter 19544], extend a little more of that article to the unfortunate motor cyclist, who has his own troubles to face without being branded as a pariah by motorists? Unfortunately he is by no means untrapped. "Fair Play" should remember that we ride without glass screens, etc., and if he had to ride in a car's dust he might himself be tempted to try and get ahead. It is also not an unknown event for a car to sprint suddenly and to try and prevent us passing. Why does "Fair Play" object to the motor cycle so? If he had the average motor cyclist's income would he be content with a perambulator? Until he offers to exchange his income for mine I must still sign myself MERELY A MOTOR CYCLIST.

CYCLE CARS.

[19572.]—In your report of the Motor Cycling Club's London-Edinburgh run I note your contributor's remarks are confined solely to those machines which come under the heading of "Cars," little or no mention being made of some excellent performances put up by several less well-known makes of miniature vehicles.

I am in accord with the exclusive attitude so admirably maintained by *The Autocar* in matters relating to the interests of its readers, but I think the entire exclusion of everything pertaining to the small or "poor man's car" is a feature to be regretted, inasmuch as in numerous cases these little vehicles are simply bristling with well-thought-out ideas which might with great advantage be adopted on larger cars.

The recent run has proved an object lesson in many ways, notably in confirming the claim of the cycle car to "get there" under almost any conditions, and particularly (to my mind) illustrating the danger to be expected by users of that awkward contraption, "sidecar attachment" for motor cycles, no less than four of these having come adrift during the course of the run.

Speaking of motor cycle attachments, I am at a loss to account for the mysterious disappearance from public use of the old type "forecar." It was at least mechanically sound, and therefore had much to commend it to those desiring passenger accommodation at any price.

That the "small car" is making vast strides into public favour was well exemplified at the commencement of the

Correspondence.

recent run. Thousands of people turned up at Highgate on the night of the 9th inst., the lateness of the hour lending enchantment rather than disillusion to the scene. From the trade point of view at least the sight was very reassuring, and, albeit the darkness to some extent forestalled the penetrating qualities of the "fault-finding genius," one had all the advantages of the best of shows with a corresponding decrease in the discomforts usually sustained on these occasions.

As illustrating the enterprising spirit which prompted several of the competitors to make the journey, I may be excused for mentioning the experience of the firm in which I am interested, i.e., Messrs. Marshall, Arter and Co., Beavor Lane, Hammersmith, W., old established and well known in connection with experimental work in nearly all phases of engineering.

Recently the firm have been engaged in the production of a small car from the collaborated design of our principals, Messrs. Marshall and Erland Arter, embodying many novel features (of which two or three are patented), and, although several new chassis are in course of construction, only one has been available for running purposes. This so far has covered something like fourteen thousand miles, and came out well in a few competitions, but prior to starting for the London-Edinburgh run, owing to many calls upon it for demonstration and other purposes, it could not receive an overhaul, and, indeed, left the works almost in the same condition in which it had returned from Brighton the previous day.

Driven by its designers, it finished the course in excellent fettle, winning a gold medal and qualifying, so far as at present can be ascertained, for the gold cup for the best performance. Having accomplished the return journey unofficially and without incident, it was in the works but twelve hours before proceeding to a Territorial camp for further punishment.

In the face of these facts I venture to suggest that no more need be said of the decline in British enterprise, and submit that the example of Messrs. Marshall, Arter and Co. is one to be encouraged if England seeks to lead in the field of motor engineering, instead of as at present being merely the copyist of Continental ingenuity.

H. C. DART.

SELF-STARTERS.

[19573.]—I feel bound, in the interests of truth and fair play, to send a few lines giving my experience of an electric self-starter. I bought a car with one of these in March, 1912, and after using it for six months in London with unflinching satisfaction, I took it to India, where for another six months the record was equally good under most trying conditions. I sold the car last month before leaving India. Hence I am astonished to read such an article as that in *The Autocar* of May 17th on "Electric Self-starters." No owner-driver who has experienced the convenience of one of these self-starters will ever again buy a car without one, and if only English motor car builders would supply an equally efficient self-starter they would increase their sales very considerably.

LIEUT.-COLONEL.

PRICES OF AMERICAN CARS.

[19574.]—Can you explain why so many of the agents over here for American cars find it necessary to make such heavy increases on the list price charged in the United States? One would imagine that their overhead charges, rent, etc., would be less in London than in New York, and that, consequently, they could afford to sell at the list price, plus the cost of bringing the cars over here, as there is no obvious reason why they should not be content with the same profit as the dealers in the United States.

One very notable case is that of the — car, which is advertised as 30 h.p. in the American papers. This, with electric self-starter and full complement of fittings, is listed at \$985 = £202. I do not suppose the cost of transportation exceeds £25, so that this car could be sold at, say, £230; but the price asked by the agents here is no less than £400. Why? I much hope that you will be able to elucidate this mystery.

A DISCOURAGED PURCHASER.

PERPETUAL MOTION (?)

[19575.]—I am glad to be able to answer your correspondent, Mr. (or Mrs.) W. S. Bromhead [letter No. 19517]. Your correspondent is evidently ignorant of the true facts of the invention, otherwise neither he nor you would have suggested "Perpetual Motion," obviously impossible from all points of view. Dr. Sandor does not claim perpetual motion, and no such suggestion is made in the article referred to in

Mr. Bromhead's article. You are probably aware that it is necessary to have a running model in Germany before a patent is granted in that country. This system is now patented in Germany, and has been for the last four years, while another foreign Government contractor has offered to buy the patents for that country. Germany does not grant a patent, neither does a Government contractor buy the sole rights for nothing. Possibly a few details written by the inventor, Dr. Sandor, may be of interest to you. He says:

"My invention has been known for many years past, but its practical application on a commercial basis has not, up to the present, been successfully achieved. I have overcome all the mechanical difficulties which prevented so far the use of the energy stored in springs as a motive power for all classes of machinery.

"My patents are issued on behalf of a spring work system, which solves the problem of transmission of power created by springs working in pairs. The special feature of the working of this device consists in the development of energy to be transmitted, and at the same time in the storing of a certain portion of it, which is automatically released and ensures a continuous production of power for a determined period.

"Without going fully into technical details, I may illustrate by a few figures the working of my invention, which means a revolution in all conceived spring works until now.

"Spring No. 1 is wound up to full tension, and spring No. 2 to three-quarters of its capacity. The first represents the expansion power, the second one the weight power. The mutual action of the springs changes automatically.

"SPRING No. 1, TENSION 100.	SPRING No. 2, TENSION 75.
1. Yielding of force from 100 to 90.	Increase of force from 75 to 85.
2. Stopped.	Yielding of force from 85 to 70.
3. Yielding of force from 90 to 80.	Increase of force from 70 to 78.
4. Stopped.	Yielding of force from 78 to 63,

and so on until after 492 hours, when the proportional force will be 70 for spring No. 1 and 58 for No. 2.

"From the foregoing it can easily be seen that the energy originally stored in the springs is utilised in the most efficient manner with a minimum amount of frictional or other losses.

"The springs, manufactured from a special steel, encased in cylindrical boxes, are tensioned at the factory and delivered ready for use.

"The springs are by no means expensive, the 18 h.p. size costing only £2 10s. each, and the makers guarantee a useful life of one year, but they are confident that the springs will last for about two and a half years.

"Smaller sizes of springs will, of course, have proportionally longer lives.

"My spring work system has been thoroughly investigated by many leading engineers and patent experts all over the world, who are unanimous in hailing it as one of the most important inventions ever made in mechanical science."

JAS. W. FERROTT,

Secretary, Sandor's Motive Power Co., Ltd.

THE VICTOR TYRE TEST.

[19576.]—We only desire to state, in reply to Mr. E. C. Stewart's letter [19521], disclaiming association with the Dunlop Co. so far as the Victor Tyre Trial was concerned, that we have not, as a matter of fact, asserted that Mr. Stewart was the representative of the Dunlop Co. or instructed by the Dunlop Co. to attend as observer on the trial, but merely that he was, and is, a member of the Dunlop Co.'s advertising staff.

We mentioned his name because we desired to applaud the sporting spirit expressed by Mr. Stewart, who, being as he admits a member of Dunlop's advertising staff, yet gave us the benefit of his services on the Trials Committee, and bore ready testimony to the entirely fair and thorough manner in which the trial had been conducted. He was, of course, under no obligation to make any statement, and his voluntary action in endorsing the charts is, therefore, particularly appreciated.

Of course, we at once accepted Mr. Stewart's statement that he joined the committee without the direct knowledge of the Dunlop Co., but that does not materially discount the value of his evidence.

In his private capacity, Mr. Stewart rendered exceedingly valuable service to the Tyre Trial Committee. For that we thank him very cordially. The fact that he is, intimately or remotely, associated with one of the other competitors, whose tyres were on trial, only adds to that extent a special value to the evidence.

Correspondence.

We may remark, finally, that we have not received any disclaimer from the Continental Co. or from Mr. Alan Braithwaite Dickinson, the member of the staff of that company, who also rendered the committee excellent service as observer, and similarly volunteered evidence of the just and equitable manner in which the tyre trial was conducted. We take it, therefore, that there is no question of the association in this case, and are glad to think that at least one of our competitors was directly represented.

W. YARWORTH JONES,
Managing Director the Victor Tyre Co., Ltd.

[19577].—This sadly interminable correspondence grows sadder and sadder. The R.A.C. has surely lost its balance, its perception, and its ability to judge situations. Cannot the Club see that it is required, in its own interests, to explain why, for the second time, it did not do the thing it promised to do? Cannot the Club understand that this second failure is of far greater importance than the first? It could perhaps have made out a case on its first failure. If it had been frank it might, in my view, have justified its trade associations for trade trial purposes, and its action after consultation with the trade in reversing its own decision. It preferred to endeavour to disguise the fact, and landed itself into an impossible and an undignified position. But on this second occasion it has a far more difficult matter to deal with. This seems to me a question of personal honour.

Did the chairman of the R.A.C. and the secretary of the R.A.C. ask for the help of the Victor Tyre Co.? Did they receive that help? Did they give an undertaking, or make a promise, or suggest an equitable *quid pro quo*? What was it? Have they redeemed it or have they broken with their undertaking?

Mr. Jones's statement and evidence are before us. Let us have the statement and evidence of the R.A.C. I am tired of the amazing vacillations of the R.A.C. It is quite pitiable and quite unnecessary. If the R.A.C. is honest and honourable, for heaven's sake let us see the evidence of it and be done.
F. W. CLARK, Capt.

[19578].—Is not the fact that the Palmer tyres used on the 25 h.p. Talbot on one day failed to do 100 miles at the rate of 100 m.p.h. without a burst, and that another set on another day did not fail, sufficient to justify the R.A.C.'s action in refusing to countenance the Victor tyre trial?

Here we have the same make and size of tyres on the same car on the same track travelling at the same speed, and one tyre out of eight burst at under 100 miles. I think this proves that the wear of a tyre depends entirely on the individual character of each and every tyre, and that the best maker is the one who turns out the fewest bad tyres. Supposing Palmers had been challenged by Victor to a trial of seven rounds, viz., only one tyre on the car at a time of each make, it would have been possible but not probable, that those seven tyres that stood the strain might have been selected and shown up well in the trial. On the other hand, if it had been a one round trial, it is still possible, and more probable, that the one which did not stand the strain might have been selected, and, consequently, would have shown up extremely badly, thereby showing that a trial of this kind—the Victor trial—proves nothing, but is a matter of pure luck.

Then why should tyre companies who have earned enviable reputations, such as the three in the present so-called test, stake their reputations on a trial of luck? It is so obviously a "Heads I win, tails you lose" trial, where Mr. Yarworth Jones insists on tossing the coin, that I fail to understand the numerous tirades against the R.A.C. for not sanctioning the trial—when, however, it is arranged, if people are prejudiced by the result, it cannot be fair to all parties concerned.

Incidentally, the snowball system is not working out here (Soudan) so well as at home, as the only people who mention the subject of the trial say "they are sick to death of Mr. Yarworth Jones's letters, grumbles, challenges, and tyres."

Apparently, the result of the trial is to be that, although at the time of writing the latest copy of *The Autocar* I have is February 22nd, the trial is not finished, and although Palmers, Colliers, Prowodnik, Avons, Sirdar, Spencer-Moulton, Hermetic, Stepany, Bateman, Goodrich, Shell, Beldam, Macintosh, and Moseley have never been on trial with Victor, Victor tyres are the best tyres, last longest, wear best, and so forth *ad inf.* Then if this be so, what on earth was the trial to prove.
QUENTIN O. GROGAN.

Mongalla Province, Sudan.

[19579].—In reply to Mr. Jones's letter 19548, I wrote the views of a large number of motorists of my acquaintance both in the Club and out of it. I am not interested in any

opposition except in so far as I am a member of the R.A.C., though not a member of the Club Committee.

I do not object to facts, but to Mr. Jones's verbose inferences therefrom. I do not give my name because this is almost certainly unknown to Mr. Jones; in addition, whether known or unknown, there is the probability that he would find in it a peg on which to hang more advertising. So far as I am concerned, this correspondence is over. Mr. Jones can now cover as many columns as you will give him with his rather far fetched grievances against the R.A.C. and with his suspicions of the integrity of anyone who has the temerity to think that he is wrong in his contentions and gravely lacking in taste in his controversial methods. He is secure from comment from me; I have made the protest I desired to.
IGNORUS.

MUD-BINDING ON MAIN ROADS

[19580].—In your issue of May 10th I was much interested in your remarks on Sir John Macdonald's recent contribution to the discussion on modern road construction. In Sussex all the main roads are made on the mud-pie method, and more disgraceful highways it would be hard to find. Excellent road metal is obtained, often from some considerable distance, at great expense, but this is nullified, as you say, by binding in with ordinary mould dug from the roadside banks, and copious streams of water. The reason for this procedure has been suggested to me. Steam rolling, assisted by mud and water, takes half the time dry rolling would. It is impressed on the surveyor that expenses must be kept down. Permitting the mud-pie method will temporarily do this. The road appears smooth and hard when finished, but possesses no lasting properties, and after a spell of dry or wet weather is soon in as bad a state as before. I conclude it is ignorance on the part of the authorities in allowing this method of road repairing. At any rate, it is a great waste of the ratepayers' money, as a road properly repaired in the first place would be cheaper to maintain in the long run. I fear we cannot expect any improvement until a central authority has entire control.
VICTIM.

SUMMARY OF CORRESPONDENCE.

INCONSIDERATE DRIVING.—"DN 114" writes to complain of the conduct of the driver of a closed dark coloured car carrying a "G.B." plate on Sunday, May 11th, half an hour past midday between Weyhill and Kimpton (Hants). There were two men in livery on the front seat and some children inside the car, which passed two ladies, who were on foot, in a narrow high-banked lane just after a very heavy rain-storm, at a "tremendous" pace, smothering them in mud. He hopes this complaint will catch the owner's eye.

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Flashes.

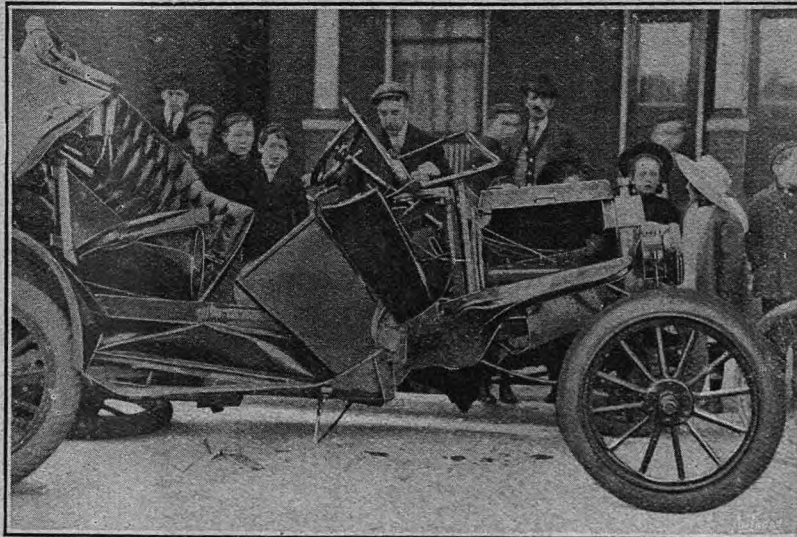
The Fifth International Road Race, under the auspices of the Savannah A.C., Georgia, for the gold challenge cup offered by the A.C. of America, will be run on the 27th November next.

* * *

An interesting account has been sent us by Mr. Hatherley Page Wood, Wakes Colne, Essex, of the running of his six-cylinder Standard car. Since this vehicle was purchased in 1908, it has been put to very hard work over every sort of road. The total distance travelled amounts to 72,000 miles. There have been two stops for tyres—one occasioned by a nail and one by a burst—and four mechanical stops, two of them being brought about by broken valve springs, one by a choked jet, and one to adjust the change speed lever. Beyond grinding in the valves, adjusting the magneto, and general cleaning, nothing has been done to the engine. In April last the cylinders were taken off in order to inspect the gudgeon pins and big end bearings. There was a considerable amount of carbon on the piston heads, but there was not sufficient play in either the gudgeon pins or big end bearings to make it necessary to take them up. The only new parts required were two ball bearings for the camshaft and magneto spindle. The original Vita sparking plugs are still being used. The petrol consumption has averaged about nineteen miles per gallon.

* * *

The Local Government Board announces that it does not propose to sanction the imposition of a ten-mile speed limit along Berkeley Street and part of Berkeley Square. The applicants for the reduced

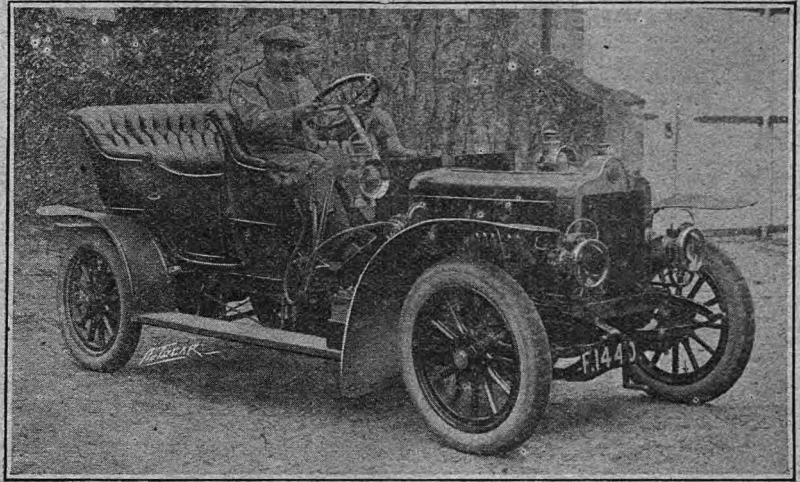


Tramcars are looked upon as the kings of the road in Toronto, Canada, and the accident to the car shown in the above photograph is a natural result of this state of affairs. The car was struck by a tramcar travelling at about thirty miles an hour, and was carried some 300 feet before the tram could be stopped. Of the unfortunate passengers of the car one was killed and three were injured.

speed limit were the London County Council, who were undeterred by the fact that they had at least once before applied for, and failed to obtain, the imposition of a ten-mile limit on the roads to which the present application related.

* * *

In our article describing and illustrating the Studebaker detachable and collapsible rims which appeared in *The Autocar* of April 26th, we stated that these



Mr. Hatherley Page Wood on his six-cylinder Standard car (referred to in the accompanying paragraph), which has shown remarkable reliability throughout a total mileage of 72,000.

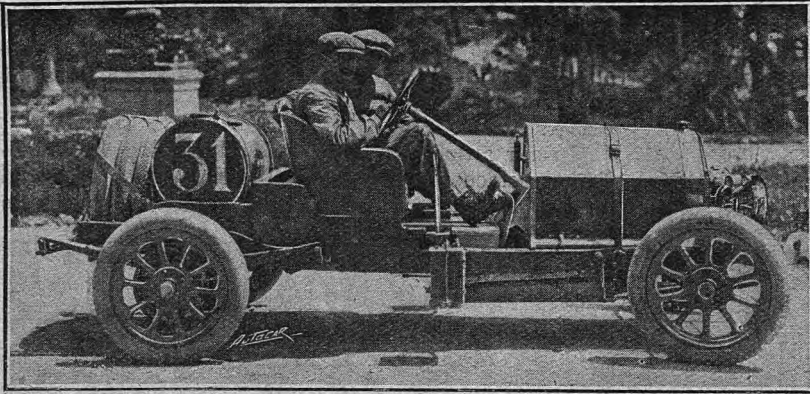
rims were fitted to all Studebaker cars. The Studebaker Corporation inform us that this is not quite the case; the detachable rim is fitted to the 15-20 h.p., and the collapsible rim to the 20-25 h.p. and 25-30 h.p. models.

* * *

In connection with the forthcoming visit of a party of members of the Institution of Automobile Engineers and the Society of Motor Manufacturers and Traders to the United States, the American Society of Engineers has designed a neat letter label in colours for use on the society's correspondence. It depicts the emblems of the three societies grouped above the representation of the steamer *City of Detroit*, on which the joint meetings for the reading of papers are to be held on Lake Michigan.

* * *

The motor ambulance which, as reported in a recent issue, is being presented by the Grand Duke Michael of Russia to a North London Hospital, is, we find, intended for the Hampstead General and North West London Hospital. In return for the hospital authorities maintaining the ambulance equipped for accident service within a radius of a mile and a half from the hospital, thus serving the districts of Hampstead, St. Pancras, and part of Marylebone, the London County Council has agreed to grant a sum of £50 per annum towards the cost of running the vehicle.



THE RACE FOR THE TARGA FLORIO. Nazzaro, the winner, on the Nazzaro car.

We hope shortly to publish an article by Mr. F. W. Lanchester on the testing of gears and the necessary conditions which must be observed to ensure accuracy.

* * *

A trap is being worked on the Sheen Road just before Richmond, and extends from the Derby Arms to the Black Horse Hotel—the only bit of clear road leaving London this way.

* * *

The Yorkshire A.C. Saltburn speed trials will be held on July 5th, 1913. At a special committee meeting held on Monday last it was decided to carry out a programme of eighteen events on a cubical capacity basis, with the exception of a race open to members of clubs associated with the R.A.C., in which a time variation of five seconds will be allowed. A new feature will be an open race for cycle cars, the complete weight being limited to 8 cwts. and a c.c. of 1,100. Entrance fees have been reduced in all events, and a much larger entry than in previous years is anticipated.

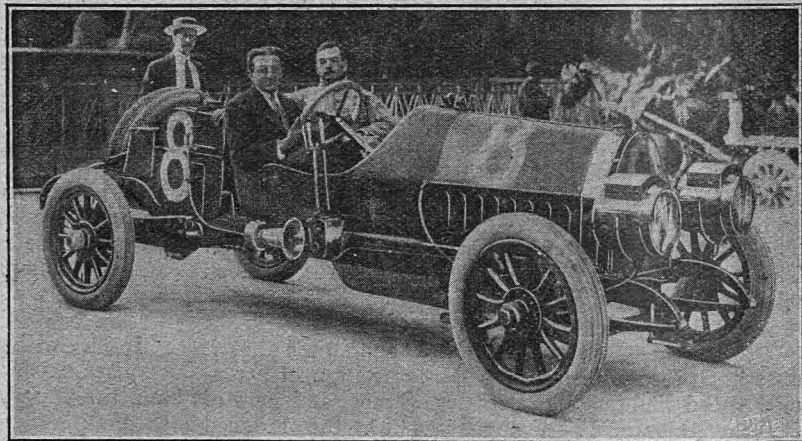
* * *

By a fatality which occurred last week attention is drawn again to a dangerous spot on the Aberayron Road, near Aberystwyth, at which a number of accidents have occurred. This time the victim was a lady

who was one of the occupants of a motor car which failed to take the corner in the dark, and was pinned beneath the car in a pit. The driver and other occupants of the car managed to extricate themselves, and eventually succeeded in taking out the deceased, but not before it was too late to save her life by artificial respiration. The jury at the inquest called the attention of the road authorities to the spot, and suggested the erection of a danger signal.

* * *

Prince Henry of Prussia, than whom there is no more enthusiastic motorist, has just celebrated his silver wedding. As a mark of its appreciation of his great services to the automobile movement, the German Society of Motor Manufacturers has presented His Royal Highness with a painting by Prof. Hans Bohrdt. The presentation was made a few days ago at the castle at Kiel, by Herr Tischbein, of the Conti-



Second in the Targa Florio Race. Marsaglia on the Aquilla.

mental Tyre Co., and Herr Heinrich Kleyer, of the Adler Co., on behalf of the society.

* * *

The Chief Constable of Inverness (Major McLean) announces that, as last year, he does not propose to time the speed of motor cars unless forced to do so by inconsiderate driving, but that the speed limit of ten miles an hour through villages will be most rigidly enforced. It is hoped that motorists generally will appreciate the friendly and reasonable spirit shown and take care not to give cause for complaint. Major McLean adds that he notices with pleasure the good work done by road guides last year, and the assistance they gave him in controlling reckless driving, and he feels sure that if they will again work in conjunction with the police he will have little cause to complain. This is to be commended, and we are pleased to note that such consideration is more general than it used to be.



Berra on the De Dion Bouton car which ran fourth in the Targa Florio Race. This is, we believe, the first time one of the new eight cylinder V type De Dions has run in a race.

Some Queries and Replies.

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

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

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

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

REPLIES.

No. 2676.—Carburettor for 40 h.p. Napier.

I have fitted a Zenith carburettor to a 1908 40 h.p. Napier in place of the original. After careful tuning up the following advantages have been gained: Very easy starting, more power at slow and medium speeds, much improved acceleration, and readier response to throttle; cooler running (boiling cured—used to be a frequent occurrence).—E.J.

No. 2616.—Carburettor for Belsize Car.

I have a 1911 Belsize 14-16 h.p. car with a Claudel-Hobson carburettor. I have not fitted extra jets and so forth because I am not competent to do so, but I run 100 miles on five gallons of petrol, and can reckon on nineteen miles to the gallon anywhere and anyhow. The car has a body with movable top, and the difference with top (2½ cwt.) on and off is about one mile per gallon. I never want to go more than 35 m.p.h., so can give no experience in that direction, and round where I live (Leominster) anyone would be ill-advised to attempt it, as the roads are not straight enough. I think "H.D.W." must be unlucky. My car was fitted with a White and Poppe carburettor as standard. When I got it, it did more miles to the gallon than your correspondent gets by a great deal.—J.G.K.K.

No. 2627.—Carburettor for Vulcan Car.

I have had one of the new Smith automatic carburettors fitted to my 15.9 h.p. Vulcan with surprising results, having improved my petrol consumption four miles per gallon (a test run of fifty-five miles, using barely two gallons) and the power greatly improved, consequently it takes hills infinitely better and gives much quicker acceleration with quieter running of the engine. I did not think that any carburettor could make such a vast improvement. I am entirely disinterested, but wish my experience known.—H.K.J.

No. 2644.—12 h.p. Valveless Darracq.

I took delivery of one of these cars on the 17th of March, and hesitated at replying when this query appeared, but, having now run the car over 1,100 miles, I am able to report that it comes fully up to my expectations. It is quiet, comfortable in its seating accommodation, well sprung, and very good on hills, taking Marford Hill, outside Wrexham, on top gear with four up without any sign of effort, which anyone who knows that locality will admit is good work for a car of this power. It does up to 35 m.p.h. on the level, but 30 m.p.h. is the top comfortable speed, and at 25 m.p.h. one would hardly know there was an engine under the bonnet. Up to the present the consumption, part Shell No. 1 and part Shell No. 2, works out about 26 m.p.g., but now I know the car thoroughly, I expect to get a little better than that. This, my fourth car in seven years, is my first Darracq. I am an engineer by training and business, so my report is not the exuberant

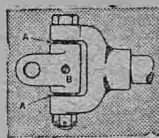
effusion of a novice. This car is not the thing for speed work, but should thoroughly satisfy anyone requiring a comfortable car of good appearance for all-round work. I have no connection with the motor trade.—ENGINEER.

No. 2665.—7 h.p. Swift.

I have a 1910 7 h.p. Swift single-cylinder which originally was fitted with the Swift Co.'s carburettor. This carburettor was good for starting easily, but I could not get more than 25 m.p.g. Early last year I changed it for a Longuemare carburettor Model D, and, after some amount of adjusting, I averaged 36 m.p.g. on give-and-take roads. Last autumn, owing to a leak in the cylinder, I had to have a new cylinder, and now average 40 to 45 m.p.g. on a fair road. In addition to the increased mileage, I find the engine has more power and can take hills on top gear that previously I had to take on the second. I am satisfied with the change except in one respect, and that is it is difficult to start from cold and in cool weather gives trouble, but once warmed up the engine pulls well.—L.D.

No. 2672.—Noisy Universal Joints.

The rattle in old pattern universal joints can only be due to excessive wear, probably owing to insufficient lubrication. After a time the bushes wear oval, and therefore the fitting of new bolts has no good effect. A cure may be effected by grinding the holes out to their circle (there is usually sufficient substance to allow this to be done) and fitting larger bolts. If necessary, also pack at points A on sketch with suitable washers to take up undue play (the washers should be a fairly tight fit on bolts). Then drill a grease hole on each side of cross centre piece on to bolts (B on sketch). Fit a secure leather pocket over joint and keep packed with a fairly thin grease. This type of joint always needed careful attention as to lubrication, and yet in most cases seemed to be entirely neglected until it squeaked badly. The joints are quite silent and wear well, if looked after.—OLD CHENARD.



I had the same trouble with an old Argyll, but overcame it by reducing the ends on the joint and letting in Thackeray spring washers at each end. The car which I so treated is still running and giving no trouble.—M. MESTON.

QUERIES.

No. 2684.—Carburettor for Lancia Car.

I SHOULD be glad to hear whether any owner of a 25-30 h.p. Lancia 1913 has tried any other carburettor than the one supplied with the chassis, and with what result. My car has a closed body, and I cannot get more than eleven miles to the gallon, which seems very poor. The country about here (Sussex) is hilly, with some steep gradients.—F.M.

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Some Queries and Replies (Continued).

No. 2685.—Tyre Alarms.
WILL any reader who has used any kind of "tyre alarm" on back wheels kindly give his experience, also where such alarms are obtainable?—**DRIVER.**

No. 2686.—90 x 140 Metallurgique.
I SHOULD be glad to have experience of the 90 x 140 mm. Metallurgique as an open car with five seats, especially on the following points: Reliability, speed, consumption, silence, flexibility, suspension, acceleration, weight, and tyre wear.—**E.D.Y.**

No. 2687.—23 h.p. Six-cylinder Star.
WILL any motorist who has used one of these cars kindly inform me of the following points: (1.) Flexibility of engine. (2.) Economy in petrol. (3.) Adaptability to, and sufficient reserve of power for, a closed body in hilly district. (4.) Economy in tyres. (5.) General characteristics.—**HOMEBWARD.**

No. 2688.—Small Car for India.
WILL any of your readers give me their experiences of the earlier 9 and 12 h.p. single-cylinder Sizaire cars? I want to take out to a hilly district in India a car of this sort, i.e., low racing body, two-seated, with a single-cylinder engine that I can look after myself. I believe there is also a Jackson car answering to this description, and an Adams, called the "Varsity" type. Experiences and comparisons of any of these (and possibly others) would therefore be of the greatest help to me.—**B.**

No. 2689.—The Pyrenean Region.
CAN any of your readers who have toured in the Southern, Central, and Eastern Pyrenean regions of France tell me of a good travellers' and motorists' book about these districts? Would Toulouse be a good "jumping off place" from which to start for the Eastern Pyrenean region? Would it be possible to hire a car for four or five persons at Toulouse for a tour of, say, a fortnight or three weeks' duration, and, if so, what would be the probable cost of such a car per day? Or would it be better to make arrangements for the hire of a car at Paris? It is proposed to visit such places as Carcassonne, Aigues - Mortes, Port Vendres, etc. I presume these are all well within the scope of a fortnight's or three weeks' tour? Can any of your readers recommend a good route?—**EASTERN PYRENEES.**

No. 2690.—Engine Starters (Air).
FROM what I can hear about some of the engine starters worked by compressed air these things are more trouble than they are worth, as they will not start the engine when cold if the car has been standing idle a week or more. I am told the air reservoir will not hold the pressure for many days, as it, or its main stop valve, leaks, so that when the self-starter is most wanted one has to do without it. My engine is a fairly large one, 7,000 odd c.c., and what I want is something which will start it for me without fail when it has had ten days or a fortnight's rest, and is cold and very stiff. When it is once warm I can restart it with a mere pull up of the handle, but it is a laborious job to get it to fire when it has stood for a long time. Therefore, if the air in the starter reservoir cannot be retained such a device is useless to me. Am I wrongly informed about the air leakage?—**BALDRICK.**

QUERIES AND REPLIES.

No. 2691.—Cars left at Public Garages.
AS I am keeping my car at a garage which is owned by a limited liability syndicate, I shall be glad if you can inform me whether, in the event of a receiver being put in for rent or other debts, he could detain my car and sell it to help satisfy the debts.—**H.D.**

A car left at a garage for repairs or for storage cannot be distrained on for rent, nor can it be successfully claimed by a liquidator or receiver unless the owner of the car has allowed the garage proprietor to use it as his own and utilise it in his trade or business.

No. 2692.—Spring Jacks.
I SHOULD like to hear of any readers' experiences with one of the new spring jacks. I have tried one of Messrs. Brown Bros., but after opening two leaves, the jack twisted out of shape. I had it trued up, but it repeated its previous performance, after opening another two leaves. I had the weight of the car jacked off the springs, so I gather this particular make is not as useful as one would think. The springs were the rear of a 13.9 B.S.A.—**H.W.H.**

Messrs. Brown Bros., Ltd., to whom a proof of the above query has been submitted, say, in reply: "We do not understand your correspondent's troubles, unless he is in the habit of trying to use this jack close up to the spring shackles, in which position it requires an enormous effort to open the springs. If he puts the points three or four inches in from the ends of the leaves in the manner stated in our directions we are quite sure that he will have no trouble. There is also the fact that people very often get the ends of the screws between different leaves. Unless the springs are clamped together they are very easily opened. The tool has been made as light as possible, but it is sufficiently strong for ordinary purposes

No. 2693.—Guarantees.
A MEMBER of the A.A. purchased a 1912 15 h.p. car new in January, 1913, for £180. He sold it to me on May 8th for £120. On the previous day the manager of the company from which the car was purchased offered me a similar car, new, for £175, impressing on me at the time that it carried a two years' guarantee. On the day I purchased the second-hand car I took it to Hatfield on a trial run and found it consumed a gallon of best petrol to every eleven miles, although it is said to average about twenty-four. The teeth on the brake quadrant would not hold the lever, making the car dangerous on a hill. I applied to the company to replace the part, but they refused to supply another without instant payment of 3s. on the ground that it was a second-hand car. Can you tell me what is the value of a guarantee?—**E. J. REGAN.**

Unless the guarantee provides otherwise the original purchaser can, or selling the machine, give the benefit of such guarantee to the new owner, but such benefit would not pass unless it was part of the arrangement when the sale to the present owner was effected. As no copy of the guarantee is enclosed it is impossible to state the exact position in this case.

Week-end and Touring Notes.

Motoring in Russia.—Warsaw to Moscow.
An Account of a Motorist's Experiences after Crossing
the Frontier from Germany to Russia.

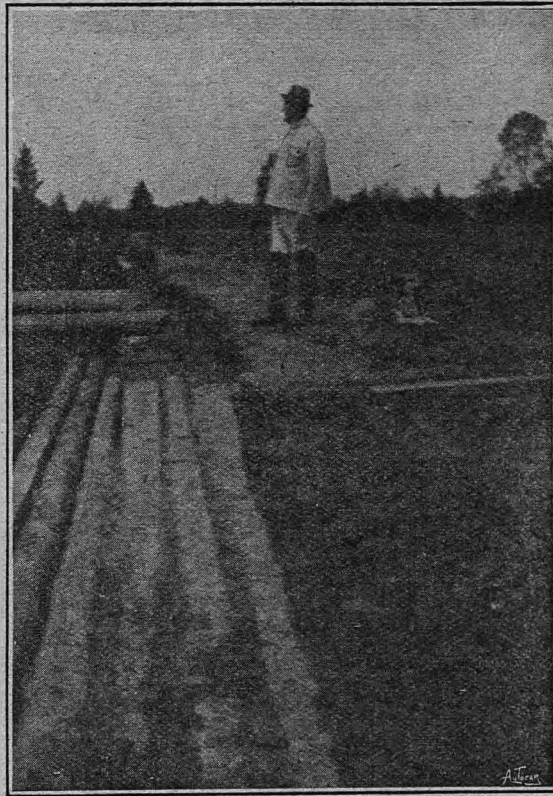
(Concluded from page 921.)

I left Bobruisk next day before 4 a.m. in the hope of getting to Roslavl before night. I drove through the fortifications to find the watergate locked and the guard gone away with the key. I waited half an hour, then sent out search parties for him. I was greatly irritated, thinking that I was being kept back solely that the guard might prolong his "night out" by another hour. Nobody thought of telling me that if he had been at his post, I should merely have had to wait fifty yards further on. At last he appeared and unlocked the gate, and I moved through to the banks of the River Beresina. The bridge of boats had been opened to allow passage of a flotilla of timber rafts on its way towards the Black Sea. I was told the bridge would be remade as soon as one "forest" had passed. So I waited, eating sunflower seeds, which is something no one can do who has any other occupation for fingers or brain. But it was interesting to watch the rafts snoot between the bridge ends and turn completely round in an eddy below to continue their way. I watched fourteen rafts pass the bridge till waiting became tiresome and the sun became very hot. Then, when there were at least 300 waggons waiting, the master said he would remake the bridge.

A Jew appeared who, it seemed, had a "forest" immediately behind the first. He became very angry that the bridge would be remade, and demanded that his "forest" be allowed to pass too. There were many words between him and the bridgmaster, and eventually the Jew demanded to see the regulations. The two entered the bridgmaster's office and the Russian waggons all looked at one another and spoke the Yiddish word "Geschaeft." The Jew and the bridgmaster soon reappeared and the latter hoisted the signal that the passage of rafts was stopped. The Jew's rafts paid no attention to this signal. The bridgmaster stormed, raged, and swore, but the rafts came on, and one did not dare attempt to remake the bridge. The waggons said the Jew had made his raftsmen a sign that he had arranged with the bridgmaster that no punishment would be inflicted for their disobedience. Whether this was true or only the imagination of the angry waggons I cannot say, but the bridge-

master continued to swear and to order them back, and the rafts continued to pass through, paying no attention to the bridgmaster at all. The Jew meanwhile looked very pleased.

I had waited over four hours before a start was made to remake the bridge, and the remaking was a very long business. The boats had to be pulled into place and fastened together with beams. Some beam-shackles would not meet and I was asked to bring my car on to the bridge to depress this part or that. I helped and at last the bridge was securely fastened.



A specimen of a Russian road; really not much more than a track of soft earth.

I was, therefore, in the middle of the bridge when liberty to cross was given. Some 200 or 300 waggons from outside and fifty or sixty from the town raced at once on to the bridge, each lot occupying the whole width of the road. They met around me. For some time nobody could move a yard—the confusion was awful. I stopped my engine until things cleared, which did happen in time. I suggested to the policemen sitting on the bridge-rail that a little control would be beneficial to everybody. One replied, "What can we do with such rabble? They won't obey us." A thought passed through my mind that there was not a man in all that rabble who would have dared hum the tune of the French National Anthem if he had been offered a month's wages for doing so, unless he had first been given time to promise half the prize to the police.

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Week-end and Touring Notes (Continued).

When I got fairly under way, six hours after my first start, I found myself a mile from the hotel at which I had stayed the night. But the disagreeable nature of the crossing of this river Beresina was placed on record just over a century ago.

From the Beresina to the Dnieper is a very pleasant easy run of two hours. I crossed this latter river at Rogatchev by a very good ferry-boat, without stopping for lunch, as I feared more timber rafts, and entered a Russia quite different from that which I had already traversed. The country became sharply undulating. I believe it is this road which gives in France the name of "montagnes russes" to what we call a switchback railway. It would have been delightful if one had dared let the car go and have the momentum of the descent to carry it over the next summit. But there was always in the bottoms a ditch-bridge which had to be crossed dead slow, so this road is rather trying, all braking and gear-changing. The country became much more thinly populated, and traffic must be very light, as the road was often grass-grown for considerable distances. The scenery was splendid—there were bits here and there which might have been picked out of the beauty-spots of rural Surrey or Hampshire—but I was not in condition to appreciate it. It was late afternoon, and I had eaten nothing since the day before, except sunflower seeds. Sunflower seeds occupy painfully little space. At last I reached a house at which I was told I could obtain food. I could not leave the kitchen whilst it was being prepared in case it were delayed after being made ready, so I know the recipe for the dish I was served with. First a large tin was half filled with potatoes which had been baked in their jackets; these were covered with a layer of chopped raw onions. Then an uncooked salt herring was taken and cut into small pieces. (This had probably been shipped originally from Hull or Grimsby and been much handled since.) The herring was thrown on top of the onions and potatoes and a most generous supply of melted butter poured over the whole. I thought, when I tasted it, that if M. Escoffier had served this "plat" to his "gourmands" they would have adjudged his "pêches Melba" and his "fraises Sara Bernhardt" to be merely the tentative poems of his youth—provided always, as the lawyers say, that he could get his "gourmands" to table with the appetite I brought. Then refreshed, I continued up and down across a country with a surface like that of a corrugated-iron roof, always seeing at the top of each rise the Moscow Road eight or ten miles in front, running as straight as an arrow.

I was tired by my long wait at the Beresina, and felt unable to continue to Roslavl, so I stopped at a post-station and asked to be taken in. These post-stations date from the time when all the traffic between East and West passed along this road. (All the signposts in this country show only the distance from one post-station to the next.) I believe they belong to and are still kept up by the Government. At present they are almost useless, travellers always making north for the railway, but with their splendid garages they will make excellent

motorists' hotels some day; they are all alike, and are placed ten to twenty miles apart all along the road. They consist of a long house having a great gate at either end, giving access to a courtyard behind, which has accommodation for fifty or sixty horses and twenty or thirty carriages. They are clean because there is little in them to get dirty, and seem under some sort of supervision. They have hardwood parquet floors, and nothing but a table and two couches, covered with leather-cloth, in each of their three guest chambers. Nothing to eat but bread—eggs and tea can be obtained; and no provision is made for sleeping. I was told that the keepers are forbidden to receive anybody but travellers by the public conveyances, but I have never been refused admission. Such a prohibition would seem to be unnecessary, as I have never seen another traveller in any of these houses, though I was once turned out of the best room in the middle of the night to make way for somebody who did not arrive.

They are not exactly comfortable to sleep in. I tried to sleep on the couch which was too short, then on the floor which was too hard, then back to the couch, where I slept at last, though rather cramped. But I preferred to spend the next night in a similar place rather than in one of the less clean country hotels. Something should be done with these post-stations. Russia, with few railways, needs many motors, and these stations, instead of being useless expense, might be made most useful and even self-supporting.

At Roslavl, next morning, I bought two poods of petrol. Some of it fell on the tank, and I saw that it formed oily globules. I smelt it; it was exactly like paraffin. I thought the Jew vendor had mistaken the cask and given me paraffin by mistake. He said no, and insisted that he had supplied first quality petrol. I got the policeman and all the village to smell, and they all said it was paraffin; it was possibly a mixture. I feared to empty it out, as I might be unable to obtain anything else, so I agreed to accept delivery provided that the engine would run well on it. The engine ran beautifully whilst test was being made, and has never run properly since. I soon found I had to keep the engine running fast to prevent missing and stopping, and after some hours of this, I decided to empty it out if I could find anything better, so at Louknov I made enquiry. It may have been a coincidence, but the only man who had petrol there was also a Jew, and he asked nine roubles a pood for it, which was just double the highest price I had ever yet paid. I refused to deal. The Jew seemed surprised; he evidently thought I was "cornered." But I had a big reserve tank I had not yet touched. I told him I would rather hire a horse. I wondered whether this man had an understanding with his co-religionist in Roslavl.

I slept that night at a post-station between Louknov and Medyn. There were quite a number of Circassians in this neighbourhood. I was told that some forest owners greatly favour these men as forest guards, as the Circassian is a savage fighter and shows no mercy to the peasants caught stealing timber or wrongfully pasturing cattle. They are fine-looking men in their national

Week-end and Touring Notes (Continued).

costume and big Astrakhan fur hats, and I was told that their popularity with the male peasants is not increased by the affection shown for them by the local ladies.

So far everything had gone fairly well with me, but on this last day my misfortunes came thickly. My foot-brake had been almost useless for some time, and I was forced to keep the engine running too quickly for my liking on account of its refusing to fire at slow speeds on my bad petrol. So when a crevasse, which had been hidden by a bridge, suddenly appeared across the road in front of me, I knew something was going to happen. Mine is the best car I know for rough work, but it was not built for "lepping." When it came out of that hole, the side brakes were gone, a new tyre had burst, and the transverse rear spring was smashed. Most cars would have crumpled up. It was a good thing this did not happen earlier; I was now only ninety-seven miles from a repair shop. I fitted up a jury rear spring with timber I found by the roadside, fastened with rope, tyre levers, jack shaft, and other sundries I had in the car. I am very proud of this repair; it carried me into Moscow without requiring to be retouched.

Then I proceeded, but—with no brakes, a broken spring, and engine firing occasionally—I had to travel very slowly. It was a very tiring day. All these metalled roads have an earth track on either side of them for the peasants' unshod horses, so the trees are too distant for the centre part to receive any shade. And it was very hot. Then I discovered that my temporary tank was leaking, and nearly all my reserve of petrol was lost. At Maloyaroslavietz I bought two gallons, which was all there was to be had; and a very unpleasant doubt arose whether I had enough to reach Podolsk. It was most irritating to be pulled up by three toll-gates, the first I had seen in Russia, and delayed whilst my engine consumed its precious last drops of fuel. I just managed to arrive in Podolsk with my petrol tanks absolutely dry. I bought only enough more to carry me to Moscow, as it

seemed little better than that I had bought at Roslavl. Here I noticed that the peasants were much less friendly, but when I met two motor cars out of Moscow the explanation was clear. They were driven with no consideration for anyone. Perhaps they were being shown to intending buyers; I find buyers here attach great importance to maximum speed. When they have owned cars a little longer they will have learnt that speed is one of the last qualities to be desired in a car for use in this country.

Then from the top of a rise I saw the gilded domes of the Church of Jesus Christ and the Kremlin, and was heartily glad to be near the end of this day's run. I entered the big village of Moscow in a duststorm, and drove my poor wrecked car to the first repair shop I could find. By good luck it was just the place I should have chosen if I had visited them all. The owners, Kriloff Bros. and Co., employ as chief mechanic a very clever German, and I believe the partners have also German experience in automobile work.

I took up my quarters at the Boyarski Dvor, an excellent Russian hotel with reasonable charges. The hotels which cater for foreigners are extremely expensive. At Moscow I left my car, as I was going to a place in the forest between the head waters of the Volga and Dwina. I am now in the centre of 40,000 square miles of country, in which no motor could stand the roads, and in which few bridges could carry a motor. I have no desire to be the first to bring a car here. The forest people are not like the gentle peasants of the agricultural districts. Before meeting forest men a motorist would be well advised first to take out a very full R.A.C. policy on his car, "and next to insure . . . his life in some office of note," as the Banker sagely counselled the Beaver.

Here no letters are ever delivered, and one lives and eats much as one must have lived and eaten in rural England in Tudor days.

But my present existence has nothing to do with motoring. X.

Flashes (Continued).

Motor Schools, Ltd., of Heddon Street, Regent Street, W., point out that, in addition to the six guineas course, they give a full course of driving lessons and a week's practical instruction in a class for £3 3s. and 12s. 6d. respectively. New lecture rooms are now being built at their works at Loudoun Road, St. John's Wood, which will shortly be opened.

The Connaught Motor and Carriage Co., Ltd., 27 and 29, Long Acre, W.C., have obtained the sole concession for Great Britain, the Colonies, and Dependencies for the Sidea (small) cars, which are made in two powers, the 8-17 h.p. and the 10-22 h.p. The price of the former complete for the road with tyres, that is with hood, screen, lamps, etc., is 200 guineas, and the latter 260 guineas with a neat two-seated body. A copy of the catalogue describing this car can be obtained from the above firm on application.

The Knight-Kilbourne Co., of Chicago, have just granted a licence for the manufacture of the Knight sleeve valve engine to the Moline Automobile Co., Moline, Iowa, U.S.A.

Bougie Pognon, Ltd., have recently issued a very interesting circular, which, in non-technical language, gives some valuable hints on ignition. There are numerous kinds of Pognon plugs, to suit every type of engine, including one kind intended for use on very hot engines. Further, there are two platinum patterns, one with electrodes of V-shape, allowing the spark to vary its path, and another with super-imposed electrodes, both of pure platinum. The centre stalk of the latter carries the upper electrode, and, being free to expand under increases of temperature, it automatically widens the sparking gap as the speed of the engine increases. A copy of the leaflet may be obtained from 29, Vauxhall Bridge Road, London, S.W.



THIS WEEK'S BARGAINS.

EXCHANGE.—If your present Lamps are not powerful enough, exchange them for new latest high-class Willocq-Bottin Rushmore, Alpha, Lucas, Blériot, Dependence, Ducellier, Powell and Hammer or Howes and Barley Lamps at Snyth's. You cannot possibly get better terms elsewhere.

HEADLIGHTS.—New Mirror Lens Headlights from 9/6 each; Two small Willocq-Bottin Self-contained Headlights, as new, 39/6 each (maker's price, £3 10s.); Two large ditto, £3 each; Lucas plated Motolite Self-contained Headlight, £3 15s.; Lucas plated Kinglite ditto, £4 10s.; Lucas plated Autolite ditto, £2 15s.; Two Lucas Duplex 704 Lens Mirror ditto, £4 15s. each; Pair large Lucas plated projectors, No. 676, £9 10s. (maker's price £14); Two Rotax No. 267 Lens Mirror Self-contained Headlights, 38/- each; Pair large Rotax "Brightlight," No. 3287 Lens Mirror projectors, £4 15s.; Two Ford Lens Mirror Headlights and A.L. Generator, 37/6 set; Two new powerful Schmidt's Original Lens Mirror Headlights, 7in. fronts, and new Generator, 14 5s.; Two new larger ditto, 8 1/2 in. fronts, and new Generator, £5 5s.; Large quantity of other Headlights, all sizes, to sets; Adjustable Headlight Brackets, 7/6; Special Sets of Acetylene Tubing, 6/- (usual 7/6).

GENERATORS.—Frankonia, 16/6; A.L., 18/-; Blériot, 20/-; Ducellier, 25/-; Goldenlyte, 25/-; Double Salisbury, 30/-; Round Rushmore, 35/-; Square Rushmore, 45/-; other Generators from 4/6.

SIDE LAMPS.—New Reliable Oil Side Lamps, 16/-, 20/-, 25/- pair; Second-hand from 10s. pair; Electric from 10/- pair; Tail Lamps from 5/-.

HORNS.—Baby Boa, 23/- (usual 45/-); Largest Boa Constrictor, 34/- (usual 63/-); Snail pattern from 9/6; Newtone Superior Electric, 42/-; Echo Electric, 30/-; Gabriel, 30/-, etc., etc.

ACCUMULATORS.—Not the usual auction rubbish, but guaranteed twelve months 20 amp. 8/6, 40 amp. 12/-, 60 amp. 15/-, 100 amp. 25/-; 8 volt, 80 amp., in box, 44/-; Quantity of Second-hand Coils at ridiculously low prices.

LAMP REPAIRS, PLATING, etc.—Send your Lamps here. No fancy prices charged. If too badly damaged will exchange for other lamps.

STEPNEY WHEELS (Perfect).—810 x 90, flange type (less flanges), 36/-; 815 x 105, 40/-; 815 x 105, flange type (less flanges), 38/6; 870 x 90, 37/6; 910 x 90, 37/6; 875 x 105, 47/6; 820 x 120, 55/-; 880 x 120, 55/-; 920 x 120, 55/-; 880 x 120, combination, 65/-; 920 x 120, combination, 65/-; 895 x 135, combination, 65/-.

TYRES.—Several new 700 x 85 Dunlop heavy Covers, 33/-; Tubes, 14/-; 700 x 90 ditto, 48/-; Tubes, 17/-; 710 x 90 Continental Square, 47/6; Tubes, 16/-; Few New and Second-hand Covers of other sizes, Dunlop, Michelin, Continental, etc. Good Second-hand Tubes from 10/-; also Parson's Chains, Detachable Non-skids, Tyre Liners, etc.

CARBURETTORS.—New Latest ZENITH, SOLEX, CLAUDEL-HOBSON, STEWART-PRECISSION Carburetors supplied on fourteen days' trial, and exceptional allowances made for old carburetors in exchange.

MAGNETOS.—Several 2, 3, 4, and 6-cylinder Bosch at reasonable prices; also new Simms and Nieuport at very low prices.

BARGAINS.—Pair J.M. Shock Absorbers, 55/-; H.F. Car Vulcanizer, 75/-; Several Second-hand Speedometers from 25/-; Dashboard Clocks from 8/6; Mirrors from 3/6; Jacks from 4/6; Pumps from 3/-; Tools, Plugs, etc., etc.

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"The Autocar" Share List.

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

Issued Capital.	Amt. of Share	NAME OF COMPANY.	Present Prices.	Last Year.		This Year.		Last Div.	Div. Payable
				Highest	Lowest.	Highest	Lowest.		
£ 2,520	1/	Abingdon-Ecco, Ltd.	2/6 3/6	3/-	2/3	3/6	3/-	%	Nov.
45,000	£5	Alldays & Onions (£3 paid)	3 1/2 sellers	4 1/2	3 1/2	3 1/2	3 1/2	5	Ap/Dc
50,000	£5	" " 6% Cum. Pref.	5 5 1/2	5 1/2	5 3/4	5 1/2	5 1/2	6	Ap/Dc
209,802	10/-	Argylls, Ltd.	5/3 5/9	6/-	4/-	6/-	4/9	Nil	Dec.
150,000	£1	Belsize Motors, Ltd.	26/- sellers	28/1 1/2	25/-	27/6	26/-	12	My/Nv
100,000	£1	" " Cum. Pref.	19/6 20/-	20/9	20/-	20/3	20/-	6	Fb/Au
44,771	£1	Bowden Brake, Ltd.	5/- sellers	7/-	3/1 1/2	5/-	3/-	Nil	Dec.
788,982	£1	Birmingham Sm'l Arms, Ltd.	47/- 48/-	53/3	46/3	50/-	47/6	10	Mr/Sp
203,150	£5	" " Cum. Pref.	5 1/2 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp
75,000	£5	Braintree Bros. Cum. Pref.	4 sellers	4 1/2	3 1/2	4	3 1/2	6	Oct.
100,000	£1	Brooks, J. B., & Co., Ltd.	36/- 37/-	37/6	31/-	36/6	35/-	5	My/Nv
100,000	£5	" " Cum. Pref.	5 1/2 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	My/Nv
100,000	£5	Brown Bros. Cum. Pref.	5 1/2 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	6	Ap/Oc
380,000	£1	Charron Par. Pref. Ord. ...	13/6 14/-	11/6	8/-	14/-	7/9	9	Ju/Dc
200,000	£1	Clement-Gladiator	3/3 3/9	3/-	1/6	6/-	2/1 1/2	Nil	Dec.
100,000	£1	" " 6% Cum. Pref.	14/6 sellers	14/9	10/4 1/2	15/-	13/6	6	Ju/Dc
55,000	£1	Components, Ltd.	5/9 6/9	6/9	4/9	7/9	6/-	Nil	Dec.
25,347	£1	" " 7% Cum. Pref.	12/6 13/6	15/-	11/4 1/2	13/-	12/-	7	Dec.
275,000	£1	Darraq, A., & Co., Ltd. ...	14/3 14/6	18/4 1/2	8/9	15/-	9/9	Nil	Ju/Dc
375,000	£1	" " 7% Cum. Pref. Ord.	15/6 15/9	19/1 1/2	11/10 1/2	16/-	13/-	7	Ap/Oc
159,299	£1	De Dion-Bouton, 7% Ord.	8/6 9/-	11/3	8/9	10/-	7/6	6	Dec.
1,000,000	£1	Dunlop Rubber	38/- buyers	56/9	27/6	39/6	35/6	12 1/2	Ap/Oc
200,000	£1	" " Cum. Pref.	19/9 20/3	21/-	17/-	20/-	18/6	6	M/SD
312,785	£1	" " Income Stock	17/9 18/6	19/-	15/8	19/-	17/6	5	Ju/Dc
624,995	£1	Dunlop Parent Co. 8% Ord.	15/9 buyers	18/7 1/2	10/-	18/-	15/9	19	Ju/Dc
994,990	£1	" " 5% Cum. Pref.	12/8 buyers	16/9	10/6	15/1 1/2	12/7 1/2	5	Ju/Dc
499,962	£1	" " Deferred	11/- buyers	15/-	6/3	11/-	8/-	Nil	Ju/Dc
99,977	£1	Enfield Cycle	21/- 22/-	19/9	13/9	21/9	18/-	5	Oct.
24,985	£1	" " Cum. Pref.	20/6 21/6	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	£1	Humber, Ltd. (New)	10/6 10/9	7/6	3/7 1/2	14/-	6/9	Nil	Nov.
331,495	£1	" " 1% Cum. Pref.	15/6 15/9	11/-	6/9	17/9	10/1 1/2	Nil	Nov.
50,000	£1	James Cycle	12/- sellers	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	£5	Lucas, Joseph, Ltd.	9 1/2 9 1/2	9 1/2	9	9 1/2	9 1/2	5	Ap/Nv
100,000	£5	" " Cum. Pref.	5 1/2 sellers	5 1/2	5 1/2	5 1/2	5 1/2	10	Mr/Sp
73,385	£1	New Hudson Cycle Co.	25/- 25/3	24/6	14/6	28/-	24/0	10	Nov.
18,033	£1	" " Cum. Pref.	18/3 19/3	20/-	18/-	19/6	19/-	6	Mr/Nv
50,000	£1	Premier Cycle	4/6 4/9	5/-	3/-	5/6	4/4 1/2	15	Sept.
125,000	10/-	" " Cum. Pref.	7/6 7/9	8/9	6/9	8/6	7/3	7 1/2	Sept.
31,000	£1	Riley (Coventry), Ltd.	6/1 1/2 6/6	8/9	5/3	7/4 1/2	5/3	Nil	Feb.
200,000	£1	Rolls-Royce	44/- 44/6	47/3	36/3	48/0	44/6	30	Ju/Ju
138,668	£1	Rover	39/- 39/6	31/3	12/6	40/-	30/9	10	Nov.
100,000	£1	Rudge-Whitworth, Ltd.	19/9 20/-	24/-	15/-	25/3	20/-	5	Oct.
100,000	£5	" " 6% Cum. Pref.	3 3/8 3 3/8	3 1/2	3 1/2	3 1/2	3 1/2	*12	Oct.
41,621	£1	Siddeley-Deasy	10/6 11/6	10/6	6/-	11/-	8/10 1/2	8 1/2	Dec.
50,000	£1	Singer & Co., Ltd.	17/6 18/6	19/6	6/6	19/1 1/2	16/-	Nil	Oct.
70,000	£1	Star Engineering, Ltd.	12/9 sellers	18/6	10/6	17/-	12/3	5	Mar.
69,157	£1	" " Cum. Pref.	17/- sellers	18/-	15/4 1/2	17/6	16/9	7	Mar.
87,550	£1	Stepney Wheel	29/- 30/-	35/-	30/-	32/0	29/6	20	Mr/Oc
120,000	£1	Sunbeam Motor Car	56/- 57/-	59/-	37/6	50/-	52/-	25	Nov.
30,000	£1	" " 6% Cum. Pref.	21/- 22/-	23/3	20/4 1/2	22/6	21/6	6	Ap/Nv
80,000	£1	Swift Cycle	19/6 20/3	21/9	13/-	24/-	20/-	6	Dec.
100,000	£1	" " 6 1/2% Cum. Pref.	17/- sellers	17/3	14/10 1/2	17/3	16/3	6 1/2	Ju/Dc
80,000	£1	Triumph Cycle	77/- 79/-	71/6	43/9	82/-	68/-	30	Nov.
50,000	£1	" " 5% Cum. Par. Pr.	24/- sellers	23/6	20/7 1/2	24/6	21/6	6 1/2	Nov.

* Including all arrears.
The feature of the week has been the acute weakness of Rudge-Whitworth ordinary shares. Sunbeams, Triumphs, Components, Clement-Gladiators, Stars and Premiers are all easier. Darraq ordinary and preferred ordinary, Humber ordinary and preference, Dunlop Rubbers, Charron, and the Parent Tyre Company issues are all harder.

"The Autocar" Diary.

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|--|---|
| May. | June. |
| 21 and 28. — Examinations for R.A.C. Driving Certificates. Fall Mall, S.W., 9 a.m. | 19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly. |
| 24.—Hampshire A.C. Hill-climb at Brook Hill, Bramshaw. | 21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Porthcawl. |
| 24.—Cardiff M.C. Annual Hill climb. | 22-29.—Austrian Alpine Tour. |
| 24.—Essex M.C. Race Meeting at Brooklands. | July. |
| 24.—Herts County A.C. Aston Hill-climb. | 5.—Yorkshire A.C. Speed Trials on Saltburn Sands. |
| 30.—500 Miles Race on Indianapolis track, U.S.A. | 12.—Grand Prix Race. Picardie Circuit. |
| 31.—R.A.C. and Associated Clubs' Gala Day, Brooklands. | 19 and 20.—R.A.C. of Belgium Grand Prix Race. |
| June. | 28.—Grand Prix de France and Coupe de la Sarthe. Le Mans. |
| 4 and 6.—Tourist Trophy Races, Isle of Man (see <i>The Motor Cycle</i>). | August. |
| 7.—Shelsley Walsh Hill-climb. | 10.—Mont Ventoux Hill Climb. |
| | September. |
| | 21.—Coupe de l'Auto, Boulogne Circuit. |
| | 25.—International Stock Car Race, Isle of Man. |

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