

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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Notes.

Horn Blowing.

Last week we gave a summarised report of nearly thirty cases at the Norton (Malton, Yorks.) Police Court, in which motorists were fined for failing to blow their horns at a certain cross road. This is not the kind of thing which is going to render road traffic safer, though evidently the Norton Bench think it is. What is wanted at cross roads is a clear definition as to which road is the main road, and then everyone who comes into the main road without due care should be summoned and fined heavily. The mere blowing or

non-blowing of a horn at a crossing will not avert a collision in nine cases out of ten. People should look as well as listen where they go.

However, the matter does not end with a mere local outbreak of misdirected energy. Anyone who has read a report of an inquiry into an accident which has been caused by collision at cross roads between a motor car and another vehicle will have found that one of the questions invariably asked the driver of the motor car is whether he sounded his horn or not. The fact that someone may have driven out of a side road straight across the main road in front of the car does not seem to be regarded as having any bearing on the case; the question is, Did the motorist sound his horn?

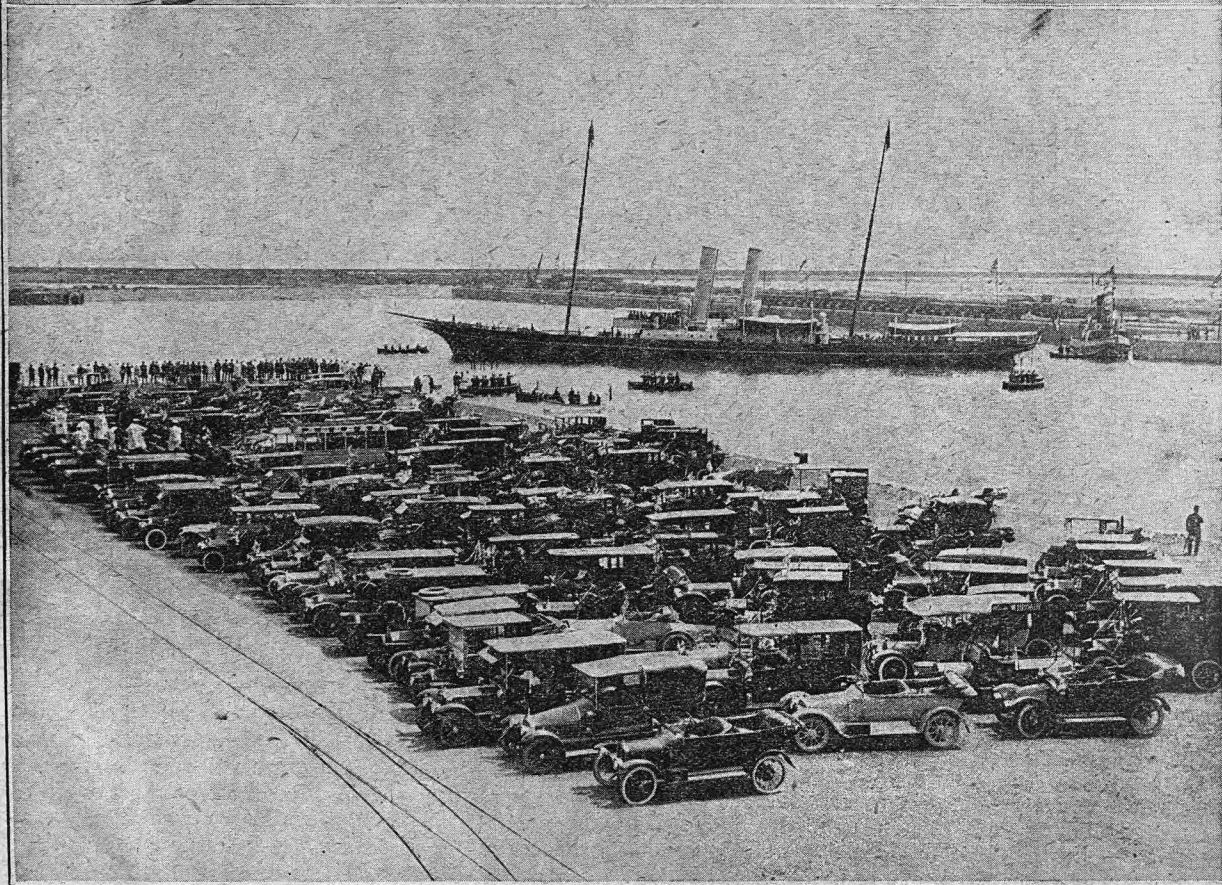
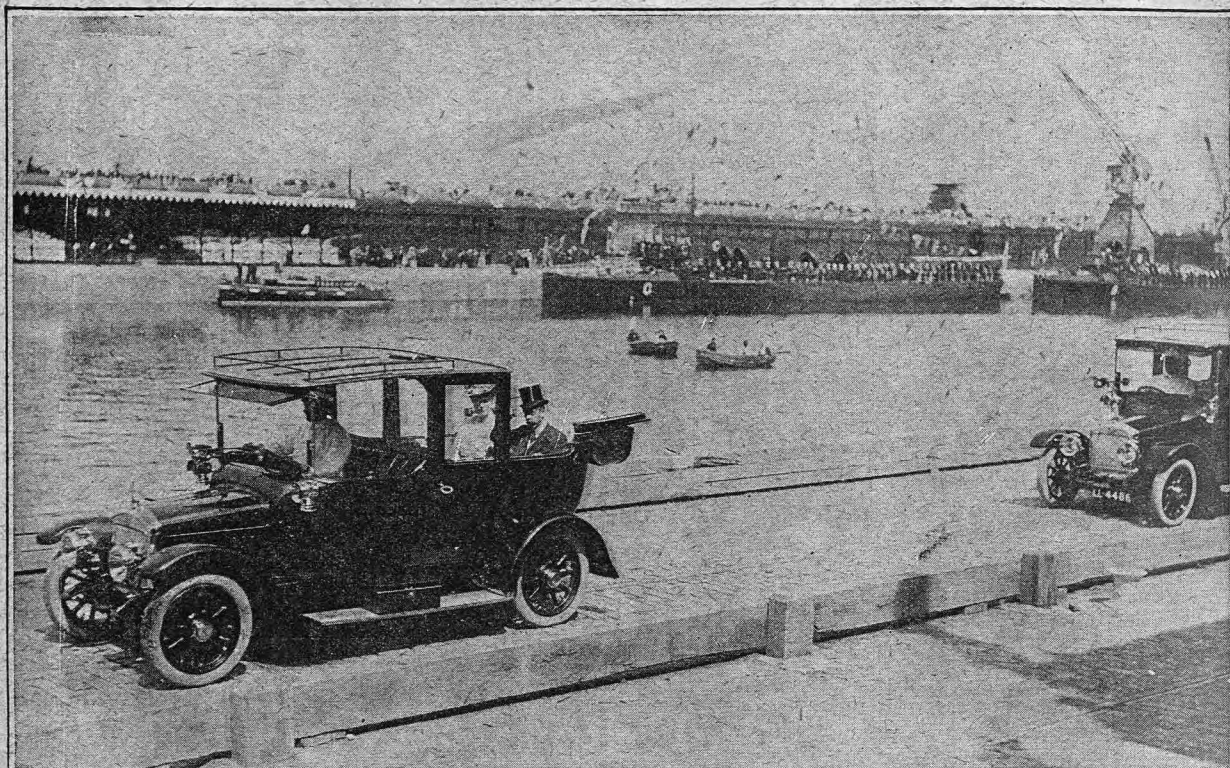
We have before us as we write a report of an inquest upon a farmer who lost his life through driving his dogcart across a busy main road, straight into a motor car, apparently without taking the smallest precaution to see whether traffic was passing or not. The car driver stated, in reply to the coroner, that he sounded his horn before coming to the road crossing, but out of four witnesses, all of whom were quite close to the spot, two averred that he did not sound his horn and two that he did.

The Need for Unnecessary Noise.

The foregoing is but a typical case, but it follows that, while the administration of the law remains as it is, and while such a fictitious importance is given to the sounding of the horn, it is not only necessary to sound it but to make a great noise about it, as it seems fairly obvious that a low-toned horn makes no impression upon the mind of the average witness, and he swears quite honestly that he did not hear the motorist sound his horn. We are entirely against the creation of needless din, but we do not see in what other way the motorist can protect himself. It is not enough to conform to the law: one must impress other people that one has done so; and while so many users of the roads prefer to guide their movements by hearing rather than by sight, we think those people who rage against harsh-sounding horns are protesting vainly. In saying this we are not to be taken as advocating the practice of those thoughtless motorists who tear through villages and towns at night, making night hideous by their needless screechings, but we must say we think that within moderation the motorist is bound under present conditions to make a good deal more noise than should be strictly necessary.

All this incidentally brings up the question as to whether the outcry against noise is not a sign of decadence. Virile nations are not so afraid of noises as so many Englishmen appear to be nowadays. Indeed, it appears to us that a good many of the people who complain of noises ought really to have a little specially silenced world of their own to live in, as we do not believe they will ever be satisfied in any other way. After all the thing is much on the lines of the famous definition of heterodoxy and orthodoxy, and may be freely rendered as defining objectionable noises as the noises made by other people.

The Royal Visit to Hull.



At the top, Their Majesties the King and Queen at the dock side in one of the Austin cars used for the occasion. Below are seen guests' cars parked during the ceremony of opening the new dock.

Useful Hints and Tips.

Filling Greasers.

THE average owner-driver puts off as long as possible the evil day when he must face the messy job of refilling the numerous brass thimbles which adorn the minor moving parts of his car. When at last he reluctantly essays the task, he usually collects the greasers, stands them on a tray, sits down with a knife and a can of grease, and, taking a wedge of grease on the knife blade, smears the open end of each greaser. This method is unnecessarily dirty, and completely inefficient, for the first smear blocks the whole orifice of the brass cap, which is often less than one quarter full when he replaces it. The cleanest method is to use a grease gun, consisting of a cone-ended barrel, a loose grease-sheath, and a wood plunger. The smallest size costs 3s. 6d., but it is worth while to get the half-guinea size, so that the gun need only be refilled at rare intervals. The sheath can be filled by plunging it bodily into the grease can and wiping off the surplus, but there is less mess and waste if a "paddle" be used to transfer the grease from its can to the gun. Some makers supply paddles, others do not; but a paddle can easily be made by buying an iron kitchen tablespoon and cutting off the tip of the bowl with a hacksaw. The sheath can then be filled without waste and without soiling the hands.

With the aid of the gun each greaser, however small, can be filled cramful of grease; operate the gun so as to eject a tiny thread of grease, say $\frac{1}{8}$ in. in diameter, and wind the thread round the centre of the greaser till it is filled. A little grease will be squeezed out in replacing the brass caps on their bases, because makers will not realise that these caps are not easily engaged on their threads when full of grease. It would be much easier to engage greasers which had no screw threads cut inside them for the first $\frac{1}{4}$ in. on bases which had threadless guiding sockets, compelling the thread to engage squarely.—B.D.

Clearing out and Repairing Accumulators.

Very often a double cell accumulator fails to take a charge on one side or will only show half the normal voltage. This is often caused by the expanding of the positive plates upwards so that they touch the connecting bar or bus bar of the negative plates, thus setting up a short circuit. In some cases also a short circuit may be set up by the sediment which is deposited at the bottom of the cell. This cannot always be washed out by putting water in through the holes used for putting in the acid, and the only other way is to remove the lid of the accumulator. This can easily be done by inserting the point of a penknife between the joint of the lid and the side of the cell, then by turning the knife sideways the joint will crack. Working all round with the knife in this way, until the lid is quite free, it must now be drawn upwards until further movement is stopped by the connecting bar; the other side of the lid can then be sprung over the terminal and the whole turned round. In this way cutting or disconnecting the bar will be avoided. Now take the end of a hose pipe and squeeze it so as to make the water pass up between the plates; this will very soon remove all the deposit from the bottom of the cell, and will avoid removing the plates. If the connecting bar inside the accumulator should be found to be touching the tops of the plates, it should be very carefully prised upwards with the end of a screw-driver.

Now work the lid back into position and, after carefully pressing it down all round, cement it down with some celluloid solution, and have the cells put on a good long charge until they gas freely.

If a terminal be broken off from the bar inside the accumulator and leave a hole too big for tapping out again, get a small blow lamp and soldering iron, and, after placing some pieces of sheet asbestos round the hole to prevent the flame from the blow lamp melting the celluloid case, fill up the hole with solder, using tallow or resin as flux, and drill out and tap in the ordinary way.—W. J. SNELGROVE.

Petrol Pipes near the Silencer.

Whilst driving at a smart pace recently, a sudden whirr under the bonnet drew attention to the fact that the ignition switch on the dash had been accidentally turned to the "off" position. An instant sufficed to switch on again, but, travelling at a pretty fast pace, the engine had time to pump a good deal of unburnt gas into the silencer. The first discharge of exhaust after switching on exploded the mixture in the silencer with the result that that member burst with a loud explosion somewhat resembling that of a gun.

Examination of the damage showed that the burst casing was much too stout to render possible any first-aid operations, but it was noticed that the split seam was so situated as to direct most of the hot exhaust gases on to the petrol pipe and the pressure pipe running between the engine and the petrol tank at the back of the car.

Further violent ill-treatment of the unoffending casing enabled the two tubes to be withdrawn from their resting place in the channel of the frame side-member; the most was made of the slack, and both tubes were bent down well away from the hot exhaust stream. This was done for two reasons: firstly, because boiling petrol gives rise to faulty carburation and difficulty with the pressure feed arrangement, and, secondly, a slight leak of petrol creeping along the pipes would be practically certain to ignite with disastrous results.

But burst silencer or not, it is distinctly inadvisable to have petrol pipes in such a position that any leak from a bad union or split pipe will allow the petrol to drop on to the hot exhaust box or pipe. A flare-up might easily result from such a combination of affairs.—R.P.

A Carbide Economiser.

Now that the price of petrol is so high, it behoves the motorist to save where he can. If the lamps are run until the last cubic inch of gas is used, they have a trick of going out at awkward moments. To avoid this a good deal of carbide is often wasted by emptying the lamps too soon. For some time past I have had a small sifter six inches square with an $\frac{1}{8}$ in. mesh with which I sift the contents of the lamp container. Quite a large proportion of good carbide is usable again, but it seems that an admixture of this with fresh carbide makes the lamp work more uniformly than upon this rescued carbide alone. Under the sifter is a box of the same dimensions as the sifter just referred to, this being placed there to catch the powder, which is used in the garden as a fertiliser.—J.L.D.

"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. 13d.

The First Motor Mountaineering Tour.

Recollections on the Tenth Anniversary of an Historic Pioneer Trip.

By H. Massac Buist.

THERE is something fit in the fact that on the tenth anniversary of the start of the first motor mountaineering tour, from June 26th to July 8th, 1904, the attention of the motoring community should be devoted in very large measure to the occurrences in connection with the latest Alpine test in which cars of many nationalities are engaged. What was thought by many to be an almost wildly daring enterprise a decade ago has become more or less a commonplace of to-day, now that the car is ubiquitous, thanks to many developments of chassis and tyres.

It is, nevertheless, a fact that, apart from straining the steering by driving into an obstacle at a very early stage of our pioneer motor mountaineering trip, nothing untoward happened to the mechanism of the 16-20 h.p. Martini car. We came through without a

puncture, despite the fact that the statisticians worked out our efforts in the course of twelve and a half days' touring as aggregating climbing to the extent of thirty-three miles sheer, with corresponding brake work. Yet the sole member of the party who suffered from nose bleeding on the mountains was the only one of us who was born on them and lived on them, Max de Martini. Captain H. H. P. Deasy and myself completed those who went through the whole stage, Georges Prade, then *L'Auto's* star man, accompanying us some days, and Alphonse Steines others, while for one or two short spells we had both of them aboard, so that sometimes the car was carrying five.

The diary of our doings, together with the principal passes included in our route, is set out in the accompanying table.

Date.	Route.	Weather Conditions.	Passes Crossed and Height in Feet.	Total Distance each Day.	Gross Running Time.
1904. June 26	From Neuchatel (leaving 12.40 p.m.), via La Chaux de Fonds, Le Locle, Les Ponts, Boudry, Yverdon, Eschallens, Lausanne, Gllion, to Caux	Rainy weather, slippery roads	—	kiloms. 164	h. m. 8 34
June 27	From Caux, via Montreux, Aigle, Chateau d'Oex, Saanen, Gsteig, etc., to Martigny	Wet, clouds sometimes dispersing	Col de Pillon (4894)	150	4 27
June 28	From Martigny, via Forclaz, St. Gervais, Megève, Flumet, Albertville, Montiers, Bourg St. Maurice, to Hospice Petit St. Bernard	Road surface treacherous with wet, cleared after Chamounix	Col de Forclaz (4966) First across Petit St. Bernard (7010)	197	15 10
June 29	From Petit St. Bernard, via Morgex, Aosta, Torée, to Turin	Fine weather, good roads	—	250	No record
June 30	From Turin, via Susa, Modane, St. Michel de Maurienne, to Valloires	Good weather, dry roads	Mont Cenis (6770) Les Trois Croix (5200)	160	8 23
July 1	From Valloires, via Cesanne, Susa, back to Turin	Good weather, dry roads	Galibier (9425) Mont Genève (6415)	165	10 58
July 2	From Turin, via Pignerole, Briançon, Bourg d'Oisans, Vizelle la Mure, to Gap	Fine weather, bumpy roads	Sostrieres (8479) Genève (6415) Col du Lautaret (6688) Laffrey (3078) Brouis (2681) Braus (3104)	308	12 5
July 3	From Gap, via Embrun, Guillestre, Coni, to Nice	Fine weather, good roads	Saluce (6305) Vars (6874) d'Argentière (6415) Tende (4550)	308	13 23
July 4	From Nice (sea level), via Puget, Theniers, to Barcelonnette	Great heat, dusty roads	Vergous (3900) Valgelaye (7312)	183	8 35
July 5	From Barcelonnette, via Dignes, Carpentras, to Nyons	Fine weather, roads slippery in places	St. Jean (5031) Labouret (3299) Ventoux (6477)	326	14 42
July 6	From Nyons, via Pont en Royan, Grenoble, Bourg d'Oisans, Le Grave, to Lautaret	Great heat, dusty roads	Joncheres (3061) Rousset (5395) Lautaret (2nd time) . (6688)	289	13 24
July 7	From Lautaret, via Valloires, St. Michel, St. Jean de Maurienne, Chambéry, to St. Pierre de la Grande Chartreuse	Fine weather, roads good but dangerous.	Galibier (2nd time) .. (9425) Trois Croix (2nd time) (5200) Charvin (7150) Frene (4875)	207	No record
July 8	From St. Pierre de la Grande Chartreuse, via Grenoble, Chambéry, Aix-les-Bains, Annecy, Faverges, Ugines, Flumet, Bonneville, to Geneva (arriving 9.15 p.m.)	Fine weather, dusty roads	De la Porte (4394) Le Sappet (4550) Planpalais (3835) Arravis (4875)	303½	14 15

The mountaineering trip from Neuchâtel to Geneva was about 3,009 kilometres, or a distance of approximately 1,700 miles, traversed in 12½ days, over nine-and-twenty passes, four of which were taken twice from opposite sides, to test the ability of the 16 h.p. Martini car, with water-cooled brakes, to negotiate it equally well from either approach. From Geneva the car was driven by the route among the Jura Mountains to Paris, over a distance of 539 kilometres, without any adjustment in the interval, it being further notable that the car finished with the four Continental tyres with which it had started out, the only work done on the pneumatics being to change the front tyres on to the back wheels, and the other way about once, halfway through the run, as a precautionary measure; the loose metal on many of the mountain climbs resulting in the treads being flayed right through to the canvas, yet we never had a puncture.

It was in many respects a fine experience to take part in the first realisation of the motorist's dream of mountaineering, especially as we went where railways were not, and had besides one fleeting glimpse of a chamois leaping from point to point on the dizzy heights still beyond those which we had dared to climb. For twelve and a half days we meandered among the finest and highest mountain passes in mid-Europe, and in the course of our journey had neither met nor overtaken more motor cars outside the great towns we had passed through than there were cities in our route. How different is the situation to-day, when, during the season, there are public motor vehicle services up most of the famous passes.

Of course, we went to many regions where no cars had been seen before, as, for instance, when crossing the Col de Forclaz and the Croix de Fer, reaching out from St. Jean, when we found, after traversing some nineteen kilometres of the way, that the track was nothing more than a narrow, unmade mule path, culminating in a *cul-de-sac* in place of the Government road marked on the map. The fact was that, though funds had been granted some time previously for the undertaking, the cartographer had taken the will for the deed, and in his optimism had overlooked the tardiness with which the mere work of making the road was undertaken, so that none was ready till considerably after our appearance.

In making quite half a dozen different ascents, we were told by an astonished peasantry that we were the second or third party to appear among them with a motor car. None of the local authorities had ever heard of motorists setting out to tour pass after pass, such car drivers as had preceded us having been well content with encountering one dose of trouble at a time and not making a habit of the vice. Yet for all this our spare tin of petrol was brought into use only once.

Changes of Temperature and Altitude.

The nature of our routes among the mountains caused great changes of temperature to be experienced within remarkably brief spaces of time. Ascents had perforce to be made turn and turn about with descents,

The First Motor Mountaineering Tour. ours not being a flying machine expedition. Hence it is remarkable that we never experienced any trouble with the carburetter, nor any need to adjust it, nor was the water in the radiator replenished after any of the climbs; and the water-cooled brakes were seldom warmer than the bare hand could endure, though the conditions of our going were such that frequently the tyres were too hot to touch. The car had to pass over long patches of newly laid, sharp and unrolled stones on trying ascents with more than the average weight of four passengers and luggage, yet at the finish the Continental covers were still in running order.

Great care had to be taken to avoid chills, to which nevertheless each of us succumbed in turn, probably in some measure owing to the sheer physical strain. Thus Turin, where sleep had been impossible, would be left at five o'clock in the morning in the lightest possible attire; within three hours the Martini had climbed like a cat up among the white peaks. There



MOTOR MOUNTAINEERING IN 1904. The 16-20 h.p. Martini car outside the telegraph office at Chateau d'Oex.

all available wrappings had to be donned in haste and snowballing to be indulged in to promote circulation. Again, a day spent in mounting nearly half a dozen passes of a mean height of nearly 6,000 feet above sea level ended in a descent to Nice, which appeared strangely unpeopled at so fine a season of the year, but wisely so when the great heat there in July is had in mind. We would lunch late in Grenoble, craving for a breath of cool air, and would shiver slightly as the evening breeze was felt at the Lautaret. The most refreshing slumbers were those obtained on the nights we slept on the heights, as at the Petit St. Bernard and St. Pierre de la Grande Chartreuse. But in the hottest part of the day it was possible always to enjoy a cool, refreshing breeze, even when not actually on the heights, if our way took us over roads beside rushing mountain streams.

From the Gordon-Bennett Race to Touring Conditions

With a pause for two days' rest at Old Heidelberg, I had come to this enterprise from the Gordon-Bennett Race in Germany, where I had been travelling in practice at ninety-four miles an hour for long stretches on the fastest cars then built; yet found that the feeling of exhilaration experienced then was as nothing compared with that of mountaineering on a motor car. In the one case there were air baths and joltings in

The First Motor Mountaineering Tour.

relation to the road surface traversed and the speed attained; in the other there were a series of exercises that ran the gamut of the differential, radiation, brake, and engine flexibility scales. After entering the mountain region we did not traverse 100 kilometres of straight stretches. It was a real test of a touring car, compared with which the Gordon-Bennett speed competition became impractical and of minor account.

Ten years' progress has shown that this pioneer performance by a standard vehicle was no freak effort; such journeyings have instead become a commonplace of motoring in summer time in 1914. Once set forth, we never ceased either going up hill or down dale. The three most famous sites for hill-climbing competitions on the Continent—Mont Cenis, Laffrey, and Ventoux—were negotiated, proving mere child's play in comparison with many of the passes we crossed. To make up the desired distance among the Alps, it had been necessary to trace and retrace our tracks; also to pass frontiers time and again. Moreover, to ensure the car achieving ascents from the more difficult sides of the passes, some mountains were climbed from both approaches, such as Galibier, the highest roadway in Europe.

It was impossible to spend day after day on the car without growing to admire and love it, and to realise that it was a thing imbued with a fascinating form of life. As in descending it swung round the edge of some sharp turn where the track doubled on itself, and the outer side of the roadway was marked solely by a sheer drop into space in days when steel-studded, non-skid tyres were almost unheard of, the low note from beneath the bonnet would become slower and yet more slow till the grey car would seem like a live thing cautiously scenting its way round the doubtful passage. As often as not, it had to be taken by reversing and advancing two or three times, for you are to know that in those days wheel locks were very different affairs from the average practice of 1914.

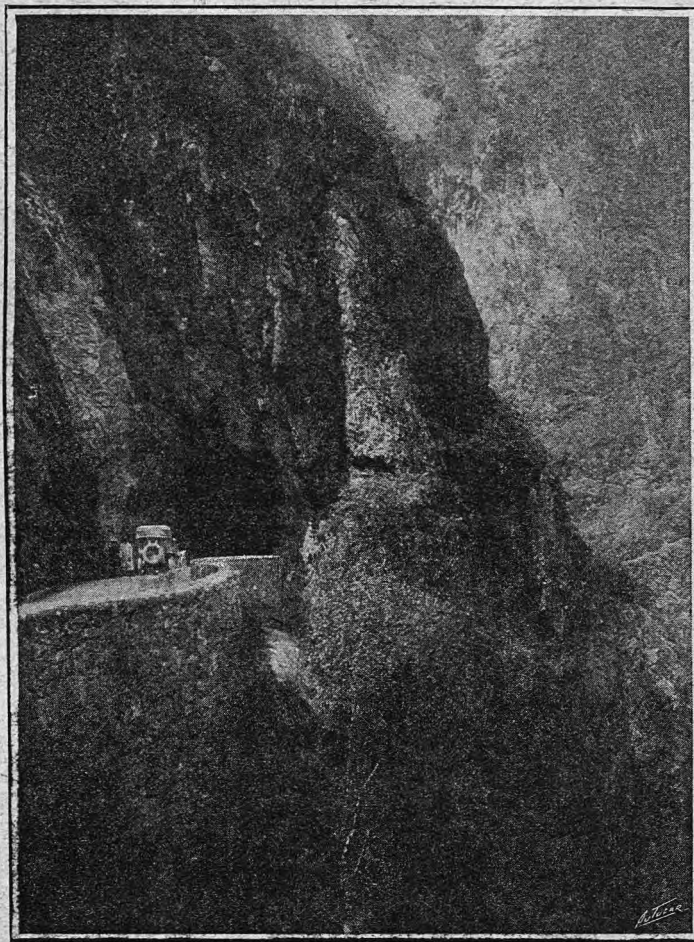
Moreover, many of these points were rendered the more dangerous by the path being built with an appreciable slope towards the unguarded edge of the precipice, as notably in the descent from the forbidden Precelaz into France. On this occasion we had great

fun. We subsequently had to explain away how it was that we were motoring in a country into which we had never officially entered according to our passport. In addition also, when about to pass the Customs officer at the foot of the descent we sounded the signal horn half a mile short of his establishment for the sheer pleasure of seeing him get out of bed and gaze on us at early dawn through sleepy eyes. After we had gone by a backward glance showed that the reality of our appearance had at last been borne in on the man: he was standing in the middle of the roadway in his nightshirt with a gun in his hand! And our

Swiss guide was not only breathing again quite freely, he was besides swallowing gallons of light beer at an appalling rate and finding his tongue with an astonishing rapidity.

Incidents and Adventures.

When there was rain and side-slipping tendencies were manifested in negotiating abrupt turnings, subsequent investigation oftentimes revealed that, whether in Italy, France, or Switzerland, our wheel tracks showed fewer than six inches to have separated us from the extreme edge of the unledged roadways. Many of the tracks were narrow, and, more generally than not, the more abrupt turnings had to be taken by backing and advancing. In many districts there were bends every few hundred yards, round which it was impossible to see



MOTOR MOUNTAINEERING IN 1904. In the Valley of Ronanche: the car is seen about to pass through one of the many tunnels on this road.

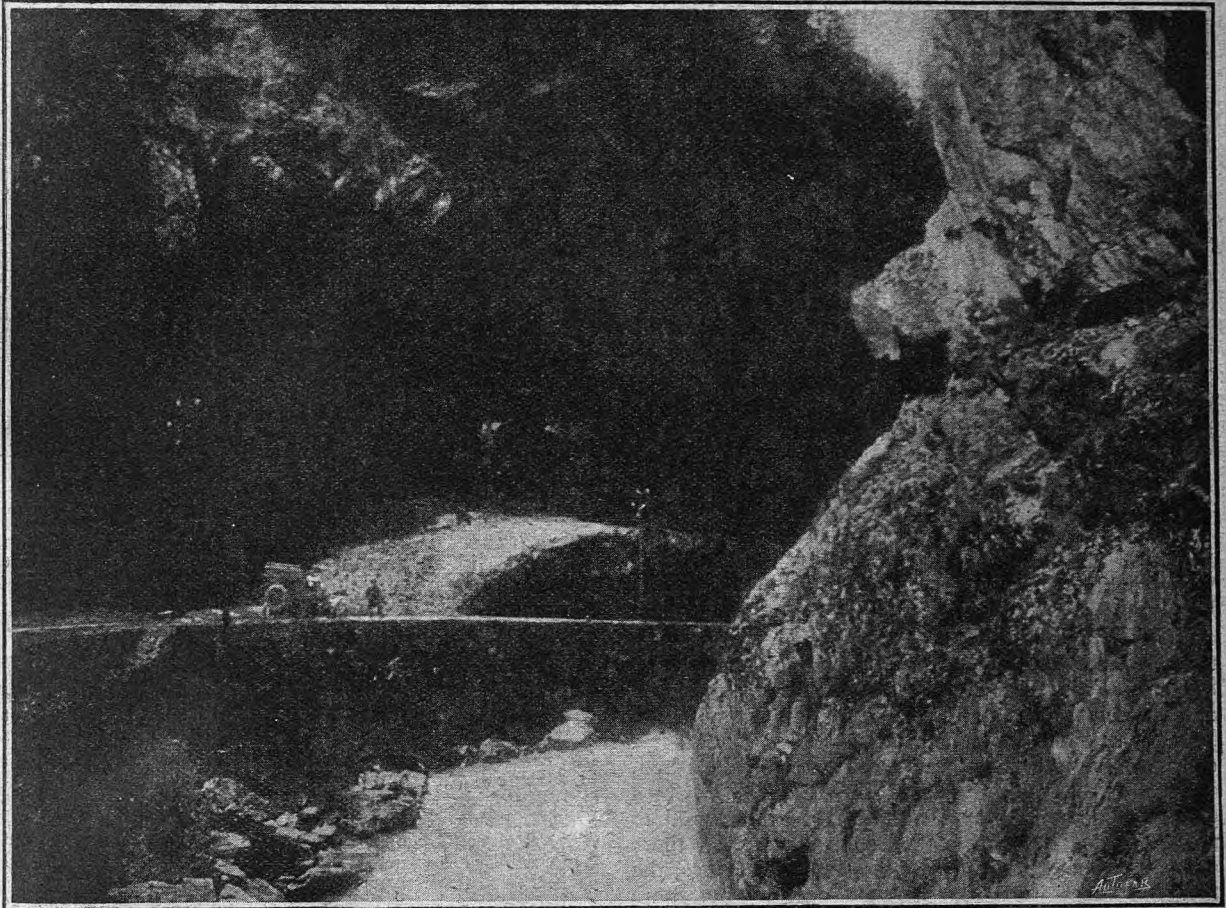
until the turns were being negotiated. It is, of course, the southern Continental custom to go to sleep when driving in the summer time as soon as the town is left. Thus one morning we had only come sixteen miles from Barcelonnette, along the Col de Valgelaye, when on cautiously rounding an unguarded bend of the path a three-horse diligence, whose sleeping driver and two passengers had been heedless of our repeatedly sounded signal horn, was upon us. Quick as thought, the brakes were applied. The car stopped almost instantly, and the reverse was rammed in with a jerk. The two poles of the vehicle were within inches of battering the radiator, when the car began to move backwards, not round the curve it had been making, but straight towards the sheer drop over the verge. We nearly had one wheel over the precipice that time.

A little further on the track widened just enough to enable us to squeeze past now that the diligence driver was quite awake and fully alive to his business.

On another occasion, a mule took the notion of shying after passing the car, the result being nothing more serious than a broken mudguard for ourselves. Again, when ascending the Col de Trois Croix, a mule that had espied us from afar came bolting down the path with a cart, the sole occupant of which was a woman who was standing up in it. The animal, which appeared to be only looking at our car, made straight

The First Motor Mountaineering Tour. had ever beheld a motor car before, the dogs invariably running straight down the road ahead of us, being too scared to turn either right or left. The sight of the appallingly high proportion of imbeciles in the more remote mountain regions off the regular route is the one painful memory of the whole enterprise.

After climbing height after height with scarce a down grade throughout the day's journey, the night would be passed thousands of feet above sea level in some little village that nestled in a basin formed between a circle of surrounding peaks. Cascades and



MOTOR MOUNTAINEERING IN 1904. *An impressive view in the valley of Romanche.*

for the edge of the path, but, with the cunning of its kind, pulled up dead on the very verge and stood stock still for some moments until we had passed by. It was a miracle that its sudden stoppage did not tilt the woman over its head into the depths below. Yet all she did was to pass the time of day with us with a laugh.

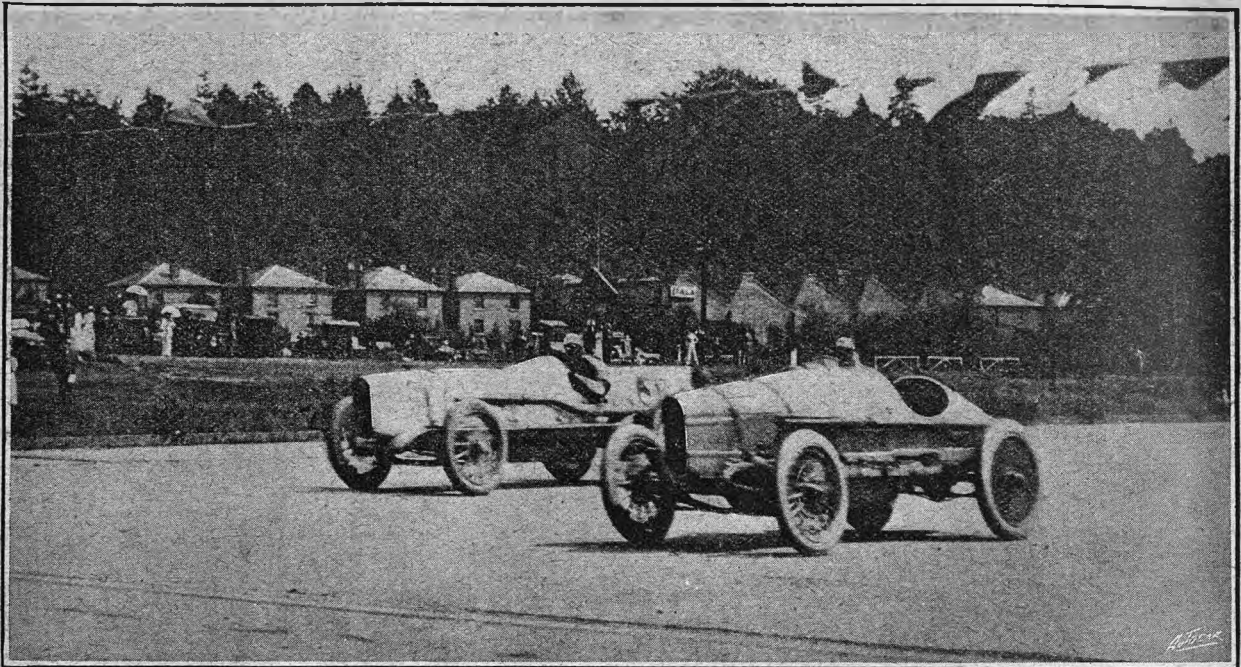
Despite the fact that we drove sometimes for fourteen or more hours a day, there was never a moment's weariness. Every few yards gave a new view, and the car was never engaged many moments at the same task. Great, gaunt, grey gorges that towered above the traveller until he knew the delights of being dwarfed by nature and of beholding the sky a mere artery of blue above, were succeeded by serpentine ascents giving distant and yet more far views at every twist and turn of the coiling track. We had travelled over the passes by which Napoleon marched his troops over the Alps into Italy; and we passed amid many a mountain region in 1904 where neither man nor beast

cataracts lent life to the vast, rough-hewn, brown mountain side, while the sight of snow-capped peaks with glaciers passing between had, and still has, a charm beyond the power of words to convey. Small wonder that in the ten years that have elapsed since our pioneer trip motor mountaineering has come to be recognised as one of the most fascinating ways of spending a holiday.

The total number of motor vehicles (exclusive of motor cycles) imported into Java during 1913 (says *The Board of Trade Journal*) was 1,126, as against 1,104 in 1912 and 622 in 1911. The number of vehicles for commercial purposes is not stated in the official statistics of imports, but both light and heavy motor waggons are now being used in steadily increasing numbers. So far as can be ascertained, only one British make of commercial motor is in use in Java.

Brooklands Midsummer Meeting.

An Excellent Programme. A Small Attendance of Spectators, but Good Sport.



A close finish in the Lightning Long Handicap. This was just won by Mr. Malcolm Campbell on his three-litre Sunbeam from Mr. J. W. Read on a 95 x 140 mm. Vauxhall.

IF ever any evidence were needed to show that Brooklands, far from attracting an essentially specialised crowd, has long since become of ordinary public interest, it is supplied by the fact that on Saturday last a mere horse-race meeting at Sandown Park succeeded in reducing the attendance at the track to such an extent that one might easily have thought oneself at a private affair. It is some considerable time since these two fixtures have clashed, and no doubt, on the side of the B.A.R.C., even a greater period will elapse before they are allowed to do so again. In spite of the small attendance, there was some excellent sport, as, amongst other things, the first two races were won in each case by not more than half a length, and much of the criticism that has been directed at the handicappers thus refuted. At the last meeting it will be remembered that there was quite a little grumbling, but there are not wanting those who hold that this would become less if drivers did not attempt to start off (1) on the reverse gear, (2) in neutral, (3) with the brakes on. No system of time allowances will cover this sort of thing, and there is no question but that it is at the start that a good proportion of Brooklands races are won and lost. The writer made one or two trips to the fork in company with Mr. Ebblewhite to observe the manner in which the cars were got away, but as it happened on each occasion there was no "fluffing" or gear missing, though there were wide differences enough in the way the cars were handled. Even amongst such hardened drivers as frequent Brooklands, it seems that there is still a majority which change "up" too soon.

For once in a way there were no motor cycle races on the programme, which was therefore completed by an earlier hour than usual. A feature of the meeting was that all the races were well filled, and that in only

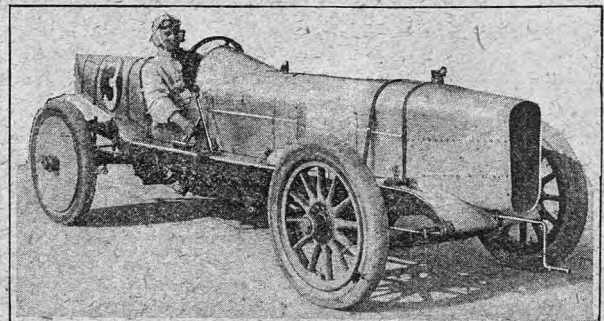
one case did an entrant fail to put in an appearance at the start.

First Race.

THE JUNE PRIVATE COMPETITORS' HANDICAP.
Distance, 5½ miles. Starters:

	Bore and stroke.	c.c.	m. s.
H. W. Cook (Isotta-Fraschini) ...	130 x 200	10,618	0 0
F. Oscar Morris (Daimler) ...	130 x 150	7,964	0 8
Arthur Williams (Straker-Squire) ...	90 x 120	3,054	0 12
M. Campbell (Charron) ...	110 x 150	5,702	0 36
G. W. Robinson (Calthorpe) ...	79½ x 150	2,978	0 42
W. G. Barlow (Sunbeam) ...	80 x 150	3,016	0 42
O. D. Pollak (Grégoire) ...	68 x 140	2,034	0 54
Capt. Lindsay Stewart (Schneider) ...	82½ x 140	2,996	0 54
E. E. Elwell (Calthorpe) ...	69 x 130	1,949	1 14
F. H. B. Samuelson (Marlborough) ...	59 x 100	1,094	2 4

This provided a most thrilling finish, as the first four past the post were separated by not more than half a length between each and the first six all arrived within less than two seconds. Mr. Samuelson's Marlborough and Mr. Elwell's Calthorpe both had big time allowances, and though they led at the end of the first lap they were being rapidly overhauled. At this point Mr. Barlow's Sunbeam had worked



Mr. J. W. Read on his 95 x 140 mm. Vauxhall, the winner of the Lightning Short Handicap.

Brooklands. Midsummer Meeting.

It is not often that a car that is new to the track, starting from scratch, manages for the first time of asking to work its way clean through the field, but this is what happened in this race, the winner, Mr. Fish's Grégoire, showing a very fine turn of speed. The value of acceleration was well shown at the start by the little Hillman, handled at this meeting by Mr. J. Broadbent instead of Mr. Nelson

its way up to third place, and therefore looked extremely like winning, but Captain Lindsay Stewart's Schneider managed to get its nose in front, and it was only at the very end of the race that a couple of back-markers, in the forms of the Straker-Squire and the big Isotta-Fraschini came up to challenge it. Mr. G. W. Robinson's Calthorpe was fourth. After its successes at the last meeting the poppet valve Daimler-cum-Darraaq was expected to do something sensational, but failed to give a good account of itself. Speed, 70½ m.p.h. Result:

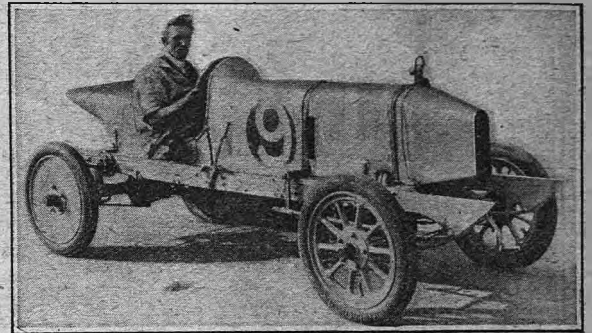
1. Capt. Stewart's Schneider.
2. Mr. H. W. Cook's Isotta-Fraschini.
3. Mr. A. Williams's Straker-Squire.

Second Race.

THE THIRD LIGHTNING LONG HANDICAP. Distance, 8½ miles. Starters:

	Bore and stroke.	c.c.	m. s.
N. F. Holder (Vauxhall) ...	98 x 150	4,526	0 0
Gordon Watney (Peugeot) ...	78 x 156	2,982	0 12
J. W. Read (Vauxhall) ...	95 x 140	3,940	0 45
M. Campbell (Sunbeam) ...	80 x 149	2,996	0 45

This race provided another exceedingly close finish, although as a matter of fact, there is no doubt that Mr. Campbell's Sunbeam was not quite fully extended. At the end of the first lap Mr. Read's Vauxhall was leading the Sunbeam by about four lengths, the latter having been the quickest away from the mark but overhauled by the Vauxhall before the railway straight was reached, and



The Hillman light car which secured first place in the Sprint Race and second in the 75 m.p.h. Long Handicap.

Smith. It started level with Mr. Pollak's Grégoire and yet was as much as four lengths ahead in less than a hundred yards. Mr. Campbell's Darraq was slow from the start, but was not, as usual, "owner up," as also was Captain Stewart's Schneider, penalised for winning the first race. The first lap found Mr. Elwell's Calthorpe maintaining a good lead, with Mr. Scott's Schneider a rather slow second, and the little Hillman making good speed after them. Mr. Pollak turned into the straight after completing one circuit, whilst the Darraq and the Grégoire both seemed about to make a mistake at the fork and turn in a lap too soon; this, however, was corrected at the last moment. A lap later saw the Hillman fifty yards in front, with Mr. Scott's Schneider still second, and this order was kept till the banking behind the aviation sheds was reached, when the Grégoire came along very well, and, getting the lead, won by a hundred and fifty yards, the Hillman being second, and the Peugeot third by the length of the straight. Speed, 75 m.p.h. Result:

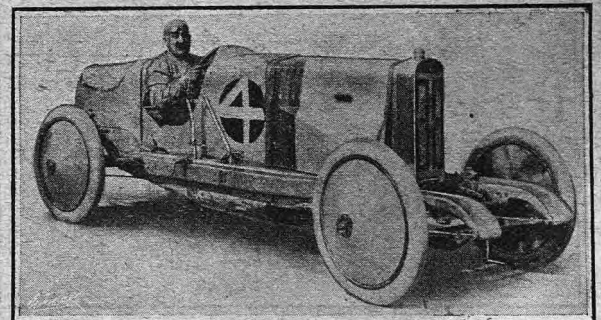
1. Mr. Fish's Grégoire.
2. Mr. Hillman's Hillman.
3. Hon. R. W. Beckett's Peugeot.

Fourth Race.

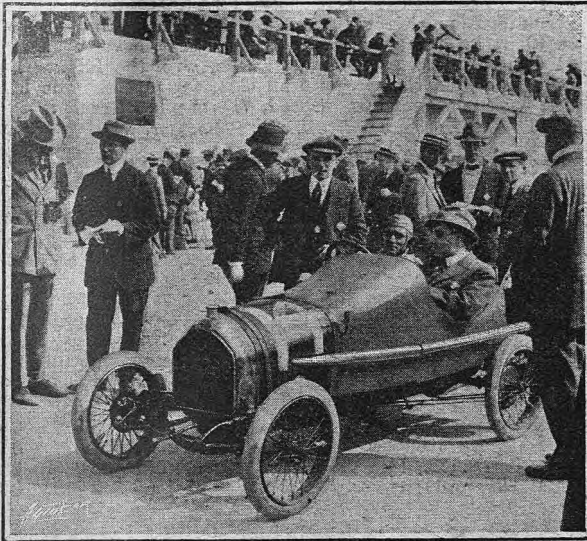
THE SIXTEENTH 100 m.p.h. LONG HANDICAP. 8½ miles. Starters:

	Bore and stroke.	c.c.	m. s.
C. L. E. Geach (Peugeot) ...	78 x 156	2,982	0 0
Gordon Watney (Mercedes) ...	140 x 150	9,237	0 24
H. W. Cook (Isotta-Fraschini) ...	130 x 200	10,618	0 24
E. J. Rossiter (Hispano-Suiza) ...	85 x 130	2,950	0 30
Arthur Williams (Straker-Squire) ...	90 x 120	3,054	0 42
A. Bovier (Schneider) ...	96 x 190	5,501	*0 45
Malcolm Campbell (Charron) ...	110 x 150	5,702	1 18
L. M. Sanford (Bedford-Buick) ...	95 x 95	2,715	1 18
B. Haywood (Singer) ...	63 x 88	1,097	1 18
Mrs. Thekla Duncan (Mercedes) ...	120 x 150	6,786	1 18

*Penalised 12 secs.



The winner of the 100 m.p.h. Long Handicap. Mr. A. G. Brown on Mr. E. G. Rossiter's Hispano-Suiza.



The Baby Peugeot which ran in the 75 m.p.h. Short Handicap. In the background can be seen the rear of the grandstand against the finishing straight, the photograph having been taken from the paddock.

at this stage the scratch Vauxhall of Mr. Holder had picked up a due fraction of the allowance it was making to Watney's Peugeot. A circuit later found Mr. Campbell in front by almost five lengths, having dashed ahead on the straight. This order was kept to the finish, the cars coming in exactly as they had started. The race was won by half a length with almost three hundred yards between second and third. Speed, 86 m.p.h. Result:

1. Mr. M. Campbell's Sunbeam.
2. Mr. Read's Vauxhall.
3. Mr. Watney's Peugeot.

Third Race.

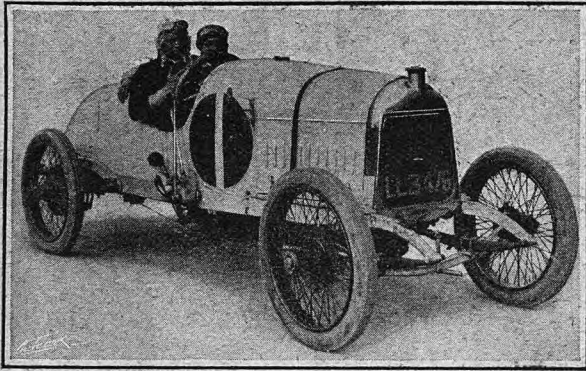
THE SIXTH 75 m.p.h. LONG HANDICAP. Distance, 8½ miles. Starters:

	Bore and stroke.	c.c.	m. s.
R. C. Fish (Grégoire) ...	80 x 160	3,217	0 0
Hon. R. W. Beckett (Peugeot) ...	78 x 156	2,982	0 0
O. D. Pollak (Grégoire) ...	68 x 140	2,034	0 24
W. Hillman (Hillman) ...	60 x 120	1,357	0 24
Capt. Lindsay Stewart (Schneider) ...	82½ x 140	2,996	0 24
M. Campbell (Darraaq) ...	85 x 130	2,950	0 30
Walter Scott (Schneider) ...	82½ x 140	2,996	0 45
E. E. Elwell (Calthorpe) ...	69 x 130	1,949	0 54

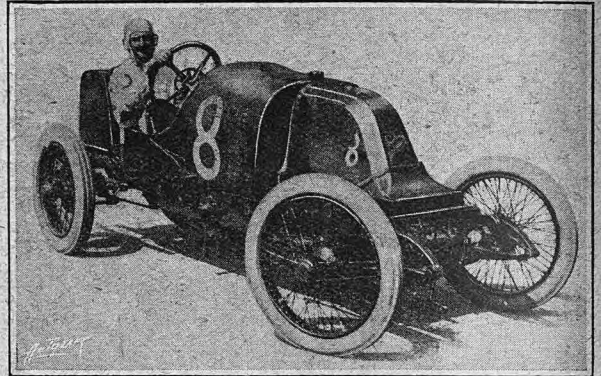
Brooklands Midsummer Meeting.

The value of an expert driver is evidently a material matter with the Brooklands executive, for when it was known that Mr. Hornsted was to drive Mr. Bovier's Schneider, that car was at once penalised twelve seconds. The Singer and the Buick were both quickly away from the start and had soon overhauled Mrs. Duncan's Mercedes. At its first

This was not a very exciting race, for no one ever looked like holding Capt. Lindsay-Stewart's fast Schneider, which, at the end of the first lap, was three lengths behind the Hillman, Mr. Robinson's Calthorpe third, and the Baby Peugeot fourth. Mr. Campbell's Darracq was running badly and Mr. Pollak's Grégoire was by no means up to form. Mr.



Mr. R. C. Fish on his 80 x 160 mm. Grégoire, which he drove through from scratch mark to first place in the 75 m.p.h. Long Handicap.



The winner of the Private Competitors' Handicap and the 75 m.p.h. Short Handicap. Captain Lindsay Stewart on his Th. Schneider.

time past the fork the Singer was leading and the Buick second, Mrs. Duncan's Mercedes third, and the Straker-Squire fourth, having already got in front of Hornsted's Schneider. Mr Campbell brought his Charron in at the end of the lap, as also did Mr. Geach his Peugeot, which had started misfiring. A round later the Straker-Squire was leading, but it slowed down at the fork and Mr. Hornsted thus obtained the lead, with the Hispano-Suiza third, and the Isotta fourth. Mr. Rossiter's car then came away very finely, and passing the Straker on the Byfleet banking, won the race by three lengths, with the Isotta a good third, and Mr. Watney's Mercedes fourth. Speed, 86 m.p.h. Result :

1. Mr. Rossiter's Hispano-Suiza.
2. Mr. Bovier's Schneider.
3. Mr. H. W. Cook's Isotta-Fraschini.

Fifth Race.

THE SIXTH 75 m.p.h. SHORT HANDICAP. Distance, 5 1/2 miles. Starters :

	Bore and stroke.	c.c.	m. s.
R. C. Fish (Grégoire) ...	80 x 160	3,217	0 16
Hon. R. W. Beckett (Lion Peugeot) ...	78 x 156	2,982	scr.
G. Cory Wright (Bedford-Buick) ...	95 x 95	2,715	scr.
G. W. Robinson (Calthorpe) ...	79 1/2 x 150	2,978	0 4
W. G. Barlow (Sunbeam) ...	80 x 150	3,016	0 4
O. D. Pollak (Grégoire) ...	68 x 140	2,034	0 16
W. Hillman (Hillman) ...	60 x 120	1,357	0 16
Captain Lindsay Stewart (Schneider) ...	82 1/2 x 140	2,996	0 16
M. Campbell (Darracq) ...	85 x 130	2,950	0 20
Harold C. Lambert (Bugatti) ...	65 x 100	1,327	0 26
Walter Scott (Schneider) ...	82 1/2 x 140	2,996	0 30
C. H. Parkes (Universal-Turner) ...	65 x 100	1,327	0 54
H. Boissy (Peugeot) ...	60 x 90	1,018	1 8

* Penalised.

Harold Lambert's Bugatti, after starting well, only completed one lap. Capt. Stewart's Schneider obtained the lead on the railway straight, and was, after that, never challenged. It won easily by about eighty yards, with the Hillman, the Calthorpe, and the Grégoire all close for places. The latter had been penalised 16s. Speed, 71 1/2 m.p.h. Result :

1. Capt. Lindsay-Stewart's Schneider.
2. Mr. G. Robinson's Calthorpe.
3. Mr. W. Hillman's Hillman.

Sixth Race.

THE SEVENTEENTH 100 m.p.h. SHORT HANDICAP. Distance, 5 1/2 miles. Starters :

	Bore and stroke.	c.c.	m. s.
G. L. E. Geach (Peugeot) ...	78 x 156	2,982	scr.
E. J. Rossiter (Hispano-Suiza) ...	85 x 130	2,950	* 0 2
Gordon Watney (Mercedes) ...	140 x 150	9,237	0 16
H. W. Cook (Isotta-Fraschini) ...	130 x 200	10,618	0 16
Arthur Williams (Straker-Squire) ...	90 x 120	3,054	0 28
A. Bovier (Schneider) ...	96 x 190	5,501	* 0 30
M. Campbell (Grégoire) ...	80 x 160	3,217	0 44
B. Haywood (Singer) ...	63 x 88	1,097	0 52
Mrs. T. Duncan (Mercedes) ...	120 x 150	6,786	0 52
L. M. Sanford (Bedford-Buick) ...	95 x 95	2,715	0 52

* Penalised.

This proved a very popular win for the Isotta-Fraschini and probably broke the hearts of the "bookies." It is rare, indeed, that such long odds as 10 to 1 against are given about a car which has any chance at all, this being the usual figure for a non-starter, and this is, therefore, probably the only time that a winner has started at such odds. The little Singer led at the end of the first lap with Mr. Campbell's Grégoire second. The latter was, however, soon passed by the Straker-Squire, which was already being hard pressed both by Geach's Peugeot and the Isotta. The last named got in front behind the sheds, and thundered home a winner by five lengths. Mr. Hornsted, who was again penalised for being Mr. Hornsted, was third by about the same distance. Speed, 87 3/4 m.p.h. Result :

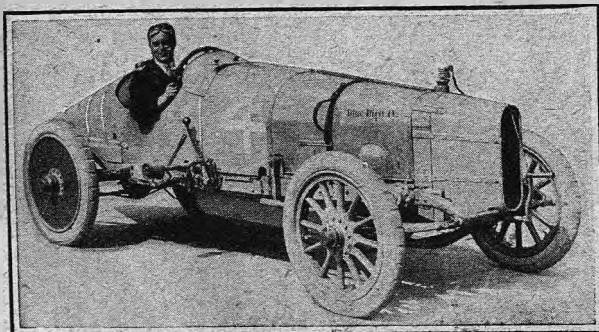
1. Mr. H. W. Cook's Isotta-Fraschini.
2. Mr. A. Williams's Straker-Squire.
3. Mr. A. Bovier's Schneider.

Seventh Race.

THE THIRD LIGHTNING SHORT HANDICAP. Distance, 5 1/2 miles. Starters :

	Bore and stroke.	c.c.	m. s.
N. F. Holder (Vauxhall) ...	98 x 150	4,526	0 0
G. Watney (Peugeot) ...	78 x 156	2,982	0 8
J. W. Read (Vauxhall) ...	95 x 140	3,940	0 30
Malcolm Campbell (Sunbeam) ...	80 x 149	2,996	0 30

A procession. Mr. Campbell's Sunbeam was evidently not up to the form it had shown in the long handicap of the same class, and was unable to do anything with Read's Vauxhall, which kept the lead of a hundred yards it had



Mr. Malcolm Campbell on his Sunbeam, which he drove into first place in the Lightning Long Handicap.

established at the end of the first lap right up to the finish. Mr. Holder's Vauxhall was a poorish third, whilst the Peugeot ran disappointingly, and never looked like doing anything. Speed, 82½ m.p.h. Result:

1. Mr. J. Read's Vauxhall.
2. Mr. Campbell's Sunbeam
3. Mr. Holder's Vauxhall.

Eighth Race.

THE JUNE SPRINT RACE. Distance, 2 miles. Starters:

	Bore and stroke.	c.c.	m. s.
C. L. E. Geach (Peugeot)	78 x 156	2,982	0 0
Gordon Watney (Mercedes)	140 x 150	9,237	0 4
E. J. Rossiter (Hispano-Suiza)	85 x 130	2,950	*0 2
Arthur Williams (Straker-Squire)	90 x 120	3,054	0 9
M. Campbell (Grégoire)	80 x 160	3,217	0 15
B. Haywood (Singer)	63 x 88	1,097	0 15
L. M. Sanford (Bedford-Buick)	95 x 95	2,715	0 17
G. Cory-Wright (Bedford-Buick)	95 x 95	2,715	0 17
W. Hillman (Hillman)	60 x 120	1,357	0 24
Capt. Lindsay Stewart (Schneider)	82½ x 140	2,996	*0 13
N. S. Hind (Bugatti)	65 x 100	1,328	0 26
Harold Lambert (Bugatti)	65 x 100	1,328	0 26

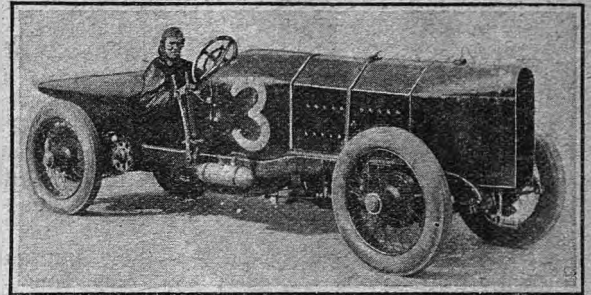
*Penalised.

This event ended in an astonishing win for the little Hillman. From the start its acceleration was perfectly extraordinary, and it was fifty yards ahead of anything at the

Brooklands Midsummer Meeting.

end of the railway straight, and the only ones which had a chance to catch it up were the scratch cars. It was, however, too quickly run for the fliers, and came home a capital winner by a length from the Straker-Squire, with Mr. Geach's Peugeot a very close third. The Hillman's speed from a standing start is amazing, considering the size of its engine. Speed, 66½ m.p.h. Result:

1. Mr. W. Hillman's Hillman.
2. Mr. A. Williams's Straker-Squire.
3. Mr. C. L. E. Geach's Peugeot.



Mr. H. W. Cook, the winner of the 100 m.p.h. Short Handicap, on his 130 x 200 mm. Isotta-Fraschini.

On the Track.

The Fastest Speed ever timed on the Track. Records by Hornsted on the Benz.

WHEN Hémary on the Benz put up his epoch-making records in November, 1909, it was generally conceded that they were likely to remain unbeaten for many years, especially as the International Federation laid it down that short world's records should in future be run in both directions, and that the mean speed of two such runs should alone rank for record.

On Wednesday morning last week Hornsted was out for the hour record on the car now familiarly known as the big Benz. He took as mechanic-passenger a French mechanic from the Itala Works at Weybridge, and Hornsted was heard to say that he had never before had so satisfactory a mate. He looked upon the run absolutely in the light of a joy-ride, and busied himself with the duties that fell to him during the run without turning a hair, just as he might on a big touring car purring along at a modest 40 m.p.h.

This attempt on the hour record came to an abrupt conclusion at the end of the sixth lap owing to the tread of the off side back tyre coming free and taking liberties with Hornsted's elbow. Thinking the joint might stiffen Major Lloyd suggested postponing a proposed attempt on the mile world's record till after lunch, and it was not till 2.40 p.m. that the fresh start was made.

The existing record for the flying mile, which was made in one direction only, stood at 115.92 m.p.h., and Hornsted was very elated when, after making a

smart run in the reverse direction, he looked in at the timing box and learned that in the reverse direction he had considerably exceeded the existing record speed, his speed being 120.28 m.p.h. Thus encouraged he had one bite at the mile in the normal direction and attained the marvellous speed of 128.16 m.p.h., giving a mean of 124.10 m.p.h. for the two attempts, and thus beating the previous record by over 8 m.p.h.

The times may be summarised thus:

Reverse direction	29.93s.	= 120.28 m.p.h.
Normal direction	28.09s.	= 128.16 m.p.h.
Mean speed	29.01s.	= 124.10 m.p.h.

The speed for the normal direction, viz., 128.16 m.p.h., will rank as a record in the 90 Rating Class and Cubic Capacity Class J., and will be now the fastest Brooklands record. Had the timing strips been in position for the half-mile and kilometre even better figures might have been recorded for these distances.

Saturday's meeting at Brooklands, which we report elsewhere in this issue, provided, as we anticipated last week, some very fine finishes, but it was noteworthy in another respect. No competitor failed to put in an appearance, and there was a non-starter in only one event!

We wonder why the B.A.R.C. dropped the R.A.C. ratings from its race card on Saturday, or how many people noticed the omission.

Washing Down the Car.

Every time a car is washed the varnish loses some of its lustre; it is best, therefore, not to wash it oftener than is necessary, and the process should not be unduly prolonged. Ordinarily, the washing water should be at such a temperature that it will not cause discomfort in doing the work, but under no circumstances must hot water be used. There are a few general rules connected with the washing of cars which, if followed, will ensure the varnish retaining its good appearance for the maximum length of time.

These rules do not cover the whole art of body washing, but are sufficiently comprehensive to enable anyone who follows them carefully to keep his car looking its best. They are as follow: Never use a chamois until all the dirt and grease have been washed off. Keep the sponges and chamois clean by frequent washing and wringing. Use different sponges on the body and on the wheels and lower part of the car. Rinse the car thoroughly and carefully after washing. Do not use a strong force of water on a newly painted car.

R.A.C. Light Car Impromptu Trials.

IN these impromptu trials the Royal Automobile Club has endeavoured to strike a new note, writes the Secretary of the Club. In the organised trial of the usual type elaborate regulations are a necessity, and this prevents many would-be sporting amateur competitors from taking part in them. The Impromptu Trials are designed to enable the owners of light cars to compete in a sporting way with the least possible amount of trouble to themselves. For instance, as entries are only received on the day of the competition the owner need only make up his mind to take part on that morning if he feels so inclined and if the weather is fine. The whole competition will be over early in the afternoon, and the places at which the trials will be held will usually be found in those districts already well-known as pleasant motoring country.

It is, therefore, anticipated that these Impromptu Trials will become popular, not only from the point of view of the testing merits of the car about which the amateur owner is usually very confident, but also from the point of view of a drive amidst pleasant surroundings and in congenial society. There is nothing, however, in the regulations to prevent members of the trade entering their vehicles, but the private owner will have nothing to fear on this score, as the nature of the trial will not be disclosed until the time for receiving the entries. Consequently, it will not be possible to tune up cars specially as would be the case if full particulars were published in advance. For instance, a car prepared specially for a fuel consumption test would probably not be so successful on a hill as a car not so prepared.

It is expected that the first of these trials will be held on Saturday, July 25th, and prospective entrants

are invited to communicate with the Secretary of the R.A.C., Pall Mall, London, S.W.. The regulations provide:

1. The trials shall be for any four-wheeled vehicle which comes within the following definition: Cars fitted with engines of cylinder capacity more than 1,100 c.c. and not more than 1,400 c.c., and weighing, as run (without passengers), not more than 1,600 lb.
2. The place of assembly of each trial will be announced one or two weeks before the date of the trial.
3. The time of assembly will be 10 a.m.
4. Entries on the official entry form will be received only at the place of assembly between 10 a.m. and 11 a.m. on the day of the trial, and the place and nature of the trial will be then announced.
5. The entry fee will be £1, which includes enrolment on the competitors' register.
6. At 11.30 o'clock the competing cars will be led by a pilot car to the place of the trial, which will be within a radius of approximately twenty miles of the place of assembly.
7. Trials may consist of hill-climbs, fuel consumption tests, short reliability tests on severe routes, etc.
8. The Club will award a silver medal to the car making the best performance in each trial.
9. The leading vehicle in each event being X, the remaining cars will be classified by comparison with that figure.
10. The cars will be started on the trial in the order in which the entries are received.
11. Each car must carry throughout the trial the full complement of passengers for which, in the opinion of the Club, it is designed. Passengers (minimum weight of 150 lb.) must be provided by the entrant.
12. The dimensions of the car may be checked by Club officials before or after any trial.
13. Competitors must provide themselves with fuel, oil, and water for the trial.
14. Entrants and drivers must be upon the competitors' register of the Club, and arrangements will be made to enrol them (if not already on the register) at the place of assembly. Competitors who are enrolled must present their register cards at the time of entry.
15. The results will be published and circularised to the press without delay.

The Clipstone Speed Trials.

On Saturday last week, the Notts A.C. held their annual speed trials upon the Duke of Portland's private track at Clipstone Drive. The weather conditions being perfect, and a large number of competitors having entered, the meeting proved a great success and excited much interest among the spectators present.

There were five events, three of them for the Hardy and Wilson challenge cups and the light car race, being open to members of the Notts A.C. alone, the others, the Morrison Challenge Cup and the open event, also receiving entries from the Lincolnshire, Derbyshire, North Staffordshire, and Leicestershire clubs. The awards were decided on formula, the winners of the various events being as follow:

Hardy Challenge Cup (flying kilometre handicap): W. G. Higgins (25 h.p. Vauxhall).

Morrison Challenge Cup (flying kilometre handicap): W. G. Higgins (25 h.p. Vauxhall).

Open Event (flying kilometre handicap): A. R. Fraser (20.1 h.p. Singer), the fastest time being made by Mr. Higgins's 25 h.p. Vauxhall.

Wilson Challenge Cup (one mile handicap): R. G. Hogarth (10 h.p. Austin).

Light Car Race (flying kilometre handicap): J. Mather (11 h.p. Lagonda).

Mr. R. Wilkie, who won every event on formula last year on a 20 h.p. Vauxhall, and every event, except one on time, and was expected to give a good account of himself, experienced some gear trouble in the first event which put his car out of the competition.

The 25 h.p. Berliet, entered by Mr. J. Mather, was disqualified, and the owner has lodged a protest with the secretary of the club, claiming to have won all the principal events.

The Belgian Grand Prix Races.

It is announced from Brussels that the Executive Committee of the Royal Belgian Automobile Club has suddenly altered the rules and regulations of the Grand Prix races which are to be held on the 25th and 26th July. As at first arranged the contests were intended to be for cars with engines of cylinder capacities up to 2,500 c.c. and 4,500 c.c. For a reason not stated, but doubtless with the view of securing some entries from the firms that took part in the recent Tourist Trophy Race in the Isle of Man, it has been decided to alter the 2,500 c.c. category to one for cars of not more than 3,300 c.c.

We are asked by Mr. Henry Alexander to state that the Calthorpe Minor car which he drove in the Six Days Scottish Trials did not smash its rear axle, but that a nut, which had no business in the axle at all, by some means or other had found its way into the grease inside the casing, with the result that the axle jammed. After dismantling the axle, discovering and removing the nut, and re-erecting the axle, Mr. Alexander was able to finish the course, arriving back in Edinburgh with the rest of the competitors.

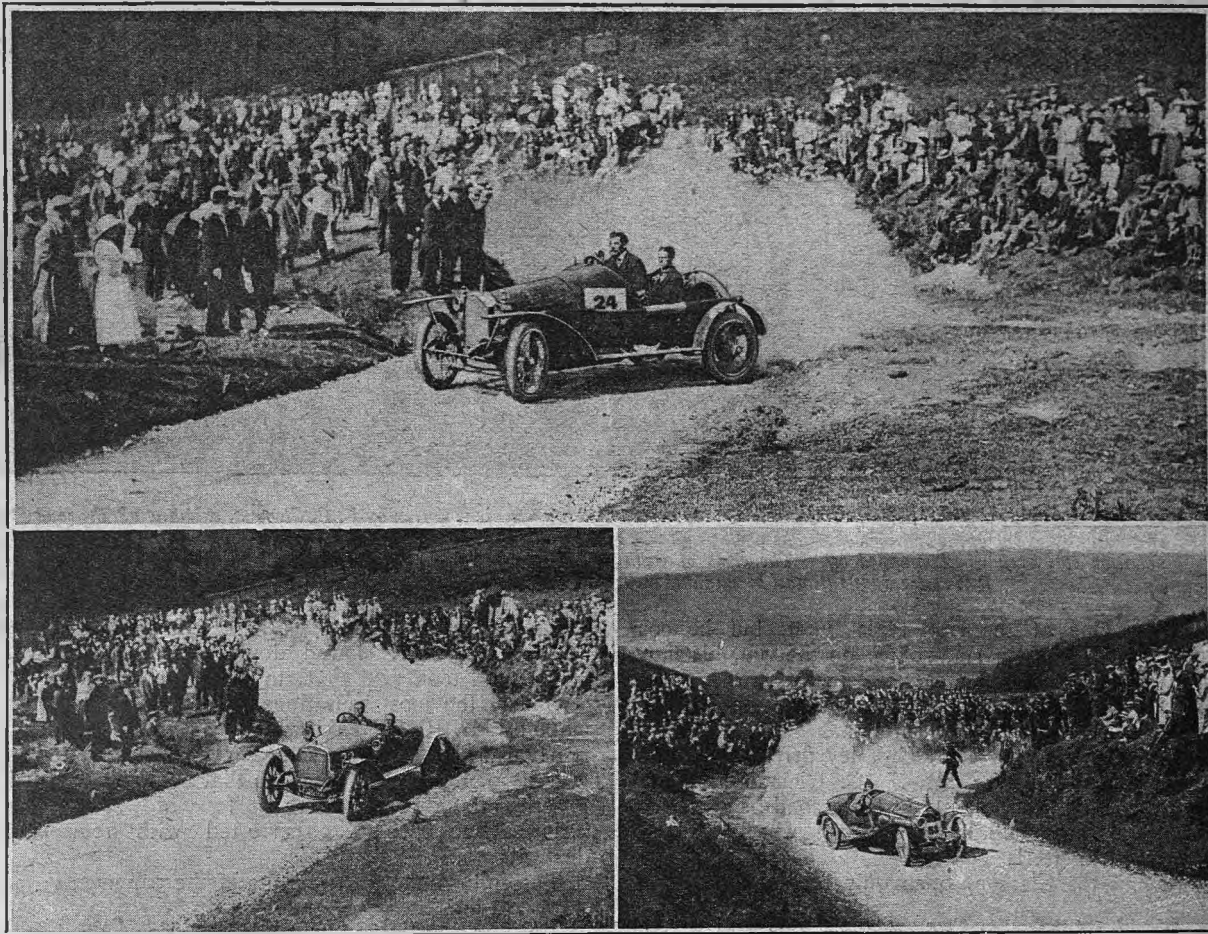
Open Competitions in South Wales.

The Caerphilly Hill-climb and the Porthcawl Speed Trials on the Sands.

THE Caerphilly hill climb and Porthcawl speed trials, promoted by the South Wales Automobile Club and the Cardiff Motor Club, were run off respectively on Thursday and Saturday last week. The test hill, which is at Caerphilly, near Cardiff, is altogether 1,194 yards in length. The average gradient is 1 in 18.6, and at the steepest part the gradient is 1 in 6.2. There are three bends, at each of which the road is cut through the hillside, making natural grandstands. There is a slight downward gradient at the start at the bottom of the hill for about seventy yards which allows the cars to accelerate

gave a most sensational exhibition of skilful high-speed cornering at the second bend, and ran some yards along the banking. Mr. R. S. Witchell took the bend in masterly style, and although he appeared to be travelling at a higher speed than Mr. Hands, he hardly skidded at all, and very cleverly took his Straker-Squire completely round the inner edge of the road. He was $5\frac{2}{5}$ s. behind Mr. Hands.

The fastest time in Class I. for light cars was 1m. 22 $\frac{1}{5}$ s., made by a 10 h.p. Singer driven by Mr. L. Martin. A very creditable climb was made in Class II., for cars not exceeding 70 mm. bore, by Mr. W. G. Tuck



THE CAERPHILLY HILL-CLIMB. Three striking examples of dry skids at two of the corners of the hill. At the top, one of the most pronounced skids of the day by Mr. R. Lisle's Tourist Trophy Star. Below, on the left, is the 20-30 h.p. Talbot, driven by Mr. H. G. Day. At the bottom, on the right, is Mr. W. O. Bentley's Tourist Trophy D.F.P.

quickly. The first upward gradient rises about 1 in 9, and continues through a sharp S bend at about 1 in 8. About 100 yards of straight road follows, leading up to the most difficult bend of the course, at which point spectators were afforded a study in skilful skidding.

The record time for the ascent was made in 1913 by Mr. A. J. Hancock, who on a 98 x 150 mm. Vauxhall, occupied 1m. 4 $\frac{3}{5}$ s. Only one car in 1914, however, approached anywhere near the record, this being the 25-50 h.p. 101.5 x 150 mm. Talbot, entered by the Earl of Shrewsbury and Talbot, and driven by Mr. L. Hands, which completed the course in 1m. 6 $\frac{3}{5}$ s. Mr. Hands

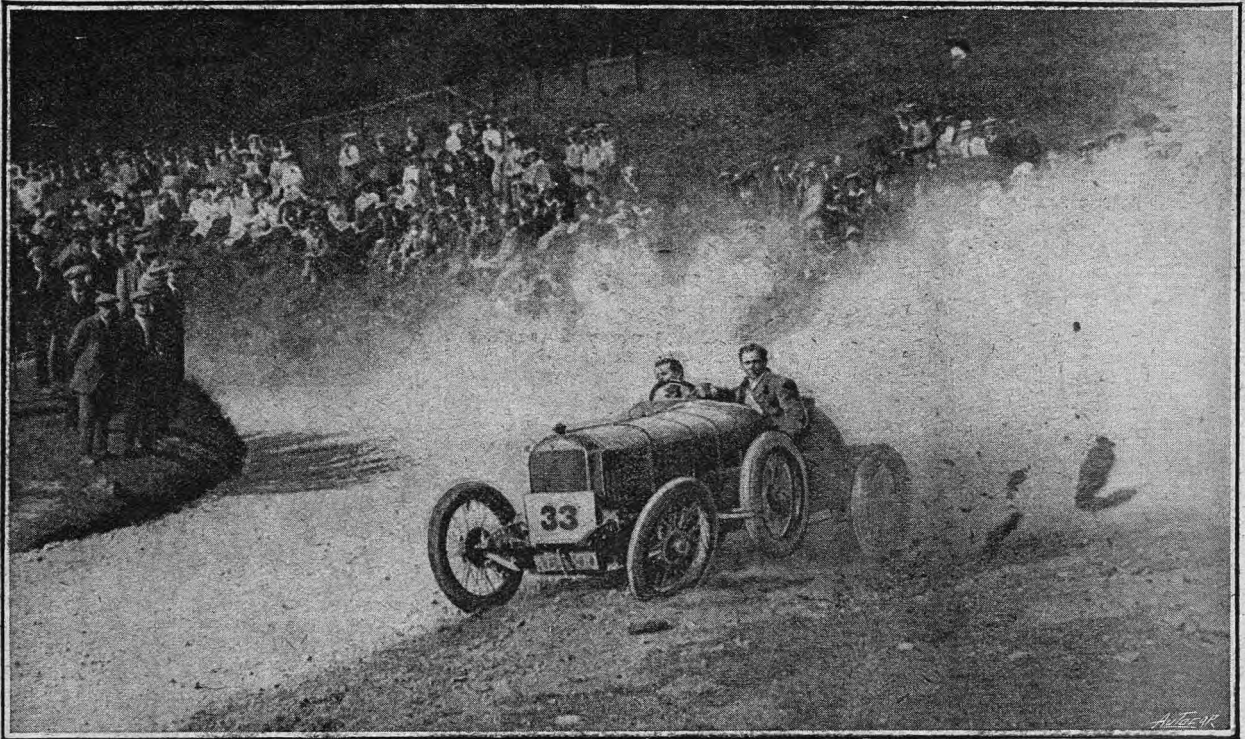
on an 11.9 h.p. 69 x 130 mm. Humber. He started splendidly, but skidded violently at the second bend, and burst both back tyres. He continued the ascent and accomplished it in 1m. 27 $\frac{4}{5}$ s., showing a figure of merit of 1.9097.

That enthusiastic lady driver in hill-climbs, Miss Laura B. Starkey, was a competitor in Class IV. (bore not exceeding 80 mm.), and made an excellent climb on her 12-16 h.p. 80 x 150 mm. Sunbeam in 1m. 32 $\frac{1}{5}$ s., being warmly applauded for her cornering. The fastest time in that class was 1m. 19 $\frac{2}{5}$ s., made by Mr. E. R. Insole, also on a Sunbeam of the same bore and stroke.

Open Competitions in South Wales.

A capital climb was made by Mr. R. S. Witchell's 93 x 120 mm. Straker-Squire in the class for special cars, conforming with the regulations of, and entered for, the recent Tourist Trophy Race. At the second bend Mr. Witchell ran three or four yards up the bank, but by clever steering brought the car back on to the

South Wales Automobile Club and the Cardiff Motor Club, first place on formula was secured by Mr. E. R. Insole on an 80 x 150 mm. Sunbeam. His time was 1m. 19 $\frac{2}{5}$ s., and formula award 2.3060. Another Sunbeam was third, that driven by Dr. N. Davies, while the 12-16 h.p. Talbot, driven by Mr. G.



A SEVERE TEST FOR THE WHEELS. One of the T.T. Straker-Squires, driven by F. C. Clement, skidding off the road at Caerphilly at one of the bad corners. The photograph was taken as the front axle was bending and just before the fixed hub of the near side back wheel snapped off. The clods of earth thrown out by the wheels can be seen. To the great credit of the R.W. wire wheels it must be said that they came through the ordeal without being injured.

course. One of the rear tyres burst, but he completed the ascent in 1m. 10 $\frac{3}{5}$ s. on the rim, his figure of merit being 2.0895. Mr. R. Lisle, on the Tourist Trophy Star, was second on time in 1m. 14 $\frac{3}{5}$ s., but was placed third on formula. With a figure of merit of 2.0178, the T.T. Crossley driven by Bianchi gained second place. Mr. F. C. Clement's Straker-Squire skidded so violently at the second bend that the near side inner hub broke and the wheel came off, uninjured in itself.

As regards Class 9, open only to members of the

Kenshole, was second. Mr. H. K. Neale, on his 14 h.p. Humber, slowed down appreciably on the bends, and took 2m. 4 $\frac{1}{5}$ s. to make the ascent.

One of the most sensational climbs of the day was made by Mr. R. F. Wakley on his 25-35 h.p. 100 x 150 mm. Züst. He evidently somewhat under-estimated the severity of the second bend, so that he negotiated it in a series of side-slips, three or four of which looked serious, but each was corrected with remarkable dexterity.

The following are the results of the car events:

CLASS I. (OPEN).—FOR TWO-CYLINDER LIGHT CARS, BORE NOT EXCEEDING 92 MM., OR FOR FOUR-CYLINDER LIGHT CARS, BORE NOT EXCEEDING 65 MM.

H.P. and Car.	Driver.	Bore and Stroke.	No. of Cyls.	H.P. on Formula.	Time.	Figure of Merit.	PLACING.	
							Formula.	Time.
		mm.			m. s.			
10 Singer	L. Martin	63 x 88	4	7.543	1 22 $\frac{1}{2}$	2.1990	1	1
10 Morris-Oxford	R. J. Sully	60 x 90	4	6.95	1 42 $\frac{3}{4}$	1.7894	2	3
10 Humber	S. Powell	65 x 120	4	9.833	1 55	1.5952	3	4
12 A.C.	C. L. Scott	65 x 100	4	8.709	1 41 $\frac{1}{2}$	1.5790	4	2
10 Mathis	B. Davies	58 x 100	4	6.934	2 13 $\frac{3}{4}$	1.4831	5	5
9 Adler	E. Brands	65 x 98	4	8.605	2 47	.9549	6	6

CLASS II. (OPEN).—FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 70 MM.

12-15 D.F.P.	W. O. Bentley	70 x 130	4	—	1 25 $\frac{2}{5}$	2.1533	1	1
12-15 D.F.P.	J. Withers	70 x 130	4	—	1 35 $\frac{3}{5}$	2.0878	2	3
11.9 Humber	W. G. Tuck	69 x 130	4	11.688	1 27 $\frac{4}{5}$	1.9097	3	2
12-14 Vinot	H. Ramois	70 x 110	4	10.78	2 22 $\frac{1}{2}$	1.7096	4	6
12-14 Gladiator	G. Usmar	70 x 110	4	10.78	2 10	1.6479	5	4
11.9 Arrol-Johnston	H. Glide	69 x 120	4	11.08	2 16 $\frac{4}{5}$	1.5332	6	5

CLASS III. (OPEN).—FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 75 MM.

H.P. and Car.	Driver.	Bore and Stroke.	No. of Cyls.	H.P. on Formula.	Time.	Figure of Merit.	PLACING.	
							Formula.	Time.
		mm.			m. s.			
14 Humber	M. Neale	75 × 130	4	13.823	1 54 ¹ / ₅	1.9337	1	4
14 Humber	W. G. Tuck	75 × 140	4	14.51	1 33 ³ / ₅	1.8141	2	2
14 Humber	H. K. Neale	75 × 130	4	13.823	2 8 ² / ₅	1.7867	3	5
12-16 Vermorel	J. I. Walters	74 × 120	4	12.745	1 31 ⁴ / ₅	1.7715	4	1
14 Humber	J. Thomas	75 × 140	4	14.51	1 40 ² / ₅	1.7057	5	3

CLASS IV. (OPEN).—FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 80 MM.

15-20 Talbot	E. Stokes	80 × 150	4	17.28	1 19 ³ / ₅	2.7889	1	2
15.9 Sunbeam	E. R. Insole	80 × 150	4	17.28	1 19	2.3177	2	1
15 Crossley	C. Bianchi	79.4 × 123	4	14.975	1 33 ⁴ / ₅	2.1732	3	4
12 Talbot	B. Davies	80 × 120	4	14.81	1 41 ³ / ₅	2.0285	4	6
12-16 Sunbeam	Miss L. B. Starkey	80 × 150	4	17.28	1 32 ¹ / ₅	1.9560	5	3
15.9 Hispano-Suiza	F. D. Pritchard	80 × 180	4	19.51	1 30 ² / ₅	1.3119	6	5

CLASS V. (OPEN).—FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 91 MM.

20-30 Talbot	H. G. Day	90 × 150	4	21.87	1 19 ² / ₅	3.1629	1	2
20 Star	R. Lisle	90 × 130	4	19.89	1 17	1.7383	2	1
18 Minerva	J. H. Jones	90 × 130	4	19.89	1 21 ³ / ₅	1.7289	3	3

CLASS VI. (OPEN).—FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 102 MM.

15-20 Straker-Squire	R. S. Witchell	93 × 120	4	20.125	1 12	2.3795	1	2
25 Vauxhall	G. D. Pearce-Jones	95 × 140	4	23.27	1 21 ¹ / ₅	1.9858	2	3
25-50 Talbot	L. Hands	101.5 × 150	4	27.845	1 0 ² / ₅	1.5099	3	1
25-35 Züst	R. F. Wakley	100 × 150	4	27.01	1 34 ¹ / ₅	1.2545	4	4

CLASS VII.—FOR SPECIAL CARS CONFORMING WITH THE REGULATIONS OF, AND ENTERED FOR, THE TOURIST TROPHY RACE, JUNE 10-11TH.

15-20 Straker-Squire	R. S. Witchell	93 × 120	4	20.125	1 10 ³ / ₅	2.0895	1	1
15-20 Crossley	C. Bianchi	81 × 158.8	4	18.4	1 22 ¹ / ₅	2.0178	2	3
20 Star	R. Lisle	90 × 130	4	19.89	1 14 ³ / ₅	1.8022	3	2

CLASS VIII. (CLOSED TO MEMBERS OF THE ORGANISING CLUBS).—FOR TWO-CYLINDER LIGHT CARS, BORE NOT EXCEEDING 92 MM., OR FOR FOUR-CYLINDER LIGHT CARS, BORE NOT EXCEEDING 65 MM.

10 Humber	H. K. Neale	65 × 120	4	9.833	1 53 ² / ₅	1.7828	1	1
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CLASS IX. (CLOSED).—FOR TWO-CYLINDER CARS, BORE NOT EXCEEDING 113 MM., OR FOR FOUR-CYLINDER CARS, BORE NOT EXCEEDING 80 MM., OR FOR SIX-CYLINDER CARS, BORE NOT EXCEEDING 65.3 MM.

15.9 Sunbeam	E. R. Insole	80 × 150	4	17.28	1 19 ² / ₅	2.3060	1	1
12-16 Talbot	G. Kenshole	80 × 120	4	14.81	1 34 ³ / ₅	2.2936	2	3
12-16 Sunbeam	Dr. N. Davies	80 × 150	4	17.28	1 36 ² / ₅	2.0057	3	4
12-16 Sunbeam	Miss L. B. Starkey	80 × 150	4	17.28	1 30	2.0038	4	2
14 Humber	M. Neale	75 × 130	4	13.823	1 51	1.9894	5	6
14 Humber	H. K. Neale	75 × 130	4	13.823	2 4 ¹ / ₅	1.8471	6	7
15.9 Hispano-Suiza	F. D. Pritchard	80 × 180	4	19.51	1 38 ² / ₅	1.2880	7	5

CLASS X. (CLOSED).—FOR TWO-CYLINDER CARS, BORE EXCEEDING 113 MM., OR FOR FOUR-CYLINDER CARS, BORE EXCEEDING 80 MM., OR SIX-CYLINDER CARS, BORE EXCEEDING 65.3 MM.

25 Vauxhall	G. D. Pearce-Jones	95 × 140	4	23.27	1 18 ⁴ / ₅	2.0463	1	1
15 Talbot	E. S. Pink	90 × 140	4	20.895	1 42 ¹ / ₅	1.7575	2	6
25 Vauxhall	H. West	95 × 140	4	23.27	1 32 ¹ / ₅	1.7197	3	4
25 Vauxhall	R. F. Wakley	95 × 140	4	23.27	1 34	1.6998	4	5
16-20 Vauxhall	A. E. Smithson	90 × 120	4	18.85	1 55	1.4983	5	8
24 Darracq	A. Sgonina	100 × 130	4	24.555	1 52 ² / ₅	1.4385	6	7
48.6 Royce	Miss L. Cooper	113 × 119	6	44.31	1 31	1.1456	7	3
35 Daimler	W. H. Graham	134 × 150	4	48.48	1 29 ² / ₅	.8702	8	2

CLASS XI.—FOR CARS DRIVEN BY PAID DRIVERS, AND OF UNLIMITED CAPACITY.

12-16 Sunbeam	H. Taylor	80 × 150	4	17.28	1 37 ² / ₅	1.9851	1	—
25 Vauxhall	A. Grainger	95 × 140	4	23.27	1 37	1.6473	2	—
15.9 Hispano-Suiza	Entrant, Mr. F. D. Pritchard	80 × 180	4	19.52	1 41 ¹ / ₅	1.2549	3	—
35 Daimler	G. Allen	134 × 150	4	48.48	1 42 ¹ / ₅	.7612	4	—

Porthcawl Speed Trials.

Ideal climatic conditions favoured the Porthcawl open speed trials, held in the Rest Bay on Saturday. Although the start had to be delayed for a couple of hours on account of the high tide and wet state of the sand, when the first class was eventually run off the course was in excellent condition, the sand firm and free from troublesome ridges. The course selected was absolutely straight, and about one mile in length. The Talbot cars, which performed so well in last year's events, were again prominent, one making the

fastest time of the day, and creating a new record for the course.

Class I., for four-cylinder cars, bore not exceeding 65 mm., produced a close finish, Mr. C. L. Scott's 12 h.p. A.C. being only 1³/₅s. in front of the 10 h.p. Singer driven by Mr. L. Martin.

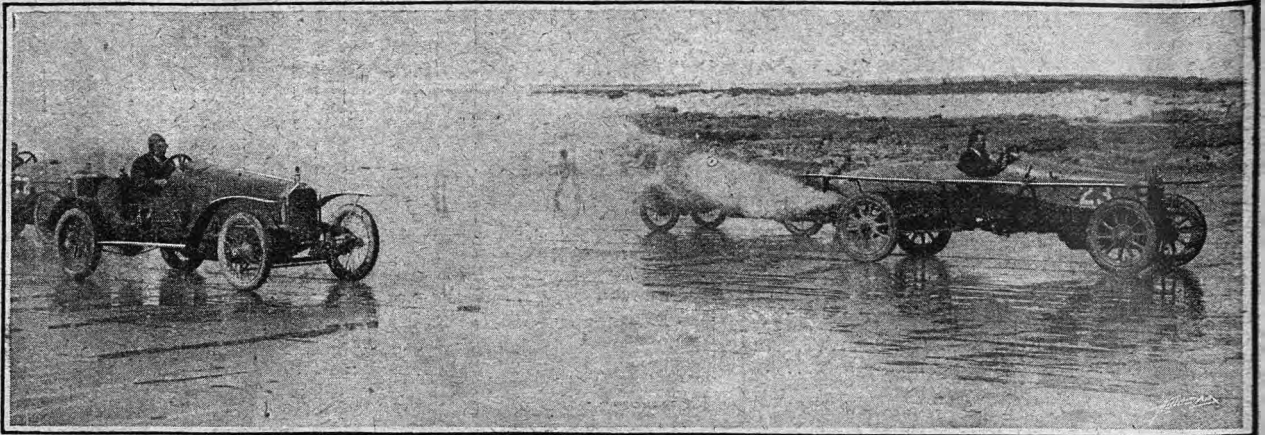
Mr. W. G. Tuck again succeeded in winning the R. E. Jones Challenge Cup for the fastest time in Class II., bore not exceeding 70 mm. Driving the 11.9 h.p. 69 × 130 mm. Humber, he covered the

Open Competitions in South Wales.

course in 1m. $9\frac{2}{5}$ s., a speed of 51.87 m.p.h. He had a good lead over Mr. W. O. Bentley (12-15 D.F.P.), who was second in 1m. 17s.

In Class III. for four-cylinder cars, bore up to 75 mm., Mr. Bentley improved a couple of seconds,

announced that he had covered the course in $52\frac{1}{5}$ s. (68.97 m.p.h.), he was warmly applauded. By winning this class Mr. Hands secured the challenge cup presented by the Porthcawl Chamber of Trade. Mr. Hands was also to have competed in the unlimited



The start of the final heat in Class V. in the Porthcawl Speed Trials. Leading is H. G. Day on the 20-30 h.p. Talbot; second, C. Bianchi, on a Crossley; third, R. Lisle, on the 20 h.p. Star; and fourth, J. H. Jones on the 18 h.p. Minerva.

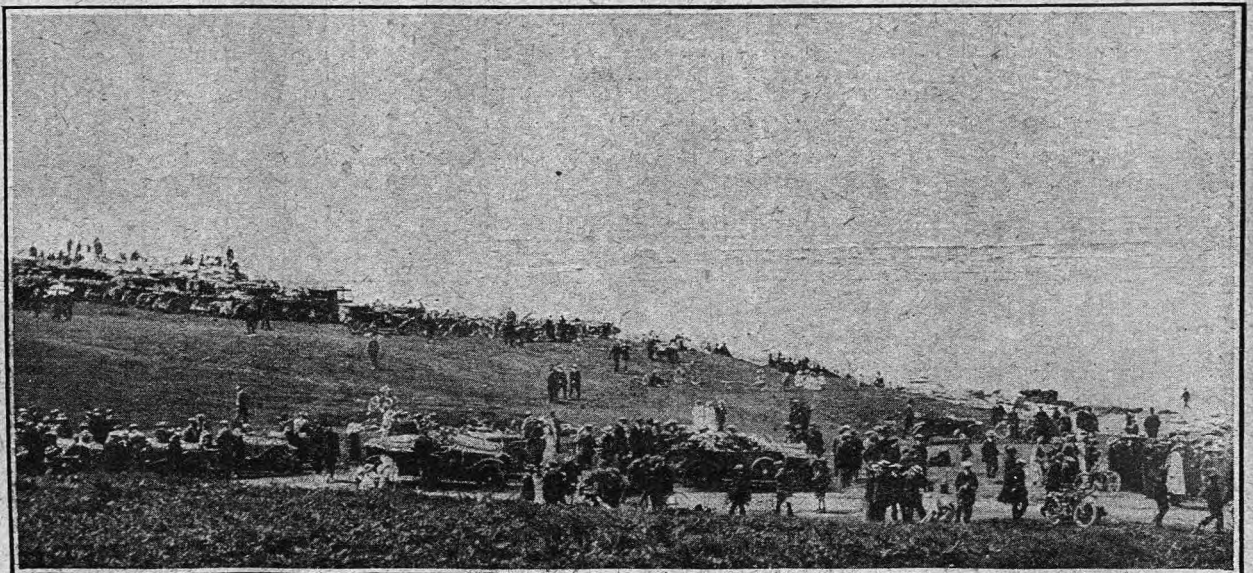
and won the silver vase presented by Humber, Ltd. Mr. E. I. Walters, on the 12-16 h.p. Vermorel, led at the commencement, but his engine misfired badly once or twice, and the D.F.P. shot ahead, beating the Vermorel by three seconds.

The C. H. Bailey silver cup (Class IV., bore not exceeding 80 mm.) was won easily by Mr. E. Stokes, driving a 15-20 h.p. 80 x 150 mm. Talbot. Mr. Stokes did not appear to start well, but picked up wonderfully and completed the course in $57\frac{2}{5}$ s., a speed of 62.72 m.p.h. Mr. C. Bianchi, on the T.T. Crossley (79.4 x 123.8 mm.), passed the finishing post $5\frac{3}{5}$ s. later, while Miss L. B. Starkey's time on her 12-16 h.p. Sunbeam was 1m. $9\frac{1}{5}$ s.

The fastest official time of the day was made by Mr. L. Hands, driving the 25.50 h.p. 101.5 x 150 mm. Talbot in Class VI., for four-cylinder cars not exceeding 102 mm. bore. He made a fast start and maintained his speed throughout. When it was

capacity class, but was by some cause prevented from doing so. He was, however, afterwards allowed a private trial, apart, of course, from the competition, and in this trial he completed the distance in $50\frac{4}{5}$ s., a speed of 71.43 m.p.h.

The class for cars of an unlimited capacity, driven by ladies, was of an interesting character. Each competitor made a preliminary run down the course and was timed, a handicap being arranged on a time basis. Any competitor whose time was more than 5s. faster than her trial run was disqualified. Singularly enough, Mrs. H. Neall, who won the class on her 14 h.p. Humber, improved just 5s. on her trial run. She had 41s. start, but her actual time was the slowest of all. The fastest actual time was made by Miss Starkey on her Sunbeam, which started scratch and covered the course at the rate of 50 m.p.h. It is interesting to note that in the preliminary run her time was 1m. $10\frac{4}{5}$ s.



A portion of the crowd of cars and spectators on the cliff at the Porthcawl Speed Trials.

The final results of the speed trials were as follow:

CLASS I.—For Four-cylinder Light Cars, Bore not exceeding 65 mm. (open).

Driver and Car.	B. and S. mm.	Time. m. s.	Speed. m.p.h.
1. C. L. Scott (12 A.C.)	65 × 100	1 25 ³ / ₈	42.15
2. L. Martin (10 Singer)	63 × 88	1 27	41.38
3. R. J. Sully (10 Morris-Oxford)	60 × 90	1 30	40.00
4. B. Davies (10 Mathis)	58 × 100	1 35	37.89

CLASS II.—For Four-cylinder Cars, Bore not exceeding 70 mm. (open).

1. W. G. Tuck (11.9 Humber)	69 × 130	1 9 ³ / ₈	51.87
2. W. O. Bentley (12-15 D.F.P.)	70 × 130	1 17	46.75
3. J. Withers (12-15 D.F.P.)	70 × 130	1 19	45.57
4. R. J. Sully (10 Morris-Oxford)	60 × 90	1 24	42.86
5. G. Usmar (12-14 Gladiator)	70 × 110	1 30	40.00

CLASS III.—For Four-cylinder Cars, Bore not exceeding 75 mm. (open).

1. W. O. Bentley (12-15 D.F.P.)	70 × 130	1 15	48.00
2. E. I. Walters (12-16 Vermorel)	74 × 120	1 18	46.15
3. A. Bray (14 Foy-Steele)	75 × 130	1 20 ¹ / ₂	44.89
4. W. G. Tuck (14 Humber)	75 × 140	1 22	43.90

CLASS IV.—For Four-cylinder Cars, Bore not exceeding 80 mm. (open).

1. E. Stokes (15-20 Talbot)	80 × 150	57 ³ / ₈	62.72
2. C. Bianchi (15-20 Crossley)	79.4 × 123.8	1 3	57.14
3. Miss L. B. Starkey (12-16 Sunbeam)	80 × 150	1 9 ¹ / ₈	52.02
4. B. Davies (12 Talbot)	80 × 120	1 15 ³ / ₈	47.75

CLASS V.—For Four-cylinder Cars, Bore not exceeding 91 mm. (open).

1. H. G. Day (20-30 Talbot)	90 × 150	58	62.07
2. R. Lisle (20 Star)	90 × 130	1 0 ¹ / ₈	59.80
3. C. Bianchi (15-20 Crossley)	81 × 158.8	1 2	58.06
4. J. H. Jones (18 Minerva)	90 × 130	1 9 ³ / ₈	51.87

CLASS VI.—For Four-cylinder Cars, Bore not exceeding 102 mm. (open).

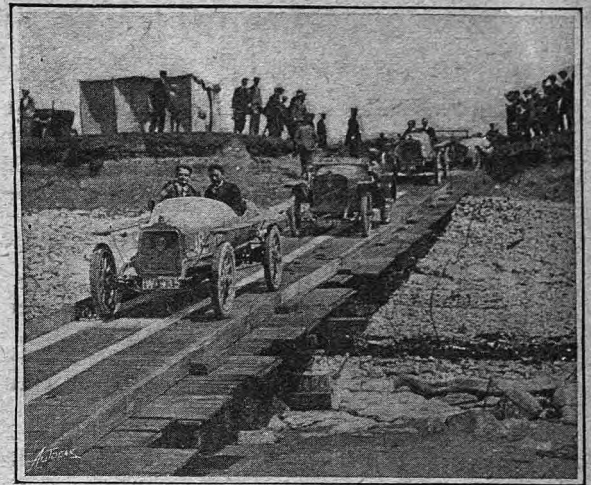
1. L. Hands (25-50 Talbot)	101.5 × 150	52 ¹ / ₈	68.97
2. R. F. Wakley (25-35 Züst)	100 × 150	1 1 ¹ / ₈	58.44
3. J. H. Jones (18 Minerva)	90 × 130	1 9 ³ / ₈	51.87
4. I. D. Newton (25 Vauxhall)	95 × 140	1 24 ¹ / ₈	42.76

CLASS VII.—For Four or Six-cylinder Cars, Unlimited Capacity (open).

1. A. Bertelli (30-98 Vauxhall)	101 × 160	1 0 ¹ / ₈	59.80
2. J. H. Jones (18 Minerva)	90 × 130	1 8 ³ / ₈	52.63
3. R. F. Wakley (25 Vauxhall)	95 × 140	1 20 ³ / ₈	44.78

CLASS VIII.—For Special Cars, conforming with the regulations of and entered for the T.T. Race, 1913.

1. F. C. Clement (15-20 Straker-Squire)	93 × 120	1 1 ³ / ₈	58.25
2. C. Bianchi (15-20 Crossley)	81 × 158.8	1 2	58.06
3. R. S. Witchell (15-20 Straker-Squire)	93 × 120	1 4	56.25



Competing cars descending the slip-way down to the sands at the Porthcawl Speed Trials.

CLASS IX.—For Cars driven by Ladies, Unlimited Capacity, Handicap on a time basis (open).

Driver and Car.	B. and S. mm.	Actual Speed. time.	m.p.h.
1. Mrs. H. Neale (14 Humber), 41s.	75 × 130	1 46 ³ / ₈	33.83
2. Mrs. W. E. Jones (25 Vauxhall), 10s.	95 × 140	1 17	46.75
3. Mrs. Powell (10 Humber), 23s.	65 × 120	1 32 ¹ / ₈	39.05

CLASS X.—For Two-cylinder Light Cars, Bore not exceeding 92 mm.; or for Four-cylinder Cars, Bore not exceeding 65 mm. (closed).

1. H. K. Neale (10 Humber)	65 × 120	1 32 ³ / ₈	38.96
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CLASS XI.—For Four-cylinder Cars, Bore not exceeding 80 mm. (closed).

1. Miss L. B. Starkey (12-16 Sunbeam)	80 × 150	1 12 ³ / ₈	49.72
2. E. R. Insole (15.9 Sunbeam)	80 × 150	1 17	46.75
3. F. D. Pritchard (15.9 Hispano-Suiza)	80 × 180	1 19 ³ / ₈	45.34
4. W. H. Lewis (15-20 Talbot)	80 × 130	1 24	42.86

CLASS XII.—For Four-cylinder Cars, Bore exceeding 80 mm.; or for Six-cylinder Cars, Bore exceeding 65.3 mm. (closed).

1. Miss L. Cooper (48.6 Rolls-Royce)	113 × 119	1 17 ¹ / ₈	46.63
2. R. Pomeroy (20-30 Talbot)	90 × 140	1 20	45.00
3. R. F. Wakley (25 Vauxhall)	95 × 140	1 21	44.44
4. A. Sgonina (24 Darracq)	100 × 130	1 22	43.90
5. E. S. Pink (15 Talbot)	90 × 140	1 28	40.91



THE PORTHCAWL SPEED TRIALS. The line up for the start of Class IX. for lady drivers.

We have been informed that the first ten cars with the exception of the fourth in the Indianapolis motor race used Dixon's graphite motor lubricant except for the engines. For the transmissions and differentials graphite oil was used. For the wheel bearings also a graphite oil was used, while a special heat-proof grease was used for the universal joints. But

perhaps the most interesting item is the fact that graphite instead of French chalk was used for the internal lubrication of the tyres; the use of blacklead instead of chalk dates back for many years, but a scientifically compounded graphite lubricant for tyres, such as was used on this occasion, is a comparative novelty.

Notes for Beginners.

By Eric W. Walford.

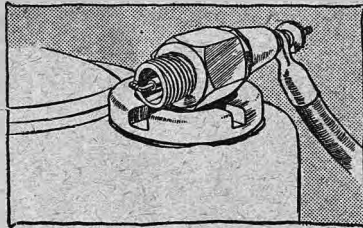
A further series of articles, the object of which is to aid those having little or no experience in the purchase, care, and upkeep of motor cars. Beginners in doubt or difficulty on any matter are invited to seek assistance from the writer. Queries should be addressed to the Editor; replies will be posted direct if desired or published under the above heading as space permits.

Spares and Replacements carried on Tour.

IN my remarks on touring in the issue of June 13th, pp. 1139-1140, I specified certain articles which it is advisable to carry on tour, and a correspondent asks the object of including high-tension wire, insulating tape, copper wire, and cord in my list.

It does sometimes happen that one of the wires from the magneto to the sparking plug breaks, or chafes or burns through; hence the desirability of carrying a spare length. The insulating tape is useful for repairing a chafed high-tension wire or for attaching a wire to the sparking plug when the terminal is lost. It is useful in a hundred and one other ways, as it is a kind of adhesive plaster, and can be used for repairing broken piping, etc. In the case of a cracked petrol pipe the procedure is to rub the crack with soap, wrap it with insulating tape, and tie the tube with copper wire or string so as to prevent it vibrating. If a water joint leak, it can be wrapped with insulating tape and bound with string or wire. If a rod rattle, a short length of insulating tape wrapped round the parts that make contact will stop the noise. It is obviously impossible to give all the uses to which insulating tape may be put, and the same applies to copper wire, for the temporary repairs in which the latter may find a place are without number.

The same correspondent asks, in connection with my suggestion that a complete magneto contact-breaker be



A sparking plug rested on a valve cap for testing purposes.

carried, how a beginner is to know if this part of the mechanism be defective. This leads one into the very wide subject of diagnosing faults, which I shall hope to deal with very fully in subsequent issues. Briefly, I

may say that if the engine fail to run or to start the trouble is due (in the majority of cases) to the absence of a spark at the sparking points or to absence of petrol in the carburetter. I am assuming that the throttle is open, the switch on, and so forth. Having convinced oneself that there is petrol in the carburetter, and that it will come out of the jet, the obvious conclusion is that the ignition system is at fault.

To test the ignition system rapidly, one of the sparking plugs should be taken out and the inner end of the plug moistened with petrol. It should then be laid on the engine in the manner shown in the sketch so that the metal body of the plug rests on the engine, with the terminal and end of the wire at least half an inch away from any metal part of the engine. Now if the starting handle be rotated quickly, the switch being on and the ignition fully advanced, the petrol at the end of the sparking plug must be ignited if there be any spark. Alternatively, one may merely

look at the plug to see if it spark as the handle is turned, but a little petrol put on the plug makes the test much simpler, but there should not be enough petrol used in this way to do any damage. Half a dozen drops of petrol is quite enough.

If the petrol does not catch fire a different sparking plug should be fitted, and a set of four in good condition should be carried. If this does not remedy matters, see that the wire to this particular plug is properly attached

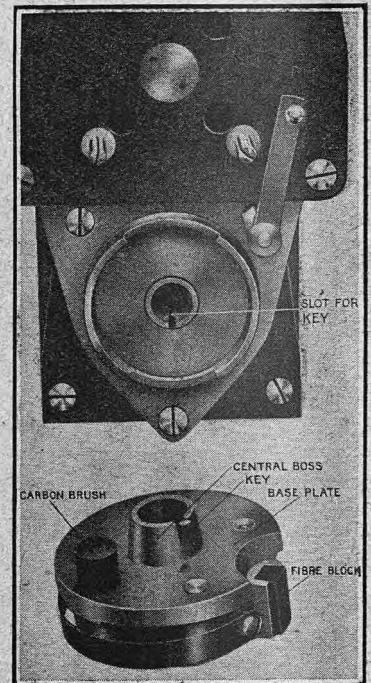
at both ends, and, if this be all in order, the spare contact-breaker may be fitted. Actually the trouble with the contact-breaker can usually be remedied without removing it from the magneto, but the beginner is well advised to carry a spare and use it when in doubt. He must

take very great care when fitting the new contact-breaker to see that the little key or projection seen in the accompanying illustration at the back of the contact-breaker fits into the groove formed to receive it; this ensures the

contact-breaker being fitted in the right position. It is then impossible for the timing to be wrong.

In *The Autocar* of November 2nd and November 9th, 1912, I described in simple words the construction and operation of the whole magneto and gave copious photographic illustrations of all the parts. Also in *The Autocar Handbook* there is a good description of this important part of the car.

We have heard a great many things in favour of benzole and a great many things against it. The other day we heard an entirely new charge which we should imagine is about the most groundless that has ever been uttered against coal spirit. It was to the effect that the exhaust fumes were not only more offensive than those of petrol, but so bad for the lungs as to be likely to cause consumption. This is really the most extraordinary suggestion we have ever come across even from an unbeliever in benzole.



A view of a contact-breaker detached from a magneto, showing the key and keyway.

The Essex M.C. Open Speed Trials.

A Successful Meeting on the Esplanade at Westcliff-on-Sea.

GREAT credit is due to the executive of the Essex Motor Club for the excellent meeting which took place on Thursday last week on the Esplanade road between Leigh-on-Sea and Southend-on-Sea by permission of the Southend Corporation. Glorious weather, a high tide, a large and appreciative body of spectators, and fast times combined to make a good day's sport. If criticism there must be, it is that a programme of seventy-five events was too long, and, moreover, was cut up into such small sections that it was difficult to follow the events. On another occasion, we suggest, the number of classes should be reduced very considerably, and handicaps arranged accordingly.

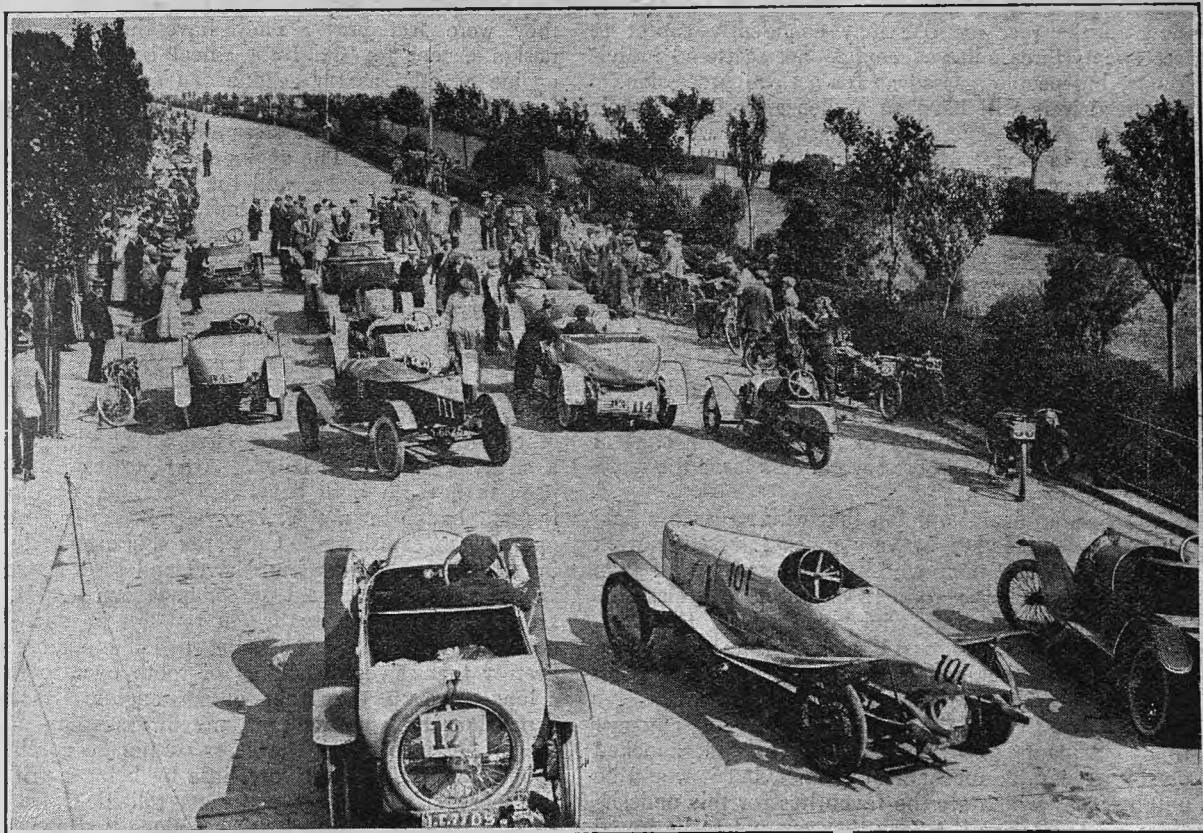
One or two entries in an event does not make a race, but twenty or more divided into, say, five heats and a final immediately following, would maintain interest at a higher pitch. There were thirty-four different cars entered for the fifteen car events, or actually a total of eighty-two entries for the fifteen events. The meeting concluded with a match between the motor cycle and the car making the fastest runs of the day.

The following is the list of winners of the various events:

- | Event. | Driver and Car. |
|--|------------------------------------|
| Half-mile (flying start), 1,100 max. c.c.— | Bramley Haywood (10 h.p. Singer). |
| One kilometre (standing start), 1,500 max. c.c.— | F. Ll. Scholte (8 h.p. Bugatti). |
| One kilometre (standing start), 1,100 max. c.c.— | Miss Addis-Price (10 h.p. Mathis). |
| Half-mile (flying start), 1,500 max. c.c.— | H. Nelson Smith (9 h.p. Hillman). |

- | Event. | Driver and Car. |
|--|--|
| One kilometre (standing start), 2,100 max. c.c.— | H. Nelson Smith (9 h.p. Hillman). |
| One kilometre (standing start), 3,000 max. c.c.— | H. Nelson Smith (9 h.p. Hillman). |
| Half-mile (flying start), 2,100 max. c.c.— | H. Nelson Smith (9 h.p. Hillman). |
| Half-mile (flying start), 3,000 max. c.c.— | L. M. Sanford (22 h.p. Bedford-Buick). |
| One kilometre (standing start), 4,000 max. c.c.— | D. C. Sykes (20 h.p. Ford). |
| Half-mile (flying start), 4,000 max. c.c.— | Arthur Bray (14 h.p. Foy-Steele). |
| One kilometre (standing start), 3,100 max. c.c.— | Closed event for Essex and Southend clubs.—N. A. Stevens (10 h.p. La Ponette). |
| Half-mile (flying start), 5,000 max. c.c.— | L. C. Rawlence (24.8 h.p. Berliet). |
| One kilometre (standing start), unlimited.— | A. Bovier (15 h.p. Schneider). |
| One kilometre (standing start), 5,000 max. c.c.— | C. Leece (24.8 h.p. Berliet). |
| Half-mile (flying start), unlimited.— | A. Bovier (15 h.p. Schneider). |
- The concluding match—motor car *versus* motor cycle, the two machines competing being those making the fastest time of the day each in its own section—was won by Mr. Harry Reed on an 8 h.p. Dot motor cycle against Mr. P. H. Easton's 15 h.p. Schneider.

Mr. Sydney Guy has recently relinquished his position as works manager of the Sunbeam Motor Car Co. to start a new company for the manufacture of commercial vehicles. From what we have heard of the design from Mr. Sydney Guy, we believe it will embody a number of points which will not be without interest to owners of private cars, and in due time we hope to deal with them.



THE ESSEX M.C. SPEED TRIALS. Some of the competing cars assembled at the starting point

The Eve of the Grand Prix.

Some Details of the Competing Cars.

The Grand Prix Race will be run to-day (Saturday, July 4th) on a circuit of 23½ miles, near Lyons. Twenty laps will be covered, a total distance of 470 miles. The race is confined to cars with engines not larger than 4,500 c.c.

SATURDAY, July 4th, 1914, will be a great day in the annals of motoring, as a great race for the Grand Prix de l'Automobile Club de France will be run with a splendid entry and over a fine course. Whether the French favourites again take all the places, or whether England, Germany, or Italy can wrest the prize from its holders, matters little from a sporting point of view, because, with more than three dozen starters, a hotly contested event is a certainty.

The organisers have made preparations for a record crowd, and also they hope to give their visitors rather better accommodation than has been the case in former years. Not only is the grandstand much bigger, but it is better fitted. The garage behind is larger and has easier entrances, the restaurant is to be better managed—so we are assured—and there is also much more room for what the French rather aptly call "circulation," which means that when tired of sitting still there is plenty of space in which to walk about without losing a view of the road.

And what a view it is, too! Probably never before has such a length of road been visible from a road race stand, and it is not a length of straight such as one gets on the old Sarthe circuit at Le Mans. Straight, downhill, and corner work, all can be seen from the Tribunes with their 4,000 seats. In the other three stands, one on the hairpin above the official quarters, the other two at the top of the hill, will be almost as many people as in the Tribunes proper; and on the roadside one may confidently expect to see twenty-three miles of crowd—not scattered individuals, but people massed as for a royal procession.

The drivers will have an audience worthy of their skill, and, from experience of past years, we have no hesitation in saying that the foreign drivers will get as much encouragement as the native; even the Germans were applauded heartily at Le Mans last August.

The Start.

As the course is wide, and particularly so at the grandstand, the cars will start two at a time, which will add immensely to the interest of the beginning of the race. Naturally every man will want to be in front of the other one of the pair, so we shall see exactly of what each car is capable in the way of acceleration during the first few seconds of its running. This will make the start comparable in interest with a start at Brooklands in a race where several cars leave the mark at once.

It seems a general opinion that with so large a field there is not likely to be very much interesting work at the pits, since a man who has to stop for more than tyres, fuel, or oil is certain to be out of it, unless the adjustment is of a very trivial character. However, one can never be sure, and there is certain to be some heroic job or other undertaken by the staff of a team who want to *finish* whatever else happens.

Of course, there is the usual private betting amongst the participants as to who will be the first knocked out by irreparable mechanical mishap, but it would be unfair to say which are the favourites for this undesirable event. Suffice it to say they are not to be found in either British team.

The Starters.

Even at the time of writing—Sunday, June 28th—it is not certain which of the long list of starters will be absentees on the great day. Opinion here in Lyons, and also in Turin, is that the Cæsars will not turn up, but one Nazzaro with that fine driver at the wheel is sure to come, and one Aquila-Italiana. The other two Nazzaros and the second and third Aquilas are also possible starters. It is also a question whether the full Piccard-Pictet team will be there, but otherwise no other absentees are feared. Suppose both the Cæsars, two Nazzaros, one Piccard-Pictet, and two Aquila-Italianas are absentees, that still leaves thirty-four cars to circle on a twenty-three mile course; quite enough to provide the spectators with continual excitement.

The Vauxhalls are all here and have been doing quite well, so we are informed, in unofficial practice, not on the course. Mr. Pomeroy considers that the weaknesses shown up in the Tourist Trophy have been eliminated from the Grand Prix cars, and he really seems more confident than we have ever before seen him on the eve of a great race.

The Peugeot Cars.

It is always very difficult to obtain reliable data concerning the Continental cars entered for a big race. The makers are usually extremely reticent, and such information as can be picked up from drivers and mechanics is liable to be inaccurate. In a general way the prime favourites—Peugeot—are the same as they were last year. They have the same general design except for the front wheel brakes, the same engine exactly, as far as one can see externally; in fact, the only observable difference apart from size is the body, which has a streamline tail enclosing the two spare wheels. The engine dimensions are 92 mm. bore x 169 mm. stroke, and the cylinders are slightly off-set relative to the crankshaft, a feature shared by all the other engines of the Grand Prix cars in varying degrees.

Briefly to recapitulate the features of the engine, there are two camshafts arranged so as to operate almost directly upon the ends of the valve stems. Each cylinder has four valves and each valve two springs, one inside the other, the idea being that if the outer one—which is the main spring—should break, the other will keep the valve working, albeit with perhaps a slight loss of efficiency. After experiments had been made with both bevel and skew gearing it was thought better to use a long train of spur gears to operate the camshafts. On paper this seems clumsy, but the reason is that both bevel and skew gears are no use unless they are in proper engagement. If they are too tight they actually get red hot on such high-speed work as camshaft-driving, and if too loose they destroy themselves by sliding of tooth over tooth. In a long drive up the front of an engine all sorts of expansions and contractions are always going on, so the proper meshing of the gears cannot be continual; spur gears are affected very little by being a trifle on the loose side, and are the most reliable form. Of course, they are noisy, but what does that matter in a racing car?

For both front and rear axles the springs are underhung, and there are spring checks to minimise the axle movement. Incidentally, a good deal more play is allowed the back axle than is given to the front. The clutch is a leather cone, and an externally ordinary gear box provides four speeds with direct on top, while the propeller-shaft has two universal joints.

Altogether, say the 1914 Grand Prix Peugeot is identical with the 1913 save for dimensions and one is not far out. The question is whether the designers have been able to get more power per litre of cylinder capacity than they got last year. If they have, the mean effective pressure must be very high indeed. The carburetter has been altered a little and better results are claimed for it, but it has been noticed in practice that Peugeots have struck the misfiring trouble encountered by almost all the Isle of Man competitors. No doubt, however, it will be overcome before the race. Of course the outstanding feature of the Peugeot is the front wheel brakes, which are foot-operated. Each brake is roughly 15 in. in diameter by 2½ in. wide, and the operation is by short universally-jointed shafts whose inner ends are in brackets on the front dumb irons. The rear brakes are controlled by the usual hand lever, and the brake compensation and actual operation is by wire cable. Of course the drums both fore and aft are ribbed.

F.I.A.T.

The F.I.A.T. cars for this year's event are very, very different machines from those mighty old roarsers of ever-glorious memory. They have a much shorter stroke than the majority of the cars—100 × 143 mm.—and also the F.I.A.T. engineers have been satisfied with two valves to each cylinder. There is a central overhead camshaft and a rocker for each valve, but let it not be thought that the engines are of the ultra slow speed type, for they have been made to turn at almost 3,000 r.p.m., though this is relatively slow for engines in this year's Grand Prix. For the lubrication the almost universally adopted forced system is used, but there are two pumps, one for supply and one to keep the sump empty by returning oil to the tank, where it has a better chance to cool.

For engine and four-speed gear box there is a unit system on three-point suspension—distinctly unusual in racing practice—and this, of course, includes the plate clutch. For the brakes there is a transmission drum with contracting shoes, and this is foot-operated. The hand lever controls a brake on each of the four wheels, but the front drums are much smaller than the Peugeot. There is, however, a very ingenious compensation for the front brakes: at the centre of the front cross member is a bracket with

bearings for the brake camshafts, and these shafts are threaded with a quick pitch. To connect them is a sleeve, female threaded, and it is on this sleeve that the lever connected to the operating rod is situated.

The F.I.A.T. Co. have broken away from tradition by keeping the cars fairly low and observing some care as to wind resistance. There are two universal joints, and the torque is taken by the springs.

Front Wheel Brakes.

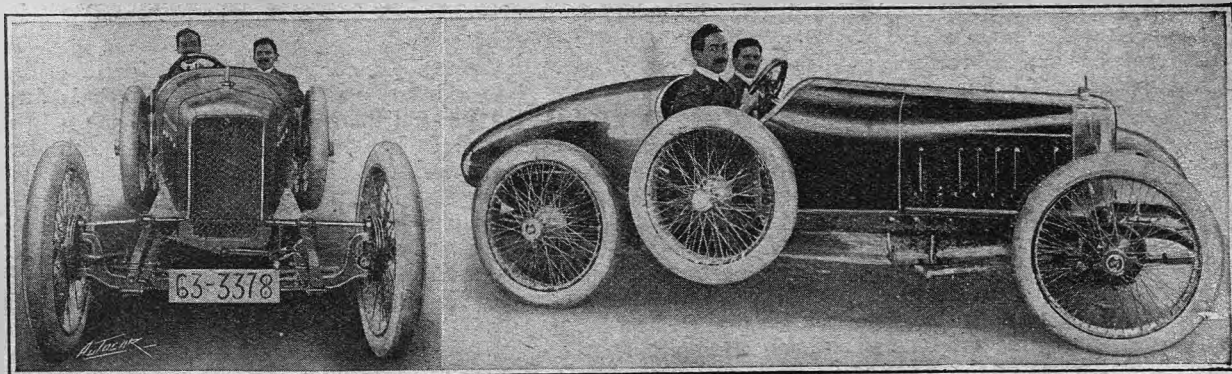
Only the two cars mentioned and Delage and Piccard Pictet have front wheel brakes, and it is worthy of especial notice that the two French designs both rely on cable operation and compensation, while the F.I.A.T. have cable connections. In the Delage construction the cable is carried over pulleys of several inches in diameter, so that it really does get a chance to slide the requisite small amount. Of course, the chief objection to wire cables for ordinary touring car work is that they suffer much more from age deterioration than any rod and lever construction, but this poorish durability is of no account for racing work where the cable gets no chance to rust or grow stiff. Carried out as in the Delage the life of the cable ought to be long enough for many races, and it is only really necessary that it should be long enough for one.

Aquila-Italiana.

Of the other Italian cars the Aquila-Italiana has by far the most original design. Firstly, it is the only six-cylinder car, and the engine is not—like last year's Sunbeam—a tuned-up standard type, but a wholly special design. The reason for the use of six cylinders is that the designer believes better accelerative qualities are obtainable from a multiplicity of pistons.

Externally the engine is probably the neatest of all, since on opening the bonnet there is disclosed a smooth block casting with an aluminium cover on the top. No valves can be seen—in fact, external to the engine is only the magneto which pokes through the dashboard and stands on a platform at about half cylinder height.

Actually, all the valves are in the head and are inclined. There are two per cylinder, and each is mounted in a cage. A camshaft lies along each side of the cylinder block and high up so that an intermediate gear is necessary between the crankshaft pinion and the camshaft wheels. Outside each camshaft is a fixed longitudinal shaft acting as a fulcrum for rockers that lie on top of the cams, and the inner ends of these rockers lift vertical rods, the rocker serving slightly to magnify the cam amplitude. These vertical push-rods lie in the narrow spaces between the cylinders, and there are staggered rockers on the top of



Front and side views of the F.I.A.T. car to be driven by Cagno in the Grand Prix race to-day

The Eve of the Grand Prix.

the cylinders to make connection between the valve stems and the upper ends of the push rods. Although this sounds a most complicated construction, it is really extremely neat.

The cylinders are block cast, and have a separate—also block cast—head, this being necessary to enable the assembling of the valve mechanism. It has been said that the magneto is situated in a cavity in the dash, and it should be explained that there is a separate shaft to drive it from the distribution gear. The crankshaft has ball bearings, and these enable the length to be kept down.

The pistons are very short and of aluminium, while the rings and the connecting rods are round section hollow B.N.D. steel; really beautiful examples of design and workmanship. Piston, rings, and connecting rod together weigh 600 grammes, or 1 lb. 5.2 oz., which is little enough for an engine of 85 × 132 mm. bore and stroke.

The carburettor used is a double Zenith with one float chamber and two jet portions, the air being taken in through a streamline funnel facing forwards.

The originality of the car does not cease with its engine, for the gear box is mounted on the front end of the torque tube, being embraced by a huge steel fork that is secured to pivots in line with the single universal joint. The back axle is carried on cantilever springs something like the Vauxhall, but they appear to be heavier, and the front springs each have three reversed leaves on top to increase the friction and so have a damping effect additional to that of the shock absorbers.

Another peculiarity is the very wide track, 4ft. 9½ in., as against the ordinary width of 4ft. 4½ in. Five inches does not, perhaps, sound a very large amount, but it is enough to make the axles immensely wide. The idea is, of course, to make for stability on corners and steadiness on the straight. Of the four speeds the third is direct and the top one a high ratio intended for use on the long straight, but the engine can turn over at 3,000 r.p.m. or more, so the pace on the direct third of almost exactly 3 to 1 should be sufficiently high for most parts of the Grand Prix course.

The Nazzaro Car.

The other Italian car, the Nazzaro, is a different kind of job altogether, and, as far as the engine goes, is much more like the F.I.A.T., though it has an overhead camshaft instead of operating the valves by push rods. There is a single camshaft and rockers for the four valves per cylinder, and the camshaft is driven by bevel gearing. Above the crankshaft, and in a sort of "nose" on the crank case, is a regular nest of bevel gears, from which the oil pump, the magneto, and the water pump are driven. The oil pump is on the apex of the nose, and the magneto and water pump on the ends of short shafts set V fashion, as seen in plan. Save for the fact that the nose is inside the pointed radiator, this accessory mounting makes for accessibility, and it has all the customary Italian neatness of appearance. The great question is, Will the bevels stand up to the work of driving the camshaft? If they do and the car makes a good showing, it will seem that Peugeot and Sunbeam experience is incomplete, and that the necessity for a train of pinions does not exist.

Stroke-bore ratio is the same as in the Delage, 94 × 160 mm. being the dimensions, and steel pistons much drilled out are used. Ball bearings are also employed for both crankshaft and camshaft. Engine

and four-speed gear box are made into a unit by two robust arms on the latter portion which are bolted up to the crank case and embrace the dry plate clutch. It seems rather remarkable that this clutch can be run dry, by the way, as it consists of quite ordinary steel rings just ground up as for use with oil, but it must, of course, be remembered that the clutch will be more free without anything to drag the plates, and if it is altogether used up during the race it is a matter of no moment.

The rear axle and torque tube are made up from two steel pressings welded together, a feature shared, by the way, with the Aquila, and each car thus has only a single universal joint. The Aquila, however, uses a forked end for the torque tube as already explained, and the Nazzaro a ball end, but in each case the brakes are all in the rear hubs, there being two separate sets side by side, operated by pedal in one case and side lever in the other.

The British Cars.

Turning to the English designs, really all that is to be said of both Sunbeam and Vauxhall has already appeared in accounts of the Tourist Trophy cars. Vauxhall is even using the identical chassis, save for Hancock's, which is replaced by the T.T. spare car, but the engines are, of course, larger—101 mm. × 140 mm. We gather that most of the trouble in the Island last month arose from small causes which are now removed. To look at either with bonnet on or off there is no difference to be seen.

As for the Sunbeams, while the design is line for line that of the T.T. cars, entirely new chassis are being run, and they are a few inches longer in the wheelbase, these few inches making a big difference in steadiness at really high speeds: so the drivers say. Again 94 mm. × 160 mm. are the dimensions chosen for the engines. As a matter of fact, there are no less than six different makers using this size of engine—Alda, Opel, Delage, Sunbeam, Nazzaro, and Schneider, while the Nagant 94.5 × 158 mm. is so close that the stroke-bore ratio of this, the only Belgian car, is to all intents the same.

Delage.

The Delages, though their extremely peculiar exhaust noise remains the same, have quite different engines from those used last year, as the horizontal valves have given place to a more Peugeot-like arrangement. The valves are, however, mechanically closed as well as mechanically opened, a special cam operating within a stirrup extension of each valve tappet and lifting the valve against its seating through the medium of a buffer spring. Each tappet operates two valves by the provision of dual crossheads which make contact with the valves.

Rather a shorter stroke has been chosen than for the Peugeots, the dimensions being 94 × 160 mm. The Delages have five speeds, of which the fourth is direct and fifth indirect, and a Hele-Shaw clutch is fitted. Like the Peugeot there are two universal joints in the propeller-shaft. Both the pair of brakes on the front wheel hubs and the rear pair are operated by pedal—there is no side lever whatever. For the steering the pivots are not only canted so that the production of the axis cuts the ground in the plane of the wheel, but they are steeply raked as well, giving a castering action. No attempt has been made at streamline formation, though there are no needless excrescences, and, having a high bonnet, the cars are most impressive on the road, being even reminiscent of the 1912 F.I.A.T.'s.

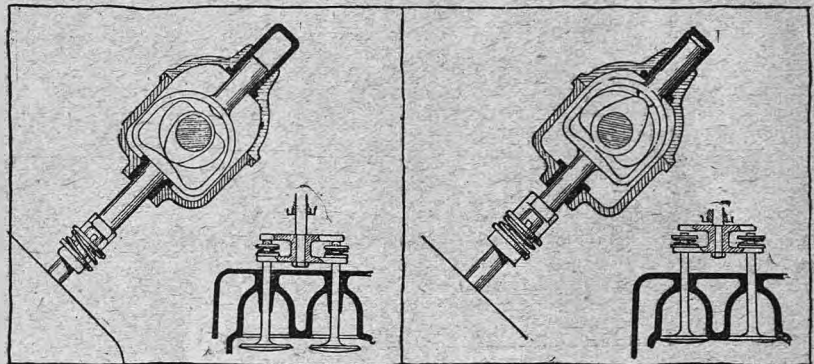
Mercedes.

Turning now to Germany, the principal representative is, of course, Mercedes, not only because there are five of them, but also because more is expected of them than the Opel; whether this expectation is justified or not remains to be seen. At Le Mans last year Mercedes ran two types of car, a four-cylinder and a six-cylinder, and as a result of their experience on that occasion they have now decided to use a four-cylinder type. The engine is to all intents and purposes a Mercedes aeroplane engine having two overhead valves to each cylinder, operated by push rods. Each cylinder is made from a solid billet of steel with the valve chambers inclined at 90° in the head, the water jacket being formed by separate pieces of steel welded in position. The Mercedes Co. have manufactured many hundreds of these engines for the German Army Aeroplane Department, and it is the success of this type of motor in the air which has led to its adoption for the Grand Prix cars. Steel is used for the pistons as well as for the cylinders, and large clearances are allowed in order to guard against any risk of seizure. We understand that the crankshaft and the crank case are considerably heavier than is normal for the aeroplane engine, but the fully forced system of lubrication remains the same save for the fact that the mechanic can introduce extra oil when necessary.

The aeroplane engine was not designed for very high speeds of revolution, so the normal rate has been increased considerably for the racing cars. Last winter, we understand, a chassis was made for this engine having a chain final drive, but when tried on

The Eve of the Grand Prix.

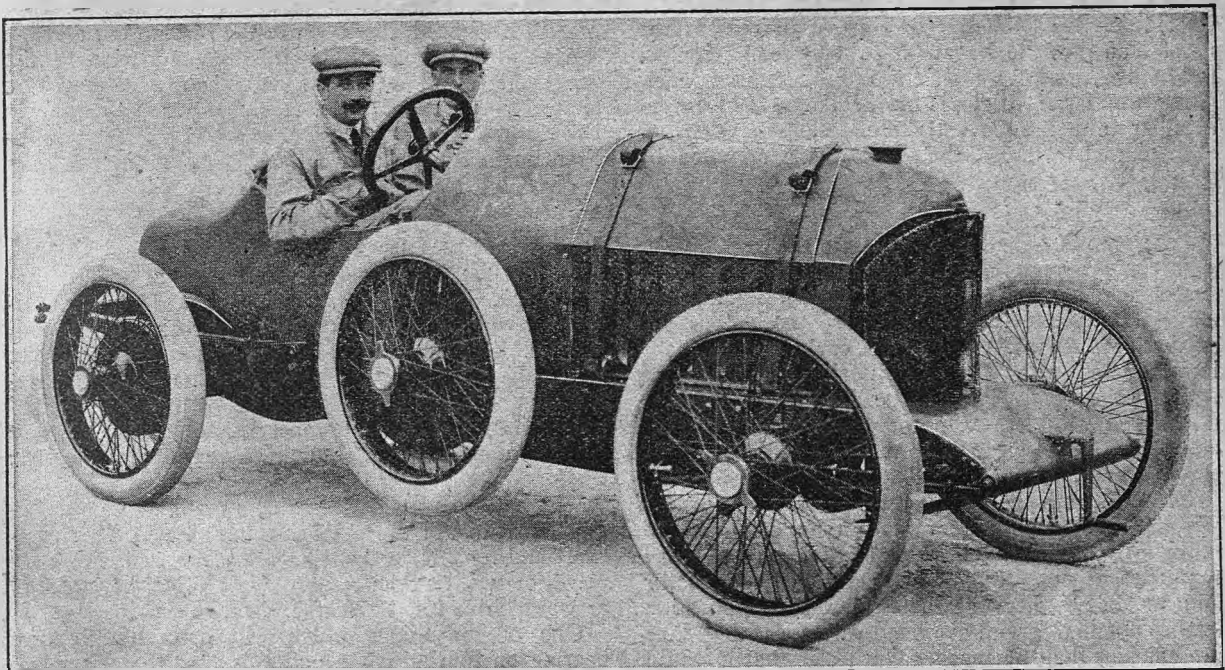
the circuit it held the road very badly indeed, consequently the racing cars have an ordinary bevel transmission with a four-speed gear box. Mercedes have in no way followed other makes, in fact in many respects they are the most individual cars in the race. Having tried front wheel brakes many years ago, they



Diagrams showing how the valves on the Grand Prix Delage engines are mechanically closed as well as mechanically opened. On the left are seen the positions of the two cams and special tappet gear when a pair of valves is open. On the right, the heart-shaped cam is holding a pair of valves closed against their seatings. The T-head of each tappet operates two valves, the upper cross-piece depressing them to open, and the lower one lifting them to close, and holding them so by reason of the special heart-shaped cam acting upon the stirrup head of the tappet.

have decided that they are far too dangerous for racing.

One feature of the chassis is, however, quite different from the standard cars, this being the steering. One of the most difficult problems to be overcome by the designers was so to proportion the car that it could do more than 100 m.p.h. on the straight over a very rough road. Like Delage the Mercedes have caster axles, but they are different from the Delage in that while the latter's steering pivots are inclined those of the Mercedes are vertical, the stub axle being set some distance behind the pivots.



Side view of one of the Grand Prix Nazzaro cars. At the wheel is Nazzaro, who will drive this car in the race.

*The Eve of the Grand Prix.***Opel.**

The Opels appear to be more or less standard chassis, save for the fact that they have an engine with four overhead valves per cylinder. There is a single camshaft arranged above the cylinders, the special point in the design being that the bevel drive for the camshaft is at the flywheel end of the motor.

It seems that there is a double bearing at the flywheel end of the crankshaft with a bevel pinion in the middle; from this pinion is driven the vertical shaft, and on a level with the top of the crank case is a cross-shaft having the magneto on the right and water pump on the left-hand ends respectively.

A disc clutch is used, and a separate four-speed gear box, aft of which is a double-jointed propeller-shaft and a live axle built up with a cast steel centre and drawn conical steel sleeves. The car, as a whole, has a very clean outline, and appears to possess an unusually small projected area.

Schneider.

So far the Schneider cars have not been available for inspection, but we believe they are in general characteristics similar to those seen last year at Amiens.

Alda.

The remaining French representative is the Alda, and this externally is not unlike the Schneider, but, instead of having a dashboard radiator with the sloping type bonnet, the radiator forms the nose of the bonnet. It may be recollected that the Alda cars which competed in the Coupe de *L'Auto* at Boulogne last September had a peculiar arrangement of transverse spring for the rear axle; this has been discarded in favour of cantilever springs of very large proportions, much heavier than the Vauxhall and heavier than the Aquila-Italiana. As a whole, the chassis is very neat and on almost ordinary lines. The engine has two valves per cylinder, these being arranged in the head, but their stems are vertical. The top of the cylinders is enclosed by an aluminium cover, and beneath this are rockers connecting to the camshaft.

Nagant.

So much for France, Italy, and Germany, there remaining the Nagant from Belgium and the Piccard-Pictet from Switzerland. To anyone present at the Isle of Man race the Nagant is strongly reminiscent of the Humber, having a high and rather narrow bonnet. Lifting the latter discloses an engine also not very dissimilar from the Coventry production, having four valves to each cylinder, the valves being operated by

rockers from a single central camshaft, which is driven by a train of spur gears at the front of the engine. There is a separate pinion for the magneto and water pump, which lie on the right-hand side. Behind the disc clutch is a very large gear box providing five speeds, of which the third is direct. There is a very large foot-operated transmission brake with a hand adjustment within the reach of the mechanic. One of the features of the chassis is the enormous petrol pipe, which is quite $\frac{3}{4}$ in. in diameter. Altogether the car impresses one as being an exceedingly robust job. As in the Mercedes, there are three plugs per cylinder and two magnetos, one being a two-spark machine, the idea being that it is improbable both should fail at the same time.

Piccard-Pictet and Cæsar.

So far it has been impossible to gain access to the Piccard-Pictet, but there is a general idea this make has not been entered seriously. On Wednesday a Cæsar appeared, but only a touring car. These cars, it appears, have not definitely been withdrawn, though last week it was thought that they certainly would not start, but the arrival of the touring car at this late hour suggests that possibly they will start after all.

The circuit has not been opened for practice again since a week ago last Saturday. The drivers of the British cars appear unanimously to endorse the opinion which we expressed last week of the action of the Automobile Club de France. If a serious accident should occur to one of the cars which has never made a lap of the circuit, the responsibility will be upon the heads of the misnamed sporting committee of the A.C.F. So far, in running on easier circuits in previous years, the monstrously unfair behaviour of this autocratic body has not resulted in any death directly traceable to its policy. It needs, however, very little repetition of this year's tactics to bring about such a disaster as befell the half-finished Paris-Madrid of ever lamented memory.

In France, the idea of an international race seems to be to give the native every possible advantage and the foreigner every possible disadvantage. If a foreign car can succeed in winning a French Grand Prix as at present organised, it will prove the foreign car and the foreign driver both to be infinitely superior to the vanquished. To win a fair and square race may be a matter of luck, but for a foreigner to win a race in France means something as close to a miracle as Frenchmen can make it.

Mechanical Features on Trial.

In the present Grand Prix there are two new things, the first a preponderance of overhead valve engines, the second the popularity of the front wheel braking; though this second feature is not so marked as the first by any means. Only one car, and that the Piccard-Pictet with the Argyll single-sleeve valve engine, has not valves in the head. Only four makers are satisfied with less than four valves per cylinder. Peugeot imitation! cries the ordinary motorist, and so it is, in a way.

The real truth is rather that it was easier for everyone to develop his ordinary type of motor to the highest possible pitch of perfection than to work out altogether new designs. Years ago most motor engineers knew that the hemispherical combustion chamber obtainable with overhead valves was thermally more efficient than the pocket type; also that it would accommodate a greater valve area. To experiment, however, meant much time and much money with very

little direct benefit to the ordinary touring cars. When, however, the Peugeot Co. proceeded to spend their money and time with a complete disregard to their touring cars, other makers anxious for racing honours had, perforce, to follow suit. If a manufacturer is going to use a special engine for racing, he naturally chooses the Peugeot type, not only because it has been proved good by Peugeots, but because it is obviously the best present known type for obtaining a very high volumetric efficiency.

The battle now rages round the methods for arranging the details of the overhead valve type. One camshaft and rockers, or two shafts and no rockers? Four valves or two, or even three? Gear drive, bevel drive, or worm drive for the shaft? And so on.

One of the things which will have the greatest bearing on touring car practice is that there is much difference in the materials used for these highly stressed valves and their operating gear, and also this gear

will either cause the aluminium alloy piston to become the usual thing or will put it away for a very long time.

Many firms, too, are finding out the very real advantages of a properly balanced crankshaft, and this will, no doubt, affect their standard cars.

The cantilever spring has three exponents in the present race which means that three firms appreciate its special qualities and want to try them to the utmost, while in the Tourist Trophy and the Grand Prix together enough will be learnt about brakes, their design, and the materials for their construction to form a very valuable addition to the automobile engineer's store of knowledge. It is, however, not to be expected that a success with front wheel brakes will lead to their reintroduction in touring work, since there is now no question as to their value—given proper and intelligent handling. Such handling as the racing driver can be relied upon to give is not forthcoming.

The Eve of the Grand Prix.

from the everyday motorist or paid driver in whose hands the average front wheel brake may be an actual source of danger.

There are no cars this year without a differential, owing, no doubt, to the number of the corners. It is a little surprising that no one has had the courage to fit a controllable differential lock for use on the long straight only, but one never knows, and perhaps some of the cars have such a fitting.

The Victor Tyre Co. ask us to state that they know nothing of, and are not in any way connected with, a company selling the Victor cycle car.

* * *

In connection with the Saltburn speed trials to-day (Saturday), the Yorkshire Automobile Club have completed arrangements for timing the events by an electric chronograph as used at Brooklands.

Leading Particulars of the Grand Prix Cars.

Order of Start.	Car, Driver, and Country Represented.	Bore and Stroke.	Cubic Capacity (Limit 4,500)	Car-buretter.	Clutch.	Direct Drive, Gear. Ratio.	WHEEL SIZES.	
							Front.	Back.
		mm.	c.c.			mm.		
1	Alda I. (Sisz) (France)	94 x 160	4441	Zenith	Leather cone	3 to 1	870 x 90	880 x 120
2	Opel I. (Breckheimer) (Germany)	94 x 160	4441	Zenith	Leather cone	2.5 to 1	875 x 105	880 x 120
3	Nagant I. (Esser) (Belgium)	94.5 x 158	4435	Zenith	Hele-Shaw	2.8 to 1	875 x 105	880 x 120
4	Vauxhall I. (Hancock) (England)	101 x 140	4487	Zenith	Leather cone	3 to 1	875 x 105	880 x 120
5	Peugeot I. (Poillot) (France)	92 x 169	4494	Zenith	Leather cone	2.7 to 1	875 x 105	880 x 120
6	Schneider I. (Champoiseau) (France)	94 x 160	4441	Claudel	Leather cone	3 to 1	870 x 90	880 x 120
8	Nazzaro I. (Nazzaro) (Italy)	94 x 160	4441	Zenith	Hele-Shaw	3 to 1	875 x 105	880 x 120
9	Delage I. (Bablot) (France)	94 x 160	4441	Claudel	Hele-Shaw	2.9 to 1	875 x 105	880 x 120
10	Sunbeam I. (Chassagne) (England)	94 x 160	4441	Claudel	Leather cone	2.6 to 1	815 x 105	880 x 120
11	Piccard-Pictet I. (Tournier) (Switzerland)	97 x 150	4434	Zenith	Disc	3.9 to 1	875 x 105	880 x 120
12	Aquila-Italiana I. (Beria) (Italy)	85 x 132	*4494	Zenith	Hele-Shaw	3.1 to 1	820 x 120	820 x 120
13	F.I.A.T. I. (Cagno) (Italy)	100 x 143	4492	F.I.A.T.	Hele-Shaw	3.2 to 1	875 x 105	920 x 120
14	Mercédès I. (Wagner) (Germany)	93 x 164	4456	Mercédès	Leather cone	3 to 1	815 x 105	820 x 135
15	Alda II. (Pietro) (France)	94 x 160	4441	Zenith	Leather cone	3 to 1	870 x 90	880 x 120
16	Opel II. (Erndtmann) (Germany)	94 x 160	4441	Zenith	Leather cone	2.5 to 1	875 x 105	880 x 120
17	Nagant II. (Elskamp) (Belgium)	94.5 x 158	4435	Zenith	Hele-Shaw	2.8 to 1	875 x 105	880 x 120
18	Vauxhall II. (Ralph de Palma) (England)	101 x 140	4487	Zenith	Leather cone	3 to 1	875 x 105	880 x 120
19	Peugeot II. (Goux) (France)	92 x 169	4494	Zenith	Leather cone	2.7 to 1	875 x 105	880 x 120
20	Schneider II. (Gabriel) (France)	94 x 160	4441	Claudel	Leather cone	3 to 1	870 x 90	880 x 120
22	Nazzaro II. (Porporato) (Italy)	94 x 160	4441	Zenith	Hele-Shaw	3 to 1	875 x 105	880 x 120
23	Delage II. (Guyot) (France)	94 x 160	4441	Claudel	Hele-Shaw	2.9 to 1	875 x 105	880 x 120
24	Sunbeam II. (Resta) (England)	94 x 160	4441	Claudel	Leather cone	2.6 to 1	815 x 105	880 x 120
25	Piccard-Pictet II. (Clarke) (Switzerland)	97 x 150	4434	Zenith	Disc	3.9 to 1	875 x 105	880 x 120
26	Aquila Italiana II. (Constantini) (Italy)	85 x 132	*4494	Zenith	Hele-Shaw	3.1 to 1	820 x 120	820 x 120
27	F.I.A.T. II. (Fagnano) (Italy)	100 x 143	4492	F.I.A.T.	Hele-Shaw	3.2 to 1	875 x 105	920 x 120
28	Mercédès II. (Lautenschlager) (Germany)	93 x 164	4456	Mercédès	Leather cone	3 to 1	815 x 105	820 x 135
29	Alda III. (Tabuteau) (France)	94 x 160	4441	Zenith	Leather cone	3 to 1	870 x 90	880 x 120
30	Opel III. (Joerns) (Germany)	94 x 160	4441	Zenith	Leather cone	2.5 to 1	875 x 105	880 x 120
31	Vauxhall III. (Watson) (England)	101 x 140	4487	Zenith	Leather cone	3 to 1	875 x 105	880 x 120
32	Peugeot III. (Rigal) (France)	92 x 169	4494	Zenith	Leather cone	2.7 to 1	875 x 105	880 x 120
33	Schneider III. (Juvanon) (France)	94 x 160	4441	Claudel	Leather cone	3 to 1	870 x 90	880 x 120
34	Nazzaro III. (de Moraes) (Italy)	94 x 160	4441	Zenith	Hele-Shaw	3 to 1	875 x 105	880 x 120
35	Delage III. (Duray) (France)	94 x 160	4441	Claudel	Hele-Shaw	2.9 to 1	875 x 105	880 x 120
36	Sunbeam III. (K. Lee Guinness) (England)	94 x 160	4441	Claudel	Leather cone	2.6 to 1	815 x 105	880 x 120
37	Aquila Italiana III. (Masaglia) (Italy)	85 x 132	*4494	Zenith	Hele-Shaw	3.1 to 1	820 x 120	820 x 120
38	F.I.A.T. III. (Scales) (Italy)	100 x 143	4492	F.I.A.T.	Hele-Shaw	3.2 to 1	875 x 105	920 x 120
39	Mercédès III. (Sailer) (Germany)	93 x 164	4456	Mercédès	Leather cone	3 to 1	815 x 105	820 x 135
40	Mercédès IV. (Salzer) (Germany)	93 x 164	4456	Mercédès	Leather cone	3 to 1	815 x 105	820 x 135
41	Mercédès V. (Pilette) (Germany)	93 x 164	4456	Mercédès	Leather cone	3 to 1	815 x 105	820 x 135

* The Aquila-Italiana cars have six-cylinder engines.

No particulars are available of the two Caesar cars Nos. 7 and 21.

The Hele-Shaw multiple-disc clutch used on the Nazzaro cars is of the dry plate type; the other cars using this make of clutch have the discs running in oil.

The Nagant, Alda, Opel, Vauxhall, Peugeot, Nazzaro, Sunbeam, Aquila-Italiana, Piccard-Pictet, F.I.A.T., and Mercédès cars have four-speed gear boxes, and are direct on fourth gear, with the exception of the Piccard-Pictet and Aquila, which are direct on third. The Schneider and the Delage have five speeds, each direct on fourth.

All cars are fitted with Rudge-Whitworth detachable wire wheels, with the exception of the Aldas, which have R.A.F. (Dunlop wire) wheels.

All engines have the cylinders cast en bloc except the Mercédès, which have separate steel cylinders. The Piccard-Pictet cars are fitted with Argyll sleeve valve engines. The Opel, Nagant, Vauxhall, Peugeot, Schneider, Nazzaro, Delage, and Sunbeam have four valves per cylinder. The Mercédès, Alda, F.I.A.T., and Aquila-Italiana have two valves per cylinder.

Peugeot, Delage, F.I.A.T., and Piccard-Pictet have front wheel brakes.

Telegraphic Reports of the Grand Prix.

IN our last issue we announced that we had made arrangements for telegrams recording the progress of the Grand Prix Race at various stages to be despatched from the course and exhibited at a large number of addresses throughout the country. The telegraphic reports in connection with the Tourist Trophy Race were very much appreciated, and it was for this reason that we decided to deal in a somewhat similar manner with the Grand Prix. As, however,

the circuit is a shorter one, and is to be covered twenty times, we are not attempting to deal with the Grand Prix lap by lap, but shall wire the position of the three leaders at the end of the fifth, tenth, fifteenth, and final laps.

For the convenience of those who wish to follow the progress of the race, we publish below a full list of the addresses at which the telegraphic reports will be exhibited.

BELFAST.
J. B. Ferguson, Ltd., Chichester Street.
Harry Ferguson, Ltd., May Street.
Grand Central Hotel.

BIRMINGHAM.
Henry Garner, Ltd., 120-124, Alcester Road.
Heath's Garage, Ltd., 58-70, John Bright Street.
Heath's Garage, Ltd., 280, Broad Street.
Queen's Hotel.

BOURNEMOUTH.
Bright's Stores, Ltd., 14 to 26, Old Christchurch Road.
The Grosvenor Garage, Grand Parade, Westbourne.

BOXHILL, SURREY.
Burford Bridge Hotel.

BRIDGWATER.
Bridgwater Motor Co., Ltd., Eastover.

BRIGHTON.
Royal Albion Hotel.
Royal York Hotel.
Moore of Brighton (1910), Ltd., 68, Preston Street.

BRISTOL.
Bristol Wagon and Carriage Co., Ltd., 138, Victoria Street.

CARDIFF.
Hill's Garage, Westgate Street.

CHELTENHAM.
T. V. West, 88, High Street.

COBHAM, SURREY.
The White Lion Hotel.

COVENTRY.
King's Head Hotel.
Midland Daily Telegraph, - Hertford Street.

Rover Co., Ltd., Warwick Row.

CRAWLEY: SURREY.
George Hotel.

DERBY.
A. R. Atkey and Co., Ltd., Becket Street.

DONCASTER.
Smith and Sons, motor engineers.

DUBLIN.
Harry Ferguson, Ltd., 39, Dawson Street.

DUNDEE.
Rossleigh, Ltd., 23, Albert Square.

EDINBURGH.
North British Station Hotel.
Rossleigh, Ltd., 32, Shandwick Place.

ETON.
Archibald Edgar, 45, High Street.

EXETER.
Gould Bros., Ltd., London Inn Square.

ESHER: SURREY.
Bear Hotel.

FARNHAM.
Bush Hotel.

FRENESHAM: SURREY.
Frensham Pond Hotel.

GUILDFORD.
Angel Hotel.

HEREFORD.
Fryer's No. 2 Garage, Commercial Road.

IPSWICH.
Botwood's, Ltd., Carr Street.
Egerton's Garage, Northgate Street.

LEAMINGTON SPA.
Sleath's, Ltd., Clemens Street and 60, The Parade.

LEEDS.
Queen's Hotel.
R. Wilkie, 68, Albion Street.

LEICESTER.
Midland Counties Motor Garage Co., Granby Street.
T. H. Wathes and Co., Ltd., 88, High Street.

LIVERPOOL.
W. Watson and Co., Renshaw Street.

LONDON.
A.T. Speedometer Co., Ltd., 140, Long Acre.
Austin Motor Co. (1914), Ltd., 479 to 483, Oxford Street, W.
Automobile Association and Motor Union, Fanum House, Whitcomb Street, Coventry Street, W.
F. W. Berwick and Co., Ltd., 18, Berkeley Street, Piccadilly, W.
Boon and Porter, Ltd., 159-161, Castelnau, S.W.

Wm. Cole and Sons, Ltd., 235, Hammersmith Road, W.
J. Coxeter and Co., Ltd., 84, Victoria Street, Westminster, S.W.

Hispano-Suiza Cars, 118, Shaftesbury Avenue, W.
H. M. Hobson, Ltd., 16-17, Pall Mall, S.W.

Jarrott, Ltd., 24-27, Orchard Street, Oxford Street, W.
Milnes-Daimler-Mercedès, Ltd., 132 to 135, Long Acre, W.C.

A. Pellant, Ltd., 74, Shaftesbury Avenue, W.
Rock, Thorpe, and Chatfield, 24, Baker Street, W.

Palmer Tyre, Ltd., 119, Shaftesbury Avenue, W.C.
Whiting, Ltd., 334 to 340, Euston Road, N.W.

MAIDENHEAD.
Skindle's Hotel.

MANCHESTER.
Beattie, Jack and Co., Ltd., 287, Deansgate.

Max R. Lawrence, 33, Blackfriars Street.
Midland Hotel.
Newton and Bennett, Ltd., King Street West.

Royle and Allen, Ltd., 28, St. Ann Street.
Sunbeam Motor Car Co., Ltd., 112, Deansgate.

MANSFIELD.
C. Evinson, Portland Motor Co., Ltd., West Gate.

LINCOLN.
R. M. Wright and Co., Newlands.

NEWCASTLE-ON-TYNE.
Sir Wm. Angus Sanderson and Co., Ltd., St. Thomas Street.

NORWICH.
Austin Motor Co., Ltd., 18 and 22, Prince of Wales Road.

NOTTINGHAM.
R. Cripps and Co., Ltd., Milton Street.

OXFORD.
J. Coxeter and Co., Ltd., 40, Park End Street.

PLYMOUTH.
H. Andrew and Co., Ltd., the Garage, Athenæum Place.

RIPLEY: SURREY.
Talbot Hotel.

SHEFFIELD.
Freeman, Oakes and Co., Ltd., 131, Devonshire Street.

SHREWSBURY.
Samuel Withers, the Motor House, Welsh Bridge.

SOUTH SHIELDS.
Robert Rigby, Fowler Street.

STONEBRIDGE: NEAR COVENTRY
Stonebridge Hotel.

TRING: HERTS.
Rose and Crown Hotel.

TORQUAY.
Gibson and Holloway, 23 and 24, Torwood Street.

WISLEY: SURREY.
Hut Hotel.

WOLVERHAMPTON.
Victoria Hotel.

WORTHING.
Warne's Hotel

To meet the demand for a tyre saving device for Ford cars, Messrs. A. J. Dew and Co., 21, Endell Street, London, W.C., have introduced a special model of the "Gemco" tyre-saving jacks at 25s. per set of four. The set is the same in design as the standard type, and is well made and finished in aluminium.

From their Italian works, Messrs. Newton and Bennett, Ltd., have received a wire stating that Ceirano on a 60 h.p. S.C.A.T. won the Palma hill-climb, over a fifty-three kilometre course of exceedingly severe gradients and very rough road surfaces. The S.C.A.T., which was the same car that finished second in the Coupe Florio, beat cars of 120 h.p., proving faster both on the level stretch approaching the hill and also on the hill itself, completing the course in 4m. 42s. at a speed averaging 49 m.p.h., and beating last year's record by three minutes.

The Great Alpine Trial

The Tauern and the Katschberg. Terrors of the Turracherhöhe. An "Off Day" of 480 Miles. A Bridge carried away.

(Second Instalment, dealing with the Last Three Days of the Trial.)

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



THE GREAT ALPINE TRIAL. A view above St. Leonard on the Jaufen Pass.

IT is all over by now, and, as a matter of fact, I am wending my way across the Alps to Lyons and the Grand Prix; but the last three journeys of the Alpine Trial exceeded in interest—nay, dramatic intensity—even their forerunners, and must be described, so far as such crowded hours can be described, in categorical continuance.

Seventh Day, June 20.—Rest at Innsbruck.

It should have been a rest, that is, but it was an anxious time for the crew of the skiff Rolls-Royce—Sir Everard Duncombe, Mr. Arthur Gibbs, and myself to wit. I left off last week with a picture of Radley running up the Brenner Pass with two gendarmes on board our car. Next morning a detective came round to the Tirolerhof and made close enquiries as to Mr. Jarrott's car, the second free-lance Rolls-Royce. Now Jarrott had neither hit nor inconvenienced a living soul, nor slaughtered a solitary fowl, and we could only speculate as to whether the police had mixed up his car with that of Radley, and whether the latter was already in durance vile. The "crew" were fuming as to the prospect of being unable to continue the trial, and Blackshaw, the driver, was anxious for a chance of putting the dynamo in order; he was about to do this when Radley borrowed the car. The fact that he had no lights available did not make us any more comfortable as to his safe return, police

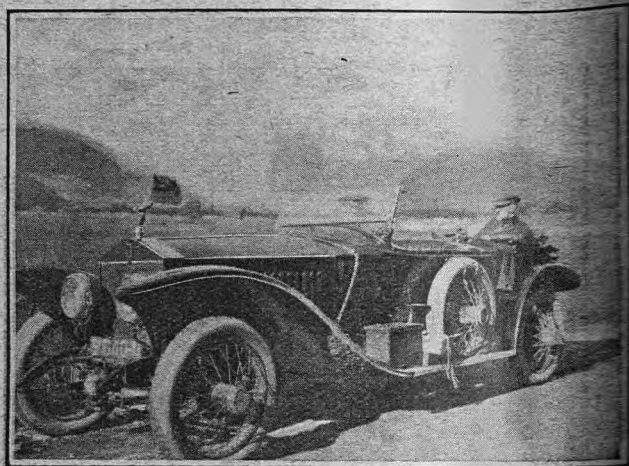
troubles apart. We consoled ourselves as best we could, and orally expressed confidence in Radley's adroitness as a driver and the infallibility of the Rolls-Royce; inwardly we feared the police, and, whatever our faith in the car, we did not suppose that it was being driven at exactly a snail's pace or was especially immune from the risks of road travel. We waited on the pavement till long after dinner, and eventually went to bed in the hope of finding the car waiting outside the hotel at 4 a.m., which was the hour at which we had agreed to start.

And so it was. The full story of Radley's exploit I did not gather until after the trial was over; all one could get out of him at Innsbruck was that the Turracherhöhe was "not so bad," but that the hill at Radenthein was a "corker." What Radley had actually accomplished, however, during his off day sounds more like a Munchausen narrative than sober fact. He had only three hours' driving on Friday night, as he could get no further than Toblach because he had no lights. He slept there and left at 5.30 a.m., then set off for Villach and the morrow's official route over the Turracherhöhe, intending to return the same way. It did not prove the sort of road that one would care to go over twice with alacrity, so he added enormously to his distance by cutting across from Predlitz, and on to Tamsweg.

The Great Alpine Trial.

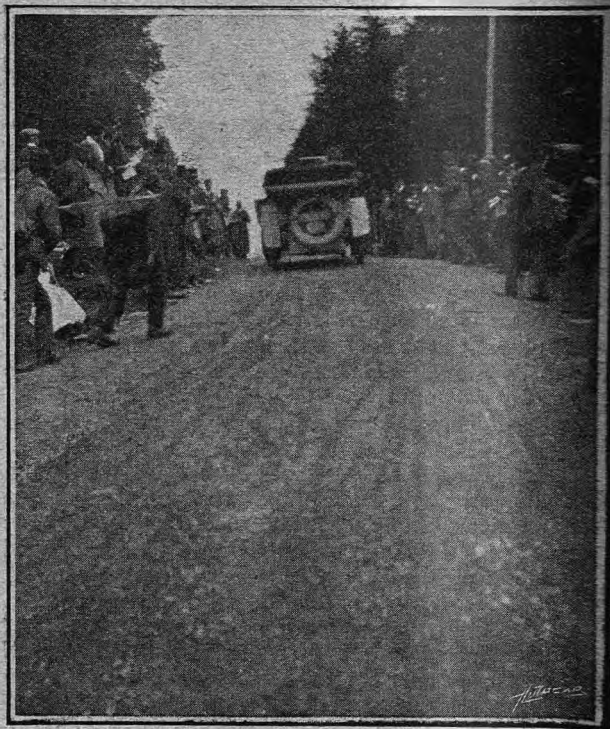
From there he went on to Mautendorf, and gaily ran over the Tauern Pass and back. Not content with this, he crossed the Katschberg, descended to Spittal, went by way of the Pusterthal to Franzensfeste, and finally reached Innsbruck over the Brenner, down which he wound in inky darkness after ten o'clock. His actual time on the road, including breakfast at Villach, from Friday evening had been 19h. 20m., and meanwhile he had covered 774½ kilometres, or 480 miles, over the stiffest portion of the whole contest! Then he came down debonairly as ever as we left Innsbruck at 4 a.m. for the Tauern-Katschberg journey. The gendarme incident, by the way, was easily accounted for; the men had asked him for a lift over the Brenner, as they had been on duty all

summer and a winter resort alike, and proceeded over the Thurn Pass to Mittersill. I had tried to cross this pass in 1912, but was turned back by floods in the Salzach Valley, and was delighted now to find that it offered a splendid road, while the *coup d'aile* of



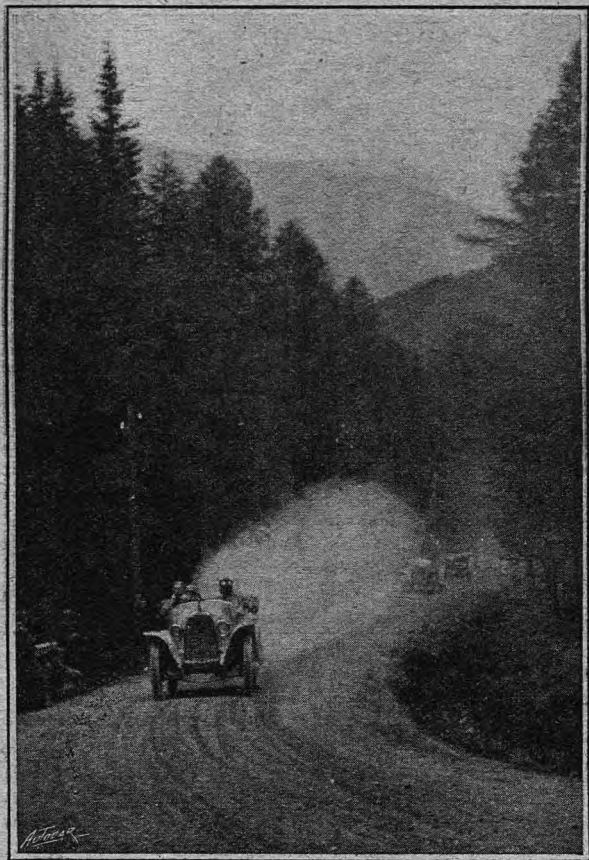
The Rolls-Royce car with a skiff body used by Mr. C. L. Freeston in following the trials.

the Grosser Venediger Alps after we had passed the summit was in every way superb. Snow is unusually plentiful this year, and the range of giant peaks ahead was covered with a thick mantle of white, glistening in the morning sun.



The Cadillac car driven by Mrs. Boston at the summit of the steepest portion of the Katschberg.

From the foot of the pass the running was good along the valley to Taxenbach, and thenceforward for nearly twenty miles it was repeatedly blocked by operations connected with the doubling of the adjoining railway. We got through without much trouble, but



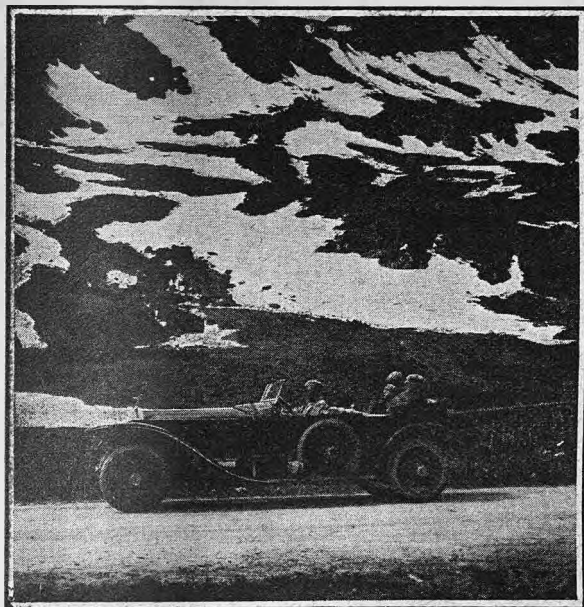
A bunch of cars approaching the summit of the 1 in 3½ portion of the Katschberg.

day, and he carried them to Sterzing on the steps; the visit of the detective to our hotel remains a mystery unsolved.

Eighth Day, June 21 — Innsbruck to Villach, 228 Miles.

Being anxious not to miss any possible fun on the Katschberg, and with the demands of the camera to bear in mind, I set off early, as above stated, inwardly praying that Radley would not overhaul us and get there first. As a matter of fact, we had to wait over two hours at the top, but of that more anon. The first fifty odd miles were along the famous Tirolese Valley of the Inn, and led through Brixlegg, where the villagers hold periodical Passion plays, and where the well-known sportsman and author, Mr. W. A. Baillie Grohmann, who has done so much for Tyrol by his writings, dwells in Castle Matzen. At S. Johann the route branched south to Kitzbühel, charming as a

the competing cars were held up by officials and made to cover this stage in procession. Meanwhile we had reached the foot of the Tauern Pass, and ascended its eleven kilometres, rising to nearly six thousand feet, with a maximum of 22.8%, in 15m. 26s. Descending



At the top of the Tauern Pass.

to St. Michael-im-Lungau, we faced the still harder climb of the famous Katschberg, with its 27.9% maximum, as it is now stated to be, and ran up easily in nine minutes. We had covered 179 miles in 6½ hours, including the three passes and the railway excavations.

Then came a tedious wait, sundry private or official cars ascending meanwhile, and many others from the opposite side, until there was a big cluster of spectators at the steepest section of the pass just below the summit. At 12.40, Radley came up like a bird amid the cheers of the Englishmen in the crowd. Timekeepers, I may point out, were at work, and telephones had been installed, for whereas on all the other leading passes the observers had "clocked" the cars for general observation purposes, the Katschberg was the official safeguard against the use of abnormally low gears, and every competitor was required to ascend within a given time according to his cylinder capacity. The schedule began with forty minutes for 2,000 c.c. and ended with ten minutes for over 8,500 c.c. The allowance for Radley's Rolls-Royce was 11¾m., of which he made very light indeed. The Vauxhall had twenty minutes, but came up easily in less than half that allowance; the Armsrington-Whitworth had the same margin for error and was abundantly in hand; the Austin had 24½m. and needed only 12m. 27¾s., while the Singer took the steepest part amid cheers, but had been stopped lower down to change a

plug, the back cylinder having been flooded with oil. The same thing had happened on the Loibl owing to the absence of a baffle plate in the base chamber, while the ordinary method of testing the amount of oil present by means of the drain tap was impracticable, as the bonnet had been sealed by the officials at the opening of the trial.

Rain began to fall just before the leaders arrived, and for a time photography was at a discount; nor were matters much better afterwards, for the crowd stepped into the roadway whenever a competitor was coming up, and, if he stuck, they closed round the back of the car. The first to follow Radley was the No. 1 Benz, and then came Count Schönfeld's F.I.A.T. When Frau Hauswaldt topped the crest she indulged in somewhat more gallery play, with repeated arm-waving, than was altogether agreeable to contemplate. The No. 9 Cadillac had to chase a Puch all the way up the final rise, being faster than the car in front but not quite fast enough to be able to rush by. Baron Steinheil's Graf and Stift overhauled No. 26 Praga, and the latter then stuck and was the first car to be pushed. As car after car came up it was always a problem whether those which were pulsating slowly were at their last gasp or had accelerative power in hand for the final pitch, and waiting for the rising note or otherwise was the chief interest of the scene, though, of course, some drivers approached all out with a fast running engine, and the question then became whether it would die down to zero before the top or not. Most of the cars were loaded with flowers which had been thrown *en route*, and as spectators at the top had others ready there was often a veritable *batallie de fleurs* between them and the occupants.

No. 25 Praga stopped near the top, but after four "dot and carry one" attempts reached the top without assistance. The driver, Herr Stoll, weighs 20½ stone! No. 10 Cadillac came up steaming and had to be pushed; this was the car which had seized up in the Dolomites owing to paraffin having been poured in the engine instead of oil, and it had cut the route and was running *hors concours*. No. 60 Darracq stopped and restarted three times, but was not pushed.



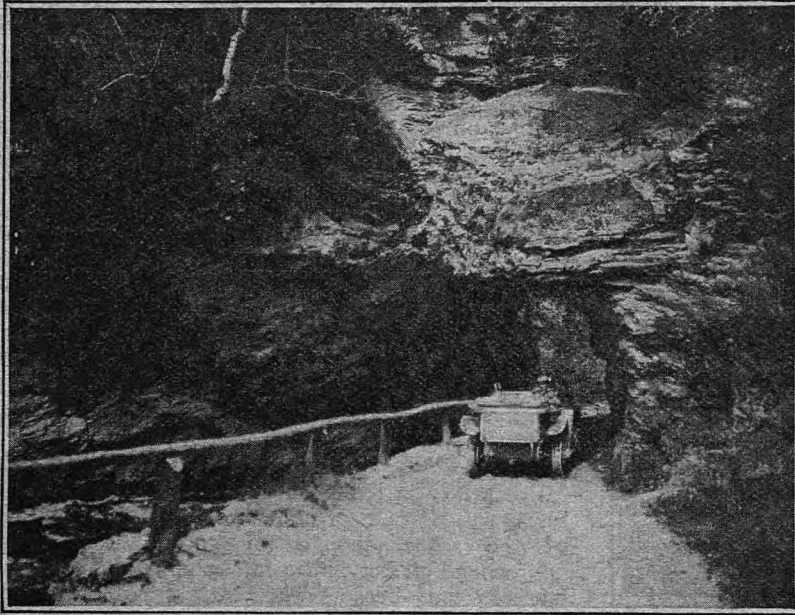
The Rolls-Royce car used by Mr. C. L. Freeston in following the trials and the little Singer which eventually, and to its great credit, completed the whole circuit. The photograph was taken after the descent from the Katschberg Pass.

Mrs. Boston, whose radiator had been strained by her accident on the Pordoi, and had been leaking ever since, had to zigzag resolutely at the top, but just surmounted it amid cheers; how she had the pluck to drive after her harrowing experience is something to

been chosen as a final "knock-out," and was more or less away from decent highways. Straightaway from Villach we plunged into a narrow lane leading past two lakes and full of ruts and grease, over which we bumped and skated. Then at Radenthein we came

across two chain-horses in readiness, and found ourselves climbing an acclivity of one foot rise in three on a slippery surface and between banks that almost scraped the wings. We got up it safely enough, but it was touch and go where adhesion was concerned, and had given Radley, in fact, an anxious moment the day before; hence I quite expected that there would be some failures and a resort to the horses by and by, as proved to be the case. Many cars would fail to ascend in dry weather, but on grease it would be no disgrace for even the best to be stalled with spinning wheels.

The foot of the Turracherhöhe itself was nineteen kilometres further on. The road proved to be dry, which was fortunate, but anything more lurid than the ascent I have never dreamed of in my wildest nightmares. Deep gulleys spanned the road every few yards, and, though the Kreuzberg might be rather worse in this respect, the fact remained that the pass rose to 1,763 metres, or 5,783 feet, from 1,080 metres, or 3,542 feet, the rise being one of 2,241 feet in 7.8 kilometres. Owing to the deep *caniveaux* the drivers could not take the rise at their best speed, especially if the flywheel or gear box was too low, but in any case the bumping was something too horrible for words. The rear passengers on every car were forced to hang their whole weight on to whatever they could clutch to avoid broken spines. If the



A rock tunnel on the descent from the Turracherhöhe.

marvel at. A tyre waggon then stuck and was only just scotched by a wooden block in time to prevent an ascending car being baulked.

After having been at the summit over four hours we walked on to where our "skiff" was waiting, and several other competitors passed meanwhile, including the Austin, but I could not photograph it because of people in the way. After descending the pass we halted in a village to take in petrol, as we had only a standard tank fitted, and the Singer came along, driver Roberts also halting and telling us with glee that he had passed Count Thun von Hohenstein's big Benz on the steepest part.

The rest of the journey to Villach was uneventful, save for the heavy rain that came on and rendered the road greasy. Later on I heard that an N.A.G. was overturned a few kilometres out owing to the driver skidding into the bank while avoiding a child anxious to recover a posy of flowers. Fortunately no one was hurt.

Ninth Day, June 22. — Villach to Salzburg, 214 Miles.

And now came the day of days. The amount of talk that had been going round about the Turracherhöhe was enough to frighten off anyone who could avoid the pass, but Radley had already had his preliminary canter with the free-lance "skiff" and in any case I should not have been disposed to funk the ordeal or miss the fun even if fate had made me a victim as well as others. There is a good main road from Villach, but the route had



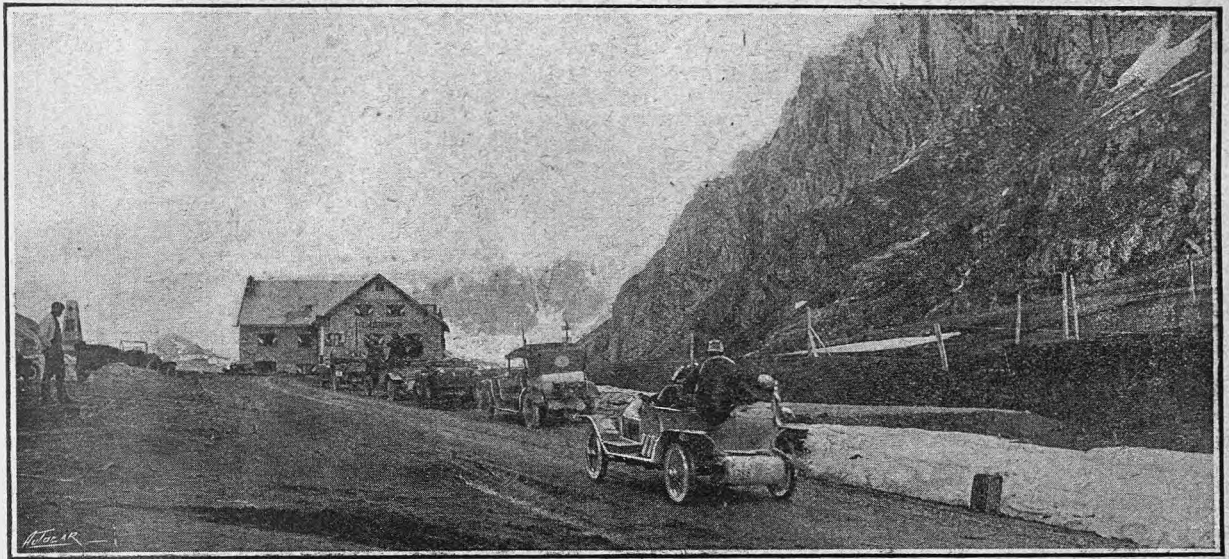
On the Turracherhöhe. Baron Steinheil's Graf and Stift just after negotiating one of the hairpin corners on the ascent.

road had been open in character, and the cars could have been kept in view throughout, their upward progress must have seemed as ludicrously gymnastic to the spectators as it was painful to the passengers. Without further emphasising the agonies of the situation, I can only say that I was thankful to reach the top, and, after leaving the car at the *gast haus* by the lake on the plateau summit, walked back to the last portion of the rise. Adjoining hedges and the direction of the sun made it impossible to get any adequate reproduction of the horrors of the hill lower down, while even near the top the road was so narrow that one could hardly point one's camera without danger of being bowled over. I waited for the passing of the Rolls-Royce and two or three more cars, and then retired to breakfast at the inn. When I came out, Corry, on No. 9 Cadillac, came up, minus passengers, and reported having been blocked on the steepest part, so that he could not get going again with his full load. Every car which stuck, either on the

had then arrived, I pitied the fate of those drivers who were still outside beneath the bursting clouds. Some were soaked to the skin even through their mackintoshes and with hoods spread; but worse was to follow for the small cars and those which were very late owing to some cause of failure.

The storm carried away a bridge at Golling, and the main road was impassable accordingly, nor could even the alternative be embraced of reaching Salzburg by crossing the frontier into Bavaria. Several cars had therefore to be driven back along the narrow by-road and rejoined the morrow's route at Ischl. The Singer, however came near to naked tragedy. During the storm a flash of lightning dazed Roberts, the driver; he is not at all sure that he was not actually struck, but in any case he ran into a bank and bent his front axle. Heroically he set to work to straighten this over a cottage fire, a task of several hours, and then resumed his journey. In the dead of night he came across the break in the road, and, but for the fact of having good

The Great Alpine Trial.



At the summit of the Pordoi Pass.

hill outside Radenthein or in the Turracher Pass, made it impossible for those immediately behind to do themselves justice, and as a result there was plenty of work for the horses, and everyone was breathing maledictions on the man who discovered this awful route, which proved a trump card for the committee as a "knock-out."

Competitors appeared on the scene very slowly, and eventually I left the summit and went down the other side of the pass, the array of gulleys on which was not quite so long-drawn. Beyond the village of Turrach there is a rock tunnel so low that I doubt if a car could pass under it with the hood unfurled. Then came a series of minor passes—the Polshals, the Hohentauern, the Pötschen, and the Gschutt, with a long stretch of narrow road before reaching Golling and the main road for Salzburg.

But things were yet to happen. At five o'clock I drove to the Salzburg control, a barrack square, to count the arrivals. Suddenly a violent tornado sprang up which filled the yard with swirling gravel, swept off every bonnet apron which was not secure, and sent the number tickets for the cars' positions flying into the unknown. The tempest was still raging at the end of an hour, by which time I left the scene well-nigh blinded with grit, and, as only twenty-five cars

lamps, would have been hurled into the swollen river. As he had been delayed by the accident to his car, he had not even seen those who had turned back and had gone right forward to what might have proved his doom. He, too, had then to retrace his wheel tracks and found a bed at Gosern, but rejoined the route next morning by way of Ischl, and drove his car to the very doors of the Automobile Club in Vienna. Hats off to a display of true British pluck! There are manufacturers in plenty who are afraid to enter for the Alpine Trial, and legions of tourists too timorous to essay even the easy gradients and sand-papered surfaces of the modern passes; but an honourable minority comes forward and redeems the race from the charge of decadence.

Let it be noted in passing, for the benefit of those who regard the Alpine roads as a region of perils, that the successive blockings of the road on the fifth, sixth, and ninth days of the trial all occurred on the plains themselves, within a few miles of a large town in each case, and might equally have checked the progress of any urban motorist who had never crossed a pass in his life. Also let me add that, though I have crossed passes hundreds of times, I have never yet been baulked by a landslide or other obstacle on high ground; indeed, the feeling that over-rides all others

The Great Alpine Trial.

with the experienced pass-climber is that the further he rises above the plains the nearer he is to safety, comfort, and enjoyment alike.

Tenth Day, June 23.—Salzburg to Vienna, 221 Miles.

The old Adam must assert itself at times. All through the trial up to now I had been endeavouring to be in fifty places at once, and to know all that was happening everywhere along the road from Radley in the forefront to the little Singer a hundred miles or more behind. I had stayed nearly four hours on the Loibl, and more on the Katschberg summit, but now that the last day had come I felt that I, too, might be allowed to get going in true Alpenfahrt fashion and make a bid for an early arrival at the goal. Last year I entered Vienna first on Radley's car; this year I meant to come in as near to his back wheels as possible.

Allowing myself ten minutes start I left the Hotel Europe, Salzburg, at 5.50 a.m., the committee having changed the usual hour of five for the competitors to six o'clock. A belated observer on the roadside begged for a lift to the "park," and this took off five minutes' grace, so I fully expected to hear the scream of Radley's Klaxons before I reached the lakes of the Salzkammergut. The road through this lovely district is narrow and winding, and bordered with hedgerows that are strongly reminiscent of England, but it proved to be of perfect surface, and much improved since my last visit, as may be said of all the Austrian roads of any consequence; the Alpenfahrt by-roads do not count where the ordinary tourist is concerned. After the first forty-four miles had been traversed past the Fuschl and S. Wolfgang lakes to Ischl, the attractive spa where the Emperor has a summer villa, the

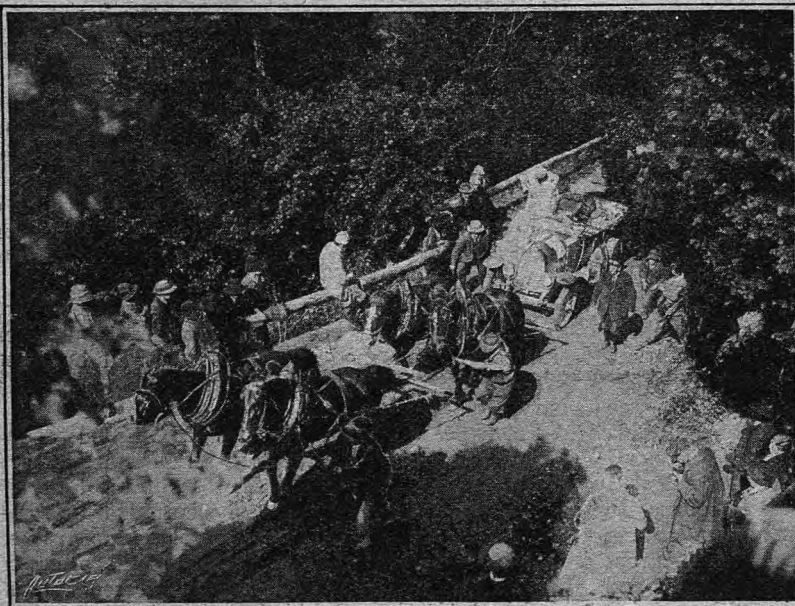
beautiful Traunsee was reached, and the road which runs alongside it to Gmunden was found to be of perfect quality. At Lambach the main road, some thirty miles shorter, from Salzburg was joined, and thenceforward it was plain sailing over the grand highway to Vienna. No soldiers or flagmen had been seen up



An Austro-Daimler ascending the Turracherhöhe.

to now, however, and I had been wondering whether it would have been better to take the shorter route; but Radley had not been in sight, and the "skiff" Rolls-Royce reached Wels, 91 miles from the start, in less than three hours without having been passed. The extraordinary quickness of acceleration of which it is capable was shown between Lambach and Wels, when we several times got up to 68 miles an hour, and once to 69, on comparatively short stretches of straight road. It was a standard continental model, without the latest features embodied in Radley's Aier, and we were in full touring rig, with all luggage aboard.

Calling a halt at the starting point for the timed speed trials beyond Wels, I asked the officials in charge—Baron von Draths Schmidt Bruckheim and Herr Tasbender, the chief secretary—if I might proceed as soon as Radley himself had passed. At first they doubted the feasibility of this lest the timing operations might be disturbed, but I said that it would be better to go on than to have to overhaul slower cars and give them our dust, and, though it had not been intended to let anyone "chip in," they agreed to my doing so as a matter of personal obligation. Radley had now arrived on the scene and busied himself in getting ready for the time test. Over the rear portion of the car he placed a cover with two holes which fitted over the heads of his fellow passenger and observer, and a very comical picture they presented—as though buried to their necks in the ground.



An overhead view, showing one of the competing cars, which failed to make the climb under its own power, being drawn up the Turracherhöhe by a team of four horses.

After about a quarter of an hour's waiting for the signal that the timekeepers were ready and the course cleared, Radley was sent on his way, and, starting on his second speed, just got going on his fourth by the time he reached the streamer indicating the beginning of the timed stretch of five kilometres with flying start. A minute later I was allowed to go



The Cadillac car, driven by Mrs. Boston, which, through skidding on a stone at one of the bad corners on the Pordoi Pass, narrowly escaped disaster. It was only prevented from rolling over the mountain side by a large stone which jammed a back wheel. The photograph was taken during the efforts to put the car back on the road.

after him, but could not be timed, as I was under a promise to slow down before the finish to allow the timekeepers to recognise the car as a non-competitor. During the first four kilometres we touch the 73 miles an hour mark on the speedometer, but Blackshaw averred that the car could do even better. As we ran by the finishing post I saw Jarrott and his party waiting to see the sport; they had come out from Salzburg by the direct road.

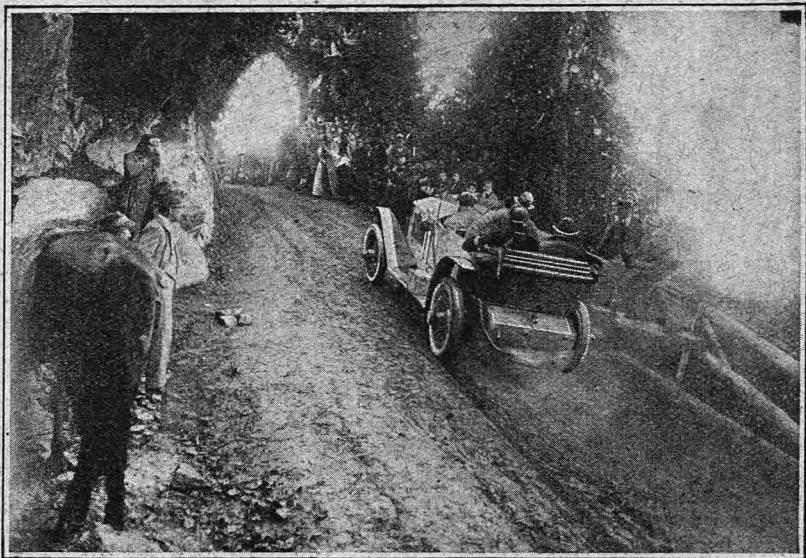
Soon afterwards, to our surprise, we came suddenly upon Radley's car stationary in the road, and pulled up after passing to let him get ahead. He had stopped to change tyres, and ran slowly for some distance with Ward, the mechanic, standing on the step and fastening up discarded covers. From that time forward we made the best of our way to Vienna, a distance of 126 miles, with one very hilly stage. There were no police or soldiers ready to receive us when we reached the capital, which is always an awkward one in which to steer one's way about, and we did not hit upon the direct road to the Automobile Club. We stopped at our hotel, and then went across to the club, where Radley was the only arrival. "How long have you been here?" I sang out, and "Seven minutes" was the reply. This was at 12.45 p.m., long before anyone was expected, so that altogether I think that the "skiff" Rolls-Royce had made a very good showing, and enabled two British cars to reach Vienna first.

A good performance was put up by Count Schönfeld's F.I.A.T., which came in next, with the Hotchkiss not far behind. Mr. Ainsworth's

handling of the last-named was one of the most admirable features of the contest, although, in point of fact, he was now *hors concours*. On the Loibl he had lost marks through a slipping fan-belt causing overheating, with the ultimate necessity of changing an incandescent plug, and on the Turracherhöhe he had to shed his passengers because his gear box was too low to allow him to go anything near as fast as his car was capable of, and this put him out of the competition. In spite of this he finished fourth on the Loibl day and fifth on the Turracher run, while he twice ended third and once first. Had he known the nature of the course he would have provided himself with larger wheels, a lower gear, and a bigger radiator. He turned out on a standard car which ran splendidly, barring the two incidents above mentioned, and generally outpaced a considerable number of bigger cars in front, for he started No. 21.

Cars came up at intervals for over three hours after my arrival, and, including a dozen which were running *hors concours*, no fewer than sixty-two were driven to the finish. An unpleasant shock was forthcoming, however, when the absentees were found to include the Armstrong-Whitworth. It had made non-stop runs on every one of the seven previous running days, but on the timed stretch was doing 69 miles an hour, far in excess of its qualifying speed, when either a piston broke or the engine seized, and the car was put out of the contest. It had been driven excellently throughout by Mr. Slaney, and behaved consistently well at every point up to this sudden and unexpected blow to its prospects of a non-stop finish.

And now I come to an analysis of the performances of the English cars, which is only rendered possible from the fact that I have been specially favoured by the committee of the I.R.A.A.C. with the official figures as to the time tests on the measured distance of five kilometres on the flat. It is not the intention of the Club to publish the speeds generally, but they have made an exception on my account in respect of the English competitors. The figures provide interesting reading, but I will first give those relating to the Katschberg. The first column of figures shows the times which the cars were required to attain to



Radley's Rolls-Royce on the stiff portion of the Turracherhöhe. The terrible surface, severe gradient, bad corners and narrow roads, made this climb the worst encountered during the whole of the trials.

The Great Alpine Trial.

justify their cylinder capacity, and the second column the times actually attained:

The Katschberg Time Test

	Stipulated time.		Actual time.	
	m.	s.	m.	s.
Rolls-Royce	11	45	7	16
Vauxhall	20	0	9	4 $\frac{1}{2}$
Armstrong-Whitworth ...	20	0	10	46 $\frac{1}{2}$
Austin	24	30	12	27 $\frac{1}{2}$
Singer	40	0	49	12 $\frac{3}{8}$ *

*Stopped midway to change a plug.

These ample margins for error were further maintained on the speed trials on the flat; but it must be pointed out that the distance between the start and the beginning of the timed stage was too short to constitute a genuine flying start, and Mr. Kendall, the driver of the Austin, tells me that he was still on his third when crossing the starting line.

Speed Trials (5 Kiloms., or 3 Miles).

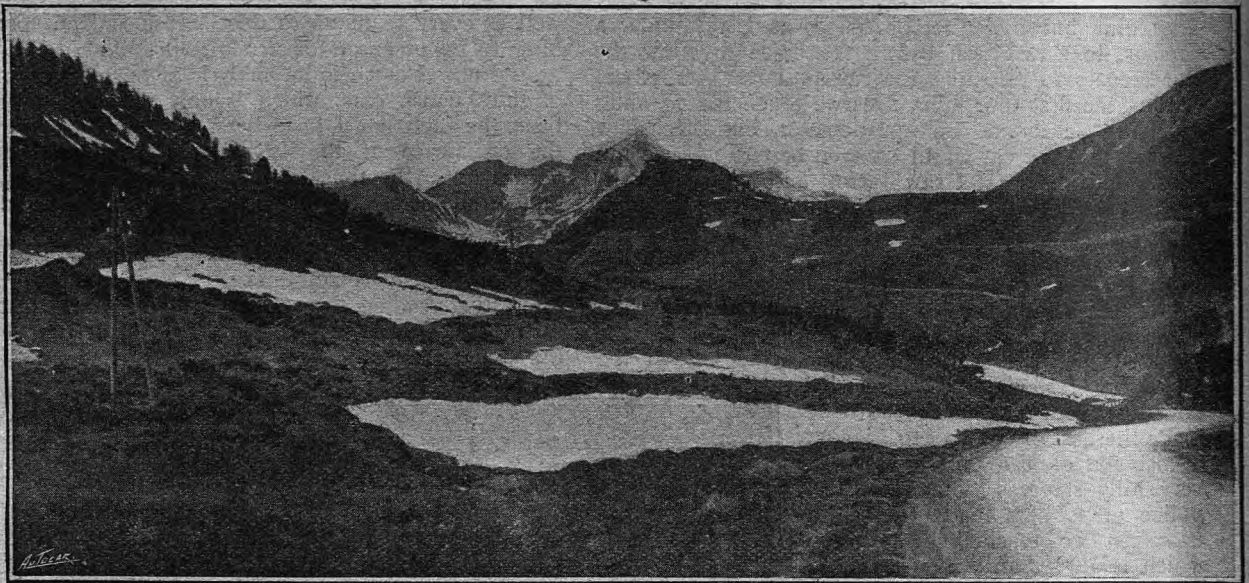
	Stipulated time.		Actual time.	
	m.	s.	m.	s.
Rolls-Royce	2	55 $\frac{3}{8}$	2	43 $\frac{3}{8}$
Vauxhall	3	45	3	24 $\frac{3}{8}$
Armstrong-Whitworth ...	3	47 $\frac{1}{4}$	3	53 $\frac{3}{8}$ *
Austin	4	10	2	59 $\frac{1}{2}$
Singer	5	0	4	10 $\frac{1}{2}$

*Engine failed during measured trial.

Mr. Radley's speed represents an average of 68.9 m.p.h., Mr. Waterhouse's was 53.99 m.p.h., Mr. Slaney's 47.3 m.p.h., Mr. Kendall's 61.6 m.p.h. and Mr. Robert's 44.8 m.p.h. As regards the Armstrong-Whitworth, however, though I have not come across Mr.

presented from various quarters. After being driven more or less unmercifully throughout, the Rolls-Royce might have been expected, perhaps, to disclose some flaw, for Radley's sole and professed object was to attain the glory of being in first every day, and he succeeded in this save on June 15th, when he went ninety kilometres out of his way. The Rolls-Royce emerged scathless, however, from the inspection, and altogether its performance might be classed with the finest ever achieved by an English-built car. There is only one Radley it is true, and his position in the van day after day might have been largely attributed to his driving; but the official figures above quoted display unmistakably that the car itself was supreme, for although I am not permitted to quote the times of any other cars, I may state definitely that the Rolls-Royce was the fastest vehicle on the Katschberg and on the flat, and in each case by a big margin.

Mr. Waterhouse, whose sporting entry as an amateur was much appreciated in Austria—as also was that of Sir Everard Duncombe, who met with ill-luck—made a good showing on his Vauxhall. His only losses were due to the failure of a sparking plug on two occasions, and one mark in the third category for taking 1m. 25s. to start instead of one minute. The car was very fast on the passes and the level alike, and his only trouble was that he could not get a clear enough course on the ascents, for he was geared high. I am inclined to think that the figures for the trial on the flat from some cause or other are delusive, but



A view on Tauern Pass.

Slaney himself, I learn that, according to the observer, the engine went wrong after the first kilometre, and the car had come nearly to a standstill before the course was ended; consequently the figures are no criterion of the speed capabilities of the car. The Austin performance can only be described as extraordinary, and Mr. Austin, jun., who was on the car, informs me that the engine will turn at 3,800 revolutions a minute. As for the Singer, even after all its vicissitudes on so heroic a course, it was still able to travel much faster than its required minimum.

There still remained the examination for condition after trial of those cars which had come through pointless (*punkti-frei*) or had a reasonable chance of gaining one of the thirty-five prizes which had been

have not met Mr. Waterhouse since the trial was over.

Mr. Slaney was universally sympathised with for the unfortunate incident of the last day, and the Austrians had noted with surprise the way in which his Armstrong-Whitworth had been piling up non-stops; for it must be remembered that no English vehicle except the Rolls-Royce has been entered in previous competitions.

The figures above quoted show how much the Austin had in hand throughout, and that its usually late arrival, though well within the control times, was due to a consistent policy on the part of its driver. It only had one day of penalty, and this was due to water getting in the petrol. The car had to be filled up during the storm at Salzburg, and though a cover was held

over the tank and the petrol was poured through chamois leather, while the carburetter itself is protected, water must have found its way in, though how Mr. Kendall is quite at a loss to understand. Both he and Mr. Austin, moreover, are mystified as to the penalty—19 marks. [Subsequently reduced to 4.—ED.]

The Singer met with troubles galore on the first day. The observer calmly went in to enjoy a *table d'hôte* lunch, and left the car with the engine running for half an hour, though the driver did not know that he was entitled to stop it after ten minutes. He ran out of petrol only five miles from the finish, but had to wait three hours before he could get a fresh supply. Eye witnesses tell me, however, that he had taken the Pack Pass in fine style. On the Loibl he was blocked by several cars, and while he was waiting with the engine running the fourth cylinder got flooded with oil on the steep road and he had to change a plug. The same thing occurred on the Katschberg, as already

The Great Alpine Trial.
if no repair were made, taking in petrol or water during the day's run, stopping on a hill-climb, and exceeding the stipulated time on the speed trial.



Mantendorp Castle on the Tauern Pass.

stated. On the Turracherhöhe he had to replenish with water, and then went up fast. The car is capable of 57 miles an hour on the flat, but on the speed trial he intentionally kept the speedometer needle at 44 miles an hour, as one of the front wheels was out of truth. Despite his experience with the lightning and the buckled axle, and the fact that his tank was not large enough to prevent replenishment every day, he brought the car to a finish *hors concours*, and the name of Singer is now one to conjure with in Vienna.

Official Markings.

Subjoined is the complete official list of total markings for each competitor throughout the trial. The system of three different categories is fully explained in the rules, but is too long to quote here; suffice it to say that the most important items of possible failure come under category one.

Marks were deducted for any or all of the following: An involuntary stop, exceeding the one minute allowed for starting up, breaking the bonnet seal even

	Total penalties.		
	Category 1.	Category 2.	Category 3.
1. Benz	7	—	39
2. Benz	137	—	11
3. Graf and Stift ...	—	—	1
4. Benz	Finished	<i>hors concours.</i>	—
5. Rolls-Royce	—	—	—
6. Minerva - Knight	Finished	<i>hors concours.</i>	—
7. Minerva - Knight	Did not finish.	—	—
8. Cadillac	Finished	<i>hors concours.</i>	—
9. Cadillac	1,159	5	6
10. Cadillac	Finished	<i>hors concours.</i>	—
11. Graf and Stift ...	—	—	1
12. Horch	15	3	0
13. R.A.F. - Knight	Did not finish.	—	—
14. Laurin and Klement	Did not finish	—	—
15. Laurin and Klement	Disqualified.	—	—
16. Laurin and Klement	Did not finish.	—	—
17. W.A.F.	Finished	<i>hors concours.</i>	—
18. Overland	Did not start.	—	—
19. F.I.A.T.	33	—	—
20. Vauxhall	25	—	1
21. Hotchkiss	Finished	<i>hors concours.</i>	—
22. Benz	—	—	—
23. Overland	Did not start.	—	—
24. Armstrong-Whitworth	Did not finish.	—	—
25. Praga	338	15	15
26. Praga	3	—	—
27. Raba	Did not finish.	—	—
28. Raba	1	9	—
29. Overland	Did not finish.	—	—
30. Puch	87	—	—
31. Puch	—	5	—
32. Puch	—	5	—
33. Puch	162	10	10
34. Austro - Daimler	Finished	<i>hors concours.</i>	—
35. Austro - Daimler	Did not finish.	—	—
36. Audi	—	—	—
37. Audi	—	—	—
38. Audi	—	—	—
39. Audi	—	—	—
40. Audi	—	—	—
43. Austro - Daimler	—	—	—
42. Austro - Daimler	Finished	<i>hors concours.</i>	—
46. Austro - Daimler	—	—	—
44. Austro - Daimler	3	—	—
45. Austro - Daimler	—	—	1
46. Austro - Daimler	—	—	—
47. Protos	16	—	1
48. F.I.A.T.	—	—	—
49. F.I.A.T.	—	—	—
50. F.I.A.T.	—	—	—
51. F.I.A.T.	63	—	—
52. Minerva Knight	—	—	—
53. Minerva - Knight	—	—	—
54. Minerva - Knight	6	—	—
55. Austin	19	[Reduced to 4.—ED]	—
56. Protos	Did not finish.	—	—
57. Wolseley	Did not finish.	—	—
58. Opel	—	—	—
59. Darracq	274	—	5
60. Darracq	157	—	—
61. Darracq	Did not finish.	—	—
62. Chevrolet	Did not finish.	—	—
63. Protos	Finished	<i>hors concours.</i>	—
64. F.I.A.T.	Finished	<i>hors concours.</i>	—
65. N.A.G.	560	6	0
66. N.A.G.	293	—	—
67. N.A.G.	Disqualified.	—	—
68. N.A.G.	34	0	5
69. Hansa	—	—	6
70. Hansa	—	—	10
71. Hansa	—	—	10
72. N.S.U.	90	—	—
73. F.I.A.T.	Finished	<i>hors concours.</i>	—
74. Protos	204	—	—
75. Benz	Did not start.	—	—
76. Wanderer	—	3	8
77. Wanderer	Did not finish.	—	—
78. Singer	Finished	<i>hors concours.</i>	—

The Great Alpine Trial.

On the Katschberg time test marks were lost as follow :

	Category 1.	Category 2.	Category 3.
No. 9	13	5	5
No. 25	100	5	5

On the speed trials cars Nos. 1, 2, 3, 9, and 11 lost one mark each in the third category.

The condition after trial examination resulted in the following penalties being awarded :

No. 31	—	5	—
No. 32	—	5	—
No. 68	—	—	5
No. 70	—	—	10
No. 71	—	—	10

The following sixteen cars earned no penalties under any headings whatsoever: 5, 22, 36, 37, 38, 39, 40, 41, 43, 46, 48, 49, 50, 52, 53, and 58.

It will be noticed that the Rolls-Royce was the only high-powered-car to come through "point free," and that the bulk of the successes were gained by the cars of from 3,560 c.c. to 2,980 c.c. capacity. Several competitors turned up this year with much smaller cars than last.

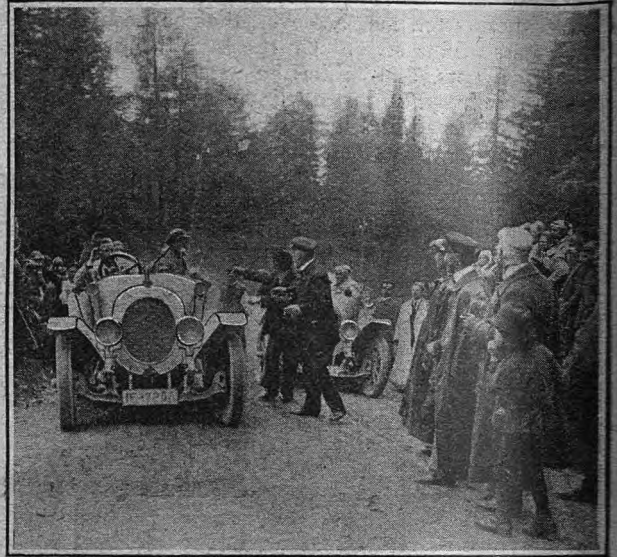
I cannot conclude this summary of an ever-memorable contest without testifying to the unflinching courtesy of the secretaries of the Imperial and Royal Austrian Automobile Club—Herr Fasbender, Herr Czerny, and Herr Spanner, who were never too busy to answer legitimate questions. A member of the committee, moreover, Captain L. von Draths Schmidt Bruckheim, was of particular service to myself on more than one occasion, and even took the trouble to come over to my hotel as soon as the results were passed. He further obtained for me the figures as to the English competitors' times and the permission of his colleagues to use them here. The organisation, I may add, was admirable throughout, the only difficulties experienced being the blockages caused by stalled competitors, but, annoying as this undoubtedly was, it is not easy to see how every mountain pass can be guarded along so formidable a route, with several passes at times in a day, and competitors spread in a line of far-reaching extent. If the cars had been marshalled at the foot of each, and sent up singly by telephone, the itinerary could by no possibility have been completed.

There was some amount of friction on the subject of cars being kept back by slower ones in front, but Count Schönfeld in particular earned the esteem of

the competitors by the sportsmanlike way in which he always drew aside whenever others wished to pass.

Since writing the foregoing I learn that the Austin penalty of nineteen marks in respect of the stoppage for water in the petrol has been reduced to four. The explanation of Mr. Waterhouse's relatively slow time in the speed trials is that he had two "groggy" tyres, and merely drove according to his speedometer, at a speed sufficient to ensure his qualifying, and did not attempt to get the maximum pace out of the car.

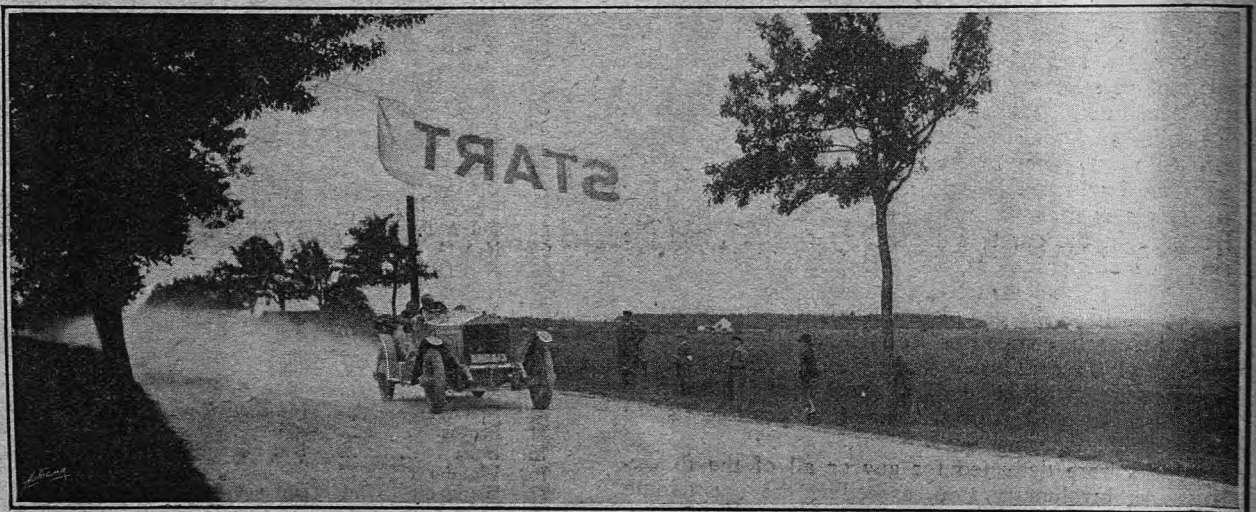
It is possible that a doubtful point which was under



An N.A.G. car badly baulked by another competing car on the stiff portion of the Katschberg.

consideration in respect of one of the Audi-cars may have been decided adversely to the driver, and that the Hansa will be the sole winners of a team prize. These cars lost marks in the third category only, and these, it may be pointed out, do not count against cars in regard to the team prize award.

The heavy total against one of the Cadillacs was mainly due to the fact that it suffered a very long delay when it skidded into a ditch. The only trouble the Cadillacs suffered from was overheating, the radiators only holding two gallons of water each.



Radley, on the Rolls-Royce, at the start of the measured three miles speed trials course near Wels.

Inter-'Varsity Meeting at Brooklands.

AS bad weather necessitated the postponement of the above meeting, open to past and present members of the Universities, the elements made ample amends on Tuesday last, the heat of the sun being tempered by a steady breeze blowing down the straight. All the races were run over one or more laps commencing and finishing at the fork, the usual "straight" being cut out. At the fork a good muster

of spectators assembled, but considering the promise of close racing given by the programme, we expected the men would have persuaded more of their people to turn out if only for a brief respite from a sweltering season in town. There were eight events altogether, three for cars, four for motor cycles, and one for light cars, cycle cars, and motor bicycles with sidecars, all of them handicaps. The last-mentioned resulted in a win for Mr. Lionel Martin's 9.8 h.p. Singer, with Mr. B. Sandeman's 8.3 h.p. Mathis second.

The first car race—a one lap handicap for cars—produced an entry of a round dozen, eight of whom lined up at the start, including Mr. J. W. Read on his Vauxhall and Mr. H. W. Cook on the big black Isotta. Mr. Lionel Martin's Singer, with 39s. start, was expected to put up a good fight in a single lap race which would hardly give the big cars time to get going. However, a dark horse in the shape of Mr. R. M. Knowles's Austin proved the winner, but things would probably have been different if Cook had not missed his gear at the commencement of the banking after leaving the starter. Result:

1. Mr. R. M. Knowles's Austin.
2. Mr. Lionel Martin's Singer.
3. Mr. H. W. Cook's Isotta-Fraschini.
4. Mr. J. W. Read's Vauxhall.

The winner's time for the lap was 3m. 16s., equal to 50.96 m.p.h., Cook's time being 3m. 27s. = 77.03 m.p.h.

In the second car race practically the same field turned out, but Mr. Knowles's Austin had its handicap allowance reduced from 2m. 32s. to 2m. 29s. for its previous win. Result:

1. Mr. H. W. Cook's Isotta-Fraschini.
2. Mr. J. W. Read's Vauxhall.
3. Mr. B. Sandeman's Mathis.
4. Mr. Lionel Martin's Singer.

Of the ten entries for the third car race, one of three laps (about 8½ miles), only four competitors turned out. Result:

1. Mr. R. M. Knowles's Austin.
2. Mr. J. W. Read's Vauxhall.
3. Mr. J. W. Read's Vauxhall.
4. Mr. B. Sandeman's Mathis.



A Swift light car which secured first prize in the competition for decorated light cars at Edinburgh on Alexandra Day.

The Police Trapping Campaign near Southampton.

The treatment of motorists near Southampton by the county police is becoming a scandal. From a local paper, *The Advocate*, we quote the following:

The county police were recently engaged day and night in large numbers in setting and minding "traps." Were not any of the policemen needed elsewhere? As many as eight traps—necessitating sixteen men—were arranged within a comparatively few miles. Result: A large batch of prosecutions and heavy fines. Upon no account do we vouchsafe to motorists the unrestricted run of the roads. They do not personally wish anything of the kind. They pay dearly towards the upkeep of the roads. They have every right to be treated as responsible human beings—not as criminal madmen. Here are a few points. We consider the county police are utterly unreasonable. A motor is not an aged horse. It cannot be treated as such. Mechanical motion is an invaluable commercial asset. It has come to stay. County police traps are set in venues where a little more

speed, to any unprejudiced mind, makes little or no appreciable difference. The county police by their absence trust motorists to negotiate difficult and dangerous places. Cannot they extend to them reasonable and mutual consideration on the long, straight highway? Scouts are not permitted to warn possible offenders. The police by reason of their open presence do not do so. Prevention is therefore not best! The law lowers its majesty by conniving, in hiding, at offence, and only pounces out to gloat over its easily preventable perpetration. Truly a deplorable state of things. If the ratepayers of the county are willing to pay an army of police for such work, we must continue to marvel. If the people really want a "motor boycott" of the county we shall marvel the more. Depend upon it, a boycott will ensue if the persecution goes on. Traders generally will suffer. Southampton will do so through no fault of its own. Why do not the county authorities in this matter learn something from the tolerant and gentlemanly demeanour of the borough police, under their best of chiefs, Mr. Jones?

The Institution of Automobile Engineers.

At a council meeting of the Institution of Automobile Engineers last week, the programme for next session was decided. The papers to be read will include the presidential address by Col. H. C. L. Holden and one on the position of the self-starter in America by one of the party of members of the S.A.E., who will be visiting this country in November. Other subjects to be dealt with will be lubrication of motor vehicles, some experiments with benzole, two papers on aspects of commercial vehicles, gears and gear-

cutting, worm drive, and power expended in flight. The arrangements for the summer visit to Belgium are now practically completed, and it is expected that some thirty odd members will take part in the trip.

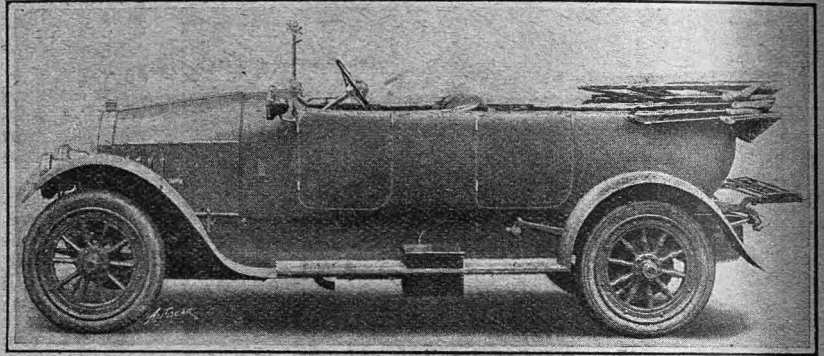
We learn that the speedometer drive on the Sheffield-Simplex cars illustrated in our last issue has been specially designed to work in conjunction with the O.S. instrument, as the latter is being fitted as standard on all Sheffield-Simplex cars.

On the Road.

An Appreciation of East Anglia and the Fen Country as Touring Grounds.

ONE never feels one is getting old so much as that young folk are absurdly young. Which satisfying moralisation occurred to me when I was waiting in the entrance of the Lion at Cambridge for a 60 h.p. Itala to take me on to Hunstanton to swell sweepstakes and, incidentally, to play abominable golf. "May Week" was on, and I felt as a ghost wandering amid the living. Once upon a time I was young and part of May Week myself, wore new dress clothes, revered almost all the other sex, rushed about all days, acted all evenings, danced all nights, and bathed instead of going to bed. That, of course, was long before there were motors; now the young things can do three times as much—and don't appreciate it. Cambridge is changing: colleges one never heard of are famous on the river, little educational establishments give balls that never used to get beyond concerts, the Footlights have pictorial posters and half-guinea stalls, only the quiet and aristocratic A.D.C. pursues its high-bred way and produces the dramas of thirty years ago. But the greatest of all changes at Cambridge is in the bottom of the Cam. When I was a young thing and sat on the Hall wall and smoked and watched, only boats and canoes ever passed by, and any oar or paddle that delved too deep was guilty of attempted poisoning. Black, foul mud boiled up, and after it greasy bubbles rose for minutes in succession. Now, as I leant over Garret Hostel Bridge, punts passed beneath me, and the steel ends of punt

poles clinked on a gravelled bottom. So wonderful was the change that I hardly noticed how the punts contained what punts always should and what punts were built to contain; my thoughts were toward the man who got rid of the mud and who placed the shingle where it was. There should be a statue to

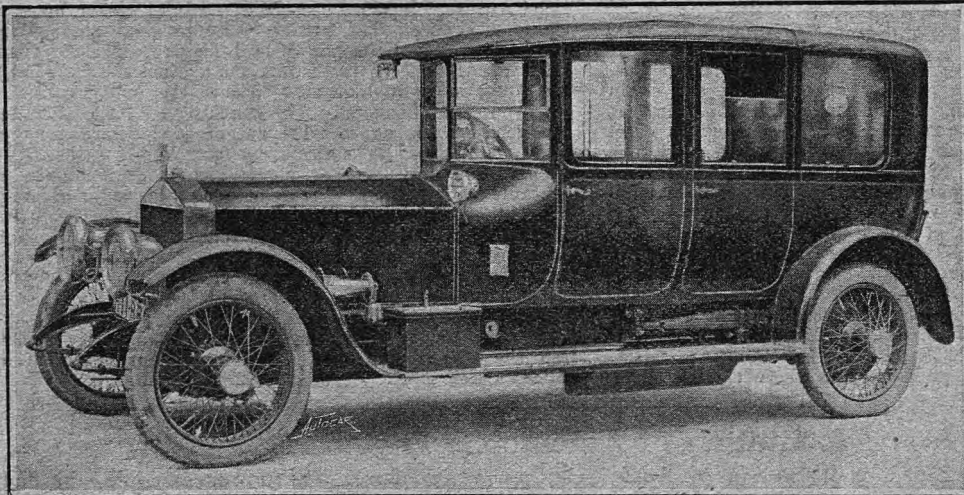


A 15-20 h.p. Mercedes with a sporting type four-seated body with a fifth folding seat, by Messrs. Brown, Hughes & Strachan, Ltd., Shepherd's Bush, London, W. The side panels are slightly incurved at the top, and the back is slightly bulbous. The finish is in Dreadnought grey with black leather upholstery, and the equipment includes C.A.V. electric lighting and Warland Dual rims.

him; except that there are no statues at University towns because youth will have its fling, and it is so easy to be funny with statues.

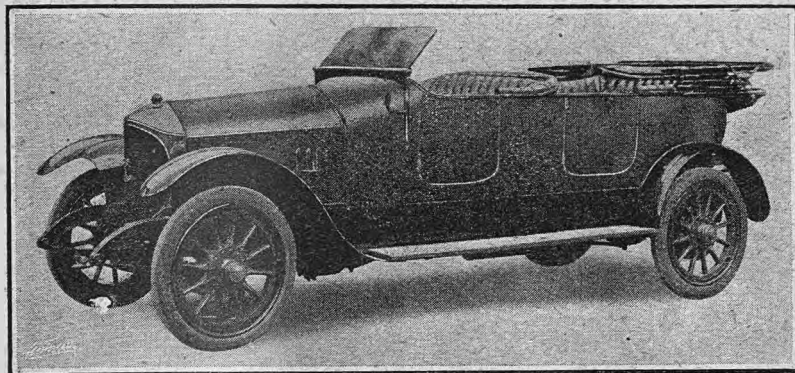
How beautiful are the Cambridge backs: Oxford has nothing to compare with them. Oxford is a collection of samples: Cambridge is much better designed. Cambridge and its neighbourhood—all East Anglia is in the neighbourhood of Cambridge—is not visited nearly enough. Most motor tourists leave it out altogether to go to places which are not half as interesting and only slightly more beautiful in parts. When the big Itala turned up—that it was late is why I waited and mused as above—we dined, and, having dined and watched the beautiful young things depart for their respective balls—May Week balls begin long before they are advertised to—we, too, went off, and drove sixty miles by sluggish rivers through a dank, cold sea-fog through Ely and Downham Market to very modern Hunstanton.

Sixty horse-power and an average of fifteen miles an hour! To keep the road by watching



A 40-50 h.p. Rolls-Royce carrying a saloon landaulet body by Arthur Mulliner-London, Ltd., Gillingham Street, S.W. The windows at the back of the driver's seat are arranged to be interchangeable with those of the doors to the front seats, so that the car can be made in the form of a saloon with both back and front seats in the same compartment, or with the two windows in their position at the back of the driver converting the rear portion into a closed carriage. The front screen is V-shaped with a horizontal division in each panel. The back seat accommodates two people, and two comfortable detachable seats are provided. These seats can be used in the face-forward position, and the backs of the chairs are finished in polished mahogany and ivory to harmonise with the roof, doors, and sides of the body. The car is provided with a C.A.V. lighting equipment and Dunlop detachable wheels

the selvedge of the grass by its side for four hours, to climb signposts, to awaken inhabitants for directions—these things are bad enough, but, on arrival, to go to the wrong hotel (because it was the one where one has always stayed before), to fail to awaken anyone, to find an unlatched window, to creep upstairs, and only to find out the mistake by inspecting the name on the cover of the Visitors' Book; for such things as these there are no words, and that we did



An 18-30 h.p. Palladium with a seven-seated flush-sided body by Messrs. Morgan Sharpe and Co., Cricklewood. This car has been supplied to a purchaser resident in Gothenberg. A new type of V-fronted radiator is fitted.

them is a great compliment to the air that makes for sleep and the unsuspecting nature of the native.

So came the end of the run, but next day I took out the big car and we went in the sunshine for miles across the fens, where colours are brighter than anywhere else in England, where asparagus beds are laid down by the acre, tulips by the square mile, ducks are kept by the thousand, and Holland itself has been transplanted to England. Because the highest part of the land is the water its roads run often on the banks that keep it in, and for miles on either side of the dykes grow the fat crops spaced by the ugly steam pump-houses that have supplanted the hundreds of windmills that used to do the work of pumping. But the time of these supplanters is not for ever; before long the tides they keep in check will do their work for them and for lots of other machinery, and men will wonder why they never harnessed their untiring forces long before.

Motor tourists ought certainly to visit the fen country, for here hotels are better than in more hackneyed resorts, the cooking is more English, the food itself is more interesting, and the many little towns that lie, as a rule, about a dozen miles apart, are full of interest, while one, Ramsey, possesses a street that is uglier than any other south of Lauder or Ecclefechan. Still, Ramsey has other attractions, while, not very far off, is St. Ives—where the cats came from—which is not much removed from having one of the most exquisite "bits" in all England.

Ely, of course, one must see. Wells, in Somerset, is only more beautiful as a type of a small cathedral town; and King's Lynn, in spite of shocking modern developments, is full of old things, includ-

ing memories of Eugene Aram, monarchs, and of much ancient traffic from foreign and mysterious parts. As one passes over altering surfaces, just opposite to the Town Hall, where King John's pearl sword reposes, is the stone staircase down which "four-and-twenty happy boys came bounding out of school." But my last night's crawl, which had included this same town, had brought to my memory far more vividly the other lines of the same poem (I quote from a treacherous memory, the author being one of the few I do not possess):

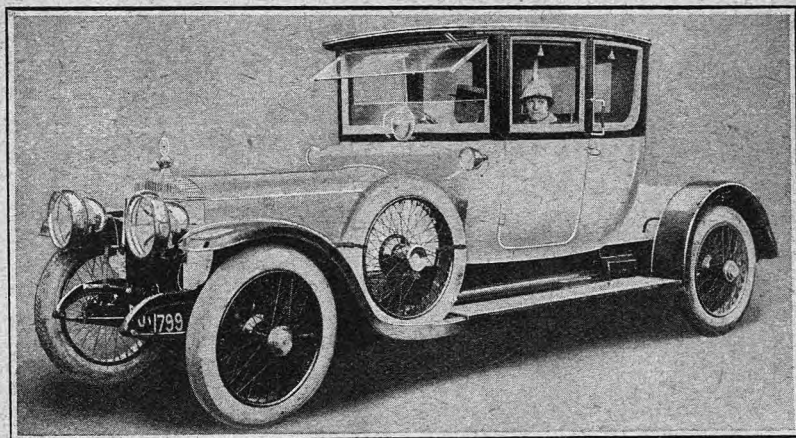
" . . . through the cold and driving mist
Two stern-faced men set out from Lynn,
And Eugene Aram walked between
With gyves upon his wrist."

As a port I believe Lyme Regis is declining: as a centre assuredly it is growing. But East Country-folk are not successful with modern architecture, and the horrible white bricks that come from the neighbourhood of Peterborough have ruined the beauty of many of its towns.

Peterborough itself is very fine and surprisingly interesting. The new bridge the G.N.R. (or the town, or the county) has built must be a godsend to local motorists, and it was needed nearly as much as its sister one for the relief of Doncaster traffic on the Great North Road. Its building has quite altered that end of Peterborough, and the new street that goes northward from the cathedral gates is doing the same elsewhere. The cathedral is hidden as much as possible, which is a pity, for undoubtedly it is very fine, and the inhabitants ought to be much prouder of it than they seem to be.

Fenland proper divides here, for, though both to the North and to the East there are fens, yet they seem different types, the Wash being the only thing they have in common. Boston with its "stump" should be visited, also Crowland; otherwise, the Norfolk and Isle of Ely plains should be held to as the more uncommon and refreshing.

In the years when England had really hard winters it was quite the thing to visit these parts and skate from town to town and there are hundreds of miles



A 45 h.p. special Daimler (six cylinders 110 x 130 mm.) with an all-enclosed body. The owner, Mr. Nate-Mock, of Charlottenburg, Berlin, is at the wheel.

On the Road.

of drains undisturbed by traffic where one could move untrammelled and careless in a hard frost even now. Water traffic in the fenland is as moribund as elsewhere, but it is curious to note the many places where one waterway is taken clean over another, so that boats can travel beneath the one even though the surrounding country is flatter than is a pancake.

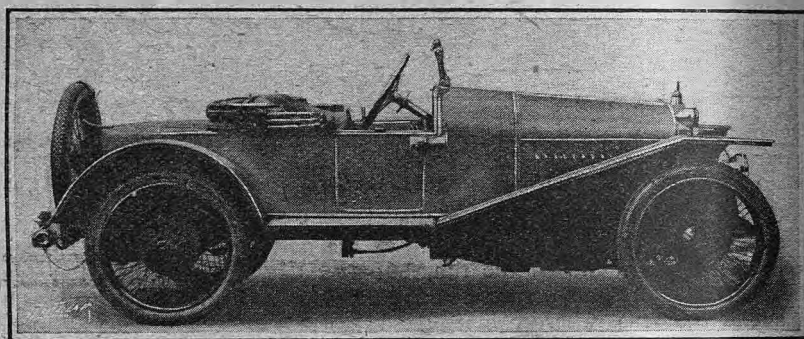
Talking of flatness, it was here, or hereabouts, that the advocates of a flat earth were finally confounded—except the few that are still out of asylums to-day—by the experiment of putting tall posts of equal height in the same river and allowing them to judge for themselves as to why they could not see more than a certain number. That, at least, was the idea of the experiment. I can find no references to it, nor the name of the sect who required so convincing. Nevertheless, I know it has all been recorded at great length somewhere by many learned writers.

My thoughts stray back to Cambridge and its May Week. People really ought to see Cambridge in early summer, though when I say Cambridge I mean the Cambridge backs, for the rest of it might be the environs of Hackney or Edmonton. Cambridge is luckier than Oxford in its hotels. Of course, there are expensive and modern ones at both, but at the former there are old hotels which have grown up with the town and preserved their original characteristics. My favourite used to be "The Olde Hoop," but that has gone, turned into a mere garage and its place knoweth it no more. Now I go to the Lion, which has the reputation of being the most moderate and serving the best food. Of course, in May Week it had a band in the dining-room, which was pardonable and does not happen all the year round. Here came real "nuts" to dine with their parties, and very nice they looked as they sipped their coffees and their liqueurs in the long once-upon-a-time courtyard now covered in and filled with chairs. It is also a great commercial house, and may I be pardoned if I suggest to the leaders of commercial traveller society that if their members desire to behave as they expect to be treated they might refrain from taking off their dusty boots from their weary feet and putting on the immemorial carpet slippers when elegant young ladies and gentlemen are sitting around them. Little things like this are much better evidences of decency than waxed moustaches, diamond shirt studs, or the smoking of cigars with their bands on.

Cambridge undergraduates appreciate automobiles to the full. I noticed one evening a stripped chassis with a soap-box body being driven round and round the town by two most glorious nuts in full evening dress who fairly rejoiced in it and its unsubdued clatter, and

I never saw any two youths more enjoying of themselves. It made me think how times change and fashions with them. When I first came up the smart thing was to drive a dogcart on Sunday to Linton. Down came Authority on it and it was stopped. Then Undergraduatheod, in the shape of the first few new numbers of the *Granta*, suggested *pour rire* that the forbidden drivers should obtain bicycles—the "safety" pattern had but just evolved itself and pneumatics were hideously funny and quaint-looking—and solemnly assemble on King's Parade to shame the proctors who had made the order. Whether they did or not I forget; probably there were not fifty bicycles in all Cambridge. I remember I used to hire a three-wheeler, and no part of England was better suited than the district around Cambridge for that method of getting about.

Which brings me back to motors, and particularly to the big Itala I began about. As an admirer of new developments I am a great believer in the rotary



A 15.9 h.p. Hispano-Suiza car with a special two-seated body built by Mr. T. H. Gill, Chilworth Street, London, W., to the design of Mr. R. F. Fugle, Edgware. Very deep seat cushions are secured on the floor of the body. A folding dickey seat is provided in the boot, behind which the spare wheel is carried.

valve, and any motorist who is not acquainted with the quiet and simple way the engine purrs round has much to learn. Certainly at high speed it cannot be excelled, and the absence of all sorts of springs and valves and tappets makes for the supreme excellence we are all looking for. Also, unlike some other big speed cars, at low speeds it is handy and pleasant, and I can see no reason at all why its design is not a peep into the design of the future. Good as present-day cars of all sorts are, there is none of them perfect, and perfection in the future will take the shape, in my little opinion, of a four-cylinder car of this or some similar type, which will be able to run as well as present day six-cylinders of the best kind. For real comfort at present (as the words of a leading article in *The Autocar* a few weeks back put it) is only to be attained by means of a big engine being restrained from doing anything like the amount of work it is capable of—and what, after all, do we want but comfort?

OWEN JOHN.

The Automobile Club of Switzerland has issued a series of suggestions to motorists contemplating a tour in Switzerland. The Club strongly recommends that the rules and regulations of the different Cantons should be carefully studied and strictly adhered to, and that speed should be reduced when passing through towns or villages. The use of the free exhaust, or cut-out, is forbidden in Switzerland; certain mountain roads are closed to motor traffic during certain hours;

motor cars are entirely forbidden in the Canton of Grisons, and visitors' cars are not permitted to be run in the Cantons of Glaris and Schwyt on Sundays. The Club places its offices in Geneva, Zurich, and Lucerne at the disposal of touring motorists for information of any kind relating to motor traffic in Switzerland. The motorist's pleasure, however, is usually marred by the constant dread that he might transgress one or other of the vexatious regulations.

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.

TWO-POINT IGNITION.

[21004.]—We think that Mr. Marshall's report in *The Autocar* of June 27th (page 1245), of an engine test using two-point ignition, may give a wrong impression. We expect that in the case of that engine the two plugs were close together, and it would be interesting to know the distance between the plug centres and the bore of the cylinder.

Two-point ignition depends for its advantage on igniting the gas at two well separated points, thereby reducing the time taken for complete combustion. We might mention that, in the case of engines having all the valves on one side, the best results are usually obtained by placing the double-pole plug over the inlet valve, and the second (ordinary) plug over the centre of the cylinder.

Our own experiments go to show that the increase in power with two-point ignition is more noticeable in the case of large combustion chambers, and in the case of high speed engines. This is, of course, exactly as would be expected.

If the efficiency of the petrol engine is to be still further increased, we are confident that two-point ignition must be adopted.

THE LODGE SPARKING PLUG Co., LTD.

ACCESSORIES ON RACING CARS.

[21005.]—In your issue of June 27th, pages 1252-3, you raise the important question of cash contributions by makers of parts, accessories, and tyres influencing the equipment of the racing car.

I suggest you have been a little biased by the case you report of an accessory not having much confidence in its own interior, borrowing that of a better accessory so that it may be more likely to behave with credit and add undeserved renown to its maker. This is dishonest; but if you condemn the whole system because someone is dishonest I fear that one of these days you will discover that an advertisement in your paper is not quite accurate, and will stop all your advertisements. This will stop the dishonest advertiser all right, but will be very unfair to the rest of us.

At the same time other papers might take the same course, and we honest advertisers would be driven to bombarding the public through the post just as the moneylenders do for a like reason, which, in my view, is an intolerable interference with the sanctity of the mail bag.

Motor racing plays so important a part in the development of the motor bicycle, motor car, motor boat, aeroplane, battleship, and sub-marine, all of which are essential to our well being and security, and it receives so little encouragement in this country that I want at once to defend a system that helps to keep it going. In this I feel sure I shall get your support, and can even derive it from the article in question, for you say:

"Even if a driver win on X tyres while he would rather run on Y, there remains no doubt that X tyres are good."

My firm looks at the matter in this way. Motor car racing is an exceedingly expensive game, and the maker of any part which contributes to the success, or is severely stressed and tested by racing, gains a good deal of publicity from it, and should be only too pleased to make some contribution to the cost.

The practice we have adopted, and shall continue to adopt, is to offer cash prizes for the winners, and other leading positions in the more important competitions. This is a practice that is perfectly satisfactory from our point of view, because we only pay for what we get, but I can understand that, from the car makers' point of view, it may not always be entirely satisfactory. For example, in the Isle of Man race every make of car but one used Rudge-Whitworth wheels, while naturally only three cars could among them get first, second, and third, thus all the remainder would get absolutely nothing for using our wheels. This illustrates the real sportsmanship that exists in motor racing circles, for each of

the other cars must have been sanguine enough to expect to get a place, or else merely used the wheels because they preferred them, as in the case of the D.F.P., which put up such a splendid performance, but, owing to its tiny little engine, hardly contemplated, I am sure, at any time, the possibility of winning.

In the Grand Prix, to which your article relates, the same conditions obtain. Although there is no starting money, and only place money, every car but one uses R.W. wheels.

I would like to add a word on what I conceive to be the value of racing. I have heard it suggested that racing can only be valuable if the public is able to buy an exact facsimile of the car raced on. If this were the case the general public would be very disappointed, for since racing cars are designed to win races, they are not likely to be the best possible cars for anything else. The real facts are these. To win a motor race demands an extraordinary combination of qualifications; including adequate financial resources, ability to tackle an immensely difficult technical problem in so short a time that the method of trial and error is hard to apply. In addition to this, the firm, and, of course, its staff, must have sufficient determination to face and overcome quickly the little difficulties (sometimes they are pretty big ones) that are bound to arise in spite of the most careful design. The firm must also have a sufficiently fixed policy and foresight to make their preparations in plenty of time, and again they must have a great knowledge of men in order to pick the drivers and mechanics who can be trusted with such responsible work, very often far from the headquarters of the firm, and without control other than that of their own high characters. Now, all these qualifications are just as necessary for the making of the right kind of car for touring or for any other purpose as they are for producing a racing car, and when a firm has, by winning races, demonstrated that it has these qualifications the majority of probable purchasers of motor cars are sufficiently intelligent to appreciate the fact.

There is a tendency to exaggerate the cash prizes offered, owing to the plan adopted by the Contest Board of the American Automobile Association in the Indianapolis race, whereby the ruling body took charge of the cash, handed it to the winners, obtained their receipts, and issued Certificates of Merit. I am able to give you the exact figures as far as Rudge-Whitworth is concerned, viz.: £100 first prize, £50 second prize, and £25 third prize for cars using our wheels. All three prizes were won, and Goux (on l' Peugeot) who finished fourth did not get a penny.

Incidentally, I suggest that this system of payments publicly made through the ruling body, and of Certificates of Merit would go far to prevent the dishonesty of which you properly complain.

From the makers' point of view, apart from the effect of publicity on sales, racing is of incalculable value. It is very difficult (personally I think it is impossible) by means of laboratory or bench tests, or even private road tests, to find out as much as you find out by racing, and beyond all this, while it is just possible to deceive yourself in your private tests, you cannot do so in racing, where any defect arising is at once obvious and public.

A very good case in point is the great team performance of the Minerva cars in the Tourist Trophy race. These cars had Knight engines. They had special exhaust ports, and they smoked abominably, and were just as noisy as the cars with pocket valves, though they were not, of course, anything like so fast as the highly developed Sunbeam cars, which are the product of years.

This race disposed of two fallacies relating to the sleeve valve engine, viz., its essential silence and its essentially low volumetric efficiency, as no other test could do.

It showed the public what may have been and doubtless was known to many engineers, viz., that with many valve systems a high volumetric efficiency can be obtained with a

Correspondence.

great deal of noise, and that a great deal of silence can be obtained with a low volumetric efficiency. It also called attention to the smoke, which the clever engineers associated with the Knight engine will now have to tackle, and racing has in this respect done the engine a service. In a word it will compel those responsible for it to develop its real qualities and cure its real failings instead of sacrificing other desirable qualities for a degree of silence that is not really wanted and is not to-day confined to the Knight engine.

One word more. To be a great or even a moderately good driver of a racing car requires qualities of extreme value to the nation, and since these qualities can only be developed by risking life and limb the drivers ought to be able to win great prizes.

JOHN PUGH.

[21006.]—With regard to the strongly-worded observations of your correspondent on the subject of fitting accessories to racing cars, and the conditions under which many accessories are so fitted, which appear on pages 1252 and 1253 of your issue of the 27th ult., we shall be grateful if you will allow us to state that the Houdaille hydraulic suspensions which were so successful on the Sunbeam cars in the Tourist Trophy, and are fitted to all the Sunbeams in the Grand Prix, were ordered and paid for by the Sunbeam Company in spite of the great value of the advertisement that we obtained by their having been so fitted.

THE HOUDAILLE HYDRAULIC SUSPENSION CO., LTD.

OLD AND NEW RACING CARS.

[21007.]—I have read with great interest Mr. Gordon Watney's letter [20979], and from what I can gather Mr. Watney seems to be of opinion that the material used in the motor car of to-day is not of the standard of that used when his old 60 h.p. Mercedes was designed and built, but I would suggest that his comparisons are somewhat unjust, as I think it would be admitted by all that one of the most essential points dear to the modern manufacturer is efficiency with lightness, and to obtain this it has been found absolutely imperative to ignore the old engineering formulae, more especially in regard to piston speed, and pressure on the oil, and probably his experiences of frequent collapses of modern engines have been due more to the abuse of those formulae than the use of inferior material. I think it is agreed that the advent of the internal combustion engine has had a greater influence on the production of a higher grade material combining lightness with efficiency than any other branch of engineering of modern times. At the period when the 60 h.p. Mercedes was built, all processes of production were lengthy and expensive, but present day results have justified the modern method of producing the various parts in the form of stampings in suitable higher grade materials where hitherto expensive machined forgings were the order of the day. I think probably I am right in suggesting that the numerous breakdowns that have come before Mr. Watney have in most cases been connected with high-speed engines used principally for competition work; these are the ones I think he refers to as being "sewing machine" dimensions.

I am of opinion that it will not be necessary for him to "start to go back," as he suggests, owing to the lamentable results he has experienced due to his efforts to obtain greater efficiency from a given model than the designers had even hoped to obtain, and his query as to the relative merits of high and slow-speed engines is, I consider, a matter of taste or fashion; either term would apply. I do not think it an improbable proposition that at some future date the public will demand a slow-speed engine, at the same time realising that if the present day high-speed engine justifies its existence, the question of increased weight, which is absolutely essential, will of itself be sufficient to condemn its readoption.

P.C.C.

T.T. RACING CARS.

[21008.]—Whilst congratulating the Sunbeam Company on its splendid victory in the recent T.T. Race, I think it only right to refer to the striking similarity of these cars to those of the 1913 three-litre Peugeot racing cars which were described last year in most of the English motor journals, and which were so successful and far ahead of all competitors in the 1913 Grand Prix, Coupe de Voiturettes, and all other races in which they were entered.

The Peugeot racing cars were not entered in this year's T.T. Race owing to their other engagements, both in the Indianapolis and Grand Prix races. I, nevertheless, consider that the Sunbeam victory was first and foremost a victory for the 1913 Peugeot three-litre design.

The Peugeot racing cars wiped the board in 1913 owing to their very special design; the Sunbeam, which in that

year unsuccessfully competed against the Peugeot in the Grand Prix and Coupe de l'Auto, were of standard type, and the Sunbeam Company made it a feature of its claims that its racing cars were of standard design, and sought to belittle the Peugeot victories over their cars by pointing out that the Peugeots were purely of racing design, and in the case of the Grand Prix of a much larger engine capacity than were the Sunbeam racers.

A simple comparison of the 1913 Peugeot racers, published in *The Autocar* some time ago, with the design of the Sunbeam car which won the recent T.T. race, will clearly show how extraordinary is the resemblance between the two. If the Sunbeam Co. has achieved its signal success in the T.T. race by means of the experience it has gained from the Peugeot racers, I think it would be only right and fair that the company should make a suitable acknowledgment.

H. BOISSY,
Peugeot (England), Ltd.

HANDICAPPING AT BROOKLANDS.

[21009.]—"Non-competitor" [letter 20981] has made statements which are not in accordance with facts.

At the Easter meeting the Hillman had not to allow time to the Crespelle in any race, as these two cars never raced against each other. The Crespelle was entered in the 100 m.p.h. handicaps, and the Hillman in the 75 m.p.h. handicaps.

F. LINDSAY LLOYD,
Clerk of the Course.

ROYAL AUTOMOBILE CLUB TRIALS.

[21010.]—I have read with considerable interest the correspondence on this subject. I entirely agree with the position taken up by Mr. Vane, of the Napier Co. For a manufacturer to enter his car or accessory for test under the severe conditions of the R.A.C. shows that he has so much confidence in his product that he is willing to stand or fall by the result. It must be borne in mind that the result of an R.A.C. test, whether successful or not, is published to the world, and consequently a failure would mean irrecoverable loss of prestige. A manufacturer who has the courage to face the ordeal, and succeeds, undoubtedly therefore deserves the confidence of the motoring public, and, I have no hesitation in saying, obtains it.

I am speaking with some experience on the matter, as my company has just completed a 5,000 miles R.A.C. test of Plantation-made motor tyres, and is at present running a further trial, and I have been particularly struck with the strictness and impartiality of the R.A.C. regulations and the courtesy and fairness of the officials. There can be no doubt that the high standard set by the R.A.C. renders its certificate a document which is accepted the wide world over as the highest degree that can be conferred on any car or accessory.

It is obvious that while unofficial tests and individual experiences may be very interesting, they cannot be accepted by the motoring public in the same way or as of the same value as an officially observed Royal Automobile Club test.

In my opinion, the day will come when no manufacturers of cars or accessories will feel they are able to appeal for public support unless they have an R.A.C. certificate to endorse their claims.

ALEXANDER JOHNSTON,
The North British Rubber Co., Ltd.

[21011.]—I notice in your correspondence columns some criticism anent the above, and one letter [20934] seems to me to try to belittle the running of a Napier car in Scotland, and cynically mentions a "few loose nuts," which, when explained by the owner, it seems, had nothing to do with the engine, transmission, or the efficiency of the car.

In justice to the makers of the Napier car, I write to say that I, too, am the owner of a six-cylinder 30 h.p. Napier, and have just returned from a 2,000 miles tour in the Savoie and Dauphine, France, going over quite half a score of passes varying in height from 2,000ft. to 7,000ft., and in two excursions going over the very worst rough roads it was ever my experience to travel after twelve years' motoring over Europe. The Napier car never gave one moment's trouble from start to finish, not even an adjustment or a nut touched.

The car goes as sweetly and silently as ever. With the same car last year I travelled 2,150 miles in the Auvergne and never had a moment's trouble or had to do anything to the car, although it was a very trying country to travel in—plenty of long mountain roads, with grades twelve and fourteen per cent.

I write this letter solely as a satisfied owner, with the usual disclaimer.

ANOTHER OWNER-DRIVER.

ATTENTION REQUIRED BY A CAR.

[21012].—If you will allow me, I should very much like to add a few remarks to those I made in my last letter [20958] about the care of motor cars. To begin with, let me thank "Owen John" for his courteous treatment of my criticisms. Not everyone who disagrees with "The Autocrat of *The Autocar*" escapes so easily, and even the best intentioned stranger Knight who appears in the lists to break a lance with Lancelot may congratulate himself if horse and man do not go down in the encounter.

This time I think I am in the right, though "Owen John" is not necessarily in the wrong. We are talking of two quite different kinds of motoring. Of course, given a driver with "Owen John's" experience of cars, a motorist who would very quickly discover any fault in the running of his car, nothing more is needed than an attendant who will do what he is told. Add to this a Valveless car, costing perhaps £600, and a ready access to repairers and manufacturers, and, of course, again, you have all the necessary elements for comfort and success. But look at my point of view. I buy a car for some £290, which, for various good reasons, has to last me some eight or ten years. I live four miles from the shops, the Post Office, and the station, and the nearest large sized town is six miles away. Nearly every day, sometimes many times a day, the car is wanted, and it is a serious inconvenience if it cannot be used even for a day or two. Suppose the pistons and cylinders get dirty, and this happens, at any rate, to such cars as mine. Knowing what to do, I dismount the cylinders one afternoon after the morning's run, clean them and the piston heads, and am ready to start the next day in the afternoon. The valves, etc., can be "polished in" or ground in, between the short spins. This would, if I had to take the car to the nearest repairer, mean two or three days' delay, and might cost from £2 to £3 instead of nothing.

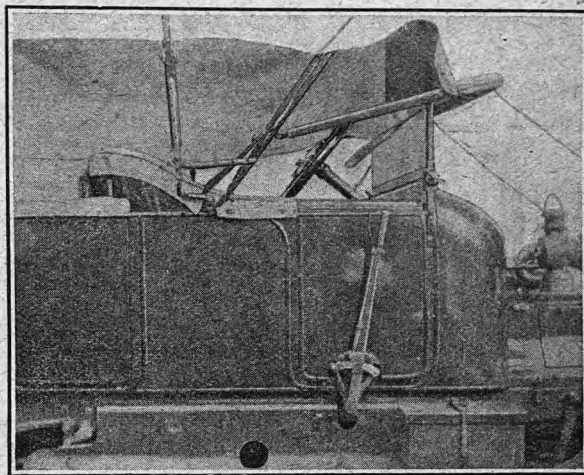
The fitting of new piston rings, valves, valve springs, water joints, adjusting brakes, fitting new linings to brakes, adjusting steering arms, cleaning and scraping cylinders and pistons without removing them, cleaning out silencer, painting the car, and many other details, take time, and would be expensive if the car had to be sent to the works. If I could I would motor as "Owen John" does, and, in his case, I can well imagine that an obedient servant is infinitely preferable to a haughty mechanic, who looks upon the car he allows the owner to drive as really his own. But the mechanic, if somewhat inclined to domineer, is worth his wages, if one can afford them. He will take a real pride in "his" car, and it is something to have someone to talk to about one's car who does not look on a car as a mere soulless machine, for carting passengers and luggage about.

If I could afford a good mechanic as chauffeur I would look for one to-morrow. As I cannot do this I try to "nurse" my car as a good mechanic would "nurse" it, and the car seems to know it. More than five years of perfect satisfaction, an ever-increasing love and interest in all things that concern the car, is at least some argument in favour of giving your best care to your machine. M. A. TRENCHARD.

MOTOR CARS IN THUNDERSTORMS.

[21013].—In this country, where cases of lightning stroke are not uncommon, the safety or otherwise of motor cars in thunderstorms is a question one often hears discussed; various reasons for and against are given, but practically always the comfortable assurance is put forward that there are no cases recorded of a car being struck. This, however, does not carry one very far when, after making due allowance for the rapid increase in the number of cars in use, their number in this country, as yet, is small when compared to Cape carts, ox waggons, etc., and in which, unfortunately, deaths are frequently recorded. The question is one which I believe your readers would be glad to have experts theorise upon, and I certainly think it is the duty of all to publish any facts that come to their notice. I therefore submit the following experience. I was driving my five-seated Talbot car slowly in an open space of this town (Heilbron) in a not particularly severe thunderstorm, slight rain falling, the nearest house being about twenty yards distant and a corrugated iron blacksmith's shop, with plenty of scrap iron lying around, some thirty yards away. The hood was up, but the car was without side curtains. I was about to change gear, with one hand on the steering wheel, the other on the gear lever, which is inside the body of the car; my left foot was on the metal clutch pedal and my right foot on the accelerator, when I was startled by a terrific crash and experienced for a fraction of a second a tremendous pressure and great heat. I saw the gravel spurt up from the ground just behind the off fore wheel and my

corner of the hood falling. The thought of a burst tyre was not fully formed when I realised that the car had been struck by lightning. I next saw that the hood stick, within a few inches of my head, was badly splintered (the accompanying photograph shows this fairly well), and that a piece of this stick was lying about five yards from the car. I stopped the



A hood damaged by lightning whilst the owner was driving.

car, alighted, and found the tyres all in order, but the ground on which they were standing at the time of the flash showed four well marked shallow depressions corresponding to the four wheels, and radiating from these starlike lines, some of them 2ft. in length, most marked on the two off side places. For myself I experienced no shock, except the instantaneous pressure as from a gale out of a blast furnace, although I was well connected up with the car. I saw no flash, though that the electric discharge was not a mild one was proved by the terrific volume of sound and the condition of the ground on which the car was standing. A blacksmith standing some thirty yards away fell against his shop wall probably from surprise, and was momentarily blinded by the flash and saw only a lot of dust about the car. Kaffir maids washing clothes about 100 yards distant rushed into the house under the impression that they were struck; a lady about 300 yards away, with her back to the flash, was "all of a shake" for some hours afterwards. The engine, running on magneto ignition, never turned a hair, and continued to tick regularly round as usual. The car, with the exception of this splintered wood, has not suffered, as many miles driving since then shows. What the photograph does not show is that inside the splintered stick is carried a brass rod on which slides the forward extension of the hood; the points of the screws holding this rod show signs of fusing, so that I am led to believe that the major part of the current took the hood mostly on the off side perilously near to my head, selected the brass moulding outside, jumped through to the mass of extension brasswork high up, for the Kamac cloth is singed at this point, ran down the brass rod, and, impatient of getting to earth, splintered the stick, fused the points of those two screws, and so to the brass plate outside the stick (as shown in the photograph), thence easily to the metal panels of body and chassis and to earth. The splintered stick was blackened and charred at the position of the brass screws. The one clear point in this episode is that in a thunderstorm one should pray for rain to moisten the externals of one's car, most certainly put the hood up, and on no account allow your head to be the highest point for attack. E.P.R.T.

Heilbron, O.F.S., South Africa.

LIGHT CARS.

[21014].—I have had two letters from motor agents in answer to mine [20964] published in your issue of June 20th. One letter says that the 8-10 h.p. De Dion answers my requirements. It does not. The engine is too small, the car too heavy, and though De Dion cars are well known for reliability, this is a new departure for them—the small high efficiency engine. I believe the other parts of the chassis would answer my specification as regards durability, but the engine has not yet "made good." Then, as regards weight, though a fine design of clutch and suspension saves tyres, it

Correspondence.

stands to reason that, *ceteris paribus*, a 12 cwt. is going to be more economical than 14 cwt. both as regards tyres and petrol.

Motorists with whom I have discussed the subject tell me that I am wrong in wanting to keep a car for six years or more because cars so quickly become old-fashioned. This is a point which I should like to see discussed. Is there any reasonable chance that, within the next six years, the internal combustion engine will be so improved as to render all present designs quite obsolete? I can scarcely believe it.

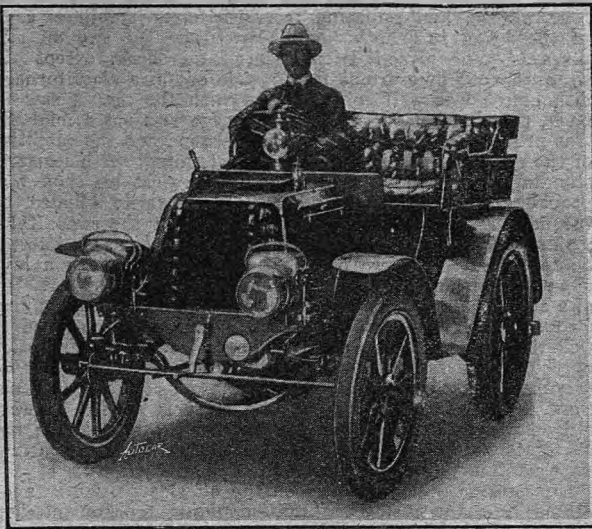
I imagine that theoretically the carburetter, as we have it, is a clumsy and wasteful device, but an improved vaporiser, of whatever sort, will always be something which can be fitted to an existing engine of older design. Is that not so? Then again, the two-stroke engine may tend to lessen wear on tyres, but to what extent? Personally, I believe the motor stands now very much where the push bicycle stood fifteen or twenty years ago. Just as between 1890 and 1895 the push bicycle underwent very rapid development, so did the motor car between 1900 and 1905. Since 1905 the main lines of motor car design have remained fixed. We have now smaller engines and lighter chassis, but these changes were, I imagine, already foreshadowed in 1905. Can anyone to-day foresee further changes of equal importance? If not, then the quest for a "six years car" is not vain.

ANASTASIUS.

AN OLD 12 H.P. PANHARD.

[21015.]—I venture to send you an old photograph of a 12 h.p. Panhard that used to belong to the late Hon. C. S. Rolls. I understand that it was the premier car in the 1,000 miles trial of 1900. You will notice it has no number.

It is quite ten years since I drove it, and it was then the property of Mr. R. W. Hudson, of Danesfield, Great Marlow. I fetched it from Mr. Rolls's place, South Lodge, Kingsbridge, when Mr. Hudson purchased it in 1900. In



An old Panhard car which belonged to the late Hon. C. S. Rolls.

those days it was considered a fast car—it could do about 35 m.p.h. It was chain driven, with four speeds forward and reverse (I once had to drive it backwards twenty miles, viz., from Slough to London), tube and electric ignition, tyres 90 mm. front and 120 mm. back. For several years I drove another Panhard, really an older car than the Hon. C. S. Rolls's, the property of Mr. A. L. Langman. I had a considerable amount of trouble with the tyres and the wheel brake that used to act on the tyres. This car had tube ignition only, and was geared the same as the other.

R. O. HOWARD.

RETREADING GUARANTEES.

[21016.]—I am as keen an economist as anyone, but cannot see the point of paying approximately half the price of a new tyre for a retread, with the probability of the casing going before the retread is worn out.

My own experience of retreads is a very bad one, two going within sixty miles. No doubt they should never have been done. So far as I can see a cover must be retreaded—if the work is to last long before it would otherwise be scrapped.

B40

Consequently you either lose a large portion of the life of the original tread and get a successful retread which will last about half the time of the normal life of the original tyre, or your casing goes soon after the retread is put on. In either case you lose.

At best (short of freaks) you do not save anything, as the retread costs half the price of a new tyre, and gives, say, half the mileage, while you stand the risk of it doing far less and save all the bother of sending it away and waiting for its return.

Regarding the letter of Messrs. Ripley Strong [20978] anent rebuilding the casing before retreading, this is very sound if the cost is not prohibitive, but I fancy by the time retreading and rebuilding were paid for the cost would not fall far short of that of a new tyre, in which case you might as well buy one.

As regards Searle tubes, I have often been tempted to buy one, but consider the price too high. How long will they last?

Personally, I find the best plan is to run tyres to death. It is less bother and, with liners (which I find most satisfactory on a 19 cwt. car, 760×90 wheels), I run till I can see the liner through the cover and seldom get a burst or undue trouble. In fact, I consider liners save many punctures. They are no trouble to fit and outlast many tyres. I find I get at least 4,000 miles a cover. At this moment my two front tyres have each a hole clean through them, and I have run them a considerable distance (at least 500 miles) in this state with the liner and an internal gaiter over the place—cost 2s.—without any trouble or bursts. Mine is not a fast car, but I average 20 m.p.h. I should be glad of readers' experiences with the various systems of sticking two more or less worn covers together. Mine are unfortunate, as the stitches tore away at the sides very early in the day.

FARM.

OVERSIZE TYRES.

[21017.]—We note with interest a letter [No. 20993], signed "O.G.," in your June 27th issue, and as the same question has been asked us very frequently, perhaps you will allow us as prominent makers of oversize tyres to explain the anomaly.

If we look at the prices of Moseley grooved tyres we find that the oversize 880 × 135 is listed at £5 17s., whereas the ordinary sized grooved tyre 895 × 135 is listed at £5 14s. 6d. In other words the oversize tyre is 2s. 6d. dearer. This is not such a great difference as the instance which your correspondent mentions, but at first sight it does appear strange that the oversize tyre should be dearer. We think your correspondent will clearly see why it should be so if he considers that, whilst the sections of the two tyres are the same, the oversize is made to fit on the 880 × 120 rim, which rim is of larger diameter than the 895 × 135 rim, and therefore it follows that the oversize tyre 880 × 135 has more material in it than the 895 × 135 tyre, and, consequently, costs more. Strictly speaking, the oversize tyre should be given some other measurement, but, from a manufacturer's point of view, it is more convenient to call it 880 × 135, thereby denoting it fits on the 880 × 120 rim, which is easily remembered, than to call it, for example, 910 × 135, or some such figure.

We ourselves introduced the oversize tyre eight years ago, and have constantly advised the larger sized tyres ever since, and in order to give every inducement to the motorist to fit oversize tyres we have, contrary to your correspondent's suggestion of "reaping more than the usual profit," actually brought the price of the oversize tyre down below the current market prize for ordinary tyres.

DAVID MOSELEY AND SONS, LTD.

LOUD WARNING SIGNALS.

[21018.]—Letter 20988, over the initials "T.S.F.," suggests using the Klaxon on the full voltage for the country, and on a slightly reduced voltage for town.

"T.S.F." is anxious to know if other readers have tried this scheme. We, as manufacturers of the Klaxon, would like to state that the idea as suggested by him, *i.e.*, 8 or 12 volts for the country and 6 or 8-10 volts for town use, would not bring about his desired effect.

The sound of an 8 volt Klaxon on 6 volts, though less penetrating, would be still too powerful for general town use, and equally so if a 12 volt Klaxon were worked off 8-10 volts. The voltage would need to be reduced by not less than 50%; but we would like "T.S.F." to consider a suggestion that is ever so much more simple, and one that can be brought about without any alteration of wiring, etc.

Let him give the Klaxon push button a quick and light touch with the palm of his hand, and notice the effect. The Klaxon will emit a short, sharp, deep-toned note. This is known as the Klaxon "Tiger."

Correspondence.

When driving in town, except in cases of extreme emergency, the "tiger" is all that is necessary. One "tiger" is more effective than a dozen nagging "honks" of the bulb horn, and makes much less noise, neither does it offend.

It is ideal for corner work, or to stop a pedestrian absorbed in thought from stepping into the roadway. The driver, however, should only use the palm of the hand, as it is not possible to get an effective "tiger" by any other means.

When "T.S.F." has tried the foregoing suggestion we shall be delighted to have his opinion. THE KLAXON CO., LTD.

SPARKING PLUGS.

[21019].—We have read on page 1125 of your issue of June 13th a paragraph by "Runabout," in which he states that sparking plug manufacturers seem ignorant of a sufficiently searching test. We have no idea who "Runabout" is, but if anybody has to be searching, it must be the gentleman using this *nom de plume*, as if he had searched at all for information and had reached as far as 204, Tottenham Court Road, he could have been furnished with some information that would have enabled him to give the public something reliable.

It may interest you to know that no detail on a motor car has received so much attention as the sparking plug. It can also be said that no detail for its size has given so much trouble to the manufacturer as the sparking plug, and that we, as manufacturers, turning out as we are to-day 200,000 plugs per month, are not doing this without due consideration for the various purposes for which the plugs have to be used.

Very little searching would be necessary on the part of "Runabout" to find out how many different types of sparking plugs are manufactured to meet the various requirements of engines by this firm alone. We do not think it fair of "Runabout" to make such a bold statement in ignorance, when it is such a simple matter to learn the truth.

THE BOSCH MAGNETO CO., LTD.

Arthur E. Bennett, Technical Manager.

A proof of the foregoing letter was sent to "Runabout," whose rejoinder is as follows:

Mr. Bennett does justice to the reputation of the Bosch Co. in word rather than in thought. I happen to have run a car for five years on one and the same set of Bosch plugs. Hence, it was hardly probable that I should fit a different make of plug without trying the Bosch, or that I should complain of plugs in general without testing the make which had previously served me best. Mr. Bennett may be interested to know that the Bosch plugs which served me so well on an obsolete make of slow-speed engine proved utterly inadequate to the demands of the 1914 high-speed miniature four-cylinder. I used up two complete sets of the two leading types of Bosch plugs on my Morris-Oxford car during the first six weeks of the current year, since when I have eschewed the Bosch and used rival types. Some of these have given at least as much trouble as the two sets of Bosch plugs; but I am at present using another German plug which has given no trouble at all for three months. Mr. Bennett, therefore, owes me an apology for imagining that I make sweeping statements without experience. I have actually tried all the best known plugs on the market during the present year. RUNABOUT.

PETROL CAN STOPPERS.

[21020].—Personally, I intend to use the bottoms of the cans until the petrol people have the decency to give us a tool for nothing. Surely they can afford to, just as much as a sardine packer can; it would save them money. X. Y. Z.

PINKING.

[21021].—I have in my charge a 12-16 h.p. Sunbeam, which was delivered as recently as a month ago, and has covered 1,300 miles. This car was inclined to "pink" when pulling slowly, so I filled the tank with equal proportions of petrol and benzole, having tried this with success on a 12 h.p. Rover. The result was, as I anticipated, that all signs of "pinking" disappeared. The car pulls as well as before, and consumption is slightly decreased. I get twenty-five miles per gallon. I heard of the tip through a friend who had read it in *The Autocar*. CHAUFFEUR.

THE INDIANAPOLIS 500-MILE RACE.

[21022].—Allow me to correct the statement in your issue of June 20th, that M. Christiaens, driver of the Excelsior car in the Indianapolis 500-miles race, "nearly collapsed from fatigue when the race was a little more than half completed, but gamely stuck to the wheel until

the finish." On the first of his two stops M. Christiaens caught his heel on the edge of the car body, and, instead of vaulting out, stumbled to the ground. He was up again in a fraction of a second. Because a man slips when vaulting out of a car it is somewhat hasty to conclude that he is on the point of collapse. M. Christiaens was the only man in the race to make his own replenishments, change his own tyres, etc. All the others employed the two helpers allowed under the rules. The Excelsior was leading for the first forty laps, then, as the track got greasy from oil drippings, the driver found it impossible to take the turns fast with a car minus a differential. Speed had to be reduced, and the car finished sixth in less time than last year's winner. The bonnet was never lifted, and not a tool was used. There were few workers on the track as fresh as Christiaens at the end of that race.

W. F. BRADLEY,

Team manager for J. Christiaens, Thomas, Guyot, and Duray.

THE PRICE OF PETROL.

[21023].—The recent discussion in Parliament has once again drawn attention to the fact that the main petrol supplies of the world are now concentrated in a very few hands; hence the measures for self-protection forced on the Government, and hence also the high prices charged to private users. May I, therefore, add my testimony to that of the other members of the Petrol Users' and Traders' Supply Society, whose letters you have been good enough to publish?

This association was founded by motorists, not for the sake of dividends, but to obtain, through co-operation, petrol at a reasonable rate for its members. If, however, a penny saved is a penny gained, it is really a very money-making concern. I cannot do better than relate my own experience.

Originally I took sixteen £1 shares, each of which entitles me to call on the society annually for twenty gallons of motor spirit. Up to the present I have received 240 gallons, which is all I have asked for or needed—delivered at my door in two gallon tins at 1s. 2½d. per gallon. I gave, for trial, two gallons to the garage owner from whom I was accustomed to buy my supplies. He, honest man, declared it to be the best he had used, an opinion I heartily endorse. It is very easy to start on, and gives increased flexibility and mileage. Besides saving 6½d. on every gallon, I have the prospect of a bonus on the total quantity used by me, and also a 5% dividend. Obviously, the yearly return on my invested capital is considerably over 50%. It is beyond my comprehension that motorists should continue to pay extortionate prices when a means of escape so easy and satisfactory is at hand. G. ARCHDALE REID.

:: BOOKS and MAPS ::
:: FOR MOTORISTS ::

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Flashes.

The lighting-up time for to-day (Saturday, July 4th) is 9.17 p.m. * * *

The Monmouthshire C.C. is promoting a scheme for a new road from Bedwas to Caerphilly, including the construction of a bridge. The new road will avoid the present hill, and also cut out the circuitous bend in the present road. * * *

The Japanese Ministry of War is making provision for the formation of a Motor Car Corps in connection with the Japanese Army. * * *

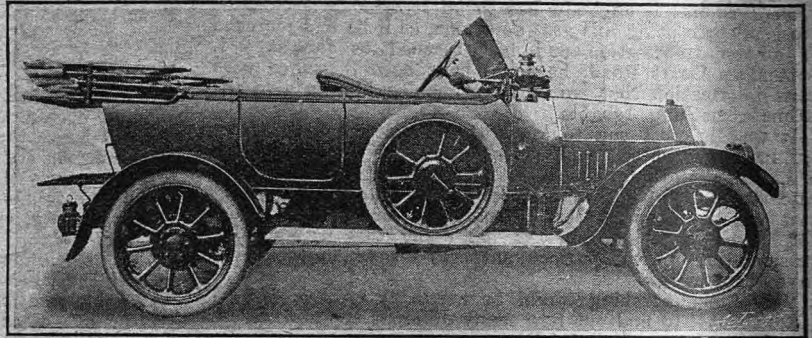
The annual automobile meeting at Boulogne-sur-Mer is to be held on the 20th, 21st, and 22nd July. The programme will comprise a 300 metre speed trial on the well-known hilly Rue Porte Gayole in the town, a 7 kilometre speed trial on the level, and a mile hill-climb at Baincthun. It is stated that a sum of £240 will be offered in prizes in connection with the meeting, which will close with an appearance competition. * * *

As the result of a conference between the Middlesex and Surrey County Councils with regard to the proposed improvement of the bridge over the Thames at Richmond, it is announced that it has been found to be possible to devise a scheme at a moderate cost to widen the bridge and improve the approach on the Surrey side, whilst retaining the present outline of the structure. * * *

At a single sitting of the Feltham (Middlesex) Police Court, thirty-two motorists were fined for exceeding the speed limit. The Godalming magistrates, too, continue to exact toll upon motorists, as at a recent sitting they levied fines and costs amount-

ing in the aggregate to nearly £50 upon some forty motorists. Such a common everyday occurrence has the prosecution of motorists become at Godalming that a local newspaper, in reporting the proceedings, remarks, "There were no features of public interest in the details of the cases." * * *

The Manchester Corporation has recently effected several small, but valuable, improvements in various thoroughfares in Manchester at the instigation of the Lancashire and Cheshire Branch of the Roads Improvement Association.



A 15.9 h.p. Belsize car supplied to the Crown Agents for the Colonies for service in the Gold Coast district. The car has a 4ft. 8in. track, unusual road clearance, colonial springs, Claudel-Hobson carburettor with extra air inlet, specially large radiator, an extra petrol tank under the dash, and Dunlop tyres. The parts usually plated have black oxidised finish.

The programme of the annual automobile meeting at Ostend, from the 11th to the 14th July, has now been issued. The proceedings will commence with a rally, the starting points for the cars proceeding to Ostend for the purpose of participating in the rally being Antwerp, Brussels, Charleroi, and Liège. On the 12th there will be an appearance competition, and on the 13th a series of flying kilometre and 20 kilometre speed trials. * * *

The Dundee Harbour Trust announce that, as a result of the lengthening of the Craig Pier, the ferry steamers plying on the River Tay between Newport, Fifeshire, and Dundee, can now land motor vehicles at all states of the tide. As the boats run hourly, every facility is now available for the quick transit of vehicles between the South and the Highlands. * * *

The city of Chicago, since June 15th, has put into force a head-light ordinance prohibiting motor vehicles from using dazzling or glaring head lights. Lights and devices may be submitted by manufacturers to a board of inspectors appointed under the ordinance, and when the devices, etc., have passed certain tests in dark rooms and on the road, the manufacturers are given a certificate, a copy of which may be issued to purchasers, provided the lamps or other devices are exactly similar to the one passed by the board. Users of certificated devices will be free from molestation by the police.



A car in a 10 ft. trench. Whilst driving recently at 11 p.m. between Weymouth and Dorchester, a doctor failed to understand the arrangement of the lights round a trench, cut partly across the road, and charged a 4 ft. bank of earth, surmounted it and dropped into the trench as shown above. The doctor was, fortunately, not seriously hurt.

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 Auto-car," 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. 3187.—Argyll Petrol Consumption.

"W.H." says he does only 18 m.p.g. I can only get 17 m.p.g. for a 1913 12-18 h.p. Argyll. I was told that I should do quite 28 or even 30 m.p.g. I should be quite pleased if I could get 25 m.p.g. or so.—G.M.H.

No. 3180.—Carburettor for 16-25 h.p. Alpine Austro-Daimler.

I own a 16-18 h.p. Austro-Daimler. When I first bought the car I had exactly the same trouble, and obtained the same mileage, viz., 15 m.p.g. I had a Claudel-Hobson fitted, and get the following mileage now: Petrol, 22 to 26; half petrol, half benzole, 28 to 30; benzole, 30-33 m.p.g. I prefer the half-and-half mixture, as pure benzole is rather dirty. I also use a Bowden air inlet, but employ it chiefly for running downhill without the brakes.—F.R.C.V.S.

No. 3087.—Carburettor for 12 h.p. Talbot

I have one of these cars, 1914 model. Driving it from London to Lancashire I got somewhere near 20 m.p.g.; after that my mileage got worse. I examined the adjusting screw at the bottom of the carburettor, which is set at the works and is not supposed to need any further adjustment; I found it loose. I have screwed this up until I can get 17 or 17½ m.p.g., but have just found out that the metal float which is fitted to this year's models (cork in previous years) is full of petrol. If the querist will examine these points he may be able very much to improve his mileage.—WM. TATTERSALL, JUNR.

No. 3181.—Misfiring.

I advise fitting a set of Stentophone spark gaps, which immediately act as tale-tellers, enabling you to see at a glance if you have the spark to the top of the plug. If perfect to this point, you have to look to the plug for the trouble, and though this may spark perfectly out of the cylinder, it is not doing so when under compression. If you are not getting a good spark at the plug (and supposing your K.W. or ordinary coil is right), you have to look to the magneto, the trouble most probably being caused by a very small piece of wire from the brake bands shorting one of the magnets.—A.W.T.

No. 3182.—The Use of an Extra Air Valve.

I have been much interested in query and reply No. 3182 on this subject. Your reply says: "With regard to running downhill with the throttle closed and the air valve open, this is quite the correct thing to do, and although the throttle may not actually shut, yet the opening of the air valve nullifies the slight opening of the throttle, and no suction is exerted upon the jet. We should not advise the ignition being switched off when going downhill." A short time ago, before descending a very steep and dangerous hill, I engaged first speed, opened the extra air valve fully and closed the throttle, allowing the

engine to act as a brake. Halfway down the hill the carburettor caught fire, presumably owing to the very weak mixture. The engine is a high compression one, with a long stroke. Since then, with a view to avoiding a similar mishap, I have switched the magneto off. As is stated in the query and reply, there is a danger of this procedure being followed by an explosion in the silencer, and possibly a burst. I have, I think, obviated this danger by utilising the cut-out, which is fitted to the car, for a short distance, when the engine takes up the running again.—LC 3095.

No. 3183.—Stelastic Tyres.

I have an 810×90 mm. on the off side rear wheel of a 11.9 h.p. four-seater Humber touring car. This has now run just over 4,000 miles over all sorts of roads, including the coast route to Land's End and back, and has required no further attention than care to keep just over 70 lb. pressure. Have had no punctures, and, more satisfactory still, there are no cuts in the tyre, and it looks thoroughly good for a long time yet. Altogether it is the most satisfactory tyre I have had yet. I am so well pleased that I have just put a similar one on the near side driving wheel, and am considering using no others.—BRUM.

No. 3133.—Picking up Water for Steamers

Answering "Loco's" queries as to my maintaining the Stanley steam car in instant readiness for starting by keeping the pilot light going, I should like to point out that after blowing off, my man allows the water to syphon into the boiler from the tank, which usually takes about half an hour after blowing off. The vaporisers during this time have not lost all their heat, and the relighting of the pilot takes less than a minute. I am aware that by this practice carbonisation in the vaporisers is apt to occur sooner than if the fire is only lighted when required; but for the small expense of a new vaporiser I think it is well worth while.—C. P. HUNTER.

"Loco" raises the question of blowing off the boiler and yet leaving the pilot light going. I do not know what system Mr. Hunter practises, but I mention a tip which I use myself. When I bring my car into the garage I blow the boiler down to about 300 lb., with the pilot turned as low as possible, jack the back wheels up, and run the pumps from the remaining steam until the boiler is nearly full. The sediment settles to the bottom of the boiler, and when the main fire is turned on in the morning this is stirred up by the heat. If the blow-off tap under the boiler is opened it can all be blown out without noise. My car is a 10 h.p. four-seater, and gives about thirty-five miles to a tank of water in Devonshire, but it is rather a close shave. Personally, I do not consider a petrol car is in the same street as steam, and yet some experts (!) say steam cars are useless.—STANLEY.

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ECONOMY—POWER—
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A FEW RECENT TESTIMONIALS
(unsolicited). Originals can be seen
at office if desired.

Littlewick Green.

Dear Sirs,

I have had a "S.U." Carburettor fitted to my Straker Squire after infinite trouble with other Carburettors, with complete success in every way, and as it is a pleasure now to drive the car, it should be a pleasure to recognise the cause.—L.M.

Kensington, W.

Dear Sirs,

I have had a "S.U." Carburettor fitted on my 18-25 h.p. Mercedes for over 3 years, and it has never given any trouble whatsoever. It has given me the fullest satisfaction.—M.M.

Thrsk.

Dear Sirs,

I am pleased to be able to say I find the "S.U." Carburettor everything you claim for it. It is a pleasure to drive a car fitted with same.—W.H.

Wyld Green.

Dear Sirs,

I herewith enclose cheque for Carburettor. I have now given it every test, and am delighted with the result. It is certainly a great improvement on any Carburettor I have had.—J.A.

Portsmouth.

Dear Sirs,

I have much pleasure in sending you cheque. The Carburettor has added new life to the car, especially on hills.—R.B.

Fareham.

Dear Sirs,

The Carburettor has proved very successful. It has reduced the petrol consumption of my 12-20 h.p. "HUMBER" from 13 m.p.g. to 19½ m.p.g. It also gives greatly increased power.—D.

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Some Queries and Replies (Continued).

No. 3163.—13.9 Stoewer Car.

I have had a 13.9 four-seater Stoewer for just over a year, during which time I have used it for 8,500 miles. Just recently I had the engine, gear box, and back axle dismantled, and the garage people have informed me that there was no trace of wear whatever. The car runs even a little better now than when new. It is easily capable of 50 m.p.h. on the level, and I have speeded it up to 57 m.p.h. Petrol consumption is about 30 m.p.g., and the original tyres are not nearly worn out. The cooling is perfectly efficient on the most hilly parts of the Derbyshire Peak District, and I find that it is only a very high-powered car that I cannot pass on a hill. The year before last I had another Stoewer, which I ran for 18,000 miles without an overhaul, and then the car did not require it.—N. L. GODBER.

QUERIES.

No. 3193.—12 h.p. Rover Petrol Consumption.

WILL any readers inform me how many miles per gallon of petrol they are getting from the 1914 12 h.p. Rover car?—W.G.H.

No. 3194.—18-24 h.p. 1914 Siddeley-Deasy
WOULD any owner of one of the above cars kindly give an un-biased opinion of it, with special reference to its hill-climbing powers and general running?—D.H.P.

No. 3195.—Stoewer Car.

WILL any user of this car kindly tell an intending purchaser of any alterations or additions which should, with advantage, be made in a new car? Does this car wear well and last long?—O.C.S.

No. 3196.—Diameter of Rear Axle.

COULD any of your readers let me know the method of calculating the diameter of a rear axle, say, for a car weighing 26 cwt. light, with seating, including driver, for seven passengers for town work and five passengers for touring? The car in question is a 15.9 with cabriolet body. The axle takes both weight and drive,

and runs on ball races at end of sleeve and at end nearest differential. I am anxious to know whether the axle is up to its work.—ALPHA.

No. 3197.—Siddeley-Deasy Instruction Book.

I HAVE just bought a 14-20 h.p. Siddeley-Deasy, 1911 model, and shall be grateful if any of your readers can lend me a copy of the instruction booklet for it; the makers have none.—E. CURNOW PLUMBER.

No. 3198.—Tour in Ireland.

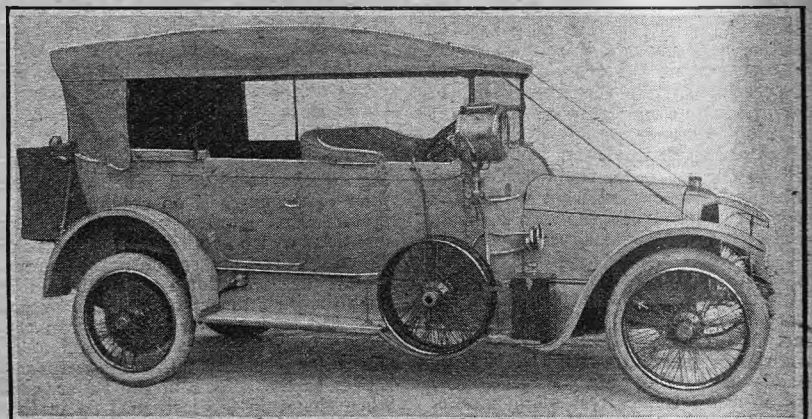
WILL some kind reader give me a good tour in Ireland to occupy about three weeks? I should like to do Killarney and neighbourhood, and after that any pretty and interesting run. Is it true that some of the Irish resent motorists and "fling a brick"?—MOTORIST.

No. 3199.—Triplex Glass Screen.

I SHOULD be greatly obliged for the experiences of readers on the subject of Triplex glass for a wind screen. Is there any difficulty in seeing through it, and what is the result when it breaks? Is the advantage great over plate glass?—TRIPLEX.

No. 3200.—Carburettor for 14-16 h.p. F.I.A.T.

I HAVE a 14-16 h.p. F.I.A.T. car, which has four cylinders 90 mm. bore and fitted with low tension magneto, and the carburettor supplied when the car was sent from the makers. The car is satisfactory in every way except petrol consumption. It is very extravagant in petrol—the best average I can get is fifteen miles to the gallon. I shall be glad of the experience of other F.I.A.T. owners who have fitted carburettors in place of the original one supplied by the makers. Is there any make of carburettor which I can depend upon to give a distinctly better mileage without loss of present excellent accelerating power? I do not want the expense of experimenting, but I would welcome the experience of any owner who has made a change with really satisfactory results. I am running on benzole and Diamond spirit in equal proportions.—SUNSHINE.



A 28 h.p. Panhard fitted with a flush-sided body to the order of The Spassky Copper Mines, and supplied by Messrs. W. & G. Du Cros, Acton Vale, London, W., this being the third repeat order for a vehicle of this type. This car has been specially designed for use in Siberia, and amongst other special features it has petrol tanks built into the scuttle dash, at the back of the driver's seat, under the driver's seat, and in the rear of the car; also special oil and water tanks. A Blériot projector, as shown, is fitted on the off-side. The wheels are Dunlop detachable.

Week-end and Touring Notes.

A Holiday with Car and Tent.

To those who are thinking of taking a motor camping tour, the following account of a Whitsuntide holiday spent in this way may be interesting and instructive. We, that is my husband, myself, and our Aberdeen puppy, determined to go into camp for Whitsuntide chiefly as an experiment, with the idea of taking a longer holiday on the same lines later on.

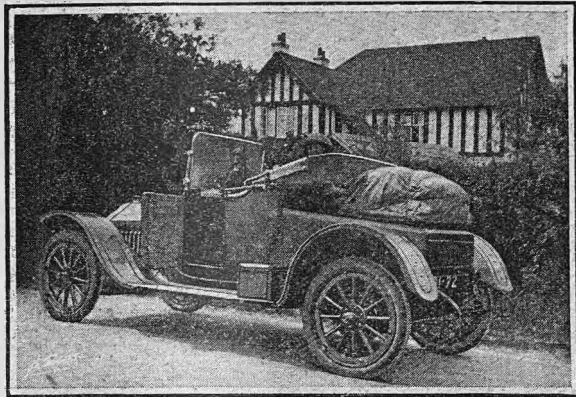
Our car is a two-seated Oakland, which we always look after and drive

of a Primus stove and a methylated stove with sufficient paraffin and spirit, a kettle, frying pan, two cooking pots, enamelled plates, cups and saucers, knives, forks, and spoons, bath towels, cloths for washing up, a looking-glass, a strap with hooks to fasten round the tent pole, and two small suit cases containing our personal belongings. Some newspapers were found very useful on which to place things upon the ground. A supply of food sufficient to

last from Saturday afternoon until Monday night was taken, and we also had, of course, a bottle for milk, another for water, and tins in which to put butter, bread, biscuits, etc. Milk and eggs we were able to get daily at farms; bread we procured with difficulty on Bank Holiday, but, needless to say, as a rule all that is required in the way of food could be obtained without trouble.

Having packed everything securely upon the car, and taken the accom-

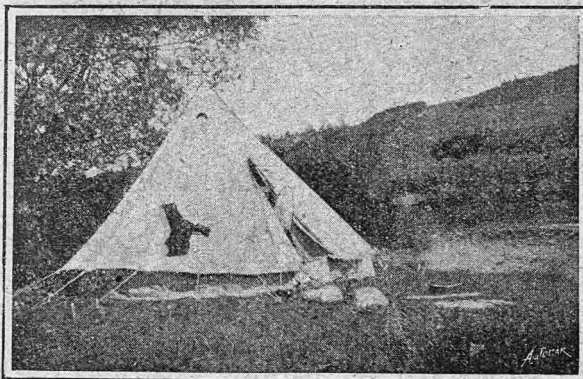
panying snap-shot, which shows how neatly our extensive equipment could be stowed away, we set out just after mid-day on Saturday. The first day's run of about seventy miles was not marked by any special incident. Towards evening we reached the New Forest and began to look about for a suitable camping place, being anxious, if possible, to get near to a supply of water. We found, however, that many of the streams marked on the map were dried up, so, as it was getting late, we pitched our tent on the outskirts of the village of Wood Green, near Fordingbridge. The only drawback to this spot was that the water for cooking and washing had to be fetched from a spring at the bottom of a hill, which was rather laborious work. Some difficulty was experienced in driving the tent-pegs into the ground, as beneath the turf the soil was of a gravelly nature, but as there was no wind it was found to be



Before the start of the Whitsun motor camping tour. The two-seated Oakland car, with tent and complete camping equipment packed upon it.

ourselves. We took an army bell tent with a pole in three pieces, a camp table, two chairs, a camp basin and bath with a frame, and a canvas bucket, all of these being collapsible. These articles were lent to us, but can be hired at a very reasonable charge, which would save the expense of buying them and avoid the difficulty of storing them when not in use. Instead of taking collapsible camp beds and mattresses, we decided to experiment in making up a bed upon the ground. For this purpose we provided ourselves with two waterproof sheets, each 7ft. x 4ft. 6in., two pieces of carpet about the same size, two eider-downs, and three large warm rugs, two of the latter being Jaegar, putting all on the ground except one eiderdown and one Jaegar, which we used for coverings. The seat out of the car made an excellent bolster, and we had two air pillows. It may as well be stated at once that this arrangement was an entire success, and on another occasion we should not attempt to improve upon it. The puppy was accommodated on the mat out of the car, and we all slept well. It is advisable to have a watch dog of some sort on these occasions, as he will growl or bark should any human intruder, not to mention cattle, approach the camp.

Our equipment further consisted



A delightful camping spot on the banks of the Thames.

Install a DRUMMOND 6in. lathe in your garage; it will install itself on the credit side of your motoring accounts. :: ::

This is an inexpensive tool with an exceptionally wide range of capability. Installed in a garage it will prove itself of the greatest help in the full enjoyment and success of your motoring and a never-failing factor of economy when the other side of motoring—the accounts—is under consideration.

Such a lathe as this will raise your garage above the level of a mere motor-house, making it a real home for your car, where repairs, replacements, adjustments, can be readily, carefully, immediately, seen to as well as, maybe, better than, in professional hands. This lathe is not merely one to tinker on; its size (centres, 6ins., rising to 9ins.: length of bed, 4ft. 6ins.) makes it a lathe not only capable of doing all running repairs ever likely to be required, but capable of undertaking practically all breakdown work as well.

One of the chief points on this lathe is the exceptionally convenient self-acting boring table. By the undoing of one nut the compound slide rest can be removed leaving a truly surfaced T-slotted boring table of large dimensions (9½ins. by 12½ins.) of great use in motor work.

In a private or small professional garage it is essential that the lathe cover a very wide range of work, the requirements of space, etc., limiting the amount of plant. This lathe is easily capable of undertaking jobs which, in the ordinary way, would be put up to a lathe of far greater centre height, and costing from three to four times the price of this tool.

A few instances of work which could not be touched on any other lathe of the same size are:

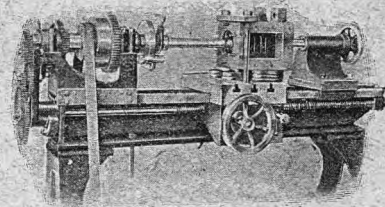
Reboring Cylinders; Reboring and Re-bushing Differentials, Gear Cases, and Crank Cases; Truing Flywheels; Turning up Cone Clutches; Turning Brake Drums; Turning Brake Shoes.

And there are a hundred and one jobs that can be more easily tackled on this tool than on a lathe of common design.

The general finish, the accuracy, and workmanship of this lathe are of a high order. It is built to withstand hard usage and in quite inexperienced hands will do good work.

Mr. J. E. Smith, of the J.E.S. Motor Works, Gloucester, writes us concerning this lathe as follows:

"I have a number of your 6in. lathes turning out various parts of work in connection with my Auxiliary Motor Attachments, and I am pleased to say that the lathes can be relied upon for very accurate work; no difficulty is found in keeping the work within an accuracy limit of one-thousandth. It might please you to know that as soon as I require more lathes I shall have no hesitation in ordering your 6in. lathes, as I consider they are excellent value."



The price of this lathe, as shown here, or with countershaft for power, is £33. We shall be pleased to send full particulars, specifications, etc., upon receipt of a card.

Drummond Bros, Ltd.,
Auto Machine Tool Works,
Guildford, Surrey.

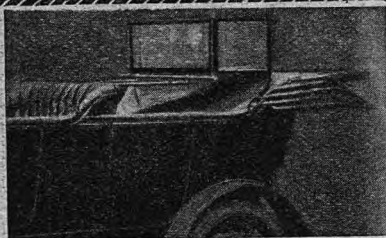
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Complete.

The Perfecta Co., Bridge Works, DARLINGTON.

Week-end and Touring Notes (Continued).

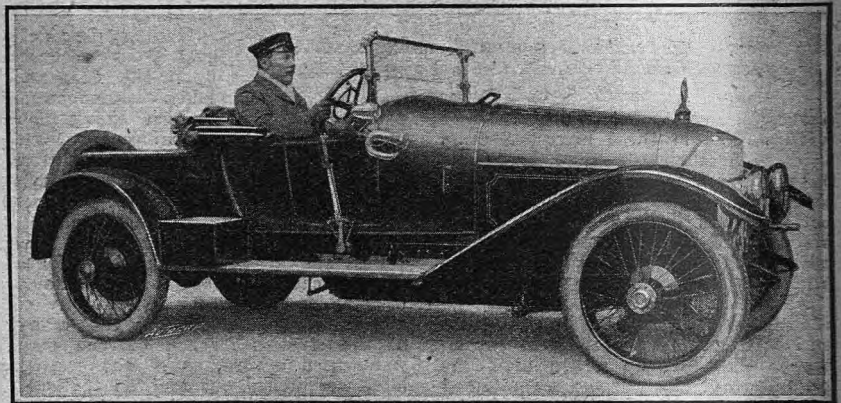
unnecessary to drive the pegs very securely; certainly the spot had many advantages, and, above all, was nice and dry. When choosing a camping place the water supply and the state of the ground, should be ascertained before beginning to unpack the camping equipment.

It took some time to get everything into order and enough water brought up to the camp for the morning, and we were quite ready for dinner by the time it was cooked. The menu may be of interest as an example of what is feasible under the circumstances: a tin of grouse soup, sausages and potatoes, Swiss roll, cheese and biscuits, and tea afterwards, as we had no coffee. For lighting the tent we had an electric lamp and a length of wire which was connected to the accumulators on the car and introduced through the ventilator of the tent. This was, of course, a luxury, and, if there had not been electric light on the car, candles stuck in bottles would have served for lighting the tent.

Undoubtedly the best part of camp life, if the weather is good, is the early morning, and one's appetite for breakfast in the morning's sunshine is astonishing. By the time our camp had been struck and a supply of milk

and eggs procured, it was about 11.15. That day we had another successful run of about the same distance with lunch and tea *en route*, stopping wherever we felt inclined to admire the views or study the map. In the evening we camped upon the banks of the Thames, near Pangbourne. Here we got within a few feet of the river and so were able to obtain as much water as we wanted without any trouble. Permission had been received from a farmer to pitch our camp in his field, and as it was a windy night and inclined to rain the tent was pitched with its back to the wind and sheltered by a hedge and some trees which also protected the car. In front of the tent we built a good fire of wood, of which a plentiful supply was found close at hand.

The next morning was fine and sunny and we had a swim in the river—another advantage of camping on the bank of a river. On Monday an earlier start was made, as the packing up, etc., naturally can be done more and more quickly as one gets used to it. After another run of about seventy miles, with halts for lunch, tea, and supper, we arrived home at about 9 p.m. after an extremely successful and enjoyable holiday. V.M.F.T



A 27-30 h.p. Prince Henry Austro-Daimler, 105 x 165 mm., with its owner, Mr. Robert Yule, at the wheel. The body, which was built by Messrs. Million Guet to Mr. Yule's specification, seats four, two on the rear folding seat. Houdaille hydraulic shock absorbers are fitted, and the car is finished in dark green with black mouldings and white lines. Mr. Yule started motoring in 1899 with a Werner front-driven motor bicycle, which was followed by a Quadrant and afterwards a Singer. In 1900 he became possessed of a Locomobile steam car, and in 1901 a two-cylinder Gladiator. Since then he has owned and driven the best known European and American cars, his present stud consisting of two Rolls-Royce cars (1911 and 1914 models), and the car illustrated above.

For the fourth year in succession Messrs. Chas. Macintosh and Co., Ltd., have received a War Office contract for their steel-studded tyres.

An addition to the growing number of motor establishments in the West End of London is made by the new showrooms for the Bianchi cars now being opened at 26, St. James's Street, S.W., by Bianchi Motors, Ltd.

The Crypto Electrical Co. ask us to state that they have removed their offices from Bermondsey to their new factory at Acton Lane, Willesden, five minutes from Harlesden Station on the L. and N.W. Railway, but that they are still retaining a repair shop in Bermondsey.

We learn that Mr. Chas. F. Redden, the organiser and director of the selling department for Maxwell cars all over the world, is now on a visit to this country, and intends to visit as many Maxwell agents as possible in the time available.

Their lease having expired, Messrs. Osborn and Co., Ltd., agents for Gregoire cars, have made arrangements to remove, on July 4th, to larger and more convenient premises at No. 4, Great Marlborough Street, Regent Street, W., two doors from their present address. We are asked to point out that the business has been established some twelve years, and has no connection with any other firm bearing a similar title.

Flashes (Continued).

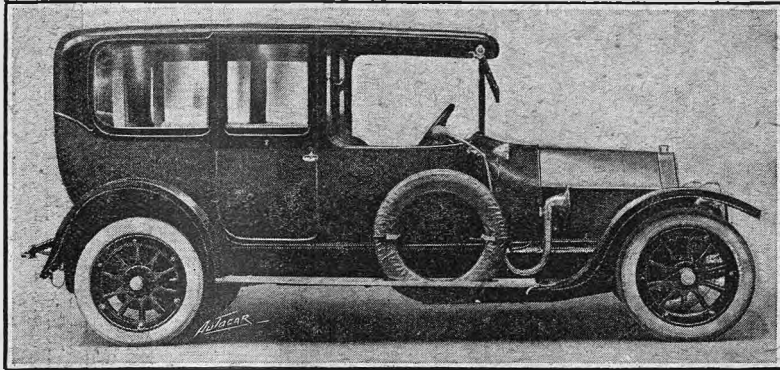
His Imperial Highness the Crown Prince of Germany has just purchased an 18 h.p. F.N. car.

Messrs. Sydney Westall and Co., Ltd., inform us that their sales department has been removed to new premises at 1, Chester Street, Grosvenor Place, London, S.W.

We are informed that the Austin Co.'s announcements and general publicity literature, for which Mr. A.

Messrs. Cleverlys, Ltd., automobile engineers, notify the removal of their showrooms and offices from 1 to 119, Long Acre, London, W.C.

We learn that Mr. Ernest H. Arnott, who has been more or less intimately connected with the motor trade since 1899, has been appointed to take control of a new branch of F.I.A.T. Motors, Ltd., which will be opened very shortly in Bristol at Hannah More Hall, Park Street. A stock of



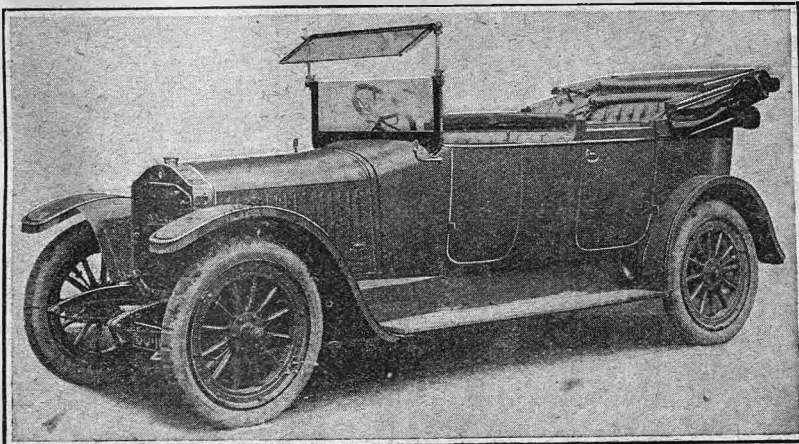
A 35 h.p. Lancia with a limousine body by Messrs. H. J. Mulliner and Co., recently supplied to a customer by Messrs. Curtis, Arthur, Campbell and Co.

E. Astington, the chief of the advertisement department, is responsible, were selected as worthy of representing British publicity methods for exhibition at the Advertising Convention recently held at Toronto.

A repair shop and garage has been opened by Messrs. J. A. Jackson and Co., the County Garage, 30, 31, and 32, Dean Street, Birmingham. The proprietor, Mr. J. A. Jackson, has had a very wide experience in the motor industry alike in the manufacturing and repairing shops and on the road. We have personal experience of his work, and are able to speak highly of it both in regard to quality and charges. It makes a great difference when the head of a business of this kind is a really practical man who is himself fully qualified to undertake any repair, however difficult, if needs be.

F.I.A.T. cars and spare parts will be kept in hand, and, in addition, Mr. Arnott will interest himself in the sale of popular-priced American cars, light cars, motor cycles, and accessories generally.

Although, as the General Electric Co., Ltd., point out, and as we know from actual use, Osram drawn wire lamps seldom fail, still the time comes when renewals are required, and that may be at an inopportune moment. Now the carriage of spare lamps on a motor car requires careful disposition, and in order to serve the motorist in this respect the General Electric Co., Ltd., 67, Queen Victoria Street, London, E.C., are putting out cases of robust construction and covered in strong leatherette, such cases containing a selection of lamps in conformity with the needs of each car.



An 18 h.p. four-cylinder De Dion (80 x 140 mm.) with a single cabriolet body, built at the Hendon coachworks of the English De Dion Company. The body is finished in fawn grey and upholstered in grey leather and corded cloth. Two additional folding seats are fitted in the inside of the body.

“Thermos Tea”
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The most suitable Tea for your Flask.

In convenient touring form—Packed in packets, sufficient to fill a one pint flask, thus preventing waste, in neatly decorated tins to fit into your tea basket. Securing you—when at home or touring—a really good cup of tea. Postage 3d.

Tin containing 12 charges 2/-.
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FOR
FORD
CARS.



TYRE SAVING JACKS.

GEMCO

Consider the pocket saving propensities of the Gemco Jack. Think how few of your tyres actually wear out, and how many are scrapped for bursts — bursts you are frequently quite unable to account for, unless by blaming the tyre makers. Those bursts are caused by the car standing, if only for one night, with its whole dead weight bearing down on a few square inches of tyre, perishing the rubber and straining the fabric to the uttermost. Gemco Jacks raise the car instantaneously off the tyres, and clear of stray oil too, and add 50% to the life of the tyres. Try a set. Sent on 7 days free trial, and we have never had a set returned yet.

Special Ford Model,	Standard for cars up to 3,000 lbs. weight,	Heavy for cars over 3,000 lbs. weights,
25/-	27/6	35/-
per set of 4.	per set of 4.	per set of 4.

SPARE TYRE & WHEEL CARRIERS.

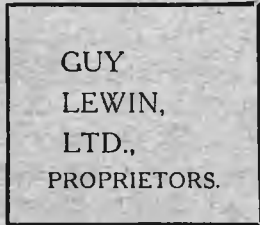
Strong neat carriers for spare tyres on Ford and similar cars. Entirely contained on footboard. Easily and quickly fitted. Finished in hard non-chipping black enamel. Take tyres up to 90 m/m or 3½ in.
For one tyre only 8/- with straps
For one or two tyres 10/6



Sole Agents: **A. J. DEW & CO.,**
21, Endell Street, LONDON, W.C.
Phones: Regent, 6262-6263 6264. Grams: "Dewmofac, London."

THE CLEANEST
REPUTATION IN
THE WORLD.

THE LARGEST
MOTOR PREMISES
IN THE WORLD.



GUY
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LTD.,
PROPRIETORS.

THE BEST CARS
IN THE WORLD.

THE BAKER STREET
MOTOR CAR BAZAAR
LONDON, W.

BARGAINS

ASTOUNDING OFFER through advantageous purchase in brand new tyres as hereunder, fully guaranteed; seven days' approval; order early; limited number only; cannot repeat at these low prices.

PLAIN.—650x65 (each): 3 Avon 25/4, 4 Clincher 27/3, 4 Continental 26/9, 2 Calmon 33/9, 2 Gaulois 26/9, 3 Hutchinson 28/3, 2 Henley 27/6, 3 Peter Union 27/6, 3 Roin 37/10, 700x85: 3 Avon 29/9, 2 Clincher, 3 Continental 30/6, 1 Hutchinson 32/2, 3 Midland 30/2, 2 Peter Union 31/6, 2 Calmon 38/9, 750x85: 3 Avon 31/6, 2 Clincher 34/3, 3 Dazin 35/4, 2 Peter Union 34/3, 1 Victor 44/8, 1 Goodrich 34/3, 760x90: 4 Avon 48/3, 3 Clincher 50/3, 2 Gaulois 48/10, 3 Goodyear 52/8, 2 Leyland 48/9, 2 Calmon 61/6, 2 Continental 48/9, 810x90: 2 Avon 49/7, 2 Dazin 55/11, 2 Peter Union 52/3, 3 Pirelli 54/3, 2 Roin 53/6, 2 Stepney 63/2, 2 Calmon 63/11, 815x105: 3 Avon 69/6, 2 Clincher 71/6, 1 Calmon 90/2, 2 Gaulois 71/4, 2 Peter Union 77/6, 4 Pirelli 77/11, 1 Midland 69/6, 820x120: 3 Avon 80/2, 4 Clincher 87/11, 2 Continental 85/3, 3 Calmon 87/6, 2 Englebert 87/6, 3 Gaulois 85/2, 880x120: 2 Dazin 100/8, 3 Englebert 93/9, 2 Pirelli 99/6, 3 Midland 90/9, 2 Burnett 124/6, 2 Clincher 95/2, 895x135: 2 Avon 100/.

GROOVED.—650x65 (each): 3 Avon 32/2, 1 Wood-Milne 35/2, 2 Clincher 33/9, 700x85: 2 Henley 38/2, 3 Midland 39/6, 1 Wood-Milne 45/2, 3 Avon 36/6, 2 Leyland 37/9, 750x85: 2 Henley 41/2, 3 Midland 39/6, 2 Avon 39/2, 760x90: 2 Wood-Milne 67/1, 2 Henley 61/6, 4 Avon 57/3, 3 Beldam 79/2, 1 Macintosh 61/6, 2 Sirdar 61/2, 810x90: 3 Henley 63/11, 2 Avon 59/9, 2 Beldam 79/2, 2 Spencer-Moulton 61/6, 3 Stepney 61/2, 3 Victor 57/3, 815x105: 3 Avon 84/2, 2 Beldam 105/2, 4 Clincher 90/2, 3 Leyland 96/6, 2 Midland 85/2, 1 Victor 111/2, 2 Wood-Milne 90/2, 820x120: 2 Stepney 105/11, 2 Spencer-Moulton 107/4, 1 Avon 86/11, 1 Beldam 124/6, 3 Clincher 107/4.

WEAR OUT YOUR OLD COVERS to the last degree, and save money by using loose liners, prevent bursts and punctures; should be used with worn and retreaded tyres; all brand new. 700x85 10/2, 750 10/3, 760x90 10/9, 810 11/2, 870 11/6, 875x105 13/6, 820x120 14/2, 880 14/6. All sizes.

FREE.—Rock Lubricating Oil, 5 gallons, 8/9, including free drum free sample. A, light; B, medium; C, heavy; D, extra heavy.

ARMSTRONG & CO., London.

Note Larger Premises. Phone: 1577 Hammersmith.

17, Goldhawk Rd., Shepherd's Bush.

"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.

Issued Capital.	Amt. of Share	Name of Company.	Present Prices.	This Year.		Last Year.		Div.	Div. Payable
				Highest	Lowest	Highest	Lowest		
£								%	
14,990	1/-	Abingdon-Ecco, Ltd.	1/3 1/6	1/6	1/3	3/6	1/3	50	Nov.
60,000	£1	Alldays & Onions (12/-paid)	18/- 19/-c	18/6	12/-	3 3/4	3	10	Ap/Dc
50,000	£1	6% Cum. Pref.	22/6 23/6c	23/-	20/6	5 1/2	5	6	Ap/Dc
209,802	10/-	Argylls, Ltd.	-/6 1/-	7/6	-/6	6/-	4/3	Nil	Dec.
73,319	£1	Associated Rubber Mfrs.	20/6 21/6	21/3	20/-	20/6	20/-	10	Apl.
200,000	£1	Belsize Motors, Ltd.	21/6 22/6	25/-	20/9	27/6	20/3	10	My/Nv
100,000	£1	" Cum. Pref.	18/6 19/-	19/9	18/-	20/3	19/6	6	Fb/Au
44,771	£1	Bowden Brake, Ltd.	5/6 7/-	7/6	4/-	7/9	3/6	Nil	Dec.
766,982	£1	Birm'ham Small Arms, Ltd.	41/6 42/-	45/6	40/6	50/-	40/6	15	Mr/Sp
203,150	£6	" Cum. Pref.	5 1/2 5 3/4	5 5/8	5 1/2	5 1/2	5	5	Mr/Sp
100,000	£1	Brooks, J. B., & Co., Ltd.	32/6 33/6	33/6	32/6	36/6	33/-	2 1/2	My/Nv
100,000	£5	" Cum. Pref.	5 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	My/Nv
20,861	£1	Calcott Bros., Ltd.	42/- 43/-	44/10 1/2	28/-	31/-	13/9	5	Oct.
207,952	£1	Charron (New)	11/3 11/9	26/9	10/-	26/6	7/9	15	Ju/Dc
200,000	£1	Clément-Gladiator	3/- 3/6	4/6	3/3	6/-	2/1 1/2	Nil	Dec.
100,000	£1	" 6% Cum. Pref.	10/6 11/-	12/6	11/-	15/-	12/6	4 1/2	Ju/Dc
55,000	£1	Components, Ltd.	4/6 5/6	6/6	4/6	7/9	4/6	Nil	Dec.
35,000	£1	" 7% Cum. Pref.	10/6 11/6	13/-	10/9	13/-	12/-	7	Dec.
275,000	£1	Darracq, A., & Co., Ltd.	26/9 27/-	35/-	24/9	33/-	9/9	Nil	Ju/Dc
375,000	£1	7% Cum. Pref. Ord.	19/- 20/-	22/3	19/-	20/3	13/-	2 1/2	Ap/Oc
159,229	£1	De Dion-Bouton, 7% Ord.	5/6 6/6	7/6	5/9	10/-	6/6	Nil	Dec.
300,000	£1	Dennis Bros.	19/6 20/-	21/9	19/9	23/6	21/10 1/2	10	My/Nv
1,000,000	£1	Dunlop Rubber	40/- 41/-	44/6	33/6	42/-	34/-	5	Dec.
495,000	£1	" Cum. Pref.	19/9 20/6	21/-	19/6	20/-	18/6	6	MJSD
312,785	£1	" Income Stock	19/- 20/-	19/6	17/-	19/-	17/-	5	Ju/Dc
624,995	£1	Parent Tyre Co., 8% Ord.	17/6 18/6	19/-	14/6	18/-	13/9	10	My/Nv
991,990	£1	" 5% Cum. Pref.	14/- 15/-	15/-	12/3	15 1/2	11/6	2 1/2	My/Nv
499,962	£1	" Deferred	16/3 16/9	18/-	12/6	15/6	8/-	5	Nov.
100,000	£1	Enfield Cycle	31/- bid	32/6	23/-	24/-	18/-	10	Oct.
25,000	£1	" Cum. Pref.	23/- 24/-	23/6	21/-	23/-	21/-	7	Fb/Oc
292,904	£1	Humber, Ltd. (New)	11/6 12/-	13/3	11/-	14/-	6/9	Nil	Nov.
331,495	£1	" 6% Cum. Pref.	17/6 18/-	18/1 1/2	15/6	17/9	10/1 1/2	6	Nov.
100,000	£5	Lucas, Joseph, Ltd.	8 1/2 8 3/4	9	8 1/2	9 1/2	8 1/2	2 1/2	Ap/Nv
100,000	£5	" Cum. Pref.	5 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp
300,000	£1	Napier & Son, Ltd.	16/6 17/-xd	18/9	16/3	20/-	18/6	7 1/2	Ju/Dc
73,385	£1	New Hudson Cycle Co.	21/- 22/-	24/6	21/-	28/-	18/6	10	Nov.
18,033	£1	" Cum. Pref.	17/- 18/-	19/-	17/6	19/6	18/-	6	Mr/Nv
50,000	4/-	Premier Cycle	2/6 bid	3/3	2/-	5/6	1/3	Nil	Sept.
125,000	10/-	" Cum. Pref.	5/6 6/-	6/4 1/2	5/-	8/6	4/-	Nil	Sept.
31,000	£1	Riley (Coventry), Ltd.	6/9 6/9 sellers	8/4 1/2	3/8	7/4 1/2	4/-	Nil	Feb.
200,000	£1	Rolls-Royce	54/6 55/6	59/4 1/2	50/6	52/10 1/2	44/6	20	Ju/Ju
138,668	£1	Rover	84/9 85/9	86/-	69/6	75/-	30/9	40	Nov.
100,000	£1	Rudge-Whitworth, Ltd.	16/- 16/6	17/3	14/6	25/3	12/3	Nil	Oct.
41,621	6/-	" 6% Cum. Pref.	3 1/2 4	3 3/4	3 1/2	4	3 1/2	3 1/2	Oct.
50,007	£1	Siddeley-Deasy	12/- 14/-	14/-	10/4 1/2	11/6	8/10 1/2	8 1/2	Nov.
70,000	£1	Singer & Co., Ltd.	43/- 44/-	45/3	28/-	29/6	16/-	Nil	Dec.
70,000	£1	Star Engineering, Ltd.	9/9 11/-	15/-	9/9	17/-	8/9	5	May
69,157	£1	" Cum. Pref.	14/- 15/3	17/-	14/-	17/6	15/-	7	May
87,550	£1	Stepney Wheel	18/3 19/3	26/-	17/6	32/6	25/-	5	Mr/Oc
120,000	£1	Sunbeam Motor Car	37/9 28/3	65/-	34/6	65/6	51/-	33 1/2	Nov.
30,000	£1	" 6% Cum. Pref.	22/6 23/6	23/-	21/6	22/6	21/3	6	Ap/Nv
100,000	£1	Swift Cycle	54/9 55/-	55/9	25/9	29/6	18/-	10	Dec.
100,000	£1	" 6 1/2% Cum. Pref.	17/9 18/3	18/6	16/-	17/3	15/3	6 1/2	Ju/Dc
80,000	£1	Triumph Cycle	73/6 75/-	74/-	65/-	82/-	58/-	3 1/2	Oct.
50,000	£1	" 5% Cum. Par. Pref.	22/9 bid	22/6	21/6	24/6	21/6	6 1/2	Oct.

* Interim. a Actual on account of arrears. b And one new for three old shares at par, with final call of 4/- to be paid by the company as bonus. c Alldays ordinary are now £1 shares, 12/- paid; preference are £1 fully paid.

Business in cycle and motor shares has shown a considerable falling off during the past week, and there have been few changes in the prices, which keep very steady and firm for the time of the year. Darracqs have probably been the most active market, and close well above lowest price touched. The Rover Company announce that they are exercising their option to redeem their total debenture issue of £50,000, and paid these off with a premium of £3 per cent. on July 1st, which leaves the company with an ordinary share capital of only £138,668, and no prior charges.

"The Autocar" Diary.

- | | |
|---|--|
| July. | July. |
| 4.—Grand Prix de l'A.C.F. Lyons Circuit. | 24.—Bolgian Grand Prix. |
| 11.—Saltburn Speed Trials, Yorkshire A.C. | August. |
| 11.—Herts. County A.C. Brooklands Meeting. | 3.—Brooklands August Meeting |
| 11.—Somerset A.C. and Bristol & Gloucester A.C. Hill-climb at Bath. | 22.—Midland A.C. Shelsley Walsh Open Hill-climb. |
| 18.—Middlesex C.A.C. Inter-club Hill-climb at South Harting. | 23.—Coupe de l'Auto, Circuit des Domes. |
| 17-18.—R.A.C. Automobile Rally, Nottingham. | September. |
| | 26.—Brooklands Meeting. |
| | 29.—Italian Grand Prix. |
| | 26 to Oct. 6.—Berlin Show. |

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 NEW ZEALAND: Gordon and Gotch, Ltd., Wellington, Auckland, Christchurch, and Dunedin.
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 SOUTH AFRICA: Central News Agency, Ltd.

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