Vol. XII. No. 4 **The 1936 Monte Carlo Rally.** *February, 1936*

MOTOR SPORT

LAND - AIR - WATER

SIXPENCE MONTHLY



[*Motor Sport Photograph*

Snow and tree-lined roads are well-known ingredients of the Monte Carlo Rally. The car is one of the new 4½-litre Lagondas.

24 HOURS AT 140.52 M.P.H.

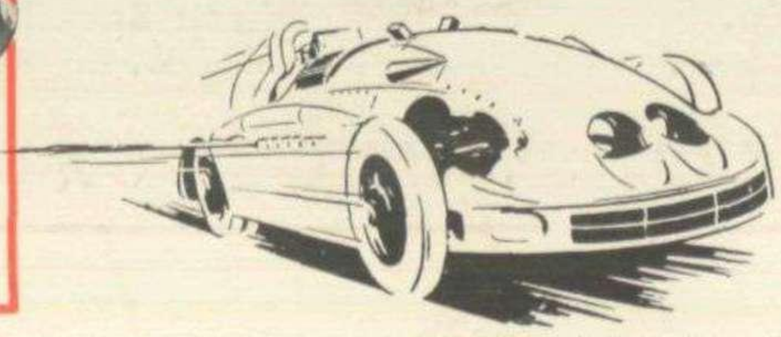


—smashing 14 other world's records on the way. Amazing performance put up by Capt. G. E. T. Eyston, Flt.-Lt. C. S. Staniland and Mr. Albert Denly — Utah, Sept. 16th/17th, 1935.

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British Empire Trophy, Cars No.
3, 4, 5, 7, 10, 12, 16, 18, 21, 24, 25, 31, 36, 39, 43.

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1, 4, 8, 9, 10, 11, 12, 14, 19, 24, 28, 29, 32, 48, 50, 51, 56, 61.

French Grand Prix, Cars No.
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2, 3, 5, 12, 13, 14, 18, 20, 21, 22, 23, 24, 26, 29, 30, 31, 34, 35, 36, 40, 45, 47, 49, 51, 53, 55, 60, 62, 64, 66, 78, 82.

Shelsley Walsh (Sept.), Cars No.
2, 4, 5, 11, 14, 15, 17, 20, 21, 23, 24, 26, 28, 29, 33, 36, 38, 42, 43, 48, 49, 58, 60, 61, 67, 78, 84.

Mannin Moar Race, Cars No.
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15.

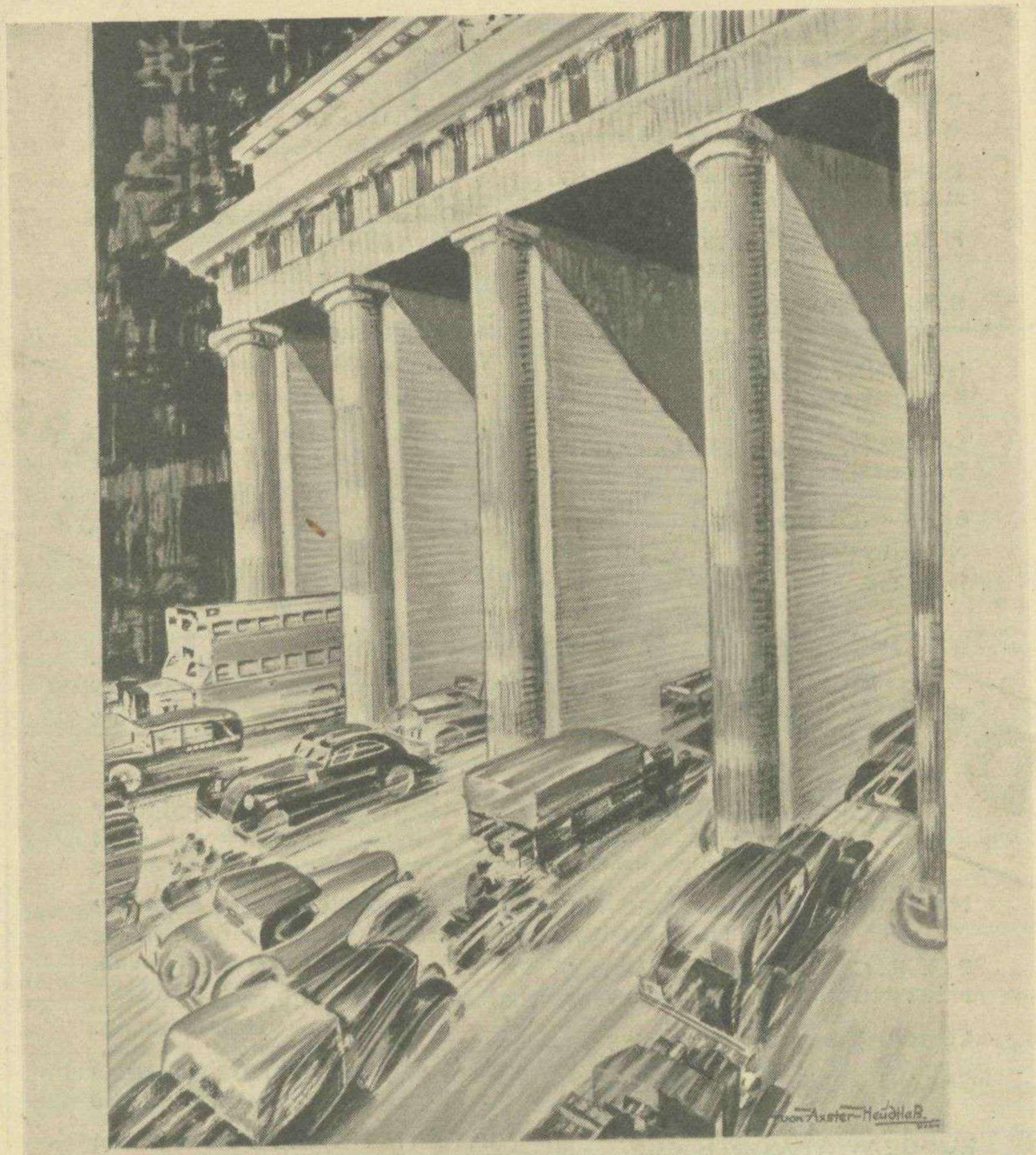
Mannin Beg Race, Cars No.
1, 2, 9, 11, 14, 15, 16, 17, 18, 19, 20.

500 Miles, Cars No.
1, 2, 4, 15, 18, 20, 21, 22, 23, 24, 26, 27, 31, 35, 36, 39, 41, 42.

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R.A.C. T.T. RACE, ULSTER
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INCORPORATING THE BROOKLANDS GAZETTE

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39, VICTORIA STREET, LONDON, S.W.1

Telephone: Victoria 5218.

KING GEORGE V

In the death of His late Majesty King George the Fifth the British Empire, and indeed the whole world, has sustained the most profound loss. At such times as this we are affected by a grief which transcends all other considerations, so that our sports, pastimes and mundane interests fall back, of necessity, before the realisation that the greatest Empire of all time, of which we are so fortunate to be members, has lost its beloved ruler.

King George will go down in history as the Perfect King. He combined to the highest degree widely divergent qualities which made him wise in counsel to his ministers and which endeared him to the hearts of his people.

No King of England has ever been submitted to a sterner test by the circumstances attending his reign. That he triumphed over them is sufficient commentary on his wisdom and unfailing sense of duty. The early years of King George's reign were clouded by the certainty that Europe would be engulfed by a storm such as no man had witnessed before. When at last the thunder-clouds broke into a roar of cannon, what was probably his most priceless gift stood him in good stead, the ability to face a crisis with calm, unhurried judgment. This rock-like quality re-echoed through his ministers to the people, and its value in sustaining the morale of the nation in those critical years cannot be placed too highly.

After the war, came not Peace, but years of economic difficulties from which the world has not emerged to this very day. Once again good-will and wise counsel could play their part, and his public speeches restored confidence, not only at home, but throughout the storm centres of the world.

No monarch has ever been inspired by a higher sense of his duty and responsibilities. Every one of the countless subjects which came beneath his notice received the most painstaking study, so that his pronouncements were weighted with profound knowledge.

So much for his incalculable influence in maintaining the equilibrium and confidence of national and international affairs. Now let us turn for a moment to that side of his character which has inspired such heartfelt affection among the peoples of his Empire.

First and foremost were his sympathy with the normal lives of ordinary people, and his constant reference to himself as the father of a loving family, sharing similar pleasures in his own home. It was here that the Christmas broadcasts welded the ties of respect, admiration and love for a man who, while experiencing the emotions and joys of the common people, yet carried the greatest burden of responsibility known to mankind.

Historians of the future will record that it was this bond between the people and their Ruler which gave the British Empire the unified strength and confidence to weather the storms of this troublous period.

Grief stricken as we are by the loss of King George, yet fortunate are we in his successor. As the Prince of Wales, King Edward the Eighth earned a world-wide popularity. His life has been one long training for the task ahead of him, a training from which he has emerged with the wisdom and sympathy which distinguished his beloved father.

But fitted as he is for the mighty responsibility that has now descended upon his shoulders, King Edward the Eighth will not spurn the earnest hopes and wishes of his people for a prolonged and happy reign.

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A PRE-RALLY DIARY

EN ROUTE TO TALLINN WITH A 4½-LITRE LAGONDA

By

T. G. MOORE

No matter how carefully a sports car is built, the final test of its qualities, assuming that bad luck does not intervene, will always be to enter it in open competition. Previous experience has convinced me that the combination of rough roads and high average speeds one meets with on the Monte Carlo Rally, form one of the most strenuous possible tests for the fast sporting car, and so I was particularly interested to be able to secure one of the new 4½-litre Lagondas for the 1936 event, a sister car being driven by Mr. A. P. Good, the chairman of the new Lagonda concern, who was thus gathering first-hand information under conditions of strenuous service.

The cars prepared for the job were standard productions except for fitting 19-inch wheels in place of the 18-inch type which are the standard equipment. The mudguards were raised to give full clearance for chains, and for running in soft snow, we were also equipped with a pair of Dunlop sports tyres on the spare wheels. The bodies on the new cars are notable, apart from their sporting line, for their very comfortable upholstery and the side-curtain equipment which provides almost the equivalent of a closed car.

Planning to get on to the Rally route as soon as possible, we took the cars via Harwich and Antwerp, reaching Parkeston Quay after the usual hectic rush over those last thirty winding miles to the port. The sea was kind to us and by daybreak we were sailing peacefully up the Schelde, docking at Antwerp at eight in the morning.

Apart from avoiding much of the pavé roads of Northern France and Belgium, our idea was to prospect a new route from Hanover to Brussels, avoiding the industrial areas round Cologne. To do this we had to run eastwards over fifty miles of cobbled roads, but the suspension proved excellent and we were able to keep up 55 m.p.h. After Bosshot and Aerschot (the golfer's joys) there were big diversions where the main road was being re-layed with concrete, but at last we reached Diest, and through narrow streets in which every other shop displayed a string of brightly-painted sabots, we gained the route to the Dutch frontier.

The roads were straight and easy to find, though surfaced with the inevitable pavé. Soon we were crossing the narrow strip of Dutch territory, en route to Venlo. Our Dutch money was confined to one note of 15 guilders, worth £3, and the keeper of the toll bridge was somewhat taken aback when this was presented for a threepenny toll. However, he took it in the form of a handful of Belgian "washers," and we were free to proceed on our journey north through Germany.



Repacking the car in Berlin. Martineau and Thornley are wondering where everything is going.

A prolonged lunch at Venlo delayed us, and darkness fell soon after we entered Germany. The headlamps of the cars were fitted with dip-and-switch mechanism, and we used this religiously going through towns and villages. Passing through one of these we were suddenly held up by a flashing light and found it was the village policeman, who was furious at cars which had, what he considered, only one front light. The sidelights he disregarded. He was joined by half-a-dozen other uniformed men, but the word "Englünder" had its usual effect and we were allowed to proceed unmolested. Twice more we were held up in the same way, the second time by a fire-engine complete with flashing red light, and so we decided to practise a special lamp drill, extinguishing the head lights and putting on the two fog lamps when approaching villages.

We stayed the night in Munster, and next day pushed on through a thickly-populated countryside, where the half-timbered houses and low hills reminded one of the North Downs, to Berlin. The roads were much improved in comparison to what we found on a previous trip over the same road and, in any case, our springs seemed adequate for all surfaces.

We stopped for lunch at a small town near Hanover, pulling up at a tiny, but clean-looking, restaurant. Its name, the "Horrido" should have given us a clue to its products, but we failed to be warned. A wait of an hour, and the toughest steak ever recorded made its appearance, and continued to remind us all the way to Berlin.



The start of the trip. Filling up the cars at Antwerp.



Leaving East Prussia for the Baltic States, a photograph taken on the Queen Louise Bridge at Tibsit.

"Comfort and Performance".

MEMORANDUM

TO: H & A.

FROM: Advertising Dept. 24 / Jany. 1936.

Picture and caption from "Motor Sport" January number.



The Frazer-Nash-B.M.W.s made short work of Nailsworth Ladder. This comfortable looking coupe was driven by L. Maxwell.

Probably suitable for use ~~both~~ in an advertisement based on the amazing ~~advertising~~ run of Frazer-Nash-B.M.W. successes in trials. In view of the considerable publicity given in the motoring press to the suggestion that present-day trials have reached the point where only specially ~~built~~ constructed cars can be expected to be successful, it would be a good idea to focus the attention of enthusiasts on the fact that the F.N.-BMW's which have developed such an impressive habit of making these supposedly difficult trials look almost ridiculously easy are - nevertheless - in contrast to these special cars - absolutely standard in every respect - furthermore that they are entered, driven and maintained by their private owners. It's rather interesting that while we ourselves have made no special effort to demonstrate their performance capabilities, our owners have themselves built up for the car a reputation for outstanding performance & absolute reliability.

NOTE: *All our future advertisements will not be in manuscript, but we like to try different ideas in our advertising whenever possible, and so this month the original notes have been used as an advertisement.* A. F. N. Ltd., 32, Grosvenor Street, W.1.

A PRE-RALLY DIARY—continued

We turned off from Potsdam to the Avus road which is used, when not required for racing, as a by-pass to Berlin. Rather to our surprise, we found the road had quite appreciable gradients and curves, so that it must be far from ideal at speeds over 150 m.p.h. The Berlin exit was completely blocked by a procession of Nazis, which we afterwards found was at least half-a-mile long and six men deep. They were all returning from the Sportpalast where they had been attending a lecture on motor-racing.

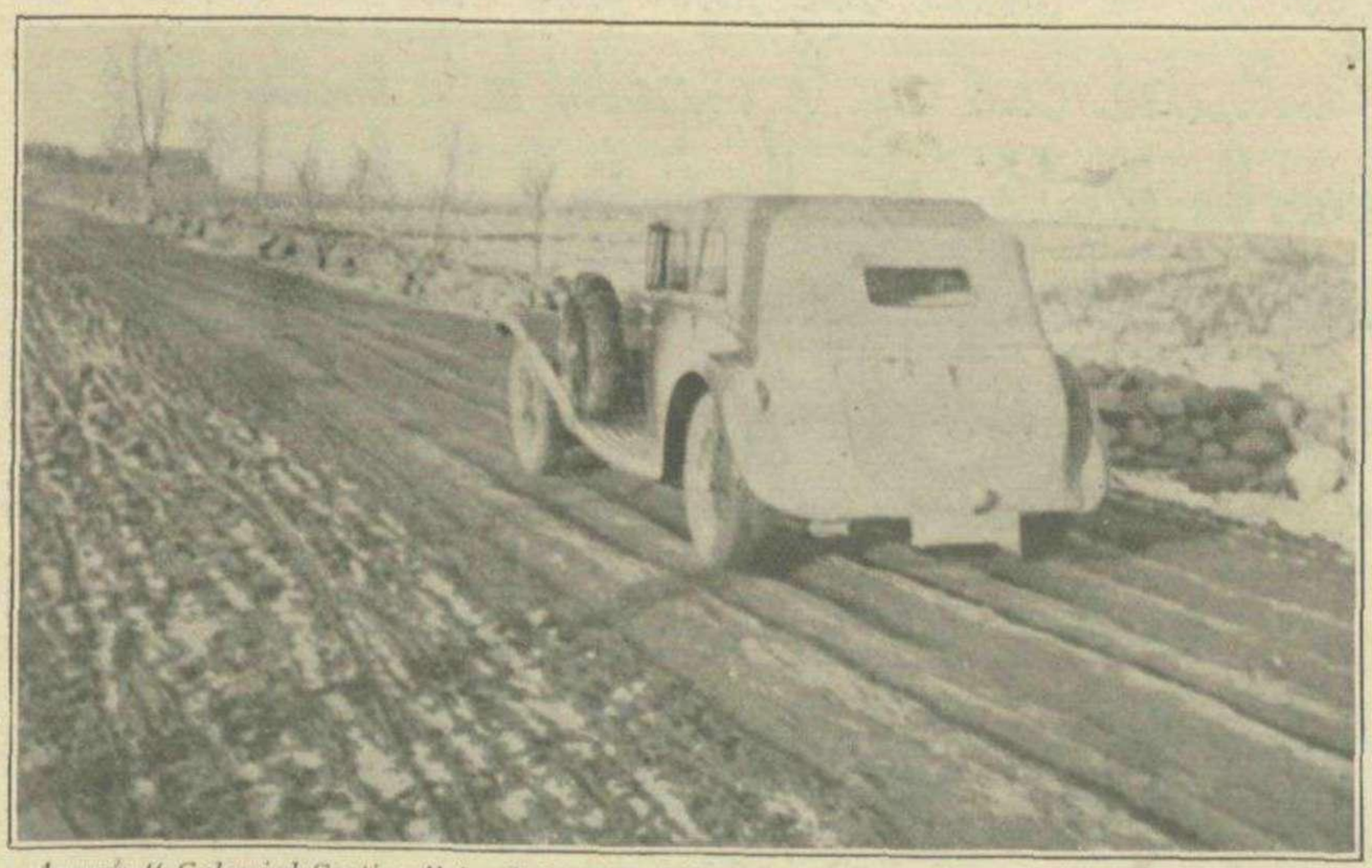
At Berlin we left Thornley to await Mr. and Mrs. Good, who were following on by aeroplane. Martineau and Wills re-packed the car with great skill, the back seat being stacked high with luggage we were to discard at Tallinn, and so we left the German capital by the Frankforter Allee en route to Warsaw.

A magnificent highway paved with smooth stone sets led to the Polish frontier and promised well for the return journey. Over the border the road continued satisfactory for a few miles and then began the sort of surface with which we were soon so familiar. The road-surface was hard but was broken up by a continual series of pot-holes, making 30 m.p.h. the utmost limit for cars not fitted with all-round independent suspension. Snow and ice began to appear on the road, but only where the sun had failed to strike through the surrounding woods.

Poznan was our limit that night, and next day we continued east with further bumpings. If the roads were bad the stretches in the villages were ten times worse, and the sound of our tyres bumping over cobbles and pot-holes was painful to hear. Then suddenly, twenty miles east of Warsaw, conditions improved and Wills, who was then driving, pushed up the speedometer to 80 m.p.h. over highways set with grey stone blocks.



Unnatural hazards of the Rally. Moving mountains of hay and the standard sledge block the roads in Lithuania.



A very "Colonial Section" in Poland. The piles of stones suggest that something is being done about it.

Warsaw proved quite amusing—but very expensive. Next day, after losing our way out of the city, we were cheered to see a further revised highway, but alas, it did not last long. A "cassis" sign proclaimed the start of the usual, shattering pot-holes, and over these with little respite we continued to the German frontier. Not a single private car was encountered in the country from frontier to frontier, which is easily understood.

The "road" was, in places, so bad that we preferred to take to the hard-frozen ruts running alongside it, but it certainly gave us a good chance of appreciating the steering, which remained free from "kick" under the most trying conditions, and the springing which allowed us to push on at 35 m.p.h. where the surface definitely forbade more than 20. Rally averages take no account of road-surface.

Bright sun cheered our way, and we reached the German frontier at three o'clock, averaging 19 m.p.h. from Warsaw. Neat houses replaced the thatched shacks of Poland, and the road-surface was also very different, but we did not have much chance to notice it, as the snow began almost with the frontier line. Stopping at Ortelsburg, we first learned from a German newspaper of the illness of the late King. The sad news of his death was conveyed to us two days later by seeing all the flags in Riga at half-mast.

We put up at the excellent Park Hotel at Königsberg and were here joined by Good, who had come direct from Berlin. Martineau created a certain sensation by rushing about the bedroom passage and calling "oder" instead of "ober" when he wanted a waiter, but nobody seemed to mind. Two other rally cars, a French Talbot and a Ford, were also in the garage, so we felt that we were getting nearer the centre of things. With plenty of snow about we decided to try our "comp." back tyres, and found a useful increase of braking and traction on the northern road.

We arrived without incident at Tilsit, the German frontier town, and after declaring our many currencies at great length, passed over the bridge into Lithuania where the process was repeated. Not for nothing is one given a time allowance of sixty minutes in the northern countries. As a parting gift, and all unknown to us, the Nazis inscribed the swastika and "Tilsit" in the mud on the back of the car.

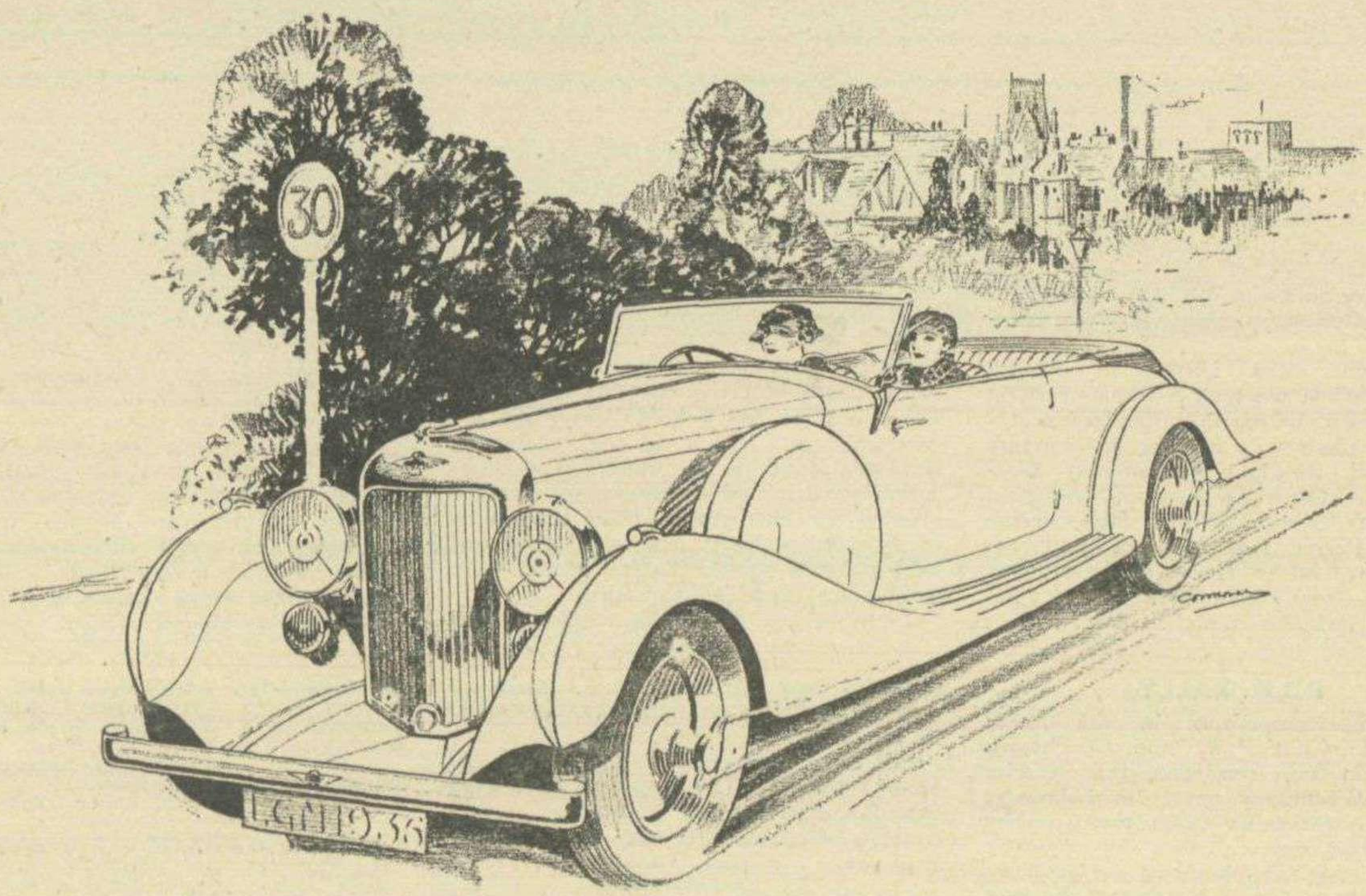
Just over the border we saw our first sleighs, crude structures which have a single horse and only one shaft. Evidently it was market day at Tauroggen, for scores of these vehicles were streaming out as we approached, taking not the slightest notice of the horns until we were almost on them. Market day is very similar all over the world, and in one case the driver was lying on his face dead to the world as a result of the local fire-water, while faithful Dobbin (or possibly Ivan) took the usual road home.

The road was bordered with the usual trees, coated here with newly-fallen snow, and the grey sky and the snow, coloured by the rays of the setting sun, made a picture of surprising beauty. The road was often dead straight as far as the eye could see; cleft straight through the forest as though with a knife and straight-edge,

LAGONDA

Quality to-day is dearly purchased, but gives a satisfaction far beyond price.

Probably the fastest . . . certainly the safest car at high speeds. The new 4½-litre LAGONDA, re-designed by Mr. W. O. Bentley, achieves the perfect blending of such refinements as silence, real comfort and ample accommodation for four passengers and luggage, with speed capabilities and road behaviour afforded by no other car in the same price category. Beautiful and distinguished in appearance, the new LAGONDA particularly appeals to those who are accustomed to a high calibre British car.



L. G. MOTORS [STAINES] LIMITED, MIDDLESEX, ENGLAND. Telephone : Staines 1122 (4 lines).

L.8.

A PRE-RALLY DIARY—continued

and we had no difficulty in keeping up 55 m.p.h. The Latvian customs gave little trouble, and we arrived at Riga at eight o'clock in the evening, and were escorted to the hotel by a representative of one of the petrol companies. The town has many fine buildings, and is dominated at night by a floodlit marble statue eighty feet in height commemorating the liberation of Latvia from the Russian rule.

The roads out of Riga were again fast but decidedly icy, so we applied a chain to the near-side front wheel. In this trim we were able to hold 55 m.p.h., which was quite encouraging. Apart from the sledges which carried all sorts of freight from live cows to piles of fir branches, we encountered two other forms of road traffic. One was the timber sleighs, where a whole tree trunk thirty feet long is supported on two small skids, the back part slewing round in an alarming way when the driver is at last persuaded to leave the crown of the road. Complete hay-ricks piled on runners also made life difficult, but the loads were so heavy that the horses lacked the necessary acceleration to bolt across the road as often happened with the lighter outfits.

The road was rutted in places, especially when we took a wrong turning and proceeded off north instead of north-east, but there was nothing to compare with what we had encountered three years ago. On that occasion roughness reached its climax on the final stretch between Parnu and Tallinn, and the writer drove off expecting to be plunged within a few kilometres into what resembled a frozen ploughed field.

Tremendous road works have been undertaken since those days, however, and instead of a rutted wilderness, we found a somewhat windy road with highly-banked corners round which the car came smoothly at 40 m.p.h. Within two years a brand new road dead straight from Tallinn to Parnu will be completed, and a first-class highway will then be available from Königsberg to the Gulf of Finland.

Rally weather does not seem to be like it used to be (perhaps it never was), and when we arrived in Tallinn we found thaw instead of the ten degrees of frost we had expected. Since then we have had rain and finally snow again on the eve of the départ, so no one knows what to expect. The local club advise "no chains" while Donald Healey, who has just appeared on the Triumph Dolomite, reports wet ice, which is the most difficult of all surfaces.

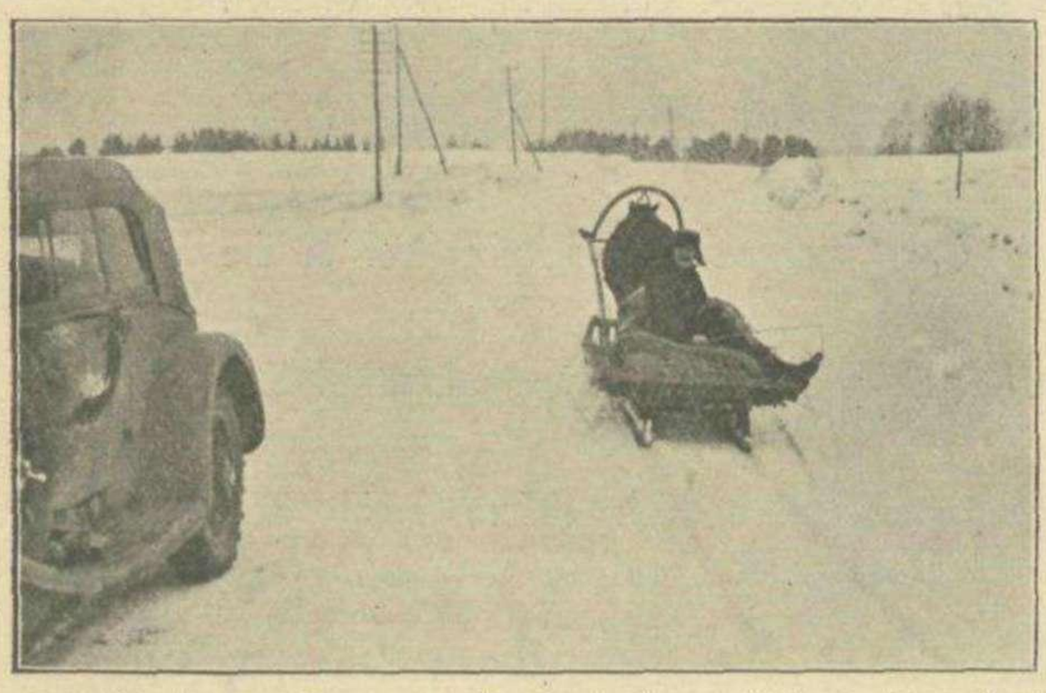
The town has laid itself out to welcome its visitors, and everyone seems to be enjoying themselves. The Kuldhövi hotel has gone all modern, but still retains its enormous table of hors d'œuvres, only beaten by the Hotel du Nord where half the room is devoted to Vorspeisen of every kind: price all-in—two shillings. The local night-clubs are similarly moderate in price, ten shillings providing drink and amusement for the evening for four people. The town with its fine old walls is most attractive, and taking it all round, Tallinn would be a good place in which to retire.

Twenty-seven cars were down to start from Tallinn and only four are missing. All four elected to start from Athens, amongst them the redoubtable Lahaye and Quatresous, last year's winners. Continual blizzards are reported from the Athens route, and it is doubtful whether any cars will get through. Our own route should be possible everywhere, the most difficult section being the road from the Lithuanian frontier to Kannas, the latter part of this being un-surfaced and much cut-up.

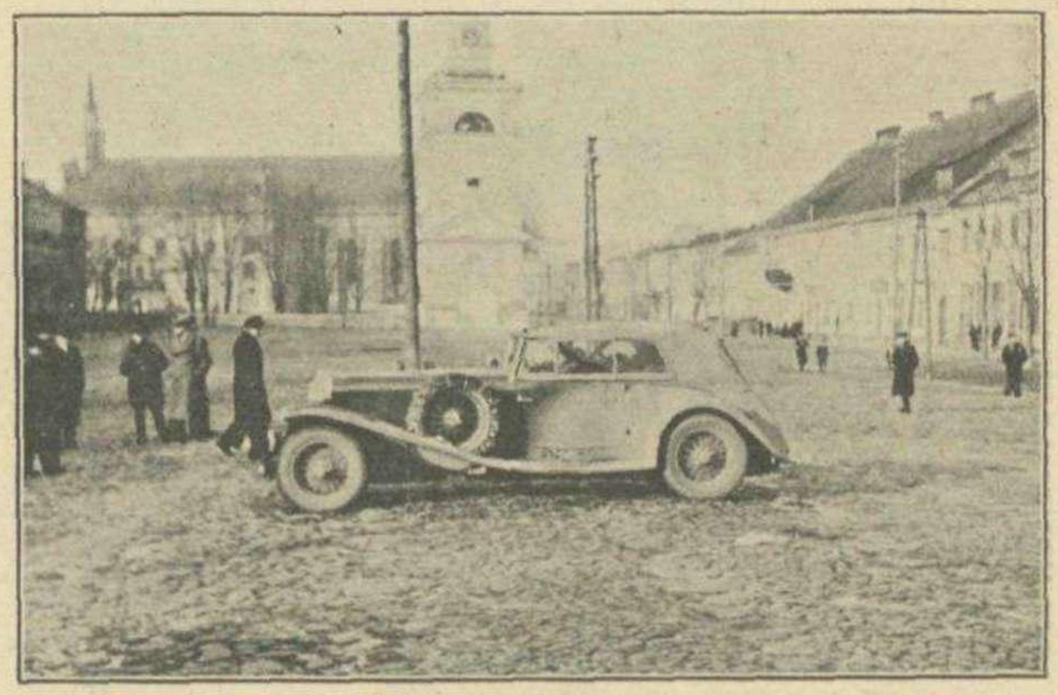
The English starters from Tallinn are T G. Moore and A. P. Good (4½-litre Lagondas), W. H. Murray (Frazer-Nash-B.M.W.), Dobell (Lagonda Rapide), S. H. Light (A.C.), D. E. Harris (Singer) and D. M. Healey (Triumph Dolomite). Murray, Light, who is driving one of the new short-chassis A.C.s, and Healey should do excellently on account of their short-wheelbase cars. The figure-of-eight test tells rather heavily against the Lagondas with their 11-foot chassis.

Of the foreigners, the most formidable is the veteran, Vasselle, who is driving a 3.8-litre Hotchkiss mounted in a 9-foot chassis. Fords are driven by Bakker Schut, Sprenger van Eijk and Chinetti, while Balester and Trintignant have a light two-seater Hudson, which ought to be fast in the final test.

Our own car has been well tested by the run north, the only attention it needed being a small adjustment of two tappets. Much can happen in 4,000 kilometres of rough and snow-covered roads, but with a roomy and well-sprung car, we have every chance of a comfortable and trouble-free run.



The Latvian gentleman on the sleigh shows distinct approval of the Lagonda.



Polish paving stones. The Lagonda in the main square of Pultusk, North of Warsaw.

R.A.C. RALLY

Intending competitors in the Royal Automobile Club Rally and Coachwork Competition are reminded that entries close on Wednesday next, 5th February, and all entries must reach the Club by noon of that day.

Already over two hundred entries have been received, but competitors can still be accepted from any of the nine selected starting points.

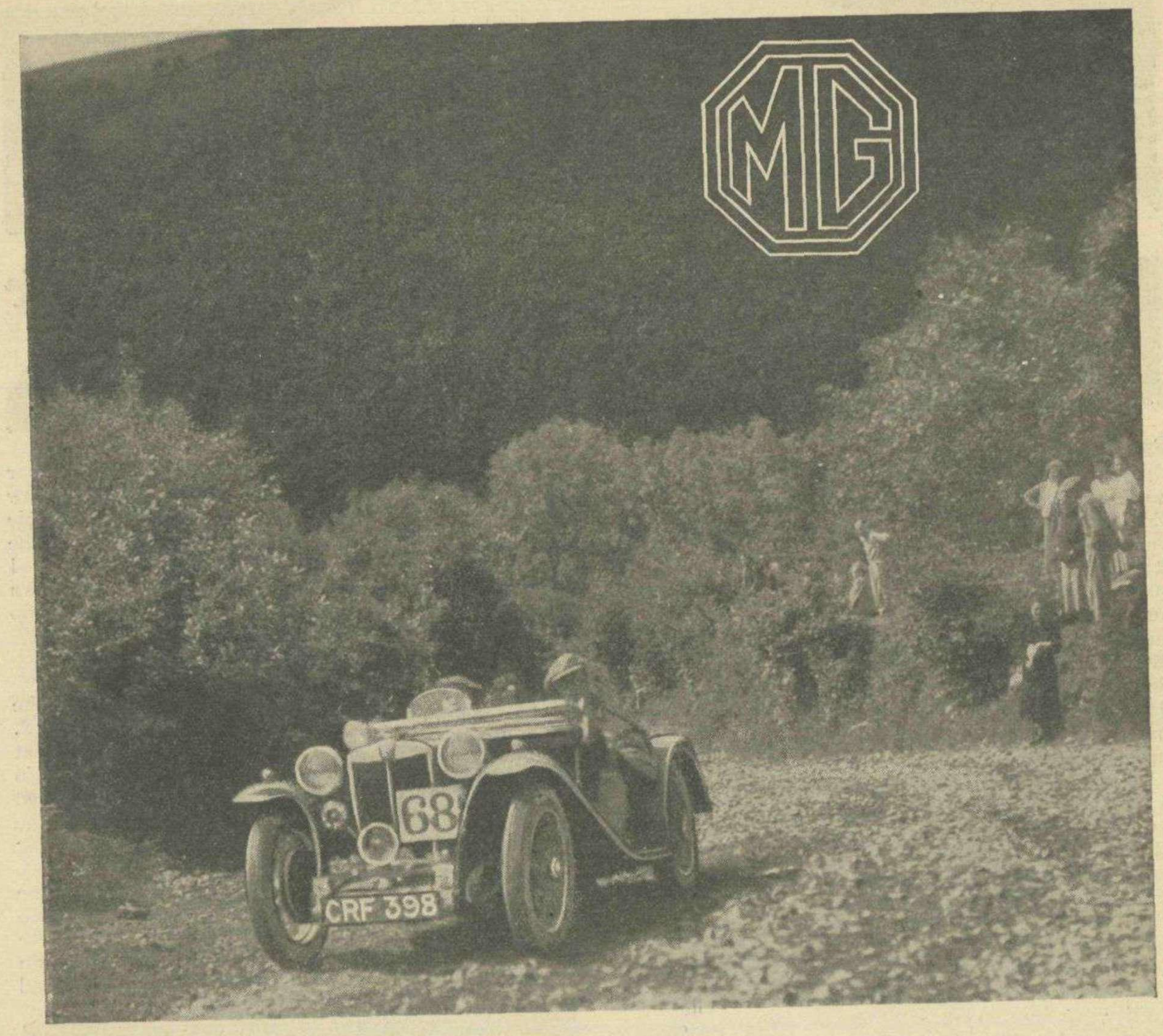
The Rally takes place on 24th-28th March, finishing at Torquay, where the Eliminating Test and Coachwork Competition will take place. The event is open to any British driver, male or female, and any manufacturer or agent in the country.

For the convenience of competitors and others, the R.A.C. gives the following list of controls in the Rally, the starting controls being the first nine in the list:—

Blackpool ...	Imperial Hydro Hotel Imperial Garage.
Bristol	Cathedral Garage, Anchor Road.
Buxton	Palace Hotel.
Glasgow	Grand Hotel. Messrs. Wylie & Lochhead, Ltd.
Harrogate ...	Grand Hotel.
Leamington ...	Regent Hotel. Regent Garage.
London	Ace of Spades Garage, Great West Road, Hounslow.
Newcastle-on-Tyne	Royal Station Hotel, Cental Station Garage.
Yarmouth, Great	Royal Hotel Marine Parade.
Llandrindod Wells	Pump House Hotel, Tom Norton's Garage.
Scarborough ...	Grand Hotel. Vernon Road & County Garages.

A NEW GARAGE AT WATFORD

Messrs. I. F. Connell and P. R. Monkhouse, will be opening on the 22nd of this month spacious showrooms and a most up-to-date garage including all the equipment for high-speed tuning, and they will be pleased to welcome their many friends after this date. The address is High Street, Watford.

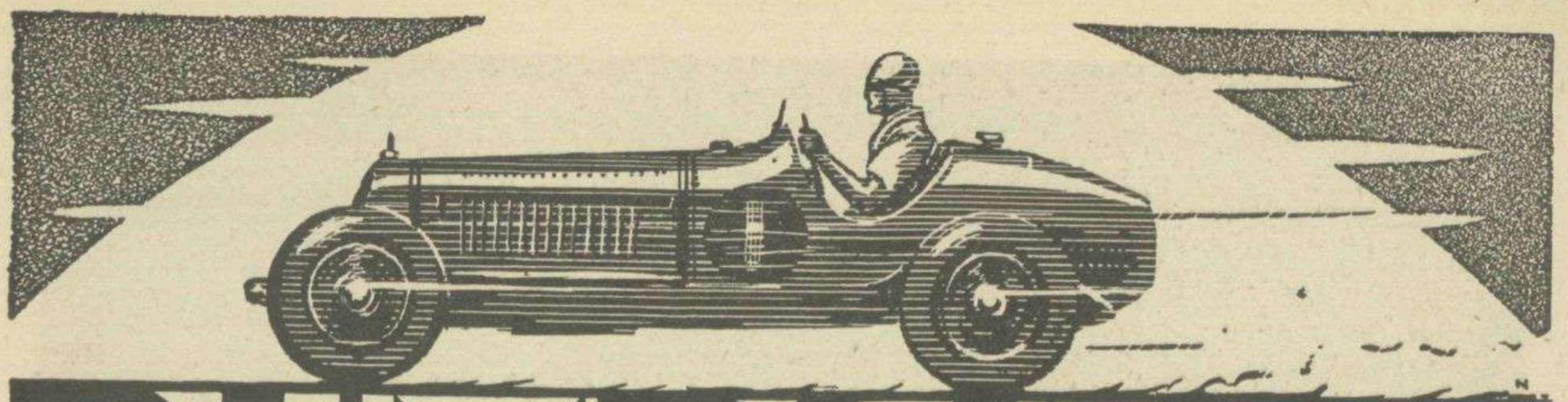


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M.2.



RUMBLINGS

Sports Cars in Winter

Ignoring the fatherly warnings of the motoring bodies and the railway companies that the North of England was unsafe for motor-cars, last month I pursued a somewhat erratic path up the Great North Road en route to Harrogate. In the course of the 200-mile journey, we must have passed nearly a hundred cars, every one was a family saloon of the most box-like characteristics. I have always wondered whatever happens to the Alfas, the Bentleys, and all the other sporting cars one sees at Brooklands throughout the summer; though, as a matter of fact, even in the fine weather one seldom meets such vehicles on the road.

Judging from the number of vehicles which had skidded off the road at various points, the lower centre of gravity of the sports car would be of real advantage on icy surfaces. I certainly did not find any difficulty in driving mine. I am afraid it must be that the modern generation of sports car owners are a less hardy crowd than those of ten years ago, and do not care to face the elements even with the protection of a modern hood and side-curtains.

As far as I could gather, newspaper reports of the severity of the weather in those parts was much exaggerated. Round Carlisle, however, conditions were definitely arctic, and a friend of mine who drove up to Scotland just before Christmas told me that without that modern equivalent of the dragon's breath, the electrical hot-screen, he would have been quite unable to proceed.

Driving Position

To be comfortable on a long journey, one of the most important factors is to have a good driving position, which covers not only the placing of the controls and the fact that one's left foot should be firmly planted on the ramp board. Equally important to my mind is that one should be able to see well over the bonnet and also to command the two wings.

On a closed car with pneumatic upholstery, the cushions can generally be blown up to give the seating position which does the trick, but on an open tourer the problem is complicated by the amount of clothing put on. Wearing a heavy leather coat and with a thick rug swathed round my middle I find myself raised nearly three inches above summer-level, and the problem is further complicated in my case by my car having a rather shallow wind-screen. I do not know whether anyone has invented a bucket seat adjustable for height. If not, there is a possible solution in the tilting seat-mechanism made by the Leveroll people. I am told that this is also excellent for providing a slight change of position, just enough to avoid cramp from driving for a long period in the same attitude.

Clear Vision

Another matter which links up with that of the driving position is the type of windscreen-wiper used. The original type in which the motor was pivoted at the top edge of the screen was obviously wrong in principle, as the rain, sleet or " what-not " removed by the wiper blade was simply lifted to the top of the panel, and ran down again as soon as the blade swung back.

The modern fashion of pivoting the blades at the lower edge of the glass so that the water is scraped downwards and outwards, is much sounder, but I have found trouble on some of the newer cars through having to look through the upper part of the cleared



" A game of bridge " at St. Moritz. Hans Stuck and Raymond Mays v. the tennis stars Boussus and Gentien. Leaning on Mays' chair is Paula von Stuck.

RUMBLINGS—continued

space, which is also the narrowest. The ideal method from the point of view of visibility would be to have blades travelling horizontally and covering the whole area of the glass as is done on the latest London taxis, but this type of wiper is, I understand, operated by engine suction, and ceases functioning when the throttle is put firmly down.

Rally Entries

After a slow beginning the Monte Carlo entries closed for quite a satisfactory 105, some sixty down on last year's figures. Hotchkiss, Delahaye and Ford have all entered strong teams, while of our own firms, Triumph have put in a last-moment brace in the persons of Miss Joan Richmond and Donald Healey. Miss Richmond's car is the sister to the one with which Ridley won the 1½-litre class last year, sans blower of course this time, and "Don" has likewise removed the supercharger from his car and has fitted two carburetters.

Snow or Water?

As I write this, Rally competitors are feverishly debating whether gum-boots or snow boots are the appropriate wear. Many of the northern roads in Scotland are blocked with snow and may well make the route from John o' Groats quite unusually severe. Meanwhile, from abroad, come accounts of rain in Athens and Tallinn which will produce mud and slush instead of the snow one always associates with the Rally run.

The A.A. tell me that most of the floods in the Rhone valley have subsided, and there only remains the question of how to negotiate Avignon, where many streets are still under water. From time to time, one sees descriptions of amazing amphibious cars which make 60 m.p.h. on land and 15 in the water, but none of the Rally cars I have seen so far have shown aquatic instincts. Plasticine for the magnetos and a flexible tail-pipe reaching well above the danger level are the nearest that most people have got.

Benzine De-Luxe

There is no country in the world where motor fuel is better, and few in which it is cheaper, than in Great Britain. This was brought very forcibly to my notice by a list of petrol prices recently issued by the R.A.C. The cheapest countries are Morocco, where it costs 1s. per gallon, and Austria, where touring spirit costs 1s. 2d., though the high-grade stuff is quoted at 2s. 4d. Denmark, Norway and Sweden are all 1s. 3d. On the other hand, in Holland it costs 1s. 10d., in Germany 2s. 10d., less, of course, if you use Registered Marks, and in France the high-water mark of 3s. 6d. Italy is quoted at 3s. 1d., but I understand now it has been raised to 5s.

Lubricating oil is proportionately costly. The French price is 11s. 3d., in Germany it costs 15s. per gallon, while Austria and Hungary break all records with 25s. and 27s. respectively. And they do not even give away cameras and bridge-sets with it.

Dixon Moving South

I met the inimitable Freddy Dixon the other night at a London ice-skating rink (this sounds like Consequences, aftermath of Christmas, no doubt). His enforced stay in Durham had given him a chance to recover fully from his varied accidents and he was looking forward keenly to next season. Incidentally, he had nothing to do with the tuning of the Durham police-cars—if he had, as he said, they would never have caught anything again.

Feeling that the local authorities have a grudge against him, he is planning to move his garage down close to London, Reigate or somewhere to the South, which will also be handy for Brooklands. He has given up the idea of further work on the Silver Bullet, for though he is confident he could beat Blue Bird's speed of 301 m.p.h., he considers there is no further knowledge to be gained in doing so using an enormous aero engine. His new designs call for an engine of some eight to ten litres in a chassis of tubular type with independent springing and possibly four-wheel-drive.

He has bought one of the 3.3 Grand Prix-type Bugattis and considers that he should be able to make it go a great deal faster than has yet been done, and will also be driving Rileys in the French Grand Prix and at Ulster.

Healthy Signs

No one can tell yet what is going to happen in next year's Grand Prix racing abroad, but in England, at any rate, there are excellent prospects of interesting racing. I hear that next season one or more 4½-litre blown Bentleys special cars with cut-down chassis will be raced at Brooklands, while there is a good chance

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RUMBLINGS—continued

of an 8-litre being entered for Le Mans. With open four-seater bodies and running on fifty-fifty, these cars should be capable of 130 m.p.h., and the Le Mans circuit is straight and wide enough to allow them to reach their maximum. The only trouble would be the amount of fuel needed, which would be not far short of fifty gallons. The regulations provide, of course, that a certain number of laps must be covered between each stop for re-fuelling.

Rileys will also figure prominently in the news, and a well-known driver is going very thoroughly into supercharging the 1½-litre four-cylinder. A. F. Ashby of Hendon is making a welcome re-appearance at Brooklands. He also approves of the four-cylinder engine, but is reducing the capacity to 1,100 c.c. while still retaining the advantage of three main bearings.

A Light Special

Towards the end of last season the Appleton Special, which has a very much modified Riley engine, started to show a fine turn of speed, and the owner has great plans for Brooklands and Shelsley this year, with more boost and a couple of extra bearings in the engine. The chassis was originally Maserati, but is also so modified that the famous Fratelli certainly would not recognise it. The side members only weigh 102 lb. or less than the petrol tank.

A Notable Revival

Large-car enthusiasts were very favourably impressed at the last Olympia Show by the new 4½-litre Lagonda, produced under the ægis of Mr. W. O. Bentley, and a few days ago I had the privilege of a run in one of the new cars.

Unfortunately the engine was not fully run in, so we had to content ourselves with a burst up to 75 m.p.h., at which speed, incidentally, the engine is running at less than 3,000 r.p.m. What most impressed me were the smoothness and silence of the engine and the excellent springing. With the additional power now available, the standard tourer should be capable of a level 100 m.p.h.

Brooklands Gather-Round

Last month the Annual General Meeting of the B.A.R.C. was held down at the Clubhouse, followed by a film-show. Proceedings were less animated than usual, largely, no doubt, because the proprietors are following the suggestions made by this and the other motoring journals, that adequate accommodation should be provided for spectators.

Cecil Kimber suggested that races should finish at the Fork, where everyone could see them, but the difficulty here is that cars could not be stopped in time if they only had the finishing straight in which to pull up. Still, why not continue round the Outside Circuit? An enclosure on the Railway Straight was being held up until the departure of the sewage works, while a demand for accommodation alongside the Finishing Straight and behind the 500-miles Race pits is being met by earth ramps built up behind the railings. Chronograph Villa will be demolished to give a better view at the Fork.

A thing that everyone would welcome would be loud-speakers at the finishing line on the Railway Straight, but apparently the trouble there lies in bringing the current round the track to operate the speakers. A suggestion was put up and considered, that an electric signboard should be put up on the Clubhouse tower to show the winners in short races and possibly the leaders in long events, and this would undoubtedly be a popular move.

Berkhamsted M.C.C.C.

The old established and very active Berkhamsted and District Motor Cycling Club has changed its title to that of the Berkhamsted Motor Cycle and Car Club.

At the annual general meeting, Mr. A. Paul was elected Club captain and Mr. H. Gardner vice-president. The provisional programme is an ambitious one and includes two speed hill climbs, presumably the well-known Dancer's End events, a speed trial, probably at Aston Clinton, two normal trials, three solo sporting events and several socials, while a night trial has been suggested.

The annual subscription is 10s. 6d., and this Club has been responsible for some very good sprint meetings of recent years. Hon. Sec.: N. C. Lone, 57, Marlowes, Hemel Hempstead, Herts.

Brighton and Hove M.C.

On January 7th, at the annual general meeting, the Club was shown to be in a very happy position, having a credit balance of £189 15s., although 1935 began with a deficit of £17. Membership had increased during the year by the very satisfactory figure of 195, bringing the total membership up to 422. Incidentally, since 1922, the Club's books have previously always shown a deficit. Plans for the future may embrace a club-house for members' use. The Twelve Hours' Trial may be run under interesting ruling, competition tyres, supercharger or solid axle being allowed, but not in combination. The classic Brighton-Beer Trial will be run off on June 20-21, entries being limited to 100.

A motor-cycle meeting, a July meeting at Donington and the Spring Cup Trial are other events on the Fixture List, and on September 26, the Club will again hold the Brighton Speed Trials, undoubtedly the most important speed-trials on the British Calendar. The past secretary, Mr. S. W. Chandler, is now chairman. Hon. Sec.: G. H. Drewitt, 121, Western Road, Brighton, Sussex.

The Bicolour Fog Disc

Fog is, undoubtedly, the most irritating of adverse weather conditions slowing, as it does, all traffic to a crawl and for once putting all classes of cars on a common level. Skilful driving avails less than at any other time, though some persons seem to possess an uncanny gift of seeing comparatively well on a "pea-souper" night. But for the majority of us, anything tending to improve visibility is of great value.

An interesting accessory in this connection is the Bicolour, a novel, wire-mesh fog-disc which forms a translucent amber-coloured screen over half the lamp area. The disc is claimed to serve as an effective anti-dazzle device at the same time, under daylight conditions, as it possesses only a slightly reduced light beam. It is unbreakable, and by blending white and coloured rays, is extremely effective in fog or mist. It can be easily fitted inside either the upper or lower half of a head-lamp glass. The first 2,000 sets are to be sold at 10d., to establish the Bicolour, after which the price will be 3s. 6d. The makers are The Bicolour Co. and their address is 5, Cygnet House, London, S.W.3.

The Burgess Snap-Lite

Messrs. Burgess Products Co. have put on the market some decidedly novel torches termed Burgess Spot-lites. Priced at 1s. 6d. each and obtainable from all good garages and accessory agents, these lamps should give the motorist excellent service, because they have a snap-to top which protects the bulb. A choice of six modern, colourful finishes is available and spare Burgess batteries cost but 6d. each.

An Item of News

Ian Connell has acquired from the Bellevue Garage one of the Ulster T.T. type Magnettes which he has entered for Le Mans with Nevil Lloyd as his co-driver.

They have one more of these cars available for sale and can offer with it a qualification free of charge should anyone wish to enter the car in this race.

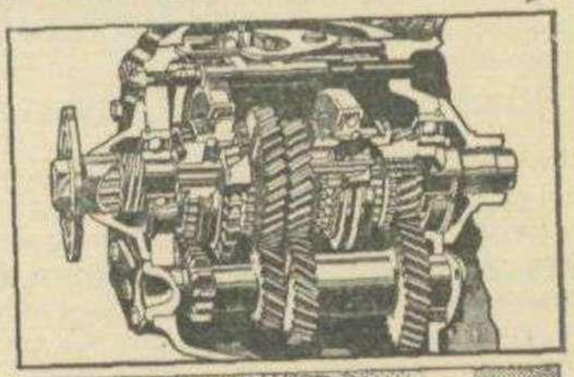
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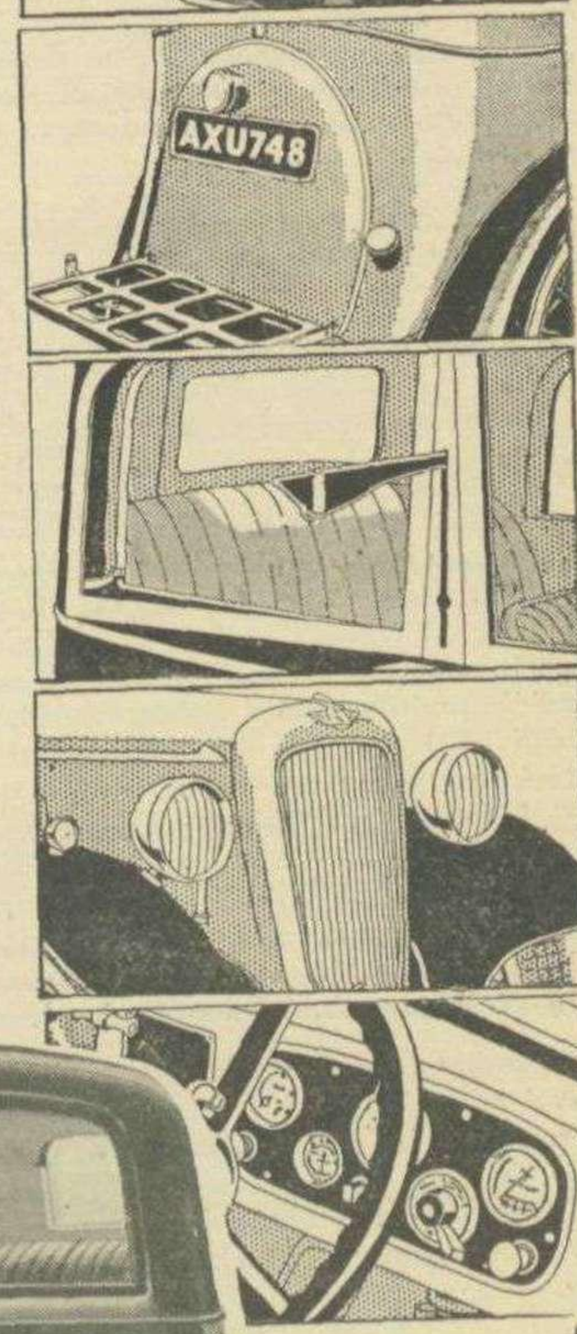
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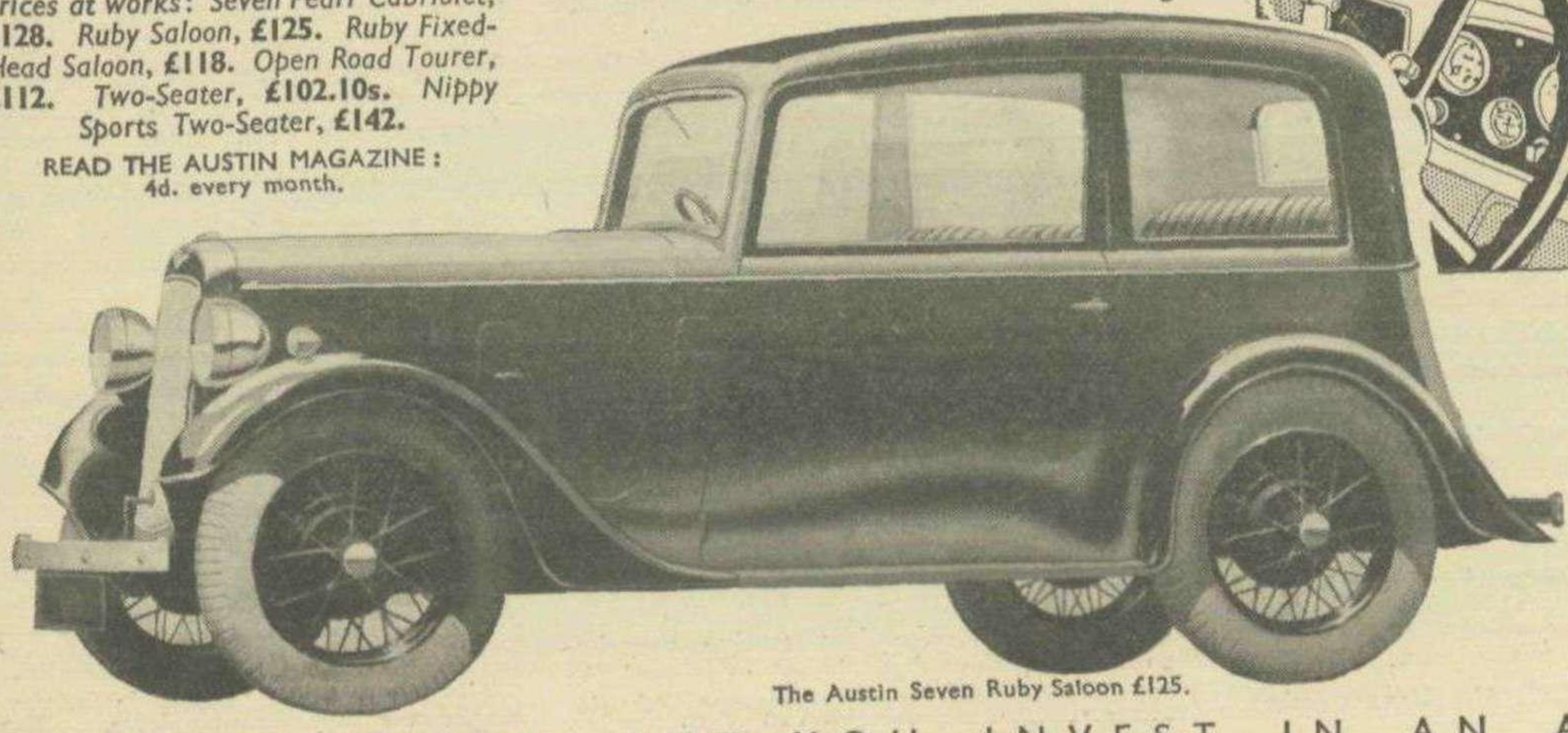
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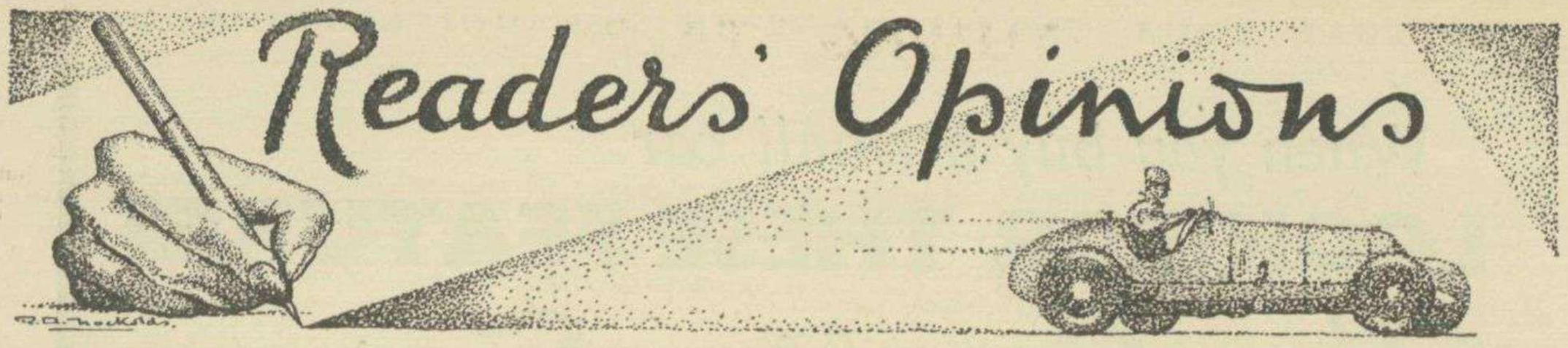
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RALPH DE PALMA

Sir,—I have recently enjoyed reading "Motor Racing and Record Breaking" by Captain Eyston and Barré Lyndon, and naturally was interested in the chapter on American Racing and American drivers. Several of our leading drivers are mentioned, but I was a bit puzzled by the omission of one of the most famous of all our racing drivers who, by the great number of his successes and the length of his career, must rank in the first group of really outstanding racing men. In 1933, he was the guest of honour at a dinner celebrating his *twenty-fifth* year of continuous participation in the sport of motor racing.

His first year of racing saw him a member of the Fiat team with Felice Nazzaro and Louis Wagner, when they took part in the American Grand Prize race at Savannah in 1908. That year he beat the redoubtable Barney Oldfield three times in succession and won the championship that season with thirty victories out of thirty-six starts. Since then, his list of successes has included the Indianapolis 500-mile Race in 1912, on a Mercédès, The Vanderbilt Cup twice with Mercédès cars, the Elgin Trophy Road Race three times, twice on a Mercédès and once on a Ballot, in 1912, 1914 and 1920 (he also drove a Ford in the stock car event when this race was revived in 1933), the Chicago Automobile Club Trophy twice with a Mercédès, second place in the French Grand Prix of 1921 on a Ballot, and many world's records, including the land speed record in 1919 at 149 m.p.h. with a Packard.

The number of dirt track, board track and road races in which he has competed must run well into four figures. As late as 1925, he won three 100-mile dirt track races, including the championship event at Syracuse against the pick of American drivers.

Among the cars he has handled are listed Fiat, Mercédès, Packard, Ballot, Mercer, Duesenberg and Miller. He was also scheduled to drive a Vauxhall in the famous French Grand Prix of 1914 but the car either did not reach the starting line, or else dropped out early in the race.

Surely this is a record of which Ralph de Palma may well be proud.

I am, yours, etc.,

E. C. WATERHOUSE.

670, Main Street,
Hartford, Conn., U.S.A.

A CORRECTION

Sir,—With reference to a statement in your January issue that Mr. W. E. Wilkinson was spare driver in the 1934 500-miles Race to Mr. R. E. Tongue, his car finishing fourth. I fear this is slightly inaccurate. In actual fact, Mr. W. E. Wilkinson was my spare driver in an M.G. Magnette. The car was indeed repaired by him, but did not finish, having only covered 162 laps when the race ended.

In the interests of accuracy, I should be glad if you could find space to publish this letter.

I am, yours, etc.,

P. L. DONKIN.

No. 16 (AC) Squadron,
Royal Air Force,
Old Sarum,
Salisbury, Wilts.

* * *

HAVE YOU A PRE-WAR CAR ?

Sir,—There has been a certain amount of general feeling recently that motors of the Edwardian era should receive some sort of public recognition, in the same way as the pre-1905s in the Brighton run, etc.

Anyone interested may therefore care to know that the Vintage Sports-Car Club has had this in mind for some little time, and if sufficient pre-war machines come into the Club, it is proposed to run special classes for them in Speed Events.

Some sort of handicapping would clearly have to be used, and the brightest scheme to date has been made by Mr. C. P. L-Nicholson, who suggests a formula taking into account the age, weight and engine capacity of the vehicle, which should be capable of giving an equal chance to all sorts and ages.

There is already a fine nucleus of these fascinating machines in the Club, but there must be many other owners of them who would like to be provided with a means of meeting and competing against similar enthusiasts.

The Secretary of the Club is Mr. E. T. Lewis, 31, Rusland Road, Harrow, and he or I will be glad to answer any enquiries relating to the scheme.

I am, yours, etc.,

C. CLUTTON.

Vintage Sports-Car Club,
The Old Manor House,
Littleton,
Shepperton, Middlesex.

* * *

SOME SUGGESTIONS

Sir,—During the last twelve months, some agitation has been expressed in competition circles on account of the public's attitude to reliability trials and their growing antagonism to these events. Many suggestions have been made as to the reason for this unsatisfactory state of affairs, but it may interest readers to know the point of view of a resident in Crowell village, which, as all enthusiasts know, is at the foot of Crowell Hill. This resident, a young man of sporting persuasions, expressed the view that "he was getting fed-up with these trials." He said that, when there were only one or two trials in the year, nobody minded putting up with a little discomfort, if that discomfort gave others an enjoyable afternoon in the country. But, nowadays, hardly a Sunday passes without the inevitable trials drivers appearing to disturb the village's Sunday afternoon siesta. On one occasion, a club ran up the Hill *twice* in one day. Often, the cars are halted in the village itself, outside some unfortunate's house, and his peace is disturbed by a thoughtless motorist or motor-cyclist keeping his engine warm by "blipping" the throttle.

That, briefly, is the non-participant's point of view and it seems to me that the solution to these problems is to run fewer trials in the district *and*, last but not least, for all competitors to cultivate the art of considering others, which is the essence of good manners.

Although these are in the minority, there are certain members of the trials driving fraternity who exhibit the most shocking bad manners whenever they appear in a trial.

Recently, I watched the start of a trial in this very Chiltern area and I was disgusted by the appalling bad manners of certain competitors and one official, who tore along the main road in a Morris saloon, suddenly swerved into the entrance of the garage, with two wheels all but off the ground, and drew up at the petrol pumps with locked wheels. An unnecessary exhibition of dash, which can have saved two seconds at the very most. Were those two seconds so very vital? Anyway, it did not impress non-competitors at all favourably. A moment later, a competitor shot out into the main road at unnecessary speed and only avoided an accident by standing hard on his brakes.

It is to be hoped that organisers will make every effort to avoid offending the public and will disqualify any competitor who is seen to drive in the manner described. That is, if competitors themselves cannot be trusted to drive like gentlemen and not road-hogs.

I am, yours, etc.,

A COMPETITOR.

Hammersmith, W.6.

LETTERS FROM READERS.

The Editor is not responsible for the views expressed by correspondents. Nom de plumes may be used providing the names and addresses of the correspondents are sent with their letters.

TUNING TALBOTS

SOME NOTES by D. N. WILCOXON

(In an Interview)



Mr. Wilcoxon is works foreman of Messrs. Fox and Nicholl. He was responsible for preparing the "90s" which secured the Team award in the Irish Grand Prix and a Class award in the 1930 T.T., and the "105s" which, amongst other successes, finished 1-2-3 in their class in successive Double Twelve and 1,000-mile races.—ED.

However much motor-cars may vary in design, the same general principle applies to any sort of tuning which may be performed on them. For a small sum of money you can have a car brought to what might be called the best standard pitch of performance. Alternately, you can spend a substantial extra amount and embody a number of alterations which make all the difference if the machine is to appear in open competition. These two aspects are dealt with below as applied to the "90" and the "105" model Talbots. Incidentally it is worth recalling that the "90" differed from the "75" only by reason of the high-compression head, so anyone who has one of the later models can readily improve the performance to that of the sports model.

The term "Ninety" referred to the horse-power and not to the all-out speed of the car in question, the maximum with open four-seater body varying between 75 and 85 m.p.h. The engine is particularly sensitive to the ignition setting, and this is always the first point we check when seeking to improve the performance.

The Delco distributor is fitted with two cams and two contact-breakers, each serving three cylinders. This arrangement halves the speed at which the breakers operate and ensures a regular spark at high revs., but it is essential that they should break at even intervals. This is not at all easy to verify by normal methods. We keep a special apparatus for checking the adjustment The firing intervals can vary by as much as half-an-inch on the flywheel, and in order to obtain maximum efficiency, gaps and firing intervals ought to be checked every thousand miles.

The advance and retard is regulated by springs and balance-weights. The former tend to become weak in time and this gives advance too early and slows acceleration, while it is also necessary to make sure that the slot which regulates the amount of advance is of the correct length. 33 degrees of advance is allowed with the standard compression of 7.5 to 1, but only 27 is needed when running on the high compression of 9 to 1. In this case, of course, neat benzol must be used as the fuel.

The carburetter does not need much alteration, though we have occasionally used jets larger than standard, with an improvement in performance and no appreciable increase in petrol consumption. On this model the fuel is supplied by an A.C. petrol pump and, as the result of high revs., the return spring becomes weak or even breaks. Misfiring at high revs. then ensues and, as the springs only cost a few pence, it is worth while renewing them every 5,000 miles.

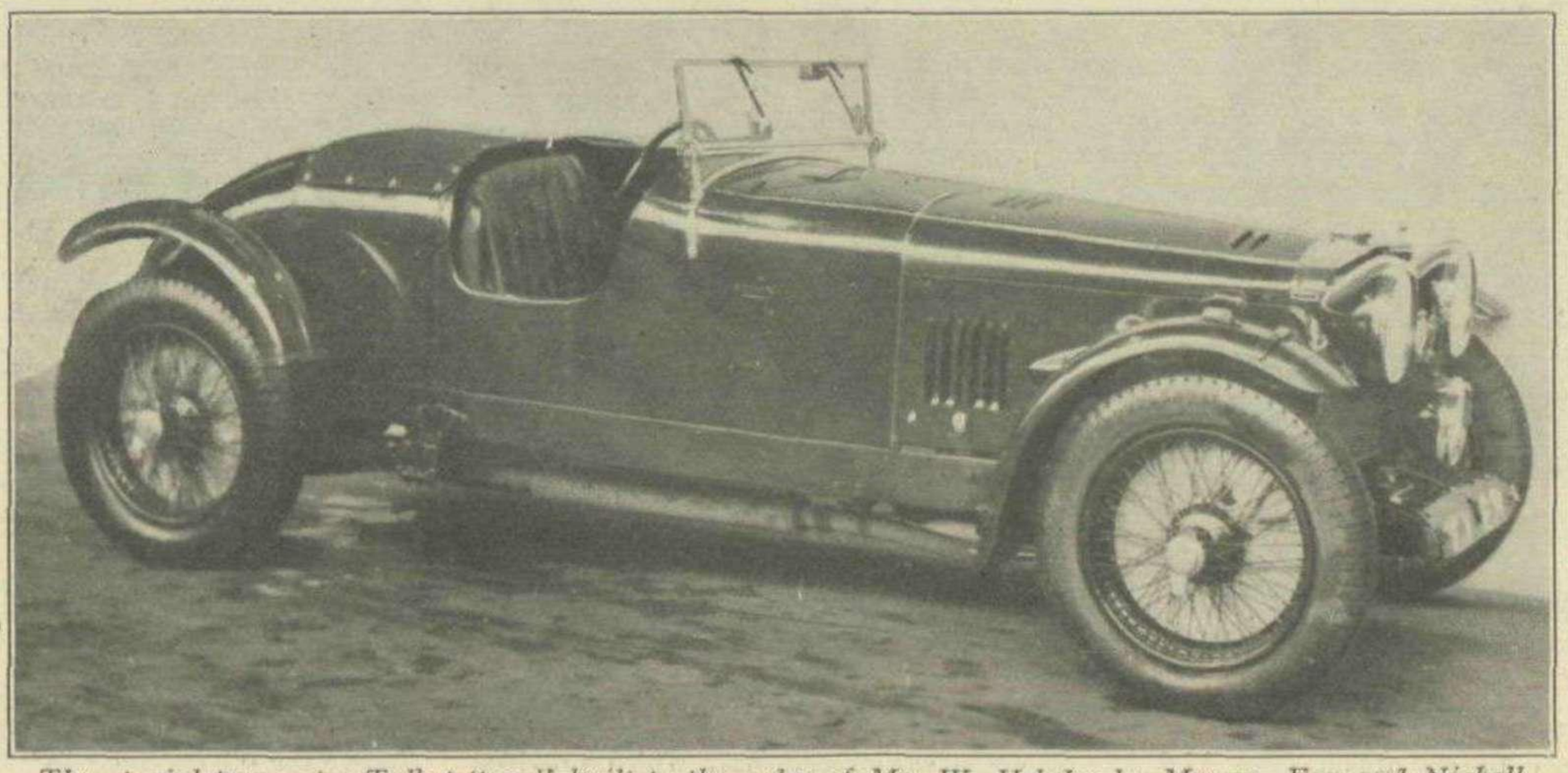
The valve clearance is not critical, but the six-thousandths advised in the instruction book is insufficient if the car is to be run at any speed. Eight-thousandths for normal running is about right, and possibly ten if continued high speeds are contemplated.

Champion R3 sparking plugs are fitted as standard, but some engines run much hotter than others, and in many cases the R12 type, which has a long body with the hexagon extending well clear of the plug recesses is to be preferred. Though these are virtually racing plugs, they do not seem to soot up in traffic, though they need occasional cleaning to ensure a ready start on a cold morning.

As to the "Nineties" which we used to race, they differed from the standard cars only in having the higher compression of 9 to 1, running on pure benzol. What really gave us the extra performance was in fitting light-weight bodies. The cars complete turned the scale at 25 cwt. as against 29 of the standard cars

Now as to the kind of car which can be evolved from the "90" chassis. The chassis in question belonged to the old white single-seater which was driven by the Hon. Brian Lewis at Brooklands in 1931 and also in the 1930 500-miles Race by the same driver and the Earl Howe when it averaged 104 m.p.h. for the full distance. It is now the property of Mr. Hebeler, who also used to perform consistently on the team cars.

The first step we took was to fit two horizontal S.U. carburetters in place of the vertical Zenith. This was far from easy, as the steering column came just where the rear carburetter was intended to go. We overcame the snag by reducing the height of the steering-box column. Then it was found possible to evolve an efficient two-carburetter manifold, with two U-shaped pipes joining in the centre to supply the double centre port. Two S.U. petrol pumps are used to supply the fuel,



The special two-seater Talbot "90" built to the order of Mr. W. Hebeler by Messrs. Fox and Nicholl.

TUNING TALBOTS—continued

as this ensures a full head of petrol in the carburetters before the dynamotor is put into operation. Incidentally, much weight has been saved by fitting a small Young battery in place of the standard fitment. Though of quite small capacity, no trouble has been experienced in getting an easy start.

A Scintilla vertex is fitted in place of the coil-ignition system. The Delco system is pre-eminently reliable, but we have always found that magneto ignition gives that little extra power.

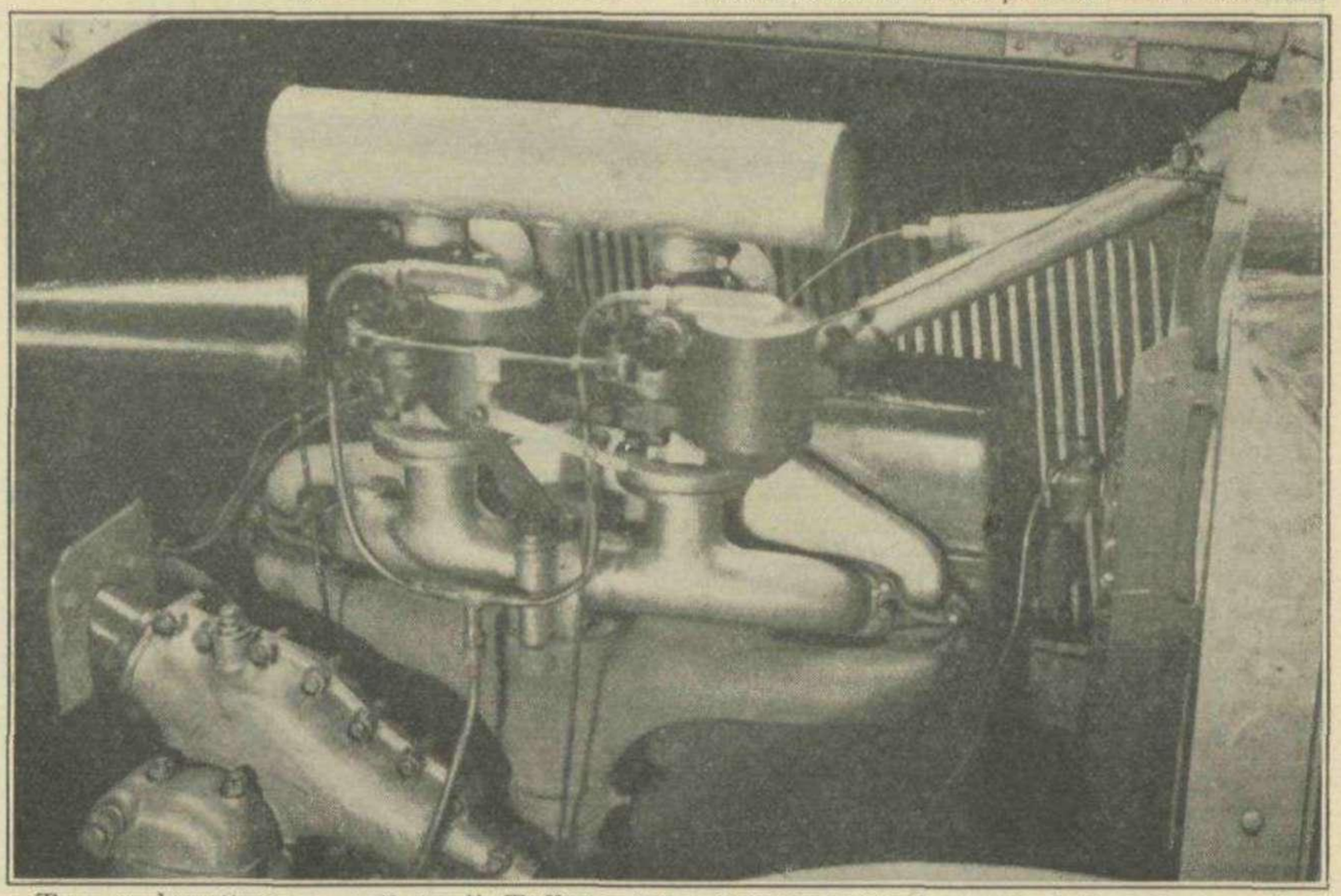
The compression has been raised to 8.5 to 1, but the car runs without a trace of pinking on Cleveland Discol. The high anti-knock value of the fuel partly accounts for this, but the better distribution which the two carburetters give is also an important factor.

In order to bring the appearance of the car into keeping with modern ideas and also incidentally to reduce the head resistance we fitted a special Serck radiator which is about eight inches lower than standard. Extra cooling capacity is secured by having the film six inches deep. The springs are now straight instead of being cambered, and a neat two-seater body is fitted. The part of the chassis behind the rear spring mounting has been cut away, and a 23-gallon petrol tank fitted just in front of the rear axle. The weight distribution is no longer affected by the amount of fuel in the tank, and there is a useful amount of luggage space between the seats and behind the seats.

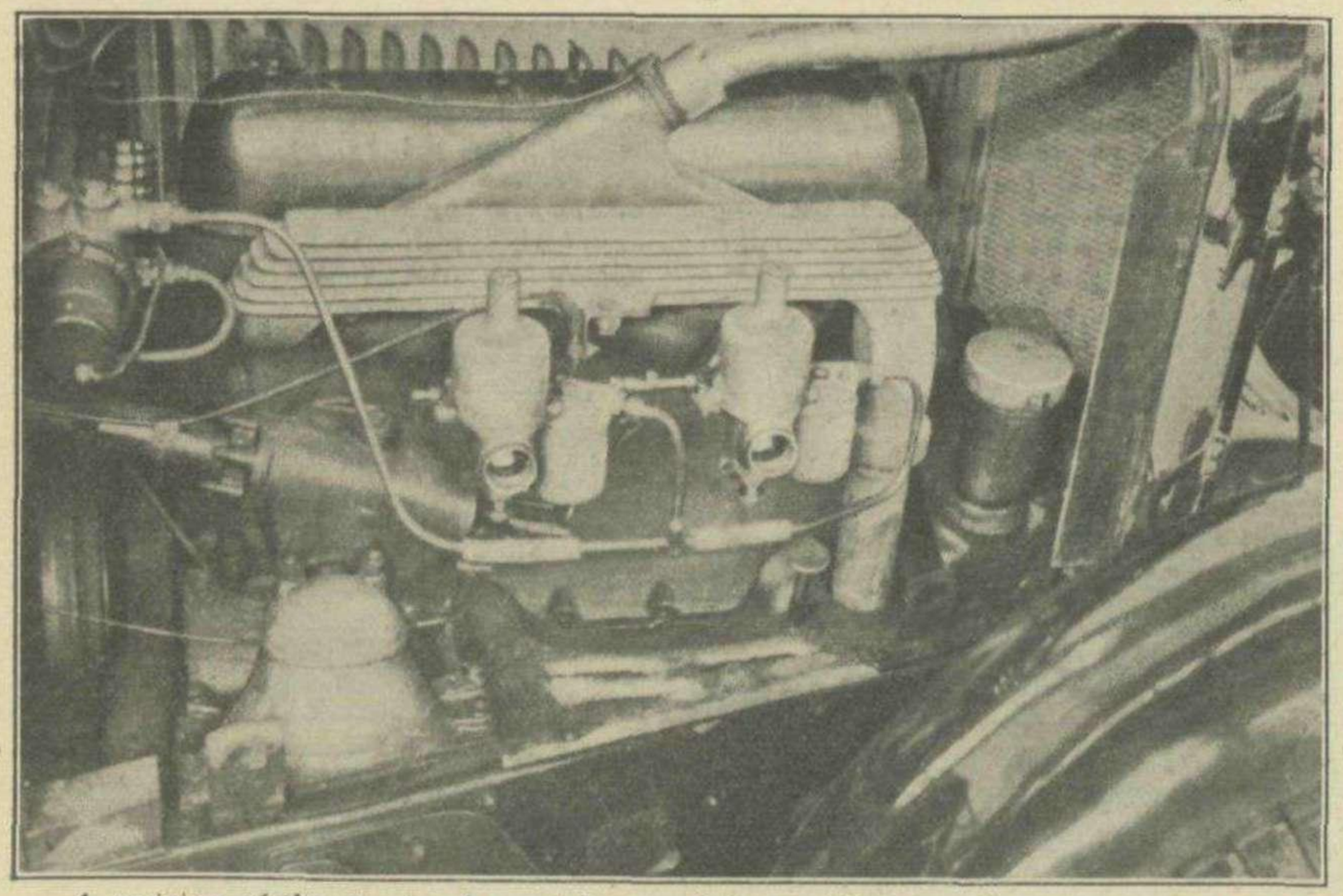
Special Holden and Hunt brake drums have been made for the car and Mr. Hebeler finds he can go for long periods without the need for adjustment.

tion. At present, this is about equal to that of a V8 Ford!

The "105" responds to the same treatment as the smaller car, particularly in respect of the ignition. The carburetion calls for little change from standard, though here again larger jet and chokes are sometimes of advantage. A peculiarity we have found is that often they do not develop their full power during the first 5,000 miles, the reason apparently being that the valves and seats take a good time to bed down. If the engine is taken down and the valves and seats tuned up with cutters, not ground-in in the ordinary way, the car will then go on with greatly increased power and for a long period. Early "105s" were fitted with rather a "slow" camshaft. On later ones the racing camshaft which provided considerable overlap was standardised.



Two carburetters on a "105" Talbot. The chassis formerly carried the single-seater which was second in the 1931 500-miles Race, apart from numerous other successes.



A revision of the steering lay-out has made it possible to mount two carburetters on the Talbot "90" engine.

The car complete only weighs 23 cwt. so its performance is quite striking. With a 4 to 1 back-axle ratio and 5-inch tyres, it reaches its rev.-limit of 4,500 r.p.m. very easily, giving a speed of 93 m.p.h. and, with larger tyres, could easily be got to go at an even higher speed with a slight sacrifice of accelera-

With the engine in good condition, the three-litre engine will pull quite a high gear, and a standard saloon we prepared and fitted with 4 to 1 back axle lapped Brooklands at 86 m.p.h. with a maximum of about 92, which is not bad for a completely equipped motor-car of this capacity.

The racing "105s" differed from standard again, only in having the high compression and a light body, the car complete weighing 28 cwt. as against 32 of the standard sports job. In this trim they have lapped Brooklands at 113 m.p.h., while Brian Lewis's single-seater got round at 119.

This latter car Mr. Fox retained and fitted the chassis with a substantial touring saloon. In this condition the car did its ninety, running on petrol and 20 per cent. benzol. Here again we experimented with twin carburetters, and evolved an induction pipe on which we fitted two down-draught S.U.s. Rather to our surprise, the car now runs perfectly smoothly on commercial benzol mixture, proving beyond doubt that better distribution is a powerful factor in preventing pinking. So much power was there, in fact, that besides the 4 to 1 back axle ratio, 6-inch rear tyres are fitted and the engine is only running at 3,800 r.p.m. at 90 m.p.h. Acceleration has not been sacrificed to obtain a high maximum, as may be gathered by the fact that Mr. Fox was able to average 60 m.p.h. for the 170 miles from Le Mans to Boulogne last year with four people up and a good load of luggage.

As an instance of how well the cars wear if properly looked after, it is worth recording that this car has done 30,000 miles of strenuous work with the original pistons. Apart from a trace of bell-mouthing at the top of the bores, which does not affect the oil consumption or power, the cylinders are still in perfect condition. The secret of long life is to change the oil regularly every 2,000 miles, while a graphite upper cylinder lubricant

TUNING TALBOTS—continued.

has been found of advantage. Equally important, of course, is to warm the engine thoroughly before putting it under load.

Two final points regarding the upkeep of Talbots. In the first place the dynamotor should be inspected regularly and carbon dust cleared away from the commutator and brushes. A motor of this type dissipated something like three electrical horse-power starting a stiff engine on a cold morning and, as the dynamotor does not have the advantage of a flywheel reduction gear, it is particularly necessary to have everything in good trim.

The other component which sometimes calls for attention is the clutch. Behind the lining a series of leaf-springs are inserted, the idea being to force out the lining at a number of points. A little slip takes place, easing the engagement until the clutch plate is pushed fully into contact with the lining. If the clutch is inclined to snatch or shudder, it means that either the leaf-springs have gone flat or broken, or the clutch plate is no longer true and needs machining.

An additional tip is to "massage" graphite into the lining with the tips of the fingers; this brings the final "velvet touch" to the take-up. Strangely enough, the same expedient can often be used to overcome snatch on the bottom gear of the self-change boxes, the only difficulty in this case being to detect the exact place to insert the graphite. Apart from that, don't play with the self-changer. It is an expert's job, and should only be entrusted to those who are thoroughly experienced in this direction.

J.C.C.'s FIFTH RALLY

Taking advantage of the fact that Brooklands will not be opening officially after its winter repairs until March, the J.C.C., by special arrangement, is holding the fifth of its interesting series of annual rallies at the Track on Saturday, February 15th.

Entries, which will be limited, are 12s. 6d., and close on February 8th. J.C.C. members only are allowed to compete and cars of any capacity may be used. Racing cars will not be eligible.

The series of tests have been slightly modified from those of the 1935 event, but the tit-bit of the afternoon will be a repetition of the Monte Carlo "wiggle-woggle," exactly as it is being run at the conclusion of the 1936 International Rally. This test, which calls for acceleration, braking, reversing and also the execution of a figure "8" at speed, provides ample scope for the good driver. In the J.C.C. event, total time for each car will be taken and those who achieve the whole course within a total time equal to the average of all runs, plus five per cent. leniency bonus, will pass.

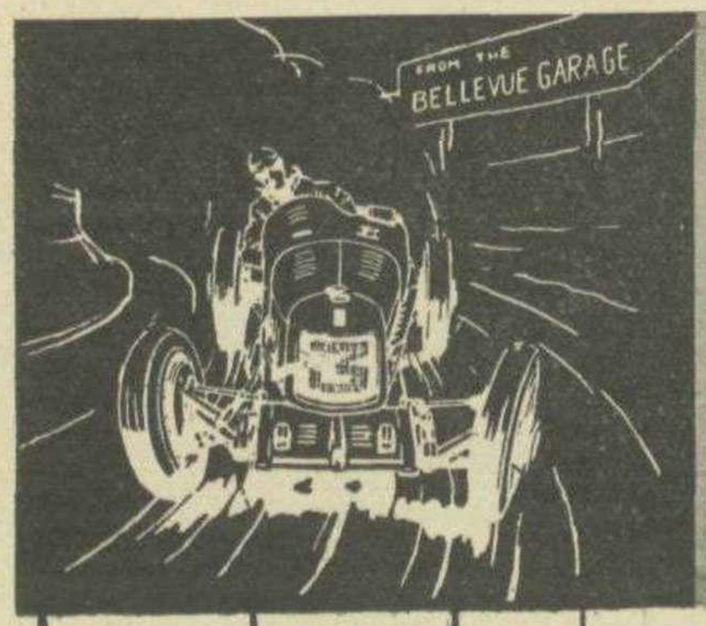
Other tests call for a stop and re-start on the 1 in 4 of the Test Hill, an exciting braking, acceleration and reversing test down the Test Hill, a flying half-mile, easy starting and a revised and practical parking test.

Regulations are available at the J.C.C., Empire House, Brompton Road, London, S.W.7.

THE B.A.R.C.

Brooklands Clubhouse was so crowded on the occasion of the members' gathering that the film display which followed tea had to be given twice. Many useful suggestions were offered, the speakers including Mr. Cecil Kimber, R. G. Shaw, Mrs. L. Gould, Paul Hardy, Dr. Roth, W. E. Humphreys and many others. The J.C.C. will stage their annual Members' Rally at the Track on February 15 and the first race-meeting of the year is scheduled for March 14.

Many improvements have been completed during the winter, including better accommodation for spectators in the Public Enclosure.



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AWARDS

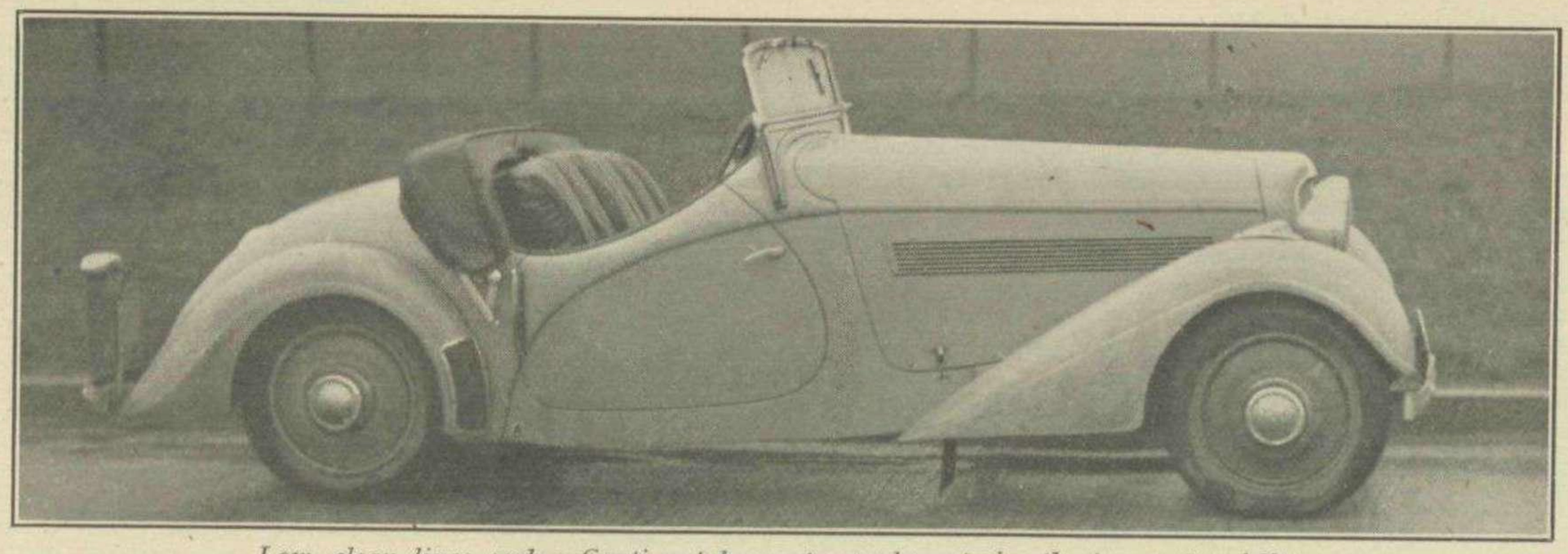
During 1935, 45 awards in racing events and 36 awards in reliability trials have been secured by drivers of cars which have been prepared and tuned by us.

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We always have available for sale a number of Racing cars and also Sports cars suitable for trials and track and road-racing events. Prices from £120 upwards. We invite your inspection and trial.

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18-19 BELLEVUE ROAD. WANDSWORTH COMMON S.W.17.



Low, clean lines and a Continental smartness characterise the two-seater Adler.

THE 1.7-LITRE ADLER

A HANDSOME FRONT-DRIVE CAR OF REMARKABLE STAMINA. ROAD-HOLDING AND STABILITY ASSURED BY HAVING ALL WHEELS INDEPENDENTLY SPRUNG

Drivers in this country are sometimes inclined to complain about the condition of our English highways, but in comparison with many of the through routes which connect important centres in Central Europe, they are veritable billiard tables. It is not surprising that Continental manufacturers, particularly those operating in Germany, have long been interested in independent springing as a solution of the suspension problem of the small car, one of the best known and oldest established being that of the Adlerwerke Company, whose works are situated at Frankfort. Front-wheel drive was another interesting feature of the car tested and, as may be supposed, we took over the car with our powers of criticism and observation, as we hoped, at full bent.

Heavy rain was falling on the day appointed for the test, while the front tyres we noticed were worn almost smooth. In spite of this, there were no signs of instability or wheel-spin even on greasy wood-blocks and, by the time we had gained the open country, felt perfectly at home and happy at the helm of the neat little two-seater.

The first question asked by the prospective purchaser would be, how does the handling of the Adler, with its front-wheel drive, compare with a car of similar type fitted with orthodox transmission? On a straight road, one can scarcely detect any difference; the pulling power of the front wheels seems to take the place of the caster action which is relied to keep the rear-wheel-drive vehicle straight on its course, and the car holds a steady path at speed without any effort on the driver's part. There is no detectable alteration in feeling, even when the accelerator is suddenly released.

On a corner, the pulling power of the wheels again takes the place of caster and helps to straighten up the front wheels and, actually, a certain effort is required to resist this effect, an effort only noticed however in comparison with the lightness of the steering in normal travel.

The only occasion where front-wheel drive might cause difficulties is when the car is being driven at full speed round a fast corner, and then finding the road blocked by some slow-moving car ahead.

BRIEF SPECIFICATION

Engine : Four cylinders. Bore 74.25 mm., stroke 95 mm., capacity 1,645 c.c. R.A.C. rating 14 h.p. Side valves. Coil ignition. Single Solex carburetter.

Gear-box : Four speeds and reverse. All synchro-mesh. Steering column control. Ratios 4.7, 6.86, 10.1, and 19.2 to 1.

Suspension : All wheels independently suspended. Front wheels on transverse leaf springs. Rear springs ¼-elliptic.

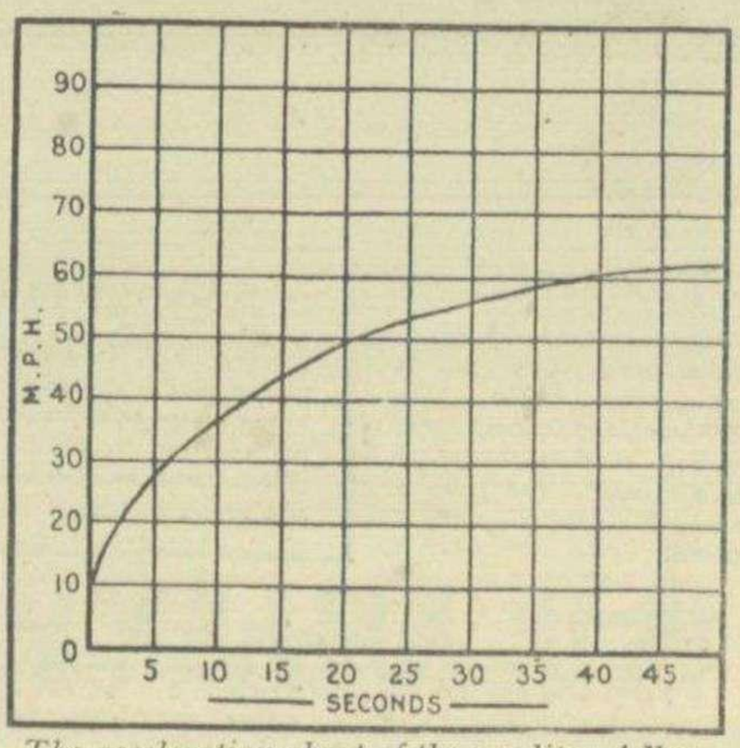
Brakes : Mechanical, operated by cased cables

Dimensions : Wheelbase 9 ft. 3 in.
Track 4 ft. 1 in.
Weight 18½ cwt.

Price : Open two-seater **£435.**

Partly through zeal and partly through confidence in the car, we even attempted this manœuvre, but the only effect was to reduce the caster effect and to make the steering rather lighter. The low centre of gravity is sufficient to take the car round even without the assistance of front traction.

Having thus proved the negative qualities and general safety of the Adler system, we were then able to get on with some fast driving. Theoretically, one ought to be able to get round a corner more quickly pulling the car than pushing from behind, and we certainly managed some fast work on bends in spite of the rain and the tricky road surfaces. With no transmission line to bother about, the engine and passengers are carried low between the side members, which helps on corners. The suspension provided good insulation against rough roads, but has not been made too supple and the car has that firm feeling on bends which the sports-car driver values so much.



The acceleration chart of the 1.7-litre Adler.

Being intended primarily for long-distance work, rally driving and the like, the Adler is purposely tuned for high-speed reliability rather than maximum speed, the highest speed we reached on the level being 67 m.p.h. We were informed by the Distributors that the same car had previously been capable of reaching something like 75 m.p.h., so possibly excessive carbon or retarded ignition may have been to blame. The important point is that the car runs quite happily at 55-60 m.p.h., or even with the accelerator hard on the floor-boards, for an unlimited period and, as the car is pre-eminently well-sprung, roomy and comfortable, excellent average speeds may be put up.

The brakes are powerful, and even on a wet road, we pulled up in 63 feet from 40 m.p.h. Considerable pedal pressure is needed to get the full effect, a factor which makes for safety on slippery surfaces.

The engine is a comparatively low-compression side-valve unit and seems to enjoy hard pulling against the collar. Main road gradients such as Bix Hill, leading out of Henley, can be taken in top gear while still accelerating, while the gear-ratio is sufficiently high to avoid any suggestion of "buzz-box." The engine is free from period and runs reasonably quietly, while most of the vibration inseparable from a four-cylinder unit is avoided by mounting it on rubber.

The forward mounting of the gear-box on a front-wheel-drive car makes it difficult to install the orthodox type of gear-lever working in a gate. On the Adler, the gears are changed by a lever on the right side of the steering column, first and second gears being obtained by pulling up the lever against a spring and moving it forwards or backwards, and third and top in a similar manner with the lever in the lower position. After a

THE 1.7-LITRE ADLER—continued

day's practice, this method of selecting the gears offers no difficulty, but the change is made rather heavy by having stiff selector springs and a strong spring pulling the lever towards the lower position.

All the gears are fitted with synchro-mesh mechanism, and though the ratios are rather widely spaced, the change is practically instantanous in every case. Bottom gear is in the nature of an emergency ratio, and acceleration figures from 10 m.p.h. were taken starting in second gear. The maxima in the gears is approximately 14, 27 and 45 m.p.h., where the engine speed is about 3,800 r.p.m. No rev.-counter is fitted, but extreme revs. are not called for in any case.

The engine is a straightforward side-valve unit, with thermo-syphon cooling through short and large-bore water pipes and a belt-driven fan mounted on the front end of the dynamo. One vertical Solex carburetter is used and, in conjunction with the auxiliary starter device, gave easy starting from cold, and an acceleration curve free from flat spots. The petrol tank, which holds eight gallons, is mounted underneath the bonnet and feeds the carburetter by gravity. The petrol gauge was inaccurate, but the consumption worked out at approximately 20 m.p.g. National Benzol mixture was the fuel recommended.

The compression ratio is 5.5 to 1, and the modest horse-power claimed by the makers is 38, but with a little tuning, it should not be difficult to carry this figure substantially higher. A three-bearing crankshaft is used.

A six-volt starting and lighting system is fitted. The battery is carried under the bonnet, with only a twelve-inch lead to the starter, so the voltage drop is negligible. The head-lamps gave an even beam free from dazzle and 55-60 m.p.h. can be maintained in safety after dark. A dipped beam is obtained by the use of dual-filament bulbs, and the lights are controlled by a lever, conveniently placed under the steering wheel.

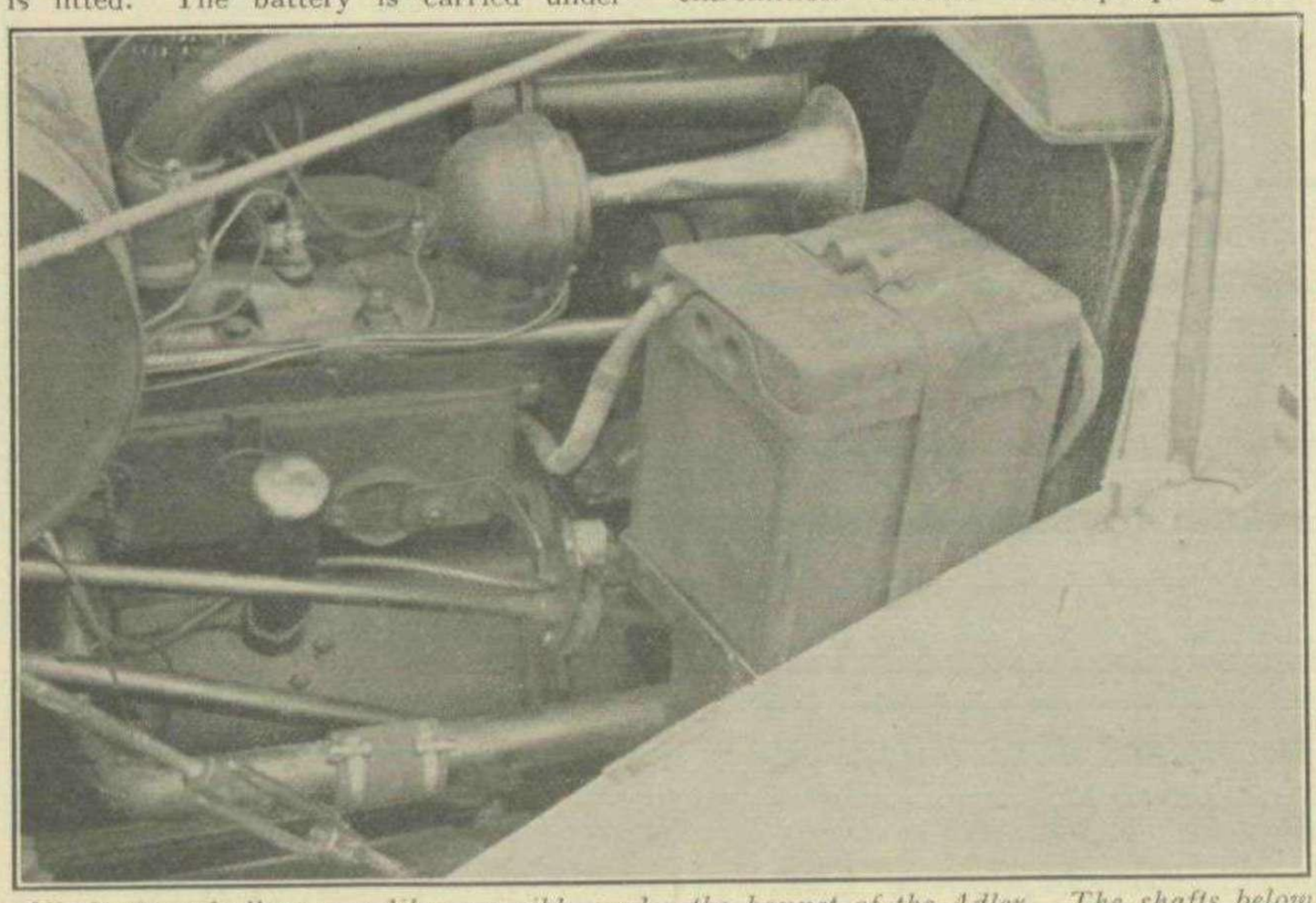
The clutch, gear-box and differential are carried in a compact unit bolted to the front end of the engine. The front wheels are carried on two transverse leaf-springs one above the other, and are driven by shafts universally jointed at the differential casing and at their outer extremities. Behind the top spring are mounted the hydraulic shock-absorbers, and below them the steering rods, which are actuated by rack-and-pinion steering gear.

The rear wheels are mounted on arms pivoted and moving parallel with the chassis, quarter-elliptic springs being bolted to their forward ends to give the effect of cantilever springing. The brakes are of the mechanical type applied by means of encased cables.

Freed from the necessity of providing clearance for the propeller shaft and back-axle, the chassis side-members are straight for their entire length, and of box-section. They converge towards the front to permit an exceptionally good steering lock, and at the rear are braced by light and simple cross-members. The underside of the car is quite smooth and the ground-clearance is $8\frac{3}{4}$ inches.



Even radiator cowls can add to the sporting effect if designed with good taste. The size of the windscreen gives a clue to the amount of room in the driving compartment.



All the "works" are readily accessible under the bonnet of the Adler. The shafts below the oil filler actuate the steering and the gear-shaft.

The open two-seater body fitted to the car we drove reached a standard both of comfort and appearance, and was obviously constructed to withstand hard elbow-room with the hood and side-usage. It was wide enough to give full curtains erected, and the screen, which could be folded flat down was deep enough for the tallest driver. There is plenty of room round the pedals, since there is no rear-mounted gear-box to come back into the driving compartment, and with the floor-boards slung well below the side-members, the driver sits commendably upright in the best position for fast driving. The squab was adjustable for rake, and a thin-rimmed Ashby steering wheel was fitted to the car we drove. The hand-brake is mounted on the left of the driver.

Being purely a two-seater, all the space under the sloping rear panel of the Adler is available as a luggage locker, capable of taking four large suit-cases and other travel gear. Tools are carried in a compartment under the seats. The hood has the double-folding mechanism beloved of Continental manufacturers, but is easily erected when one gets the knack of it. The spare wheel is recessed into a well in the rear panel.

The car tested was put at our disposal through the courtesy of Messrs. British

THE 1.7 LITRE ADLER—continued

Adler Cars of 9, Albemarle Street, London, W.1. Apart from their activities as sole concessionaires of Adler cars for England, their intention is to enter cars for long-distance competitions such as the R.A.C. Rally, in which freedom from trouble, easy running, and maintenance of tune can be demonstrated. Unfortunately there are no really long-distance high-speed events in this country corresponding to the 2,000-Kilometre Trial in Germany or the Alpine Trial, in which Adlers have been conspicuously successful, but at any rate the "resistance" demonstrated there will be of value to owners in this country. Another convincing demonstration of the ability of the 1½-litre model to stand up to hard work was given by the streamlined saloon which averaged nearly 77 m.p.h. for four days on the Avus track late last year.

London Service Depot for Zoller Compressors

The London depot of M. A. McEvoy, Ltd., Derby, which has been established in Notting Hill Gate for some years, has now been taken over by Mr. A. J. G. Bochaton, the well-known trials driver of McEvoy Special cars who will, in future, trade under the name of Bochaton Motors, Ltd.

Messrs. M. A. McEvoy, Ltd., still retain an interest in Bochaton Motors, Ltd., and a direct working agreement between the two firms will result in extended service facilities for Zoller supercharged cars in the Metropolitan area.

Bochaton Motors, Ltd., will employ mechanics trained at the Derby works and, in addition, will enjoy the benefit of the researches of McEvoy, Ltd., at Derby, and Mr. McEvoy's and Mr. Laird's racing and trials experience.

The M.G. Car Co., Ltd.

The Associated Company, M.I.E., Ltd. of the M.G. Car Co., Ltd., who handle all their Overseas business, have shipped M.G. Cars to the following different countries during the month of December:—F.M.S., Holland, Switzerland, Ceylon, Czecho-Slovakia, Germany, U.S.A., Sweden, South Africa, Java and Australia.

Torbay and Totnes M.C.

The fixture list, which includes three trials for cars shod only with ordinary tyres, is as follows:—Jan. 19, January Car Trial (standard tyres); Feb. 16, d'Espiney and de Walton-Reade Trial (std. tyres); March 22, Hare Sporting Trial; April 17, Dinner and Dance; May 17, Standard Car Trial (std. tyres); June 26, Dance; July 17, Dance; July 19, Annual General Meeting. Hon. Sec.: C. H. F. Cattell, 25, Blindwylle Road, Chelston, Torquay.

Manufacture of Motor Cycles to be Discontinued

The Board of the Triumph Co., Ltd., announce that as and from 31st January, 1936, the manufacture of motor cycles will be discontinued. This action is a further step in the re-organisation of the Company to which reference was made at the Annual Meeting in December last. Machines sold prior to this date will continue to be serviced by the Company, and spare parts will still be available.

The entire activities of the Company are being concentrated on the production of the new range of "Gloria" cars at the new works recently purchased.

The A.E.C. Oil Records

Messrs. Ferodo, Ltd., of Chapel-en-le-Frith, received the following cable from Captain G. E. T. Eyston concerning the records established on 4th January at the Montlhéry Track on the A.E.C. Oil-engined saloon car:

"WORLD'S RECORDS FOR DIESEL ENGINES

50 kilometres	98.68 m.p.h.
50 miles	101.24 ,,
100 kilometres	101.82 ,,
100 miles	102.95 ,,
200 kilometres	103.21 ,,
200 miles	103.12 ,,
1 hour	103.01 ,,

Ferodo Brake Linings gave entire satisfaction."

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All the latest news of A.A.A. races and Midgets—Pictures of Cars and Drivers—Action Shots—Intimate Interviews with Leading Drivers.

Special Offer

With each subscription (for limited time only), one 8 x 10 photo of any of the following drivers will be given FREE:

Rex Mays, Al Gordon, Harris Insinger, Louie Tomei, Johnny McDowell, A.A.A. drivers, or Bill Betteridge, Bob Swanson, Karl Young, Gilbert Guthrie, Curly Mills, Midget drivers.

2307, HONOLULU AVENUE, MONTROSE, CALIFORNIA, U.S.A.

Club News

GREAT WEST M.C.

The Great West Motor Club opened the 1936 season with its Hayward Trophy Trial on January 12.

A seven-mile course was tackled twice, the start being from The Cricketer's Arms, Bagshot. Bagshot Common caused much bother. F. A. Thatcher (M.G. Magnette) and W. L. Jackson (Frazer-Nash) were outstanding on the first section, and again on the second section, where W. E. C. Greenleaf's Ford Ten was also good. Only one first-class award was secured—by Jackson's Frazer-Nash.

RESULTS

Hayward Tankard : H. A. Nash (Talbot).

Ladies' Award : Miss D. Tilt (Triumph).

Team Award : A. C. Westwood, R. Sandford and S. G. Tett (Balilla Fiat Team).

First-class Award : W. L. Jackson (Frazer-Nash).

Third-class Awards : A. C. Westwood (Fiat); S. G. Tett (Fiat); D. Palmer (Ford V8).

BUGATTI OWNERS' CLUB

As is customary, the Bugatti Owners' Club has announced its fixtures for the complete season's activities.

On Sunday, April 5, the Opening Rally will take place at The Haycock at Wansford, the previous venue at Malvern being too far from London for some members' motors. This event allows members to re-unite after the winter, mellowed by a good lunch, and it counts towards the Victor Ludorum Trophy. It is usually followed by an impromptu hill-climb or appearance contest.

On May 17th, the seventh Monte-Honiton-Carlo Rally will be run off, in which competitors choose their own starting points and routes to Honiton, and endeavour to cover a really big mileage. Arrived at Honiton, the cars are checked for mechanical shortcomings, as on the Monte Carlo Rally, and then compete in a speed hill-climb in the grounds of Mr. Richard Marker's beautiful estate. Competitors then proceed to Sidmouth for lunch. As this interesting event was not too well supported last year, provision is to be made for those who wish to drive direct to Honiton and merely run in the hill-climb.

June 20th is reserved for a Speed Hill-climb, which will probably be a really ambitious event, on real Shelsley lines, at a venue about thirty miles from London.

July 12th will be occupied by a Gymkhana on a piece of ground off the Barnet By-pass, and August 15th is reserved for the Lewes Speed Trials. On October 24th and 25th, the Welsh Trial will be held, competitors rallying to Wales on the Saturday and tackling the 200-miles trials route on the Sunday, which embraces some very severe hills but avoids mud-sections. The very adventurous 200-mile trial by night will once again be staged on November 21st, with the Annual Dinner-Dance on December 4th.

A few new members continue to be elected each month. "Bugantics" is now in its fifth volume, the January, 1936 issue containing an account of the Night Trial, an article entitled "Bugatti Types I Have Owned," by K. W. Bear, last year's Victor Ludorum winner, and the twelfth article of W. Boddy's "Special Bugatti Types" series, which deals with Mr. L. G. Bachelier's 4.9-litre supercharged Grand Sport. Hon. Sec. : E. L. Giles, 2, Queen Street, Mayfair, W.1.

STANDARD CAR OWNERS' CLUB

The South-Eastern Section of the Standard Car Owners' Club reports a successful and enjoyable season in 1935. The 1936 programme is now under consideration, and four new members were elected recently. A benefactor wishing to hide his, or her, identity under the *nom de plume* of "Norma" has presented a special cup for the best performance by a member of the South-Eastern Section during 1936.

A working system has been drawn up, finishers and marshals in the year's competitions not being overlooked. Hon. Sec. : C. C. W. Burrage, Grand Buildings, Trafalgar Square, London, W.C.2. Telephone : Whitehall 2201.

SUNBAC

The Sunbac club announces that its well-known and popular trials will be repeated this season, including the Colmore Cup, the Colmore Trophy, the Team Trial, the Sutton Cup Trial and the Vesey Trial. In addition, invitations are anticipated, as has been the case in the past, from the N.W. London, Light Car, Singer, Bristol and M.G. Car Clubs.

The Colmore Cup and Colmore Trophy Trials are due to take place during February, but definite fixtures have not been allotted in the R.A.C. Calendar. Gen. Sec. : J. D. Woodhouse, 10, Warwick Chambers, Corporation Street, Birmingham. Telephone : Mid. 5255.

GENERAL NOTES

The "Exeter" was in good, traditional form this year, the rain, which fell in real "Hollywood" intensity all night, adding to the difficulties of the run. And those who say that no mechanical trouble overtakes competitors in modern trials must have been surprised when thirty-six competitors failed to check-in at the finish. So far as the writer of these notes is concerned, the Twenty-First "Exeter" will long be remembered, when lesser trials have been forgotten. Taking over the task of navigator in a saloon Ford Ten, a restful, post-Christmas week-end seemed assured. Alas, a mile or two beyond Exeter, after we had been on time at every check, and had made good use of our 2½-hours breakfast stop in the town, the head-gasket decided that it had had enough of an alloy head and 5 lb. of supercharge, and it "blew" forthwith between cylinders one and two. Back in Exeter, the crew parked in a deserted garage and took the blower off, removed the head, fitted a standard C. of A. gasket, replaced everything, changed the "comp." tyres and washed in two-and-a-half hours. We set out again expecting to reach London town at a reasonable hour, first bidding good-bye to Tenbosch, whose Balilla Fiat was in the same garage and sans rear axle—the result of an argument with solid rock beyond Simms.

Needless to relate, the standard gasket "blew" beyond Shaftesbury, and we spent a wretched night chewing gum and filling-up every ten miles, finally covering the last fifty miles on the water trapped in the cylinder-block. We got to London at 4.30 a.m. on the Sunday, and straightaway went to sleep—the first for some forty-five hours. I heard, subsequently, that Tenbosch beat us to it!

* * *

Apart from the Fiat's bent rear axle and the L.M.B.-Ford's blown gasket, Manton's old 3-litre Sunbeam, which had twin rear wheels, broke its axle, Denis Evans' Magnette sheared a crown wheel, Denyer's Lea-Francis a differential pinion, and Summerfield's Midget vital parts of its gear-box.

* * *

Once again the scare is going round that trials are proceeding in the wrong direction, and that their future is far from rosy. Personally, I believe that there is very little amiss with the smaller events, which are well supported, save that there are far too many events, the results of which are of short-lived interest. In an interesting article in a contemporary, a writer showed that the classic contests fail to attract a "repeat" entry year by year, and he quoted figures to prove that this was serious.

However, it should not be overlooked that whereas members of the smaller clubs are often content to run in trial after trial in company with fellow-members throughout the season, the classic M.C.C. events attract many of those who take the sport more seriously, and who often take up racing after gaining experience in these big trials. That may account for quite a considerable reduction in the number of former competitors, while expense is another item, those persons who have had one shot at a "classic" not always having the wherewithal to run regularly in events occupying a whole holiday week-end and embracing, with the return run, a rather expensive mileage.

* * *

As to trials conditions, I feel that little can be done. Some of us may feel that screaming good motors up muddy grades gets a bit stale after a time. Yet, short of running a three or four-day event over

CLUB NEWS—continued

the worst Welsh or Scottish hills, with numerous special tests thrown in, it is absolutely impossible to reproduce the conditions prevailing fifteen years ago, when sheer gradient conquered, and more than half the entry fell out with severe mechanical trouble. And it is certain that very few private owners would welcome the expense arising therefrom. So we must continue to enlist the aid of mud and slime as a "stopper." But I do think that "freak" driving and special tests might be reduced in number, their place being taken by lengthy sections of timed-acceleration tests. Providing that speeds do not tend to rise to speed hill-climb level and, in particular, that big-engined motors and the "blown brigade" are in some way handicapped, a long timed section is surely a finer test of car and driver than fifteen yards from a stand-still tackled on equal terms by the whole entry? But organisers must remember that an accident would be very unpleasant "in the wilds" with no aid in the vicinity, apart from "putting paid," in all probability, to the most active branch of motoring sport. Long, timed runs should only be staged on steep hills having no sharp drops away from the road, and if spectators arrive, marshals should be sent to look after them. Timing of longish sections stands a chance of being accurate!

* * *

Reverting to the article referred to above, I felt the writer's ideal of more normal hills, and the banning of solid axles, "comp." tyres and special "slime-vanquishing" equipment generally, to be good, but sadly impractical. The modern car, with efficient engine and very low gear-ratio, is not easy to defeat! And ordinary hills of sufficient severity would, I imagine, be difficult to find so situated that a trial could pass over them without inconvenience to other traffic. It would be interesting to have readers' opinions on these matters, and suggestions for a course which, without embracing freak surfaces and slime, would be in any way worth tackling with modern cars. Retirements no longer add to the honour of coming through clean—how many occur in the normal, short-distance trial?

No, the route itself must provide the hazards, and I see little possibility of dispensing with slime and/or bad surfaces.

* * *

Not that slime, as slime, cannot be interesting to tackle. Indeed, there is no accounting for the variations that mud-surfaces can assume. In the recent N.W. London versus Kentish Border Match Trial, I was passenger in a Centric-blown M.G. Midget with solid axle.

Normally this little car is a very effective job over a trials course. Its engine was in good fettle, with plenty of revs., the comp. tyres and weight carried were as usual, its driver right on form. Yet, with the slime as it was on that day, our motor just wouldn't play! Is it any wonder that so many methods are adopted by trialsmen, or that the trials "star" is ever changing? Just at present, the over-bored M.G. Magnettes with mild super-charge seem the most effective hill-flatteners, with the totally-different, light, unblown Frazer-Nash-B.M.W.s their match in everything save short acceleration tests against the watch. The V8 Ford, too, if a shade temperamental in the matter of spinning its wheels, has had a good and effective innings! Yet who knows what the position will be in six months time?

* * *

The new 4.4 Morgan is attracting interest as a possible trials car. Its initial appearance in the "Exeter" resulted in a Premier with no apparent fuss at all.

* * *

An interesting entry in the Great West M.C. Bagshot Trial was F. R. G. Spikins' Spikins-Hudson-Special, which had a supercharged, much modified Hudson straight-eight motor, and ran with twin rear wheels. It will be run at Shelsley and elsewhere. Another trials-entry intended for sterner stuff was K. B. Shaw's British Salmson, which is destined for Brooklands, in the N.W. London match event.

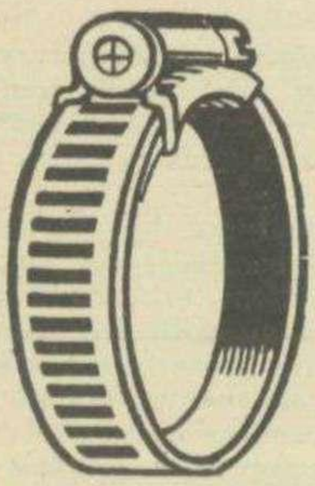
* * *

"Can route-cards be dispensed with to improve trials"? questioned a writer a few weeks ago. This writer says quite definitely "no"! It is poor fun to lose the route in a trial, because marshals do not wait for one at the hills and special tests. Route-card reading may amuse the navigator, but is usually worrying to the driver, who is fearful of going astray and more or less obliged to rely upon shouted instructions from a seemingly indifferent passenger—who, poor fellow, is only doing his very best.

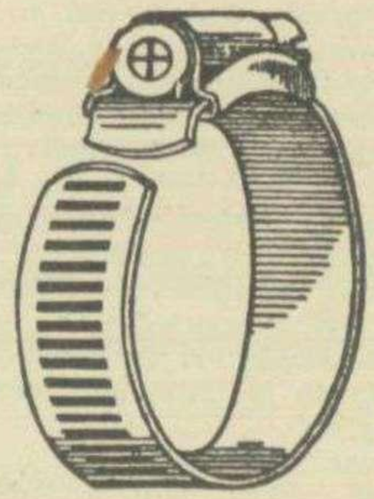
Personally, I am always mighty relieved when a trial on which I am going as passenger (ballast-ed!) turns out to be a "follow-my-leader affair."

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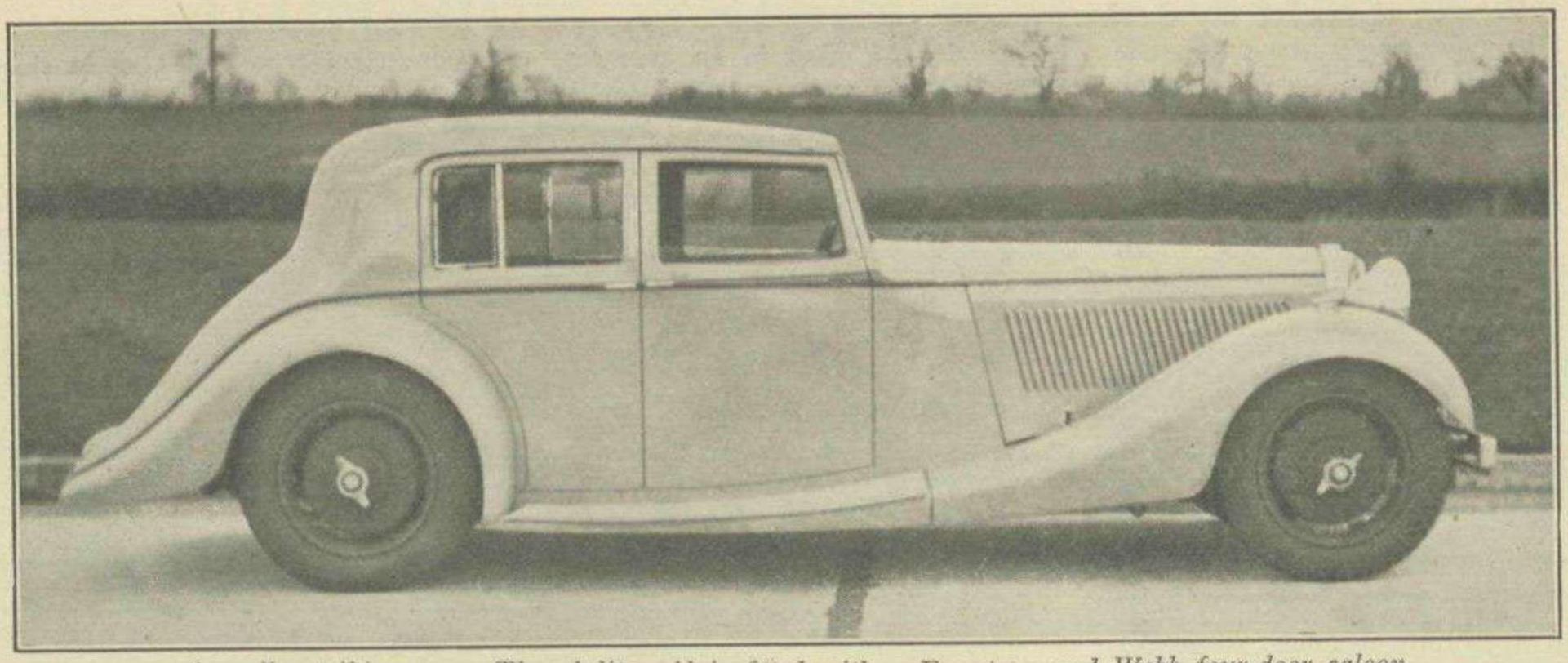
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A really striking car. The 3½-litre Alvis fitted with a Freestone and Webb four-door saloon.

A DE-LUXE ALVIS

THE NEW 3½-LITRE CAR COMBINES A STRIKING PERFORMANCE WITH THE HIGHEST STANDARDS OF SILENCE, SUSPENSION AND GOOD LOOKS

If you have a friend who has a prejudice against the genus "Sports-car," take him out in the new 3½-litre Alvis. A smoothness which is supposed to be the perquisite of the touring chassis is combined with the perfect handling, high all-out speed and liveliness which the sporting enthusiast regards as essentials. Of course, this latest product of the Alvis factory is a costly car, but the outlay is reflected in the finish and care which is lavished on the chassis and the distinguished air which characterises the car as a whole. If such refinements were not worth paying for, none of the world's finest cars would be on the market to-day.

The chassis follows the same advanced design as that of the Speed Twenty, with independent front-wheel suspension, a low chassis-line and a rigidly-braced frame which forms an ideal basis for open or closed coachwork. The engine is a newly-designed seven-bearing unit, and by virtue of an ample capacity, produces the necessary power without recourse to high revs. or compression-ratio.

We took over the car in the centre of London and were at once impressed with the silent running of the engine, and the way it pulled away down to 15 m.p.h. on top gear, or 10 if the ignition were slightly retarded, getting away smoothly on the same ratio if need be. The suspension with the shock-absorbers slacked off was as flexible as anyone could wish for, without the impression of instability, and meets the most exacting requirements as regards use as a town-carriage cum sports car.

Crowded streets were soon left behind, and we quickly gained the road to the open country. It did not take long to appreciate that the car we were driving was fast as well as smooth, and a speed of over 90 m.p.h., admittedly with a slight following wind, revealed the sporting possibilities of the new chassis. Tele-control shock-absorbers were fitted, but unfortunately the rear ones required replenishing with fluid. Not wishing to lose the advantages of the small amount of by-pass road, we did not trouble to remove the floor boards to pump in a further supply, but even without the extra damping, the long rear springs gave satisfactory control of the car. The latest type of tele-control shockers have an external adjusting nut in addition to the hydraulic control, and at a subsequent stop, we tightened these up to get the small extra amount of friction required for fast cornering.

BRIEF SPECIFICATION

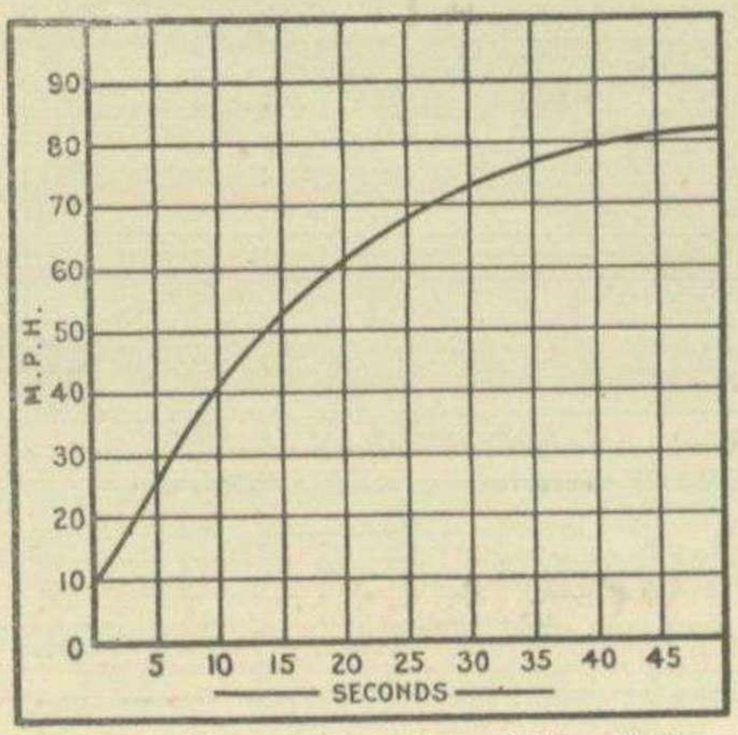
Engine : Six cylinders. Bore 83 mm., stroke 110 mm., capacity 3,571 c.c. R.A.C. rating 25.63 h.p. Push rod operated, o.h.v. Dual ignition, magneto or coil. Three S.U. carburetters.

Gear-box : Four speeds and reverse. All forward ratios constant-mesh and fitted with synchro-mesh mechanism. Ratios 4.11, 5.9, 8.34, and 12.95 to 1. Central change.

Suspension : Independently sprung front wheels with transverse cantilever spring. Semi-elliptic at rear.

Dimensions : Wheelbase 10 ft. 7 in.
Track 4 ft. 8 in.
Weight with four-door saloon body, 35 cwt.

Price : chassis **£775.** Four-door saloon **£1,270.**



The acceleration chart of the 3½-litre Alvis.

Boisterous, squally winds and a succession of rain showers made conditions unpleasant for fast motoring, and we were content at first to make our way steadily into the teeth of the wind at some 65 m.p.h., not unpleased for once to be in a warm saloon, and conscious that the throttle was only half open.

The Alvis is essentially a car light to control. The independent suspension prevents any kick-back in the steering, which is light and free to handle, and the steering encourages a gentle hold even at speed. The whole car has an easy, effortless stride which fairly eats up the miles and leaves one unfatigued even after the longest journey. Given throttle on main-road hills, it sails up with steadily-increasing speed, nearly always in top gear, and the power available at low speeds gives a smooth, but definite get-away after slowing down for corners.

As conditions improved, the car seemed to call for higher speeds, and soon we were cruising at 75. This is the normal cruising speed when road conditions permit, and as the engine is turning quietly and smoothly at only 3,400 r.p.m. there is no reason why it should not do so indefinitely. Above 78, a certain amount of engine noise and vibration becomes apparent, though only in comparison with the silence lower down. As has been said, under favourable conditions the road speed goes up to 90. Repairs at Brooklands made it impossible to get a timed maximum speed, but from two-way tests on a suitable piece of straight road and a comparison of the rev.-counter and speedometer figures, we should place it at 85 m.p.h.

As may be appreciated, the gears are not much required in normal running, but they are there to be used when needed. The special Alvis gear-box which has synchro-mesh mechanism on all ratios, is much lighter to control than on previous models we have driven. The

A DE-LUXE ALVIS—continued

lever can be pulled gently over or snapped across the gate when a quick change is required, while double-clutching can be performed by those who prefer to drive in the normal way. The majority of experienced drivers still feel a keen satisfaction in a smooth, clean-cut gear change, and with a stiff lever which comes naturally under the hand and a responsive engine, the Alvis responds with verve when one calls for flat-out performance.

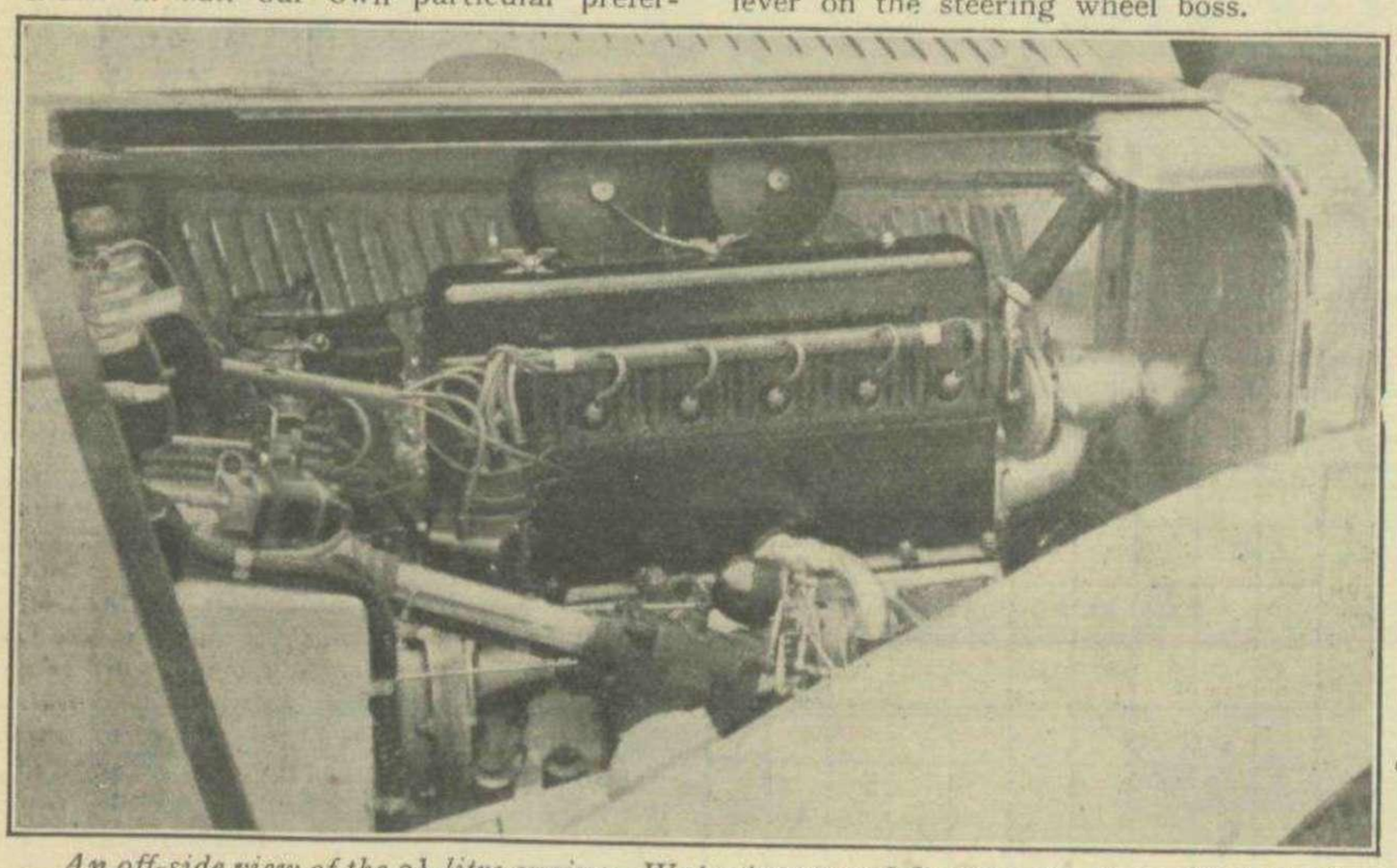
The engine runs up smoothly to 3,500 r.p.m., but from then on, a slight roughness is felt, and though there is no red mark at 4,000 r.p.m., increasing noise and vibration suggested that this was the useful upper limit. The road speeds at 4,000 r.p.m. in the indirect gears are: first gear 24 m.p.h., second gear 37 m.p.h. and third gear 58 m.p.h. Second and third gears are inaudible except for a slight hum on the over-run. The clutch is fully up to its work and takes up smoothly from a light pedal pressure.

After a hundred miles of fast touring, we considered we had learnt all there was to know in this direction, and thereupon settled down to some really rapid motoring. With the shock absorbers firm, the driver has no cause to remember he is at the wheel of quite a large and heavy saloon, and the car can be slung round corners in a most satisfying way and without that squealing of tyres that suggests that the car is being driven harder than it likes. The steering is light and free but has plenty of caster action, and the front wheels follow just the desired path even on a rough adverse camber. The driving position was satisfactory, and in spite of sitting low behind a spacious bonnet, the top of the near-side wing could still be seen. The back of the driving seat was sloped back too much to suit our own particular preference, though restful enough for the front passenger, but this could easily be modified to the owner's liking.

Average speeds depend so much on the roads on which they are put up that they can only be given with reserve, but over one give-and-take road we put in a comfortable 53 miles in an hour and a hundred miles in just over two. Considering that much of the latter run was done after dark, with patches of wet road and a number of 30-mile limits scrupulously though reluctantly observed, it says much for the handling and stability of the car. The Lucas P100 lamps were excellent, allowing a safe 85 m.p.h. in places, and 50 is quite safe with the two Pass-lights, which are brought into use when meeting oncoming traffic in use. Charging and lamps are controlled by lever on the steering wheel boss.



The Alvis is low in build without restricting head-room. The new radiator is particularly neat.



An off-side view of the 3½-litre engine. Water pump and dynamo are accessible behind the steering column. The tips of the air-cleaners can be seen behind the valve covers.

The brakes unfortunately were rather off colour, and were in obvious need of adjustment. As it was, they pulled the car up dead straight in eighty-five feet from forty m.p.h. The Speed "Twenty" tested last year in MOTOR SPORT and which was fitted with brakes of similar pattern could be pulled up in sixty feet, so those of the 3½ should have similar figures when properly adjusted.

The car we drove was fitted with a particularly handsome four-door saloon built by Messrs. Freestone and Webb of Willesden. The lines were essentially sporting without being unorthodox, and are in keeping with the fine workmanship of the chassis. The car was finished in light blue, with a dark blue waistline. The seats were upholstered in soft leather. The rear seats provided ample width and leg room for six-foot passengers and, being set well forward on the rear axle, should be just as comfortable as those in front. The tail of the car is devoted to a spacious locker and the tools are carried in a locker with a fitted tray. A sliding roof is standardised, and the quarter windows swing open to give full ventilation in the back of the car.

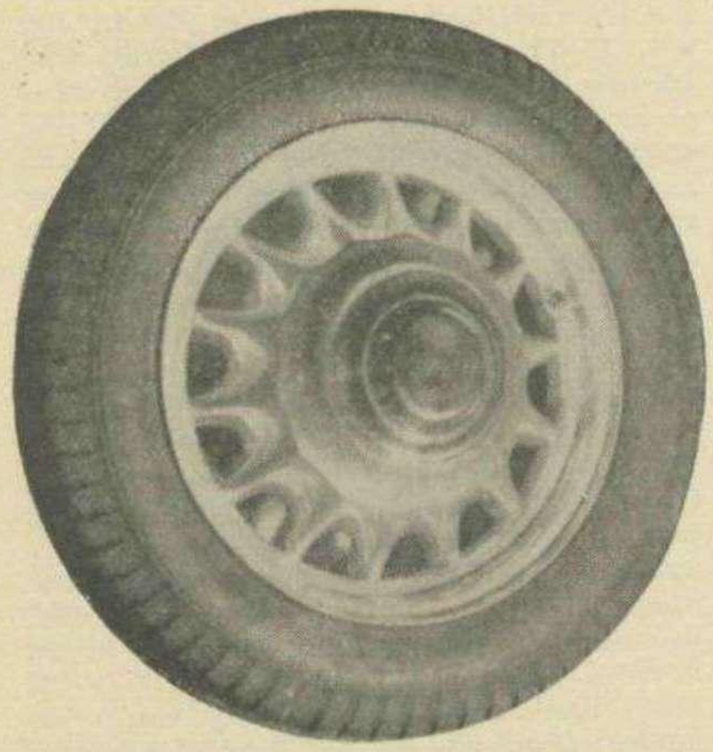
The engine, which is distinctly compact for a seven-bearing unit of 3½ litres capacity, displays a number of original points. In the first place, a set of twelve valve springs of small diameter and disposed around the valve stem are used instead of the usual concentric type. Increased silence and freedom from valve-bounce is claimed for this arrangement. Then the camshaft and all auxiliaries are driven by chain from the rear end of the crankshaft, where the drive is not subject to torsional vibrations. The valve rockers and push-rod ends, like almost all other parts of the engine, are lubricated under pressure.

The cylinder-head and the block are of steel, and have exterior water passages, which are thus independent of the cylinder-head gasket. The crankcase is separate and aluminium casting of great strength. A fan and a pump assist the cooling of the large radiator, and the pump and dynamo are each accessible on the off-side of the engine.

Continued on the next page

ALUMINIUM WHEELS FOR AUSTINS

After what seemed a period of neglect, the blown Austin Seven has started to re-appear in races all over the country, particularly at Southport, where the suspension has proved particularly suited to sand racing, and at Donington, where Turner has made some meteoric circuits. An interesting newcomer on the Derby circuit last year was the tiny single-seater built by the Almack Engineering Services of Hampstead and driven by G. Abecassis.



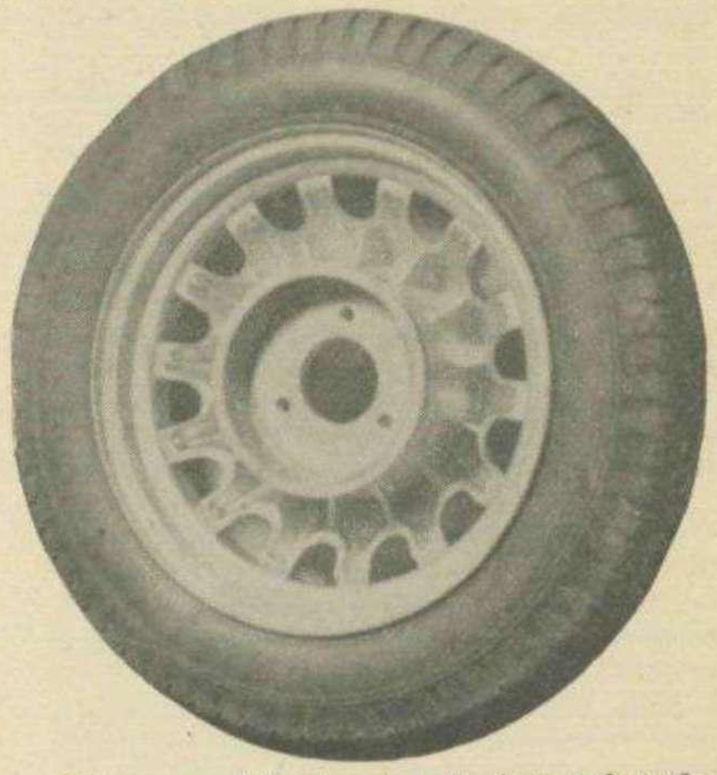
A front view of the new alloy wheel.

Continued research on this little car has shown it as capable of close on 110 m.p.h. The brakes have been modified to cope with these speeds, but Mr. Almack found that after two or three laps of the Brooklands mountain circuit, the brake drums became red-hot, so he determined to produce an aluminium alloy wheel which would dissipate the heat and retain the brakes at their original efficiency.

Accordingly, in conjunction with a famous tyre manufacturer, an aircraft firm, and the famous Bramber wheel works, it has been possible to design a wheel, fully patented, which is a great advance over any previous design in alloy. The accompanying illustrations give some idea of the finished appearance, which is very pleasing to the eye.

The wheel consists of three parts, each of different material. The brake drum is of steel chromium, which has been found to give the greatest frictional co-efficient. This drum is machined inside and out, the outside machining forming a taper. This, in turn, forms a hub around which is shrunk an Aerolite buttressed casting of special alloy on the outer circumference of which is shrunk a special steel rim with a wider base than normal, so that used in conjunction with tyres having a modified bead, the rim of the wheel is wider than the tread of the tyre. This results in the wall of the tyre being fully supported and not subject to side-flex, and the new wheels exert their pressure on the tread of the tyre instead of dissipating energy on the walls. This is but one of the many advantages obtained.

The alloy castings are heat treated for no less than twenty hours after machining. Next, the drum is frozen and the casting re-heated, both to pre-determined temperatures, the two parts being placed on jigs under a hydraulic press, so that they are both pressed and shrunk together, at the same time, care being taken to obtain complete contact over the entire area of machined surfaces. The drum and the casting, now in one piece, are then frozen and the outer rim heated and forced over, when it locks itself solidly to the "spoke" casting. The union obtained by this "interference fit" is so powerful that the outer rim can be broken with a sledge hammer without causing it to part from the inner casting but, in order to give entire confidence, the whole is riveted up by the special Aerolite process.



The rear side, showing the integral steel brake drum.

Originally it was intended only to use these wheels for the racing single-seater Austins marketed by the Almack concern to special order, and which cost £385.

In response to enquiries, however, it has been decided to market the wheels independently in sets of five, the cost (wheels, tyres and tubes complete) being £30.

A DE-LUXE ALVIS—continued from the preceding page

Coil ignition is used for starting, in conjunction with a special auxiliary carburetter, and the engine is then switched over to the polar-inductor magneto, the distributor of the latter being also utilised for the coil ignition.

Three S.U. carburetters are fitted, and are effectively silenced by two A.C. cleaners mounted between them. Two S.U. electric pumps supply the fuel from the 17-gallon rear tank. A reserve tap is fitted under the scuttle. The petrol-consumption worked out at 14 m.p.g., and the fuel recommended was Esso Ethyl.

The clutch is of the single dry-plate type, and the synchro-mesh gear-box has already been discussed.

The chassis is upswept in front, with a massive box-section cross-member in front of the engine. Apart from the usual cross-members, the floor wheels help to brace the structure at the rear, together with a deep steel pressing in line with the rear spring mounting. The chassis is sharply upswept to clear the rear axle, and the bottom of the upsweep is bridged with detachable strengthening plates.

The well-known independent front-wheel springing has a transverse cantilever spring passing over the side-members, while the lower ends of the steering pivots are supported on swinging radius arms. The rear springs are underslung half-elliptics. Tele-control friction shock-absorbers are fitted front and rear.

The chassis equipment is so thorough that it would be impossible to enumerate all the fitments, but two important items are the one-shot lubrication, pedal-operated from the front seat and the D.W.S. permanent jacks. The instrument board is neatly laid out with all necessary instruments, and we also liked the new Lucas wind-tone horns.

The 3½-litre Alvis is making its entry into the ranks of de-luxe sports cars at a time when there is a real appreciation for this type of vehicle. There can be no doubt of its hearty welcome amongst discriminating motorists.

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OPPOSED PISTONS

By

BALADEUR

There is a special satisfaction reserved for the cynic in the study of extinct animals. It must tickle his fancy no end to think of nature, having achieved the diplodocus, finding that the largest creature in the world was no good anyhow. (I believe that someone has calculated that if another animal bit the diplodocus' tail, it was a couple of minutes before the head knew anything about it. But perhaps it wasn't the diplodocus at all and anyhow I am getting off the point.) Nature, having discovered her mistake, had to go all the way back to the diplodocus' great-grandfather and start altering his other descendants before she got a nice rhinoceros, or a kangaroo, or whatever it was she wanted.

All this is by way of an analogy. It is fairly easy to trace the descent of your M.G. Magnette from M. Levassor's original car; but in the course of those forty years, there have been all sorts of original people who have strayed off the beaten track, designing the most ingenious machines, which in the end have proved to be merely diplodoci. But in the case of cars, the cynic must beware. Designs which appear to be as extinct as the diplodocus have a habit of reviving. After all, Georges and Maurice Sizaire were exponents of knee-action thirty years ago.

Opposed Pistons

You never find engines with opposed pistons nowadays, but years ago an enormous amount of energy was devoted to designs based on this principle. Many engineers undoubtedly slummed it for fear of suspicion that they were embracing the fallacy of "power lost against the cylinder head." But others were bolder—anyone who has felt the vibrations of an early engine can guess their motive. Koch and Riancey in France, Gustav Mees in Germany, were all building horizontal engines with opposed pistons in the 'nineties. But it was those famous engineers Messieurs Gobron and Brillié who brought the principle to the world's notice by constructing racing engines embodying it. I well remember at school being enormously impressed with a car of this marque belonging to the parents of another boy. The latter informed me that the engine was far better than those of conventional design, but that its commercial success had been killed by inimical racing rules. I expect he was right; but at first all went well.

The Gobron-Brillie Engine

The original Gobron-Brillié engine, designed towards the end of last century, had two vertical cylinders in which fact there was nothing remarkable, but in each cylinder there were two pistons. The lower pair were both coupled to the same crank, while the inverted pistons working in the top halves of the cylinders were connected to a cross-head. At either end, this bar had a connecting rod of great length, which ran down by the side of its cylinder, and was coupled at its lower end to a crank at 180 degrees to the central one driven by the two lower pistons. The whole affair was balanced with immense care, but whether the results in this respect were better than with a four-cylinder engine of the same date, I do not know. The automatic inlet and the exhaust valve were arranged in an ordinary valve pocket situated about half-way up the cylinder. At any rate the design, one must admit, was one of great ingenuity and deserved that more should be heard of it. Quite a lot was!

Racing Experiences

The marque made its racing début in the Paris-Toulouse-Paris race which, with a nett racing distance of 837 miles, was the great event of 1900. A single car started, in the heavy class, and was driven by one of its designers, M. Brillié. It had a two-cylinder engine rated at 18 h.p., but, unfortunately, I have not been able to find its dimensions. It was, however, the heaviest car in the race, weighing 1,400 kilos. while the winning 24 h.p. Mors weighed but 1,200. The Gobron-Brillié certainly worked—for it finished the race; but it does not seem to have been very fast, for Brillié only averaged 19.3 m.p.h. against the winner's 40.2 m.p.h.

Perhaps MM. Gobron and Brillié realised that the weight of their car militated against its performance. At any rate, the next year the three cars which they ran in the Paris-Berlin race were so much lighter that they qualified for the 650-kilo. "voitures legères" class. The engine was still a two-cylinder, but this year was rated at only 8 h.p., the dimensions being, bore 110 mm, stroke of each piston 100 mm, giving a capacity of 3,801 c.c. A slightly larger Gobron-Brillié engine, rated at 10 h.p. was used in the Nancéenne cars, built by a firm which at this time concentrated on lorries fitted with this engine. One of these started in the light car class, but the other, which incidentally was driven by M. Brillié, weighed 725 kilos., and had to run with the big cars.

The three Gobron-Brilliés proper, driven by Roland, Dernier (who belied his name) and Rigolly all reached Berlin. The fastest one, driven by Roland, averaged 27.7 m.p.h. compared with the speed of 35.5 m.p.h. recorded by Giraud's Panhard et Levassor, which was the class winner. This Panhard, rated at 12 h.p. had a four-cylinder engine with a bore and stroke of 90 by 130 mm. and a capacity of 3,296 c.c., which was, therefore, smaller than that of the Gobron-Brilliés. The two, however, were fairly comparable, in view of Panhard's reputation at the time, the opposed piston principle may be said to have acquitted itself adequately.

Later Races

The next year was the Circuit du Nord race, and three Gobron-Brillié light cars were in it. They were now called 16 h.p. but the dimensions seem to have been the same as in 1901. All the cars in this race had to use alcohol fuel, of which I believe Gobron-Brillié had made a special study; but as at least some of the Panhards used it voluntarily in the Paris-Vienna Race later in the year, perhaps there is not much in that. At any rate Rigolly finished third in the light car class, averaging only 32.5 m.p.h. and being beaten only by a Darracq and a Panhard, which averaged 41.2 m.p.h. and 37.8 m.p.h. respectively. By now, too, the Darracq had an engine of 120 by 130 mm. (5,618 c.c.) while the Panhard's was 100 by 130 mm. (4,084 c.c.). On this occasion, therefore, the Gobron-Brillié engine may be considered to have proved itself at least comparable to the best motors built on conventional lines.

Paris-Vienna later in the year again saw the Gobron-Brillié light cars and also a team of machines using the same engine, but built at the Nagaut works in Belgium. It was actually one of the latter that did best, but although it finished creditably, it was not in the first flight. The triumph of the opposed piston principle came in the Circuit des Ardennes at the end of the year. In that race, Rigolly, driving his Gobron-Brillie, finished first in the light car class at an average speed of 46.3 m.p.h., beating all that Panhard and Darracq could do against him, and all but four of the cars in the heavy class. In the racing world, Gobron-Brillié had arrived.

Eternal Youth

With this encouragement, the firm decided to go forward to greater things. The light cars were entered for Paris-Madrid in 1903, but the interest had shifted from them, for Gobron-Brillié had now built a team of racers to compete in the heavy, 1,000 kilos. class. The principle was extended to a four-cylinder, eight-piston engine. The bore was increased to 140 mm. and the piston strokes to 110 mm. each, which gives a capacity of 11,680 c.c. These new cars did not prove the leaders in the Paris-Madrid, but all three of them reached Bordeaux in creditable time, and that was no small achievement in the most famous race of all time. Again, greater success came in the Ardennes race, for although neither of the big cars which started succeeded in finishing, Tavenaux on the 4-litre light car came in second in his class, being beaten only by a Darracq with a 7½-litre engine.

1903 was practically the last year when any attention was paid to the light car class but in 1904, the same big Gobron-Brilliés which had run in the Paris-Madrid started in the French eliminating trials for the Gordon Bennett team. None of them finished, but Rigolly continued to show that his 1903 racer possessed the secret of eternal youth. He appeared on it in the Circuit des Ardennes race later in 1904 and finished fourth, only 1⅓ m.p.h. slower than the winner in a race of 367 miles. He started again in the Gordon Bennett eliminating race of 1905 and finished eighth, 3.8 m.p.h. slower than the winner. In the first Grand Prix in 1906, he was eleventh at the end of the first day, but fell out on the second, and started once again in the second Grand Prix in 1907 with his four-year-old racer. Throughout this period,

OPPOSED PISTONS—continued

he was able to compete on equal terms with the latest productions from other factories.

In 1908, the Grand Prix rules limited the bore of engines, and made no provision for these built on the Gobron-Brillié principle. This spelt the end of the firm's racing career, and perhaps, as my school friend claimed, of the design. But while it lasted, it was an interesting and not unsuccessful experiment.

The Arrol-Johnston

In the meantime, the development of the opposed piston principle was being developed in this country also. Here, its great protagonist was Arrol-Johnston, and it was brought very much to the public notice by the victory of one of these machines, designed by Mr. J. S. Napier, in the first Tourist Trophy race of 1905. In the case of the Arrol-Johnston, the engine was a 2-cylinder, but the cylinders were arranged horizontally, with the crankshaft below them. Each cylinder contained two pistons, but unlike the Gobron-Brillié, neither was connected direct to the crankshaft. Instead, each had a connecting rod attached to the end of a rocking lever, the other end of which had another connecting rod all which drove the crankshaft. The cranks connected to the two pistons of the same cylinder were at 180 degrees to each other and at 90 degrees to the cranks of the other cylinder. The bore was 120 mm., combined stroke of the two pistons, 165 mm., giving a capacity of 3,733 c.c. The engine apparently reached a speed of 1,100 r.p.m., and was stated to develop 18 h.p. at 800 r.p.m. I do not know whether the peak of the power curve was there, or whether this statement was in deference to the R.A.C., which organised the race and which, by its formula, rated the engine at 18.05 h.p. The formula, incidentally, is based, as everyone knows, on the bore of the cylinder but, as perhaps everyone does not know, takes no account of the number of pistons in the cylinder. In this respect, incidentally, taxation does not follow the R.A.C. formula as the tax calculated on the bore is multiplied by the number of pistons, not by the number of cylinders. Perhaps, otherwise, opposed pistons would be the rage to-day.

The Arrol-Johnston engine had automatic inlet valves and governed on the exhaust valves, which was useful with a fuel consumption limit for the race. The engine, incidentally, was no novelty, having been used in the Arrol-Johnston dog-cart since 1900.

In The Tourist Trophy Of 1905

The race was run over four rounds of the Manx course on 14th September, 1905, the total distance being, to be exact, 208 miles 4 furlongs. Fuel was originally to be allowed at the rate of 25 m.p.g., but at the last moment the limit was altered to 22.54 m.p.g., a change which annoyed some of the entrants of the more economical cars. However, it made no difference to the winner of the race, as the Arrol-Johnston averaged over 25 m.p.g. Two of these cars actually started, one driven by its designer, J. S. Napier, the other by E. J. C. Roberts. At the end of the first lap, Napier led from a field of 42 starters and he was never displaced. His average speed for the whole race was 33.9 m.p.h., which compared with a stated maximum speed of 45 m.p.h. Second place went to Percy Northey's Rolls-Royce, third to Norman Littlejohn Vinot et Déguingand and fourth to the second Arrol-Johnston.

From the point of view of the engine, it is interesting to compare the Arrol-Johnston with the Rolls-Royce and the Vinot. The Rolls had a 4-cylinder engine of 100 by 127 mm. (3,990 c.c.), which was stated to develop 20 h.p. at 1,000 r.p.m., while the car's maximum speed was given at 45½ m.p.h. The Arrol-Johnston's win, even by less than two minutes was thus highly creditable for the opposed piston principle, in view of the larger size of the engine of the Rolls which, incidentally, would not have finished if the fuel consumption limit had been left at 25 m.p.g. Nor for that matter would the Vinot, although it had a rather smaller 4-cylinder engine of 90 by 130 mm. bore and stroke (3,308 c.c.), and was only stated to develop 14 h.p. at 900 r.p.m.

The opposed piston principle was applied to Arrol-Johnstons which appeared in subsequent Tourist Trophy races, but the same success did not attend them as in the first race of the series.

The Principle Re-emerges

The idea apparently passed into oblivion. The intensive study of aero engines during the war, however, included the problem of filling the cylinders with gas at high altitudes, and focused attention on the supercharger with which Marc Brikigt of Hispano-Suiza fame and others had been toying before the outbreak of hostilities, as a result of the capacity limit used for the Coupe de l'Auto and Grand Prix races. After the war Mercédès used their aero engine experience to apply superchargers to the racing car in a thoroughly secretive manner, but Fiat definitely placed the blower on the racing map by a spectacular failure in the 1923 Grand Prix. After a year or two, everyone was using superchargers, superchargers made them think of two-strokes, and two-strokes made them think of—opposed pistons. For a moment it looked as if Gobron-Brillié and Arrol-Johnston had not been exploring a blind alley twenty years before, after all. Fiat apparently experimented with an opposed-piston engine in 1927, but in the end abandoned it in favour of a 12-cylinder with two rows of parallel cylinders and the crankshafts geared together. In France, however, experimenters were also at work. In 1927, the Cozette Carburetter Company built a vertical 4-cylinder, opposed-piston, supercharged 2-stroke engine, and a M. Causan a similar engine, except that it was horizontal, which he operated successfully in a boat. Both the vertical principle of Gobron-Brillié and the horizontal design of Arrol-Johnston was thus represented. The two more recent engines, however, differed from their prototypes in that they had two crankshafts. The Cozette engine which was intended to be applied to racing cars, had a bore of 56 mm. and a combined stroke of 110 mm., bringing the capacity at 1,084 c.c. just within the 1,100 c.c. class. The two crankshafts were united at the rear of the engine by spur-gearing with an intermediate pinion. This engine is believed to have run at very high speed, and to have developed 100 h.p. At that moment, however, the quest for volumetric efficiency in racing engines was brought to an end for the time being by the passive resistance of manufacturers who refused to build cars for races run under a capacity limit. So perhaps it was a blind alley after all. On the other hand, one of these days a fresh turning may show that it does lead somewhere.

TEN YEARS OF MOTORS AND MOTOR RACING

By **LT.-COL. CHARLES JARROTT,** *the famous Pioneer Racing Motorist.*

"... A book which everybody who is in the least interested in motor racing should obtain at once. It is a revival of that old, famous and well illustrated book, practically the first of its kind, by Charles Jarrott, which remains one of the finest books on motor racing that has ever been written."—THE AUTOCAR.

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SPECIALISED MOTOR ENGINEERING

A VISIT TO THE LAYSTALL WORKS AT SOUTHWARK

"Crankshaft by Laystall" appears almost inevitably in the specification of any British racing or high-performance sports car, and a visit to Ewer Street, on the southern side of Southwark Bridge, S.E.1, is an essential part of the racing man's education. The tour of inspection we made under the guidance of Mr. F. T. Bersey, M.I.A.E., the Managing Director, was all too short to appreciate the many branches of tuning and overhaul undertaken, but some of the principal activities can at any rate be described

The average sports car, and the same applies to a lesser extent to the racing machine, is built to have a mechanical margin of safety sufficient for the use for which it was originally intended. To succeed in competition, however, one needs that little extra bit, fairly easily attained nowadays by raising compression and engine speed and possibly altering the head and the camshaft. This increase of power inevitably throws extra strain on those long-suffering components, the connecting rods and the crankshaft, a strain which can only be withstood by specially-designed parts, and these are the special care of the Laystall works.

Considering first of all the crankshaft, it is found that good material and good balance are of equal importance. An imperfectly balanced shaft made of good material will crystallise and break just as surely as the inferior one, since the out-of balance forces soon destroy the tough grain.

With a free hand to design, there is not much difficulty in evolving a crankshaft which will be rigid and allows of proper balancing. The shaft is then roughed-out from a solid billet, and heat-treated in oil baths. The grain of the metal then flows from end to end of the shaft instead of being severed, as it would be if the blank were treated before machining.

It is then turned up to the desired pattern, and in the process can have the journals hollowed out, special oilways fitted and other refinements which would be uneconomical to embody in a mass-produced component. The balance weights take form, and the polished shaft, usually twice as heavy as the one it was designed to replace, is transferred to the balancing rig.

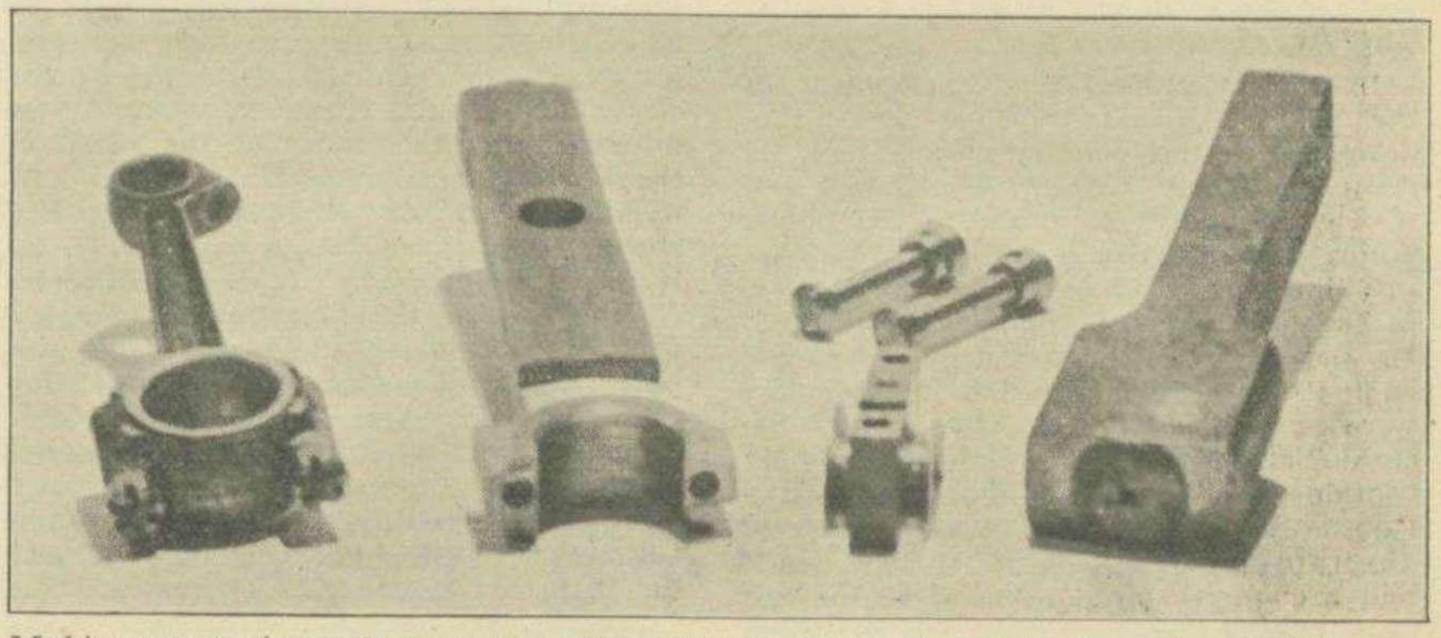
Here the crankshaft is supported on rollers, which are in turn free to vibrate on rubber supports, and is caused to rotate at any chosen speed up to 4,000 r.p.m., by a belt passing over the centre journal. Long pointers attached to the supports indicate the slightest out-of-balance force. Lead weights of varying size are then attached to the crank pins until each half of the crankshaft runs without a tremor, a job easier to describe than to perform, as it sometimes requires the services of a skilled workman for four or five hours. This operation may often be performed with advantage on existing crankshafts, thereby raising the first period of the "crank" by 1,000 r.p.m. and putting it well out of the working engine speed. When the balancing is completed, a weight of metal equal to the lead weights attached is removed from the balance weights and webs of the shaft, and all is then ready for the final hardening.

Only the bearing surfaces need this treatment, so the whole of the shaft is given a coating of tin, which is then removed from the journals and crank-pins. Hardening is carried out by the nitriding process, in which the part to be hardened is heated to a comparatively low temperature, not more than 500 degrees Centigrade, in the presence of ammonia gas. Nitrogen is abstracted from the ammonia and combines with the special aluminium-chromium alloy steel to give a surface of tremendous hardness and resistance to wear, the actual figure being 900-1,100 by the Brinell test.

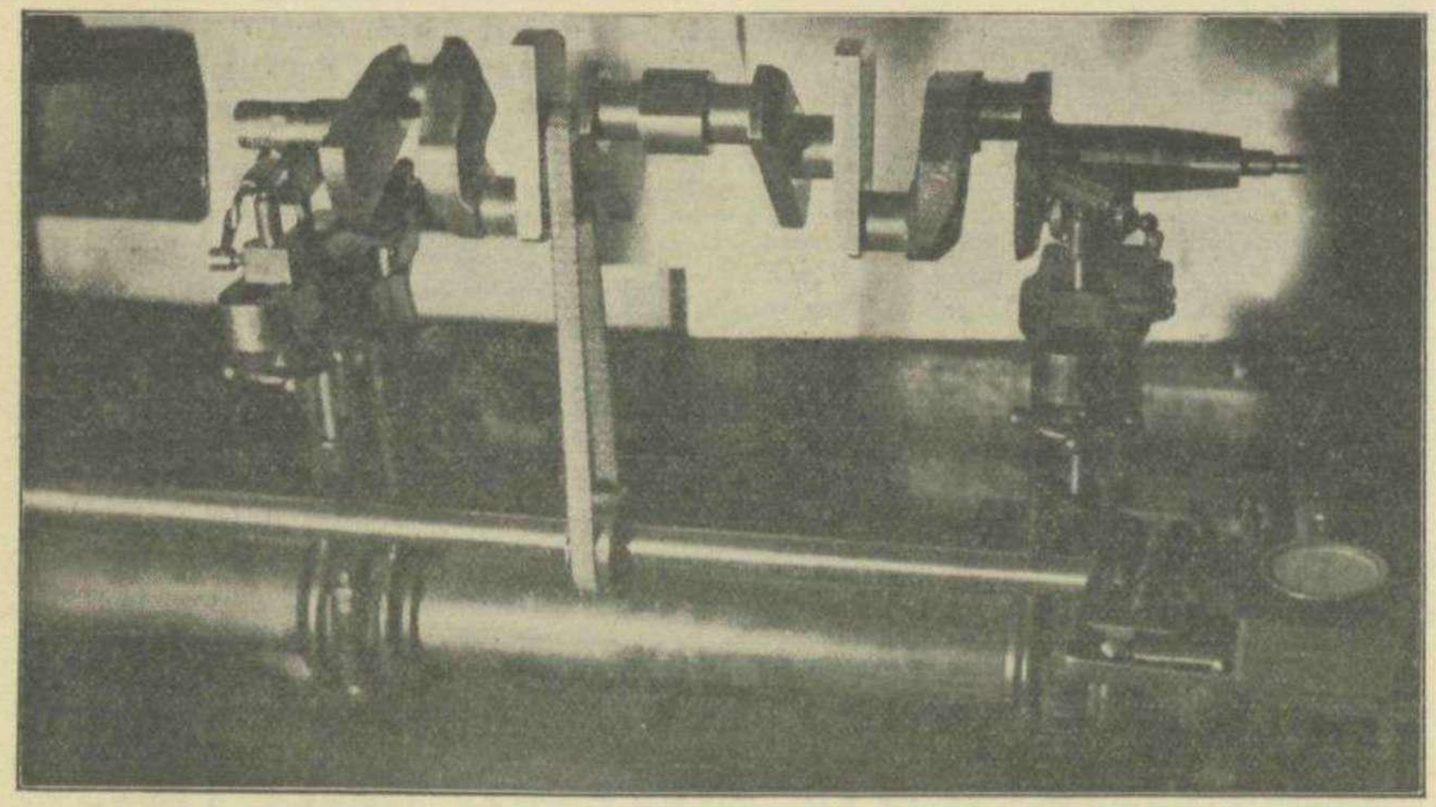
A set of connecting rods with visible bends in them demonstrated all too clearly the effect of super-tuning on unsuitable components. Laystall rods are machined from solid billets, and a gradual taper from big-end to the centre of the rod prevents the fractures which are liable to happen where a sudden change of section takes place. Unlike the average commercial rod, a great thickness of metal is left on the big-end caps between the bolts, then a thin section on either side, with a cooling and strengthening rib round either end of the cap and bearing support on the rod. The total weight is therefore actually less than with the conventional design.

The finished rods are then suspended by rods passing through the big and small ends on special balances graduated down to drams, which enables the centre of gravity and therefore the balance to be determined. Not until the complete set have been brought to the same figures, by removing metal from the heavier ones, are they passed out for service.

Mention has already been made of special camshafts. These may either be produced to the customer's own design, or based on the wide experience of the Laystall specialists. A dummy camshaft with two blanks, one for the inlet and one for the exhaust cam is first produced. The blanks are then shaped by hand in



Making connecting rods from the solid. The blank is on the right, then a finished big-end cap with cooling fins and specially machined big-end bolts. Next to it is a partly finished blank, with the small end hole already drilled. The connecting rod on the left is a standard stamping with abrupt changes of section.



A crankshaft set up in the balancing rig.

SPECIALISED MOTOR ENGINEERING—continued

accordance with the working drawings, and then checked by means of micrometer gauge and a graduated dial, on which each degree is represented by a quarter-of-an-inch of travel. These cams are then used to operate a profiling machine which cuts a double master-cam in hard material and, from this, an unlimited number of camshafts with exactly the correct setting can be cut. Despite the amount of work involved the complete set of operations and the production of the finished camshaft can be put through from £8.

Many other intricate operations such as the production of experimental clutches and the components of an intricate epi-cyclic gear-box for a new racing car held us enthralled at the Ewer Street premises, but time pressed, and we moved on to the Gravel Lane Works to see the overhaul and assembly of complete chassis.

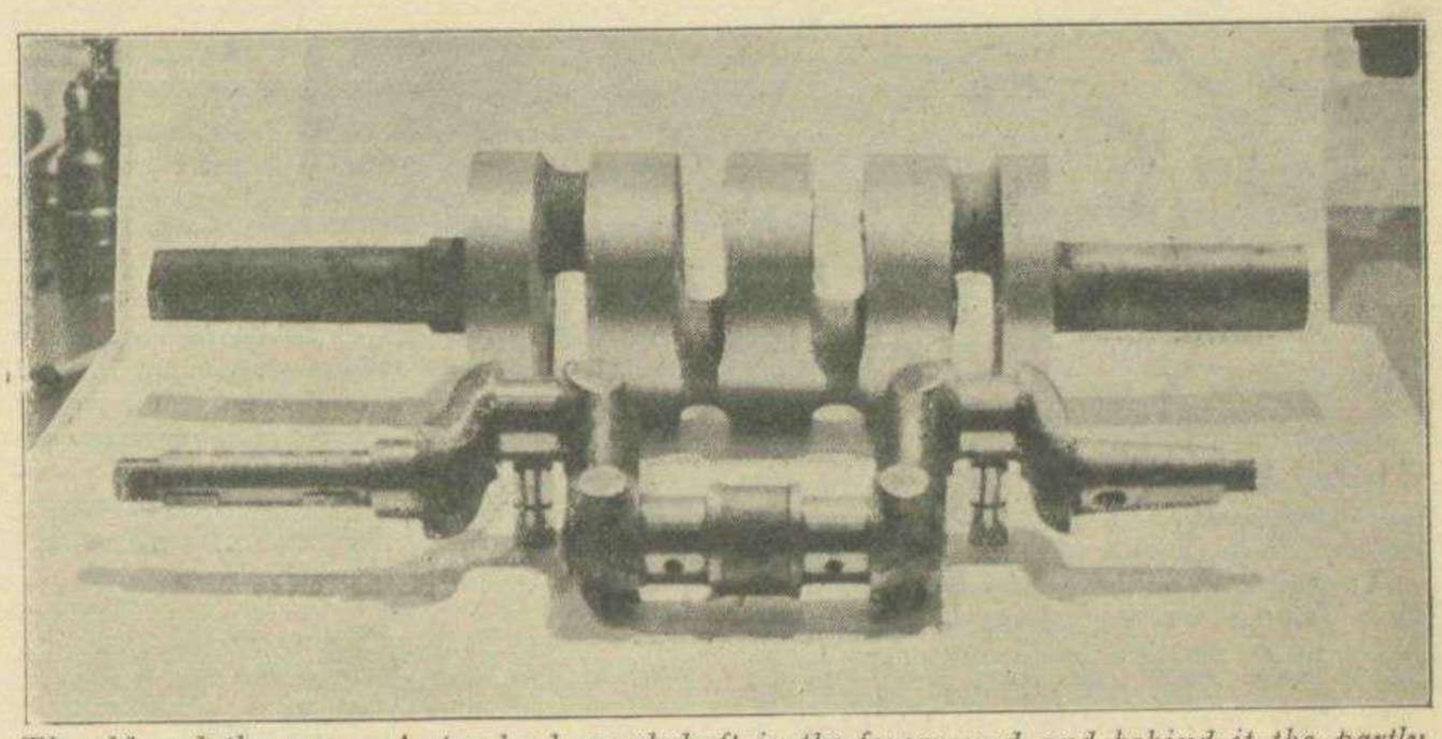
The ground floor was devoted to welding, and we were shown some magnificent work in which cracked cylinder blocks, crankcases and the like were restored to their original form at a tithe of the cost of complete replacement and, in many cases with increased strength. Above this floor were situated two engine-erecting bays nearly a hundred feet long. Apart from making new components for sports and racing cars, many well-known machines have received their final tuning in these shops, and three test beds complete with water brakes are available in an adjacent bay. An unusual feature is the mounting of the beds on pneumatic tyres, a practice which is better for the engine, and which allows it to run under conditions approximating to those it will encounter on the road.

On the top floor are situated the four large "Nitriding" furnaces which play such a large part in the production of tough, long-wearing components. Amongst these may be mentioned Laystall cylinder liners and brake-drum liners. Fitting cylinder liners is little more expensive than a normal re-bore, while the surface is so hard that no wear should take place during the subsequent life of the car. The original pistons can be re-fitted if in good condition.

The brake-drum liners are actually grown into the drums by a patented process which locks them immovably in place. Like the cylinder liners, the brake liners have a Brinell hardness of 1,000 and, besides being proof against wear and scoring, actually improve the co-efficient of friction of the fabric brake-shoe linings.

Laystallising is another interesting process carried out under the same roof, and is used for the restoration of worn parts of all kinds, from the wearing surfaces of overhead valve rockers to the bevel shafts of commercial vehicles. In essence, it consists of welding to the worn surface a layer of suitable hard metal. This is reduced to the original contour by machining or grinding, allowing the parts to be used again at small cost and with full efficiency.

From the foregoing it might seem that the Laystall works is only concerned with building special parts for sports and racing engines, but its scope is much wider than that. We saw sports cars, touring cars, and commercial vehicles, all in for anything from a re-bore to a complete overhaul, and all being undertaken with a care which augered well for complete satisfaction and long service. To have a car overhauled under such conditions is to be sure that the work will be 100 per cent. efficient, and the trusty sports car or the low-priced bargain will profit equally from a tonic administered by the old-established firm of Laystall.



The old and the new. A standard crankshaft in the foreground and behind it the partly machined blank for a special crankshaft for the same engine.

THE E.R.A. CLUB

Nearly forty people were present including several ladies. The Chair was taken by Mr. A. F. Rivers Fletcher, and it was unanimously decided to form a Club under the name of the E.R.A. Club, its objects being to assist in every possible way E.R.A. Limited, in their endeavours to uphold Britain's prestige in International Motor Racing.

The subscription to be £1 per annum with a minimum entrance fee of 5s. This entrance fee covers the cost of the Coat Badge which will take the form of three circles containing the letters E.R.A. —as used on the car radiator badge, together with the year date and the word "Club." The badge will be as small as possible and in the form of a brooch.

An E.R.A. Bulletin will be issued monthly or bi-monthly throughout the year giving details of work behind the scenes at Bourne, practice before races, and other interesting information.

Parties will be arranged to visit races and hill-climbs and also to visit the E.R.A. Works at Bourne. It is hoped to arrange lectures by E.R.A. drivers and also a dinner and/or dance at the end of the season.

The cost of running the Club is to be kept as low as possible in order that as large a sum of money as possible can be handed over to E.R.A. Limited at the end of the season.

The following were elected to serve on the General Committee:—

Messrs. Corbett, Mayne, Bird, Allback, Stone, Payne, Faulkner, Rivers Fletcher (*Hon. Secretary*), Green (*Hon. Asst. Secretary*), Miss Flannagan (*Hon. Treasurer*).

The meeting closed with a short speech from Mr. Peter Berthon, the designer of E.R.A. cars who expressed on behalf of his fellow directors their appreciation of their efforts and approval of the lines on which it has been proposed the Club be run. He also promised that E.R.A. Limited would do their best to keep them amused and will assist with the E.R.A. Bulletin as much as possible.

There was an immense air of enthusiasm throughout the entire meeting, and it seemed to be everyone's idea to receive as little as possible for their subscription and to hand over as much as possible to E.R.A. Limited. The idea of the minimum entrance fee of 5s. is to encourage those who have the means to give more, and indeed many of the first entrance fees have been considerably larger than the minimum amount.

Estimates are being obtained for a car badge, and as soon as details are settled, it is hoped to offer one at a reasonable price.

THE IRISH MOTOR RACING CLUB, LTD., 1936 EVENTS

February 22nd	...	Treasure Hunt
March 17th	...	Reliability Trial
April 11th	...	Treasure Hunt
May 16th	...	CORK CAR RACE
June 6th...	...	Speed Trial
June 20/21st	...	Rally to Bangor (Co. Down Trophy Race)
July 4th...	...	Novelty Event
August 3rd	...	LIMERICK GRAND PRIX
September 5th/6th		Rally to Belfast (Tourist Trophy Race)
September 26th	...	PHOENIX PARK INTERNATIONAL CAR RACE
November 7th	...	Treasure Hunt
November 28th	...	Reliability Trial
December 19th	...	Treasure Hunt

The Address of the Irish Motor Racing Club, Ltd., on and after the 1st February is National Bank Chambers, 1, Cavendish Row, Dublin.

CAREERS FOR OUR BOYS

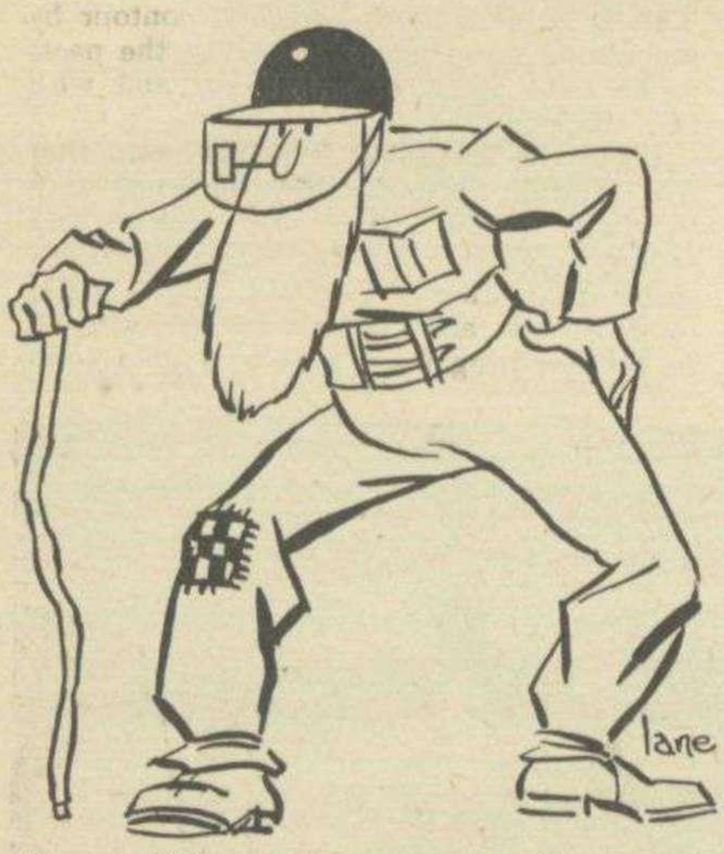
(*NUMBER* 3)

OR HOW TO BECOME A RACING DRIVER

By

NEVIL LLOYD

(Illustrations by George Lane)



". . . Fifty years — it seems like half-a-century"

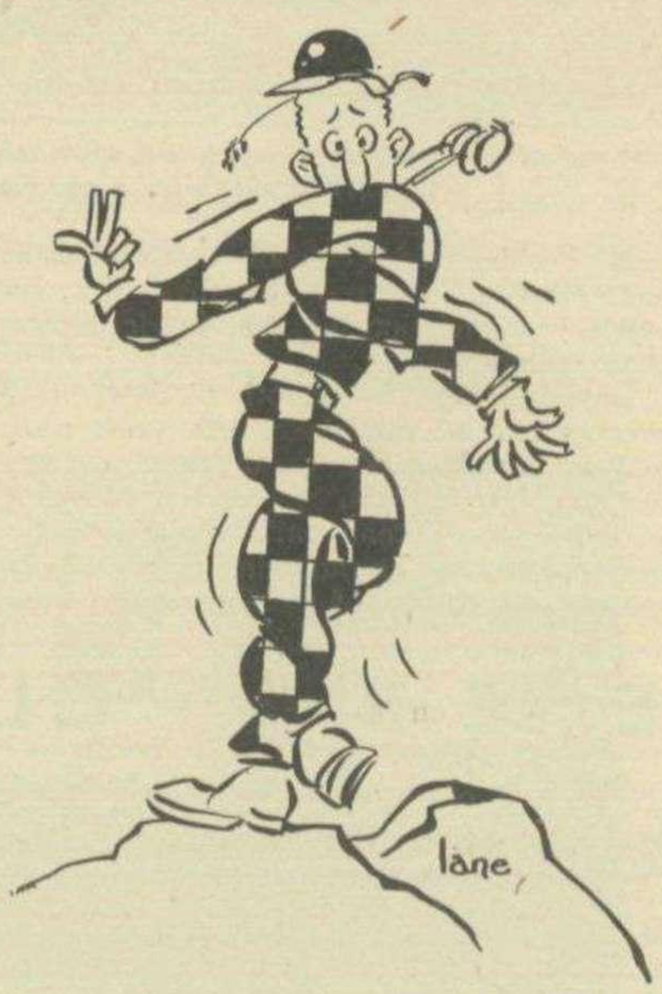
To think it is only fifty years since I first started writing about motor-racing. Why, it seems like half-a-century. Little did I think then, and still less do I think now that my knowledge would assist a new generation of potential racing drivers to realise their ambition. However.

It is, I think, common knowledge, though not as common as white helmets on reliability trials, that motor racing in this country is not as popular as it might be. Such fine old English sports such as hunting with the hounds and running with the hare, casting pearls before swine, and leading horses to the water have appropriated much of the thunder due to motor racing. This is unfortunate, but is perhaps due to the fact that in England, racing is only possible under the handicap system.

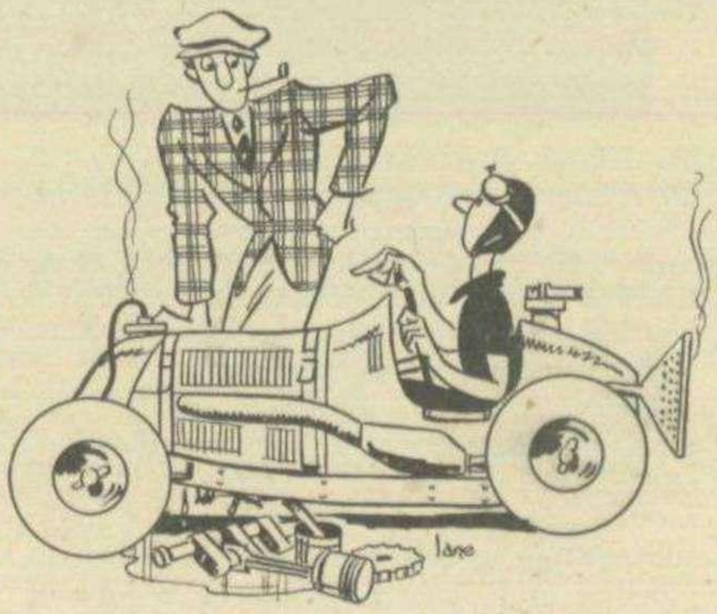
And what, the earnest student will ask in a high-pitched treble, is this handicap system exactly? This is a question that has been asked many times, and there is still no answer. In fact one man whom I know personally, a Mr. Smith, who stood for all that was best in racing circles, asked himself this question so many times that he went raving mad and disappeared. He was eventually found wandering about on the Himalayas, labouring under the impression that he was a chequered flag and going about waving himself frantically at a number of imaginary Nuvolaris. So much for handicap racing. The actual definition of a handicap may be obtained from any racing driver in one of the following ways, either by asking him, or dropping a large piece of concrete upon his toe as he is about to take wine with a fellow "ace." The resultant answer will be the same in both cases. The Greeks also had a word for it.

One of the more encouraging things about motor racing as a profession is that it isn't a profession at all. To become a doctor, one must hold various degrees. A solicitor also must hold a degree. But to become a racing motorist, one need not hold so much as a bunch of daisies. It is, of course, an expensive game, this motor racing. About the only cheap thing about it is the estimate for the repair of the car. That is free. An original remark which I made up after only hearing it twice.

Expenses, however, can be considerably reduced if you happen to be in the motor trade. This can be done by charging all your tuning, maintenance and repair work to your own garage at very favourable terms, and then forget to pay yourself. I suggest, though, that first you take yourself out to lunch to get yourself in a good frame of mind. After all, you can't go about sending accounts to yourself with rude remarks on them about it having overlooked your own attention, and a remittance from yourself within the next ten days would oblige you very much. And if the worst comes to the worst, as it so often does, I can't quite see how you can take steps against yourself. This, of course, is very high finance, so high that it smells terrible to me.



". . . Mr. Smith—a man who stood for all that was best in racing circles"



". . . . carburetter trouble"



". . . . . incredible blonde (for use when not racing)"

The next point which rears its ugly head before the student who aspires to dice with death is the problem of equipment. Apart from a crash helmet, goggles and overalls, the three essentials are:—

1. An incredible blonde (for use when not racing)
2. A car (for use whilst racing) and,
3. A number of plausible excuses (for use after racing).

I will take it for granted that you have the car and, unless you happen to be a very plain student, the blonde also. The excuses, however, for explaining why the motor failed to proceed at any speed worthy of being named racing, must be learned by heart. They are in order of merit:—

1. Carburetter trouble.
2. Carburetter trouble.
3. Carburetter trouble.

Actually your engine may have seized solid owing to the omission of such a trifling formality as filling up with oil, your crankshaft may have taken a turn for the worse, in fact any thing may have happened, and probably has, but the student racer should always say that it was carburetter trouble, old boy, have another one, will you? There is a fourth excuse, the type known as Truthful, for which you will obviously have no use, so the matter may be left at that.

One last point. That is the question of learning the vernacular of the racing

Continued at foot of next page

Continental Notes and News

By

OUR CONTINENTAL CORRESPONDENT

Teaming Up

One by one the teams and scuderias are shaping up for the rapidly-approaching season. Mercédès-Benz were the first to settle their drivers, Caracciola, Fagioli, Chiron, Von Brauchitsch and Lang. Auto-Union has altered its policy to the extent of having a first and second team, the former consisting of Varzi, Stuck and Rosemeyer, and the latter being provisionally composed of Heyder, Hasse and Von Delius. The formation of the second team depends on trials due to take place at the end of January, and there is a possibility of Prince Leiningen attending. Heyder is the young "works" chauffeur whose driving so impressed Stuck that he was promptly given the wheel of a racing car.

Mercédès-Benz are due at Monza during February, and I hear that the reason for the long trek to Italy is that the north curve of Avus is being drastically repaired.

In Italy

The plans of the Scuderia Ferrari go on, heedless of Italy's preoccupation with war. A valuable recruit to the racing personnel has been found in Antonio Brivio. Brivio drove for Ferrari last year, of course, but he has only recently renewed his contract. The full team is now Nuvolari, Brivio, Tadini, Farina and Pintacuda. Both Grand Prix and sports-car races will be entered, and two nominations have already been made for the French Grand Prix.

As usual, the Maserati plans seem to be rather vague, and the only driver reported to have signed up is the motor-cyclist, Tenni, who is to race a 1,100 c.c. model in the Mille Miglia, a monoposto 1,500 c.c. car in voiturette races, and a 4,200 c.c. 8-cylinder model in Grand Prix events.

The position of the Scuderia Subalpina is rather curious. At first it was announced that the Scuderia had been dissolved, and the Count Della Chiesa was withdrawing his support. Now it has turned out that the Scuderia is to continue its existence with Ghersi, Siena and Dusio as drivers. At the same time, Della Chiesa turns up at Monza with a party of drivers, engineers and cars, and proceeds to hold serious trials.

The machines were both 3.7-litre 6-cylinder Maseratis, one with normal suspension and the other fitted out with Parisi independent springing. Engineers Ambrosini and Parisi attended the trials, with Count Della Chiesa, and the cars were driven by Count Trossi and Dusio.

Trossi himself has big plans for the Monaco-designed radial-engined car which he has specially built for Grand Prix racing. Its first appearance will probably be at Monaco, where its front-wheel drive may be of great assistance on the slow corners.

Chez Bugatti

Finally, the Bugatti team has been completed by the inclusion of W. Williams, the Anglo-Frenchman. Everyone will be glad to see Williams in action once more, particularly with a Bugatti. He has been handicapped in the past by being a driver of moods. On occasion, he could be brilliant, as I well remember one year at Rheims, where his speed round the very fast curve beyond the grandstands was only equalled by Nuvolari. At other times a series of minor "ditchings" has rather spoiled his reputation.

The other Bugatti drivers are the veteran Benoist and the "coming man" Wimille, while that popular sportsman, Veyron, will defend the Molsheim colours in 1,500 c.c. events.

Talking of 1,500 c.c. cars reminds me that Bugatti is hard at work trying to finish a team of voiturettes for the Prince Rainer Cup at Monaco. No official announcement as to the design of the cars has yet been made, but there seems every possibility of them being "sixes," which is unusual for Bugatti, with chassis of well-tried Bugatti shape.

Off to America

Rudolf Caracciola seems to have become a kind of unofficial ambassador for German motor-racing. The success of his visit to England last autumn and his extraordinary charm of manner certainly mark him as the ideal man for the job.

Now he is off to America, for a study of American manufacturing methods and racing conditions. It would all be in accordance with Germany's highly-developed propaganda system for some German cars to take part in American races. Indianapolis is rather out of the question, owing to its regulations, but the proposed road race next October may attract them.

It was strongly rumoured a few weeks ago that Nuvolari would compete at Indianapolis. I feel this is very unlikely, particularly as the fuel consumption of European-formula cars would bring them to a standstill long before the 500 miles of the race had been completed. Another thing is that the American race comes in the middle of the European season.

Meanwhile, it is hoped to have the artificial road circuit completed at Mineola, Long Island, by next summer. Instead of holding the opening race immediately, it is proposed to postpone it until the end of October, in order to give European drivers a chance to finish their "home" fixtures. The circuit will measure four miles, with one straight of a kilometre, and the rest a series of curves and bends. The road will be thirty yards wide throughout.

Tit for Tat

With all this talk of Continental drivers going to America, it is interesting to hear that the organisers of the Geneva Grand Prix hope to obtain some American entries for their race. Unfortunately for them, however, the event takes place on the same day as Indianapolis, which always draws the cream of "three A" drivers.

The Geneva race, by the way, will consist of two heats and a *repêchage* of 150 kilometres each, and a final of 200 kilometres. There will be no weight or engine limit, and the changing of drivers will be forbidden.

Mille Miglia News

The most startling news about the Mille Miglia is that five cars powered by coal-gas have been entered under the ægis of Professor Ferragutte. There will be one 2.3-litre Alfa-Romeo, a 1,750 c.c. Alfa, and three Balilla Fiats. They will be driven by Ferragutte himself, Sguanci, Cuzman and two others as yet unnamed.

Other entries are four Ferrari Alfas, to be handled by Brivio, Tadini, Pintacuda and Farina. They will be unblown "eights," and the race is being used as a trial for the French Grand Prix. Technical details are bore and stroke of 68 by 100, capacity 2,905 c.c., 140 k.p.h. at 5,000 r.p.m. Independent springing. Weight 700 kilos. Two-seater bodies. Speed 175 k.p.h. Consumption 28 litres per 100 kilometres. Tank capacity 130 litres.

Another worthy entrant is likely to be Alfieri, an enthusiastic young driver. Last year Alfieri made a particularly good performance in winning the blown 1,500 c.c. class at Pescara, with an old 1,500 c.c. Alfa-Romeo. Now he is negotiating with Maserati for a mount in the Mille Miglia.

Coppa Ciano Alterations

It seems rather a pity that the R.A.C.I. has decided to alter the circuit for the Coppa Ciano. The Montenero circuit was a real teaser, but its chief drawback seems to have been the difficulty of fencing it adequately and thereby reaping a little gate-money.

The new circuit is a much more ordinary affair, and lies just outside the town of Livorna, between that place and Antignano.

CAREERS FOR OUR BOYS—continued from page 144

track and their several meanings. This is most important, as is shown by the fact that one driver whom I knew who was rapidly becoming a pillar of the profession until, in an unguarded moment, he admitted that he thought a ratio was the christian name of a man called Bottomley. His racing career was wrecked, and he ended by being drummed out of his regiment, a noisy and expensive procedure. His mother was a Trampleasure, of course. Though it is doubtful if this had much bearing on the case.

In conclusion, I can only hope that this article will give the young student enough food for thought to give him violent indigestion. That is what it gives me.

RALLYING FROM TALLINN

Four hours ago, which seems like an age, we left our warm beds in Tallinn; outside the hotel we found it mild and clear, and debated removing the front chain. Caution won and it remained in place.

With Lahaye and his Renault safely in Athens, the Lagonda was due to take its place as first car away, with Good next behind. There are twenty-three cars in all, and the populace turned out en masse at the Estonian Theatre to cheer us on our way.

The official car took its place, the flag was raised and at 9.20 we were dispatched on our 4,000 kilometre journey. The streets of the town were coated with slippery ice and the writer had to tread warily to avoid charging the crowds on the pavement.

Out in the country there was little snow, but a layer of ice on a steeply-cambered road made us glad we kept on our chains. The road wound this way and that, but the Lagonda swept smoothly round the well-banked curves.

Slowing down to avoid a throng, Bakker Schut passed us on his Ford, but no one else had come into sight. We have averaged 34 m.p.h., which is quite encouraging. As I write this we are passing through Parnu. The river is once more frozen and we were able to drive across it. We have so far made up an hour on our Rally average. Now for a sleep at the Latvian frontier.

Riga

Just before the frontier we were passed by a German Hansa, and then by Vasselle on the tiny two-seater Hotchkiss. At the frontier post itself an enthusiastic crowd closed round the cars as they stopped for the custom formalities. All the papers had been sent on from Tallinn, and instead of the hour which the rally authorities allowed us, we passed through in five minutes.

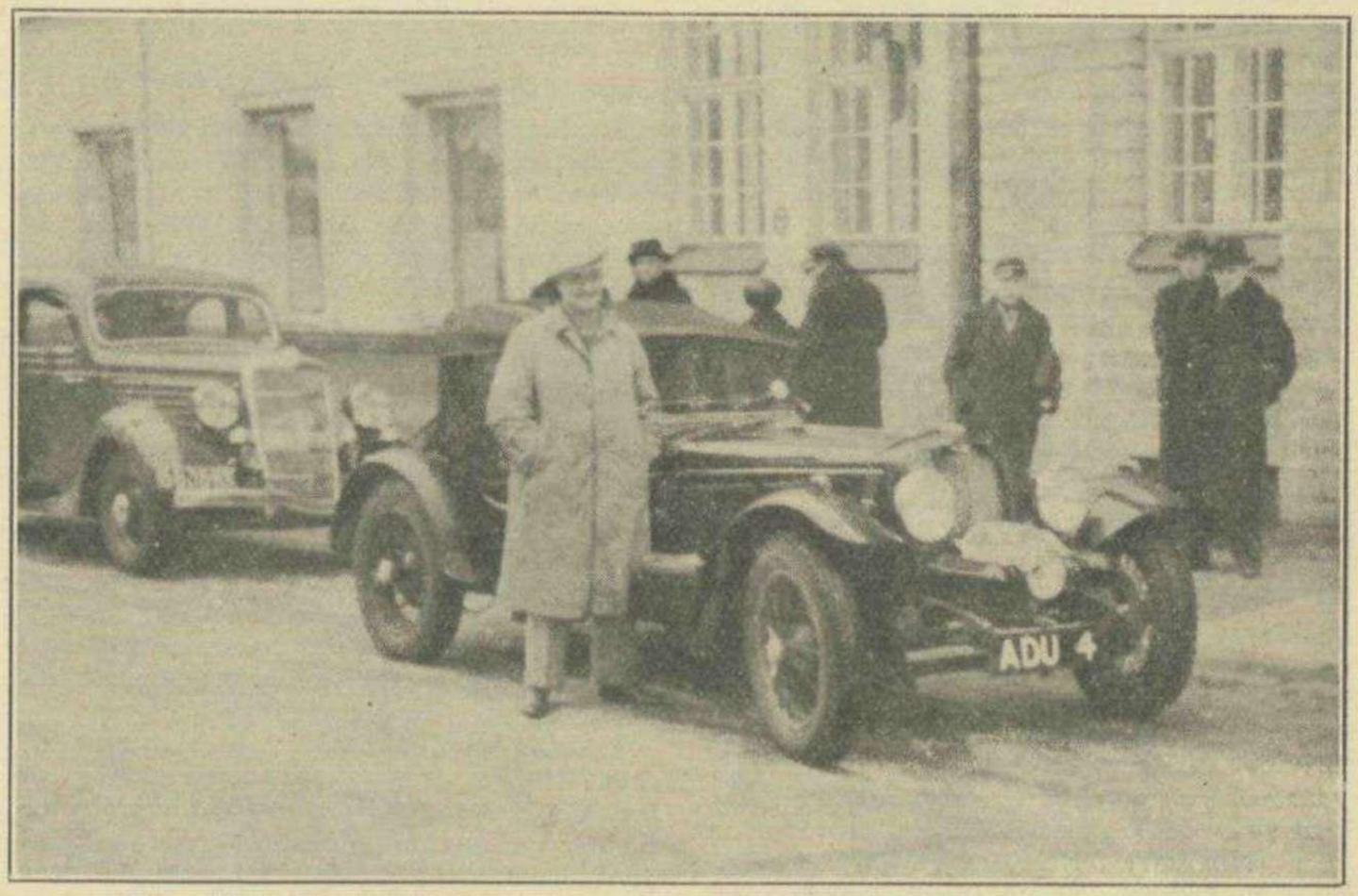
Over the frontier a good deal of snow had fallen and the road was uneven and slippery. Driving with considerable ease we noticed at a right-angle corner ahead a bunch of people round a car. This proved to be the speedy Vasselle, whose car had shot into the ditch stern first. He waved cheerfully to show all was well and we continued on our way. A few minutes later we had a narrow escape from a collision with a sledge. The horse tried to pull across the road, then changed its mind, and shot off across the fields, dropping the driver on his way in the ditch.

The roads improved near Riga and we got up to 55 m.p.h. The route we found thirty miles shorter than the distance given in the road book and so, much to our surprise, reached the check actually 4½ hours ahead of schedule. At the check we learnt that Good's Lagonda had gone off the road at exactly the same spot as Vasselle. The clutch casing caught on the edge of the road and the clutch was damaged. Chinetti and Gastaud had shot off the road on their Ford but were towed back by Dobell. Another Ford driver who came off the road was the Dutch driver, Dr. Sprenger van Eijk.

The Riga Club provided food and a room to rest in, and the most gassy lemonade we have yet encountered. Strengthened and rested, we set off for Kaunas at 9.20 p.m. Vasselle's car was undamaged, but we left Good anxiously wondering whether his car would be fixed in time to continue. Light on the A.C. discovered he had left his carnet in Riga, but quick work by the local authorities provided him with another.

Konigsberg

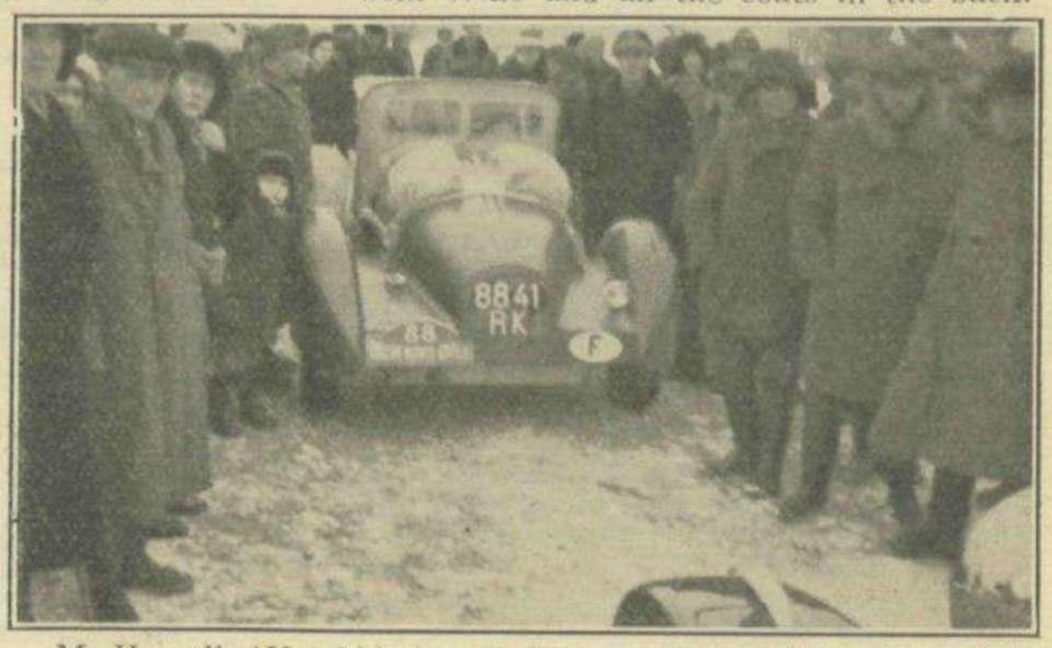
We are now feeling much more cheerful, having negotiated the bad section in Lithuania between the main road and Kaunas without any trouble. The roads from Riga to where we turned off were excellent and, leaving at 7.20 in the evening, we averaged 46 m.p.h., including five minutes for crossing the Latvian-Lithuanian frontier. The turning to Kaunas would have been difficult to find in the normal way but arrows and the use of the lamps turned us at the right place. For the first five miles, the surface was appalling, 20 m.p.h. being the absolute maximum and we envied the drivers of the independently-sprung German Hansa, which was disappearing in the distance. Soon, however, the road improved and we were bowling along at 45 m.p.h. Then a forlorn figure appeared at the roadside. It was one of the Germans, his car had shot off the road at 50 m.p.h. By a miracle both men escaped with nothing worse than bruises, and we completed the remaining eighty miles to Kaunas, most of which was very rough, with the two Germans in with Wills and all the coats in the back.



Donald Healey beside his Triumph Dolomite just before the start at Tallinn.



The Hotchkiss driven by Vasselle being pulled out of a ditch, some 40 miles after leaving Tallinn.



M. Vasselle (Hotchkiss) at Tallinn, surrounded by a crowd of enthusiastic admirers.

RALLYING FROM TALLINN—continued

Outside Kaunas a crowd had gathered and a marshal sent us off with one of a fleet of waiting motor-cyclists who guided us into the city. Crossing a wide bridge on the river, and fussing through mean streets which had a distinctly Balham smell, we gained the centre of the town. At the control point a battery of cinema projectors were blazing, and half-a-ton of flash powder must have been shot off at our arrival.

It was half-past one in the morning but large crowds were gathered there to cheer the Rally cars. The Auto Club de Lithuanie provided us with supper and bedrooms free of charge, and the enthusiasm for the rally extended everywhere. Very smart policemen guarded cross roads and the local inhabitants watched at cross roads with lanterns.

The road from Kaunas was very much better and we made our 40 m.p.h. average between there and Königsberg. At the German frontier there were straight roads almost everywhere clear from snow to the frontier post. Needing as we did every moment of time to negotiate the rough Polish roads, we kept the needle at 70-75 m.p.h. and covered the hundred miles in 2½ hours. Five minutes stop for each customs house and then we set out for the most strenuous part of our venture.

We soon found that we owed the Poles an apology. Following the route provided by the National Automobile Club, we were let over new dead-straight roads with good surfaces making 55 instead of the 25 m.p.h. which was our maximum on the way up. Forty miles from Warsaw we returned to the bad old road, but we were so relieved at missing the early part that it made no impression. The Polish Club fed and slept us, and we set out due westwards towards Germany in fine form.

Dead straight for the first fifty-eight miles, Wills pushed along at a steady 75 m.p.h., a fine run except when a mongrel



The cars lined up in the square at Tallinn for examination.

banners out, a guard of Nazis who "Heiled" us in the approved manner, and a host of interpreters to overcome any difficulty which the foreign competitors might have. Efficiency even extended to cleaning the windscreens and distributing apples and coffee.

Arriving here we were disappointed to find that the damage to the clutch on Good's car was too serious to allow him to continue. Equally disquieting was the news that the Hotchkiss entered by Gayard and driven by Charbonière had collided with a train outside Kaunas, the drivers being injured, and it was quite a relief to see Healey rolling into the check in the Dolomite.

We were hoping to find that snow had fallen freely in this part of the world, covering up the pot-holes in Poland. We found little in Königsberg, so are fortifying ourselves for fifteen hours of bumping by a little sleep in the Park Hotel.

Hanover

The run from Königsberg to here could scarcely have been better. We left the East Prussian capital at midday in bright sunshine and drove over dog rushed out and impinged on the bumper.

Half-way to Posen we began to get worried about petrol, as apparently we had not filled the tank fully at Poland. The gauge needle dropped to "four," but stayed there for thirty miles, and we knew that we were not to be condemned to a midnight search for petrol in unknown Poland.

For once we kept ahead of Bakker Schut, the very rapid driver of the V8 Ford next behind us. He had already been christened "Public Enemy No. 1," to his huge delight.

The run to Berlin was uneventful, but we arrived there with six hours in hand, having covered 350 miles in eight hours. We cut right across Berlin in the early morning and settled down at the Auto Hotel which is the check point, and combines garage and hotel accommodation. The proprietress told us that no eggs were available, as they were so scarce in Germany, we had already had the same experience elsewhere when we asked for butter.

The British contingent from Tallinn was still intact, though the gear-box on

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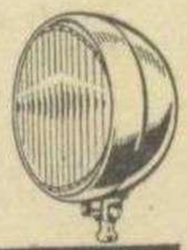
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RALLYING FROM TALLINN—continued

Dobell's Lagonda was rather shaky, and only top gear remained functioning. Harris and Iveson took life easily on their Singer, arriving with an hour to spare. Vasselle came in with his car still intact, but his arm was tremendously swollen as a result of his crash.

We left Berlin by the Avus road, and apart from fog, had an uneventful run to Hanover, averaging 40 m.p.h. Little interest was taken in the Rally, and Harris was allowed to wander about the city for an hour without finding the control station. He had been driving without a hood so far, but rain outside Rabin made him break his record.

The Stavanger and Umea routes joined ours at this point and we heard how drivers from the Scandinavian starting points had fared. The Stavanger route was unusually difficult, with ice through Oslo and down to the coast at the south of Sweden. The high spot of the run was Wist, a Norwegian, who was driving a Morris Eight. Disdaining chains, he drove absolutely flat out and as steady as a rock, leaving the other six starters, Fords, Railtons and a 5-litre Renault, far behind. Browning, who was driving Wilnott's Rover at the time, overtook him in Denmark, where British driving methods were allowed more scope, and the Norwegian remarked "We are better on the ice, but you make a better progress along the dust."

Starters from Umea found really Rally conditions. There was eight feet of snow in the north of Sweden, and without snow ploughs, it would have been impossible to get through. Ice all the way from Stockholm kept drivers on the *qui vive,* and one competitor we spoke to had only had an hour of sleep on the way south.

The hopes of the Tallinn contingent were sadly dashed by the news about Athens. Favourable conditions were now reported, and all starters from the most highly-marked starting place were expected to get through.

Brussels

The Dutch authorities were making arrangements to help competitors across the Venlo frontier, and the majority of those passing through Hanover continued over that route. We kept the Lagonda going at a steady seventy over miles of straight, tree-lined roads, only slightly impeded by rain before the frontier.

It is first come first served when getting through the customs, and we indulged in several ten-mile chasses, catching up slower vehicles. We were followed for miles by a very fast Ford and when we slowed down to consult a map, he shot off into the blue. We then found the road we were following led due north, and history does not relate where the Swede finished up. Near Roemond, a Dutch garage was displaying quite extraordinary service with cold buffet and champagne for all, and of the fifty competitors who passed into Holland before us, only three preceeded us to the Belgian frontier.

The route across Belgium was comparatively simple, though owing to the lack of signposts, we tried every way from quite small villages without success. We reached Brussels with six hours in hand, and spent the time well in adjusting carburetters which seemed too weak, changing the Dunlop sports tyres which had run quite happily up to 80 m.p.h. without cruising.

The check point at Paris was the A.C.F. headquarters at the Place de la Concorde. We debated hotly whether we should have the tyres "cut" in view of the run over the Estorel, but fine weather prevailed and we slept instead.

We fought our way out of Paris at 4 o'clock to begin the last 1,000 kilometres, over which the schedule was 35 to 37½ m.p.h. Dijon was our objective and our route advised going through Troyes; missing the turning, we took the Auxerre road instead, actually a fortunate accident as the road was much easier. We reached Dijon with forty minutes to spare and "tanked" the car and our own interiors. A fast run to Lyons followed and here we had an hour in hand. The Rhone was now free from floods and Wills made good time to Avignon, in spite of having to meet streams of lorries with blazing lights. Near Avignon the whole sky was lit up by an enormous one which had caught fire by the roadside, and as we passed we quite shamelessly cheered.



The 4½-litre Lagonda, entered by T. G. Moore, having the chains taken off by Wills and Martineau, a few miles out of Tallinn.

The last two stages, Avignon-Brignoles and Brignoles-Monte Carlo were the most strenuous, for apart from the twisty roads, the time margin was small, in one case twelve minutes, and, in the second, fourteen. Rain was falling as we left Avignon, and Martineau who knew well how slippery those roads could be was doubtful of our chances.

We flashed out of the Avignon check like a green projectile, blazing with lights and horn blowing continually.

Ten minutes to spare at Aix, then an unforgettable climb up and down mountains in mist, wind and rain to Brignoles, passing one rally car in pieces, a second in the ditch and a third overturned in a field. We arrived at Brignoles with 25 minutes to spare, and what an experience.

Next came the run over the Estorel. The writer took the wheel and just used everything the car had, the wheels snaking even on top gear on the few straight stretches and bumping round the narrow hair-pins up and down the mountains. One was remarkably grateful for the perfect balance of the car which made such manœuvres possible, but even more thankful when Cannes was reached, with the average speed just maintained.

A fresh driver seemed wise for the final dash to Monte Carlo, so Wills took over, and aided and abetted by Martineau, who shouted warnings of twists and turns, we set out for Nice. Flat out was the command, and we had gained two minutes by the time we got to Nice. Full speed along the Moyenne-Corniche, fortunately free from traffic at nine in the morning, and a lightning dash down the winding streets of Monte Carlo to the front.

Within a hundred yards for our goal we avoided, by inches, a blundering local car which was suitably dealt with by the police, and gained the triumphal arch leading on the Quai. We got there with ten minutes in hand, very delighted at the successful outcome of what had virtually been an unguarded road race.

Checking over was diversified this year by the special method of marking the components. The car was run up a ramp and a special compound which reacted with the varnish applied to cylinder block and other parts at the départ was rubbed on with cotton wool. The organisers soon satisfied themselves that our components were the original ones and we were allowed to collect our luggage in the pouring rain and bear it away to the hotel. Great fun this rallying with a suitable car, but we doubt whether another year the organisers will be allowed to have their Mille Miglia finish.

A FANTASTIC MONTE CARLO RALLY

ZAMFIRESCOU AND CRISTEA WIN ON V8 FORD — SCHELL (DELAHAYE) SECOND LAHAYE AND QUATRESOUS (RENAULT) THIRD

The 1936 Monte Carlo Rally will go down in motoring history as a Rally of surprises. In the first place it proved unexpectedly mild over all routes except the rather despised British run from John o' Groats.

Then the alarming results of the 37 m.p.h. average over the 1,000 kms., from Paris outwards, and, last but not least, the cunning displayed by competitors in preparing their cars for the figure-of-eight tests, which resulted in many cases of drivers from the easier starting points beating the die-hards, or so it seemed at the start of the Rally, who had ventured out to Athens. The cars which took the first three places started from the latter point, but the fourth and subsequent high positions were taken by those competitors who started from Tallinn.

The markings from the seven principal starting points were as follows: Athens 506, Bucarest and Tallinn 503, Umea, Stavanger and Palermo 501 and John o' Groats 496.

There were fourteen starters from Athens and all but one of them got through to Monte Carlo without the loss of a mark. Conditions in Greece have now greatly improved and there are actually bus services running on the roads round Athens and Salonika. Bulgaria still provides some very rough riding, but everyone made it and passed safely through Yugo-Slavia and Hungary to Vienna.

A heavy snowdrift in the Salsburg district might have proved a serious obstacle, but a path had been cut through wide enough to permit the Rally cars, not without much bumping, to gain their way to Germany and France.

Of the Tallinn route full details appear elsewhere in this number. On page 120 an article about the journey to Tallinn commences, while the actual rally run is printed on pages 146 to 148. The illustrations with these articles give a good idea of the conditions met with en route.

The roads presented no difficulty to a car properly prepared. Bucarest in previous years was something of a forlorn hope, but the revision of the route now avoids Poland, and has brought it within the bounds of possibility. In fact all four starters got through, one of them having an English driver, F. Thellusson. There was mud in Roumania and ice and fog in Czechoslovakia, but after that the run was comparatively simple.

The run from Sweden this year proved unusually trying. Driving north through Stockholm en route for the starting point, competitors had found rain and thaw, but further north deep snow was encountered.

Starting off from Umea, the cars ran between walls of snow six feet high, on a track only wide enough for one car. Fortunately the drivers in the lead were experienced and fast and all drivers got through on time. In the Stockholm region frost had again set in and drivers were kept on the *qui vive* right down to the Danish ferry, driving on ice-coated roads all the way.

Conditions from Stavanger were similar and the narrow roads from the west coast right down to Oslo and the wider highways which lead to the Swedish border, were treacherous with verglass.

Caledonia was very stern and wild as competitors foregathered at John o' Groats, and there was considerable doubt as to whether the return journey was possible.

On the run down, snow drifts alternated with patches of ice, and here and there a thaw had set in and the hollows between successive hills were filled with a foot of water and slush.

More wonder that nearly every competitor, on reaching Aberdeen, had lost ninety marks. Brian Lewis's S.S. went into a ditch which cost him a further hour. The only competitor who managed to keep a clean sheet was Miss Astbury, who handled her Singer as though she had been driving on dry roads.

Experienced Rally drivers had prophesied trouble when asked to average 37 m.p.h. over the last 1,000 kms., particularly on those narrow stretches between Avignon, Brignoles and Monte Carlo.

Two terrific crashes we witnessed ourselves. One was a Ford Sedan which crashed into a tree at the side of the road, and another where a small car had collided with two others and was lying on its back in a field. Whalley who had piloted his Ford from Athens without loss of marks, suddenly found his brakes had failed when confronted with a level-crossing barrier and crashed right through, just missing a train. Vasselle put paid to his Hotchkiss by a head-on collision with two cars shooting over the brow of a hill.

Frantic driving was the order of the day on the last section, and cars were doing 85 m.p.h. down the Promenade at Nice. Those who knew the Riviera took the Moryenne Corner on to Monte Carlo, but less fortunate ones took the coast road and fought their way past giant motor buses. Difficult pieces of bad luck were A. Scott, who again took his eight-year-old 4½-litre Bentley through Umea but failed by one minute to check in on time. Miss Astbury had her gear-box fail in the last few minutes, being the only competitor to get through from John o' Groats without loss of marks. A minute was the usual margin and it was supermen like Berlescu on his Ford, who had ten minutes in hand, who could afford to drive about the town on full throttle looking for the final check which was set on the Quai d'Albert.

There, papers were examined and engines sealed, or rather paint marks checked, and the cars were then parked in the open for the night. Monte Carlo was wet and miserable under heavy showers, and drivers and crews stumbled thankfully to waiting hotel buses and a most welcome return to comfort.

Next day was fine, and with black clouds hanging over we expected the factor of the complicated figure-of-eight test.

Preceding this was a starting test from cold, five minutes being allowed for this, and almost the only failure was a Plymouth driven by Mrs. G. Molander which was found to have a completely dry petrol tank. Surely an unusual circumstance on such an important occasion.

The cars took part in the final test in the order in which they arrived at Monte Carlo and the list began with a group from John o' Groats. Mann on his 4½-litre Lagonda was first and did well to record 1 min. 35.8 secs. Mrs. M. J. Cotton was five secs. slower in the list with her Aston-Martin and Innes on a Riley Imp then got down to 1.22 7/10. After a series of quiet runs came Mahé on a low-built baby sports Talbot, who snapped the time back to 1.16 and following him, Dobell on his Lagonda Rapide improving the Frenchman's time by half-a-second in spite of the much greater weight and wheelbase of the English car. Balester on a two-seater Hudson got down to 1.9 8/10 secs. then came the turn of Trevoux and his Hotchkiss, a competitor who had won from Athens two years ago, in 1.17 7/10 which was the best he could do while Guyot, whose Renault concealed a 5½-litre beneath its short bonnet, did a snappy 1.6 8/10.

Light, on the two-seater A.C. was supposed to have a good chance but spoilt things by ramming the sand bags and losing marks. D. H. Murray (Frazer-Nash-B.M.W.) made excellent use of the car's lock to record 1.14 9/10 secs.

There came a few other numbers and then Quatresous, partner of Lahaye who was the winner of last year's Monte Carlo Rally, on a Renault slid the car fast through the eight, evident of a terrific lock, and recorded 1.10 9/10 secs., not a winning number but sufficient for a first run. Then came the first display of acrobatics. S. A. Beyer and Clausen (Ford), the Dutchmen who started from

A FANTASTIC MONTE CARLO RALLY—continued

Umea, came down the course at great speed and then when they arrived at the reversing point, locked over the steering and jammed on the brakes. The tail of the car swung round and, after attacks of reverse to comply with the regulations, they shot away to the "wiggle-woggle," the extraordinary performance resulting in a time of 1.10½ secs., but more was to come. Bakker Schut, the Dutch driver who had been first at every control nearly all the way from Tallinn on his Ford, came down with even greater speed and, reaching the reversing pylon, his car seemed suddenly to leap, and landed pointing in the correct direction. He had his lead-cable controlling the rear brakes to the track rod, and when the steering was swung full right, the brakes locked. This manœuvre gave Bakker Schut a time of 1.5 6/10, the fastest yet recorded.

After these excitements it was a relief to see a smooth performance by Healey, who took his Triumph Dolomite round the course in 1.9 8/10. Schell followed this by an equally happy run on his Delahaye in 1.7 7/10, proving that abnormal driving methods were not essential for success. Mlle. Helle-Nice, the well-known driver of Bugattis, tried to repeat her style of cornering with her Matford, but required two reverses to get round, and this so infuriated her that she failed to take her foot off the accelerator at the far end of the course and smote the front-end of her car a resounding smack on the stonework of the Promenade.

The veteran, Carriere, who had taken a Ford from Athens, made a useful 1.14 3/10 and Symons, on one of the few genuine touring cars in the Rally, went through the test in 1.26 6/10 on his big Wolseley saloon unperturbed by heeling over and groans from the tyres. Stoffel, another experienced driver, put his 2-litre Peugeot through the hoops in 1.12 9/10.

D. E. Harris had driven his Singer 9 almost single handed from Tallinn, never exceeding 50 m.p.h.; now he entered with abandon round the figure eight to record 1.15 3/10.

Fords continued to roll and spin round the figure-of-eight in a fashion other than that intended by the makers, but the supreme performances were made by Cristea and Berlescu. Cristea had brought the *pepe queue* to a fine art, his car swinging steadily at each end of the course, and rather suggesting the solid back axle. Unfortunately he forgot to complete the eight. Berlescu actually managed 1.3 6/10, but failed to make one of the necessary reversals. Once again a motor bus had been allowed to compete and Tiel, who started from Amsterdam in a Minerva, covered the course with real virtuosity and a continued use of reverse. The first series of runs ended with Pinault and Schell in the lead and Bakker Schut and Healey in the next. After a well-earned drink and a sandwich, the officials returned to their task of a second four hours of putting the cars through their paces.

As was expected, most of the experienced drivers were reserving themselves for the second run, and times were up in nearly every case. Trevoux was less exciting than was expected with a time of 1.11 7/10, but Quatresous was on his mettle and improved his time to 1.7 2/10. Schell countered with 1.5 4/10, a remarkable performance, especially as he was not a professional driver, but it was left to Cristea to administer the *coup de grace*. He rushed down to the reversing pylon and slid gracefully round, forced his car round the figure-of-eight with the front heeling over at 45 degrees, completed another about turn at the far end of the course, and shot over the line with a time of 1 min. 5 secs. dead. As he admitted afterwards, he had practised the test nearly 400 times so he deserved his success.

No English car came anywhere near these figures; Healey was four seconds slower on his second run, while Light got round in 1.18.

Another English win in the Monte Carlo Rally can only be secured by a special car driven by a man who has been willing to practise unceasingly, and these two conditions are not likely to be fulfilled.

RESULTS

General Classification

1.	L. Zamfirescou, Ford (A)	641.0
2.	Mme. L. Schell, Delahaye (A)	640.6
3.	C. Lahaye, Renault (A)	638.8
4.	G. Bakker Schut, Ford (T)	637.4
5.	R. Guyot, Renault (T)	636.2
6.	R. Carriere, Matford (T)	634.9
7.	J. Trevoux, Hotchkiss (A)	634.3
8.	D. M. Healey, Triumph (T)	633.2
9.	C. A. Biglaard, Ford (S)	632.0
10.	P. de Massa, Talbot (T)	631.1
11.	E. Kozma, Fiat (A)	630.9
12.	C. Ambaud, Delahaye (A)	629.2
13.	B. Neamtu, Ford (B)	629.0
14.	H. Stenfeldt, Ford (U)	628.9
15.	M. Klinke, B.M.W. (P)	628.3
16.	C. Balester, Hudson (T)	628.2
17.	D. H. Murray, Frazer-Nash-B.M.W. (T)	628.1
18.	Mme. J. Marinovitch, Matford (T)	627.8
19.	A. Berlescu, Ford (B)	627.6
20.	Miss J. Richmond, Triumph (U)	625.9
	Z. Pohl, Popular (A)	625.9
22.	L. Chinetti, Ford (T)	625.0
	S. H. Light, A.C. (T)	625.0
24.	D. E. Harris, Singer (T)	624.7
25.	H. Stoffel, Peugeot (A)	624.3
26.	H. E. Symons, Wolseley (A)	624.2
27.	Dr. L. Billon, Renault (A)	624.1
28.	B. N. Willnott, Rover (S)	623.0
29.	A. E. Dobell, Lagonda (T)	622.5
30.	Mlle. L. Lamberjack, Hotchkiss (T)	621.4
31.	J. Treider, Renault (S)	620.9
32.	H. L. G. Koopmann, B.M.W. (T)	619.3
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34.	Mme. M. Mareuse, Hotchkiss (A)	617.8
35.	Mlle. M. Melin, Ford (U)	617.1
36.	F. Chevroton, Renault (P)	617.0
37.	A. Testers, Ford (V)	615.4
38.	F. Thellusson, Opal (B)	611.1
39.	P. Moccia, Auburn (B)	608.6
40.	Miss J. Astbury, Singer (J.G.)	605.2
41.	T. G. Moore, Lagonda (T)	603.9
42.	Mrs. G. Molander, Plymouth (U)	603.3
43.	T. H. Wisdom, Standard (A)	602.7
44.	Mme. O. Siko, Delahaye (A)	598.9
45.	A. C. Scott, Bentley (U)	598.6
46.	F. de Boer, Chevrolet (Am.)	598.1
47.	Mme. A. J. Cornelius-Sybrandy, D.K.W. (Am.)	596.6
48.	Mme. O. Orsini, Salmson (S)	595.2
49.	Dr. B. Bariffi, Lancia (N)	594.8
50.	F. Lecot, Citroen (V)	594.1
51.	W. Oosten, M.G. (Am.)	584.7
52.	W. Heede, Ford (U)	581.3
53.	Mrs. M. J. Cotton, Aston-Martin (Ab.)	579.2
54.	S. A. Beyer, Ford (U)	575.0
55.	M. N. Dos Santos, Adler (V)	570.6
56.	W. Zweerts de Jong, S.S. (Am.)	570.5
57.	K. W. B. Sanderson, Bentley (G)	567.8
58.	B. H. G. Brinkel, Ford (Am.)	565.4
59.	R. E. Stokes, Ford (J.G.)	560.9
60.	C. H. Mann, Lagonda (J.G.)	559.8
61.	W. P. Maidens, Rover (J.G.)	559.3
62.	M. Gawel, Fiat (T)	542.6
63.	L. Levie, Ford (Am.)	541.2
64.	Mme. G. F. Junkers, Plymouth (U)	520.0
65.	L. Lauritzen, M.T. (U)	519.8
66.	B. Wist, Morris (S)	512.1
67.	Maj. D. E. M. Douglas Morris, Ford (J.G.)	498.0
68.	W. L. Innes, Riley (J.G.)	467.3
69.	J. Abbott, Riley (J.G.)	461.6
70.	Hon. Brian Lewis, S.S. (J.G.)	443.6
71.	W. L. Thiel, Minerva Kromhout (Am.)	387.5
72.	Capt .F. E. Nord, Daimler-Benz (G)	324.0

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1.	E. Kozma, Fiat (A)	630.9
2.	Z. Pohl, Popular (A)	625.9
	Miss J. Richmond, Triumph (U)	625.9
4.	D. E. Harris, Singer (T)	624.7
5.	B. N. Willnott, Rover (S)	623.0
6.	F. Thellusson, Opal (B)	611.1
7.	Miss J. Astbury, Singer (J.G.)	605.2
8.	Mme. A. J. Cornelius-Sybrandy, D.K.W. (Am.)	596.6
9.	W. Oosten, M.G. (Am.)	584.7
10.	Mrs. M. J. Cotton, Aston-Martin (Ab.)	579.2
11.	R. E. Stokes, Ford (J.G.)	560.9
12.	W. P. Maidens, Rover (J.G.)	559.3
13.	M. Gawel, Fiat (T)	542.6
14.	L. Lauritzen, M.T. (U)	519.8
15.	B. Wist, Morris (S)	512.1
16.	W. L. Innes, Riley (J.G.)	467.3

Women's Cup

1.	Mme. Marinovitch, Matford (T)	627.8
2.	Mme. L. Lamberjack, Hotchkiss (T)	621.4
3.	Mme. M. Mareuse, Hotchkiss (A)	617.8
4.	Mlle. M. Melin, Ford (U)	617.1
5.	Mrs. G. Molander, Plymouth (U)	603.3
6.	Mme. O. Siko, Delahaye (A)	598.9
7.	Mrs. M. J. Cotton, Aston-Martin (Ab.)	579.2

Abbreviations: A started from Athens; T, Tallinn; S, Stavanger; B, Bucharest; U, Umea; P, Palermo; V, Valenca; J.G., John o' Groats; G, Glasgow; Ab., Aberdeen; Am., Amsterdam; N. Naples.

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Rene Leon Cup (best British competitor).—D. M. Healey (Triumph).

Prince Pierre Ghika Cup (best from Roumania).—B. Neamtu (Ford).

Roumanian A.C. Cup (best by a Roumanian from Roumania).—B. Neamtu (Ford).

Norway Cup (best in category one from Norway).—C. A. Bijlaard (Ford).

"Agtenposten" Trophy (best 1,500 c.c. from Norway).—B. N. Willmott (Rover).

Thistle Cup (best from British starting-point).—Miss J. Astbury (Singer).

Barclays Bank Cup (best British car).—D. M. Healey (Triumph).

Royal Scottish A.C. Prize (best from Scotland).—Miss J. Astbury (Singer).

Baltic Prize (best from Tallinn).—G. Bakker Schut (Ford).

A.C. of Monaco Cup (best time in final test).—L. Zamfirescou (Ford). Driven in test by P. G. Cristea.

A.C. of Portugal Cup (for best by member of the A.C.P.).—M. Nunes dos Santos (Adler).

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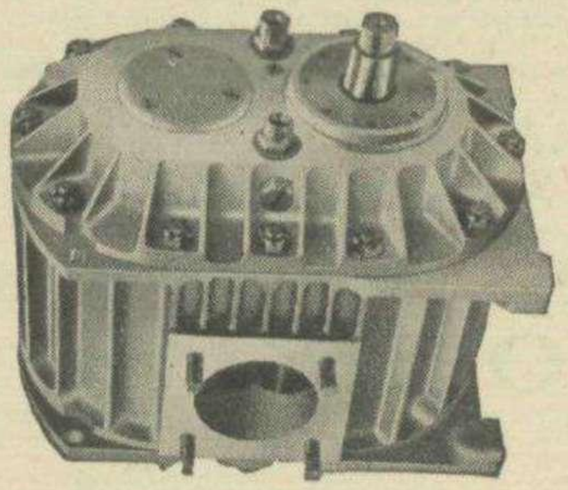
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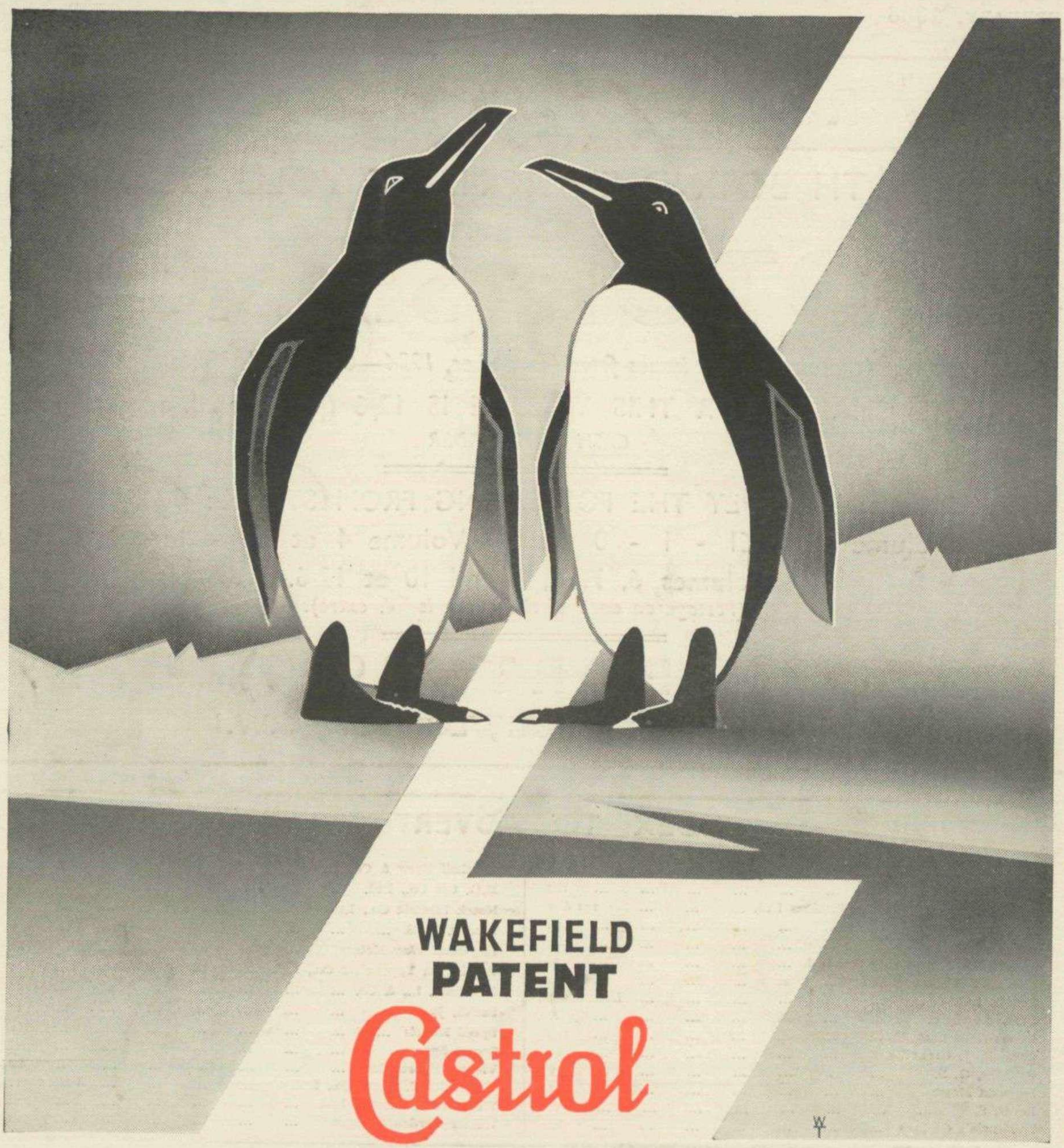
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