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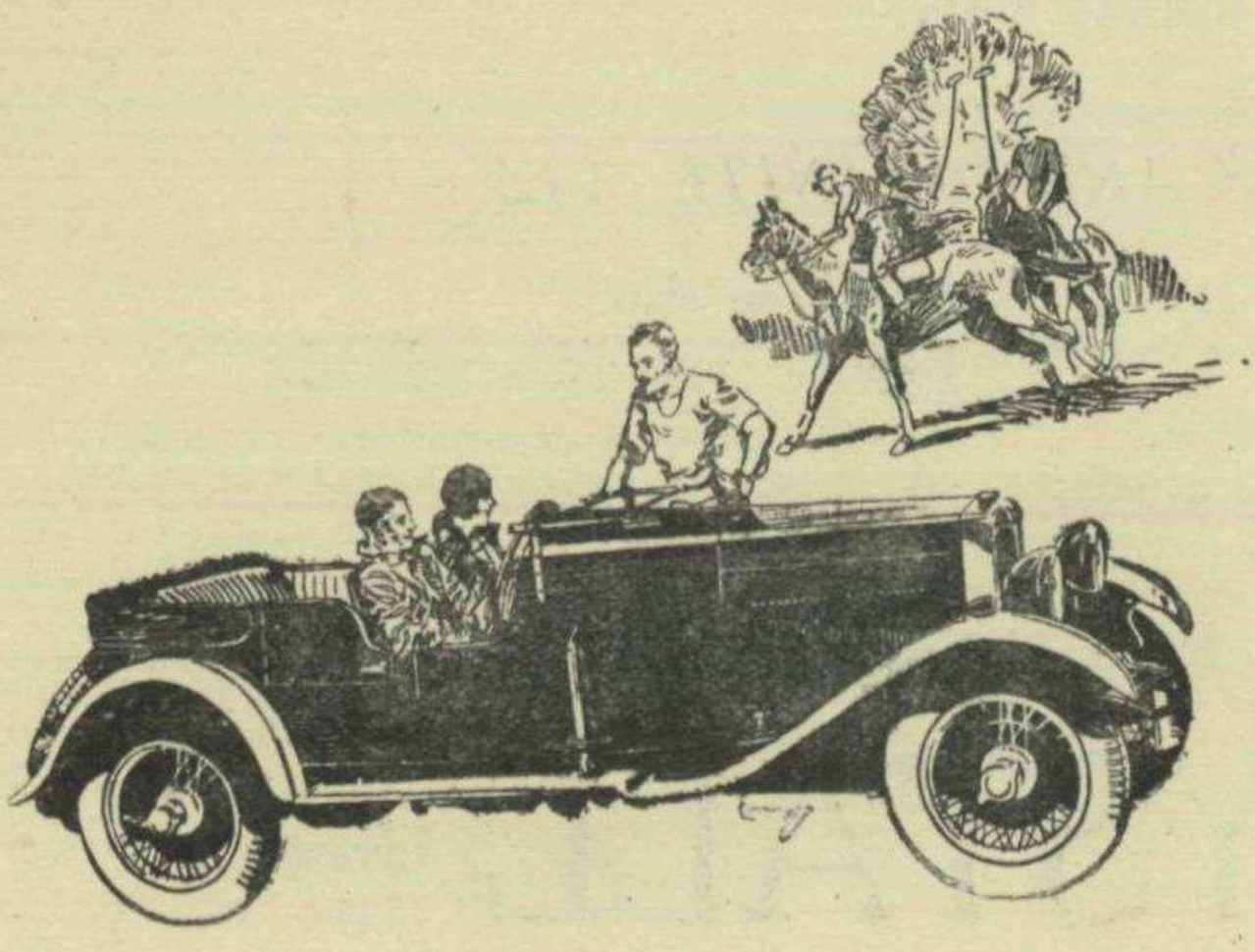
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MOTOR SPORT

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The Way of Things

Brooklands Prospects.

THE 1930 season at the track will always be remembered as marking the commencement of a new régime, and the success which has attended their efforts, in spite of various misfortunes over which they could have no control, has provided sufficient answer to the pessimists who foretold that Brooklands was a spent force as a public attraction. The thorough reorganisation and improvement of the club premises has made the B.A.R.C., more than ever a club worth while belonging to, and we anticipate a considerable increase in the membership next year.

One thing which has long been a sore point with drivers at the track, has been its rough condition. This has led to a number of drivers attempting records on foreign tracks, such as Montlèry, as in spite of the extra expense, the chances of success are greatly increased.

Many people talk glibly of repairing the track, as if is were a matter of a few days work, totally forgetting the fact that Brooklands is the largest concrete track in the world, and anything in the way of constructional work on it, is a formidable and costly undertaking. This winter, however, the authorities are planning an attack on the hills and dales of the track, and are co-operating with the drivers to collect data which will enable the maximum improvement to be carried out with the minimum of expense or wasted energy.

Considerable repairs have been carried out, of course, for many winters past, but they have always been in the nature of patching up. As the complete resurfacing of such a vast area of concrete is task far beyond the financial resources at the command of the track authorities, they have decided to make the best possible use of their available funds.

The hope has so often been expressed that next year will see a smoother Brooklands, that many drivers have despaired of there ever being a real improvement, but we may now really see something done.

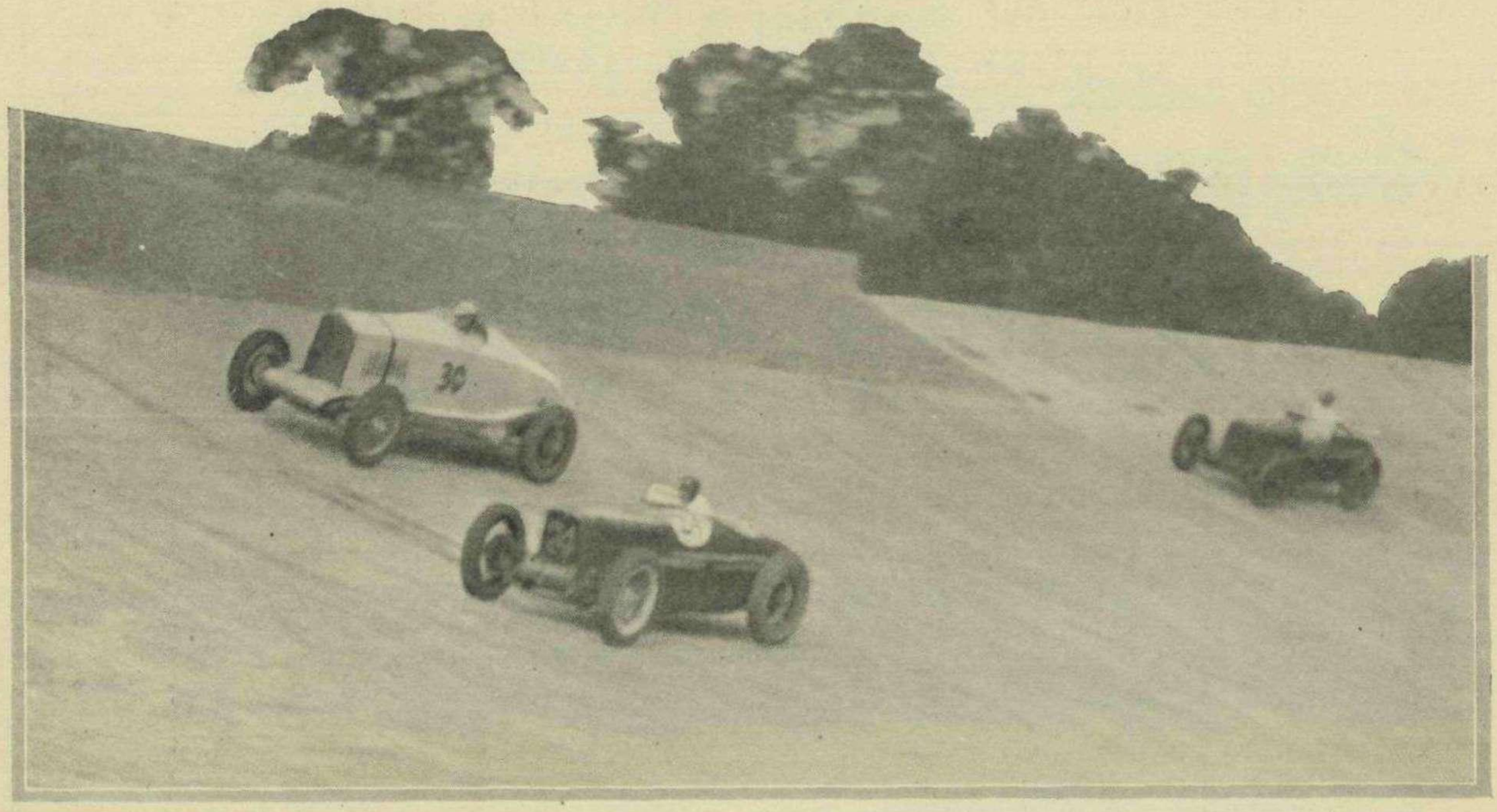
The importance of Brooklands from the point of view of the trade depends very largely on its suitability for record attempts, as records broken in this country stand a much better chance of being given good publicity, than similar successes achieved in another country. Mr. Percy Bradley, in his first year of office as Clerk of the Course, together with his colleagues, has already shown his organising ability and initiative by the introduction of progressive ideas, and we may, therefore, look forward to the time when we shall have not only a brighter, but a smoother Brooklands in 1931.

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THE 500-MILES RACE

AUSTIN SEVEN WINS AT 83.41 M.P.H. —BENTLEY AVERAGES 112.12 M.P.H.



ON its introduction last year, the British Racing Drivers' Club 500 Miles Race proved that we could in this country, stage the fastest long distance event in the world. This year, on the 4th of last month, in spite of vile weather conditions for the first half of the race, all previous speeds were once again surpassed, and the Bentley driven by Dr. Benjafield and E. R. Hall, put up the astounding average of 112.12 m.p.h. for the 500 miles to finish second. The speed of the winning Austin Seven, driven by S. C. H. Davis and the Earl of March, was 83.41 m.p.h. which would seem almost incredible if we had not already got used to the amazing capabilities of this little engine.

Steady rain, and a sky which spoke of worse to come, welcomed the drivers at the start, and it was at once evident that the " 750's " were going to be very difficult to catch. Their speed would, of course, be quite unaffected by the wet, though it made things remarkably unpleasant for their drivers, but the bigger cars, capable on a dry day of lapping at about 130 m.p.h. were heavily handicapped. To attempt such speeds on a wet track, and in such bad visibility, would have been merely foolhardy, and it was known that Birkin and the other big cars would be taking things comparatively steadily unless the weather cleared up.

At 10.30 a.m. the flag fell for the " 750s " and the " O.C. fireworks " in the background did his stuff with the maroon, and the " 500 " had begun. The works team of orange Austins started off lapping at 83 m.p.h. which must have been rather a shock for some of the teams of bigger cars waiting at the start, as it was evident that this was no flash in the pan, but the speed they were aiming to hold for the whole race. No. 1, driven by Sammy Davis took the lead from the start, and the works entries drew steadily ahead of the rest. There were, however, some very fine speeds being put up by some of the unsupercharged cars, E. F. Philips on a B.C. Special and P. Brewster, of motorcycle racing fame, on a very ordinary looking, but very fast Austin were holding over 75 m.p.h.

The first serious excitement was caused by Brewster who got into a terrific skid at the fork and gyrated merrily towards the pits, almost wiping up an official who was standing out on the track. However, he came to rest without upsetting, thanks to the slippery track, and was pushed off again. The pace soon began to tell, and Phillips was an early caller at the pits with some bother in the transmission department. The universal joint appeared to be tightening up, but after a liberal injection of grease he continued. The trouble, however, was not to be so easily dealt with and he was in again later with the offending mechanism giving off a " hot smell," and giving rise to a certain amount of badinage about " cuts off the joint," etc.

At 11.9 a.m. the 1100 c.c.'s joined in, but the amazing performance of the Austins overshadowed some of the larger cars completely, and the " 1100's " as a whole proved a very unlucky class on this occasion. " S. Bird " was, however, upholding the Riley colours effectively and was lapping at 93 m.p.h. which was certainly rather a bold effort for such a long distance race. Ashby, who is usually among the fastest of the 1100 c.c. had had very bad luck, as on the previous afternoon he had broken his crankshaft, which would be enough to make most people give up the idea of starting at all. Not so Mr. Ashby, however, and by working all night with his trusty band of mechanics, the engine was stripped, a damaged rod and piston were replaced, and an old crankshaft, which had seen much worthy service in the past was fitted in place of the broken one. This enabled them to get their car to the start, but effects of not being able to bed things down gently and at their leisure became evident. Shortly after the start he had to come in for a general " run over " of all bolts on the engine, and later his gallant effort was brought to an end by the crankshaft breaking again. R. T. Horton's T.T. Riley ran a big-end as did Stanard's car of the same make, and the 1100 c.c. chal-

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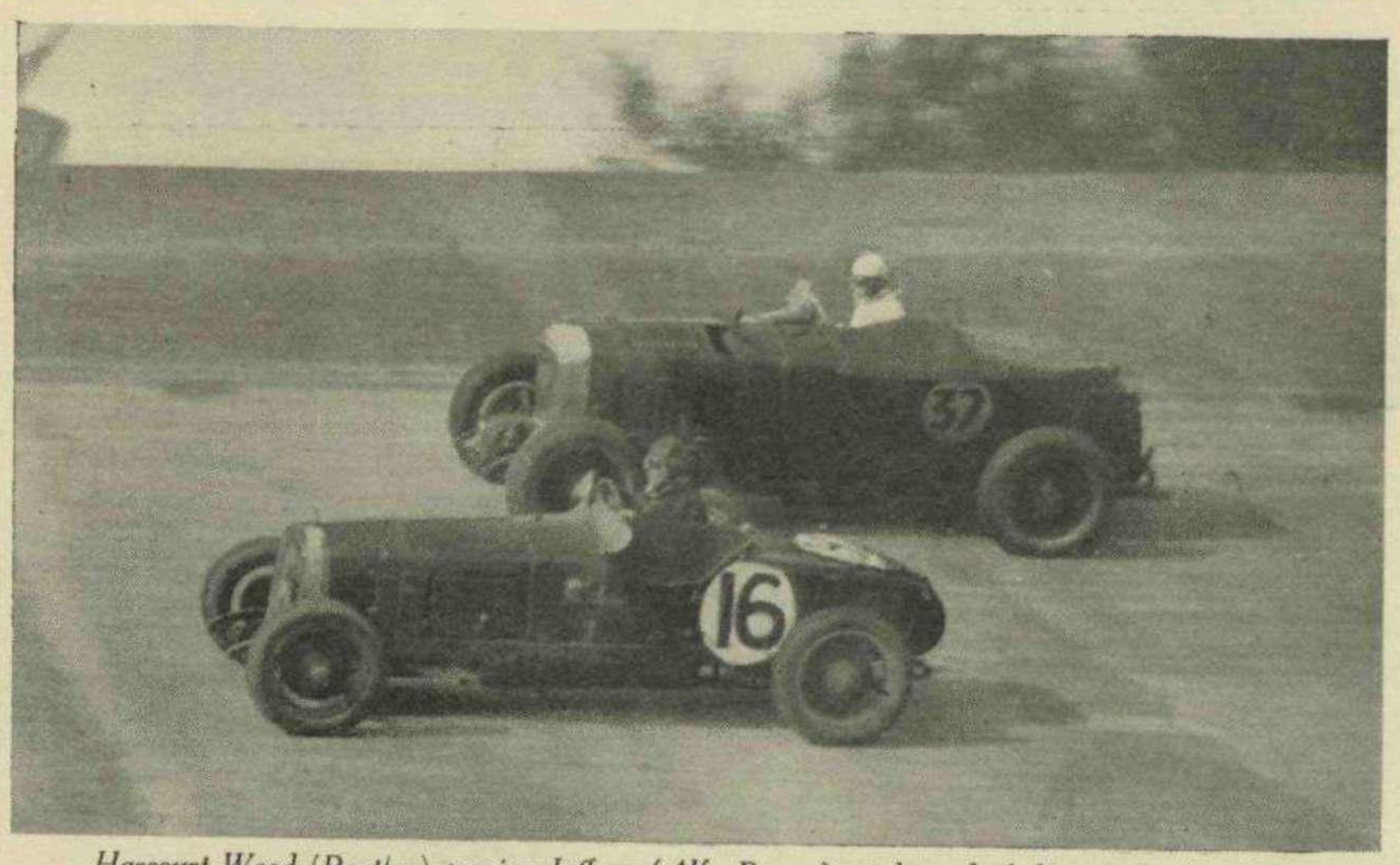
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500 MILES RACE—continued.



Harcourt-Wood (Bentley) passing Jeffress (Alfa-Romeo) at the end of the members' banking.

lenge was therefore confined to " Bird's " Riley.

The 1500 c.c. cars were now showing some real speed and Scott's wonderful little Grand Prix Delage, driven in turn by himself and by Cobb, was holding over 100 m.p.h. though at first it was behind Spero's Lea-Francis, which foi the first 100 miles showed a remarkable turn of speed and actually led its class. This was too good to last however, and Scott took the lead from him soon afterwards. The leaders in the race in the early stages did not, of course, convey any great meaning, as owing to their big start the " 750s " were bound to be leading in actual distance until very near the end whether they won or not, but the announcement that Davis was actually well ahead of his handicap showed that an Austin victory was extremely probable, if the little car could stand the terrific gruelling. By this time the rain had ceased and the rapidly drying track was giving the big cars, previously held up by the wet, a chance to make up.

By the time the whole entry had been despatched there seemed to be quite enough cars on the track to give their drivers plenty to think of, tnough universal regret was expressed at the fact that the Maserati was a non-starter.

At first it had been found, that owing to the car being constructed to suit the Monza track the weight distribution and steering were unsuitable for Brooklands. This was altered ard the car was certainly very fast in practice (one heard of 130 m.p.h. over the half-mile) but misfortune was dogging them and a porous cylinder head, which caused No. 5 cylinder to get filled with water caused its withdrawal, as no spares were availal le.

The Talbots of which there were four in the race, three with the standard racing four-seater body, and one, driven by Earl Howe and B. E. Lewis, with a streamlined single seater were all going well and lapping in the region of 103 m.p.h. which for an unsupercharged engine of only 2¼ litres is really wonderful. Their absolute reliability in racing had been endangered on this occasion by trying out some new pistons, and Eaton had to retire owing to a seized gudgeon pin. The others, however, were going perfectly and steadily increasing their speed.

The old 2-litre racing Sunbeams were showing that although racing cars may, get written off, they do not fade away and Jack Dunfee was leading the 2-litre class on one of them, and actually going as fast as anything on the track, while Harold Bardy was putting up a fine race on another of the Sunbeams.

The terrible strain on a car of some hundreds of miles at this speed on a none-too-smooth track, was having its effect throughout the entry. Although Davis's Austin was going as well as ever his team-mates had had to retire, and the larger cars were also in trouble.

The Bentley team was the last to remain complete, and the fastest of their team proved to be the four-seater driven by Hall and Benjafield. Cobb on the little Delage, after holding a wonderful speed, came in to the pits with the front wheels leaning in at a horrible angle, the bolts holding the 3-piece axle together having broken. Work was immediately started to get the car going again, but the trouble continued and the car had to be withdrawn.

Birkin's single-seater Bentley did not seem to be in very good form and was getting slower. Also George Duller, who was driving in turn with Birkin, seemed anything but happy in the car, and held a fairly low seped. The fact that he had had a front tyre burst when all out in practice, and the resulting gyrations of the car, probably made him a little more cautious than usual.

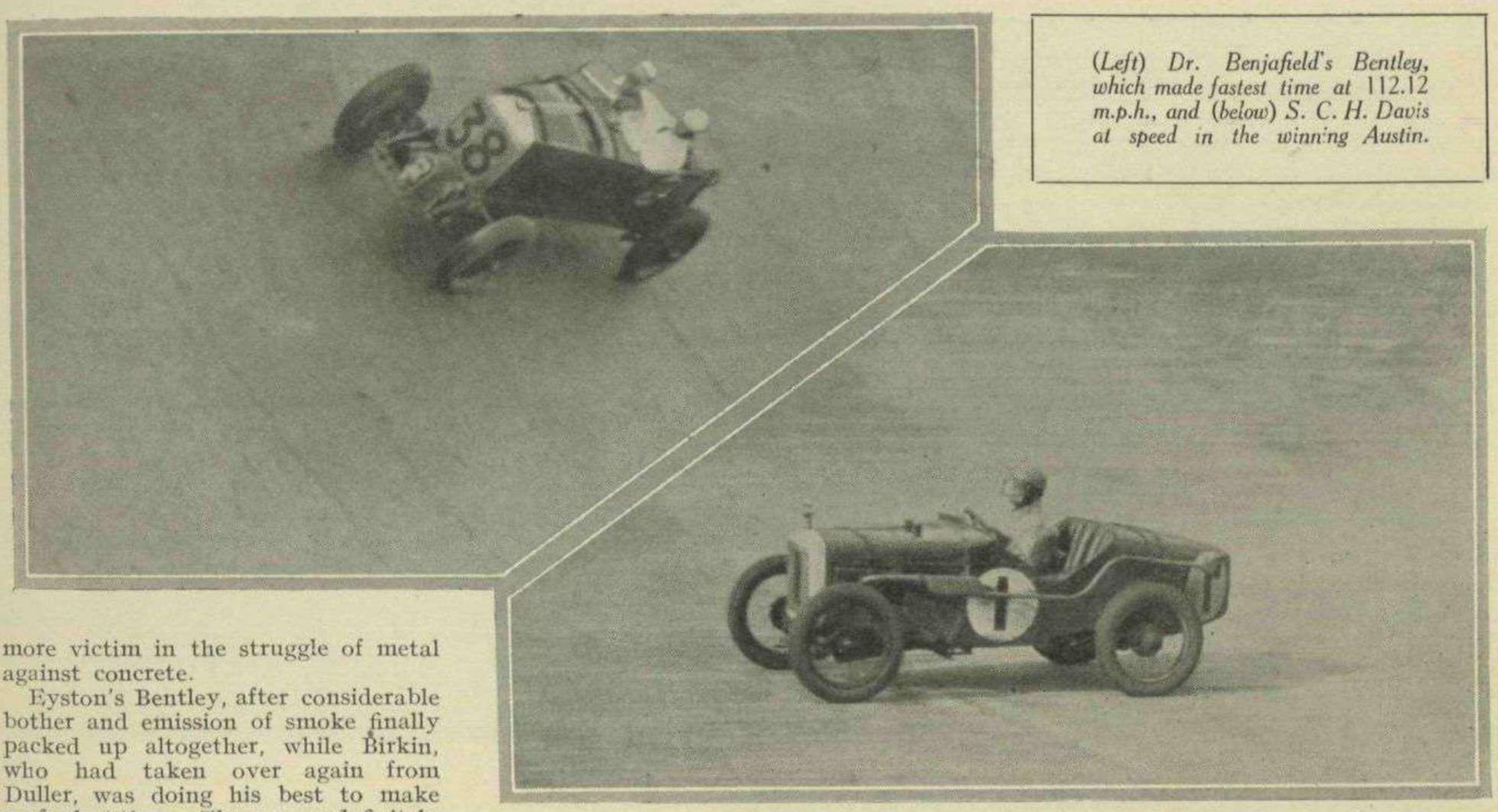
The Bentley hopes lay with Penjafield, and he was driving a wonderful race in his endeavour to catch the flying Austin His car was a terrifying sight on the banking as he went higher and higher in his efforts to get a slightly better lap speed. He was lapping actually at over 120 m.p.h. and holding this speed continuously. The whole car was above the safety line, and recalled visions of the late Parry Thomas in his meteoric, shrub-clipping laps on the old Leyland Thomas.

After a wonderful drive for over 300 miles, the effcrt of the brothers Dunfee was brought to a dramatic end. Clive came in to the pits to repair the steering column support, and also complained of binding brakes. After a brief look-over, he shot off again, but had hardly cleared the end of the pits when his off side rear wheel, complete with axle-shaft, came away, and shot across the track in the path of the following cars. Davis, in the Austin, just managed to avoid it and it was whisked off the track in a moment. Meanwhile Dunfee had brought the car to rest on the brake shoes, at the side of the track, and Brooklands had claimed one



Earl Howe and Brian Lewis keeping their Talbot dry with the former's famous umbrella, at the start.

500 MILES RACE—continued:



(Left) Dr. Benjafield's Bentley, which made fastest time at 112.12 m.p.h., and (below) S. C. H. Davis at speed in the winning Austin.

more victim in the struggle of metal against concrete.

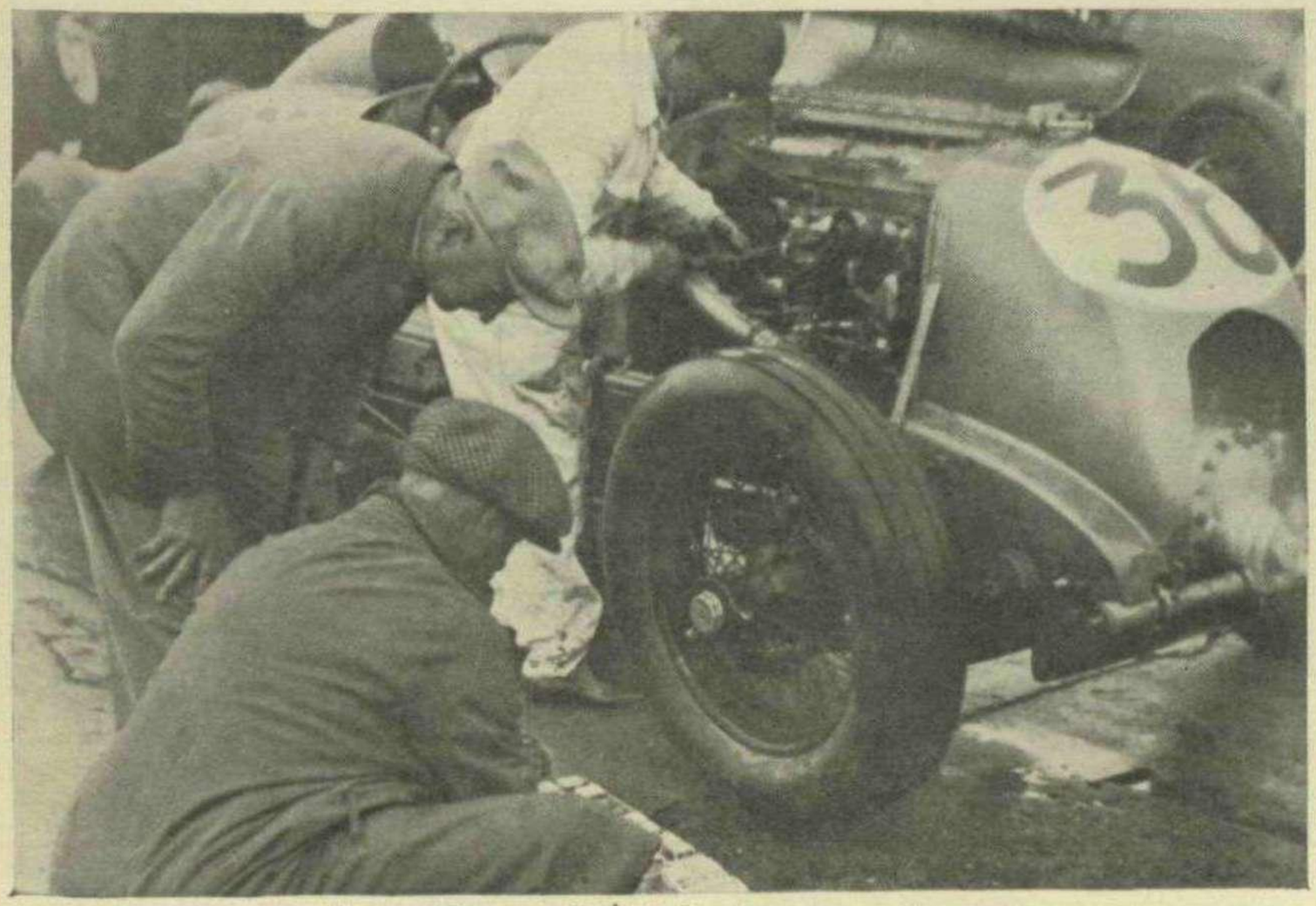
Eyston's Bentley, after considerable bother and emission of smoke finally packed up altogether, while Birkin, who had taken over again from Duller, was doing his best to make up for lost time. The car was definitely in trouble however, calls at the pits became frequent, while the exhaust note became more uneven, until it eventually sounded more like a motor cycle engine with its staccatto beat, than the steady drone of a 4-cylinder.

The result was not much longer in doubt, and after running for 6 hours at record speed, the chequered flag was hung out for the little Austin. Benjafield's Bentley thundered into second place, at 112.12 m.p.h., the highest speed ever achieved in a classic long-distance race, while the third car was the 2-litre Grand Prix Sunbeam driven by Purdy and Cushman, which at 104.75 m.p.h. just beat B. C. Lewis's Talbot. Talbots finished 4th, 6th and 7th, all at over 100 m.p.h. which performance is even more remarkable when it is considered that only 9 cars completed the distance within the time limit, although 8 more were running at the end.

A specially fine effort was that of Hindmarsh who drove his Talbot single-handed and without a stop for the entire distance, at an average speed of 103.52 m.p.h., and anyone who has experienced for even a few laps, the shaking up which the track gives to both car and driver, will realise the endurance required for such a performance. Another driver who preferred to handle his car without a reserve was Charles Brackenbury, who although compelled to drive in a bedroom slipper owing to a boil on one foot, kept going cheerfully for 167 laps, and was still running at the finish.

Benjafield was lucky to avoid delay near the end, as on completing a lap after he had finished, a tyre tread stripped with a report like a gun, and pieces of rubber flew as high as the top of the Vickers sheds as he roared by.

Although the 500 miles race was only run last year for the first time, it has already become one of the events of the season, showing clearly enough that there is a big demand for events open to any class of racing car, and the British Racing Drivers' Club are to be congratulated on their enterprise, and also on the excellent organisation of the event.

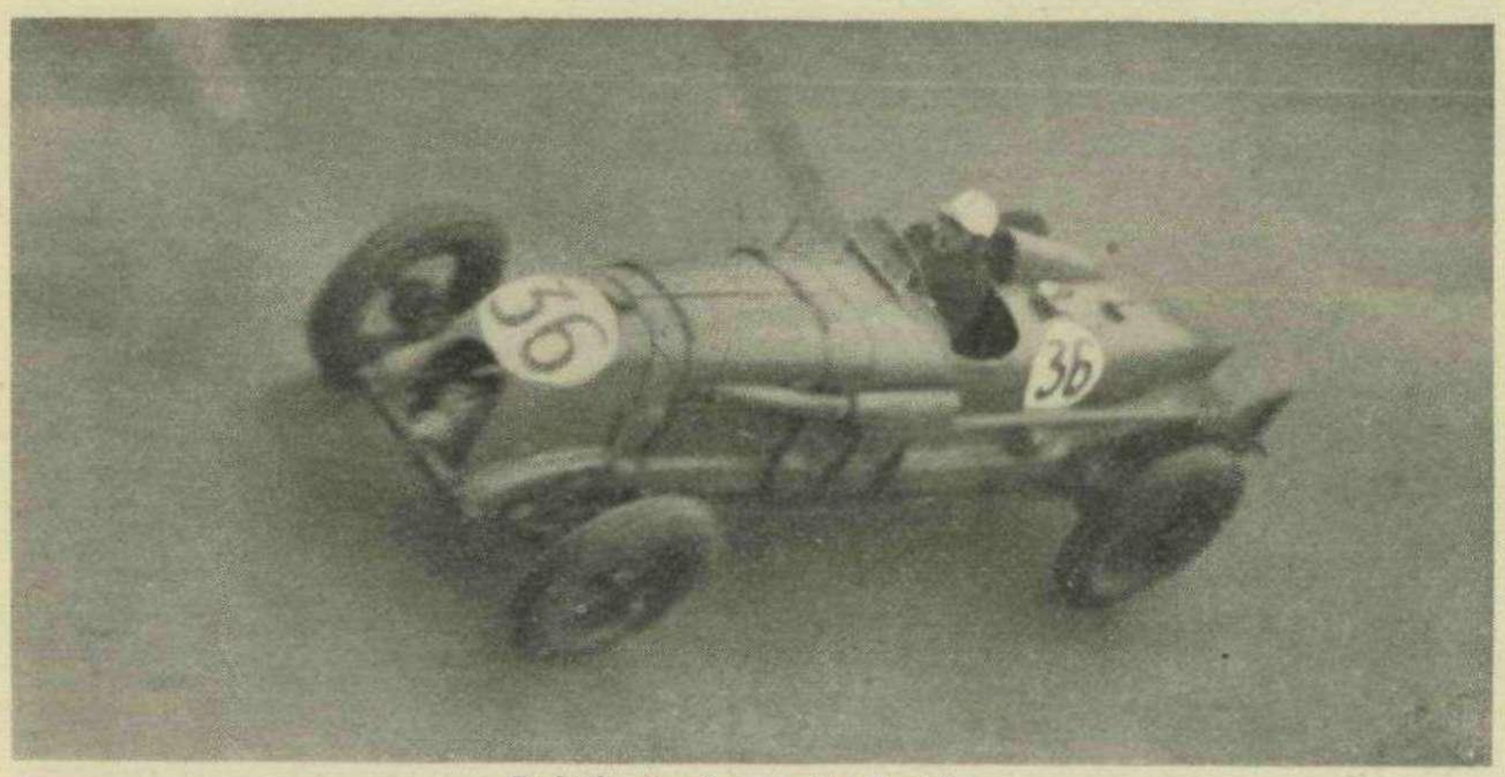


Changing plugs on Birkin's Bently, prior to the start.

RESULTS.

1. The Earl of March and S. C. H. Davis, 747 c.c. Austin (S), 6 hrs. 0 min. 13 secs=83.41 m.p.h.
2. J. D. Benjafield and E. R. Hall, 4,398 c.c. Bentley (S), 6 hrs. 7 mins. 34 secs.=112.12 m.p.h.
3. H. W. Purdy and L. Cushman, 1,988 c.c. Sunbeam (S), 6 hrs. 17 mins. 23 secs.=104.74 m.p.h.
4. The Earl Howe and B. E. Lewis, 2,276 c.c. Talbot, 6 hrs. 18 mins. 42 secs.=104.26 m.p.h.
5. B. P. Twist and R. C. Portet, 1,097 c.c. Amilcar (S), 6 hrs. 20 mins 4 secs.=88.16 m.p.h.

THE 500-MILES RACE—continued.



Birkin's Bentley on the banking.

6. J. S. Hindmarsh, 2,276 c.c. Talbot, 6 hrs. 20 mins. 44 secs. =103.52 m.p.h.

7. T. E. Rose-Richards, 2,276 c.c Talbot, 6 hrs. 29 mins. 47 secs. =100.4 m.p.h.

8. R. S. Stewart and C. R. A. Grant, 1,752 c.c. Alfa-Romeo (S), 6 hrs. 34 mins. 36 secs. =98.91 m.p.h.

9. H. R. S. Birkin and G. Duller, 4,398 c.c. Bentley (S), 6 hrs. 38 mins. 51 secs.

CLASS WINNERS.

H. (750 c.c.) Earl of March and S. C. H. Davis (747 c.c. Austin, S).

G. (1,100 c.c.) B. P. Twist and R. C Porter (1,097 c.c. Amilcar, S).

F. (1,500 c.c.). No finishers.

E. (2,000 c.c.) J. Dunfee and C. Dunfee (1,988 c.c. Sunbeam, S).

D. (3,000 c.c.) Earl Howe and B. E. Lewis (2,276 c.c. Talbot).

C. (5,000 c.c.) J. D. Benjafield and E. R. Hall (4,398 c.c. Bentley, S).

The following were still running when the race came to an end :—R. T. Horton (1,089 c.c. Riley), 27 laps ; V. S. Balls (1,097 c.c. Amilcar, S), 75 laps ; J. R. Jeffress (1,481 c.c. Alfa-Romeo), 169 laps ; W. B. Scott (1,486 c.c. Delage, S), 164 laps ; H. C. Spero (1,496 c.c. Lea-Francis, S), 90 laps ; C. Brackenbury (1,496 c.c Bugatti), 167 laps ; R. F. Oats (1,991 c.c. O.M., S), 177 laps ; P. Bamber (5,954 c.c. Delage), 17 laps.

(S denotes supercharger fitted.)

FRAZER NASH PROGRAMME

New Models

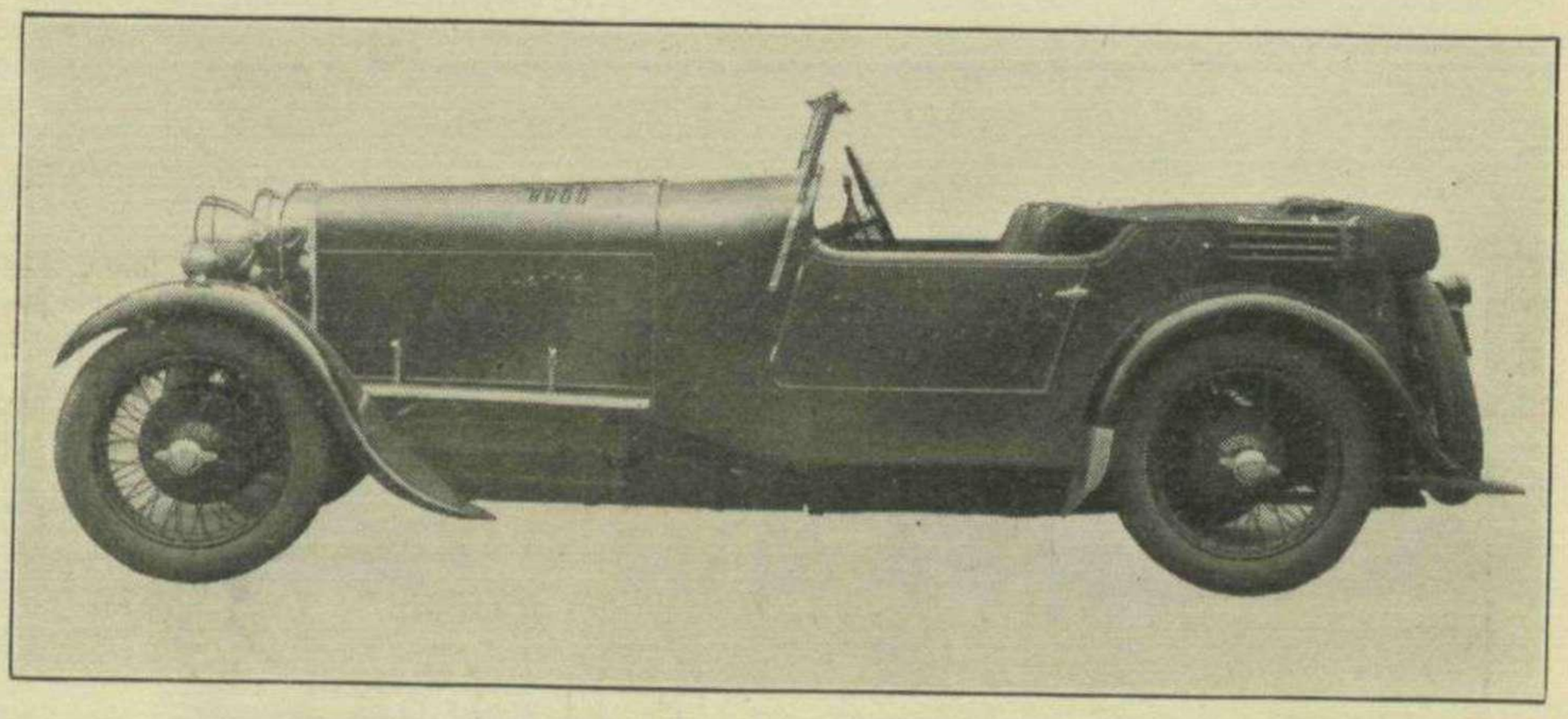
IN addition to the inclusion of an entirely new type—the " Interceptor "—in their range of models for 1931, A.F.N. Ltd., the manufacturers of Frazer Nash cars are now offering a wider variety of standard bodywork. One particularly attractive type is the four-seater here illustrated. The wide doors, absence of running boards, and continuity of waist and bonnet lines give the car a remarkably handsome and sporty appearance. At the same time, the rear compartment provides ample and comfortable accommodation for two passengers. In the case of the " Interceptor," the price with this body is £370.

The complete list with prices of 1931 Frazer Nash models is as follows :—

2-seater " Interceptor I " side valve engine, £325, 2-seater " Interceptor II " o.h.v. engine £350, 2-seater '" Falcon I " side valve engine £350, 2-seater " Falcon II " o.h.v. engine £375, 2-seater " Boulogne I " side valve engine £395, 2-seater " Boulogne II " o.h.v. engine £425, 2-seater supercharged " Boulogne I " side valve engine £450, 2-seater supercharged " Boulogne II " o.h.v. engine £475.

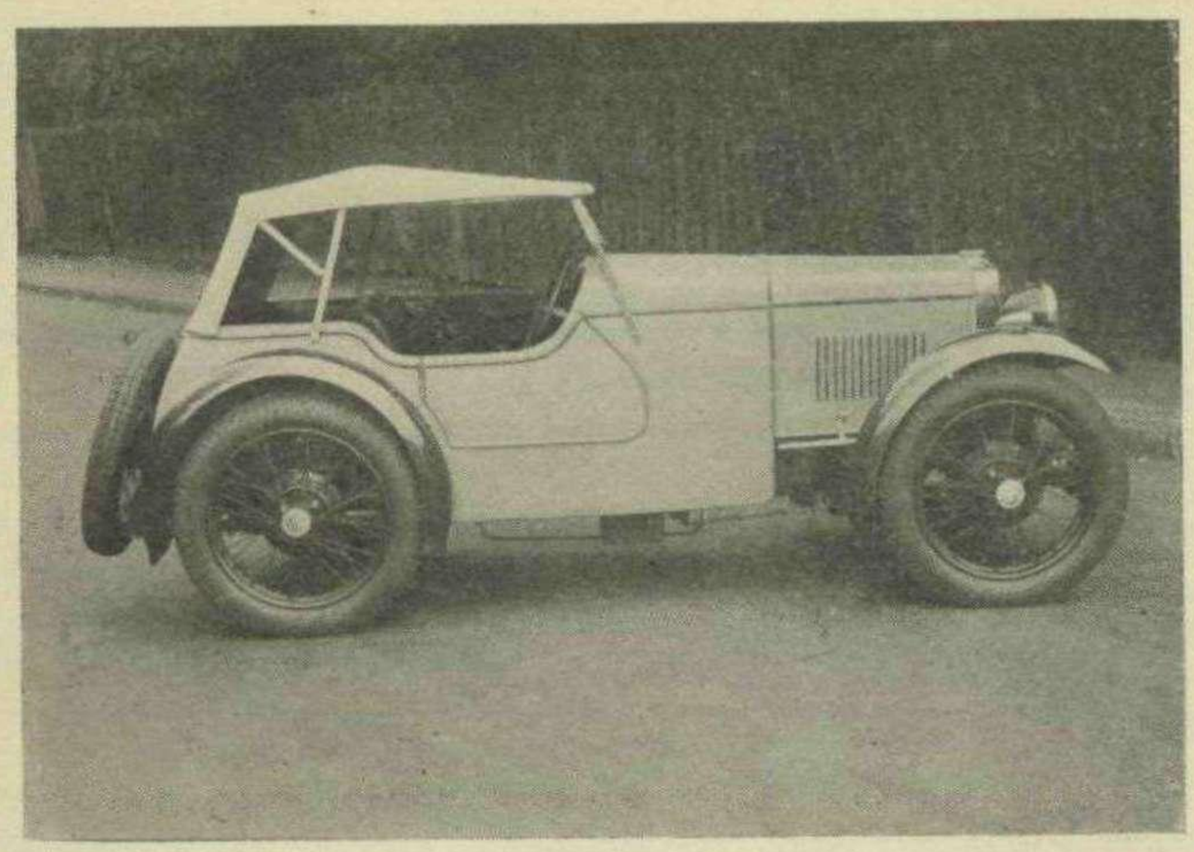
The above models can be supplied with a 3/4 seater body and long chassis at an extra cost of £25. Four speeds and reverse in place of three speeds and reverse entails an extra charge of £20.

" Ulster I " 4-speed, lowered chassis, roller bearing side valve engine, " Ulster II " 4-speed, lowered chassis, roller bearing o.h.v. engine, both £495. Supercharged " Ulster I " 4-speed, lowered chassis roller bearing side valve engine, supercharged " Ulster II " 4-speed, lowered chassis, roller bearing o.h.v. engine, both £575.



The latest Frazer Nash with four-seater body.

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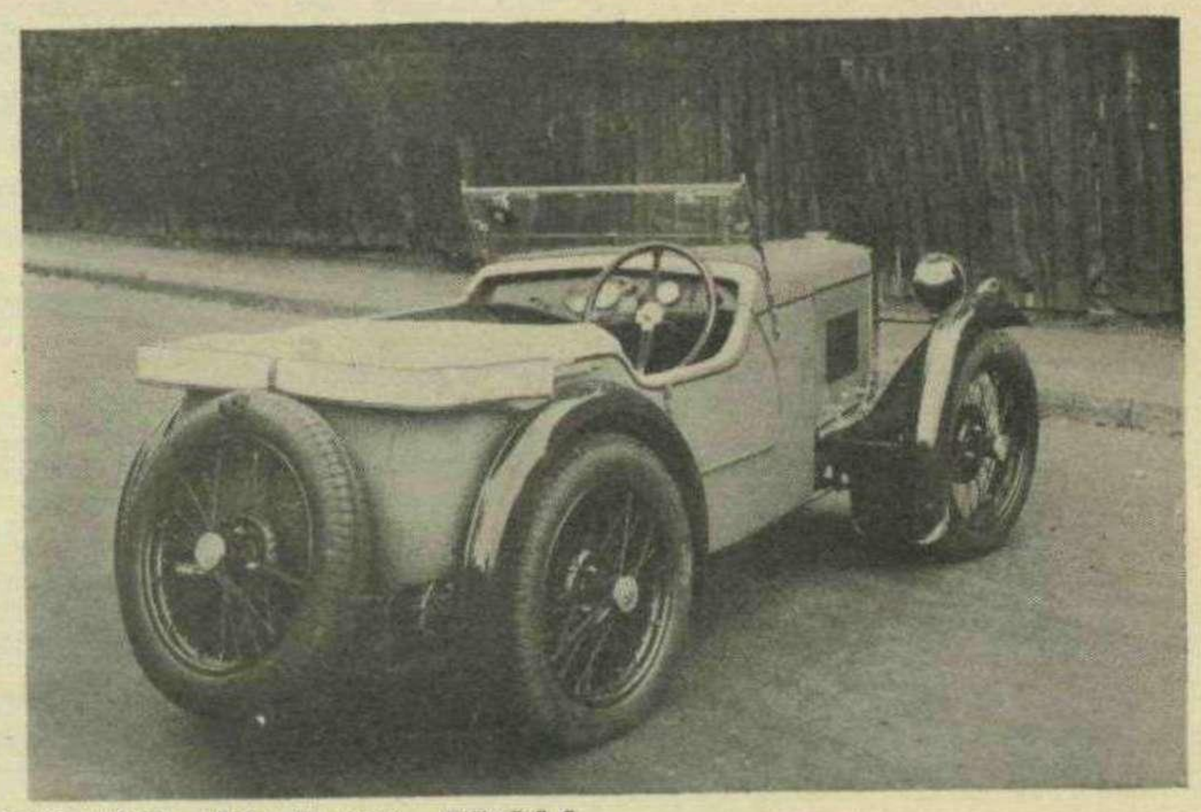


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The "Hutchinson Hundred"

A Velocette Win—at 94.68 m.p.h.

FOR once in a way the final race meeting of the year at Brooklands was run off in bright weather, when on Saturday last, October 25th, the B.M.C.R.C. held their classic "Hutchinson Hundred" and other races. But though the sun shone, a strong and chilly wind swept across the track, and this undoubtedly influenced the times in the various events. Performances on the whole were very good in all classes, however.

A three lap scratch race for "350's" opened proceedings, and drew five competitors. W. G. C. Hewitt, astride one of Worters' numerous speedy motors—in this case a Rex-Acme-Blackburne—drew away from his rivals right at the start, and led throughout. L. G. Archer on a New Imperial came second, and Staniland third. The latter was also mounted on a Rex-Acme-Blackburne of Worters'.

In the next race, a three-lap scratch affair, the riders were more evenly matched and spectators were provided with an excellent bit of duelling near the finish, when C. W. G. Lacey's Norton was passed just at the end by M. C. McCudden's Rex-Acme-Blackburne. His time for this event was 97.46 m.p.h. A three-lap non-trade members' handicap followed; this was won at 92.92 m.p.h. by A. J. Dussek on a Norton. For the fourth event, a three-lap sidecar handicap, there were eight starters, and while the speeds were not dazzling, the handicapping was accurately enough worked out to provide quite a lot of excitement at the finish when the first three riders were closely bunched together. They crossed the line in the following order:—L. J. Archer (New Imperial), C. S. Staniland (Excelsior-Blackburne), C. B. Bickell (Chater-Lea).

A very good field lined up for the big race, only nine of the original entrants failing to start. This left thirty-three riders, and as was anticipated the contest provided good fare for the crowd. Misfortune overtook many of the riders, however, and those who finished numbered only eighteen. The limit handicap man, G. Horsman, put up an excellent show on his Zenith-Villiers and as he completed lap after lap it looked as if his chances were good. But meanwhile H. Michell (Velocette) was blazing round, creeping nearer and nearer to the leader. Then, two laps before the end he overhauled him and flashed home, the victor, at 94.68 m.p.h. E. C. Fernihough was third on an Excelsior-Jap, and the fourth man was C. J. Williams on a Raleigh. The latter put up an astoundingly brilliant performance by averaging for the whole race, 103.22 m.p.h.

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SPRINGS. Stiff flat quarter elliptic front and rear. All braking and cornering torque by radius rods on both axles. Hartford Shock Absorbers to both axles.

BRAKES. Internal expanding on all four wheels. Foot control to front and rear, and hand control to rear.

WHEELS. Rudge Whitworth "Central Locknut" type, quickly detachable. Well Base. Tyres 27 x 4.40.

PETROL. Consumption 40 m.p.g. Oil Consumption 1,000 m.p.g.

DIMENSIONS. Short Chassis. Wheelbase 8' 3". Track 3' 8".

BODY. Light Fabric 2-seater with luggage accommodation, "V" windscreen and Sports detachable hood in black twill, pneumatic upholstery. Right hand gear and brake levers inside body.

EQUIPMENT. 12 Volt, 5 Lamp Lighting and Starting Set, Speedometer, clock, and oil gauge, complete tool kit, spare wheel, etc.

SPEED ON GEARS. 1st, 35 m.p.h. 2nd, 60 m.p.h., 3rd, 70-75 m.p.h. ACCELERATION. 10-30 m.p.h. 4 seconds.
WEIGHT OF CAR, 13 cwt. BRAKING FROM 30 m.p.h. in 35 feet. TURNING CIRCLE, 40 feet.

INTERCEPTOR II.

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NOTE.—The power-to-weight ratio. Acceleration. Speed on gears. Also that the specification includes detachable head, detachable block, detachable sump of aluminium. Forced feed lubrication. 3 bearing crankshaft. Separate gear box. Fool-proof gear change which is quiet and direct. Hartfords all round. 12 Volt lighting and starting.
60 m.p.h. at **CRUISING** engine revolutions 2,500 p.m

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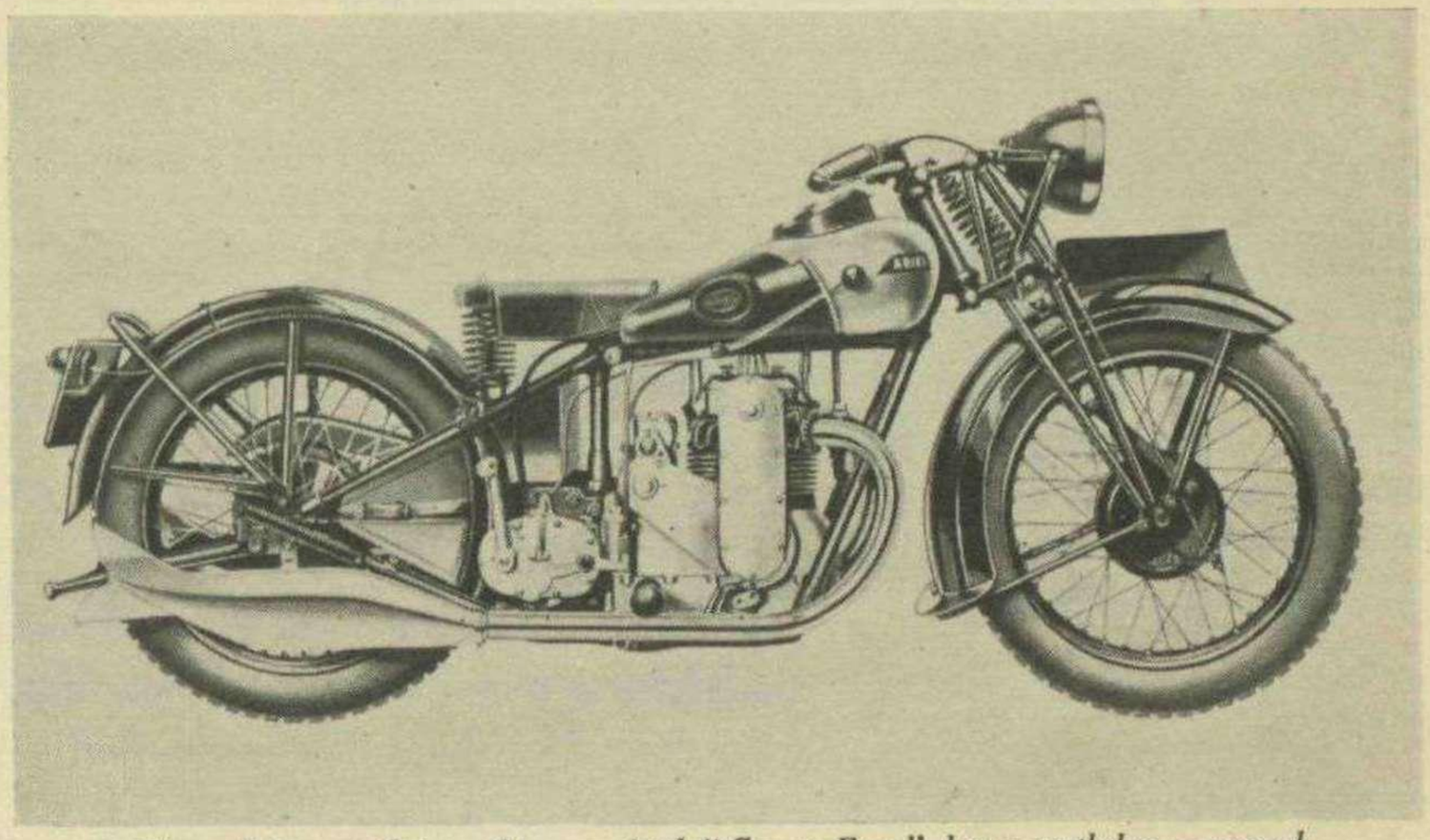
SOMETHING NEW IN MOTOR-CYCLES

First Details of Remarkable Ariel "Four."

A SATISFACTORY four-cylinder motor cycle has been from very early days, the desire of a large number of riders, and the aim of more than a few designers. But the inherent qualities of the four-cylinder power unit of smoothness of torque and quietness were, so far as early attempts are concerned, rather heavily outweighed by cooling, carburation and installation difficulties. In the few examples which have been on the market in more recent years overheating and carburation troubles have been overcome, but there still remained the drawbacks of excessive wheelbase, weight distribution and questions of frame design. Hence, the reason for the "four" remaining in the background, while the all-conquering single has gone forward in design and achievement.

With the introduction of a "four" devised on entirely new lines by the Ariel concern however, it is safe to say that there is a good likelihood of the multi-cylindered motor-cycle becoming established as a popular type before very long.

It was only in the past few weeks that news went round that this machine was to be marketed, and the details here given are, in point of fact, the first to be released by its manufacturers.



Of revolutionary design, the new Ariel "Square-Four" has nevertheless a normal and neat appearance.

500 c.c.

Known as the "Square Four," the new Ariel is of 500 c.c. The engine layout is exceedingly interesting and embodies entirely new principles. In place of the usual "in-line" or "double-flat-twin" arrangement of other designs, the cylinders are arranged so that in effect the power unit consists of two vertical twins geared to a common driving shaft. There are two crankshafts, gear-coupled and mounted on large diameter ball bearings. The main coupling gears are of specially developed tooth form, so that noise and back-lash are eliminated, and they run in a separate oil-fed chamber situated within the crankcase. The cylinders are cast *en bloc*, with a detachable head, which has the exhaust passages, and a radial induction manifold integral in the casting. All valves are in the head, and they are operated by the camshaft direct through rockers, the whole being totally enclosed by an aluminium casting, fitted with an inspection cover. The camshaft and magneto are both driven by a chain which is automatically kept at the desired tension. The con-connecting rods which are of light, high-tensile steel, run on substantial roller bearings at the big ends.

The lubrication system has been very carefully arranged. Employing two gear-pumps it is of the dry-sump type.

A single Amal carburetter (with twist-grip control) supplies the mixture and ignition is by a very compact Lucas magneto.

The drive from the engine to the rear wheel is by the usual primary and final chain arrangement. The gearbox is a fine job made specially for the machine by Messrs. Burman. It has four speeds, and a four-plate cork-inset clutch with a shock absorber. The box is supported by a frame member below, and not hung, and the whole can be swivelled so as to give a very simple and quick adjustment for the countershaft chain.

The frame, which is a particularly robust piece of work, is of the duplex cradle type, built from solid steel forgings and aircraft quality tubing. The front forks are tubular girder with central compression spring and adjustable dampers. Both front and rear wheels have taper roller bearings and brake drums of 7 inches diameter.

The petrol tank is of typical Ariel pattern and has a 2½ gallons capacity. Mounted in the forward end is an attractive instrument panel, very neat and balanced in appearance. It carries a Smith's 100 m.p.h. speedometer, a Smith's 8-day clock, an oil pressure gauge, and embraces the very large quick-release petrol filler cap. The whole is illuminated at night by a concealed bulb, which is incorporated in the lighting set. Current is supplied by a 6-volt Lucas magdyno and an accumulator;

The whole layout of the "Square Four" is amazingly compact, and at first glance it is easy to mistake it for a single cylinder machine, as it has a normal wheel-base and the power unit is practically devoid of excrescences.

At the time of writing, we have not yet had an opportunity of trying out this most interesting motor cycle. But we can vouch for the fact that the engine is astoundingly silent, a "revver" and dead smooth. With full equipment it is to be marketed at £75 10s.

The Monte Carlo Rally

SOME NEW RULES

FROM to-day, November 1st, until December 24th, entries can be sent in for the popular Monte Carlo Rally, which is organised by the International Sporting Club of Monaco.

For the forthcoming Rally, new rules have been made, amongst them being one forbidding certain forms of advertising in relation to competing cars. Announcements, for example, as to the order of arrival at Monte Carlo or at any of the intermediate checks will not be allowed nor must any speeds which may have been attained in excess of the average allowed for the whole journey be advertised.

Another change is the abolition of the regularity test over the Col de Braus, and in its place there will be an acceleration and braking test. The Rally will be open to two classes of car :—light cars with engines not exceeding 1,100 c.c. (which must carry two people), and cars of more than 1,100 c.c. These must carry either four people or a driver and one passenger, with ballast. As in former years, the principal subject of award will be distance covered. The maximum number of points available for this will be 100, and for average speed 120 for the bigger cars, and 105 for small cars. The maximum and minimum average speeds allowed will be 24.85 m.p.h. and 19.8 m.p.h. Arrivals at Monte Carlo will come under the eyes of scrutineers, and battered wings, raucous exhaust notes, and faulty electrical equipment will entail a substantial subtraction of points. The entry fee is 200 francs per vehicle.

More New Records

THIRTEEN international class records were broken at Brooklands last month by S. C. H. Davis and C. Goodacre on the latter's 500-miles' Race Austin "Seven."

These were :—1, 3, 6, 6 and 12 hours at speeds of 84, 83, 83.45, 83.73, 81.71 m.p.h. respectively. The remaining records were for 50 kilos (83.58 m.p.h.), 100 kilos (84.56 m.p.h.), 200 kilos (85.07 m.p.h.), 500 kilos (83.82 m.p.h.), 1,000 kilos (82.80 m.p.h.), 50 miles (84.35 m.p.h.), 100 miles (84.94 m.p.h.), 200 miles (82.98 m.p.h.) and 500 miles (83.72 m.p.h.).

Before completing its record run, the Austin was driven for two hours in the darkness, the salient points on the track being marked by red lights.

Old-Timers' Day

REGULATIONS have now been drawn up and issued by the Royal Automobile Club regarding the Emancipation Day Run for veteran cars from London to Brighton. The date fixed is November 23rd, and the ancients will be sent off from Henly's Garage, Glasgow Terrace, Grosvenor Road, S.W.1. The route which they will take will be by way of Westminster Bridge, Kennington, Streatham, Reigate and Crawley, and the finish will be at the Aquarium Garage, Brighton. The cars will leave London between 9 a.m. and 9.30 a.m. and those which get to Brighton before 4 p.m. will be eligible for a special R.A.C. certificate. It may be remembered that in previous runs only those cars made before 1903 were qualified to participate ; the limit has now been raised to 1905, and in consequence, it is expected that a much bigger entry will be received. Mr. E. K. H. Karslake, whose articles are such a popular feature of MOTOR SPORT will probably take part in this interesting event on his 1903 De Dion Bouton. Intending entrants should note that their application forms must be sent to the R.A.C. offices not later than Monday, the 10th of this month. The entry fee is 5s.

Motor Show Attendance

The attendance at the Motor Show on the last day, was 34,922, as compared with 32,755 on the corresponding day last year.

The total paying figure for the show was 224,091, compared with 227,474 last year.

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THE "NINETY" SPEED MODEL TALBOT

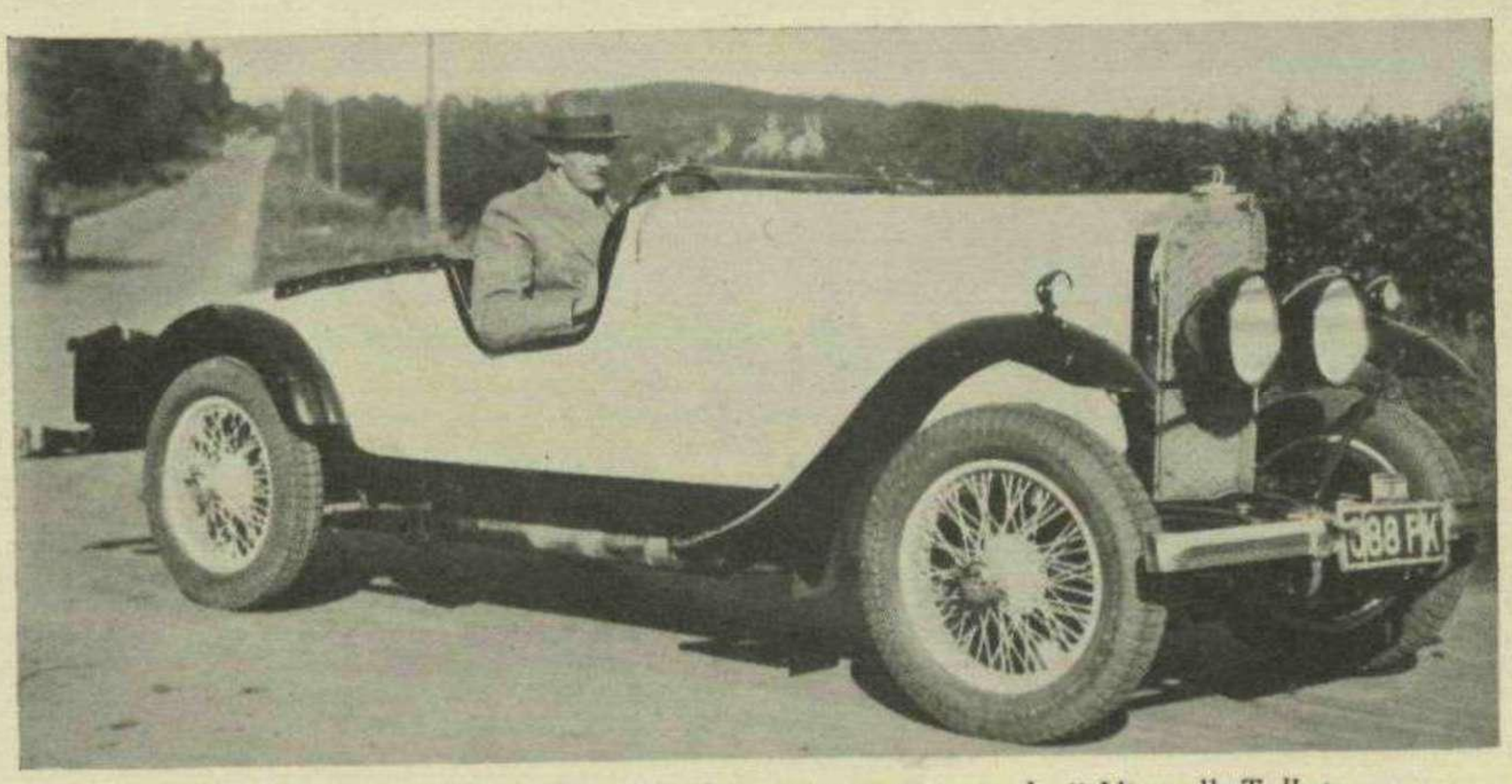
A DISTINCTIVE CAR WITH A GENUINE SPORTS PERFORMANCE



IT would be hard to recall any sports car, which in its first season has achieved such a remarkable series of successes as the new Talbot. The reliability of this team in the classic events, together with the feat of annexing the first three places in their class on several occasions has forcibly brought this model to the notice of people who wish to go fast on occasion, but who do not wish to be continually working on their engines to maintain proper tune.

The car tested by MOTOR SPORT was a perfectly standard "Ninety" chassis with the regulation 4-seater body as fitted to the team cars. The racing Talbots are, of course, standard in all their components, as this point is insisted upon by the regulations for the events in which they have been running, though they have naturally been fitted and tuned with special care, and their performance is higher than the car we tried, which had only a few hundred miles to its credit and was still slightly stiff for prolonged high speed.

The first thing one notices about the Talbot is the fact that in general layout and design it is a very normal motor car, without any startling or original features to account for its fine performance. The engine is a very neat-looking six-cylinder job, with overhead valves, in the detachable head, operated by push rods, all the gear being completely enclosed. The bore and stroke of 69.5 mm. and 100 mm. respectively gives a capacity of 2,276 c.c. only, and it is this fact that makes its speed capabilities even more surprising.



The driving position would be difficult to improve upon in the "Ninety" Talbot.

Everyone who watched the big racing events of this year was struck by the silence of the Talbots, and it was this feature which we first noticed when driving the "Ninety." The very silent exhaust gives one an opportunity to appreciate the mechanical silence of the rest of the chassis, and normal conversation with one's passenger is possible at all speeds.

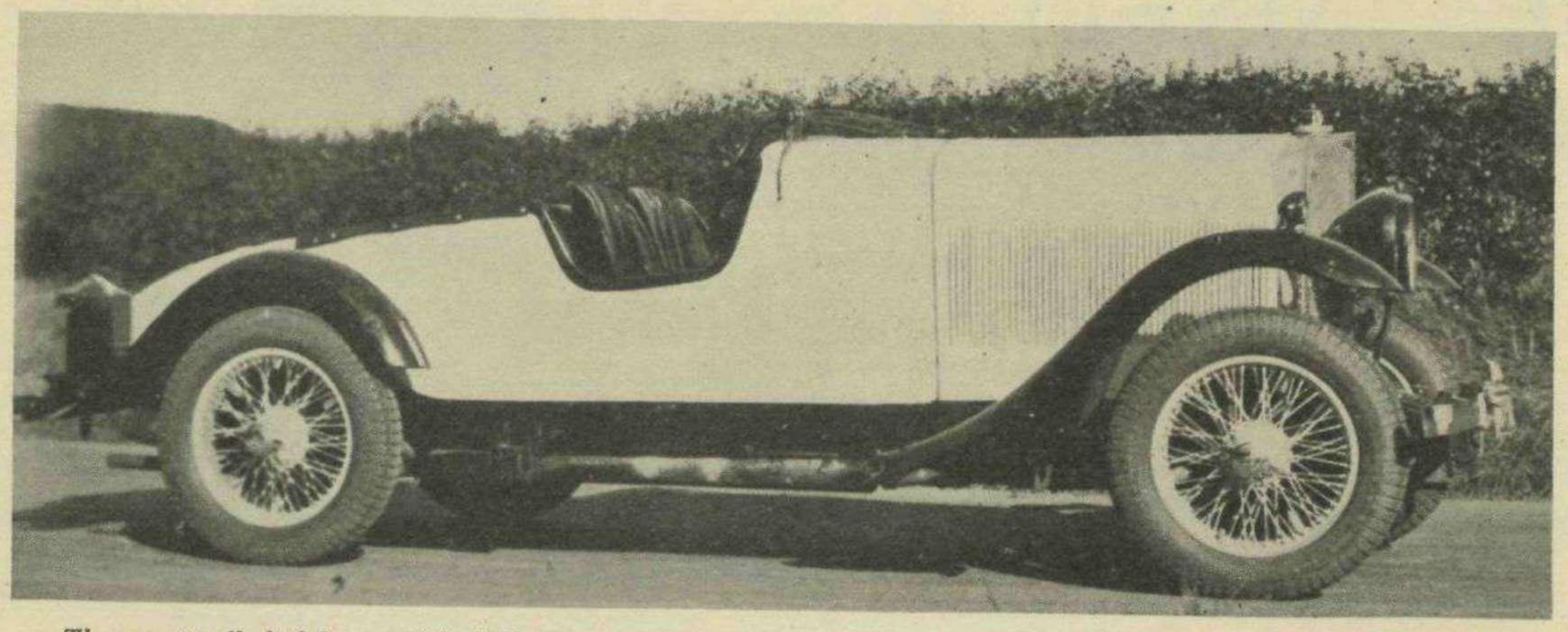
The heavy seven-bearing crankshaft undoubtedly goes far to account for the delightful smoothness of the engine, which has no vibration period within in its speed range, and which has more the characteristics of an electric motor than of an internal combustion engine.

It is, of course, comparatively easy to get smoothness at the expense of performance, but there is nothing "woolly" about this engine, and the first few hundred yards of open road saw the car well past the "seventy" mark without the slightest effort, and still accelerating hard.

Although the engine was new, as we have mentioned already, we found that the maximum speed, without particularly favourable conditions, was 85 m.p.h. at which speed control was light and accurate and the car held the road like a leech. 40 m.p.h. on second and 60 m.p.h. on third were suitable speeds for changing up to the next gear, giving approximately 4000 r.p.m. of the engine in each case. The revs. can be pushed round easily to 4500 r.p.m. or more, but out of respect for the new engine we refrained from indulging to any extent on these lines.

The actual gear change is very light and easy, being right-hand operated, and the lever works in a visible gate. Another factor which contributes greatly to the ease of gear changing is the very light and smooth single plate clutch, running dry and lined with Ferodo. The clutch is automatically lubricated from the engine, as is also the gear box, thus reducing the number of things

THE "NINETY" SPEED MODEL TALBOT—continued.



The exceptionally high bonnet of the Talbot is an uncommon feature, but it in no way detracts from the car's pleasing appearance.

to be remembered, and making it more than ever a car requiring scant attention.

For the benefit of those who dislike grovelling on the earth to drain the sump, and who therefore leave undone this highly necessary operation for many months after it is due, the dip-stick is also arranged as a drain tap. To operate it, it is only necessary to open the bonnet and press the nob, while to prevent unauthorised or accidental use of this, a neat safety catch is provided.

Radiator connections cause extra work when dismantling (even if one uses Mr. Robinson's excellent Jubilee hoseclips), and on the Talbot the lower water connection has been abolished by mounting the radiator direct on the crankcase. This has also the more important effect of preventing relative movement of engine and radiator on bad roads, and so avoids strain on the radiator itself.

A criticism which we have heard from various people about the Talbot is that it is too high. It certainly looks high in comparison with many present day sports cars, but having driven it, and examined it, we feel convinced that this is merely because the makers have not attempted to make it look lower than it is. This can be, and often is done, by cutting down the radiator height and adding "scenery" below the chassis level. This, however, does not alter the one thing that matters, the centre of gravity, and from our experience of handling the Talbot we can definitely say that this is not too high.

It is quite free from any sign of rolling on corners, and the steering enables considerable liberties to be taken with the car on a winding road. It is light without being low-geared and this gives it that essential quality of liveliness which enables the driver to feel exactly what is happening on a corner and to place the car exactly where he wants it.

The brakes are in keeping with the rest of the car, and are in actual fact, very nearly the most powerful of any we

Continued on page 15



Two close-ups, showing the mounting of the steering box on the frame member, and manifold arrangement, and (right) the large diameter brake drums.

THE SEARCH FOR POWER

A FLYING VISIT TO LAYSTALL'S WORKS

IN common with the majority of motorists, anything in the nature of a works possesses for me a fascination which only increases as I see more of them, and when on a visit to Ewer Street recently about some engine parts of mine which were receiving the magic touch from Laystalls, Mr. Bersey asked me if I would like to have a look round before I went. In a brief tour of the works (Mr. Bersey is a busy man), I began to see why so many well-known firms in the trade, in addition to thousands of private owners, avail themselves of the facilities of this amazingly versatile works.

Gudgeon Pins—all Hot.

Plunging first into a sort of devil's kitchen, I saw a furnace door swing open and the officiating sprite withdraw a huge iron tray dotted with glowing red gudgeon pins and looking like a mephistophelean birthday cake!

"Hardening Shop," remarked Mr. Bersey, and passed on to where a man wearing a fearsome sort of gas mask was gazing intently through a little window into a great metal box, from which a hollow roar proceeded to add to the Satanic appearance of the operator.

"Sand-blasting," said my guide and was gone before I could have a closer look. Realising that you cannot examine every process in a works like this in a matter of minutes, I hurried on through departments in which every step in the manufacture of pistons was going on. Through pattern-making, moulding, piles of piston castings, which although sand cast were so clean that they would be mistaken for die-castings if their internal shape had not shown this to be impossible, we came to a great store bounded entirely by finished pistons of every size and description. Deep shelves of pistons mounted from floor to ceiling on every side.

"There are over £5,000 worth of pistons here," I was informed as we passed on to the main machine shop. Here the first point of interest was a figure standing by a peculiar, delicate looking machine, in which was mounted a crankshaft revving so that the webs and crankpins were a mere silvery blurr, what time its master turned screws and took readings quite unconscious of our presence.

"Dynamic balancer," was the only comment on the machine which does so much to make an engine really something out of the ordinary, and we wended our way through the maze of machine tools on which every variety of engine component was being made, crankshafts being turned, con-rods being bored ready to add to the neatly stacked heaps of parts in various places. Never have I seen so many crankshafts in one place before. Varying in size from "750"s to shafts far larger than any car engine uses, and in condition from untouched forgings to the shining finished product, they seemed everywhere.

There was no time however to linger here, and stepping into Mr. Bersey's car we drew up a few streets away at another section of the works, and saw where cars were standing waiting for their engines to descend again from the regions above, after overhaul and test. Here also was the welding department, announced by the penetrating hiss and blinding pin points of bluish light from the various oxy-acetelyne blow pipes. A view of more hardening ovens, and we passed to the light and spacious workshop where engine overhauls are carried out. "Plenty of room, that's the great thing," and Mr. Bersey pointed out the large bench space opposite each engine stand so that parts could be arranged neatly instead of being piled in boxes in the usual way. This shop has its own machine shop attached so that they are independent of the main works.

A Busy Test Shop.

A steady hum showed the position of the test-shop and entering we saw four Heenan and Froude test plants, more than many car factories can boast of. At one end a man was taking readings of an engine on test, referring now and then to a wall chart which enabled him to translate his figures into horse-power instantly. Another engine was just being coupled up for test.

"It's the only way to prove if the job's O.K." said Mr. Bersey as he dropped me again outside his office, "Good-afternoon."

And so home to dream of a devilish figure in mask and cowl muttering incantations to a red-hot crankshaft revolving in mid-air in the glaring mouth of a furnace, and an acrid smell of burning, at which I wake to find I have been resting my feet on the grate again. I wonder if Laystalls can re-sole shoes? They seem to be able to do most things.—B.

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*THE "NINETY" SPEED MODEL TALBOT—**continued from page* 14

have tried. On a dry, concrete road, we brought the car to rest from 40 m.p.h. in 43 ft., and when the surface was examined it was found that the near side rear wheel had just locked in the last 6 feet while there was no other sign of locking at all. This means that in any normal circumstances of stopping there is little or no possibility of locking the wheels, while the braking power is very much above the average.

This model, as may be gathered from its name, is intended to be capable of 90 m.p.h., and when a new engine does 85 m.p.h. at the first time of asking, it shows that there is not likely to be much difficulty in reaching the maker's claim.

Some people consider a car's performance in relation to its engine size, and some in relation to its price, but as the Talbot engine is only 2¼ litres, and unsupercharged, while it costs only £495 for the short chassis, this car must take a very high place by whatever standards it is judged.

Taken all round it is one of the pleasantest and safest sports cars we have tried, and our thanks are due to Messrs. Fox and Nicholls, who have entered the Talbot team in all the big races of this year, for giving us the opportunity of driving such an excellent vehicle.

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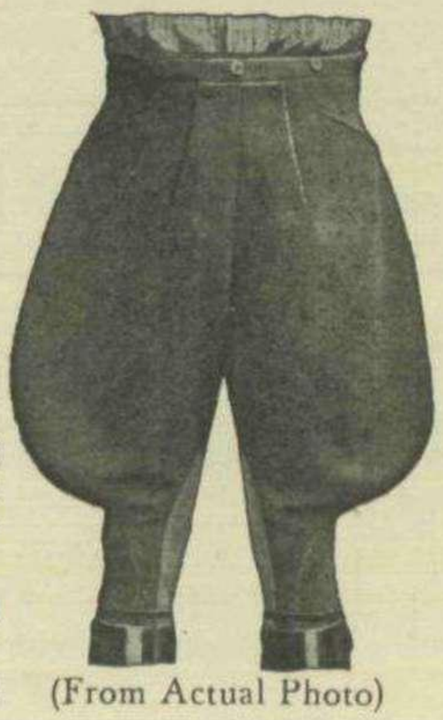


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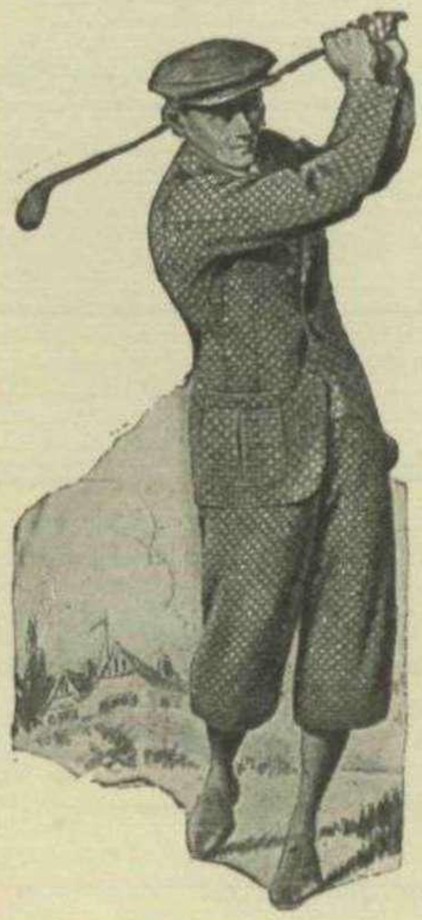
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WHAT I LIKED AT THE SHOW

SOME NOTES ON THE LATEST SPORTS MODELS

ALTHOUGH the majority of cars are becoming more than ever uniform in type, and in externals are liable to follow the fashion of the moment, among the sports cars there is always to be found something of interest. There is a good variety of genuine fast cars suitable for competition work, mainly replicas of the actual vehicles which have represented their manufacturers in the chief races of the year. Also, for the man who is not intending to go in for competitions and who does not wish to spend a great deal of money, there is an attractive selection of what might be called semi-sports cars. This description is not meant to be disparaging, but simply to include the slightly modified standard chassis with sports bodywork. This type is never intended for racing, but has a very definite place in the scheme of things.

A Great Variety.

When it comes to the actual purchase of next year's model, ideas have to be modified by more sordid considerations than those of size and performance, but Olympia gave the opportunity of gloating over what is to be available to the comparatively few, and every owner of a sports car, great or small, will have made as soon as possible for the Mercédès stand where the new 8-litre giant with 6 speeds, self changing gears etc., is on view. To the average sports car enthusiast this will savour of making driving too easy, but it is certainly proof that this firm believes in keeping ahead of the times. For real snappiness concentrated in a big car one can conceive nothing more attractive than the supercharged "38-250."

Another representative of the large class, and one which has for some time been this country's chief hope in international racing, is the Bentley. Here is another 8-litre car, with a very impressive, battle cruiser sort of appearance. In this make again, however, it is not the largest models which are most attractive to the sports car owner, and the 4½-litre supercharged model, with its fine racing record will appeal the most.

The Delage straight "8" of just under 4-litres is another fine example of a really fast car with plenty of comfort, and a stripped chassis on this stand gave an opportunity to appreciate the very robust yet not too heavy construction. The huge X-shaped cross member amidships, made from a deep pressing, is a fine example of adding strength without much weight, while the engine is a beautifully neat piece of work. The Lancia Dilambda is suited for similar work, and bears the stamp of clean design for which Italy is famous, as well as many original features, such as its independent front springing, and special "staggered" 8-cylinder engine, which in conjunction with a remarkable performance make it an ideal car for touring.

The success of the "90" model Talbot this year has attracted much attention, and accounts largely, no doubt, for the fact that several coachbuilders have produced attractive models on this chassis, in addition to the makers themselves.

Visitors to the Bugatti stand were probably disappointed not to see an example of a Grand Prix car, as all their exhibit consisted of saloons on the larger chassis. The engines are, of course, typical in all models, having the appearance of a square metal box. The latest 4½-litre Invicta is a most inspiring sight with its radiator cap almost level with the tyres, and as 100 m.p.h. is claimed for it, it appears to merit further attention from those whose tastes lie in that capacity class.

In the smaller classes, 2-litre and under, there was a pleasing sprinkling of actual road racing replicas, the Hyper Lea-Francis looking very businesslike.

Fine examples of successful racing cars were to be found on the Alfa and O.M. stands, these two Italian makes being remarkably similar in appearance. The 1000 miles race type O.M. and the stripped Alfa-Romeo chassis, both of course supercharged, must have caused many to break the tenth commandment!

A British Favourite.

In the 1500 c.c. class the Aston-Martin stands out as being one of the finest 1½-litres that this country has ever produced. Although the engine is not really a racing job, in that it is of normal compression ratio, unsupercharged, and very sweet running, it is really fast and has acquitted itself well in races against the best that our foreign rivals can produce.

The Vernon-Derby, which is handled in this country by Morgan Hastings of Albermarle Street, W., is another car which immediately inspires confidence in its stability and handiness, while the Ruby engine installed is a well-tried and proven job. Alvis have reintroduced their 12-50 h.p. 4-cylinder model, and many owners who had such wonderful service out of their old 12-50 of a few years ago, will welcome the return of this model in its latest improved form. Although only shown in touring form, this model has a definitely "sports" performance, while the demand which is sure to arise for a fully sporting edition of it will probably lead to this being available. It is not, however, listed at present. The six cylinder Silver Eagle is a genuine 80 m.p.h. car with roomy and comfortable coachwork, although the engine is well under 2-litres.

The 2-litre Lagonda engine, shown separately on their stand, attracted considerable interest and the 2-litre supercharged model is a very attractive car.

M.G.s provided a choice for various pockets, the Midgets looking very snappy, and one knows that their performance is up to their appearance. The M.G. Speed Six is another 80 m.p.h. car with qualities of refinement and smooth speed which have gained for it a most enviable reputation in the sports car world, which is as critical as can well be imagined.

O. B.

WHERE ARE OUR RACERS?



" Why cannot we have a team of British racers, produced by a combination of the finest brains in the industry, and driven under the leadership of Captain Campbell ? " asks the writer of this article, who contends that the genuine racing car has been stifled by standard car races in this country.

IT is now so long since this country produced a real racing car, that most people seem to have forgotten that it ever did. Yet this is hardly a fact to be accepted with complacency, and it would be as well to look into the cause of the complete change which motor racing has lately undergone and ask ourselves what end will be achieved.

Among the year's list of British races, there is only one, the British Racing Drivers' Club's 500 miles race, which is open to any class or condition of racing car. All the other events are for standard types of cars which must be available to the public, and which are subject to so many restrictions and regulations that many possible entrants are prejudiced from the start. If they wish to try out some modification before giving it to the public, they may be excluded altogether through inability to convince the stewards that the alteration is one which would be normally made by anyone to increase performance, and so they will have spent time and money to no purpose.

There are, of course, two sides to the question of standard car racing, and when the R.A.C. Tourist Trophy was revived in 1928 in its new guise, the *immediate* result was excellent.

Makers raced their sports models, stiffened them up and made them more reliable, and definitely " hotted-up " versions became available fitted with the numerous racing gadgets and accessories which the amateur requires for competition work as much as the professional driver, but which he had previously had to get as extras. In this way the standard products of today have been tried and proved, and brought to a fair pitch of reliability and performance, but progress is slowing down.

As a means of comparing existing British models, the big standard car races, Ulster, Phoenix Park, and the Double-Twelve, are unsurpassed, and should be retained ; but as a means of intensive research in the hitherto unexplored fields of design, they are practically useless. For real development it is essential to encourage races for cars in which the designers are given a free hand. To avoid the building of useless monsters, have a restriction on size, just as the Grand Prix races of recent years have had an engine size limit of 1,500 c.c.

People may hold, in fact many do, that standard car events will gradually develop the right type of car without the expense of designing special racers. They also say that the public are not interested in races for " specials," and, that therefore this type of event is of no advertising value to the manufacturer. Both these contentions show a deplorable narrowness of vision. On the continent there are plenty of races without restrictions other than engine size, but British cars are rarely seen in them. Recently Capt. Birkin very sportingly entered one of his 4½ litre supercharged Bentleys in the French Grand Prix, and by careful preparation and removal of superfluous weight, followed by wonderful driving in the race itself, finished second. That is, however, only one individual effort, and does not alter the fact that in all the great continental races, British cars are conspicuous by their absence.

The reason is not hard to see. There are no cars made in this country to-day which are capable of competing in the smaller classes with the products of Italy and France. It is in these small classes, that is 1500 c.c. to 3000 c.c., that there is a great demand among sporting motorists for a British car Our fastest cars are too large and heavy for an intricate road course, as was shown in Ulster this year. The winning Italian team were holding their own on a scratch basis with British cars of twice their engine size, and when their handicap was taken into account they were virtually unchallenged.

It is not that we have not the designers or the drivers in this country to produce and pilot a winning marque. It is that the standard sports cars of our continental rivals are still being developed from the victorious competitors in the Targa Florio and the other great road

WHERE ARE OUR RACERS?—continued

races; while our own cars, apart from detail improvements, are developed from racing cars now almost forgotten.

Our fast cars are too big, and our small cars are too slow, but it is not the fault of their makers. They are building cars to comply with regulations which prevent real enterprise, and just as bricks are difficult to manufacture without straw, so real progress in motor cars must depend on unrestricted competition and research.

The recent 500 miles race showed how the evolution of the genuine racing car has been stifled by the standard car races of the last few years, and also, what is of far greater moment, the fact that the sports models of to-day, even when freed from every restriction in the matter of tuning and equipment, and stripped to the last ounce, are no faster, if as fast, as the veteran racers of a few years ago. W. B. Scott's Delage, although compelled to retire near the end with broken bolts in the 3-piece front axle, due probably to fatigue in the course of a long and successful career, was the fastest 1½-litre car on the track that day. There were no 2-litre cars which could hold the wonderful old racing Sunbeams, one of which finished third.

In the bigger class we can do better, and a 4½-litre Bentley in the hands of Hall and Benjafield finished second at over 112 m.p.h., a higher speed than has ever been achieved in any 500 miles race on any track in the world, and proved that for a straightaway race in this class Britain leads. S. C. H. Davis and the Earl of March, by bringing their supercharged Austin home at over 83 m.p.h. for the distance, showed again that no car in its class, racer or otherwise, can hold the little Austin. These are two extremes however, and between exists a gap which no British racing car can fill.

The Racing 2½ litre.

For every man keen on competition work who wants, or can afford a big car, there are many whose thoughts are concentrated on something in the region from 1500 c.c. to about 2½-litres, and for a racing car of this size their thoughts immediately travel to Molsheim or Milan.

How eagerly we used to wait for and devour details of the latest Sunbeam and Talbot racers in the good old days. Then there were no complicated handicaps to confuse the followers of the sport, but a real battle between evenly matched teams of the finest machines that engineers could build. Yet, what is going to happen in a few years time? The old racers will have gradually faded into oblivion, and our standard car races alone will not develop any new types. Owing to the ridiculous way the authorities have always cramped motoring in this country, in spite of its being our most flourishing industry, we cannot have real road races in England; but the prestige of the motor trade on the continent largely depends on our being able to compete with success in their races. If this country could win the Targa Florio, the resulting kudos all over Europe would be worth far more than the cost of building the successful car, while to run at all, and show ourselves in the same class as our rivals would be a great thing for British cars abroad. Perhaps Ireland or the Isle of Man may come to the rescue and provide a race under conditions which will encourage our manufacturers to build some real road racers, and also persuade our continental rivals to come over and compete in force.

A Sound Suggestion.

If our manufacturers consider the cost of building special cars too great, why cannot we have a team of British racers, produced by a combination of the finest brains in the industry, and driven by a team under the leadership of Capt. Malcolm Campbell, without doubt our finest and most experienced racing driver, to represent Britain in the great races of the year? Italy has produced the Maserati as a government-backed racing car, so why should not our motor industry do likewise?

The project would require tact, enterprise, and above all a spirit of team-work, but given these, and they are available in plenty, we might once more see this country taking its rightful place in the great sport of motor racing, and a revival of the type of racing to which the modern sports car owes its present efficiency. The technical results could be pooled among the group responsible for the racers, and would be of immense value. The idea seems workable, and it is evident that unless something of this sort is done the medium sized sports car, of which we can still produce some very fine examples, will gradually drop behind its foreign rivals.—B.

CAMPBELL'S DAYTONA PROJECT

FOR some time it has been known in trade and motor racing circles that Captain Malcolm Campbell has been evolving plans for making an attack on the world's land speed record at Daytona early next year. It is now revealed that the design of a new car for the purpose is already in hand, though details of its construction are being kept secret for the time being.

Captain Campbell is not only determined to set up a fresh record; he intends, also, to make his visit to the U.S.A. a form of mission for "pushing" English cars, and for this purpose he proposes to get the co-operation of manufacturers, so that a number of demonstration models may be shipped with his special vehicle for display both at Daytona and other important centres in America. It is also proposed that important people associated with the British automobile industry shall accompany him.

An excellent feature of his project is that the British cars should be timed officially over the measured mile at Daytona by the A.A.A. so that a practical demonstration of the capabilities of English sports vehicles may be given.

Provided he gets the necessary support, Captain Campbell proposes to go to Canada and the Antipodes, after his U.S. visit, where he may quite possibly make further attempts on records with his new car. At the same time, demonstrations with the accompanying cars will be made in a similar way to that at Daytona. The new attempt will be all the more important as the Americans are extremely keen on securing the world's record, for which purpose at least three special cars are now being prepared.

SUPERCHARGING IS A FAILURE

when applied to a genuine touring chassis, if its only result is a normally unusable maximum speed. The supercharging of the 2-litre Lagonda "Special" has been carried out with far more in view than merely this. Full power at low engine speed, yet multi-cylinder flexibility, and an acceleration that will hold its own with any other touring car yet conceived—these are a few of the advantages with which the Lagonda designers justify their use of supercharging.

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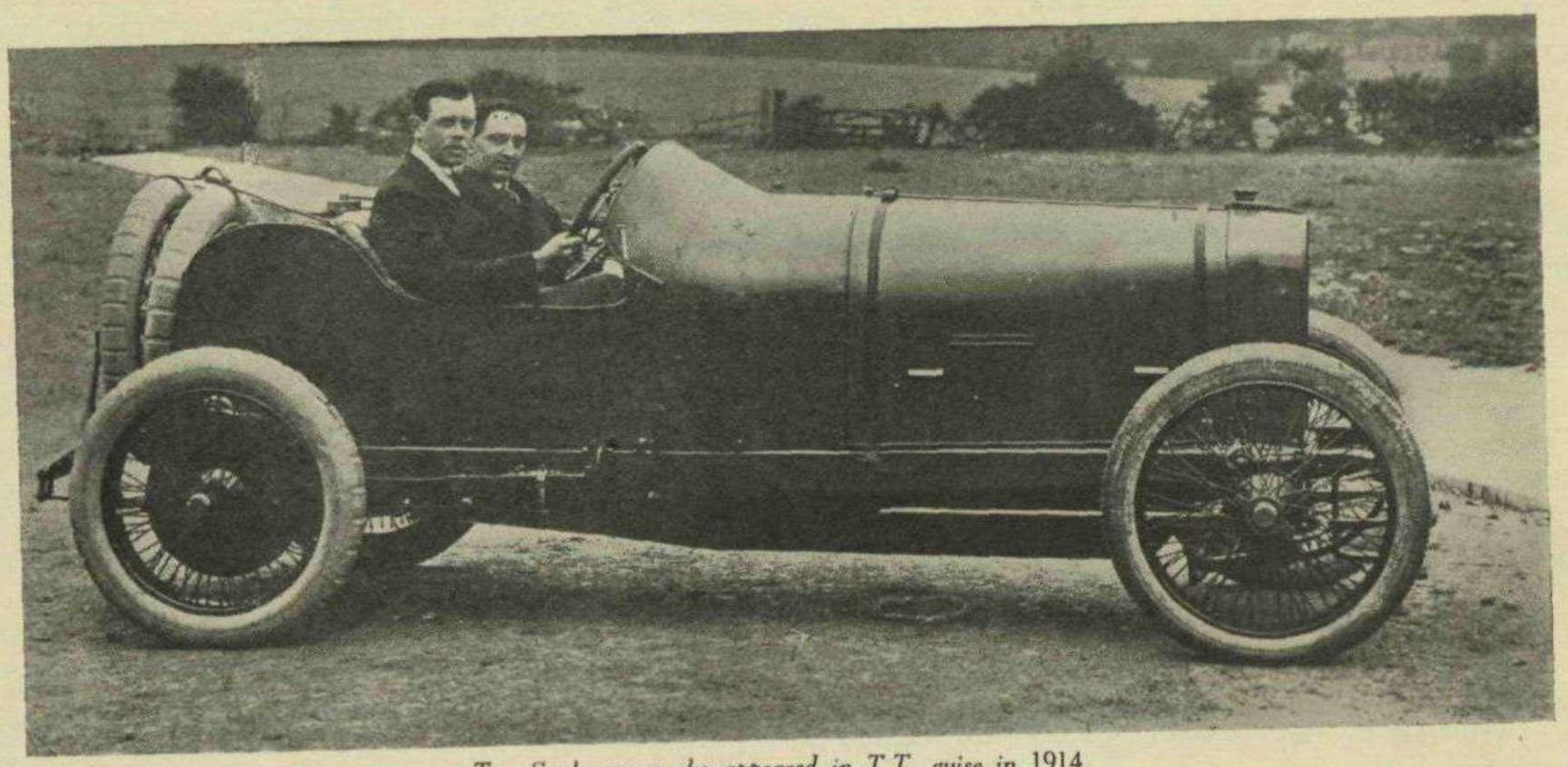
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Veteran Types

KENELM LEE GUINNESS' 1914 TOURIST TROPHY WINNER



The Sunbeam as she appeared in T.T. guise in 1914.

HAVING firmly inscribed the title of this article I may as well admit at once that I am not quite sure whether the car which I came across recently is actually the Sunbeam with which K. Lee Guinness won the last Tourist Trophy race before the war, or whether it is one of the other cars of the team which were driven by his brother Algernon, and the late Dario Resta. At any rate the car I am about to describe has I.O.M.I. engraved on the radiator, and as Kenelm Lee Guinness' car was always known as Sunbeam I in the Island, I conclude that it is the actual winning machine.

It is rather a curious feature of motor racing history that throughout its course wiseacres have shaken their heads at short intervals and declared that racing cars were getting so far away from touring machines that they were teaching their designers and manufacturers nothing which was of any use in the perfection of their series models. What, of course, they really mean is that the study of special racing machines is furthering the advance of automobile design so quickly that manufacturers who do not race are quite incapable of keeping pace with it. Thus during the few years which immediately preceded the war much ink was spilt on the theme that as the most successful racing firms were using overhead valves on their cars, all their efforts were being wasted, as valves in this position were quite impracticable for touring cars. Looking back, the best answer to this contention is that now more touring cars have overhead than side valves, largely as a result of the lessons learnt by a few firms just before the war; but, of course, the sponsors of the contention have now long ago forgotten it, and have since been spending their time railing against front wheel brakes and superchargers. Just lately, owing to the lack of races for special cars, automobile design has not been advancing quickly enough for them to find anything to object to.

However, to get back to the point, the great exponent of the overhead valve principle during the years just before the war was the house of Peugeot. On the other hand Sunbeams, when they set out on their attack on the great races, decided to do so using the then conventional valve arrangement in an L head. In spite of this handicap they succeeded in scoring a grand slam in the Coupe des Voiturettes attached to the Grand Prix in 1912; but they found themselves unable to beat the Peugeots in the same race, or in the Grand Prix of 1913. Thereupon, the English firm, much to the disgust of the anti-progress party, decided that for the 1914 season they too would use overhead valves.

In that year the R.A.C. decided to revive its Tourist Trophy, which had not been competed for since the famous "Four Inch Race" of 1908, the year of the great eclipse of motor racing. The race was supposed to further the development of the 3-litre car, which since Bablot's win on the Delage in the 1911 Coupe des Voiturettes was realised as the most interesting car of the day; but as the Isle of Man course over which the race was to be run was obviously more difficult than those usually chosen for motor races, the limit actually decided on was the somewhat curious one of 3,310 c.c. The 3-litre Sunbeam which had distinguished itself in France in 1912 and 1913 was a 4-cylinder machine of 80 x 149 mm. bore and stroke, dimensions which have later been those of other famous "3-litres" which have owed much in their design to the pre-war racing Sunbeam. Owing, however, to the increased engine size permitted by the regulations, the Sunbeams for the 1914 Tourist Trophy

VETERAN TYPES—continued.

had the stroke increased somewhat, I think to 160 mm. In accordance with the most up-to-date practice the engines had 4 overhead valves per cylinder operated by two overhead camshafts driven by a train of pinions. Dry sump lubrication was used with two oil-pumps, and the cars had cone clutches and 4-speed gear boxes.

The story of Sunbeam I in the race is soon told. The event was over 16 laps of the Manx course, a total distance of about 600 miles, and run in two halves on consecutive days. On the first lap Kenelm Lee Guinness put his Sunbeam round at 58.9 m.p.h., and appeared in first place ; and he retained this position on every one of the sixteen laps, finally proving the winner of the race at 56.44 m.p.h.

These T.T. racers had, of course, a very short life in the limelight, for the war came less than two months after the race had been run. Their later history was obscure, except for the fact that I seem to remember that one of them used to appear at Southport a few years ago ; and therefore, when I heard that the one now in question was running as a touring car and was owned by an acquaintance of mine, I was particularly interested to have a run in it and see how the pre-war racer was running.

I had arranged to meet the owner at the Marble Arch, but when I arrived there the car which I saw standing by the park railings was very different from what I had expected. Instead of the original 2-seater with bolster petrol tank which had appeared in the Island, the car now has a 4-seater sports body of typical Sunbeam appearance, a standard type Sunbeam petrol tank between the dumb-irons, a hood, windscreen, electric lighting, starting, etc., while only the colour is reminiscent of the purple hue which Kenelm Lee Guinness' racer was painted. After the first glance, however, one notices the very large cord-bound steering wheel, which seems rather unusual on an ordinary sports Sunbeam, and when one opens the bonnet one discovers a 4-cylinder engine distinctly reminiscent of the 6-cylinder power unit of the present-day 3-litre sports car.

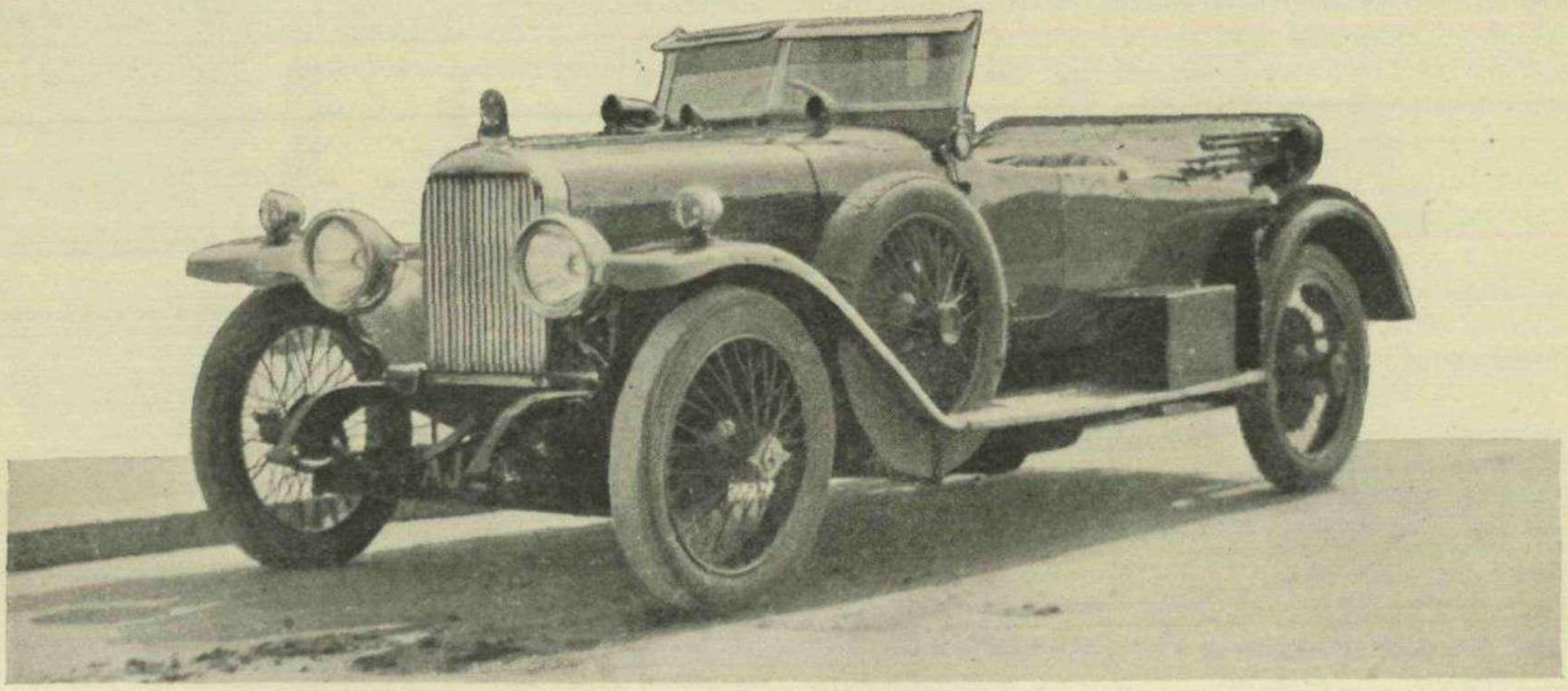
However, by the time we had got into the car and moved off, one was again surprised by the character of its performance as compared with its appearance. The engine makes that rather pleasant noise characteristic of exposed overhead valves operated by overhead camshafts, distinctly reminiscent of the racing car of a few years ago, and although unfortunately it was raining during the greater part of our run, one was able to note that the acceleration was something quite out of the ordinary.

One of the features of the car, which was most impressive, was the almost complete silence of the gearbox on the indirect ratios which was practically inaudible although the exhaust gives only a pleasant subdued boom. This feature tends to encourage one to make very ample use of third, a delightful speed on which the acceleration is terrific, and quite steep main road hills can be climbed at a pace which sends the car roaring ahead of others who think that they are keeping their revs. up quite nicely on top.

Unfortunately we had not got time to get far enough from London to get really clear of the surrounding traffic, and this fact coupled with the wet roads prevented us from getting an idea of the maximum speed of the Sunbeam. I am convinced, however, that it is high enough to prevent one's using it very frequently except under what are in this country rather unusually favourable circumstances, which has the pleasant effect of making one drive the car for the most part at well below its maximum capacity.

The outstanding impression which the Sunbeam has left with me is one of continual pleasant surprise while travelling in it, that what has the outward appearance of a quite ordinary sports machine performs like the true racing car which it is. There is something indefinably thrilling about the subdued chatter of the valve gear and the surge of power on the indirect ratios of its remarkably silent gearbox. At the moment of writing this car is for sale, and I should greatly like to buy it ; but I doubt whether if I were a millionaire I should ever find adequate stabling accommodation for all the rather out-of-the-way motorcars which I should want to buy !

E. K. H. K.



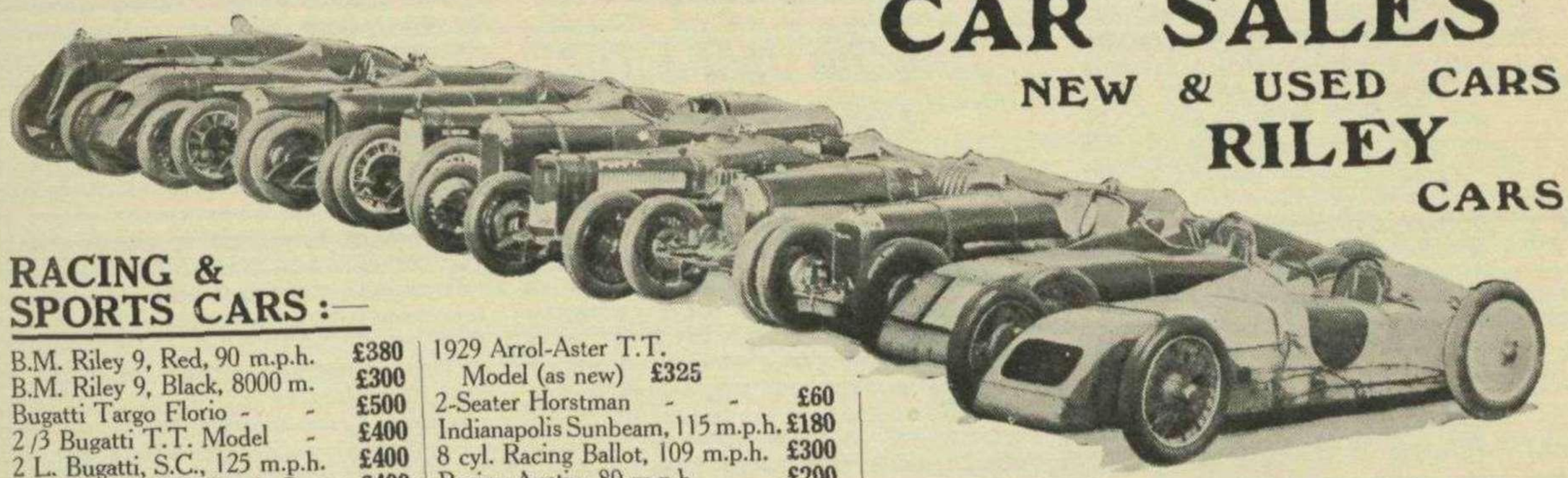
The 1914 Sunbeam as she appears to-day.

ENGINE TUNING.

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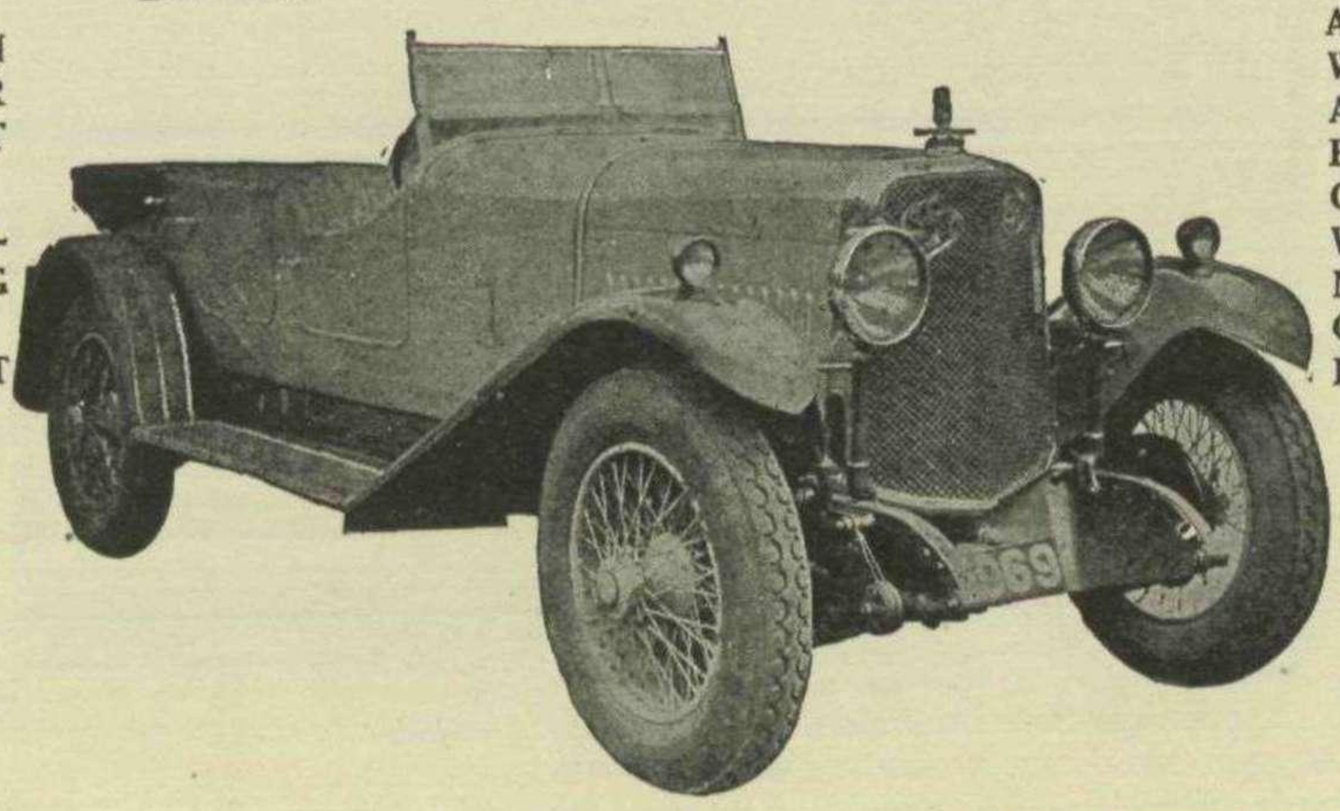
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A TECHNICAL TALK—

ON MODERN DIESEL ENGINE DESIGN

How the Heavy Oil Power-Unit is being Developed.

IN the early days of Diesel engines there seemed to be little chance that they would ever be a serious rival for light transport work to the highly successful petrol engine; but so great has been the progress made in the development of high speed editions of this type, that it is far from unlikely that sports car engines using heavy oil will soon be with us, and therefore it will not be out of place to consider the advantages of this type and also the difficulties at present confronting designers.

To most readers of MOTOR SPORT, the functioning of the petrol engine is no mystery, at any rate in its general principles, but although many people make a habit of referring to the heavy oil engine as the car engine of the future, they are distressingly vague as to the exact working of the same. It is therefore probably easiest when discussing Diesel engines, especially of the high-speed type, to draw parallels where possible between it and its petrol-driven brother.

In general mechanical characteristics, there is, of course, a great similarity between the two types, and when working at one time on an engine which had spent its youth as the motive power of a German submarine, the writer was particularly struck by its resemblance, otherwise than in point of size, to a high efficiency car engine. Six cylinders, overhead valves operated by an overhead camshaft, pistons with very narrow rings, all these things spoke of speed and efficiency in terms known to all car enthusiasts.

It is, however, in its actual methods of turning fuel into power that the great difference is seen, and it is with the difficulties which arise, and the recent work which has been done to overcome them, that this article proposes to deal.

The Difficulties.

That these difficulties are well worth overcoming will be obvious to everyone who gives the matter a moment's thought. The first reason is the fact that fuel oil costs something in the region of 4d. per gallon in bulk, and even if this could only be retailed to the motoring public at a slightly higher price, the saving would still be enormous. The second reason is the higher thermodynamic efficiency of the Diesel engine.

The expression for the efficiency of a Diesel engine differs from that of a petrol engine owing to the difference in the cycle employed. This expression, however, only applies to a slow-speed engine and is, even then, only approximate.

It is found that, as the speed of a Diesel engine rises, the thermodynamic conditions break further away from the constant pressure cycle, and become more nearly similar to that of the petrol engine, which works on a constant volume cycle. It is this tendency for the high speed Diesel to work under similar conditions to the petrol engine, that makes it easier to draw parallels between the two types, and also to see how the Diesel will have a greater efficiency.

The efficiency of the otto cycle is given by the expression $1-\left(\frac{1}{r}\right)^{\gamma-1}$ where r is the compression ratio, and y is the ratio of the specific heat at constant pressure to the specific heat at constant volume of the working fluid, and for air is approximately 1.4.

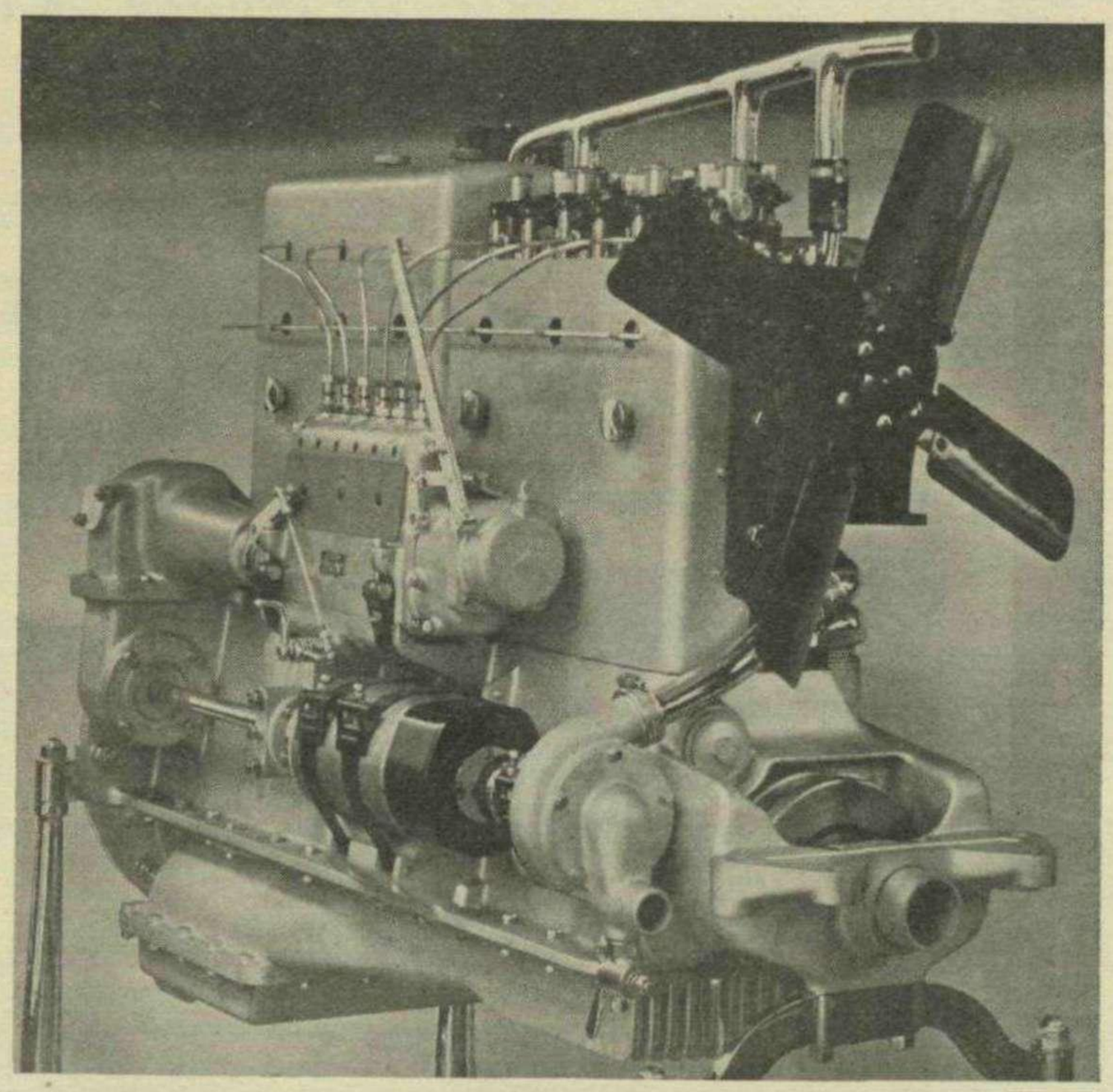
As the working fluid in all internal combustion engines consists mainly of air, no appreciable error is introduced by taking the figures for air as applying in all cases. From the expression given, and the fact that in high speed Diesels this expression is nearly correct, it will be seen that in both classes of engine the efficiency increases with an increase in the compression ratio.

This immediately brings us to the outstanding difference between the petrol engine and the Diesel. In the former we cannot employ a compression ratio higher than that at which detonation takes place, which, with the normal fuels available to the public, gives a limit of about 6. In the latter, which depends on the adiabatic compression of air to such a high temperature that it ignites the liquid fuel injected into the cylinder, we cannot use a compression ratio *lower* than that at which self-ignition will occur. This is about 12 in a normal design.

Many sports car engines use a compression ratio higher than 6, and there are on the market to-day several special fuels, suitable for general use, such as Racing Shell, which permit of somewhat higher ratios; while in special racing engines using very special fuels, containing alcohol and various anti-detonating chemicals, compressions as high as 12 are used. These however, although useful in research work, are not and probably never will be, except in much modified form, available to the public.

This shows that the normal Diesel engine begins, in this particular characteristic, some way beyond where the petrol engine leaves off, and the only thing that has so far kept it from more general use, is the fact that it has been only a comparatively low speed engine.

Recent researches however by the Royal Aircraft Establishment, and experiments by H. R. Ricardo, whose name is well known to all who have followed the development of the internal combustion engine, have shown that it is not only possible to build heavy oil engines with a piston speed of 2,000 ft. per minute and over, but that the overall efficiency is higher than with any



The Mercedes-Benz Diesel-type engine for commercial vehicles. Its normal r.p.m. are about 2,000.

MODERN DIESEL ENGINE DESIGN—continued.

low speed heavy oil engine of the past.

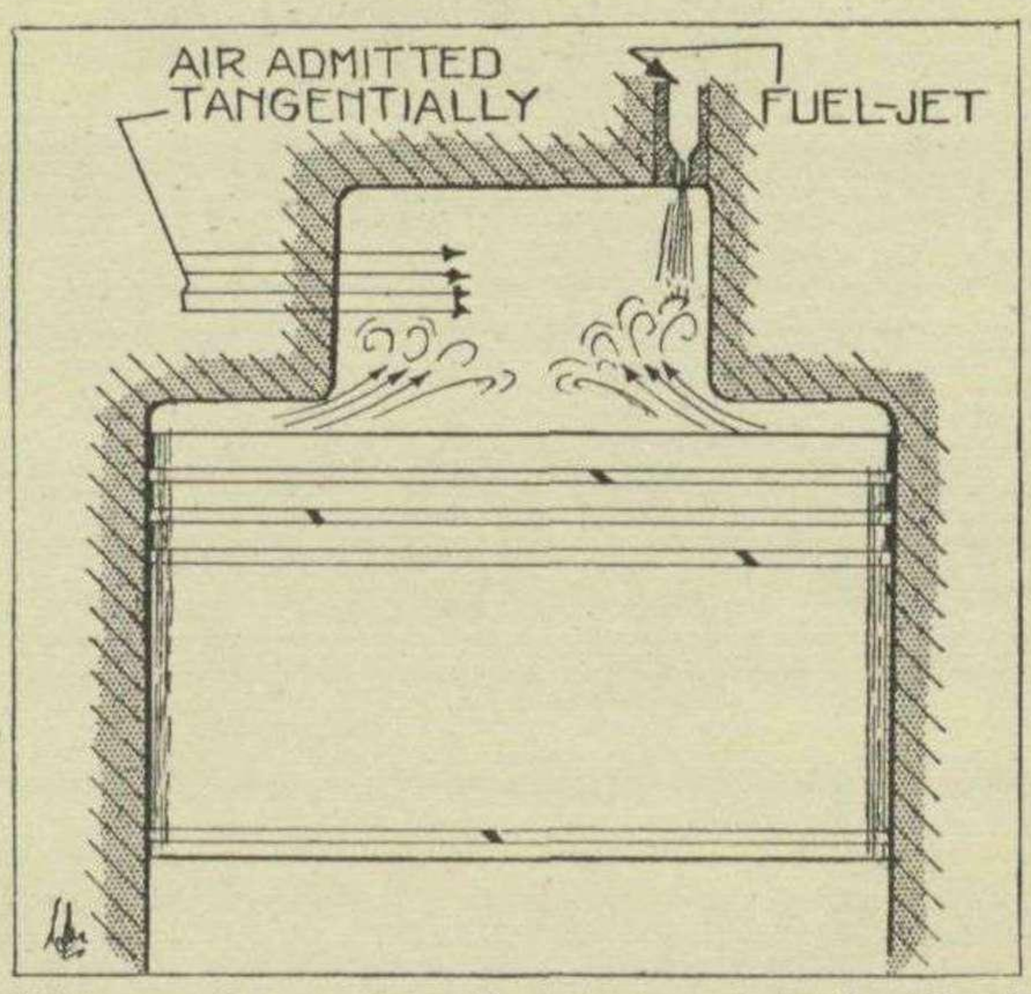
Naturally, the most important factor limiting engine speed is the rate of combustion of the fuel in the cylinder and the Diesel has so far been at a disadvantage in this respect for various reasons. Firstly, the fuel and air in a petrol engine are thoroughly mixed before entry to the cylinder, while the process corresponding to carburation does not take place in a Diesel engine till just before the top of the compression stroke, since only air is drawn in on the suction stroke. The exact time and rate of injection of fuel corresponds to the ignition timing of a petrol engine, except that in the Diesel carburation and ignition occur simultaneously.

According to Ricardo, the ignition process of a petrol engine takes place in two stages, and that of a Diesel in three. The first stage is similar in both types, and consists of a delay period in which a nucleus of flame is built up from which the whole is to be ignited. During this period there is no appreciable pressure rise, and the process itself takes a certain time independent of engine speed, and is nearly constant for any given set of conditions of fuel, mixture strength, pressure, etc., in the petrol engine, and on these factors and also the fineness of the initial jet of fuel in the Diesel engine. From this can be seen the reason for advancing the ignition timing in proportion to the engine speed.

The second, and with the petrol engine, the final stage consists of a rapid spread of the flame through the cylinder in consequence of the inevitable turbulence which occurs in any engine, and which alone makes it possible for a high speed engine to function at all. The comparatively recent introduction of so-called "turbulent heads" has given rise to a general idea that turbulence is something new. It has always occurred however, in varying degrees though imperfectly understood, and what has now happened is that recent knowledge on this subject has enabled designers to arrange the nature and degree of turbulence required for certain conditions, and so get greatly improved results. This turbulence is dependent on engine speed, and not on time, and thus the second stage of combustion in each case, consisting of the pressure rise, is nearly constant in relation to the position of the piston at all engine speeds.

In the Diesel engine however, only a proportion of the fuel is actually in the cylinder during this stage, as it is still entering, and this brings us to the final stage where, owing to the very high temperature and pressure now prevailing the fuel burns completely as it enters, giving the power of mechanically controlling further rise of pressure by the rate of injection.

But in the petrol engine there is no further control, and when the ignition advance, and degree of turbulence, are sufficient to ensure reasonably complete combustion, the maximum pressure at high speeds will be extremely high, and will give rise to violent detonation. If the compression ratio is kept high, the only way to avoid this excessive pressure rise is by the use of ingredients in the fuel which will slow down combustion. This is done in most ordinary fuels to a certain extent, but it cannot be done to excess or, in controlling the final stage of combustion, the first stage will be delayed.



Inlet ports admit air tangentially so giving a rotational swirl and additional turbulence near the top of the stroke is obtained by the air being "squirted" into the head from the cylinder.

This shows at once the limitations of the petrol engine in the matter of compression ratio, but in the Diesel this excessive maximum pressure is avoided by there only being a small portion of the fuel in the cylinder at the beginning of combustion, and the remainder, which is admitted during the final stage, gives the opportunity of maintaining the required pressure by varying the rate of injection.

Combustion Stages.

The points which have so far been considered are applicable whatever the engine speed, but when the speed is raised considerably, designers are confronted with the problem of ensuring that the various stages in the combustion take place sufficiently rapidly to be completed each cycle.

The first stage, or building up of a flame nucleus, being dependent on time and not on engine speed, cannot be speeded up by alteration in combustion head design, and this must be achieved by increasing the tendency of the fuel to self-ignite.

This can be done either by increasing the compression ratio with the same fuel, or adding some such ingredient as amyl nitrate to the fuel to make it detonate more easily with the same compression ratio.

The second phase, or spread of flame through the combustion chamber, is dependent, as in a petrol engine, on the degree of turbulence. An organised flow is of no great assistance at this point, and violent turbulence which will thoroughly "stir things up" is what is required. Too much turbulence will result, as in a petrol engine, in roughness of running due to the sudden pressure rise to a high maximum. It is therefore desirable to cut the second stage short and merge it into the last as soon as possible. This entails a certain minimum temperature being attained by the second stage, before the fuel will burn steadily from the jet.

It is in the research on this part of the cycle and the methods now used to control it in high speed engines, that so much is due to the work of H. R. Ricardo, who has carried out a vast number of experiments with a view to finding suitable cylinder head and valve designs for heavy oil engines.

In his later work he has chiefly employed sleeve valve engines, as with these it is easily possible to arrange, by deflectors on the inlet ports, any desired direction and rate of flow of the air, and thus find the best conditions. These can be permanently maintained in the final design by casting the ports according to the results obtained from the experiments with variable deflectors.

The great essential in the third, and main, stage is a high relative velocity between the air in the cylinder, and the fuel from the jet. Owing to the difficulties of very high pressure injection of the fuel, and the fact that the velocity of the particles is not maintained far from the jet, the method adopted has been to inject the fuel normally and arrange that the air shall move past the jet at the required velocity. The full pressure then required is in the region of 2,000 lbs. per sq. in. or more, and as this is considered fairly low, the difficulties of using a *really* high pressure may well be imagined.

The air speed past the jet is obtained by arranging the inlet ports so that the air is admitted tangentially and sets up a rotational swirl, of which the speed can be adjusted by deflectors as mentioned above. The rotational speed is further increased by making the actual combustion chamber about half the diameter of the cylinder, and therefore doubling the rotational speed for the same induction velocity.

Thus by placing the jet near the outside of the combustion space, a state of affairs is obtained which is remarkably similar to that in the choke tube of a normal petrol carburettor, except that in this case combustion is taking place at the same time as carburation. As the air velocity is proportional to the engine speed this arrangement works as well at high speed as low. Experiments have shown that good results are obtained with a rotational speed of 10 to 12 times the crankshaft speed, this result being obtained by varying the rotational speed by the deflectors while under test, and actually measuring, by an internal anemo-



A DUEL IN THE RAIN. A vivid impression of the 500 M
in the single-seater Talbot, and the w



lies' Race, showing H. R. S. Birkin's Bentley overtaking B. Lewis
ming Austin driven by S. C. H. Davis.

MODERN DIESEL ENGINE DESIGN—continued.

meter, the air speed in the combustion chamber at various engine speeds.

It has, however, been shown that some degree of indiscriminate turbulence is required, especially for the second stage of combustion, and it is here that this particular cylinder head form serves a dual purpose. At the top of the stroke the air is "squirted" from all round the cylinder and this produces a certain degree of "rough and tumble" in the cylinder head to supplement the ordered flow caused by the suction stroke.

The whole process of combustion in Diesel engines has now been made the subject of sufficient research to bring it nearly into line with the petrol engine, and the factors limiting their speed are now very similar. Considerations of mechanical strength, and balance of moving parts have already received ample attention as the result of racing, and the other chief difficulty, that of getting a full charge into the cylinder at high speeds, can be solved as in the case of the petrol engine, by supercharging. Moreover, owing to the supercharger having to deal with air only, and not having to respect the feelings of a sensitive carburettor, the arrangement will be greatly simplified.

The sleeve valve is, of course, only one method for the high speed Diesel, and we have mentioned it as representing the latest research of a well-known authority.

One of the most successful high speed heavy oil engines on the road to-day is, of course, the Mercédès-Benz, which is now a thoroughly tried job, which has saved many far sighted transport owners vast sums in running costs, and it is very likely that this astoundingly enterprising firm will be among the first to put a private car on the market with a similar engine.

It is always hard to forecast developments, especially in the world of motor racing, but we shall not be surprised to see within a few years, a racing car, similar in outward appearance to the Grand Prix racers of today, but devoid of plugs or magneto, having a supercharger but no carburettor, and winning races on a fuel costing under sixpence per gallon!

W. S. B.

HIGH SPEEDS ON THE SANDS.

SOUTHPORT CLUB'S LAST MEETING.

IN spite of the rather wet surface of the sand and the showery weather, the championship meeting held at Southport on the 4th of last month was one of high speeds, and altogether provided a very successful day's sport.

J. Field's Talbot, which has already distinguished itself this season in numerous events, was again in very good form and on more than one occasion during the meeting exceeded a speed of 100 m.p.h. For the 20-miles race there were twelve entrants. At first, A. W. Spottiswoode led the field on his 2-litre Bugatti, but it was not long before he gave place to T. V. G. Selby on a similar car. The race was not without incident, for Spottiswoode in trying to regain his position indulged in some very lurid corner work, with the result that he shed a tyre, while W. H. Hurst (Bentley) collided with Daybell's Vauxhall, fortunately, without sustaining very much damage.

One of the features of the meeting was the championship event between the two fastest cars and the two fastest motorcycles; this was run over a mile from a standing start, the result being a run away win for the two-wheelers with speeds of 108.5 and 106.5 m.p.h.

Both machines were Brough-Superiors, the faster being ridden by J. H. Carr and the second by J. O. Cuncliffe. In the motorcycle classes there were flying kilometre races for 350, 500, and 1,000 solos and 500, 750 and 1,000 sidecars. There were also the usual straight mile, twenty-five and fifty mile contests. In the latter race the first position fell to Charlie Dodson on his Sunbeam—the fourth occasion on which this popular rider has won this event.

There was also a veteran's race which provided much amusement. Competitors were R. G. Davies on a 1902 De Dion Bouton, G. A. Mangoletsi on a De Dion tricycle and J. A. Rogers on a Riley of about 1905 vintage. The exceptionally high speeds of the winners in all classes was, no doubt, due to an appreciable extent to the following wind which prevailed during the meeting.

Results.—Cars.

STRAIGHT MILE EVENTS.

750 c.c.—1, P. Stephenson (747 Austin).

1,100 c.c.—1, E. G. Sharp (1,087 Gnat); 2, H. F. Brayshaw (980 H.F.B.); 3, P. Stephenson (747 Austin).

1,500 c.c.—1, J. Field (1,485 Talbot); 2, H. S. Batlivala (1,498 Bugatti); 3, E. G. Sharp (1,087 Gnat).

2,000 c.c.—1, J. Field (1,485 Talbot); 2, H. S. Batlivala (1,498 Bugatti); 3, J. S. Aked (1,496 A.C.).

3,000 c.c.—1, J. Field (1,485 Talbot); 2, T. V. G. Selby (1,990 Bugatti); 3, J. S. Aked (1,496 A.C.).

Unlimited.—1, T. V. G. Selby (1,990 Bugatti); 2, G. Daybell (4,234 Vauxhall); 3, J. S. Aked (1,496 A.C.).

FLYING KILOMETRE EVENTS.

750 c.c.—1, W. L. Thompson (748 Triumph), 69.90 m.p.h.

1,100 c.c.—Ditto.

1,500 c.c.—1, J. Field (1,485 Talbot), 106.52 m.p.h.; 2, H. S. Batlivala (1,496 Bugatti), 103.56 m.p.h.; 3, D. B. D. Field (1,496 Bugatti), 92.44 m.p.h.

2,000 c.c.—1, J. Field (1,485 Talbot), 106.52 m.p.h.; 2, A. N. Spottiswoode (1,996 Bugatti), 98.98 m.p.h.; 3, T. V. G. Selby (1,996 Bugatti), 98.11 m.p.h.

3,000 c.c.—1, J. Field (1,485 Talbot), 106.52 m.p.h.; 2, G. J. Jackson (2,973 Sunbeam), 98.98 m.p.h.; 3, T. V. G. Selby (1,996 Bugatti), 98.11 m.p.h.

Unlimited.—1, J. Field (1,485 Talbot), 106.52 m.p.h.; 2, G. Daybell (4,234 Vauxhall), 100.76 m.p.h.; 3, G. J. Jackson (2,973 Sunbeam), 98.98 m.p.h.

Motorcycles.

TWENTY-FIVE MILE.—350 Solo Race: 1, R. F. Parkinson (A.J.S.); 2, F. Johnson (Montgomery); 3, F. R. Thornton (Coventry-Eagle).

FIFTY-MILE.—500 Solo: 1, C. J. P. Dodson (Sunbeam); 2, J. Fletcher (Sunbeam); 3, A. McLachlan (Scott). 750 Solo: 1, C. J. P. Dodson (Sunbeam); 2, F. Woosey (Scott); 3, H. Burns (Scott). 1,000 Solo: 1, C. J. P. Dodson (Sunbeam); 2, F. Woosey (Scott).

TEN MILE SIDECARS.—600 Class: 1, H. Burns (Scott). 1,000 Class: 1, H. C. Lones.

RUMBLINGS

By "BOANERGES."

Foreigners and the "500."

THE greatest attraction of the B.R.D.C. 500 Miles Race to most private owners is the fact that it is open to any car, provided that car will go quickly. If a car won't go quickly no one would want to enter it any way, but it is a great relief to be free for once from the eagle eye of the scrutineer, who tries to make out that something has been done that should not be done in the way of tuning, and so on.

The big road races are great fun for those who can afford it, but you practically must have motor of this year, and so soon as you start carting motor cars to foreign parts it starts to run into money in a horrifying manner. The "500" however, is different. The mileage of the model doesn't greatly matter, nor does its departure from standard in various ways.

In all these things, therefore, this race is undoubtedly "one of the ones," and the only pity is that we cannot get a bigger foreign entry. This year there was only one, the Maserati, and owing to some bother with the motor, and the fact that it was "simply miles from home," it could not be got to the line.

I was listening some time ago to the views of a famous Italian driver, on this very question, and he seemed surprised that we did not do more to make it worth their while to come over here. As he said, there are lots of road races on the continent which are easy to get to, and the promoters definitely make it worth while for world famous drivers to come to the starting line, while if they are successful it is even more worth while. When it comes to racing over here there are no road races actually in England. Brooklands has a limited number of suitable events, and the expense is very high. In fact if you win you get your money back, and that is about all. This seems rather a pessimistic view of things but it is apparently the way many foreign drivers look at the matter, and so they do not enter on their own over here, but wait till they are included in some works team in the Ulster or the Dublin races. And then they certainly make up for lost time if recent road racing results are anything to go by.

Driving Customs.

The same driver's views on the general standard of road behaviour in this country was also interesting, and certainly I have seen a great deal to bear it out, in my efforts to escape with a whole skin from the numerous, if well-meaning, attempts on my life by drivers of slow but persistent family vehicles. "You drive so slowly, I cannot think how you get anywhere, except at cross-roads and sharp corners and then——!" His expression showed that his stay in this country had not been free from the menace mentioned above. In his country apparently motorists use their brakes at corners and cross roads, and look, and listen, and then on the roads between they really move! Can we wonder that Italian sports cars are pretty lively performers. If only the motorists in this country (I mean the general run of touring drivers) would only learn to do the same, instead of travelling everywhere at a constant speed, which is a danger to everyone in crowded places, and a mere obstruction on the open road, we should find road travel a great deal safer. However, until we get road races in England, so that more people can see for themselves that good racing drivers are steady and not hectic on corners, and that speed is safe if it is only used in the right places, the standard of driving is not likely to improve to any extent.

An 1100 C.C. "Bug."

C. S. Staniland, who has had such a wonderful record of successes on cars and motorcycles, recently caused a certain amount of surprise by turning up at a meeting with a 1,100 c.c. Bugatti, and proceeded to score right away, as it proved but little slower than a 1½ litre. Several people have asked me what was the cause of this seeming mystery, and how Ettore Bugatti came to be making such a small car. Actually, however, there is no mystery at all. Staniland, having decided that the handicappers already knew a lot too much about the capabilities of his car, which is one of the fastest of its type that has ever been, had the engine fitted with Laystall liners to reduce the capacity to 1,100 c.c. and the result was certainly most effective. It would be very interesting to see how this modified model would perform in one of the big road races, but I am afraid that it would hardly be considered sufficiently standard to get past the scrutineers.

And now for Trials.

Now that the racing season is over, we have to turn to trials, if there is a suitable motor available, or else to rebuilding the fast motor for next year if we cannot afford a new one. Touching the matter of trials, the new regulations are going to cause trials secretaries a certain amount of anxiety to avoid getting into trouble. The law that a car may not be driven more than 15 yards (or whatever it is) from the highway puts the lid on some of our choicest colonial sections. However, there seems no need to despair. There are plenty of ways marked on the map as "roads," which, while being highways within the law, are quite enough to cause considerable trouble to the average car entry in a sporting trial. Of course, commons are ruled out, but this will only lead to increased ingenuity on the part of organisers. Another thing which is now liable to cause trouble is the use of dye for route-marking, as the police are now totally forbidding this is many parts. Hence, more attention to the route-card, always remembering "the onus of finding the course rests with the competitor"!

Club News

LONDON M.C.

An attractive programme of both social and sporting events has been arranged for the winter season. The Hon. Secretary, Mr. T. L. Baldwin, 79, Elm Bank Gardens, Barnes, S.W.13, will be pleased to supply full particulars to those interested.

CHADWELL HEATH & D.M.C. & C.C.

At the annual general meeting of this Club the Committee was increased in size and it was resolved to organize better social events and more trials in the future than has been done up to the present.

The Club is desirous of increasing its membership and anyone who is interested is invited to apply to the Club's headquarters, The Mayfield Café, 686, Green Lane, Goodmayes, any Wednesday evening between 8 and 11 p.m. where the secretary, Mr. B. Castle will be pleased to supply any information concerning the club that may be required.

THE M.C.A.C.

The Middlesex County Automobile Club's "Armistice" Dance is to be held at the Hotel Metropole, London, on Monday, the 10th, of this month. The tickets will be 7s. 6d. each. An excellent band has been engaged and a very enjoyable evening is anticipated. Applications for tickets, which are to be restricted, should be made as soon as possible to the Secretary, Captain W. J. Lendrum, 10, Leaside Avenue, Muswell Hill, N.10.

BERKHAMSTED & DISTRICT M.C.C.

The events of this Club for November include a Solo Sporting Scramble which will be held on Sunday, the 9th, at Pednor Farm, Chesham, commencing at 1 p.m. The classes will be for 250 c.c., 350 c.c. and unlimited c.c.

On Sunday, November the 16th, the Inter-Club Team Trial will be held in connection with the West Middlesex Motor Club. On Wednesday, the 26th of this month the annual dinner and presentation of awards, under the chairmanship of Professor A. M. Low, will take place.

THE OWL'S MOTOR CLUB.

This club will hold a restricted scramble on Sunday the 2nd of this month at Pilgrim's Farm, Titsey, Limpsfield, over a very sporting course. Members of the Carshalton, Redhill, Tunbridge Wells, Bexley Heath and Sydenham Clubs will compete. The course is found without difficulty from the bottom of either Titsey or Botley Hills. Direction cards will be set up to mark the way.

NOVEMBER EVENTS SUMMARISED.

1st. J.C.C. Half-Day Trial.
"Sunboc" Shell Trophy (for cars).
2nd. Brighton & Hove M.C. Drewitt Team Trial.
8th. Wessex Scramble.
14th. C.S.M.A. Annual Dinner.
21st. L.C.C. Annual Dinner.
22nd. Lancashire Grand National.

The Editor invites Club Secretaries to send details of their fixtures, sporting and social, for publication in these columns. These items should be sent to reach this office not later than the 16th of the month.

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Motorcycles for 1931

THERE is no doubt that 1931 is going to provide us with greater changes in the motorcycle world, both in actual machines and in opportunities for their use, than any year since the war. In the last few years motorcycling has become available to a greatly increased public, and a new type of public at that; the result has been a demand for a more uniform type. Individuality in design has rather given way to more uniform fashions, though each fashion has been due to some firm with sufficient courage to start something new.

The Ariel concern have for some years been setting the pace, as it were, and having introduced saddle tanks a few years ago with such success that they are now *de rigueur*, it has gone one getter than everyone else in the sloping engine tendency, by having twice the slope of anyone else. We do not propose to discuss at length the merits or demerits of the sloping engine, which is just another example of the way something which has been on the market for years without attracting any notice in particular, will suddenly spring into popularity.

The P. and M. had a sloping engine before the majority of present-day manufacturers were even in existence, but they remained unique until B.S.A. followed them a few years ago, and now it is rather the rule than the exception. The writer has had considerable experience of sloping engines, including some T.T. races on them in the I.O.M., and without wishing to decry their various advantages, cannot really see that they have any pull over the upright engine for general use, and for speed work found them slightly inferior. As however, the modern machine, although fairly fast, is not in general sold for speed work, this is no great matter, and for trials the sloping engine gives a chance for magnetos and dynamos to be tucked up well out of the way.

For those who want to go in for racing, either on road or track, the choice of good machines is now easier than ever before. Unless some particular fancy or personal connection turns one toward some small make fitted a proprietary racing engine such as the ever-successful J.A.P., most riders will go for a machine produced under a single roof, and numbered among the successful road racers of the present year. As we have before had "one-make years," when A.J.S., Norton, Sunbeam, Velocette, have in turn swept the board in the big events, so this year we have to hand the palm to Rudges, which though competition has never been keener, have achieved a list of victories which has never been surpassed. There is little doubt that more speedmen than ever will cast covetous eyes on the Rudge stand at Olympia, but there will be no lack of enthusiasm round the other makes we have mentioned.

Special models capable of very astounding performance are available to the public, and this leads us to sound a warning. Many motorcyclists, often fairly inexperienced, and not actually intending to go in for racing, are so attracted by the glittering, stripped, racing machine, that they think nothing else will do for them. Unless an actual racing programme is intended for next season, there is no greater mistake than to buy a track motor. It is not suitable for ordinary road work, without considerable inconvenience, and no one who matters will be in the least impressed by a rider using such a machine.

On the other hand it is just as much a mistake to buy an ordinary sports model in place of the special racing edition when racing is intended. One often hears prospective buyers suggesting that they could save the difference in the price, and do the necessary work themselves to convert their purchase into the racer. It is not only a question of work; in many cases the racing model has various different components which although quite unnecessary for ordinary fast road work, become essential when track conditions and double figure compression ratios are being considered. To change over from one to the other after purchase will probably cost considerably more than the original difference in the price, while supertuning an unsuitable model is liable to result in some very expensive internal derangements.

The four cylinder engine is another feature which will make this show one of the landmarks in motorcycling history. Not that the four-cylinder machine is anything really new, but the type now being offered, that is of normal size and weight, with ease of handling and upkeep equal to the more conventional machines, and moreover produced by well established firms which enjoy the confidence of the public, marks a new step in the development of the two-wheeler.

SCIENTIFIC BRAKE TESTS

IT is not as yet generally recognised that the new Road Traffic Act includes clauses as to the "number and nature" of brakes of motor vehicles. This clause indicates that brakes must be efficient and that they shall be subject to inspection by "authorised persons."

Whilst it is unlikely that any immediate action will be taken under this clause, the necessity for effective brakes is obvious. It is probable, to-day, that 95 per cent. of motor vehicles are being driven with brakes which are incorrectly adjusted.

For accurate brake adjustment a strictly mechanical device is essential. Such an instrument is found in the Bendix-Cowdrey brake-tester. In its simplified form this consists of two, or more, pairs of grooved rollers driven by electric motors, one pair being placed under each wheel to be tested; these rollers, when rotated, drive the vehicle wheels and actally take the place of the road. A direct reading of "the pull of the road" at each wheel can be obtained, and the necessary brake adjustment can be scientifically made.

ITEMS OF INTEREST

FROM VARIOUS SOURCES

For Cable Brakes.

THE advance made in the past few years in the design of brakes has greatly simplified their adjustment. Nevertheless, it is often found that with the cable-operated type correct balancing-up on all four wheels is not too easy to achieve owing to unequal stretch having set in. A device has recently been brought out to overcome this difficulty. It comprises a simple form of clamp, which fits on to the cable, and by means of a thumbscrew, an appreciable amount of slack may be taken up by its exerting pressure on the cable. It is marketed by Weathershields, Ltd., of 48, Moor Street, Birmingham, the cost of a set of four being 7s. 6d.

Automatic Ignition Control.

SINCE the introduction of the engine - operated windscreen wiper, the partial-vacuum obtained in the induction pipe of a car engine has been utilised for a number of purposes. The latest device which uses engine suction as an operating medium is the Advance Robot—a simple fitting for working the advance and retard of the magneto automatically. In main essentials it consists of a small cylinder (connected to the inlet pipe by a tube), in which a plunger slides. The latter is coupled to the arm of the make-and-break ring by a rod, and as the plunger moves inwards or outwards according to the degree of suction derived, so is the ignition varied. The unit has been designed by Mr. D. Dunnett, A.M.I.Mech.,E., chief engineer to the London and Lancashire Insurance Co., Ltd., of 5-7, Chancery Lane, London, W.C.2.

An Ignition Cut-Out.

ANOTHER auxiliary for fitting to the ignition system is the Ignauto cut-out for coil-and-battery circuits. This is also operated by engine suction so that as soon as the motor stops the current is switched off. It is obviously a useful and valuable device, for as many owners of cars with coil ignition have discovered, omitting to switch off, after the engine has stopped running frequently results in a burnt-out coil, a dead battery and other complications. The Ignauto is marketed at 21s. by J. W. Pickavant & Co., Ltd., Quikko Works, Granville Road, Birmingham.

Revs. and M.P.H.

THE A.T. Speedometer Co., of Chronos Works, North Circular Road, N.W. 2, are now listing an instrument which should appeal to sports car owners. This is a speedometer with a dial graduated in both M.P.H. and R.P.M. The driver is thus enabled to see at a glance what his engine speed is over his entire road speed range.

It is made in various models to fit a number of standard sports cars, including Bugatti, Aston-Martin, Salmson and Austin 7. Prices are from £6.

Austin 7 Gear-Shift.

SOME months ago MOTOR SPORT carried out a road test of the well-known B.-C. Austin Seven sports model, and one of the modifications on this vehicle which Messrs. Boyd-Carpenter Ltd., had made—and which impressed us as being a marked improvement—was in the gear change mechanism. The alteration was effected by mounting the gear lever aft of the box, on an additional cross stay, and coupling it to the original selector mechanism by a horizontal rod with yoke ends. The new lever was mounted on a ball joint, and had the usual reverse stop and trigger, and all movement both laterally and longitudinally was conveyed easily via the horizontal rod, enabling the driver to effect snappy changes with the lever in a most convenient position.

This device has now been patented and is to be marketed as an auxiliary for Austin Sevens. The manufacturers' address is:—47, West End Lane, Kilburn, N.W.6.

A Lubrication Booklet.

WE have recently received from C. C. Wakefield & Co., Ltd., a new booklet on motor car lubrication. Written by Mr. H. Thornton Rutter, this little publication goes systematically into the whole subject in a way which is at once interesting and informative to both the non-technically minded and the man who is already *au fait* with the internals of a car. Every part of the automobile, which in any way is subject to treatment by oil is dealt with, and, as a sign of the times, an appreciable amount of space is devoted to superchargers. It is well illustrated throughout with excellent line drawings.

A Plug Adaptor.

PARTICULARS have just come to hand of a plug adapter, designed to overcome those oiling-up troubles which are sometimes met with on certain types of engines. The adapter comprises a hexagonal sleeve, with a standard plug thread screwed internally and externally. This is screwed on to the plug; thus, when the latter is fitted in the cylinder the points do not project, and are protected from the oil which may have worked up past the rings. The manufacturers (Fewlex, Ltd., of 7, Tavistock Place, Russell Square, London, W.C.1.) claim that their fitting not only overcomes oiling-up, but gives better combustion, and generally improves the running of a power unit at low speeds.

A New Benjamin Horn.

AMONGST the newer additions to the well-known Benjamin range of motor accessories is a new "trumpetless"-type horn. A feature of this new accessory is that it is sprung on buffers so that a very clear, note is obtained. It is intended for mounting to the headlamp cross-stay, and weighs only 33 ozs. It is obtainable at prices ranging from 25s. to 42s. The Benjamin Electric Ltd., address is:—Brantwood Works, Tariff Road, Tottenham, N.17.

English Bosch Works.

IT is stated that plans have now been completed for the manufacture of Bosch products in this country. A site has been acquired at Neasden, Middlesex, where a factory and offices will be built. Some 1,000 workpeople will be employed.

"JUST THE VERY PAPER . . ."

Dear Sirs,

I am writing to express to you my appreciation of your paper "Motor Sport." Until a fortnight ago I was so unfortunate as to have never seen a copy.

Then, by an extraordinary stroke of good luck, I called in at an hotel on the North Wales Coast, and found there, your so excellent publication. It is to me (an earnest if somewhat amateur follower of motoring sport in all its branches), an absolute godsend. Just the very paper that I have always hoped I would some day find. What I appreciate so particularly is that besides giving your readers detailed accounts of all the leading motoring events, you give full results and accounts of more out of the way and minor competitions—results of which one would never hear but for the details published in "Motor Sport."

I can only conclude by saying that I hope I shall continue to be a regular reader of your excellent paper.

Yours faithfully,

(Signed) Philip G. Dalby-Jones.

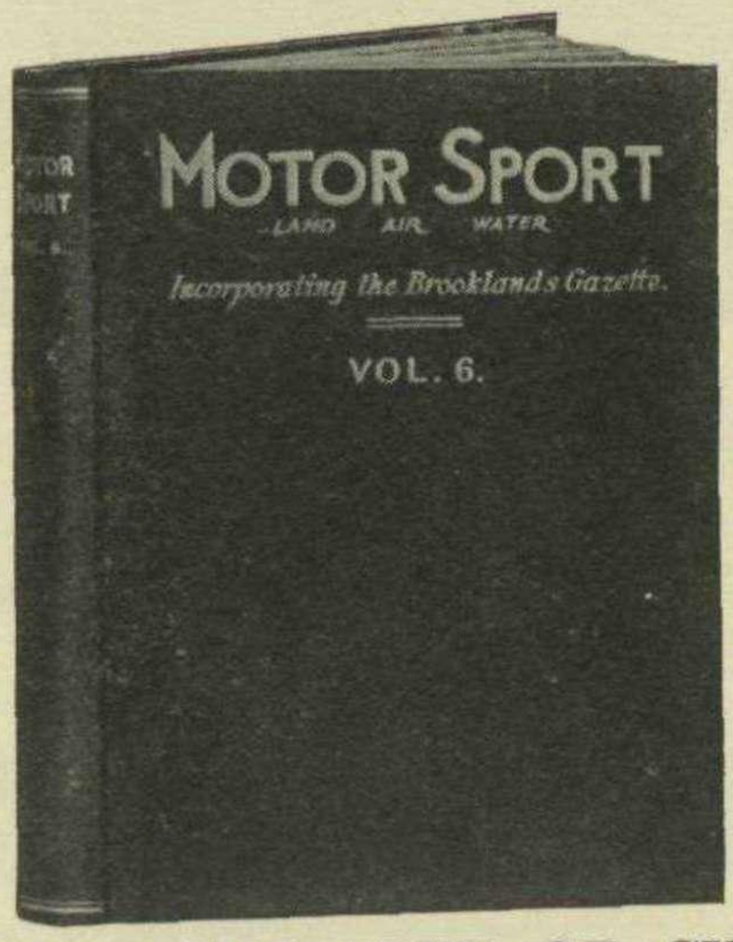
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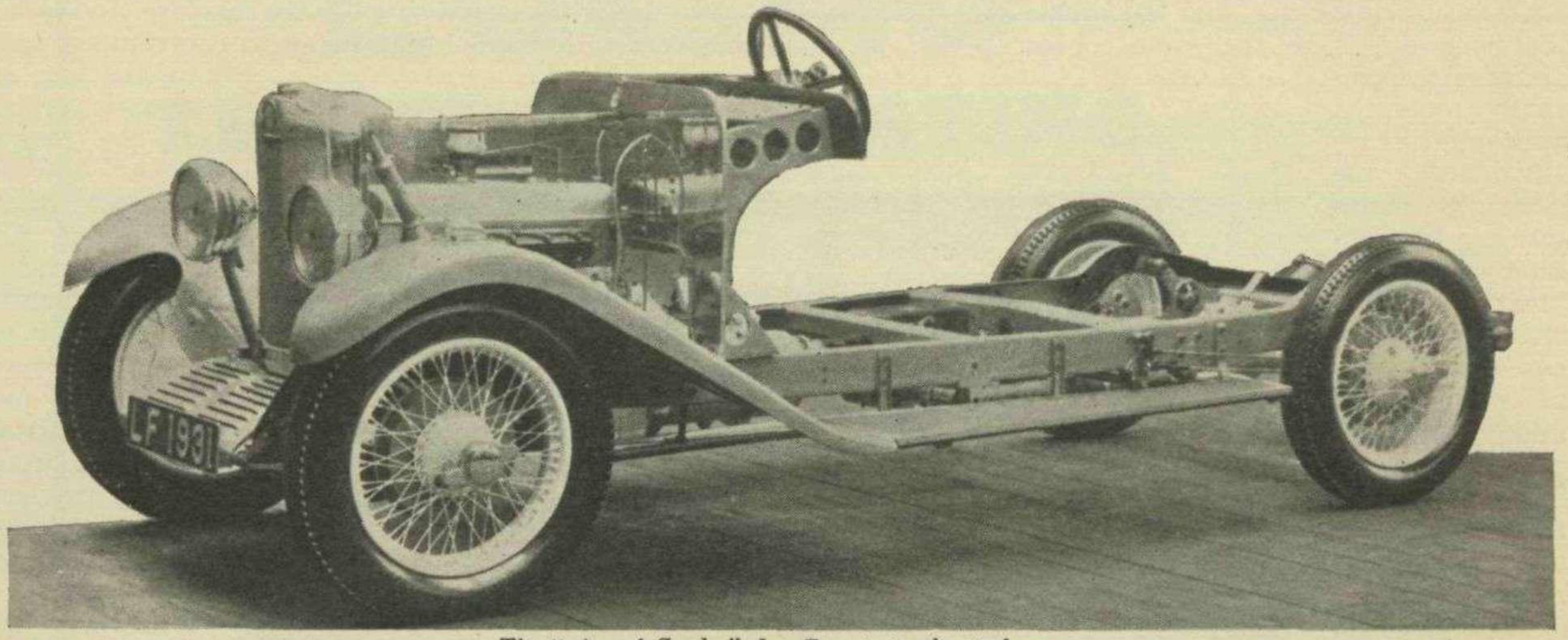
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15.7 H.P. 6-CYLINDER FOR HIGH-SPEED TOURING



The "Ace of Spades" Lea-Francis in chassis form.

AS might be expected from a firm which has taken such an active part in racing and competition work in recent years, the latest six-cylinder Lea-Francis possesses many features which differ somewhat from the conventional, and which have been developed as a result of their extensive experience with their well-known supercharged 1500 c.c. car.

Realising the great demand which exists for a car which combines the performance of a good sports model with real sweetness of running, the firm have for over a year been experimenting with the model which is now known as the "Ace of Spades." The name came to it in consequence of the shape of the front of the timing case, which is exactly the shape of that emblem, only inverted.

When we recently had an opportunity of trying for ourselves the performance and behaviour of this model, we were able to appreciate how remarkably well the designer has succeeded in his object, and were glad of the chance of examining some of the components.

Power-unit Features.

One thing which has a great deal to do with the smooth running and high revving capabilities of this engine is the very robust crankshaft. This is carried in four bearings and is both statically and dynamically balanced, and fitted with counterweights. The journals are nearly as large as the cylinder bores, and besides ensuring abnormal rigidity, should give almost complete freedom from wear. Another good point is the freedom from oil-pipes to the various parts requiring pressure lubrication, all possible oil leads being arranged integral with the casting.

Although the car we tried, the fabric saloon, was extremely roomy and comfortable, the performance was in no way impaired, and on quite a short stretch of road we attained 75 m.p.h. and there is no doubt that, given more room, a higher speed could have been reached. There was a very slight period at 55 m.p.h. but this covered only about one mile an hour and throughout the rest of the range there was no sign of any vibration.

The actual engine we were driving was an experimental job, and differed in one or two minor points from the latest edition, and we are informed that this period has been entirely eliminated in the final design.

The gearbox is a very definite departure from standard practice, and is quite the most ingenious feature of a very interesting car. The casing is made in two halves, each housing two of the forward speeds, reverse being in the same compartment as first and second. These latter are of the normal sliding type, but the other two gears, third and top, are both engaged by means of dogs. The division between the two halves of the box forms a very stiff web which supports central bearings for the main shaft and lay shaft so that each shaft is supported on three bearings. The effective length of any loaded portion of shaft is thus reduced to the absolute minimum. It is a well known fact that a great deal of noise in gear boxes is due to the flexing of the shafts under load, and if they are not rigid even the most accurately ground gears will not be silent.

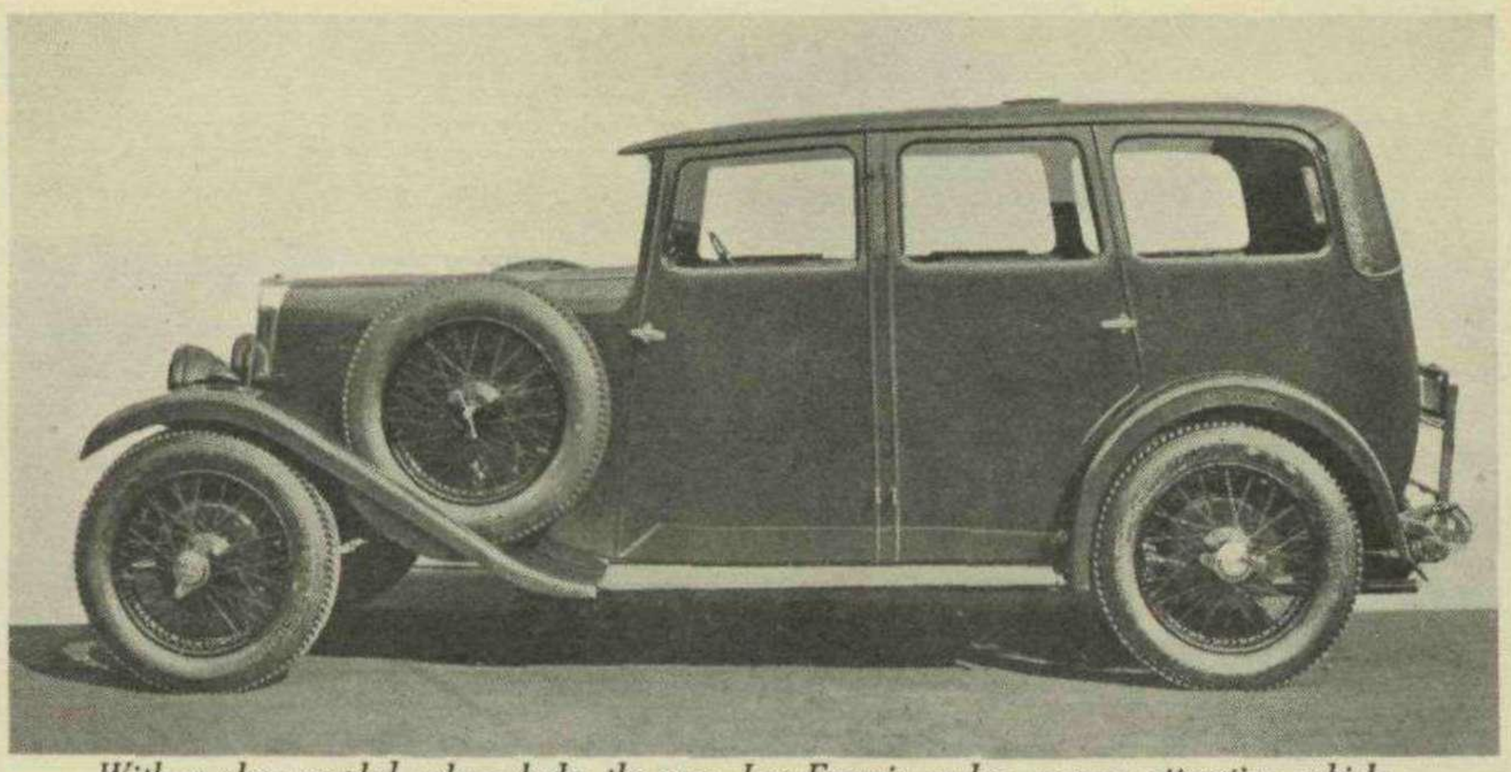
In the new Lea-Francis' box the loaded length of each shaft is not only much shorter than on any normal design, but additional rigidity is ensured by the fact that the unloaded half of each shaft has its end supported in a third bearing. It is a mechanical fact that a continuous shaft supported at intervals along its length has a smaller deflection for a given load on any one span than a single short shaft of the same length as that span. To test the effect of this design in reducing gear noise the car which we tested had been fitted with gears which had not been ground after hardening, and only a faint hum was audible, and it was much quieter than most boxes with ground gears. As the standard

THE 2-LITRE LEA-FRANCIS—continued.

job is fitted with ground gears, the new model should have one of the quietest gearboxes obtainable on any priced car today.

The steering has all those qualities of accuracy and easy control which can only be fully developed by actual road-racing experience, and the brakes owe their power and smoothness to the same source.

These are directly operated without servo assistance, the designers maintaining, in common with many great authorities, that on a light car this is the most efficient and positive method, providing the operating mechanism is correctly designed.



With a close-coupled saloon body, the new Lea-Francis makes a very attractive vehicle.

On many cars where drivers complain of the force required to operate the brakes, the trouble is due to lack of rigidity of the rods and cross shafts, resulting in the shafts binding in their bearings, and the power does not get as far as the brakes themselves. Judging from the robust design of this gear on the 2-litre Lea-Francis there should be no trouble from this source, while in actual use we found the operation commendably light.

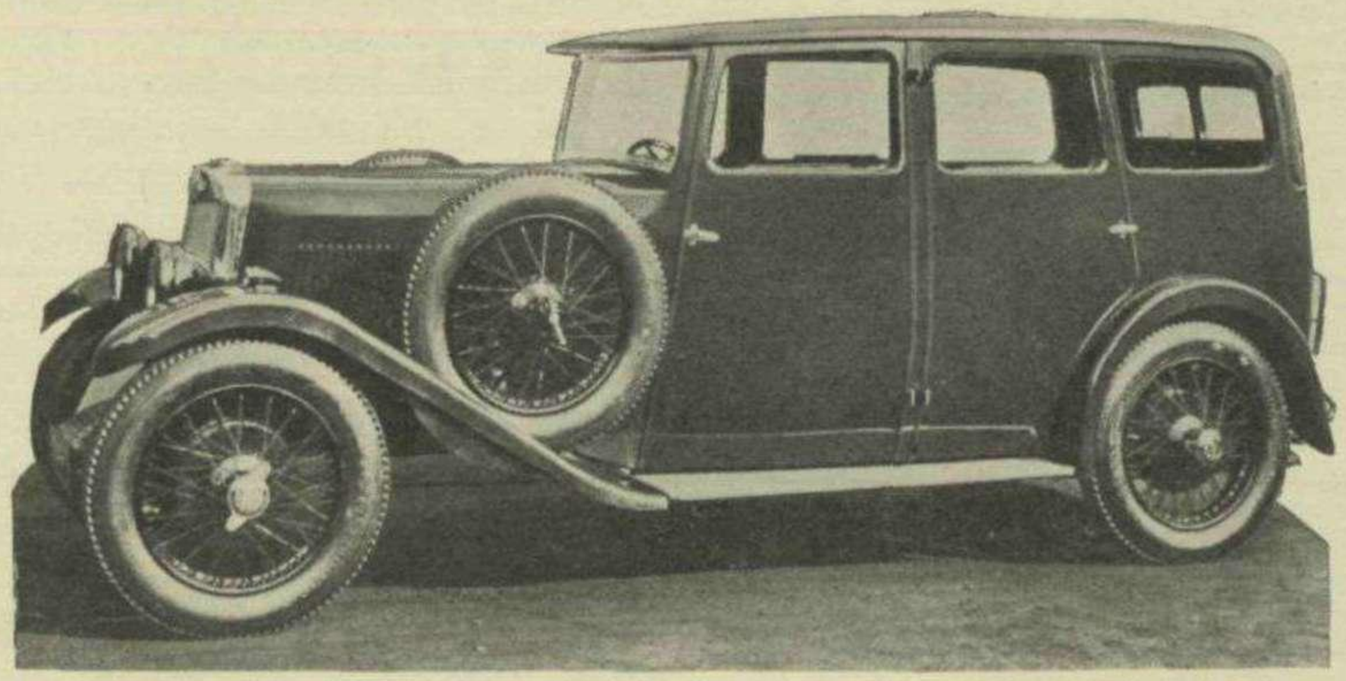
All components and accessories have been selected entirely for their efficiency, regardless of price or any other property. A Stromberg carburettor of the latest down-draught pattern supplies the mixture, and in conjunction with the Scintilla magneto contributes largely to the life and smooth running of the engine. Other components not actually made by Lea-Francis include Lucas lighting and starting, Goodrich tyres, a Gallay radiator, Hartford shock absorbers, Hardy transmission couplings, Triplex screen, and Rudge-Whitworth wire wheels.

For anyone requiring a high-speed comfortable vehicle, suitable for long-distance work in all weathers it would be difficult to spend £495 to better advantage than on the "Ace of Spades" Lea-Francis, at which price both panelled and fabric saloons are offered.

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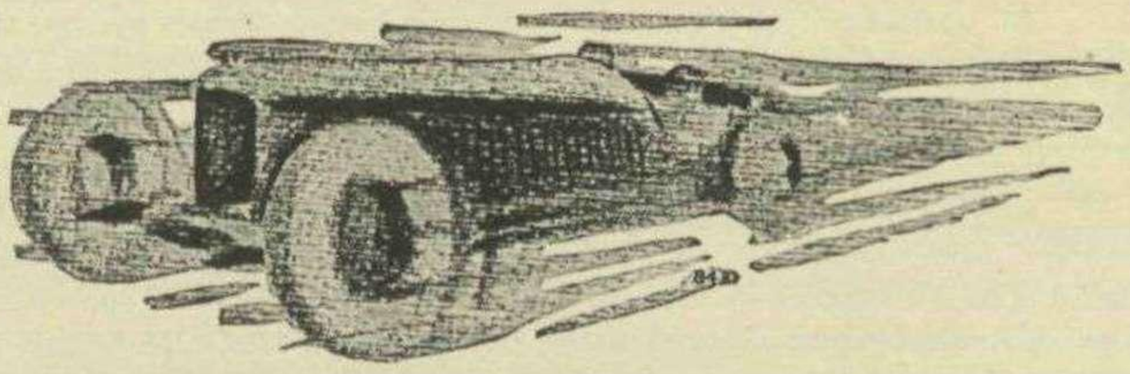
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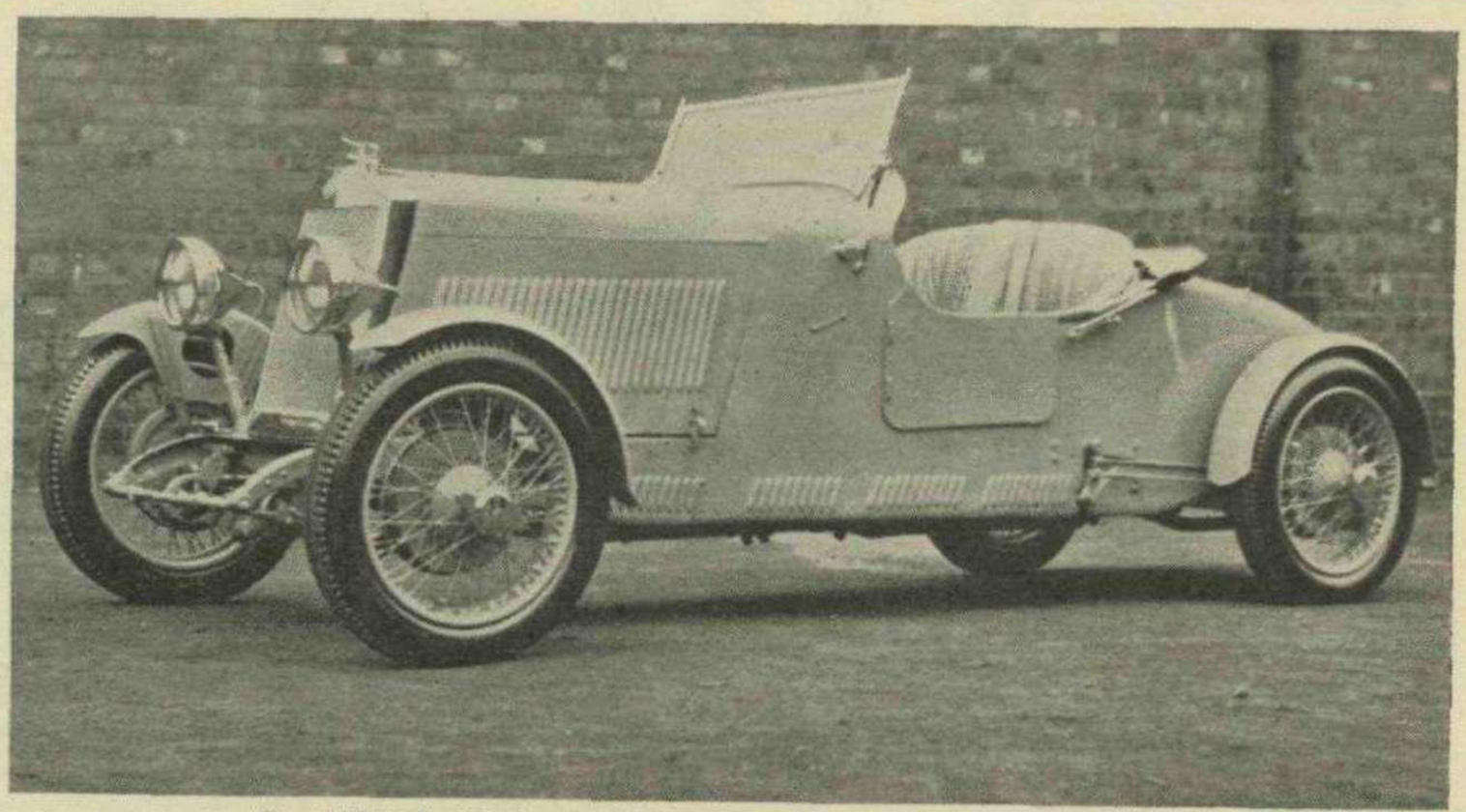
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The Evolution of a Sports Car

Early History and Present Programme of the Lea-Francis Factory

IT is a remarkable fact that the firms which are most progressive and up-to-date at the present time are those which are the oldest in point of years, and Lea and Francis Ltd. is a good example of this. The original company was formed in 1896 by Messrs. R. H. Lea and G. I. Francis and they first concerned themselves exclusively with the manufacture of push-bikes.

It seems a far cry from the humble pedal driven two-wheeler to the 100 m.p.h. racing car, but there is nothing like beginning gently, and the fact that there are still Lea-Francis cycles 30 years old in constant use speaks well for the workmanship of the founders.



For 1931 the 1½-litre model remains substantially unchanged.

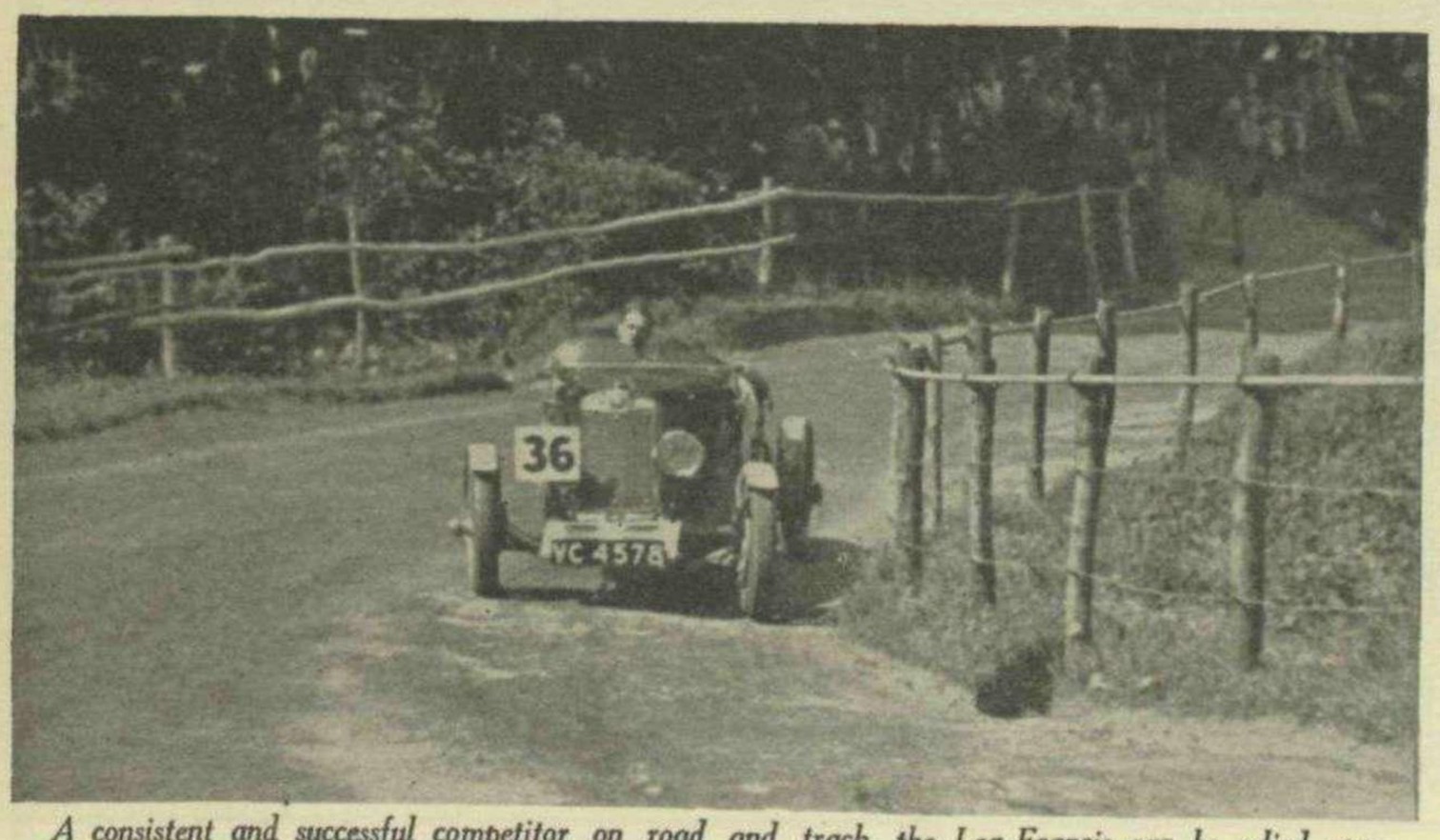
Although Lea-Francis cars were not in full production as we now know them until after the war, the firm started building cars in 1900, and in the following few years produced a remarkable vehicle with a 3-cylinder horizontal engine of 4″ bore and 6″ stroke. On a recent visit to Coventry we had an opportunity of inspecting one of these actual engines which is still kept in the works.

It is a most massive object and looks at first glance more like a small scale locomotive engine than an internal combustion motor. It had, for instance, piston rods running in cross-head bearings, driving the connecting rods after the manner of accepted steam practice, and the massive crankshaft had a flywheel at each end. The overall length was at least 4′ 6″ and we can well imagine that acceleration was not a very strong point on this model! However, although its great weight is hardly in keeping with modern ideas, the fact that it had an overhead camshaft and many other quite modern features shows that efficiency was being carefully considered even in those days.

Although this car was exhibited at the Crystal Palace Show of 1904 it was somewhat costly, and never went into production in any quantity. The next internal combustion vehicle produced by this Coventry firm was the Lea-Francis V-twin motorcycle, which from 1911 onwards enjoyed considerable popularity, and had a wonderful reputation for silence and smooth running, which was by no means a common attribute of the motorcycle of that time.

Those of us who started our motoring career on two wheels, and most of us did, will remember that this machine was a very long way ahead of its time in many details of design. Fully enclosed chain drive with a transmission shock absorber, and real brakes on both wheels, were things which only came into full use on most machines some years after the war.

The war, of course, caused a complete break in the programme and the whole works was turned over to the manufacture of aircraft parts, and other delicate operations which required a very complete machine equipment. Much experimental work was also done for the Admiralty and some of the complicated and delicate instruments for range-finding and similar work were produced there.



A consistent and successful competitor on road and track, the Lea-Francis can be relied upon to put up a good show anywhere. An "L.-F." is here seen at Shelsley Walsh.

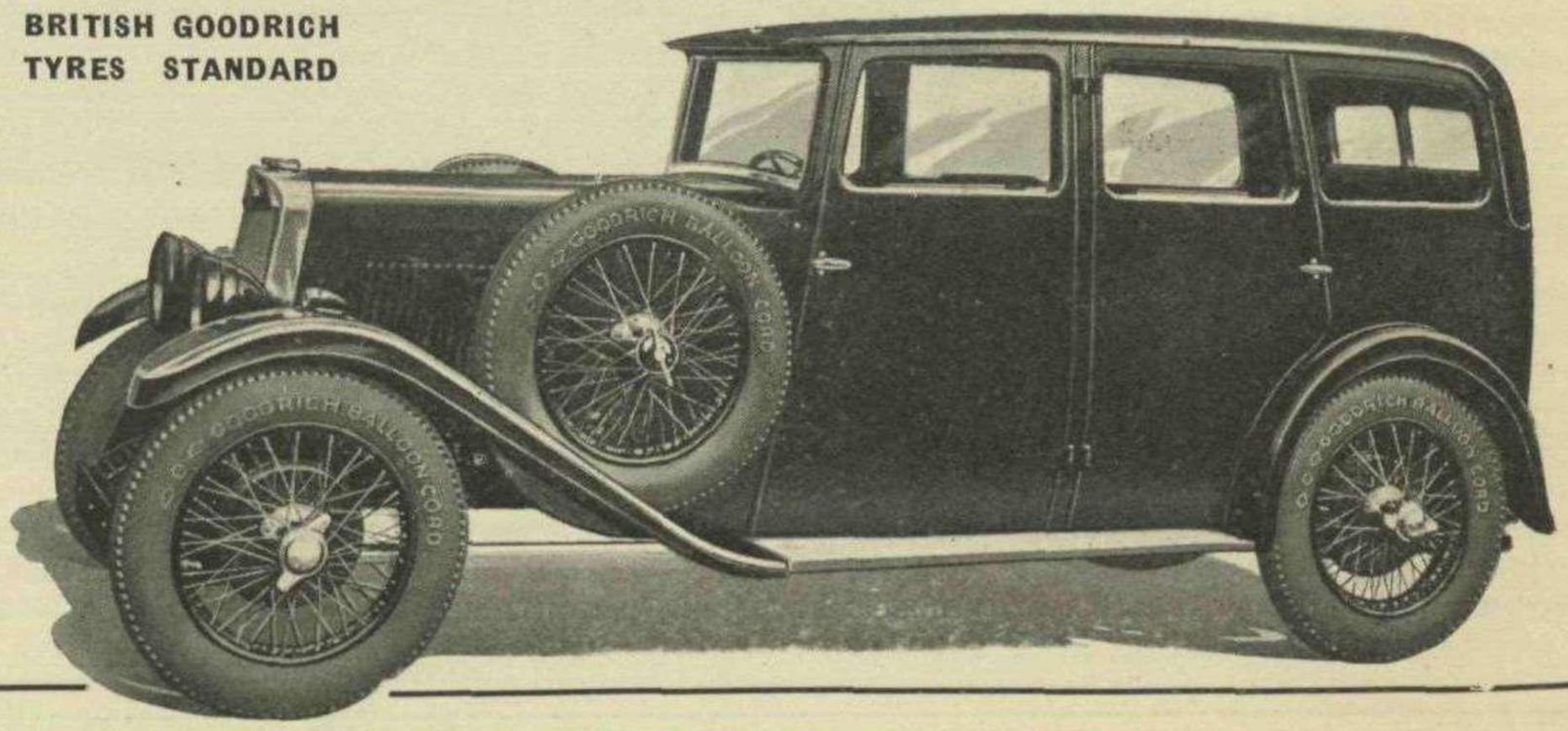
As soon as the works could regain normal conditions after the war, work was started on a 12 h.p. car. This was the real beginning of the Lea-Francis as we know it today, and the 1922 show at the White City saw the first models offered to the public.

The firm took full advantage of competition work as a means of research and of demonstrating the capabilities of their product, and in the R.A.C. six-days trial of 1924 Mr. H. Tatlow, the works manager, was awarded a special Gold Medal for his performance. During this

AN EXPERT OPINION OF THE 'ACE OF SPADES'

The New Lea-Francis 2 litre Six-cylinder Coachbuilt Saloon £495

BRITISH GOODRICH TYRES STANDARD



Writing in "The New Statesman," September 27th, 1930, R. E. Davidson says:

". . . But the new Lea-Francis . . . expresses tendencies that are sound and valuable . . . it is just the kind of car to attract an intelligent enthusiast who desires something better for 1931 and does not wish to be extravagant . . .

This new Lea-Francis has a gear-box which will be perceptibly quieter than the majority when new and is constructed to maintain its original quietness much longer than most . . .

The engine has a crankshaft which can only be described as gigantic . . . the silence and performance of an engine, especially as it ages, depends on a rigid crankshaft rigidly mounted; and no power unit of this size has ever before been so well equipped in this respect . . . it cannot help being a fine engine . . . and an astonishingly durable engine in prolonged hard work . . . this chassis creates an expectation that if its saloon body came to look unfashionable about 1933 an affectionate owner might . . . have a modern body put on it.

. . . the perfomance is of the semi-sports type. Seventy-five miles per hour is a simple affair on top . . . Flat out on third, the car should do sixty . . . This performance is given with a roomy saloon body."

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THE EVOLUTION OF A SPORTS CAR—continued

year, and up to the time that manufacturers were barred by the S.M.M.T. from entering in trials, a most formidable list of trophies had been acquired. After the ban there was no lack of keen private owners to carry on the good work, and ever since, this make has been one of the most popular among keen competition drivers.

Attention was next turned to the production of a really fast sports car, and this resulted in the supercharged 1½-litre model. Being one of the first cars on the British market to fit a supercharger as standard, it sprang into immediate popularity with sports car owners, and proof of the efficiency of this model was supplied in 1928 by Kaye Don's victory in the R.A.C. Tourist Trophy in Ulster on a supercharged Lea-Francis.



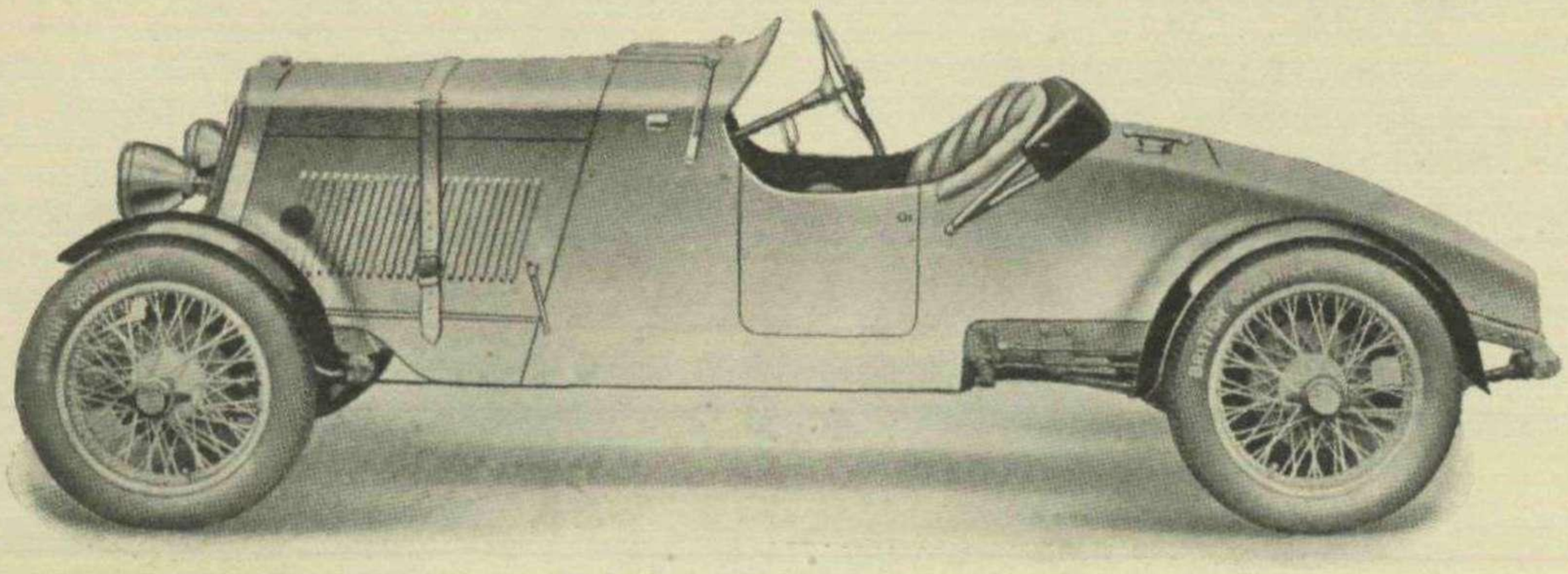
In Ireland, the scene of its former triumphs. A Lea-Francis at the pits in the last Grand Prix at Phœnix Park.

Since then these cars have figured in all the classic events, and have in fact been the chief British representatives in the 1500 c.c. class against foreign competition. Whether winning or not, Lea-Francis cars have always proved to be among the fastest in their class, and the lessons learnt in racing have been of immense value in keeping all their models up-to-date.

For the coming year the 1500 c.c. models have remained very nearly unchanged except for detail improvements, as is only to be expected, and these are obtainable both in supercharged and unsupercharged forms. The most interesting model in their range is, of course, the new 2-litre six cylinder model, of which a description and road test appear elsewhere in this issue, and which shows that Lea-Francis have no intention of losing their reputation for being up-to-date in matters of design and performance.

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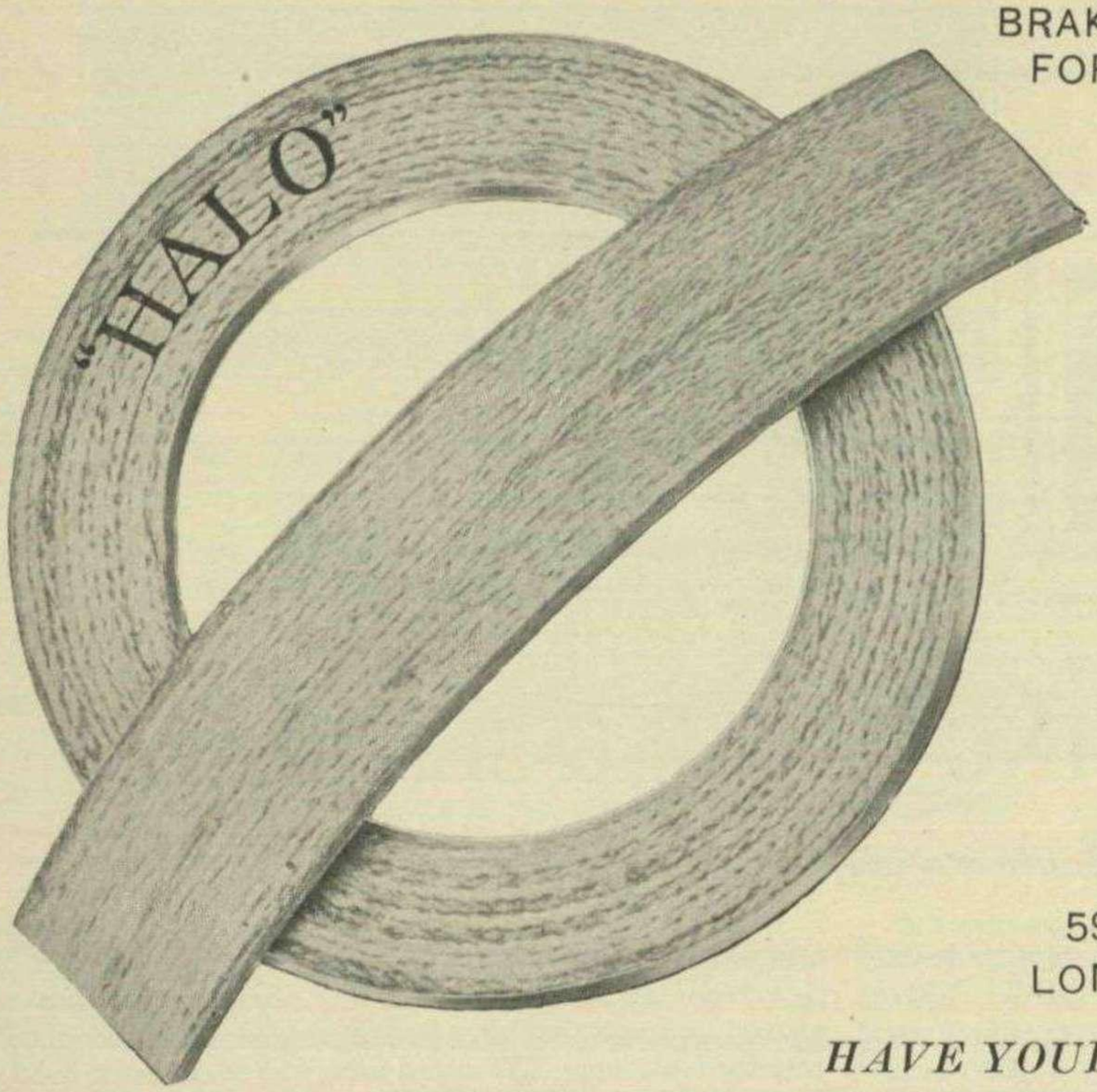
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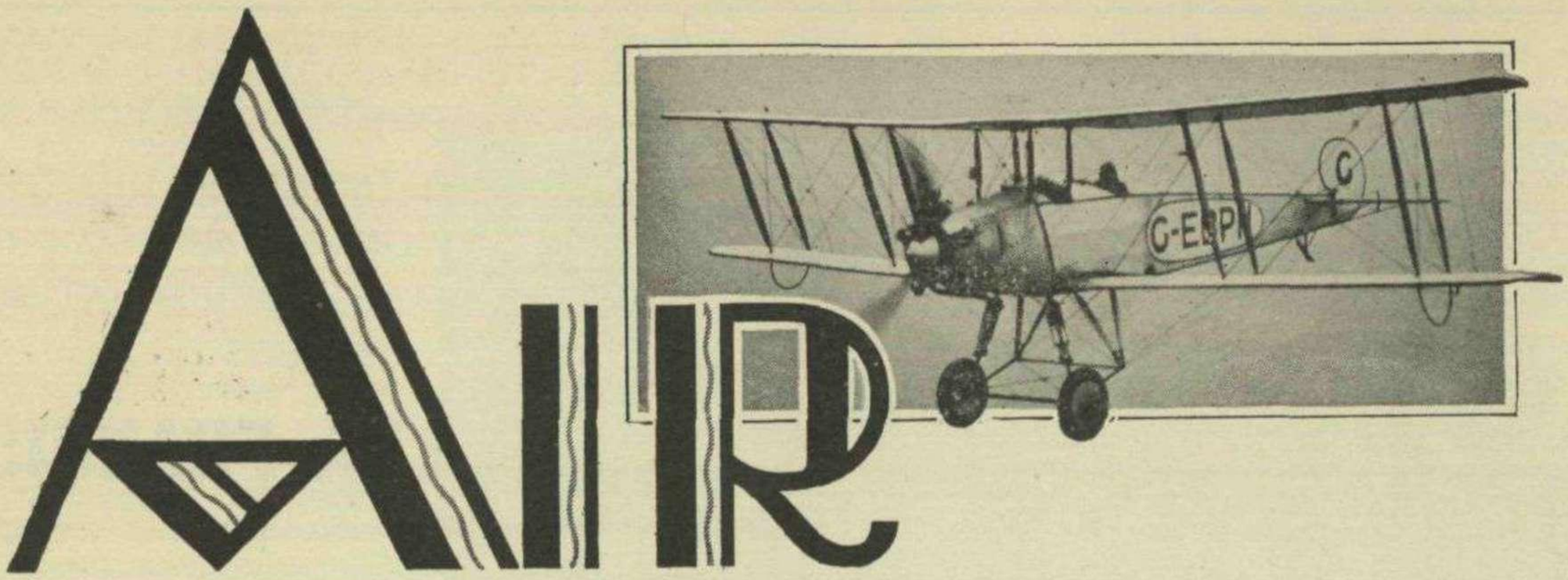


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LIGHT 'PLANE TYPES

A SPORTING SINGLE-SEATER

The Southern Aircraft "Martlet"

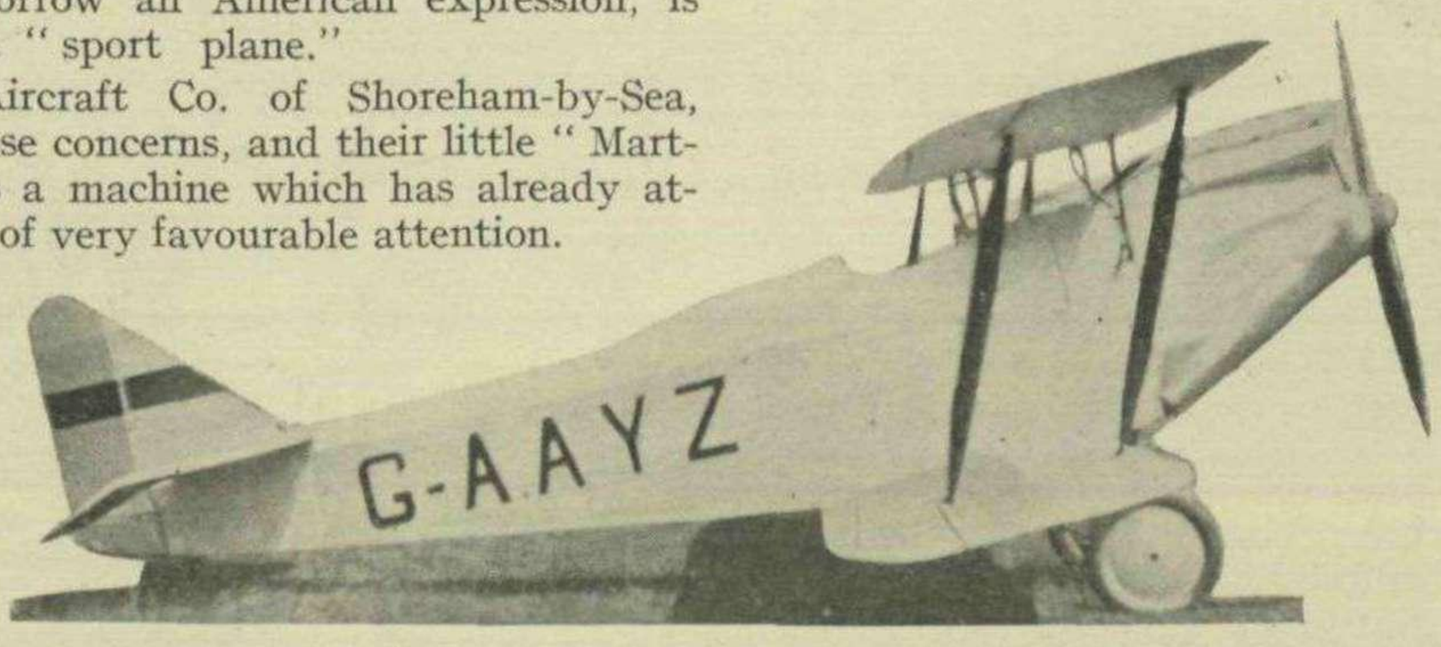
AS private flying progresses, the requirements of pilots are becoming more varied. There are some who seek an increase in comfort and sociability; hence the growing popularity of the cabin machine. On the other hand, quite a number of potential owner-pilots, for some time, have been looking for a plane of a type with which they can indulge in aerobatic and high speed flying as apart from the more staid form of aviation. Their attitude, in fact, is similar to that of the sporting motorcyclist, who plumps for a real sports solo machine and has no use for passenger vehicles.

To meet this demand, which though not large, is nevertheless very definite, at least two British aircraft manufacturers have put into production a type of machine, which, to borrow an American expression, is best described as a "sport plane."

The Southern Aircraft Co. of Shoreham-by-Sea, Sussex, is one of these concerns, and their little "Martlet," single-seater is a machine which has already attracted a great deal of very favourable attention.

The history of its evolution is rather interesting, because while it is quite a modern production, it has its basis of design in that pioneer of post-War light aeroplanes, the Avro "Baby." This latter machine, which was, of course, made famous by Mr. Bert Hinkler's wonderful flight to Turin, was actually designed before the end of the War when Mr. Roy Chadwick of the Avro concern, with commendable foresight, was convinced that when peace came, flying would take on a civilian and sporting aspect. When the "Baby" was first built, its makers were in somewhat of a quandary in regard to the power unit, there being no suitable low-powered engine in production. Eventually, however, an old pre-war 35 h.p. Green engine was found. This was far from new, having in fact, for years been used as a stationary engine in a saw-mill. Nevertheless, this same engine was removed from its workshop bedplate, overhauled and installed in the first "Baby," and it was this identical machine which Mr. Hinkler used. The Avro "Baby", unfortunately, was somewhat before its time and its makers did not continue with it, but the "Martlet," as has already been stated, is really the Avro "Baby" in a revived and revised form.

Naturally enough, it is powered with a modern engine, and it may now be obtained with an Armstrong-Siddeley "Genet," (Mark II or Major), Gipsy, Cirrus or Hermes unit. The airframe is of quite orthodox design and build, being of wood throughout, and incorporates wire bracing. Both the upper and lower planes have dihedral, but the span of the former is slightly greaterthan that of the latter. Ailerons are fitted to both. The structure of the "Martlet" is very robust throughout, and it has a margin of safety sufficient to withstand continual stunting without any fear of complications setting in. The centre section, like the interplane assembly, is braced with Rafwire and the flying wires are duplicated —an unusual feature for a light plane nowadays, but none the less desirable. The leading edge of



Like a fighter in looks and performance—the "Martlet" single-seater.

A SPORTING SINGLE-SEATER—continued.

the main-planes is reinforced with three-ply.

The tail-unit is strongly reminiscent of the "Avian," especially the rudder, which is unbalanced and hinged to a triangular-shaped fin. The tail plane is braced with wires to the fin and to the lower longerons of the fuselage. Care has been taken to keep down the frontal area of the fuselage as much as possible, the cowling of the engine being particularly clean; a padded fairing is also built on to the decking just behind the pilot's cockpit.

The petrol tank is housed in the centre section and is neatly streamlined off. A long-travel Oleo-Steel under-carriage is fitted and the tailskid is sprung with the usual shock absorbing "bunjee."



A head-on view of the "Martlet."

On the ground, the "Martlet" strikes one at once as being a very compact, sturdy and good-looking little aircraft, and its performance in the air shows that it has capabilities which are genuinely surprising. Apart from the fact that it can be "flung about" through a series of loops, half-rolls and other evolutions, its agility is further demonstrated in its take-off, and climb. Under test, for instance, it has been found to get off, without any assistance from the wind, in 32 yards, and the time taken was 5½ seconds. Other tests, in a wind of 20 m.p.h., showed that it requires a run of only 20 yards before becoming airborn. Its rate of climb is also very good, being slightly over 1,000 feet per minute. On the other hand, its landing speed is only 40 m.p.h., while its top speed is in the neighbourhood of 112 m.p.h.

Altogether it would seem to answer in every way to the requirements of the genuine sporting owner-pilot. Details of the "Martlet" are:—Span, 25ft.; Length, 20ft. 3 ins.; Weight loaded, 1,040 lbs. Price £550.

THE ENGLAND-AUSTRALIA TEN-DAYS' FLIGHT

KINGSFORD-SMITH'S ACHIEVEMENT

WHEN it became known that Wing-Commander Kingsford-Smith intended to fly back to Australia it was generally anticipated that he would set up a new record for this journey which has been attempted several times in the last year or so. But few people expected him to cover the arduous route in the amazing time of 10½ days.

Kingsford-Smith took off with his Avro "Avian" (Gipsy II) from Heston aerodrome on October 9th and his progress thereafter was as follows:—1st day, Rome (1,000 miles), 2nd day, Athens (700 miles), 3rd day, Aleppo (1,100 miles), 4th day's, Bushire (950 miles), 5th days, Karachi (1,050 miles), 6th day, Allahabad (950 miles), 7th day, Rangoon (1,100 miles), 8th day, Singapore (1,200 miles), 9th day, Sourabaya (1,000 miles), 10th day, Atamboea (900 miles), 11th day, Darwin (500 miles).

The achievement of thus averaging about 1,000 miles a day, becomes all the more remarkable when it is realised that it was done single-handed, and with a light plane. Only a pilot with Kingsford-Smith's navigating and piloting skill and endurance could have done it, yet it appears that he himself does not consider it as anything out of the ordinary; perhaps this is not altogether surprising with a man who has already flown from America, across the Pacific to Australia, from Australia to New Zealand, from Australia to Europe, from Ireland to America, and made a record-breaking trans-American flight.

Congratulations have showered on him from all parts of the world, and rightly he deserves them.

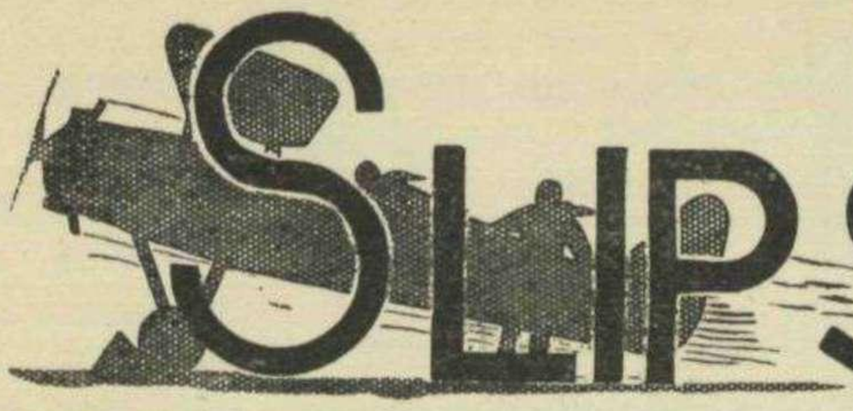
HILL'S HARD LUCK.

In applauding Kingsford-Smith's flight, it would be unfair to overlook the splendid effort of Flight-Lieutenant C. W. Hill who, but for a stroke of really bad luck, on the last stage of his journey, would have set up a new record for the same trip. Hill, like Kingsford-Smith, is an Australian, and a war-time pilot, and he set out with his "Moth" with the full intention of getting to Australia quicker than anybody had done previously. He did amazingly well, and by flying at night he reached Atamboea in 14 days. Unfortunately, when leaving the aerodrome there, his machine refused to "unstick," and Hill hit a fence and the "Moth" sustained a considerable amount of damage.

LANDING AT LYMPNE.

WE are asked to point out to private owner members of the Cinque Ports Club that the facilities for free housing and landing at Lympne only operate during such time as the club is officially open, i.e., between the hours of 10 a.m. and sunset. Private owners landing their aircraft at Lympne at other times, must house their aircraft in the Government hangar, and pay the Air Ministry's fee.

It has been arranged, that for the benefit of private owners, a club employee shall be on duty between 10 a.m. and sunset on the club's weekly off day, but of course, the club room and bar will be shut, and no flying may take place on club aircraft.



SLIPSTREAMS

Helicopters.

THE helicopter continues to attract inventors and constructors; perhaps, not so much in this country as abroad. The Americans, in particular, seem to be firm believers in its possibilities. One of the latest machines of this type has recently been completed by the Curtiss Aeroplane and Motor Co., and is due very shortly for its first test. This machine has been designed by Mr. Bleecker and outwardly resembles in its main features other helicopters, having a vertical shaft on which are mounted revolving planes. It is powered by a 425 h.p. Pratt & Whitney "Wasp" engine, which also drives four airscrews situated beneath the rotary planes. It is hoped to secure directional control by the utilisation of auxiliary surfaces attached to the revolving planes which, when operated are calculated to alter the angle of incidence of the latter. There is also a form of rudder attached to the body or fuselage of this unique machine. The Bleecker helicopter is considered to be a marked advance in design upon earlier efforts and great things are expected of it.

Another helicopter, which has been flown successfully recently, hails from Italy, and is known as the D'Ascanio. It has been flown quite considerably and although it has not risen to any great altitudes, its ability to rise and descend vertically and to be under complete control in flight has been amply demonstrated.

"Charting" Flying Pupils.

The Brooklands School of Flying has, for some time, been operating with a highly systematic method of instruction, which has been working with excellent results. Their scheme ensures that no pupil goes solo without having had the most complete tuition, not merely in fair weather but foul; at the same time the faults, traits, and progress of each *abt initio*, are charted on a board in the instructors' office. This board has sub-divisions appertaining to the various stages of instructional periods, and, according to the pupil's aptitude, so are these sub-divisions marked off. Another detail of the B.S.F.'s system is the provision of a duplicated report, concerning each individual flight, one copy of which is retained by the pupil, and the other by the instructor; this report is produced on the next instruction flight, so that all phases of teaching are satisfactorily checked and completed. Yet another feature of the system is the standardization of tuition routine, whereby each instructor uses precisely the same terms and methods.

Contrary to what many might assume, this way of doing things results in a great saving in time, and pupils reach a state of proficiency much more quickly than by less thorough methods of flying training.

Incidentally, I think, Captain Davis has something to boast about in his school, for during the past season, not a single undercarriage has suffered on any of his machines at the hands of his many pupils.

A Two-Stroke Aero Engine.

The development and growing efficiency of the typical two-stroke motor cycle engine is being watched with increasing attention by aero engineers just now, and from time to time I hear news of coming designs and experimental units working on the two-cycle principle which may possibly be used later on for aeroplane work. One of these is being constructed in London. It is a five-cylinder air-cooled radial with bore and stroke dimensions of 85 m.m. and 88 m.m., and the estimated horse power is 60 at 2,000 r.p.m. Although a two-stroke, it is not valveless, the induction system incorporating poppet valves. The pistons are truncated, as in the Dunelt engine, and the connecting rods, which are tubular, work through ball-slides at the cylinder base. This latter feature is incorporated in order to use the lower bore as a pumping cylinder. Lubrication is of the dry-sump type, with a duplex gear-type pump, carburation is by a single Claudel-Hobson instrument, and ignition is by two B.T.H. magnetos.

The Schneider Trophy.

Following the rather unfortunate situation which arose some months ago concerning entries for the 1931 Schneider Trophy Race from Italy and France, a meeting of the Fédération Aéronautique Internationale has been held in Paris to discuss the position.

In January of this year the committee of the F.A.I. revised the conditions of entry for the contest, the principal alteration being in the sum required on deposit for each machine entered by contestants; this was raised from £40 to £1,600. In June last, however, a full session of the Fédération reversed their committee's decision, and when Italy tendered her entries for the 1931 event they were sent with a deposit at the lower rate. France later supported this action, with the result that the Royal Aero Club returned all deposits.

At the time, the latter body maintained that the F.A.I. had no right or power to alter the new rules drawn up by its own committee, and at the recent meeting in Paris, Colonel O'Gorman (representing the Royal Aero Club) adhered to this declaration. General Piccio, for Italy and the French representative, Captain de l'Escaille, on the other hand, took the opposite view, although hopes were expressed that a friendly agreement might be brought about before very long. The matter has now been referred to arbitration.

In the meantime it has been officially intimated that America will not enter any machines for the next contest.

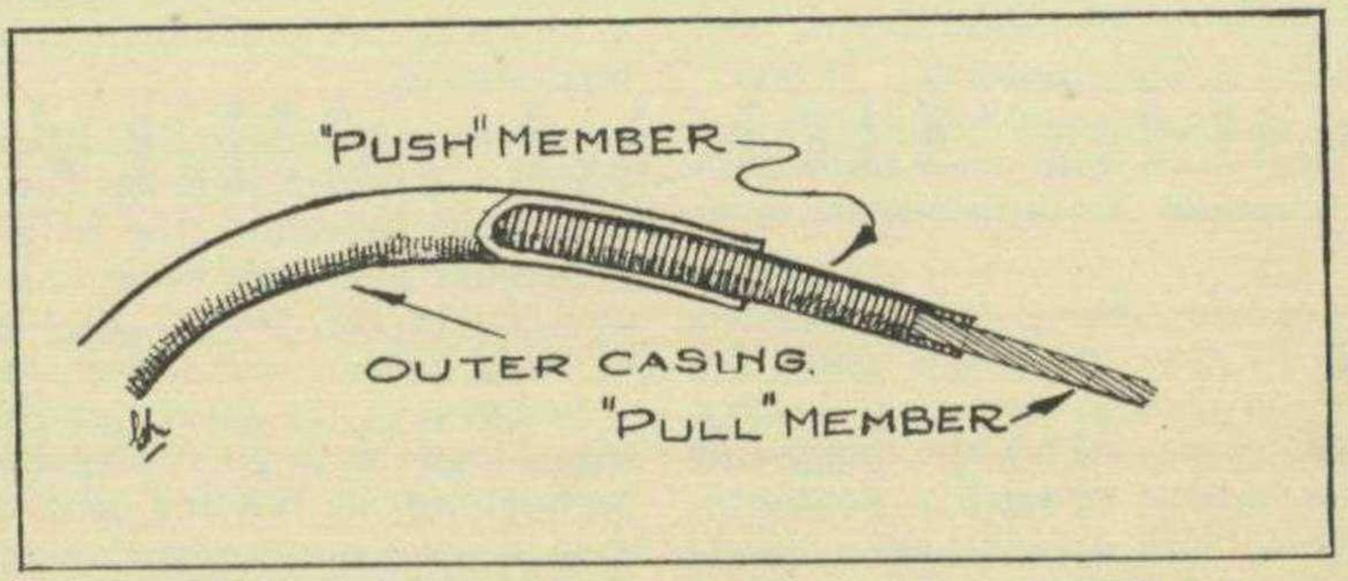
"RUDDERBAR"

The Arens System of Controls

New Device now being Widely Adopted for Aircraft Use

FOR many years it has been generally recognised by aircraft engineers that there was room for improvement in the control systems of aircraft, and in the past decade methods have been devised and employed towards the perfection of this vital part of an aeroplane, so that durability might be increased, and more positive action effected. And to an appreciable extent this has been successfully carried out by the use of ball-bearings, the elimination of fairleads and the reduction in the number of pulleys which, until a few years ago, were common features on all aircraft.

A further step in the improvement of controls is found in the Arens system which has come into considerable prominence lately, mainly on account of Captain Barnard's long distance flight on a machine fitted with this system. Like other efficient and new devices, the Arens control is extremely simple. In main essentials it comprises three parts; an outer casing or tube of duralumin into which is inserted a tightly wound spring which is free to slide in this outer casing, and again, within this second component is an ordinary flexible cable. To each end of this cable is attached, by soldering, a forked-end rod, and these rods bear tightly against the spring member so as to fully compress it. One of these end rods (the one which is connected to the operating medium i.e., "stick," rudder-bar or lever), is extended and works plunger-fashion in the extremity of the outer casing so as to act as a guide to convey the "push" movement by the spring component. The "pull" movement is, of course, taken through the inner flexible cable. The advantages offered by the Arens system at once become clear, for with it there is no necessity for pulleys, fulcrums, rods, or fairleads of any description since the outer duralumin casing acts as a guide for the whole assembly. Moreover, there is no objection to the unit being bent round quite acute radii, the minimum being in the smaller sizes, 1½ inches and in the larger, 4 inches. Another good feature is that there is no possibility of the controls fouling or becoming chafed by extraneous parts, and as it is packed internally with grease, it is practically without friction, and wear is negligible.



A sectional sketch showing the component parts of the Arens control.

Some idea of the excellent wearing qualities found in this new system is provided in the figures given by the R.A.E., following some experiments some time ago.

A length of Arens control was subjected to a test against a frictional resistance of approximately + or — 6 lbs., with engine oil as a lubricant. After 500,000 cycles the "push" member was carefully examined and it was found that the wear on the diameter was .01 inches and after a further 536,00 cycles, during which time the mechanism was sprinkled with quartz sand, there was only another .015 inches of wear. The report also states that no strands were broken following this very strenuous test.

The Engineering Division of the United States Air Service has also put the Arens control to extensive trials with similar satisfactory results. Their official report was as follows:—speed on test, 128 cycles per minute; duration of test 343 hours; total number of strokes, 2,634,240; lateral slack at finish of test .015 inches and longitudinal slack at finish .005 inches.

The system is being widely adopted in the U.S.A. and it has already been accepted by the British Air Ministry for engine and secondary controls on aircraft, and by the German Air Inspection Department for use on German civil and military machines. For engine and, in fact, all remote controls it obviously has great advantages over the more usual rod system in that there is no possibility of waste action developing, and at the same time it is much simpler to adopt and fit.

Captain Barnard's Puss Moth is the first machine to be installed throughout w th this device, but it seems likely that it will be widely adopted before very long.

CINQUE PORT CLUB'S REPORT

A VERY satisfactory state of affairs is revealed in the report of the Cinque Ports Club for the half year ending 30th September last.

For the six months ending 30th September, 1930, the three club aircraft between them flew no less than 868 hours 25 minutes. Mr. K. K. Brown as instructor flew 470 hours in the six months, and "A" licence pilots and soloists under instruction, flew just under 400 hours between them. Assuming a cruising speed of 75 miles per hour for the Cirrus Mark II Moths, this hourage represents a distance of 65,000 miles flown by the three aircraft during the period. Receipts from the sale of flying tickets to members amounted to over £1,350.

Mr. Brown trained as many as twenty-four new pilots in the six months—an average output of one a week. This represents the maximum efficiency yet attained by this club, and shows results probably unsurpassed by any other club in the country.

Gliding Gossip and News

MEMBERS of the motor trade appear to be amongst the keenest followers of gliding. Already several car firms have their own clubs, and one of the latest to be formed is the Wolseley Gliding Club. The President of this club is Mr. W. Cannell, Managing Director of Wolseley Motors, and Mr. Oliver Boden, O.B.E., is Vice-president. Memberships figures now stand at 75, and although it is not intended that any gliding shall take place until next spring, subscriptions are coming in, in increasing numbers.

LAST month the London Gliding Club staged a meeting at Itford, Sussex for inclusion in a sound-film now being made by the Gaumont concern. Lupino Lane figures in the production, and for the purpose of the film, Colonel the Master of Sempill "doubled" him. He flew a Prufling machine, clad in Lane's blazer, much to his own and the onlookers' amusement.

WETLEY Common, near Cheadle is the site chosen, and now being used by the recently formed North Staffordshire Gliding Club. In spite of rain and unsuitable weather conditions several successful meetings have already been held their during the past few weeks. It is announced that instructional sessions will be carried out every Sunday, under the guidance of Mr. Coles.

MR. Lowe-Wylde, the founder and leading spirit of the Kent Gliding Club gave a lecture on gliding recently at the Constitutional Club, Bexley Heath, when a large number of people associated with the movement were present. Mr. Lowe-Wylde, it may be remembered, has formed a company for the manufacture of gliders and sailplanes, and it is understood that the concern—known as the British Aircraft Co.—are now fully occupied in executing various orders for machines which they have lately received.

THE Bridlington Club, which was formed some time ago, has now fixed its headquarters at Fordon, Kent, where suitable ground has been found for preliminary training. The club owns a B.A.C. machine of a type which, by means of an interchangeable fuselage, can be converted into a soarer.

ON 14th October, the British Gliding Association held a dinner at the Trocadero, London, on occasion of the return to this country of Herr Robert Kronfeld. It may be recalled that during the recent International Competitions at the Wasserkuppe, the Association offered a prize for the pilot who flew the longest distance, the award taking the form of a week's visit to England. Kronfeld proved the winner—hence his re-appearance.

EQUIPMENT of the Isle of Wight Gliding Club has been progressing well during the past few weeks. The dual-control glider is now at the works of Saunders-Roe, Ltd., where it is being reconditioned, and delivery has already been accepted of a new machine—a B.A.C. II trainer. Unlike some other clubs, the Isle of Wight Club intends to carry on throughout the winter months; apart from instructional work, members intend to build a third machine, preliminary work for which has already been started.

WE learn from the Sail-Plane Club of the T.M.A.C. that Mr. E. G. Smettem has now succeeded Mr. J. Welding as hon. secretary, the latter having resigned owing to pressure of private work. All communications should now be sent, therefore, to Mr. Smettem whose address is: 2, Wine Office Court, Fleet Street, London, E.C.4.

Included in the Club's proposed programme for the winter months is the construction of a sailplane, and negotiations are pending for the acquisition of a workshop in London. Prospective members should note that the subscription for the Club is £5 5s. per annum for flying members, and £1 1s. for non-flying members.

THE Scarborough Club have secured the services, for a period, of Herr Magersuppe for giving instruction in soaring to their members on their new dual-controlled two-seater Kegel machine.

They took delivery of this craft early last month, and the occasion was marked by a ceremony at the Royal Hotel, Scarborough, where the Lady Mayoress christened it *The Scarborough*.

ORGANISED by the British Gliding Association, a two-days' inter-club gliding competition was held at Ditchling Beacon on October 18th and 19th. The event was highly successful, with favourable weather conditions, and no less than five club teams participating; these were London, Kent, Surrey, Channel and Portsmouth. Besides team matches for elementary training machines of the "Zogling" type, and intermediate gliders, there were individual contests for pilots.

The results were as follow:—

Individual duration competition ("Zogling" class): Captain Stratton (Surrey Club), time 1.40 2/5 minutes. (Prize: silver cup, presented by Cloudcraft Glider Co.)

Individual duration competition (intermediate training type class): R. Mathison (London Club), time 4.37 3/5 minutes.

Inter-club team match ("Zogling" class). Teams of 3. Pilot's prize to be awarded for the best flight in the winning team: 1st, Surrey Club, time 7.4 4/5 minutes. Team award: dope (presented by Titannine-Emaillite Co.)

Inter-club team match (intermediate training type class). Teams of 3: 1st, London Club, time 12.42 minutes. Awards were—dope (presented by the Cellon Co.), and a silver tankard as pilot's prize. The latter was won by R. Mathison.

THE SPORT AFLOAT



A VERY GOOD SHOW

THE fact that the motor boat and car trades are in so many respects allied, was evidently the guiding thought behind the introduction of a boat section to the car show at Olympia. As a result many thousands of car owners, who are all potential owners of motor craft, were brought into contact with an aspect of motoring which was new to them, and the sport of motoring on the water should flourish as a result.

The novelty of this part of the exhibition was a great point in its favour as to a large body of motorists the car show is just the least bit boring. As the majority of manufacturers introduce all the models in their programme some time before the actual show, many people are only too glad to find something else at Olympia to claim their attention. It is probably in this capacity that the boat section attracted many, but it was certainly on its own merits as the most interesting section of the whole show that it held their attention.

Well-arranged

Many who only strolled over to the new hall to pass the time stayed there all day, and came again. Never has there been in this country such a well arranged exhibition for the purpose for which it was intended, that was to turn the road motorist into a potential water motorist. The features most likely to appeal to them were stressed, and although many will realise, once they have had some experience, that in motor boats in general and cruisers in particular, high speed is not essential to good sport, most of the craft shown were of the high-speed type.

One of the most striking exhibits was the 48ft. Thornycroft express cruiser powered with a 400 h.p. 12-cylinder Thornycroft engine, and costing approximately £10,000. The actual boat shown was arranged as a day cruiser, and the upperworks were obviously constructed for work in reasonably fine weather. The hull, however, is almost identical in design with the famous C.M.B.'s, than which there is no more seaworthy craft of this type in existence. The power plant was shown separately alongside the boat, and is a most impressive affair. Forward of the main engine is a 10-16 h.p. 4-cylinder Thornycroft engine which is used to drive an air-compresser for starting the main engine, when the air supply has run out. The small engine has an electric starter. The main engine, when running, automatically stores up compressed air in another chamber, by means of a second compressor, so that normally, the small engine is not required. It is however useful in other ways, as it drives a shaft running alongside the main engine through a reduction gear to the main propeller shaft. This is intended for maneouvring in harbours, or shifting to other moorings, when it is not considered worth starting the main engine.

Every control is centralised, so that one man can manage the craft with ease ; the instruments are a first sight a somewhat fearsome array, but the various controls are self explanatory on closer inspection. A speed of 40 m.p.h. is claimed, and we understand that a considerable number of these boats are supplied for use on the big rivers of India and South America. A good array of their more normal sized power units are also shown, including the famous 2-cylinder " Handybilly," one of the most famous auxiliaries for small yachts ever built.

Another express cruiser of similar size is the Despujols, shown by Kensington-Moir and Straker, Ltd., the Aston-Martin distributors, and one of these cruisers is run by Nigel Holder, who, our readers will remember, drove in turn with A. C. Bertelli, in the Aston-Martin—which put up such a fine show in the " Double Twelve " this year. The same firm also had a Knight outboard cruiser on their stand. Another good example of this type of boat was the Rytecraft, shown by Elto Motor Sales Co. Ltd., who also displayed a range of Elto outboard motors.

New Outboards

Indian outboard engines have been introduced to this country by the Elephant Marine Equipment Company, who also showed Lockwood Motors, and a very attractive runabout. This firm also maintain a remarkably complete stock of every sort of equipment for both large and small boats.

A VERY GOOD SHOW—continued.

One of the most interesting outboard motors for the racing man is the latest Sharland, which is made in the Class B size. This is a flat twin 4-stroke with push-rod operated overhead valves and can be supplied with a compression ratio of 8½ to 1. Two motorcycle type carburettors are fitted, and it should be a likely performer in the future.

The firm of Salter Bros. has always been famous for the production of high class river craft and launches in particular, and the examples shown on their stand were very attractive craft indeed. Both inboard launches with Morris engines, and outboard craft with Johnson motors were among their exhibits. The racing hydroplane by this firm is a very fine piece of work, and has already won many events.

The latest Johnson outboard engines are really the neatest units of this type we have seen, which, added to their fine reputation for power and reliability, will make them even more popular next year.

Among the larger high speed launches the Chris-Craft shown by Arthur Bray, stand out both for their delightful lines and finish, as well as for their well-known performance.

In the cruiser class there is a good selection of boats of which the Hyland 35 footer, and the 36 footer with enclosed bridge deck giving central control, are fine examples, the latter vessel being driven by twin screws.

It is a great pity that there are not more sailing craft in the exhibition, but the Hillyard 7-tonner, which is a sailing vessel with a Thornycroft "Handybilly" as an auxiliary, is a very sturdy craft. In fact if it came to being out in really heavy weather, we would rather be on board this boat than any other in the show. It has ample draught, and fine lines for sailing, and the depth enables full 6ft. head-room to be given throughout without increasing the top hamper. As its price is only £535 complete with sails and full equipment, it should make a great appeal to the motorist who wants to spend his holidays afloat without spending too much on them.

It is to be hoped that the combining of the boat and car shows will result in a considerably increased number of motorists taking to the water next season.

A LOW-PRICED BARGE YACHT

WITH AUSTIN SEVEN ENGINE

HAVING already tried various fairly fast Austin engined boats, we were glad of the chance to see how this remarkable little engine will perform in a heavier type of craft. Therefore when Mr. Scott-Moncrieff told us to take his yacht "Watergirl" and do what we liked with it, we took him at his word and repaired to Kingston, where it was lying, to see how we liked it. Although described as a barge yacht, it differs considerably from the conventional idea of this type. Whereas a barge yacht is usually primarily intended for use under sail, this particular example appears to be intended chiefly for use under power. As a result of giving really full head room in a boat of only a few inches draught and under 20ft. in length, there is a considerable amount of top-hamper, and this is bound to restrict the sailing qualities except under favourable conditions. A centre board is provided in place of the more usual lee-boards, and this simplifies handling under sail.

The engine is neatly installed under the floor of the well, and the reverse and throttle controls are within easy reach, though personally we should have preferred a longer lever on the reverse control. A marine type reverse is fitted in place of the standard gear box, which simplifies manoeuvring. The full electric equipment of the standard engine is included, but when it is required to start up by hand this can be done from the cabin.

The accommodation is remarkable for the size of craft and it will sleep four in comfort. In fact the whole layout and design is obviously intended for comfortable use on comparatively sheltered waters, though, even if the headroom was considerably sacrificed, and the cabin top and free board reduced to enable the craft to tackle heavier weather, it would still be a roomy boat; and we would personally prefer to forgo some of the present headroom to this end. This is, however, a matter which could be arranged to suit an individual purchaser without materially affecting the cost.

The speed under power is just over 4 knots. Although this is rather low, it is chiefly due to the fact that the engine is only run at comparatively low speed, and therefore does not get a chance to develop its full power. This has been done intentionally on the actual boat we tried, but it could be greatly improved by the use of a more suitable propeller.

The mast is mounted in a tabernacle, which is a necessity for inland waters such as canals, for which the boat would be ideal, and although this form of cruising does not seem to be much in vogue, the writer can vouch from personal experience that it makes a very interesting and enjoyable holiday.

The construction of this boat is on very robust lines throughout, and should last indefinitely with the minimum of attention. The equipment is remarkably complete, even to crockery and a cooker in the galley, and includes all standing and running gear, electric light, cushions etc. Considering the very generous strength of all scantlings, and the good finish the price of £225 makes it a very attractive proposition.

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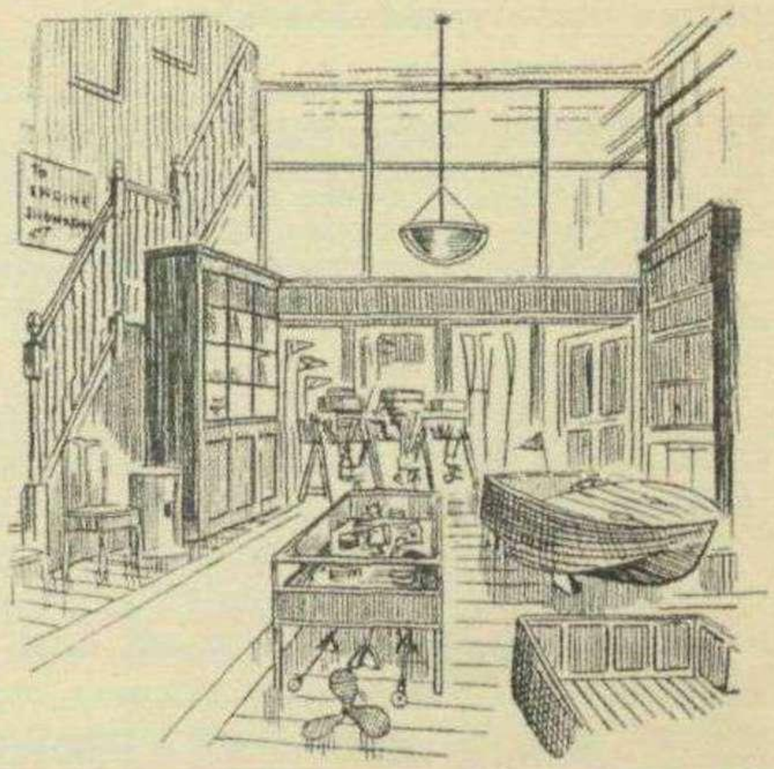
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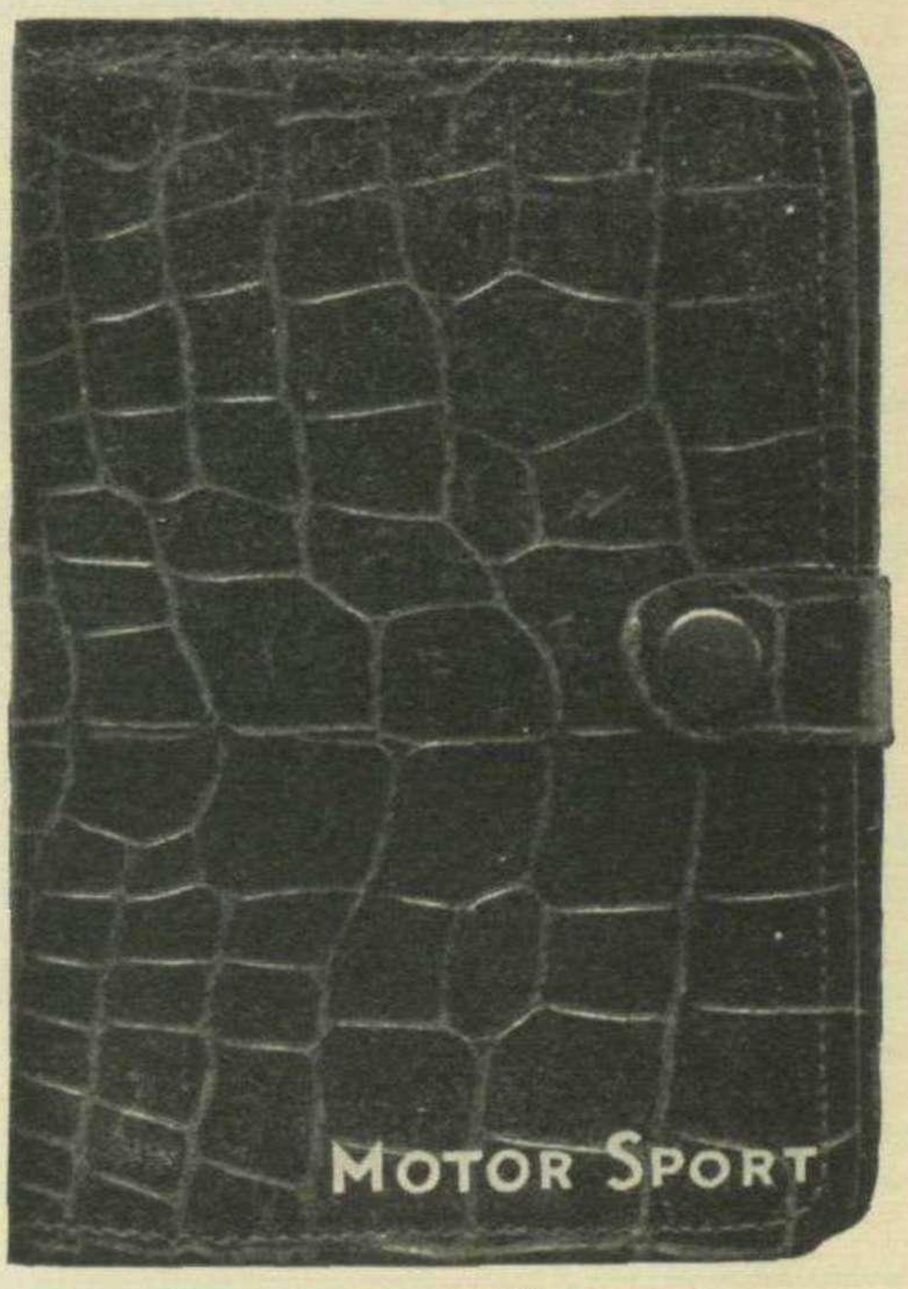
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ACTUAL SIZE

HERE and THERE

By "Camshaft"

Bentleys and World Markets.

THE efforts of the British motor industry to develop their export markets both in the Colonies and elsewhere will receive a fillip by the latest move of Bentley Motors, preliminary details of which, I heard of some little time ago.

The success of this car in International road races has earned for it a world-wide reputation and with the introduction of the new 8-litre Bentley, this firm now intends to make a bold bid for the world market and it will thus consolidate the prestige that Britain has always enjoyed as the producers of the world's finest motor cars.

A new Company—the Societé Européenne Bentley Automobiles S.A. is being formed with large capital resources, and the first step of this new organisation will be to open, in a few weeks time, a depot in Paris. The new depots will carry a full stock of essential spare parts and will be staffed by mechanics trained in the London works. Incidentally, this provision will prove a boon to the many British owners of Bentley cars who use their cars on the Continent.

Similar service organisations are to be established in other parts of the world, and arrangements for New Zealand were concluded some weeks ago.

Captain Woolf Barnato, who will be Chairman of the new Company, is now in America to arrange for the establishment of sales and service depots in the United States and Canada.

Barred from Paris Show.

The " responsibility " of the private motorist to the manufacturer of his car was demonstrated in a somewhat curious way just before the Paris Motor Show.

Earlier this year it may be remembered, it became popular for British motorists to " Beat the Blue Train " from the Riviera to Calais. The second aspirant for this honour was the owner of an Alvis, who made the attempt most successfully without the support—or even knowledge—of the manufacturers of the car.

Certain French motorists resented these British speed efforts intensely, and the result was that the Alvis Company, amongst others, was " barred " from exhibiting at the Paris Show unless they paid the authorities a cash fine. They were given no chance of defending themselves or explaining that the attempt was made without their knowledge or consent. This queer conception of justice is perhaps a Continental privilege.

A curious feature of the case is that " records " from town to town or coast to coast are almost everyday occurences in France, where—apparently provided that they are made by Frenchmen in French cars—they are made much of in the press and claimed as magnificent achievements !—well, well.

New London Showrooms.

What are probably the largest show-rooms in central London for the sale of one make of car have just been opened by the distributors of the Rover Company at 205, Great Portland Street, where there is space for no fewer than seventy cars to be shown without overcrowding.

This new departure, which is an interesting index to the growing demand for Rover cars, follows the amalgamation of Auto-Distributors, Ltd., of Baker Street, and Coppen Allan, of Great Portland Street, who, under the name of Coppen Allan Auto-Distributors Ltd., have been appointed sole wholesale distributors of Rover cars throughout London, Middlesex, Hertfordshire, and a large part of Surrey, Essex and northern Kent.

At the opening some little time ago a full range of 1931 Rover models was on view for the first time in London. These, of course, comprise the improved 10/25 h.p. model, selling at the low price of £189, the Two-Litre at £298, the Light Twenty—an entirely new model, —at £398, and the well-known Meteor, which is listed at £358. The last three models are Sixes, a feature of their lay-out being a four-speed gear-box with " Silent Third " ratio.

Winter and Windscreens.

With the steady rise in popularity of the enclosed body—and the Show gave some indication of how great it is—the matter of good visibility for the driver becomes increasingly important. The numerous types of windscreen wipers now on the market do much to diminish the inconvenience and danger of driving in wet weather, when the screen becomes blurred, of course, but very often their action is not enough ; at least, this is the opinion of many motorists. And to these, a preparation for dressing the screen and windows both inside (where it prevents condensation) and the exterior, should be of interest.

Known as " Clarocit " this substance is of a vegetable compound, and its action in keeping the glass clear remains effective for several hours. " Clarocit " has been on the market for some years now, and I understand that it is being utilised in many directions—for shop windows, cinemas, and dental work, to mention but a few ; several provincial councils and companies are also using it on their trams and 'buses. A member of the staff of MOTOR SPORT has recently carried out a test of this preparation and found it entirely satisfactory. The manufacturers address is :—Clarocit Co., Ltd., 110, Great Portland Street, London, W.1., from whom it may be obtained in tablet form in a convenient holder at 2s. 6d. Its application is simple ; the surface of the glass is damped, rubbed lightly with the preparation, and finally polished with a dry cloth.

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AUSTIN Seven 1927 "Cup" Model, fully equipped' new hood, spotlight, and special exhaust system, £60. Box 815, MOTOR SPORT.

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1926 Bentley Short Chassis 3-litre Vanden Plas 4-seater Speed Model, grey and red, exceptional condition, taxed; £340.—B.M.C., Ltd., 8, Brick St., Park Lane, W. Gros. 1768-9.

BENTLEY 3-litre Speed Model, exceptionally smart 4-seater body, Triplex, rear screen, F.W.B., mechanically and coachwork faultless, taxed year, many extras; will accept £210.—John H. Cotton, 36, Bourdon St., Berkeley Sq., W.1. Mayfair 4870.

1924 3-litre Bentley 2-seater Drop Head Coupé, extremely fine mechanical condition, just been repainted and completely overhauled; £225.—Rawlings Bros., Cromwell Rd. S.W.7. Kensington 6370.

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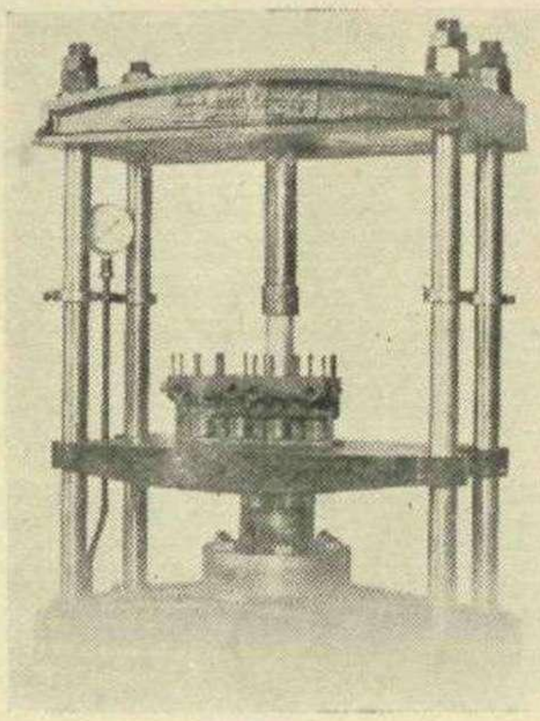
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