Vol. VIII. No. 2 December, 1931

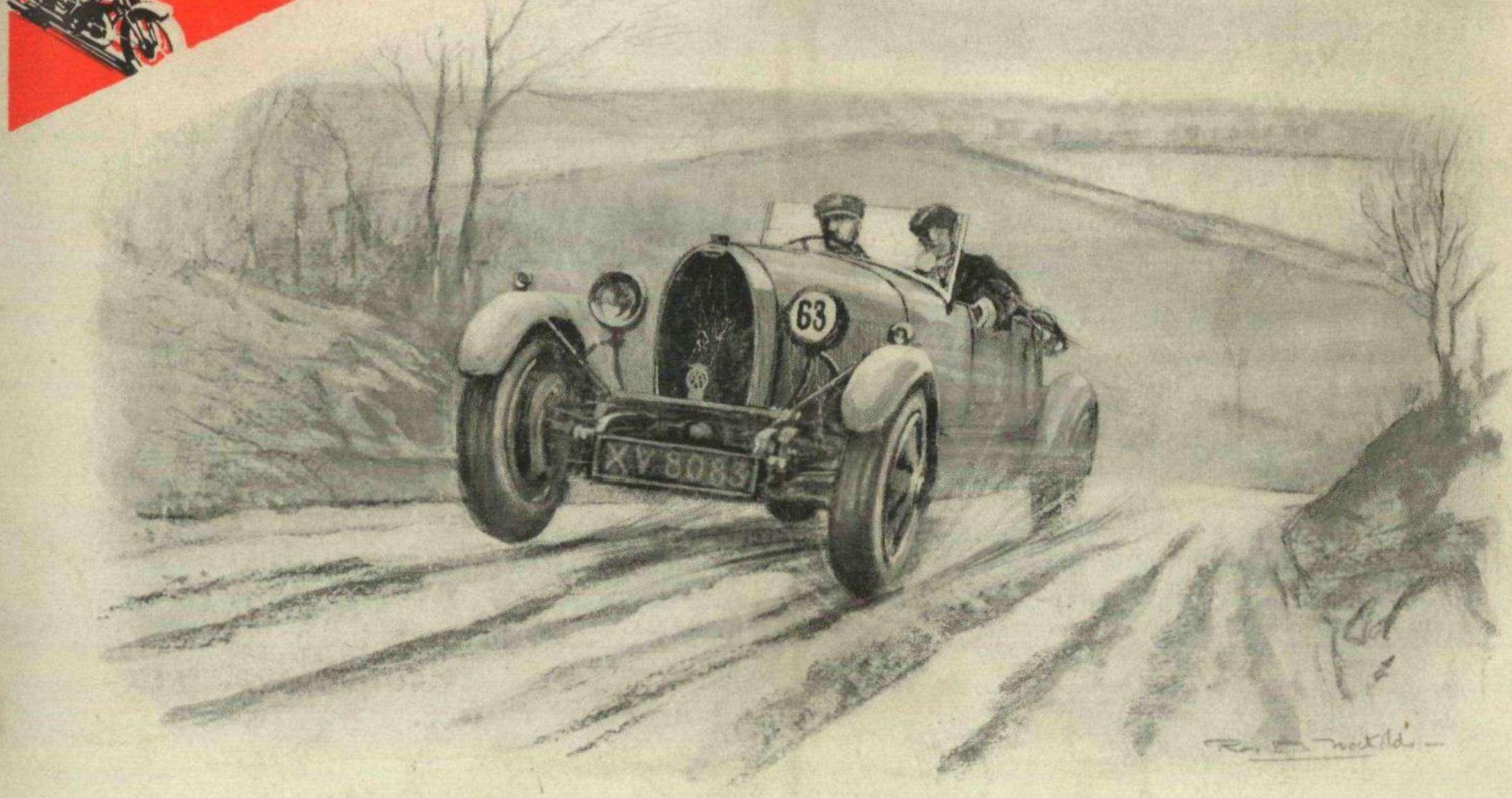
MOTOR SPORT

LAND AIR WATER

Incorporating the BROOKLANDS GAZETTE

6D

Monthly



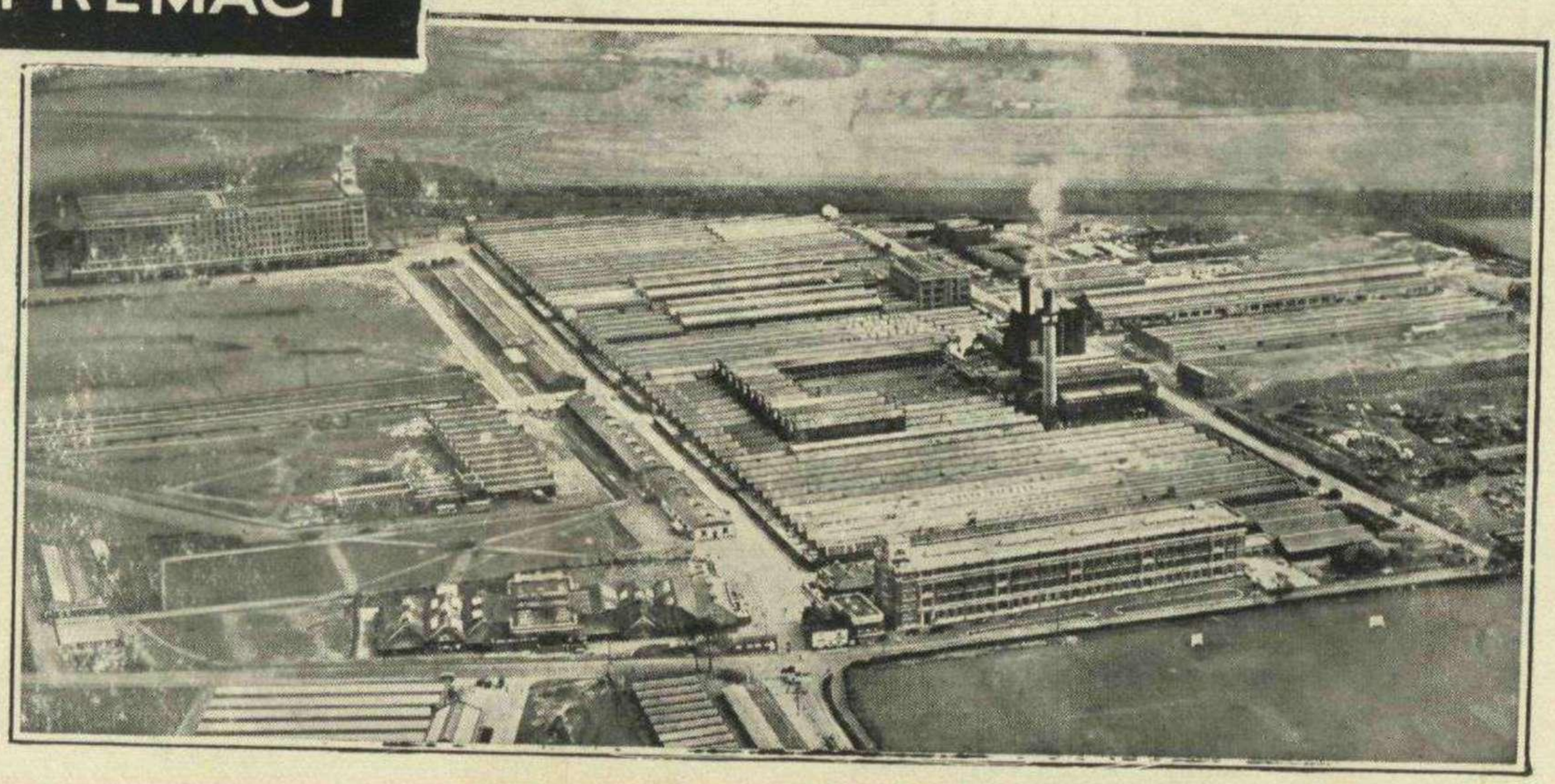
OWNERS OF FAST CARS
Should always specify



FERODO REGISTERED
BRAKE LININGS
FERODO LIMITED • CHAPEL-EN-LE-FRITH
32/397

REASONS FOR DUNLOP SUPREMACY

NUMBER ONE

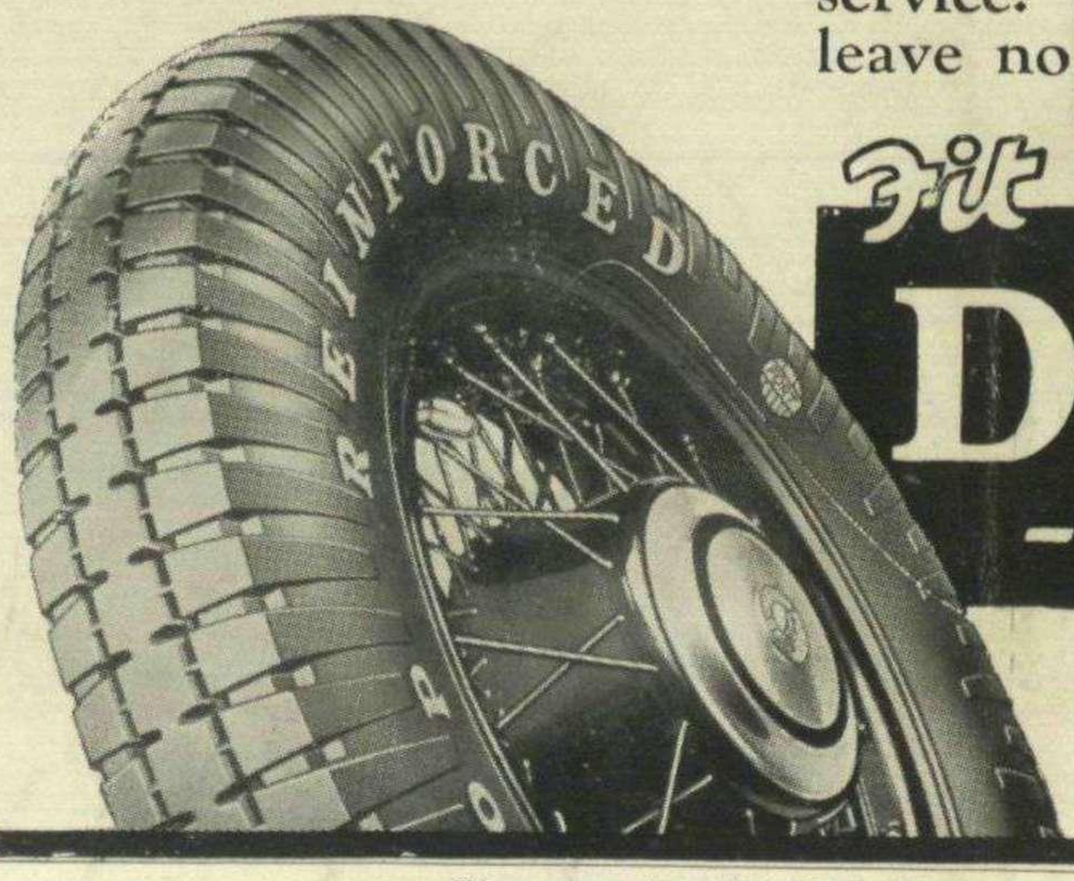


An aerial view of Fort Dunlop, the stronghold of the British Tyre Industry.

From beginning to end

Dunlop quality rests on a sure and scientific foundation. It is the result of patient research, wide experience, comprehensive testing and knowledge properly applied. Dunlop quality is built upon facts; facts which are obtained by scientific tests. The tests on Dunlop tyres commence with the raw materials, and continue throughout every stage of manufacture right up to the behaviour of the finished tyre in actual service. Dunlop tests are conclusive. They leave no room for doubt.

The Dunlop Book of Maps will show you the road. Price 3/- from all booksellers.

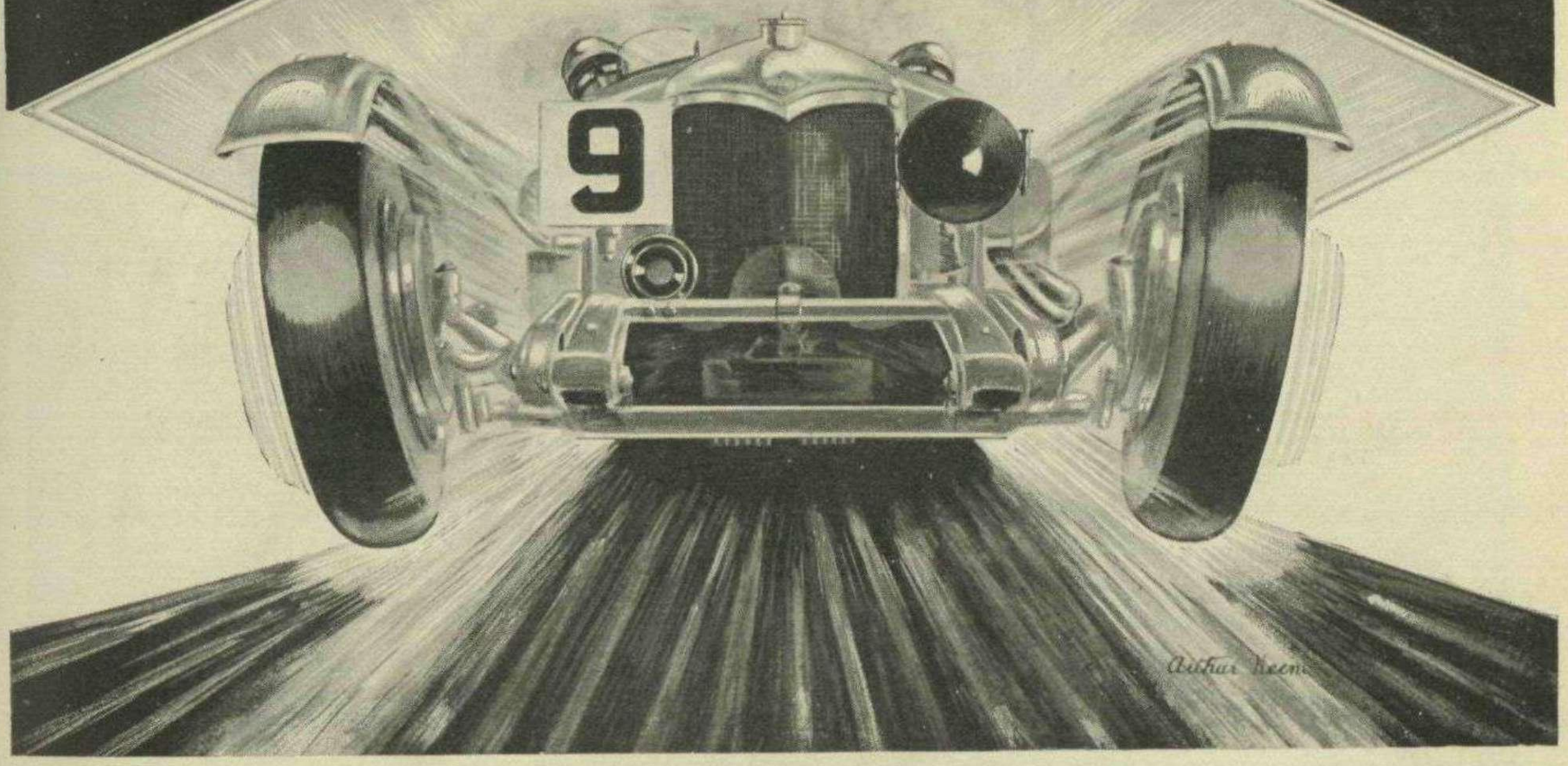


Fit DUNLOP - the tested tyre

Secure the maximum benefit from Dunlop tests by checking your own tyre pressures every Friday.

C.F.H. 803

ALWAYS Riley IN FRONT



Against all Comers!

21 International Records are now held by 9 h.p. 1,093 c.c. Riley Cars. In the case of records marked* the car was a standard Monaco Saloon running with sealed bonnet. The other records were secured by a Riley 9 h.p. Brooklands Model. All records were gained without supercharging.

50 km's. - 108.90 m.p.h.	500 km's. - 104.08 m.p.h.	4,000 km's. - *64.85 m.p.h.
50 miles - 108.39 m.p.h	3 hours - 104.08 m.p.h.	1,000 miles - *67.80 m.p.h.
100 km's. - 108.06 m.p.h.	500 miles - 98.18 m.p.h.	2,000 miles - *65.54 m.p.h.
100 miles - 108.05 m.p.h.	6 hours - 99.06 m.p.h.	24 hours - *66.63 m.p.h.
1 hour - 108.11 m.p h.	1,000 km's. - 99.24 m.p.h.	5,000 km's. - *64.39 m.p.h.
200 km's. - 108 28 m.p.h.	2,000 km's. - *66.82 m.p.h.	3,000 miles - *64.44 m.p.h.
200 miles - 104.19 m.p.h.	3,000 km's. - *65.78 m.p.h.	2 days - *64.37 m.p.h.

RILEY (Coventry) LTD—COVENTRY



Finesse en Vitesse.

This fine speed study of a Bugatti being driven in true Continental style is reproduced from a painting in oils by our artist, R. A. Nockolds.

VOL. VIII. No. 2.
SUBSCRIPTION RATE
8/- PER ANN. POST PAID

DECEMBER 1ST, 1931.

PRICE SIXPENCE
Published 1st Month

MOTOR SPORT

INCORPORATING THE BROOKLANDS GAZETTE

JOINT EDITORS } *GRENVILLE G. O. MANTON.*
W. S. BRAIDWOOD, B.A. (Mech. Sc.) Cantab.

Editorial, Publishing & Advertising Offices
39, VICTORIA STREET, LONDON, S.W.1
Telephone: Victoria 5218.

The Way of Things

THE possibility of a British racing car is one which is often discussed by the motoring fraternity, and the fact that at present all racing car events go to foreign makes is sometimes used as an argument that foreign sports cars are definitely superior to ours. But that we can produce sports cars of equal merit to our rivals is evidenced by the firms of M.G., Talbot and Riley, to mention but three who have taken a big part in the season's racing. Their success is sufficient to show that there is a good choice available without going abroad.

In the matter of the genuine racing car, we shall never be able to compete successfully, or even wish to compete at all, until a road race for such cars is actually held in this country. A sports car race would pave the way and arouse the public's desire for more, but at present the chances of any such event are frustrated by the obstructive and retrograde policy of the authorities.

There are at present three possible ways open. The first is the introduction of a Road Racing Bill, which, as it will have to be a private members' bill, is unlikely at present to survive the attitude of the authorities we have mentioned. The second is the closing of, say, Richmond Park, and holding a race therein, a suggestion which has already been made by our contemporary, *The Motor*. The difficulties in the way are considerable, but we hope not insurmountable. The third course is the adaption or construction of a suitable *venue* in the grounds of some private estate, and it is here that the attraction lies of the project being undertaken by the Automobile Racing Association on the shore of the Wash.

If any such schemes can be completed in the near future there would be a stimulus for motor racing which would probably lead to the reintroduction of the genuine racing car as a means of development in this country. If this comes, we should have no great difficulty in finding the brains, material, and drivers for supplying a British team.

But until this is done it is pretty safe to prophesy that we, in this country, shall have to leave the field of genuine racing to our foreign rivals, who from the earliest days have had the advantage of being encouraged not only by the public, but the authorities as well.

CONTENTS

	PAGE
The Way of Things	51
LAND.	
The Intervarsity Trial	52
"No. 26"	56
Rumblings	59
A Striking Sports Coupé	61
Modern Carburettor Development	63
A Day with the Testers	65
1931 in Retrospect	67
Veteran Types—X. A 1914 G.P. Opel	71
Two Home-built Hybrids	75
Motor Races in 1931	77
Club News	78
Items of Interest	79
A Technical Talk on Crankshaft Compromises	81
The Veterans have a Day Out	84
Here and There	94
AIR.	
What America is Doing	86
Stag Lane—and the London Aeroplane Club	88
A "Swift" Flies to Australia	90
Slipstreams	91
WATER.	
A Forerunner of the Speedboat	92

THE INTERVARSITY TRIAL

Oxford and Cambridge hold their Annual Affair.



Niven's M.G. Six making a valiant but unsuccessful onslaught at Alms Hill. [*Motor Sport Photograph*

ON Saturday, November 14th, occurred the annual mud-lark between the C.U.A.C. and the O.U.C.C. The weather was good, and although the organisation was more than a little hazy, the route was well and plainly marked, and a good time was had by all, or nearly all. After a certain amount of preliminary confusion, caused partly by the Cambridge secretary having other business to attend to unexpectedly, a few days before, in connection with some tomatoes (nothing to do with market gardening apparently), we finally ascertained that Ye Old Crown at Marlow was the starting point.

Having collected our navigator, mobile ballast, and court jester (all incorporated in the person of a fellow scribe who shares our predilection for utterly aimless and muddy motoring), we piloted one 5 year old Frazer-Nash to the start, to find an unexpectedly large entry working feverishly on an assortment of automobiles.

These varied widely in age, type and suitability for trials work, but all seemed hopeful. Precautions against wheelspin ranged from chains and rope on the wheels, which lost the driver his 3 marks bonus at the start, and of which the latter expedient is worse than useless, to a large block of masonry on the luggage grid of Bertram's Vauxhall, which was highly ingenious, but of doubtful use.

We were not due to start for over an hour after the first solo. We revived ourselves with hot coffee and food in Ye Old Crown till it was our turn to follow the procession to the slaughter. The first hill produced no difficulty, and we arrived at the second, Shillingridge, to find a large queue waiting for sundry unsuitable vehicles to be assisted up the gradient. The climb was easy, however, though the ruts were uncomfortable without serving any useful purpose. Not a good trials hill in fact.

With the aid of our passenger's instructions from the route card we made our way to Woolley and Wild, which is presumably named after the famous Wild and Woolly on Camberley Heath, where those of us who liked that sort of thing used to disport ourselves on motorcycles in the days of the Southern Scott Scramble. The hill is the same shape, being two gradients meeting at a spring-breaking angle at the bottom. However, this hill is easy in comparison with our old Camberley friend, and few drivers had any difficulty. Shortly before arriving at the wood which encloses it, we found our motor on three cylinders, but having replaced the detached plug lead which caused the trouble, had no further incident with the engine, which behaved perfectly and had lots of power for everything.

The next notable port of call was Alms Hill, said to be shortly coming under a ban for trials, but still open on this day for those who could cope with it. There was some delay here owing to the bashful attitude of the early cars who waited at the bottom to be signalled up, while an unknowing official out of sight on the hill waited to receive them.

This little misunderstanding being cleared up, the attack began but with very little success by the majority. Burrow's Lagonda nearly got up, but stopped with wheels on the end of the observed section. Actually the hill was comparatively dry for the time of year, and the lower slopes provided good wheel grip for those who would take advantage of it to get up sufficient speed. Bertram had two valiant attempts, but even the tombstone on the back failed to get him up. The Frazer-Nashes shot up at speed, with King's very old one about the fastest, once again proving the value of a high

CHARLES FOLLETT

LTD., 18, BERKELEY STREET, W.1.

Offer a Selection of Really Fast Sports Cars—

MASERATI 1,100 c.c. two seater in 100% condition, 6,860 kilometres, just recellulosed, complete with Triplex windscreen, disappearing hood. Ready for the road or track. Cost this year £1,300 Now offered at the remarkable price of £750.

MERCEDES 36/220 super charged four seater sports touring car, passed by makers, recellulosed, and in wonderful condition £750.

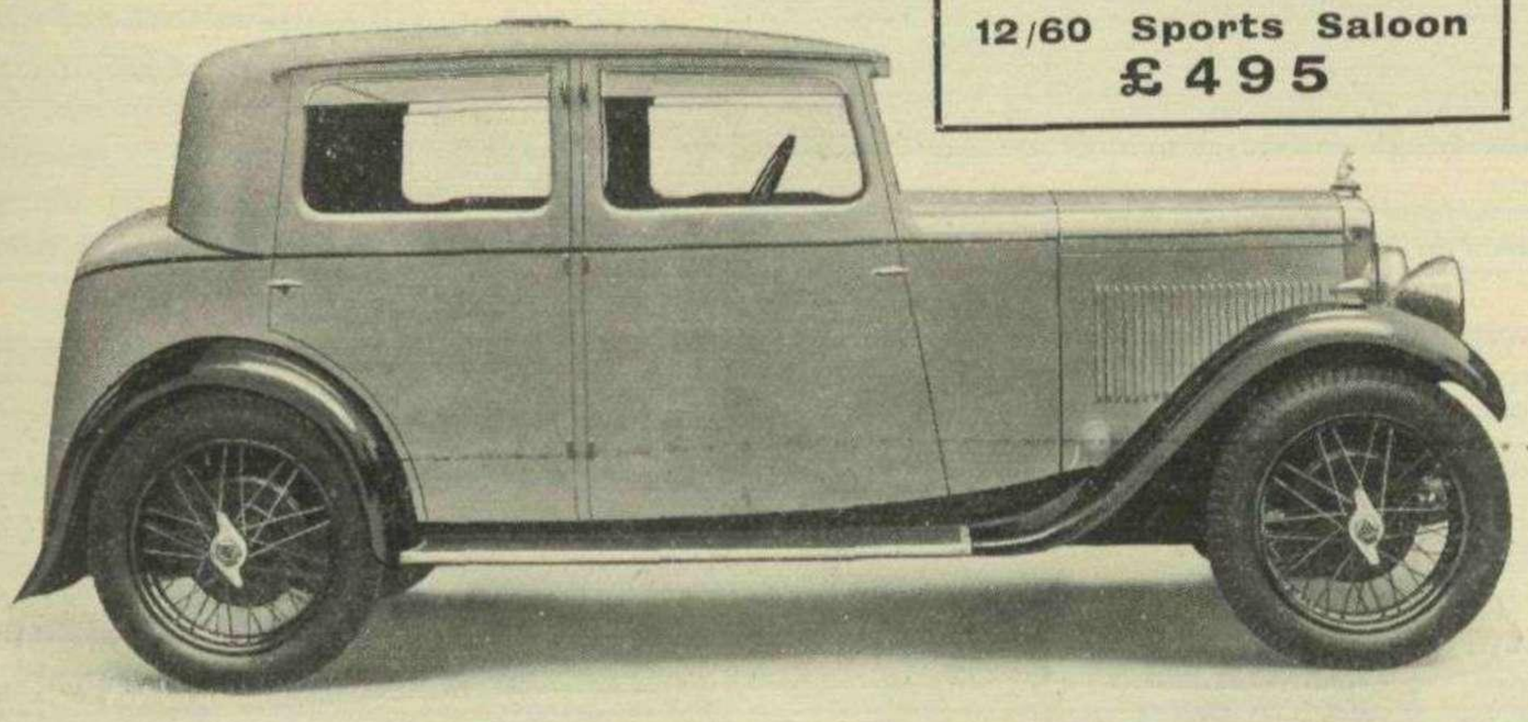
MERCEDES 36/220 super charged four door saloon by Freestone & Webb, finished grey with black wings and wheels, passed by makers. A really handsome example of a four door four seater saloon body on this famous chassis. £750.

MERCEDES 36/220 s.s. super charged four seater sports touring car, in remarkable condition throughout. Passed by makers some few weeks ago and only done a small mileage since. Price only £795

ALVIS 12/60 1931 super sports four seater finished black with brown upholstery, tonneau cover, mileage to date 3,030, in immaculate condition throughout. £345.

RILEY 9, 1931 2 carburettor sports four seater touring car, finished black, brown upholstery, tonneau cover, in faultless condition throughout. Mileage about 4,500. One owner. £225.

ALVIS
12/60 Sports Saloon
£495



Sole Distributors for ALVIS in London and District

At our showrooms we have on view a full range of the 1932 models, including the famous Super Sports 12/60 two-seater and New 20 h.p. Model.

DEFERRED TERMS
PART EXCHANGE
SERVICE AFTER SALE

MAYFAIR 6266

18, BERKELEY STREET, W.1.

THE INTERVARSITY TRIAL—continued.

power-weight ratio and a solid back axle. P. L. B. Wills got his Lea-Francis up by good driving.

One or two easy hills, mixed up with some Icknield Way brought us to Lewknor, which was easily surmounted in second gear. Bertram's Vauxhall was fast here, as were the Frazer-Nashes, but Smith's Singer broke a universal joint and passed away, while a Morris Minor stopped momentarily for no apparent reason, and continued.

Shortly after, followed Crowell Hill, for which a series of motorcycle trials in this part of the world had given us a wholesome respect. It is a long, rutted, chalky path of about 1 in 5, finishing in a wood. The large group of cars parked at the foot showed that someone was in trouble and we toiled up on foot to find some unmentionable optimist in a 3-litre Alfa saloon, firmly embedded just below the wood, the natural result of taking this type of car in for this type of trial.



King's Frazer-Nash roaring over the "Cannons." He made one of the few clean ascents at Alms.



D. B. Rogers (Bugatti) was one of the many who failed at Alms. He is here seen coming to rest after hitting one of the "Cannons."

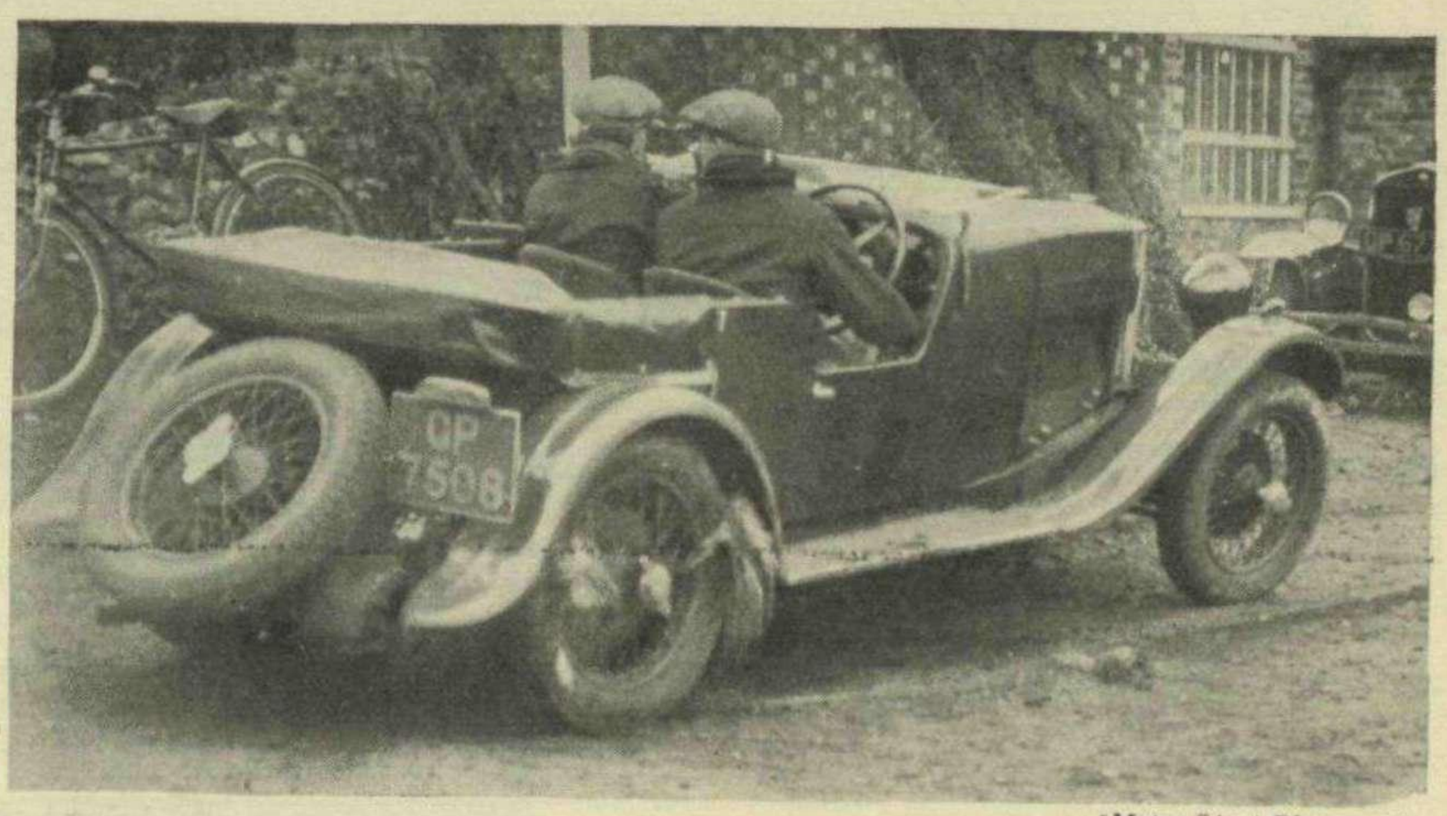
After much blasphemy and hard work, the gallant band of pushers, slightly aided by the few cylinders which functioned in the motor, contrived to convey the offending vehicle out of the way. This not being the first of their troubles, in fact the hill seemed to stop people more effectively than Alms, they were all in favour of washing it out.

Not being in charge of a large saloon we failed to see the point of this argument, and it was eventually decided that small cars could attempt the hill. How a "small car" could be defined was not stated, but Hopkins settled things by taking his Frazer-Nash up at a rousing speed, and we followed with the engine holding a steady 4,000 r.p.m. on the 11 to 1 bottom gear.

A nasty series of ruts on the bend near the start tried to upset everyone's equilibrium, and we were truly thankful that the Nash has high-geared steering, so that incipient broadsides can be dealt with before they get difficult!

Sundry Austins, and "Pige's" antique but still fruity A.C. went up, but failures were commoner than good climbs.

Prior to this, was a "special test" in which one had to coast from a line to the bottom of a dip,



[*Motor Sport Photographs*

A competitor waiting his turn. Note the rope on the rear wheels.

THE INTERVARSITY TRIAL—continued.

in neutral, stop at an appointed place, restart the motor, and accelerate over the final line. The time for this evolution was recorded for use in the event of a tie, but the only marks lost here were due to failing to stop or for doing things in the wrong order. Our starter having passed out and the handle being inoperative, we were reduced to making push starts, which are incidentally very easy on this car.

This took away any chance of being clever so we merely refrained from losing marks, thereby scoring over more ambitious drivers who pressed their starter buttons before they had stopped, etc.

The final piece of beastliness was Kimble Lane, which was really not as funny as it looked to spectators. However, most cars bounded over it more or less successfully, and so to the finish and a welcome tea at the Rose and Crown, Tring. Altogether an amusing day.

RESULTS.

CAMBRIDGE, 73.3%.

OXFORD, 53.3%.

CARS.

Best performance of the day and best veteran: W. S. Braidwood (Frazer-Nash, Camb.); best undergraduate: A. Fairtlough (Austin, Camb.); best Oxford car: A. Sebag-Montefiore (Frazer-Nash).

Finishers in order of merit: W. S. Braidwood (Frazer-Nash), A. Fairtlough (Austin), J. B. Carver (M.G. Midget), A. Sebag-Montefiore (Frazer Nash), W. G. E. Rushworth (Ulster Austin), C. M. Glover (Austin), R. M. Mere (M.G. Six), Hywel Murrell (Austin), M. E. King (Frazer-Nash), E. W. Niven (M.G.), O. H. J. Bertram (Vauxhall), S. Dyson-Taylor (Austin), E. W. Bass (Frazer-Nash), A. F. Scroggs (Trojan).

Also finished:—Truscott (Morris-Cowley), J. E. Clowes (McEvoy Special), W. Wright (Morris Minor Arrow), J. M. Sugg (McEvoy Wolseley Hornet), K. D. Evans (Alfa-Romeo), R. R. K. Horne (M.G.), Viscount Curzon (M.G. Midget), A. L. Watson (M.G.), P. McEntee (Riley), Sir A. W. McRobert (Aston-Martin), M. T. Mills (Austin), M. F. L. Falkner (Alvis), P. B. Rogers (Bugatti), H. J. O. Ripley (Riley), M. W. B. May (Aston-Martin), R. C. Porter (Alvis), P. B. L. Wills (Lea-Francis S) and J. G. Pigé-Leschallas (A.C.).



Another Alms Hill snap—Bertram (Vauxhall) making the best of it.

Bentley Motors' Future.

LAST month, upon information received from a usually reliable source, we stated that the negotiations which had been proceeded with between D. Napier & Son, Ltd., and Bentley Motors, Ltd., had been concluded, and that the absorption of the latter concern by the former had materialised.

It has since been revealed that such is not the case. Nevertheless, it is now stated that a syndicate known as The British Central Equitable Trust has secured the Bentley assets and that they are acting on behalf of no less a firm than Rolls-Royce, Ltd.

At the time of going to press nothing more is known, but further developments will be watched with interest.

The Monte Carlo Rally.

MEMBERS of the Riley Motor Club are making a determined bid for the Monte Carlo Rally next January. Their entry comprises five 9 h.p. cars, and in addition there will be three Australian women drivers of similar models. At the present time these ladies are engaged in driving their cars from Australia to Europe.

The English contingent has selected starting places as widely removed as John o' Groats, Stavanger (Norway), Umea (Sweden) and Athens. Major and Mrs. Montague Johnston, who upheld British prestige in the German 10,000 kilometre trial, will be starting from John o'Groats, as will Mrs. C. S. Staniland, wife of the famous airman.

Mr. Jack Hobbs has selected Stavanger as his starting point, whilst Mr. V. E. Leverett has chosen Umea. This is the most northerly point from which anyone has yet started, for it is 327 kilometres North East of Sundsvall, a popular starting place in the past, and little over 100 miles from the Arctic circle. Mr. Leverett won the light car class in the Rally last year.

Probably the most ambitious effort is that of Mr. Rupert Riley, who will try to reach Monte Carlo from Athens with a 9 h.p. Overseas tourer. This route is the longest of any of those permissible—3,786 kilometres as against 3,751 kilometres from Umea, the second longest. Several competitors have tried to get through from Athens in past years, but no one has yet done so in the required time.

If Mr. Riley is successful he stands the best chance of winning of anyone in the event. In winter time, however, the South European roads are entirely neglected, and if the season is wet, bridges and whole sections of the track are washed away by floods. If cold weather prevails, on the other hand, the heights of the snow-covered Dragoman Pass, just north of Salonika, are almost impassable.

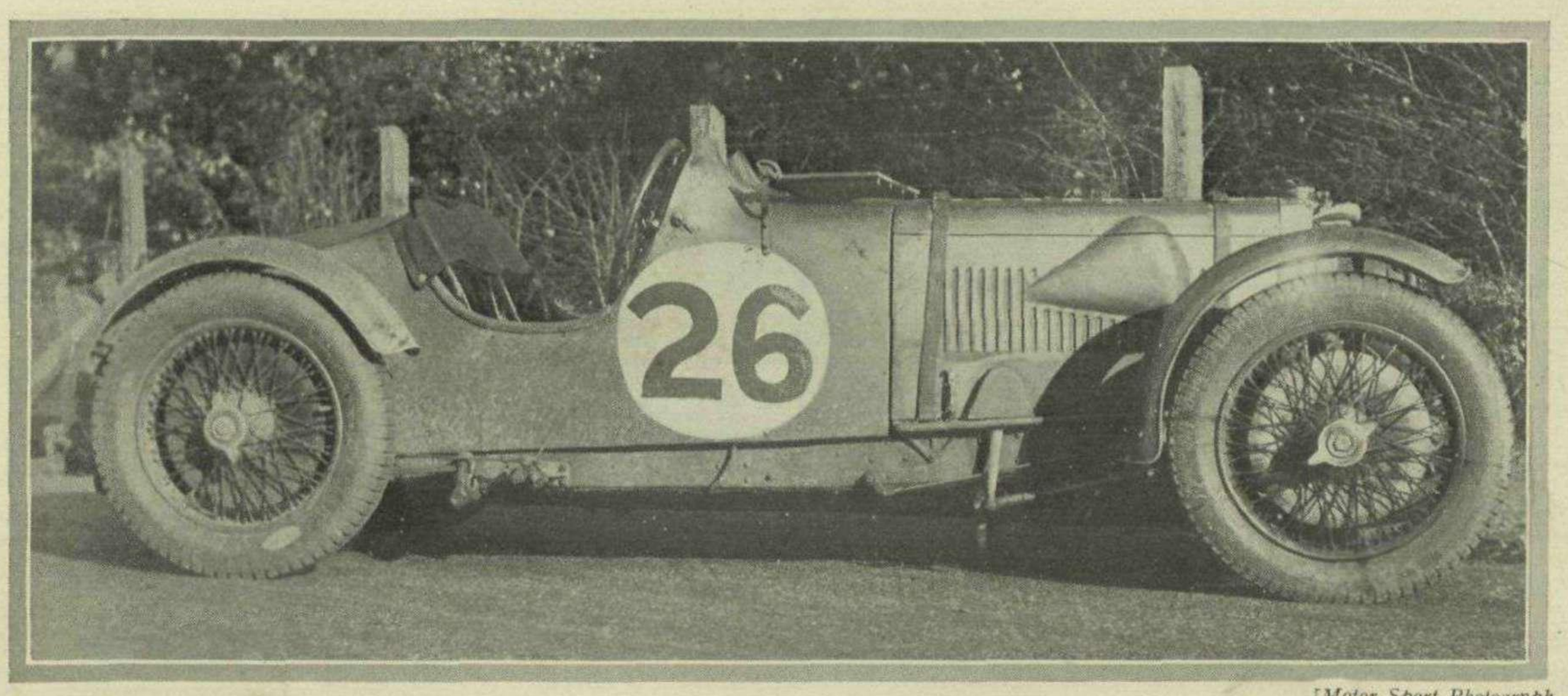
The New Alvis.

ONE of the most interesting new sports models of this year is the latest 19-82 Alvis, Introduced since the Show, it should find a ready demand. Although all the main features are already well tried and known, the layout of the chassis is a departure from normal Alvis practice. It is extremely low built, the frame being dropped from both ends giving a very low body line and seating position. The engine is based on the well known 3-carburettor sports job which has given such good performance in the Silver Eagle models. The six cylinder engine is in a unit with the gear box, and central change is employed. Coil-ignition and larger brake drums are other features.

It is hoped that this model will be in full production shortly, and fuller particulars can be obtained from the makers or from Charles Follett Ltd., of 18, Berkeley Street, the London distributors.

"NUMBER 26"

On the Road with one of the Aston-Martin Team Cars.



[Motor Sport Photograph

The low build of the Aston-Martin gives wonderful stability on the road.

THE name of Aston-Martin has long been one which stands for quality in motoring, and even in these days of cut prices and superficial attractions, there are motorists who realise that A.1. quality is well worth paying for. It is for such as these that the Aston-Martin has always been intended, and the policy has ever been rigidly adhered to of building the car as well as it can possibly be done, and then settling the price. It is to be hoped that the public's perception of what is good will eventually increase the firm's production, and so further reduce the price, but it will never be reduced by cheapening of materials, or by the omission of those many details which make the difference between the first-class and the merely serviceable.

In the case of a sports car which is not only fast but which is inherently safe, and therefore will be driven really hard under all conditions, the stresses with which it has to contend are out of all proportion to those encountered by its more touring brethren. For this reason it is only by taking part in the leading long distance road races of the year that faults can be eliminated, and real reliability maintained in the standard model over years of service.

Aston-Martin Ltd., fully realising the value of racing for years past, entered a team in this year's J.C.C. Double-Twelve, one of the biggest car smashers ever held, the Le Mans 24 hour race, and the Ulster Tourist Trophy. Their fine record of finishes and class wins has shown to what extent Mr. Bertelli's racing and designing experience has benefited the car.

The regulations for the modern sports car race, although requiring the essentials of the car to be standard, allow just those alterations in the way of tuning for increased power, which test the whole car to the utmost; and which provide the maker with valuable information which he can use in his standard products of the following season. Thus the car which we had for a few days recently, No. 26 in the Ulster T.T. and a sister car to that which won the 1,500 c.c. class in the hands of C. M. Harvey, was both a genuine racer and a standard model.

That is to say, it was in racing trim and tuned to give its maximum power without any of the usual considerations of flexibility and slow running required by the normal owner, and yet in its handling, roadworthiness, and general behaviour it is identical with any other Aston-Martin which is sold to the public.

The engine was not, however, as harsh as one expects a racing unit to be, and in spite of a compression ratio of approximately 9 to 1, it behaved remarkably well at low speeds in top gear, provided the ignition control was intelligently handled. It may seem surprising that we should have ever attempted to drive a racing car at low speed on top gear at all, but it must be remembered that this type of car, with a regulation racing silencer only, is by no means quiet when revving, and it is therefore a great advantage to be able to rumble gently through populous areas without attracting attention.

Having filled up with a mixture of 75% Ethyl and 25% pure benzol we started up the motor and let it run for some time at a fast tickover to allow the cold lubricant to get into circulation. The engine is lubricated on the dry sump principle, and the oil is carried in a tank between the front dumbirons which holds some two gallons and which also acts as an oil cooler. The oil is circulated by a double gear type pump on the front offside of the engine, one portion of the pump forcing

"NUMBER 26"—continued.

the oil to the various working parts while the other returns it from the sump to the tank.

This pump does not pick up its full quantity when the oil is cold, and we therefore get the rather unusual state of affairs of the oil pressure increasing as the oil gets warmed up.

Value Gear Details.

An interesting feature of the engine is the unique cylinder head in which the valves operate parallel to each other, but at an angle to the vertical, the top of the combustion chamber being sloped but not curved. The valves are operated by a single overhead camshaft driven by gears, the racers having a steel intermediate pinion in place of the usual Fabroil gear, with the result that a certain amount of whine, by no means unpleasant, is audible.

The gear box has a very well placed central change, and the gear ratios are 12.18 on 1st, 7.57 on 2nd, 5.56 on 3rd and 4.75 on top. Reverse is 11.4 to 1.

The underslung worm drive rear axle is driven by a shaft enclosed in a torque tube, the front universal joint being of the ball-bearing type, with supporting races on either side of it, thus entirely eliminating any chance of transmission vibration.

The liberal use of light alloys throughout the car has enabled the weight to be kept down to little over 17 cwt., without sacrificing any of the delightful feeling of strength and rigidity which is one of the great features of this chassis. Once the engine was warmed up, and we had had a gentle run round to see that all was well, we were able to see how the car performed on the open road.

The outstanding impression left in one's mind after a fast run over twisty roads and under sometimes slippery conditions, is a feeling of complete mastery over the car.

After a few minutes driving it ceased to be a mechanical contrivance operated by an ingenious collection of man-made mechanism, and became an entity with a character of its own, yet always entirely obedient to the driver's will.

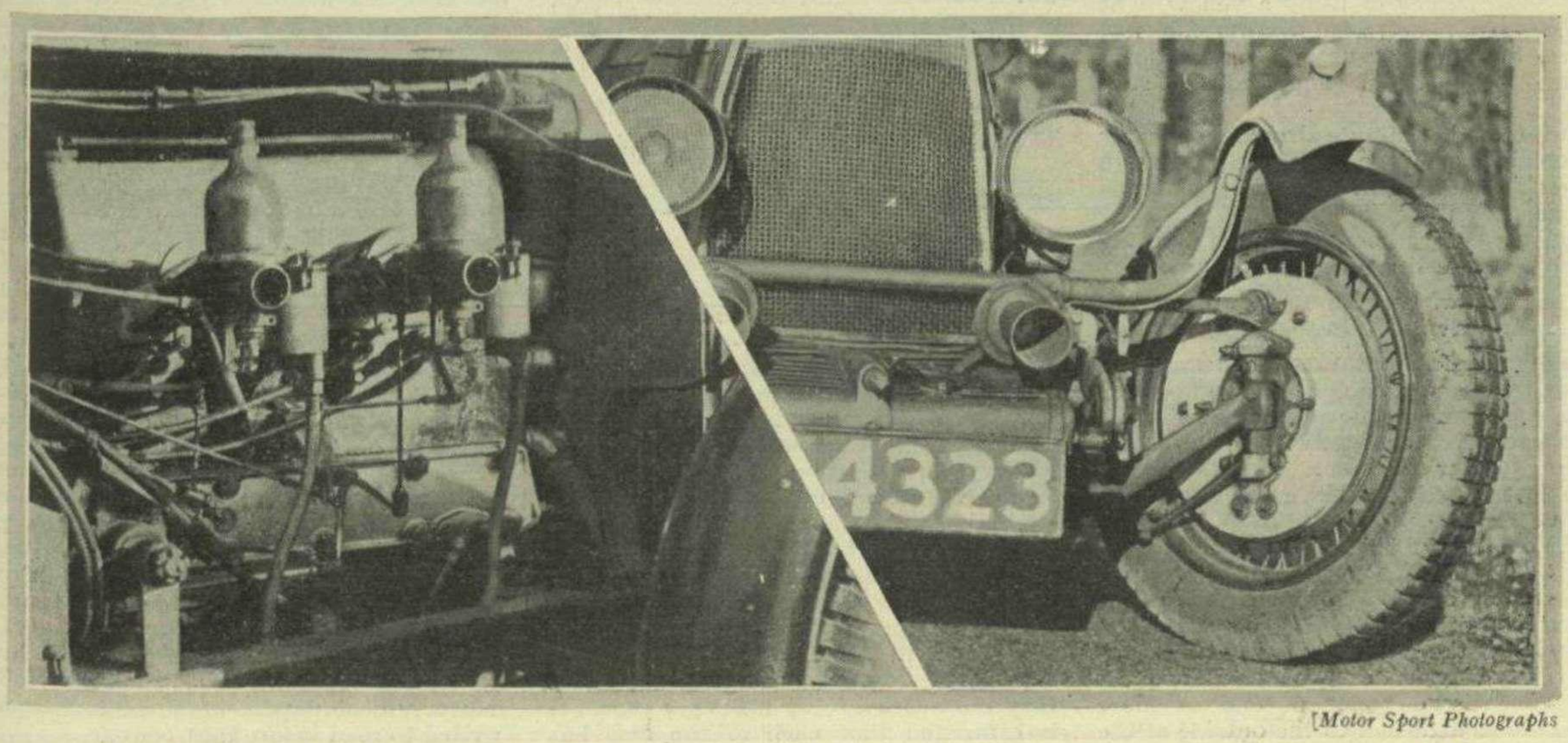
The control is so balanced and yet so positive that evolutions can not only be achieved, but completed so easily and accurately that the driver is really surprised at what he can do, and which he knows would be extremely hazardous in many more ordinary vehicles.

In fact, the steering and cornering are such as to place the car among the select few of which one says, "That is a real motor car!"

Naturally, the road performance of such a car in racing trim depends entirely on full and frequent use of the gear box, and there is no denying the fact that perfect gear changing on this box requires a certain amount of practice, and inaccuracy in judging engine and road speeds produces some very unprofessional noises. On the other hand, all the characteristics of the gear box are good, as the position of the lever is perfect and the change very quick indeed, which is an important feature when racing. Also, once used to the car the gear change becomes quite certain, and like many of this type, becomes easier to operate the higher the speed at which it is used. Thus, in winding and hilly country, when keeping the engine really working hard, we found ourselves running up and down through the gears almost automatically.

Acceleration.

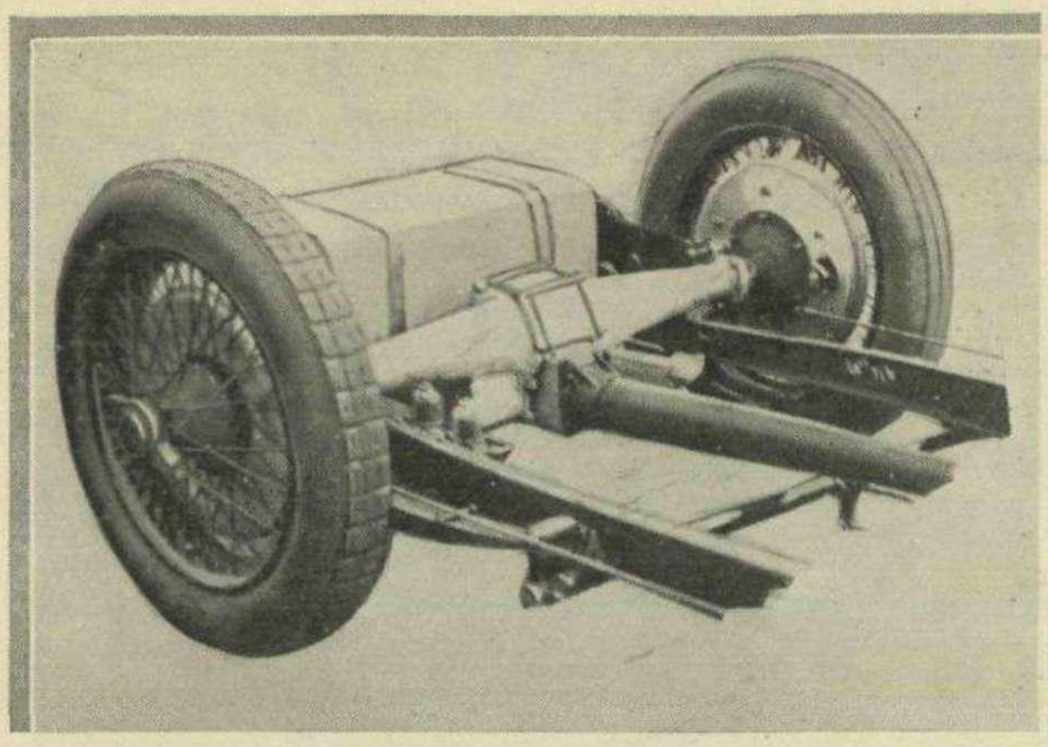
The acceleration was delightful, and would have been even better with slight alteration to the carburettor setting, as the instruments had recently been changed and there was a considerable flat spot between 1,500 and 2,500 r.p.m., when accelerating hard. This, combined with the fact that such an engine is not intended to pull hard at low speeds, makes the acceleration figures for the usual "rolling start" tests of little value, as this type of driving would never be used. It is from 2,000 r.p.m. upwards that the real power is felt, and therefore



[*Motor Sport Photographs*

The offside of the engine showing the twin carburettors and (right) the large brakes which in no way restrict the steering lock.

"NUMBER 26"—continued.



An Aston-Martin feature—the downswept frame members at the rear.

the best getaway from a mere crawl involves judicious use of the clutch.

By this method the car will go from 10-30 m.p.h. in 3 3/5 seconds, while the much more usual speed of 60 m.p.h. is easily reached in 20 seconds on the gears. This gives the car very fine average speed capabilities, and though it is hardly fair to compare the performance of such a car with ordinary vehicles, a certain amount of quiet amusement can be obtained if any optimist in some pseudo-sports car tries to be clever. 60 m.p.h. is maintained with the throttle nearly shut and 70-75 m.p.h. seems to require little more. The acceleration at the higher end of the scale is excellent and the highest speed we attained was just over 4,600 r.p.m. on top gear, which works out at a little under 86 m.p.h.

This may not sound very fast to some people for a road racer, but it must be remembered that a real 86 m.p.h. is a very different thing from the maximum speed of some so-called " 85 m.p.h." small cars and also that this speed was reached on short stretches of road under none too favourable conditions. There is consequently no comparison between an 85 m.p.h. car like this (they were doing 90 m.p.h. on the Newtownards straight in the Ulster) and a car which touches 85 on an optimistic speedometer after a mile or so downhill with the wind !

The normal maximum speed of the engine at which one changes up is 4,500 r.p.m. at which speed it is as smooth as anywhere in the range, and which gives speeds of 33, 53 and 71 m.p.h. on bottom, second, and third respectively.

These revs can, of course, be easily exceeded, as this engine gives 70 b.h.p. at 5,000 r.p.m., but in normal use, or even normal racing, one would not do so.

After a couple of hundred miles on this car we were full of praise for many details which there is no room to record here, but no mention of this marque can ever be made without reference to its wonderful brakes, which are equalled on only two or three cars and surpassed on none.

The stopping distance of 43 ft. from 40 m.p.h. is astounding in itself, but the very positive feel and great power at all speeds cannot be expressed in mere figures. They are one of the many things which put this make in the front rank of definitely good cars.

The makers are Aston-Martin Ltd., of Feltham, Middlesex, and a visit to their works and an inspection of the chassis is time well spent.

Driving in Fog.

AT the recent International Illumination Congress held at Cambridge, the fallacy of using a yellow light to improve penetration during fog was raised by The Automobile Association's representative, and unanimously supported.

Fog contains minute droplets of water which act as lenses, consequently the more powerful the illumination, the greater is the reflection.

Coloured rays merely reduce the intensity of the light.

The following recommendations are made for driving in fog :—

Direct a fairly intense concentrated beam to the nearside of the road, either from a fog lamp on the nearside dumbiron, or a spot light attached to the nearside pillar of the windscreen. Thus the driver is able to look either over or under the beam.

Where special fog directing lights are not available—

Extinguish the offside headlamp and direct the other headlamp beam on the nearside of the road. This method necessitates driving close to the nearside kerb.

Again, tissue paper of one or more thicknesses attached to the outside of the headlamp glasses, or whitening mixed with water, will be found helpful. If the driver has a preference for any colour which suits his sight, tinted tissue paper, or dry colour mixed with the whitening will produce the desired effect.

Either of the foregoing is easily removed, and does not involve exposing the lamp reflector, which is undesirable.

Ancient Armoured Cars.

ARMOURED cars which have recently been in action on the North West Frontier in India are a remarkable proof of the quality of British engineering.

The cars—fifteen of them—have been undergoing some extremely strenuous work on the exacting hill roads of North West India. It is surprising, therefore, to learn that their vintage ranges from 1909-1914 and that they have been in continuous use since then.

The cars were built by Rolls-Royce and from 1911-1914 most of them were in Mesopotamia. During the War, they all saw service in various ways and in 1920 they were sent to India for use as armoured cars on the Frontier for five years, where they ran at least 6,000 miles per year. It is estimated that each of the cars has covered altogether well over 80,000 miles. A sixteenth car which began its career as an armoured car with the others is now in use as an instructional chassis.

No other country in the world could turn out cars which would stand up to such hard work and still be in perfect running order after fifteen or twenty years.

Dunlop Appointments.

THE Board of Directors of the Dunlop Rubber Co. Ltd., have appointed Mr. Albert Healey, who has been technical manager at Fort Dunlop since 1927, to be Works Director at Birmingham, in succession to Mr. J. L. Collyer, who took over the position temporarily after the death of the late Mr. J. T. Randles. Mr. Healey has also been appointed to a seat on the local board.

Mr. Collyer has joined the headquarters staff in London so as to be also available for work in connection with other factories of the Company at home and abroad.

For the past sixteen years Mr. Healey has been engaged in important research work into manufacturing operations at home and abroad and members of the Institution of Automobile Engineers will remember the papers which he has been nvited to read before that body.

Rumblings



NOW that the period of fogs and other inflictions of the season are upon us, we have once more to consider means of getting about in spite of them.

It is quite obvious that we are little better off in bad weather conditions than we used to be, as far as visibility is concerned, while in some ways we are worse. I spent a week-end recently driving a sports car some years old which had the now defunct type of 3-piece windscreen, and in spite of beastly weather I had a perfectly comfortable and safe drive.

Single-panel screens and good screen wipers are all right up to a point, but especially at night, any sort of glass is a hindrance to visibility and increases dazzle, and being able to open just the right part of the screen without getting blown out of the car is a great advantage, while in conditions when fog is actually freezing on the screen, nothing but this type of screen is any use at all. I wonder why it has died out—perhaps in these cut-price days, cost has something to do with it. I know of one keen sports car owner who likes fast driving and is not averse to fresh air, who insists on this type of screen on his new models, and has to get them made specially.

These Speed Claims.

I was talking to a well-known designer the other day on the subject of motor car performances, and he was condemning with some violence the increasing tendency to make extravagant speed claims for cars in advertisements and elsewhere, in a way that the public get an entirely erroneous idea of what speed really means.

The result is that a maker whose car is really much faster than the average, but who states its maximum speed truthfully, is at a serious disadvantage in comparison with his more optimistic competitors.

M.P.H.—In the Showroom.

There is no doubt that salesmen and owners are inclined to talk loosely of 70-80 m.p.h. as if it was a common performance for small sports cars when, in actual fact, they never approach it, and if they did would think they were doing 90 m.p.h. at least.

The performance of the modern sports vehicle is really very remarkable indeed and its makers are to be congratulated, but it is not nearly as fast as people think. The speedometer bogey is the chief trouble, and the fact that the average motorist wants to think he is going fast has led to the fitting of geared-up speedometers as standard on many makes. The degree of optimism varies, and if the car is one of the few *really* fast ones it may even be accurate without disgracing itself.

In most cases the correct gearing of these instruments would be such a shock to the pride of the average owner that the sales of that particular car would suffer badly. The sad thing is that they would suffer unjustly, as the car's speed would be very good indeed,—it is only the distorted idea of speed that the average owner has, that would make it seem poor.

A real 75 m.p.h. on anything up to 1½-litres is really very fast indeed for a standard job, and the car which can reach that speed, and reach it quickly, need be afraid of little else on the road. It is, therefore, all the more annoying to hear owners claiming quite seriously that their perfectly standard production of something between 750 and 1,500 c.c. will comfortably exceed this. It is difficult to know what to suggest as everyone naturally claims just that little excess, which puts him on an even footing with other makes. If they all descended to the truth it would be all right, as their relative performances would still be the same, but their actual speed would be much more interesting.

When in doubt, take your motor over a measured mile with the speedometer at a fixed reading of say 40 m.p.h. and take the time by stopwatch. Do it several times to make sure, and if possible at various speeds. Then you will know where you are, and if you are not satisfied you can set about tuning the engine till it really does what you want. Nor are rev. counters infallible as the face can be rotated slightly to alter the reading.

Busy Bodybuilders.

I was down at Acton the other day having a look round the new works of Abbey Coachwork Ltd., who have been doing such a lot of Wolseley Hornet bodies. They have now got a very much larger works; which will enable them to meet the big demand for their bodies which their old place was inadequate to supply.

They were already extremely busy and were starting work on their

RUMBLINGS—continued.

special edition of the M.G. Magna, and already had several chassis there. It looks as if they will be among the first to be able to supply this car, for which there is already a big demand. There were numerous other makes of chassis in their works; one which makes a very nice job is the special speed model Rover, which has already been tested in MOTOR SPORT, and which has an amazing performance.

It is really extraordinary how quickly the demand for special bodies has grown recently, and now that they can be obtained relatively cheaply there is no excuse for owners grumbling that cars have lost their individuality by mass production.

750 c.c. Possibilities.

Now that the season has closed with the M.G. Midget having achieved 110 m.p.h. at Monthlèry, it is interesting to speculate what speeds will be reached in this class next year. The increase this year must have astounded even the most optimistic, and George Eyston and his colleagues deserve more than ordinary congratulations on their efforts. The record-breaking car is of course the property of Mr. Palmes, who is one of the directors of Jarvis and Sons, the well known agents, of Wimbledon. This active participation in the sport has given them much valuable information, and any buyers of cars from this source will have the benefit of this experience if they require any tuning, repairs or other alterations to their models, of whatever make.

I was talking to W. M. Couper the other day, and he tells me that Birkin's racing Alfa is for sale with two bodies. As this laps Brooklands at 125 m.p.h. and has many major successes to its credit, someone is going to get a good motor. Incidentally his Maserati, which won the Mountain championship, has been sold, through Philip Turner, to Straight, who raced a Riley for the latter part of last season. Birkin's own racing programme for next year has not yet been fully settled.

Another interesting racer for sale is the 1,100 c.c. Maserati which H. Widengren raced last season, finishing up with the Ulster T.T. This is being offered by Charles Follett, Ltd., the Alvis distributors.

B.A.R.C. Dinner.

The B.A.R.C. dinner was a highly successful function, and in spite of the depressions elsewhere we were able to celebrate one of the most successful seasons in the history of the track. Mr. Bradley has certainly to be congratulated on the result of his efforts, together with his staff of helpers, and Brooklands is full of new schemes. What with the aero club developments in addition to the work that has been done in other directions, we shall hardly know ourselves next season. Although there is a slack period now as far as driving is concerned, there is no rest for the track authorities, who are now getting down once more to the eternal question of bumps.

This business crops up year after year, and it is very hard to effect a big improvement without spending huge sums. However, it will be better next year, we hope. The big bump formed by the bridge over the river at the end of the home banking is not so easily dealt with, as it is formed by the meeting of two sections of the track at an angle.

I hope the fork will be smoothed out a bit on the inside, as the passage from the Byfleet banking down the straight when merely coming in after a practice lap is very rough going, and if we have any "sand-bank circuits" this part will come into use.

A Running-in Aid.

The question of running-in is one of the most important in the whole business of getting the best possible performance from an engine, and I was very interested to receive particulars of the "Talisman" Assembly and Running-in Compound as it is called. This is a blend of a special colloidal graphite with an oil. The mention of graphite is apt to frighten some engineers, as it is generally acknowledged that ordinary mined graphite, in spite of its heat resistance and properties as a dry lubricant, is useless in an internal combustion engine, owing to its liability to clog oil-ways, and become deposited.

In this compound the graphite is in a special ultra-microscopic form which cannot be subject to this trouble, while its properties as a safeguard against seizure are enhanced. In any stiff engine there is a liability to temporary breakdown of the oil film with the result that the bearing surfaces are damaged and clearances increased. By the use of this compound in the oil a last line of defence in the shape of the graphite is provided, and its resistance to temperature is so high that failure is practically impossible. Also the surface produced is of the highest finish and the overall mechanical efficiency of the engine is increased. The importance of this under racing conditions is obvious, and makes for a much higher safety factor and increased speed.

Although primarily intended for running-in the engine, considerable advantage under hard driving conditions will be found if its use is continued.

A LOSS TO BROOKLANDS.

CIVIL flying in this country and Brooklands aerodrome in particular suffered a severe loss last month when Captain E. A. Jones of the B.S.F., was involved in a fatal aeroplane accident at Hendon.

The Brooklands School of Flying recently fitted up a "Moth" with cockpit hoods and special instruments for blind-flying instruction, and on Sunday, 8th November, Captain Jones, accompanied by Flight-Lieutenant W. E. P. Johnson, of the C.F.S., Wittering, was trying out the machine in very foul weather. It appears that as they were coming in to land at Hendon aerodrome, they struck a flag pole and crashed. Jones, who was in the front seat, received such severe injuries that he died shortly afterwards, although his companion was only slightly hurt.

Captain Jones, who was generally recognised as one of the finest of instructors, had an eventful career, which started as with so many other men of his age—he was 35—with the War. He was a "1914" man, and served at the age of eighteen on the Western Front in the infantry. Later he transferred to the R.F.C., and near the end of the War, he became an instructor, graduating from Gosport.

After the Armistice when he was demobilised, Jones entered commercial aviation. He was engaged in various enterprises at different periods, and eventually joined the Brooklands School of Flying in 1927. Subsequently he became chief instructor there, a position he held at the time of his death.

Habitués of the track, whether they are associated with flying or not, will miss him very greatly, for his was a charming and cheery personality—one of the best. To his relatives, the Brooklands School of Flying, and his many friends, we offer our sincere sympathies.

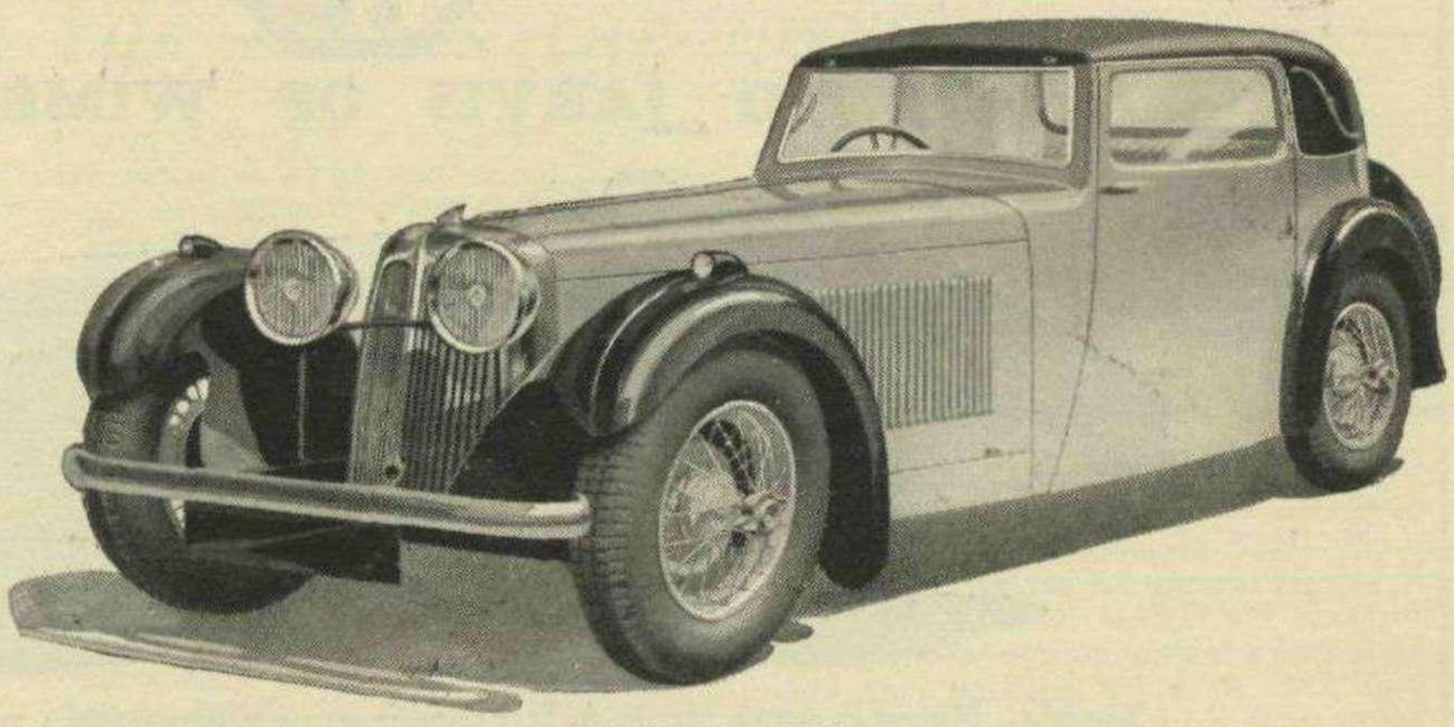
A STRIKING SPORTS COUPÉ

A NEW SWALLOW MODEL

DISTINCTIVE lines have always characterized all Swallow "specials," and the "S.S.I." sports coupé which the Swallow Coachbuilding Co., of Foleshill, Coventry, are now manufacturing is, if anything, even more striking than the other models.

The chassis of this car which is here illustrated, is specially manufactured by the Standard Motor Co., for the Swallow concern; it has an underslung frame, and the engine unit and radiator are placed behind the front wheel centres. The former is the Standard six-cylinder which has a capacity of 2,054 c.c. (tax £16), and the gearbox has ratios of 4.6, 6.15, 9.75 and 16.1. The ignition is by battery-and-coil and the carburettor is a Solex. The front axle, which is considerably dropped, has an "H" section beam, and the rear axle is of the spiral bevel type.

Other details of the specification of the S.S.I. are:—Steering: Marles-Weller cam and lever type. Springing: Half-elliptics all round with Luvax shock absorbers. Braking system: Bendix Duo Servo.



The Swallow S.S.1.

The radiator is of special design, so shaped as to blend well with the lines of the coachwork, and the filler cap is placed under the bonnet. Bumpers fore and aft are fitted as standard.

The body is an exceptionally pleasing piece of work, clean, very low, yet roomy and with plenty of headroom. It is a genuine coach-built job, with flush-fitting doors and a leather grained head with sliding roof. As can be seen, the wings are of pleasing contour with the popular swaged centres. The internal finish is in keeping with the whole, with "Vaumol" hide upholstery and an instrument panel equipped and arranged in the most modern style.

Unlike some other ultra-low built closed cars, the S.S.I. provides a really wide driving vision, and it has a very respectable road performance both in regard to speed and handling. The price is £310.

THE "LONDON-EXETER"

SOME NEW ARRANGEMENTS

ONCE again we have come round to the month of the Motor Cycling Club's classic London-to-Exeter Trial, and this will be the seventeenth of the series.

But this time there will be one or two changes in the arrangements; for instance, coming as it does at the end of the Christmas holidays, it has been considered advisable to confine it to one day only, and to give the hardy souls who enter for the run a chance to reach home again the same night. Thus, the start will take place at 12.0½ a.m. on Monday morning, 28th December, and the first man will be due to finish at Shaftesbury at about 1.15 p.m. on Monday afternoon. The start will be from the Virginia Water New Tea House and Restaurant, Virginia Water on the London-Bagshot Road, half-a-mile from the 20th milestone from London. This point is best reached from London via Chiswick, Great West Road, Staines and Egham. A hot supper will be obtainable in the restaurant before the start, and there will be no supper stop at Shaftesbury on the outward journey. The usual breakfast arrangements stand, however, at Exeter.

As regards the route, this will practically be the same as that which met with such general approval last year, but the Black Hill test will be an ordinary stop-and-restart affair instead of an acceleration test.

Intending competitors should note that the closing date for entries for the trial is Monday next, 7th December, while application for election as members to the club must be made by the same date.

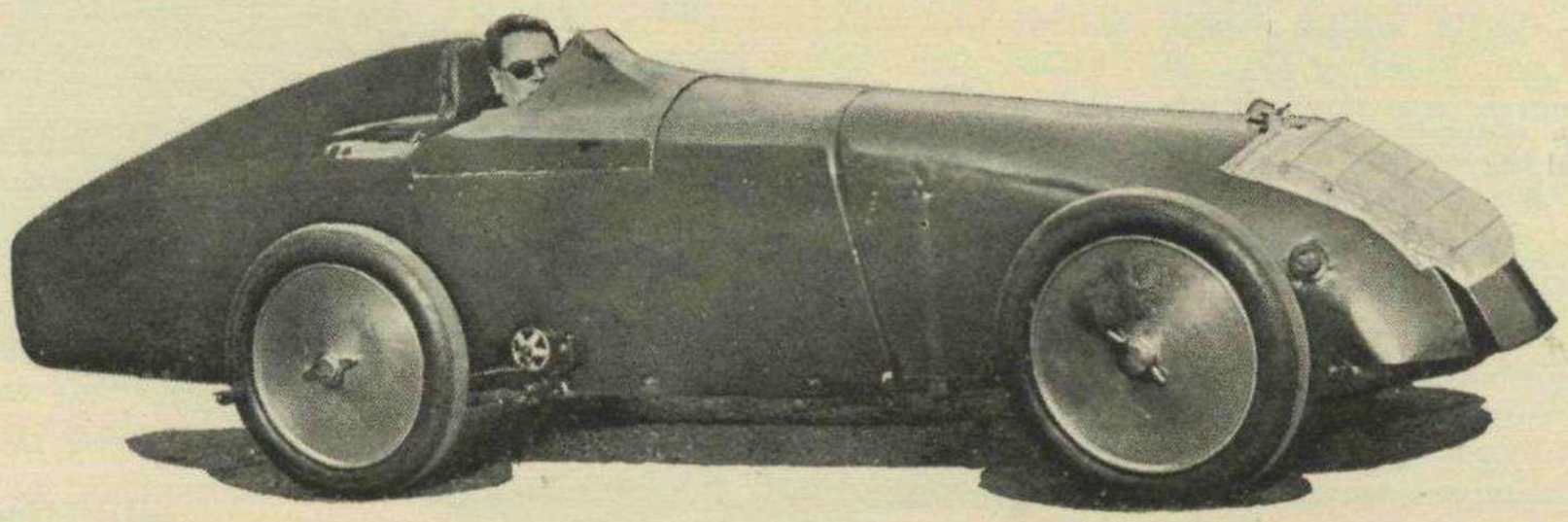
The honorary secretary of the M.C.C. is Mr. J. A. Masters, and his address is 22, Norland Square, Kensington, London, W.11.

MOTOR SPORT ILLUSTRATIONS.

WE have many requests for copies of our drawings by R. A. Nockolds, and in view of this, we can supply copies, 8″ x 6″ or 10″ x 8″ of the reproduction of the oil painting which appears on the frontispiece of this month's issue, at 2s. 6d. and 3s. 6d. respectively. Application should be made to *The Art Editor*, MOTOR SPORT.

FOR FAST MG CARS

GO TO JARVIS OF WIMBLEDON



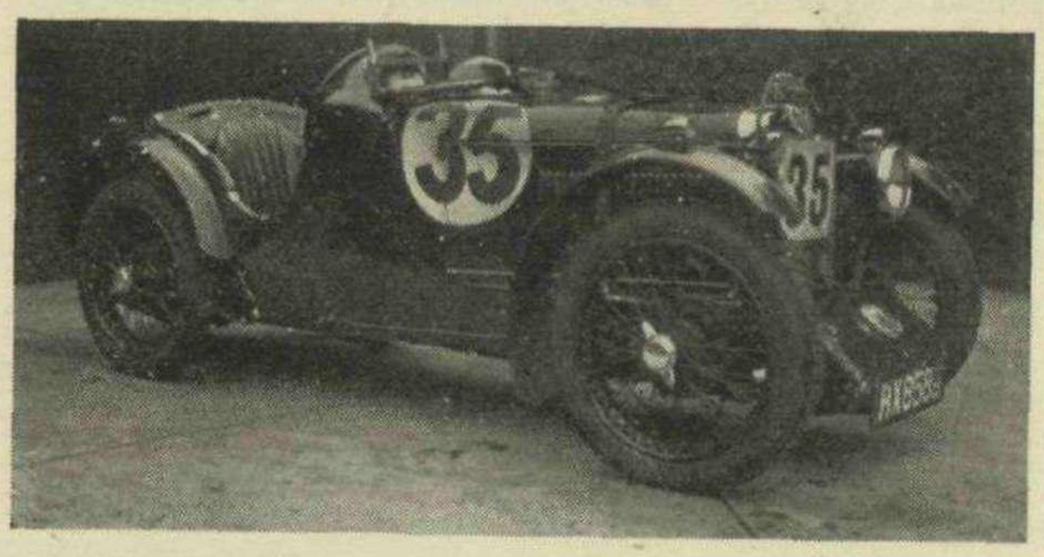
The M.G. Midget in which Mr. E. A. D. Eldridge set up a new world's record of 110.28 m.p.h. for baby cars at Monthlery.

THIS CAR IS OWNED BY M. J. A. PALMES, Esq.

MAIN SHOWROOMS:
VICTORIA CRESCENT,
WIMBLEDON.
(Opposite Wimbledon Station)
'Phone - - Wimbledon 2526
Telegrams: "Jarvis, Wimbledon."

JARVIS OF WIMBLEDON

M.G. SERVICE DEPOT
GROVE WORKS,
SOUTH WIMBLEDON.
(Opposite South Wimbledon Station)
'Phone - - Wimbledon 4366



M.G. Midget 750 c.c. Super Charged

This car has been specially prepared for road racing in every detail and is in perfect condition, having been in the hands of Thomson and Taylor Ltd. for three weeks. The following details give an idea of the car: Body, special light-weight type, fitted with regulation hood, screen, seats (driver adjustable), wings, wing stays and lamp brackets, etc., in duraluminium (cost £10:0:0). 15 gallon rear petrol tank, 2 gallon spare oil tank with automatic feed to engine and dash gauge.

The engine is fitted with special con. rods' camshaft, pistons and valve collar retainers and the vertical type S. U. carb. The car is offered for sale with road and track exhaust systems and set of new "Special Fort" tyres and is ready to race without any further preparation. This car finished second in the Irish Grand Prix (first day).

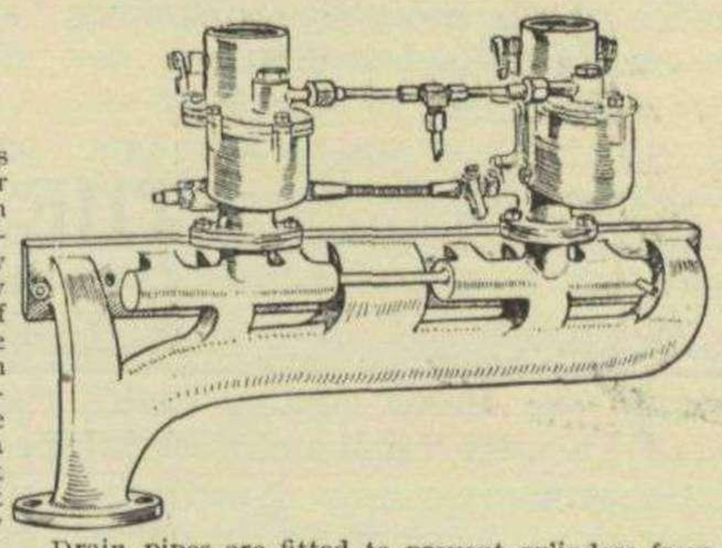
Price **£395** Not run more than 900 miles

Apply **R. T. HORTON.**

45, Anderton Park Road, Moseley, Birmingham.
Telephone: South 1677

WOLSELEY HORNET

DOWN DRAFT TWIN CARBURETTER UNITS.



These carburetters give an ever better performance than the usual horizontal units, mainly because gravity assists the flow of gas, the mixture being heavier than air falls into the induction pipe. The manifold has a very hot "impact hot spot," so that only a very dry mixture is used. Drain pipes are fitted to prevent cylinders from being flooded with petrol should the carburetters ever leak or seep The manifold diameter is increased, allowing a larger front exhaust pipe to be fitted, this large pipe is included in the price of the complete unit, of similar specification to the horizontal carburetter unit.

With single Amal Down-draught Carburetter			£12 17 6
,, twin ,,	,,	,,	£14 10 0
,, ,, S.U.	,,	,,	£15 10 0



DEEP NOTE EXHAUST SYSTEM

Increases power and acceleration and renders the interior of the car *cooler. Imparting a most pleasing deep exhaust note.* Special steel silencer with extractor baffle, 2" dia. tail pipe, cast aluminium Brooklands Fishtail, clip and rear stay ready for fitting. 4/- Post 1/3.

Terry's "Aero" Double Valve Springs definitely prevent valve bounce which normally limits engine revolutions. 14/6 set of 24.

Special tunings for Hornets and Midgets by the Specialists on these makes since their inception. Send for Special Fittings List.

V. W. DERRINGTON
159, LONDON ROAD, KINGSTON-ON-THAMES

Modern Carburettor Development.

POPULAR INSTRUMENTS NOW AVAILABLE FOR THE SPORTS CAR OWNER.

IT is certainly a far cry from the wick and surface carburettors of the early days of motoring to the almost fool-proof instruments on the market to-day, but the problems are the same in general as they have always been. The main requirement of all carburettors is that they should supply to the engine, under all conditions of speed and load, a mixture of air and finely divided fuel in constant proportions, except for slight modification to this proportion under certain special conditions.

The difficulty of solving the problem has increased as more has been found out about carburation, for every step is accompanied by parallel steps in engine design, by which increased revs. and acceleration have been obtained. A further minor problem has been introduced by the fact that modern petrol, blended to give power without detonation and also to be sold at a remarkably low price, is not so easily vapourised as the very volatile spirit obtainable many years ago.

This means that arrangements must be made for preheating the mixture, and also to provide a rich mixture for starting without swamping the cylinder with liquid fuel, to the detriment of the lubricant on the walls.

The requirements of a good instrument are more easily outlined than are the methods of fulfilling them, and the fact that widely differing methods and devices are used to get the same result does not necessarily mean that one method is better than others.

Carburation is still a problem, like so many in motoring, which has to be solved by a series of compromises, and the ingenuity and resource of designers has resulted in the efficient and reliable instruments which are in use today.

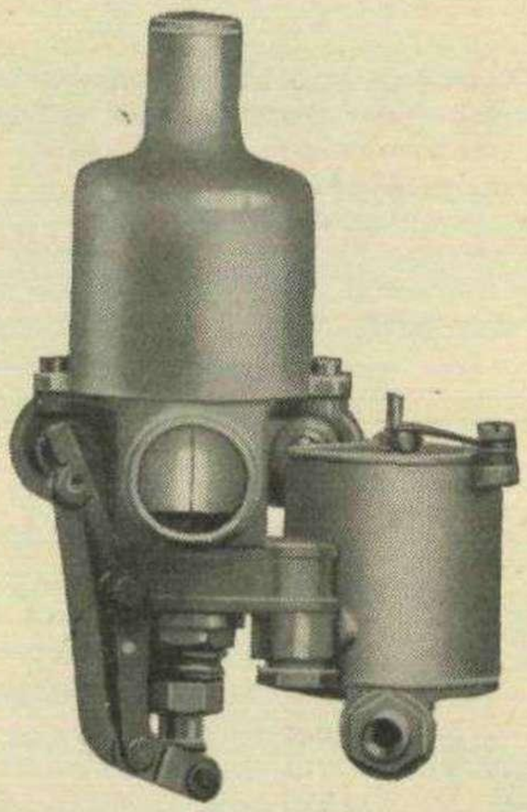
All carburettors use a jet through which the fuel passes, it being drawn through it by the depression in the choke tube in which it is situated, due to the air passing through this tube on its way to the engine.

The simple carburettor would consist of such a jet and venturi, coupled with a device such as a float chamber which maintains a constant level of petrol in the jet.

Unfortunately, this will not supply a constant proportion of fuel and air owing to the fact that the increase of air speed and consequently the depression in the choke, does not have a proportionate effect on the fuel in the jet. This is due to the different viscosities of the two fluids, and the fact that one is a liquid and one a gas, and is governed by different laws.

This results in far too much increase in the supply of fuel with increase in speed giving an over rich mixture at high speeds and too weak at low. Therefore, it is obvious that the first requirement of the carburettor is some method of compensating automatically for this error, either by introducing extra air at high speed or extra fuel at low speeds or some combination of these methods. This can be done by compensating jets, by variable jets with taper needle control, by valves operated by suction, or again by combinations of these.

The fuel must also be finely divided so that it will be completely evaporated on entering the cylinder, and the control must be such as to give maximum power at full throttle without having a rich and consequently wasteful setting at ordinary cruising speeds.



A popular instrument—the S.U.

On all car engines, and especially those of sports and racing cars, instant response to sudden throttle openings is essential.

When running light, the pressure in the induction system is very low and the whole of the fuel is evaporated. When the throttle is opened suddenly it will rise to nearly atmospheric pressure, and the fuel will no longer be evaporated fully unless heated considerably. This will reduce the volumetric efficiency, and therefore the remedy is to supply momentarily an over rich-mixture, of which the proportion of fuel deposited owing to the increased pressure, will not unduly weaken the mixture. Conditions will then settle down to the normal full power state when a layer of deposited fuel covers the walls of the induction system.

This temporary extra dose of fuel can either be supplied by storing a quantity of fuel when running idle in a small well round the jet to be delivered on opening the throttle, or by means of a pump operated by the throttle. It is important to avoid having to maintain an over-rich mixture continuously to give acceleration, as was done in early racing carburettors, as this is wasteful, and the modern instrument is extremely economical in spite of its excellent performance.

No carburation problem can be considered without reference to the distribution system, and the performance of the best carburettor can easily be maimed by a faulty design of induction pipe. Special inductions system for increasing the performance of some models are now marketed in conjunction with the carburettor sets, that supplied by V. W. Derrington for the Wolseley Hornet being an exmple.

The S.U.

This instrument differs from the more usual fixed choke type in that the choke area is varied automatically by a suction operated disc controlling the choke piston. The depression immediately behind the choke space is communicated to the upper side of the suction disc by an opening in the lower part of the choke piston. The lower side of the suction disc is at atmospheric pressure. The piston which rises and falls according to the depression in the choke also operates a tapered needle in the main jet, the shape of which therefore controls the amount of fuel passing for any given depression. Both these features are thus entirely automatic and operate independently of the throttle position, but in relation to the demand of the engine. This instrument is used on many racing and sports cars of today and has well proved the efficiency of its somewhat unusual design.

The Stromberg.

The model A Stromberg, which is here illustrated, is especially suitable for small high speed engines, while the down draft which this firm was one of the first to develop has been of great service in getting the utmost performance out of many sports engines.

The chief features of this model are a positive acting, throttle operated pump, giving an extra supply of fuel for a definite period to aid acceleration. As this only comes into action on accelerating, it allows a normally economical setting to be used throughout the range.

Incorporated with the choking device for starting from cold is an automatic relief valve preventing excessive strangling with its deleterious effect on the cylinder walls.

The Zenith.

The name of Zenith is well known to all motorists, and their instruments have always been noted for sound design and performance.

(*Continued overleaf*)

MODERN CARBURETTOR DEVELOPMENT—continued.

The latest model of this make is the U type, which incorporates many ingenious and desirable features. Great care has been taken in the streamlining of the interior passages, while accessibility has been studied and the whole instrument can be dismantled for inspection or cleaning in a matter of seconds without tools.

A compensator jet with special atomising device ensures full vapourisation of the fuel while the extra supply of fuel for instant acceleration is supplied from a well round the jet.

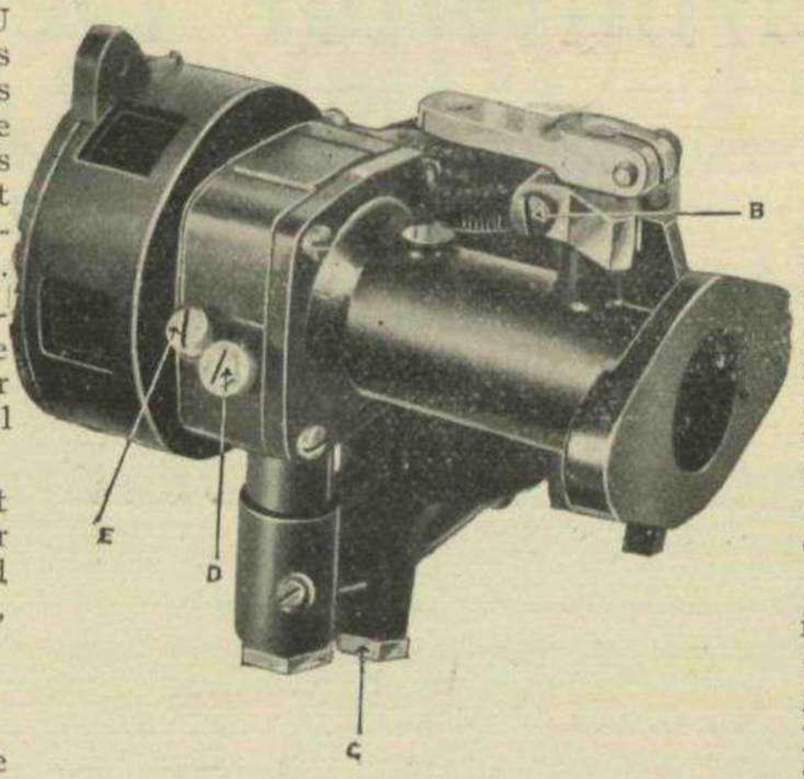
The downdraft model of this instrument should be of special interest to sports car owners as this type has now been adopted as standard equipment on Talbot cars, whose performance speaks for itself.

The R.A.G.

This make has lately come much to the fore as a result of experience on racing cars of various makes. It is an instrument of normal design in many ways but with several ingenious details. For instance, instead of the normal needle valve a hardened ball is used and complete immunity from leakage is claimed as a result.

The very important feature of accessibility has been well dealt with, and the main jet requires no special keys for its removal, and the job can easily be done in the dark.

There is a special mixture regulating ball valve which is easily adjusted, and



The Model 'A' Stromberg.

entirely automatic in action. A novel filter, which is practically self clearing, is fitted.

Acceleration is catered for by a reserve supply in a special tube which is delivered on opening the throttle, while the mechanical details of the whole instrument are extremely robust, and it is characterised by a very desirable simplicity. Experience of this instrument has shown that smoothness and good pulling at low speeds are combined with really remarkable acceleration, which make it very suitable for sports car use.

The Solex.

The outstanding feature of this make has always been a remarkable simplicity in design and construction which makes it one of the easiest instruments to tune of any on the market. The latest type incorporates the usual features of simple main and pilot jet, with a special connection between the two ensuring absence of flat-spots, but has in addition a special arrangement giving good starting from cold.

This consists of an auxiliary carburettor in the main instrument, avoiding the use of a strangler, and automatically ensuring good pick-up irrespective of engine temperature. Both economy and acceleration have always been excellent with this make.

The Amal.

This instrument is of special interest in being the result of the combining forces of Amac, Binks, and Brown and Barlow, names well known to all old time motorcyclists. When, a few years ago these three firms amalgamated under the auspices of Imperial Chemical Industries Ltd., the experience of all three firms was utilised in the production of the very successful instrument which is used today on nearly all motorcycles and by an increasing number of car firms.

The
INVINCIBLE
TALBOT

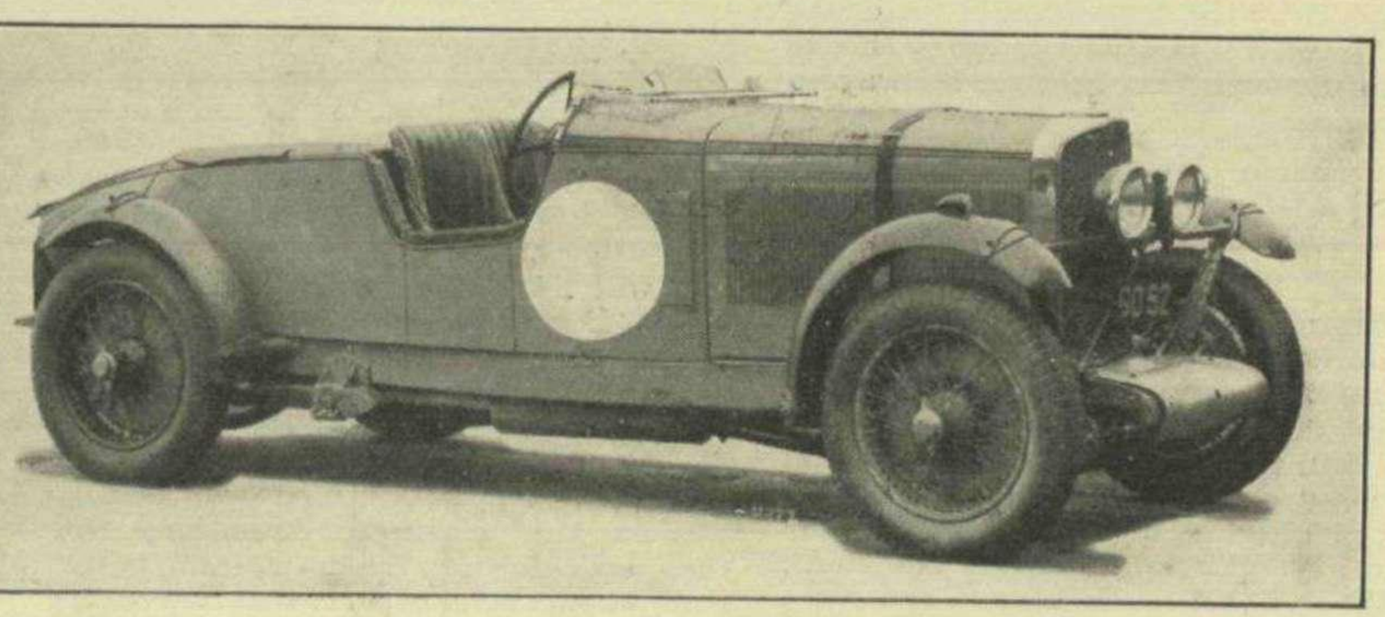
The lesson of the Talbot Record in public tests is one of complete and unequalled RELIABILITY

The Talbot is built for enduring service. There is no more reliable car in the world.

In the great Alpine Endurance Test, 1931, over the roughest mountain passes of Europe, the Talbot came through without a single fault, its repair kit and toolbox unopened.

In the Brooklands 500 Mile Race, October 3rd, 1931, the perfect reliability of the Talbot was manifest. Out of 41 cars of various makes that started, only 7 finished; 3 of these were Talbots. These were not specially constructed racing types but standard models available in touring condition to you and your friends.

Talbot prices range from £375. This is little money for such a good car.



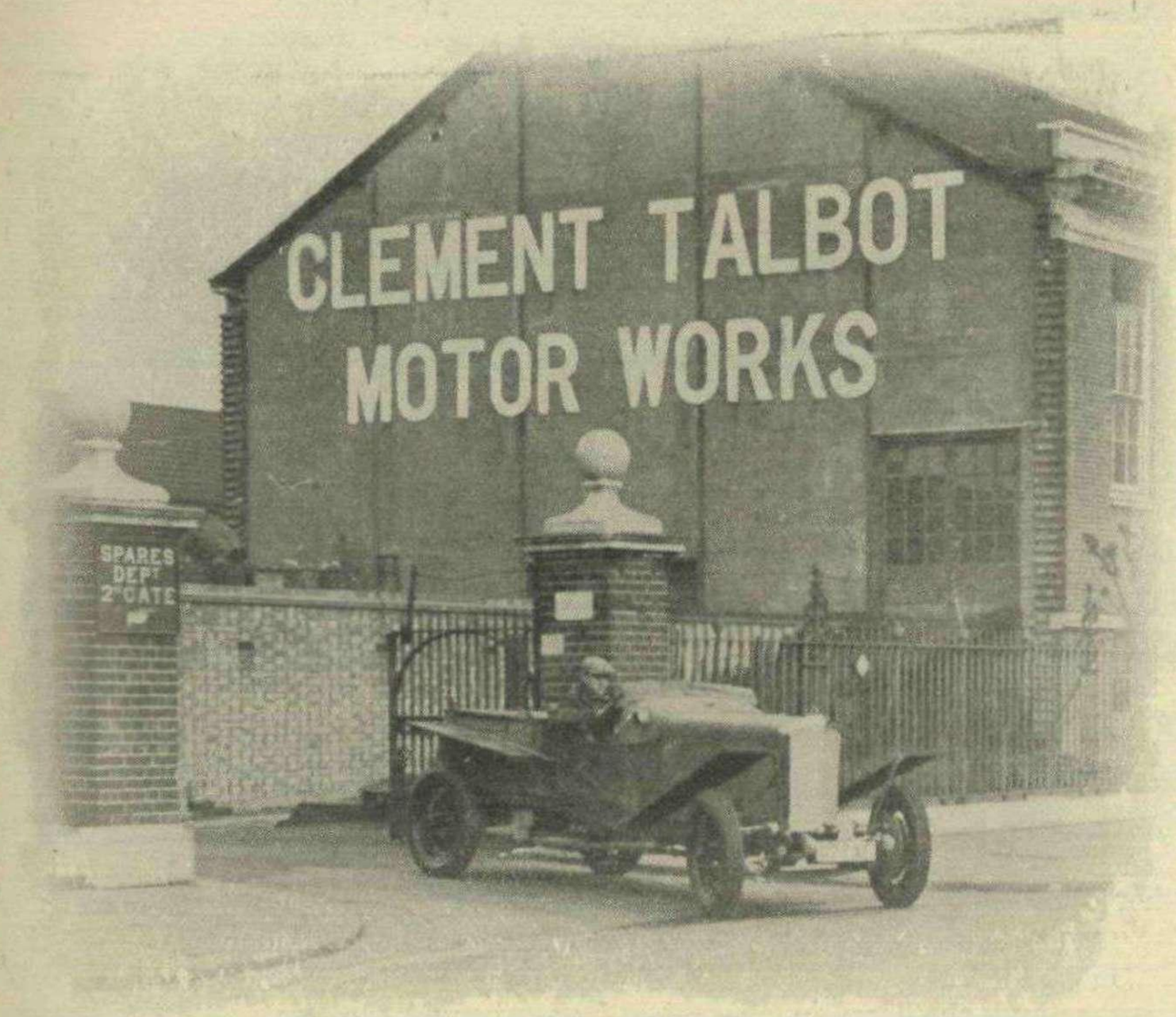
THE "105" BROOKLANDS TOURER, £835

Clement Talbot Ltd., 12 Princes St., Hanover Square, London, W.1. Works and Service: Barlby Road, Ladbroke Grove, London, W.10

A DAY WITH THE TESTERS

A GLIMPSE : AT THE : LAST PHASE IN MOTOR CAR MANUFACTURE

: : : : : : : :



One more car on the road. A brand-new chassis leaving the factory for its first test run.

"THIS," said our escort as we passed through two big sliding doors, "is the road test department—not the biggest section of our works, but one which is very important."

"There have been a lot of changes in the methods employed in building cars in the past ten years or so, which save time and labour and overheads, but you can't dispense with these fellows here if you're going to turn out a first-rate job. Attempts have been made in the past, of course, to test chassis by "synthetic" means—on revolving tracks and so forth, but we stick to the old and sounder means—a real trial on the road, and our staff here know their work as—well, you will see for yourselves."

So saying, he left us. A row of sleek, bare chassis was ranged along one side of the shop; opposite, numerous people were busy lifting rough test bodies onto cars ready for the road, fitting canvas wings and making preliminary adjustments to brakes and engines. There was a pleasant medley of sounds, of running motors punctuated now and then by a crescendo roar as throttles were snapped open. It was all vaguely reminiscent of the start of a racing classic; only the surroundings showed that it was part of a day's work in an automobile factory.

"All ready," said our driver, whose companion we were to be for the day. And we took our place in the mud-stained body. Some minor formalities were proceeded with concerning a "Pass-out," and we slipped quietly from the works and through the exit gates.

The First Mile.

In a brief while car No. A/1987 had covered the first mile of its life. "Racer!" bawled an urchin, enthusiastically if inaccurately, inspired by the skimpy equipment of our vehicle. We threaded our way over tramlines and through the turmoil of weekday traffic jambs to come eventually to the open road and rural Hertfordshire. So far our speed had been comparatively sedate, though the absence of a protecting windscreen gave us an impression of speed. "Well, how's she shaping?" we asked. "Noisy second speed, and a bunch of flat spots, but it's early yet to say," was the laconic reply.

Each power unit is run on the bench for about eight hours before installation in a chassis, and though this test obviates the likelihood of a seizure, the first run on the road is done at moderate speeds. The loud-pedal business comes later.

An hour passed and we pulled up for our first adjustment, and there was some smart work with spanners and a jet-key. A mile or so, and the process was repeated; the flat spots were being located and removed. It seemed simple enough.

Then the rain started, and streams of liquid mud swept back from the wheels and rain lashed our faces. "*Some* job on a day like this, but you get used to it," said our driver. A railway arch provided us with temporary if draughty shelter while the heavens opened. And the interval was used to check over tappet clearances and the brakes and to adjust the hand throttle control.

Half-an-hour later we left the beaten track and swept onwards up a narrow winding lane. We were taking bends now in real T.T. style with our tail keeping up a steady

A DAY WITH THE TESTERS—continued.

slide. Deftly the wheel was spun from one lock to another as we slithered our way to the summit of a greasy leaf-strewn hill.

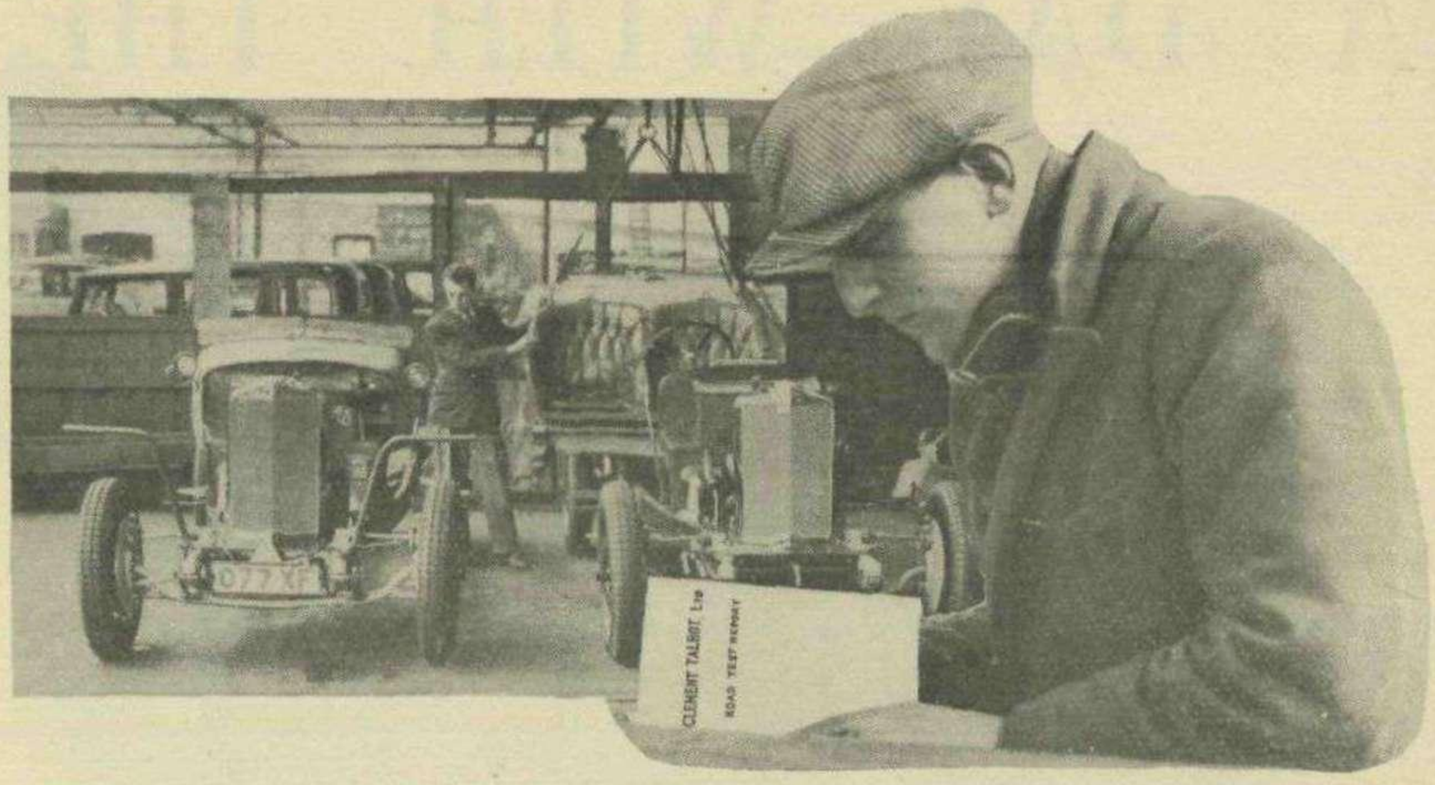
Presently our sojourn in the rural ways was ended and we came once more to a main road route, where the brakes were tried. There was a swift run up through the gears, the speedometer read 40 m.p.h., the brake pedal was depressed—and we found ourselves inspecting the scuttle at a range of ¼ inch! Well, *they* were O.K.

By now, lunch time was approaching, and we wended our way back to the works, and adjourned for an hour. Once more in the shop, the chief tester approached. "What's that one like?" he inquired.

"Noisy second speed."

"Give her another run, and meet me at the hill at four o'clock."

And so we went forth again, over the tram lines, through the traffic and onward to the broad highway. A/1987 was now no longer a fledgling, and she was given full throttle for the first time; the low hum of the silky six changed to a full-blooded roar as we gathered speed. Never mind the mud and the rain and the chilling wind—it's a great life this testing!



Next please!—the chassis on the right has just been passed O.K., and the body and rough equipment are being transferred to another. After each run the tester makes out a comprehensive report on the car's performance.

Four o'clock came and we met the "chief" at the hill with a crowd of other mud-bespattered fellows.

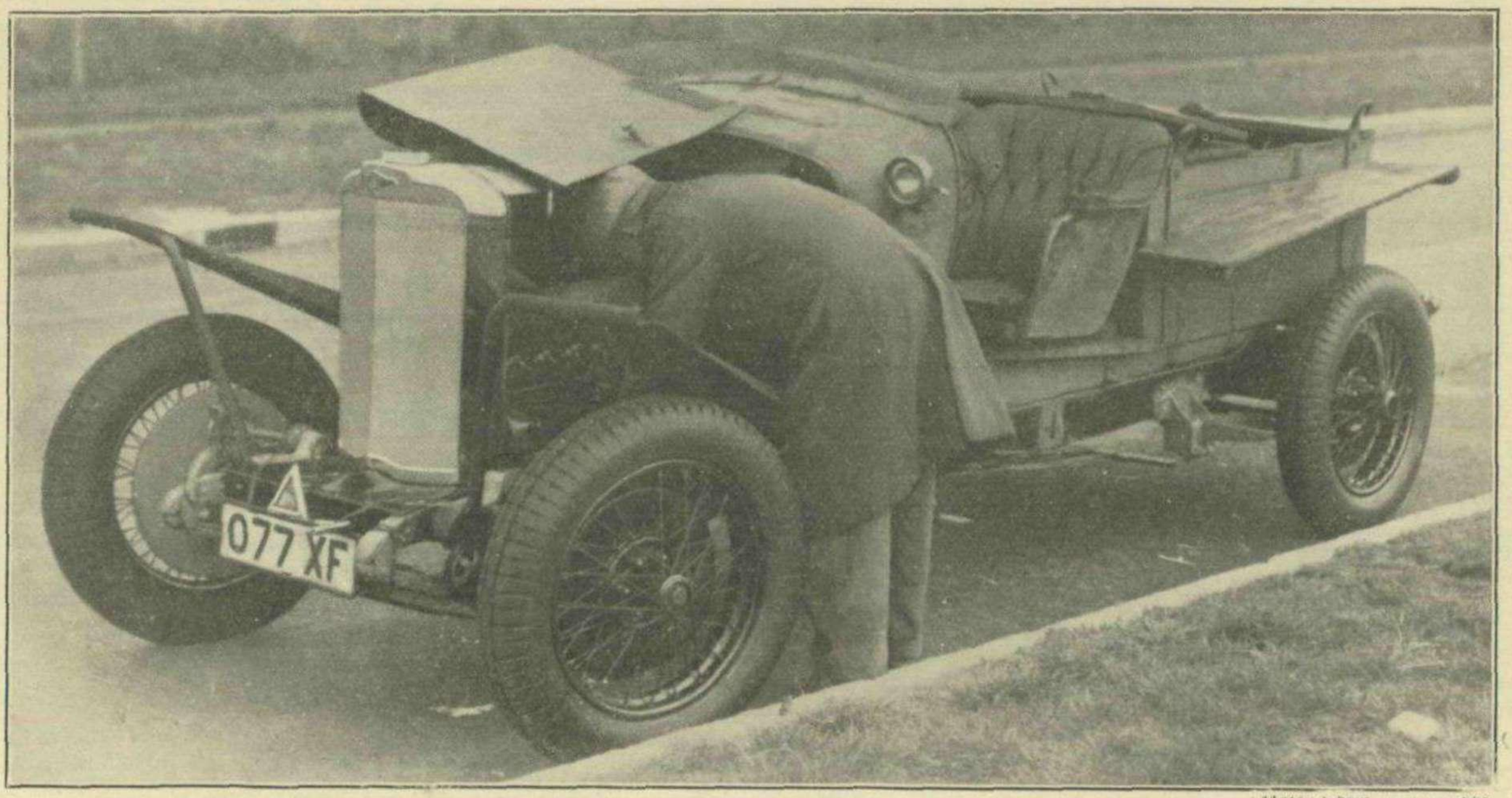
The "chief" took over and drove our car up and down the gradient. Then came the verdict—"Throw her out!"

"What happens now?" we asked. "Oh, we'll take her back to the works, and she'll go in the reject department for that second speed. Then I'll have her out again in a day or two for another run."

"And" he added, "If she doesn't come up to standard then—well she'll go back again."

The reject department, it was explained, is solely concerned in rectifying the faults diagnosed and reported by the road test department, and like the latter, the former works to a high standard.

Back in the factory once more, we turned to go. "Good-bye, A/1987" we said, "we may yet meet again—at Brooklands, Ulster, anywhere—who knows?"

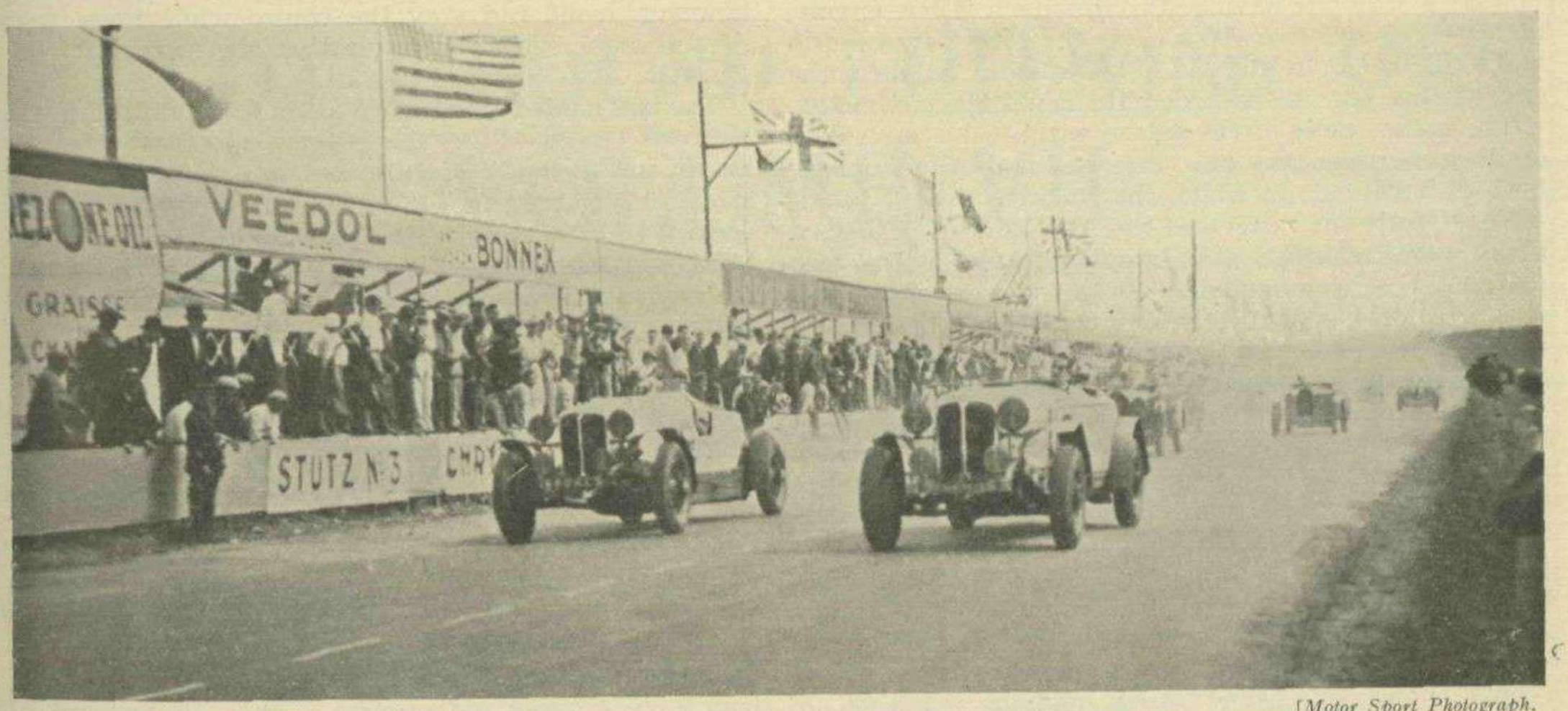


[Motor Sport Photographs

The tester pauses in his run to effect an engine adjustment.

THE YEAR IN RETROSPECT

A REVIEW OF THE SEASON'S RACING.



[*Motor Sport Photograph.*

A Continental classic—A scene in the Grand Prix D'Endurance, which took place last June.

IN most other respects, I suppose, 1931 will go down to history as a black year of depression—at least everybody must be hoping that the future will show it to have been the trough of the wave ; but in the field of motor racing its reputation will surely not be so unfavourable, for I think that in this respect it has proved the best year that I can remember since 1925.

Reviewing the position a year ago in these columns we remarked, "in these days if attention is first directed to races for real racing cars—as opposed to sports cars—one may be accused of a lack of perspective . . . but we are firmly convinced that it is only a matter of a year or two before the real racing car comes back into its own." In actual fact, this prophecy has been fulfilled perhaps even earlier than we anticipated, for there can be no doubt that at any rate from the European if not from the purely English point of view, sports car races in 1931 have been entirely eclipsed in interest by those for real racing cars. Sports car races on the Continent—with the solitary exception of the first of the kind, the Grand Prix d'Endurance at le Mans—have by a process of evolution become so far less stringent in their regulations that you have only to put some nominal mudguards on a Grand Prix racer to make it eligible, and thus the whole object of these races has been lost ; while in this country there seems to be at least a serious danger that the whole fabric of these races' entry lists will go down in a welter of argument about the handicapping. On the other hand, the real racing car events have disclosed a welcome return of interest on the part of manufacturers, and at last the ever-faithful Bugatti has been faced with opposition worthy of his "steel."

One of the healthiest signs of all in this respect has been that the three manufacturers who have been the serious contestants in this field have none of them been content with one design of racing car throughout the season, but have all of them finished the year by introducing a faster type than that which they ran in the earlier races. Realising that this year he would have to meet sterner competition than of late, Bugatti first designed his new 2,300 c.c. racer with two overhead camshafts, but before the season was ended we saw the introduction of the still newer 5-litre machine of the same general design. Similarly Alfa-Romeo, having used the new straight-eight 2,300 c.c. model in the earlier races, finished up by presenting the 3,500 c.c. double-six ; while Maserati having started with his familiar 2½-litre eight, had evolved the new 2,800 c.c. racer before the season was ended.

It is, in fact, interesting to notice how the engine sizes of racing cars have been "growing up" since the capacity limit was abandoned. Bugatti may be said to have started from his 60 x 88 mm. 2-litre straight eight originally designed for the 1922 Grand Prix ; then for the 1926 Targa Florio the stroke of this engine was increased to 100 mm. and as such it remained as his fastest racing type until this year it was superseded by the new 86 x 107 mm. 5-litre racer. Alfa-Romeo after building the 61 x 85 mm. straight-eight 2-litre racer for the 1924 and 1925 Grands Prix, decided to make a 1,500 c.c. sports car with a 62 x 82 mm. 6-cylinder engine (nearly, that is to say, ¾ of the Grand Prix motor) and used this little car in the 1928 Targa Florio. Then, requiring more power the 6-cylinder engine dimensions were increased to 65 x 88 mm. giving a capacity of 1,750 c.c., and at the

THE YEAR IN RETROSPECT—continued.

beginning of this year these dimensions were used for the new 8-cylinder, the capacity thus becoming 2,300 c.c.; while finally two 6-cylinder engines were put in one chassis to make the latest 3½-litre 12-cylinder racer. Similarly Maserati having started with a 2-litre engine, increased its size to 2,400 c.c. for the 1930 Targa Florio and to 2,500 c.c. by the end of last season; while at the end of this year he launched the new 2,800 c.c. model.

The earlier races of the season witnessed a succession of duels between the new Bugattis and Alfa-Romeos, both of 2,300 c.c., in which the Bugattis proved themselves slightly the faster and the Alfa-Romeos perhaps a little more reliable. The conflict between the two marques has been rendered all the more exciting this season by the fact that Achille Varzi, late of Alfa-Romeo, has been a member of the Bugatti team, while his old team-mate, Tazio Nuvolari, has remained faithful to the Milanese firm. These two drivers can undoubtedly both lay claim to being the greatest "ace" at the moment of Italy if not of the world, and although they are the best of friends, the keenest rivalry exists between the two men. They form, in fact, an interesting contrast, for Varzi is as cool as a cucumber at the wheel and combines soundness with real brilliance, while Nuvolari seems always to be overcome with nervous excitement and is rather surprisingly regular nevertheless; at all events, though one hears varying opinions, it is hard to choose between them for the better driver.

The Targa Florio.

The Targa Florio, the first and still the greatest of the great races of the year, provided the first round of the Varzi-Nuvolari duel, but did not represent a fair contest between the two marques, for Varzi's Bugatti ran alone against a full team of Alfa-Romeos. A landslide which necessitated using the Long instead of the Short Madonie Circuit together with atrocious weather conditions made the 1931 Targa an even more strenuous affair than former races of the series and Nuvolari's victory at 40.3 m.p.h. was a truly magnificent performance which branded the new 8-cylinder Alfa as a really good car from the outset. Varzi's first lap on the Bugatti, however, was the fastest of the race, and had his lack of mudguards not seriously handicapped him when it began to rain, he might have finished first instead of third; while actually second place went to the unassuming Borzacchini on a 1,750 c.c. Alfa, who proved his brilliance by covering the third lap in the worst of the rain faster than any other driver.

The Italian Grand Prix which was run at Monza on 24th May, was the first of this year's 10-hour races, and this time Bugatti and Alfa-Romeo teams met on level terms. This race also saw the first appearance of the 12-cylinder Alfa, but the car was obviously not yet quite "au point" and the real struggle developed between the straight-eight cars of the two marques. At first the Bugatti driven by Divo and Chiron showed itself slightly the fastest car on the course, but it was eliminated by a mechanical failure and the second Bugatti having been held back by tyre troubles, the first two places went to Alfa-Romeo.

The second round, however, came in the French Grand Prix a month later, and this time Maserati who had been absent at Monza, once more reappeared. At the start of this race it seemed to be confirmed that the Bugattis were faster than the Alfa-Romeos, although they were equalled in speed by the Maseratis; the latter cars, however, could not stay the course while those from Alsace could, with the result that the final order was Bugatti, Alfa-Romeo, Maserati.

The last-named stood down again for the third of the national Grands Prix, the Belgian race over the Spa circuit in the middle of July, and once more there was a straight Bugatti-Alfa fight. This time the Italian cars seemed to have found more speed, or on the Spa circuit there was less scope for the Bugattis to use theirs, and throughout the race there was little or nothing to choose between them. Various mechanical failures intervened however, and the first place went to Bugatti and the second and third to Alfa, with the result that it is hard to say which proved more successful in the great races of the year.

The contest, however, was not yet over for a week later the three marques came to grips again in the German Grand Prix. This time, however, there came a new intervention and Rudolf Caracciola on his giant Mercédès showed that on his home course he could beat allcomers. Of the others, however, Bugatti proved the most successful, taking second and third places, while Alfa-Romeo had to be content with fourth. Then all repaired to Italy for the Monza Grand Prix.

This race saw the first appearance of the new 5-litre Bugattis, the reappearance of the 12-cylinder Alfa-Romeos and the début of the 2,800 c.c. Maserati. In the event the 12-cylinder Alfas did no good, but the 8-cylinder model managed to beat the big Bugatti; while both of them were beaten by the new Maserati. While therefore, it is hard to say which of the two, Bugatti or Alfa-Romeo, has proved the more successful this year, it would seem that Maserati has actually produced the fastest car. At this time last year we prophesied that Maserati would one day win the Targa Florio, and we added later, "if he can keep Fagioli." So far he still has this driver, who has proved really brilliant, and although Maserati has sometimes flattered only to deceive, we are inclined to repeat this prophecy.

The "Five-Hundred."

In this country the only race which is held for real racing cars is the fin de saison "500 Miles." But this year no factory teams of modern racing cars were sent to compete, and the leading places were all taken by cars of touring type. Their performance nevertheless, was magnificent and one rather wonders which to admire most, the 6½-litre Bentley which averaged 118 m.p.h., the 3-litre Talbot which did 113 m.p.h. or the 750 c.c. M.G. with its 92 m.p.h.

Turning now to the touring car races, the season has resulted in a succession of triumphs for the new M.G. Midgets with, as their only real challengers, the Alfa-Romeos and Mercédès. Great Britain must now be regarded as unquestionably the centre for races of this type, and all three of the big events in this country have been triumphantly won by the little M.G.'s. This has been the 750 c.c. Midget's first season, and the new

WE NOW HAVE READY

CLOTH BOUND EDITIONS OF VOLUME VII

(which contains the issues from November, 1930 to October, 1931)

OF

MOTOR SPORT

The charge for this Volume is 12/6 (Postage 9d. extra).

Covers for Binding Volume VII (including Title Page and Index) - - 5/- each (Post free).

Readers' copies can be bound together with Index and Title Page (Volume VII.) of Motor Sport for the inclusive price of 6/6 each.

We can supply many single copies of the "Brooklands Gazette" and "Motor Sport" from the first issue, July, 1924, to the present date at an exclusive charge of **6d.** to **2/-** according to year of issue.

WE CAN SUPPLY FROM STOCK THE FOLLOWING:

Volume 1 at £1 1 0 Postage 9d. extra.
" 2 at £1 1 0 "
" 3 at £1 1 0 "
Volume 4 at £1 1 0 Postage 9d. extra.
" 4-5 at £1 2 6 "
" 5-6 at £1 2 6 "
(Volume 5 contains only 3 issues).

and

Volume 6 at 15/- Postage 9d. extra.

MOTOR SPORT (1929) LTD., 39, VICTORIA STREET, LONDON, S.W.1

THE YEAR IN RETROSPECT—continued.

model was developed after comparatively little racing experience with the older and larger engined type ; in consequence the practically 100% success of these little cars must be regarded as an unprecedented event in racing history. Starting with the capture of the first five places in the " Double Twelve " race at Brooklands, with the Earl of March and C. S. Staniland at the head of affairs, the marque went on to win the Irish Grand Prix a month later and the Tourist Trophy a month after that, Norman Black being the successful driver on both occasions. Surely this triple confirmation of merit must completely silence all talk of luck or favour of the handicap, and give all credit where credit is due, to Mr. Kimber and the Abingdon factory.

In the Irish Grand Prix and the Tourist Trophy, however, the runner up to the M.G. was on both occasions one of the new 8-cylinder Alfa-Romeos, the first driven by Sir Henry Birkin and the second by Borzacchini, and the worth of this model was unequivocably shown by its victory in the hands of Earl Howe and Sir Henry Birkin in the Grand Prix d'Endurance at le Mans, which it won at a speed which wrested the record for the race from a far bigger car. On this occasion the runner up was Ivanowski and Stoffel's Mercédès, and this marque also did not go without its victory, which it scored in the Belgian 24-hour race at Spa, its drivers being Prince Djordjadze and Zehender.

In general, therefore, 1931 has been a season full of interest not only from the point of view of the races which have been run, but also because of the promise which it has given for the future. Undoubtedly interest in real motor races is reviving, already rumours are afloat of the great marques which will shortly return to the game, and if only economic conditions are not too unfavourable, the immediate future may show us a great period of revival.—K.

---

700 Miles in 700 Minutes.

The last of a series of seven tests under A.C.U. observation was brought to a successful conclusion by the manufacturers of Ariel motorcycles some little time ago.

There are seven distinct models of this make for 1932, and each has been subjected to a separate test in which the figure " 7 " appears. Thus one has run for seven hours at Brooklands, another has covered 70 miles in an hour, a third has run for 70 minutes in each of its four gears, and so on.

The final test was of the 600 c.c. four-cylinder machine, the idea being to cover 700 miles in 700 minutes. The A.C.U. official selected all the engine components at random from stock, and the parts were assembled under observation. The machine was then run in and taken to Brooklands track.

The 700 miles were covered comfortably in the 700 minutes—in fact, with half an hour to spare.

After its test the machine was officially timed over a lap at the track, at a speed of 87.1 m.p.h.

LOOK FOR THE YELLOW SIGN

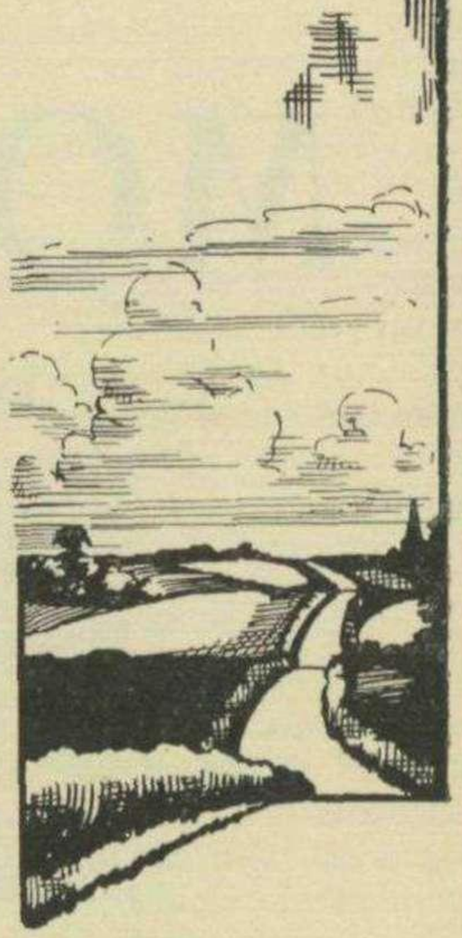
MORE MILES PER BATTERY

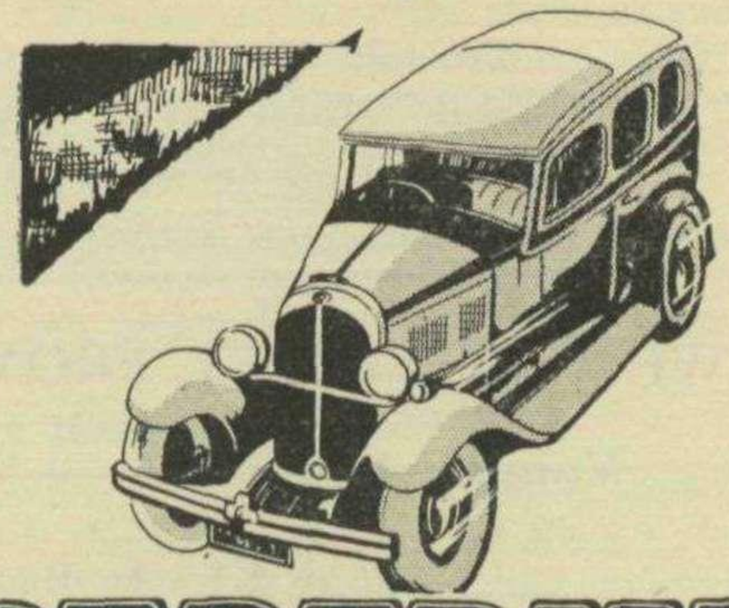
A good tyre is judged by its mileage. So is good petrol—and oil.

Judge your battery by its mileage too, and if it's a Pertrix you will get miles more light—miles more easier starting — miles more faithful service.

Don't forget too, that behind each Pertrix Battery stands Pertrix service, and a service man, skilled in battery care, to safeguard the dependability and long life built-in by Pertrix at the factory.

Ask your Service Station or garage man—they will give you full details, or, if you prefer, write direct to us.





PERTRIX BATTERIES

STARTING — LIGHTING — IGNITION

"The Batteries you can trust"

Advt. of Britannia Batteries Ltd., Britannia House, 233, Shaftesbury Avenue, London, W.C.2. Works : Redditch.
Telephone : Temple Bar 7971 (5 lines).
Telegrams : Britanicus, Westcent, London.

M212

VETERAN TYPES

X.—A 1914 G.P. OPEL

IN all the long history of motor racing there has probably never been a contest more interesting in prospect or more dramatic in its conclusions than the Grand Prix that was run at Lyons in July, 1914. For this race some of the oldest firms who for years had been out of the game, returned to the arena ; no fewer than thirty-nine cars started, and the nations represented were England, France, Germany, Italy, Belgium and Switzerland.

The tale of the grim struggle between the German Mercédès and the French Peugeots, and how but a few weeks before the outbreak of War it finished in the triumph of the former, is probably familiar to all : but as well as the cars from Untertürckheim the German contingent included three cars from the Opel factory. In the race these cars were entrusted to Karl Joerns, Erdtmann and Bruckheimer, and in view of the fact that the marque had not been seen in the great races since the Opel-Darracq days, their performance was watched with interest.

The race proved a veritable test to destruction, and of the 39 cars which started 28, including two of the Opels fell by the wayside. Joerns on Opel I, however, succeeded in finishing tenth, averaging 56.3 m.p.h. for the 467 miles of the race. This car together with one of the others was shipped to England after the race, and on August Bank Holiday, immediately before the outbreak of war, the two white Opels appeared at Brooklands. During the War they remained safely stored away somewhere, and in 1920 Joerns' car was acquired by H. O. D. Segrave, then an unknown driver, who was determined to make his name in the racing world.

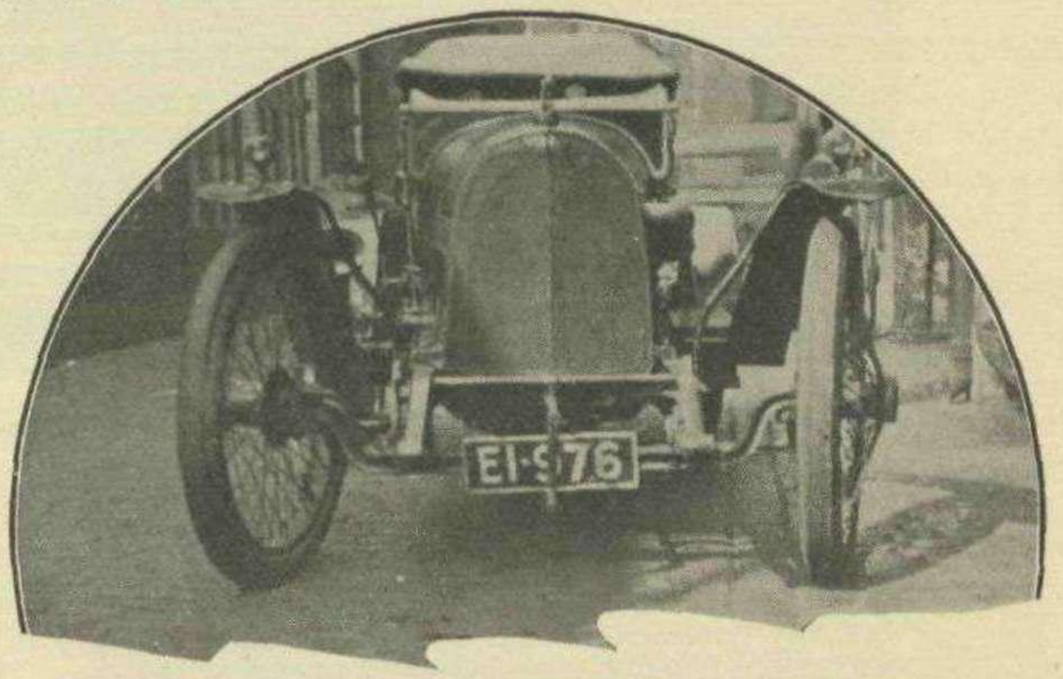
A Memory of " H.O.D."

During 1920 the car was raced by him fairly consistently at Brooklands and also took part, I think, in a Kop hill climb, with such good results that Segrave's ambition was fulfilled, and he was given a place in the Sunbeam-Talbot team in 1921.

The Opel, however, passed somewhat into oblivion, and I think that lately few people had any idea of where it was.

It was, therefore, with considerable interest that I heard that this motor car is at present for sale by Messrs. B.M.C., Ltd., of Brick Street, Park Lane, and my interest was still further aroused when I was informed that its present owners would be pleased to give me a run on it so that I could record my impressions of it on the road in MOTOR SPORT. And so at the appointed hour one afternoon I duly arrived at Brick Street, and was rather pleasantly surprised, I must admit, knowing the ways of many of those who go down to the road in motor cars, to find the Opel standing in the mews, apparently all ready to set off.

Unlike many others of its type which have been altered out of all recognition, the Opel at a first glance looks exactly what it is, a late pre-war racing car. It is true that it has since been fitted with a diminutive single



Slender and high in build, the old Opel looks strange in these days.

panel windscreen, of the type which folds forward flat on the scuttle, a hood and mudguards, but these are all of an unobtrusive nature which add to the convenience of the car without detracting materially from its appearance. First impressions of the car are a long bonnet and scuttle, a bolster petrol tank behind the seats and a couple of spare wheels strapped on behind that.

Low Weight.

The chassis of the car is, I believe, more or less that of the standard 1914 Opel and gives one the impression of being rather slender for a racing car, which is borne out by the fact that the Opels were the lightest cars of all at Lyons, turning the scale at only just over 18 cwt. The engine, however, is definitely " special," and is of advanced 1914 racing type. The four cylinders have a bore and stroke of 94 x 160 mm. dimensions which were by far the most popular at Lyons, being used also by Sunbeam, Delage, Nazzaro, Alda and Schneider, and the capacity of the engine is thus 4,440 c.c. as against the limit for the Grand Prix of 4½-litres. At the back of the engine there is a bevel gear which drives a cross-shaft, operating the magneto on the right and the water pump on the left-hand side of the engine, and in addition the vertical shaft which in turn drives the single overhead camshaft lying centrally along the top of the cylinders. By means of rockers, the outer ends of which project from the camshaft casing, the latter operates four inclined valves per cylinder, their springs being also exposed. On the right-hand side of the engine is the single large Zenith carburettor, which is now fed from the rear petrol tank by means of an Autovac, which is presumably a comparatively recent addition. The lubrication is interesting, oil being poured into a large tank in the scuttle, whence it flows both to the sump and to a subsidiary tank from which it is fed by no fewer than eight pipes to the overhead valve gear and camshaft bearings.

Behind the engine is a leather cone clutch which transmits the drive by way of a metal universal joint to the separate 4-speed gear-box. Behind this again is a short open propellor shaft whith two universal joints and a

FRAZER NASH

A Word on INDIVIDUALITY!

It is obviously impossible for a firm producing mass-production cars to build to any particular owner's individual requirements—we, however, have always made a speciality of this, and moreover (of some importance these days) the Frazer Nash is relatively cheap. We have no hesitation in asserting that for a moderate expenditure we can build you a de luxe fast tourer model Frazer Nash to your own specification—attractive in appearance, lavishly equipped, and a better motor car in every way, than it has been possible to obtain in the past for a considerably higher figure.

The New Frazer Nash is genuinely fast with an outstanding road performance, a smooth and silky engine developing considerable power, efficient transmission incorporating silent and direct drive on *all* gears, built by hand to last and thoroughly well constructed as regards both chassis and coachwork. Years of practical racing and competition experience have influenced the design of the car.

In trials the New Frazer Nash worthily upholds, and has enhanced, the reputation gained by the older models. We have been successful in considerably increasing the maximum speeds obtainable—the non-supercharged Tourist Trophy model (an absolutely standard job) is capable of well over 90 m.p.h., and is without a doubt the fastest standard 1½-litre car in the country. A non-supercharged car of this type has lapped Brooklands at 92 m.p.h.

Of all cars road-tested by "The Autocar" from October, 1930, to November 6, 1931, the Frazer Nash "Boulogne II" model had the finest acceleration figures of any car tested, *irrespective of horse-power or price.*

We do not say you cannot have this or that (a practice followed even by makers of really expensive cars) and we are at all times very glad to incorporate modifications to your personal specification. We want you to derive the utmost pleasure from owning and driving a Frazer Nash.

Salient features of Frazer Nash design which, amongst others, are subject to your personal decision, are :

Long, or short, chassis, with provision for quickly increasing, or decreasing, ground clearance.

Gear ratios to choice—and fitting of alternative ratios for trials, hill-climbing or track work.

Three, or four, forward speeds.

Gear and brake levers in *any* position.

Side valve, or overhead valve, engines, of varying horse power. Supercharged, or non-supercharged.

Low, or high, geared steering.

Light, or heavy, operation of clutch.

A most varied selection of coachwork is available.

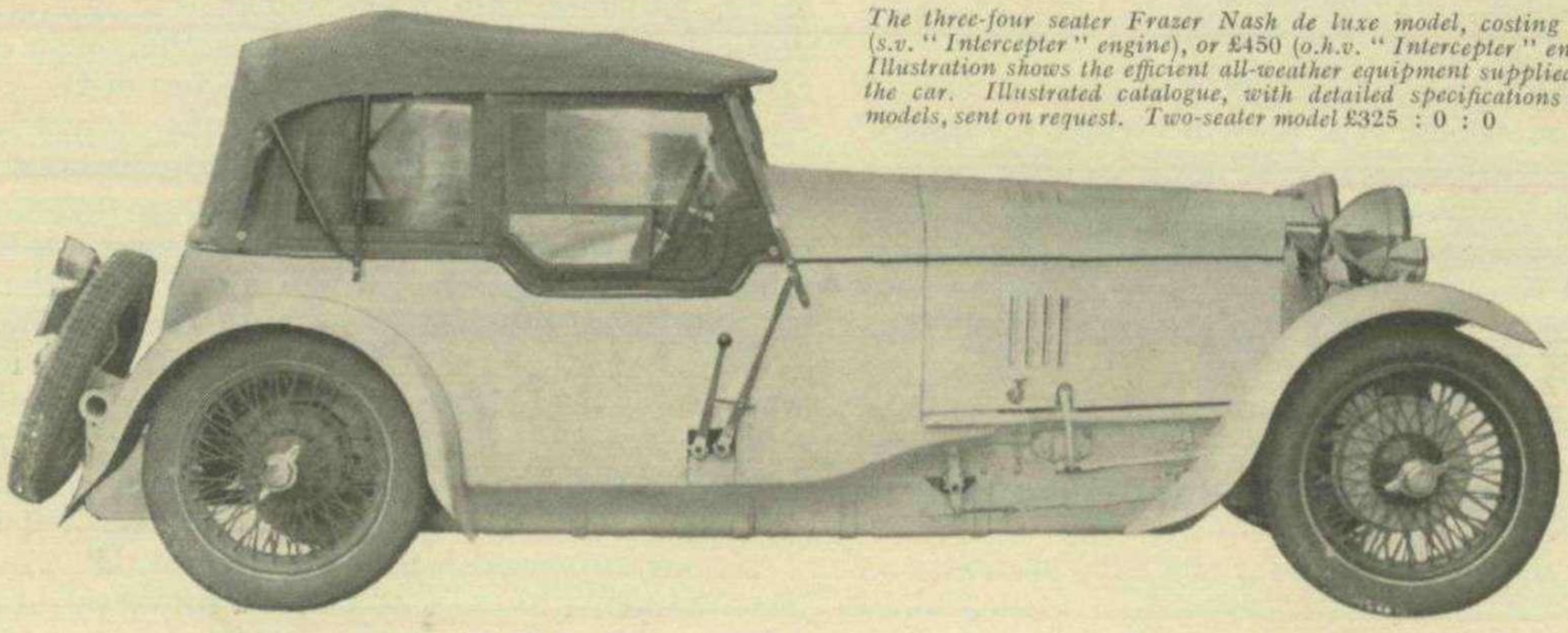
Such important details (from the driver's point of view) as driving position ; rake of steering column and position of steering wheel ; seating arrangements ; position of controls and layout of dashboard instruments ; height of windscreen, and whether single "flat-folding," two or three-panel type ; fitting of larger, and/or reserve, oil and petrol tanks ; equipment, etc.

Colour scheme entirely to choice throughout.

Even if you decide to purchase one of our standard productions, any of the above modifications can be carried out subsequently at extremely moderate cost.

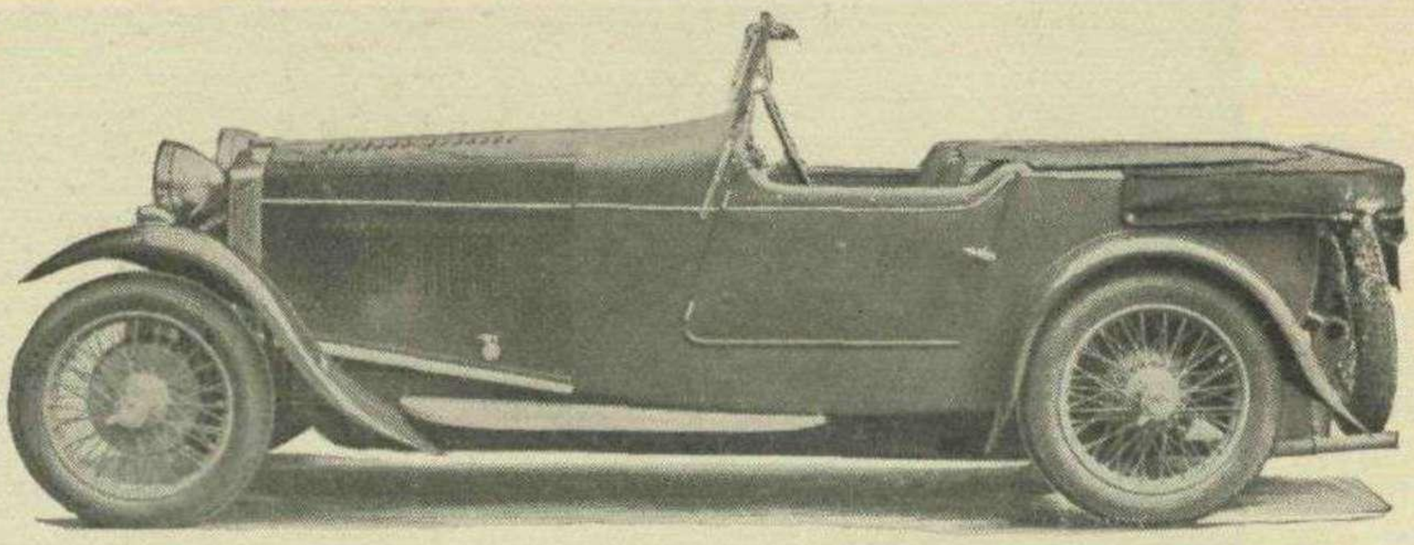
Extracts taken at random from technical reports on the Frazer Nash, which have appeared in the motoring press, must afford convincing proof that

The three-four seater Frazer Nash de luxe model, costing £425. (s.v. "Intercepter" engine), or £450 (o.h.v. "Intercepter" engine). Illustration shows the efficient all-weather equipment supplied with the car. Illustrated catalogue, with detailed specifications of all models, sent on request. Two-seater model £325 : 0 : 0



Please mention MOTOR SPORT when corresponding with advertisers.

The four-seater de luxe model Frazer Nash, with two wide doors, inside gear and brake levers and special running boards for carrying extra luggage for Continental touring, etc. The de luxe models (in addition to all essential fitments) embrace really luxury equipment and a host of refinements too numerous to enumerate.



we build a motor car which will more than satisfy the most exacting requirements. We are proud that the amazing popularity of the Frazer Nash has been built up on its reputation and performance alone, and not on advertising.

A car which has earned such an enviable reputation in trials cannot be anything else than a very delightful vehicle for normal touring purposes—particularly when it is remembered it has always been our inveterate policy to enter only standard models in races or competitions. We have never yet built a special car for any event, or a model which we were not willing to sell at list price to the public. Even more important than our successes gained with cars entered by us as manufacturers, are the outstanding achievements of our *private owners* competing in all spheres of motoring sport.

"The makers have wisely made no attempt to compete in price with mass-production machines, preferring to appeal to the immensely enthusiastic body of drivers who want a car that is fast, sporting in appearance, has fierce acceleration, responds to tuning, and can climb anything and go anywhere. This ideal the Frazer Nash admirably fulfils."—*The Autocar*. July 18, 1930.

"The Frazer Nash is in a class by itself. . . . One has only to drive the car to know that it is 'cheap at the price' and has a performance which it is almost impossible to equal . . . the sheer joy that one derives from driving it . . . this car is such as will satisfy the most fastidious and experienced motorist. It is seldom we have felt so safe at the wheel of any automobile . . . the brakes are definitely among the best we have ever tried. The comfort also was most marked and was as good at low as at high speeds. The exhilaration of driving a Frazer Nash must be experienced to be believed."—*The Motor*, June 16, 1931.

". . . latest models far in advance of anything previously achieved. For a twelve horse power, unsupercharged car the acceleration and speed are amazing, and it is difficult to imagine that any car could put up higher averages. . . . Eighty miles per hour is quickly reached, on either third or top, and over ninety miles per hour can be obtained without vibration . . . the easiest gear change that any car not fitted with an automatic selecting device could well possess. To say that the road performance of the car is out of the ordinary is to make an under-statement . . . .the car holds the road in true racing fashion . . . the steering gives a feeling of absolute security when the car is travelling fast. As a result, the extraordinary acceleration and speed of the car can be enjoyed to the full. All the gears are equally silent, and changes up and down can be made with complete ease with or without the use of the clutch. Moreover, unlike some sports cars, the Frazer Nash retains its tune to a remarkable degree . . . for high-speed touring over long distances one could hardly want a faster or more fascinating car. If there is any design on the market, of any size, at £425, which could even hold the Frazer Nash, it would undoubtedly have to be a remarkably good car. The Frazer Nash sells on performance, and one has only to drive the car to realise that it cannot be called dear at its price."—*The Autocar*. November 6, 1931.

"In these days of mass-production it is always pleasant to find a car which owes more to the hands of men than machinery . . . the Frazer Nash is a car built by enthusiasts for other enthusiasts to drive . . ."—*The Army, Navy and Air Force Gazette*.

"Never, since the first Frazer Nash was produced, has the firm made anything but sports cars . . . such a policy is bound to produce a vehicle of remarkable performance, and the competition successes of this marque have shown how well its makers understand the requirements of the really hard driver . . . the steering is exceptional in its accuracy and ease of control, and combined with the car's almost uncanny steadiness on any surface, wet or dry, makes the car a delight on a twisting road."—*Motor Sport*.

"Probably the most successful of all cars in trials is the Frazer Nash."—*The Light Car & Cyclecar*.

The biggest proofs any manufacturer can have as to the worth of his products are, firstly, its depreciation figure, and, secondly, its secondhand value—the depreciation on a new Frazer Nash is negligible, while it has unquestionably a much higher secondhand value than the average sports car. These facts, easily verified, are well worth the serious consideration of the prospective purchaser, as they constitute definite proof of the car's ability to stand up to years of really hard wear.

May we suggest you call and see us? A visit to "Falcon Works" will only take a little of your leisure time, and will not incur any obligation on your part. The performance of the Frazer Nash can only be fully appreciated by actual trial, and, as "The Autocar" said in their recent road-test report of the car, "a run in one of the latest models is an experience to be remembered."

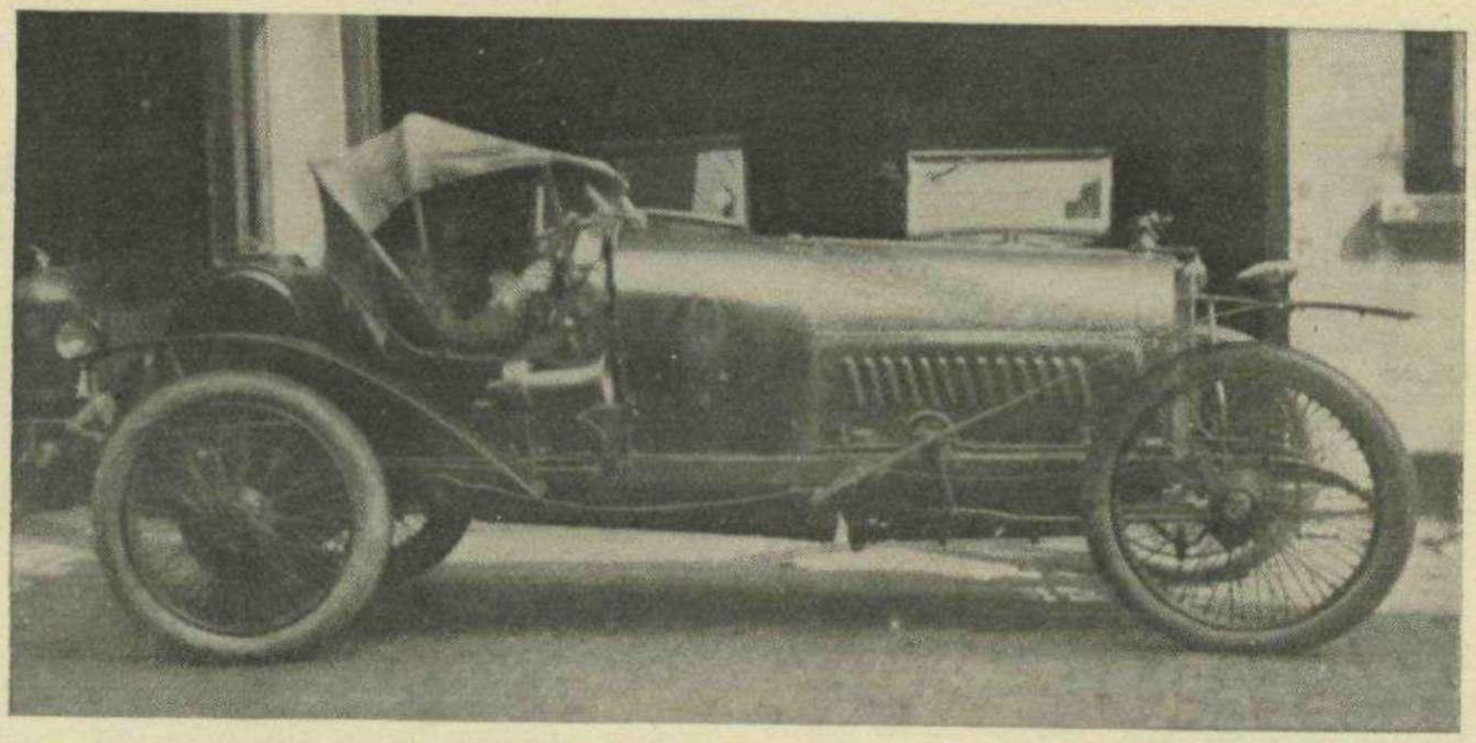
FRAZER NASH CARS

(Managing Director: H. J. ALDINGTON)

"Falcon Works," London Road, Isleworth, Middlesex.

Telephone: HOUNSLOW 3171—3172.

VETERAN TYPES—continued.



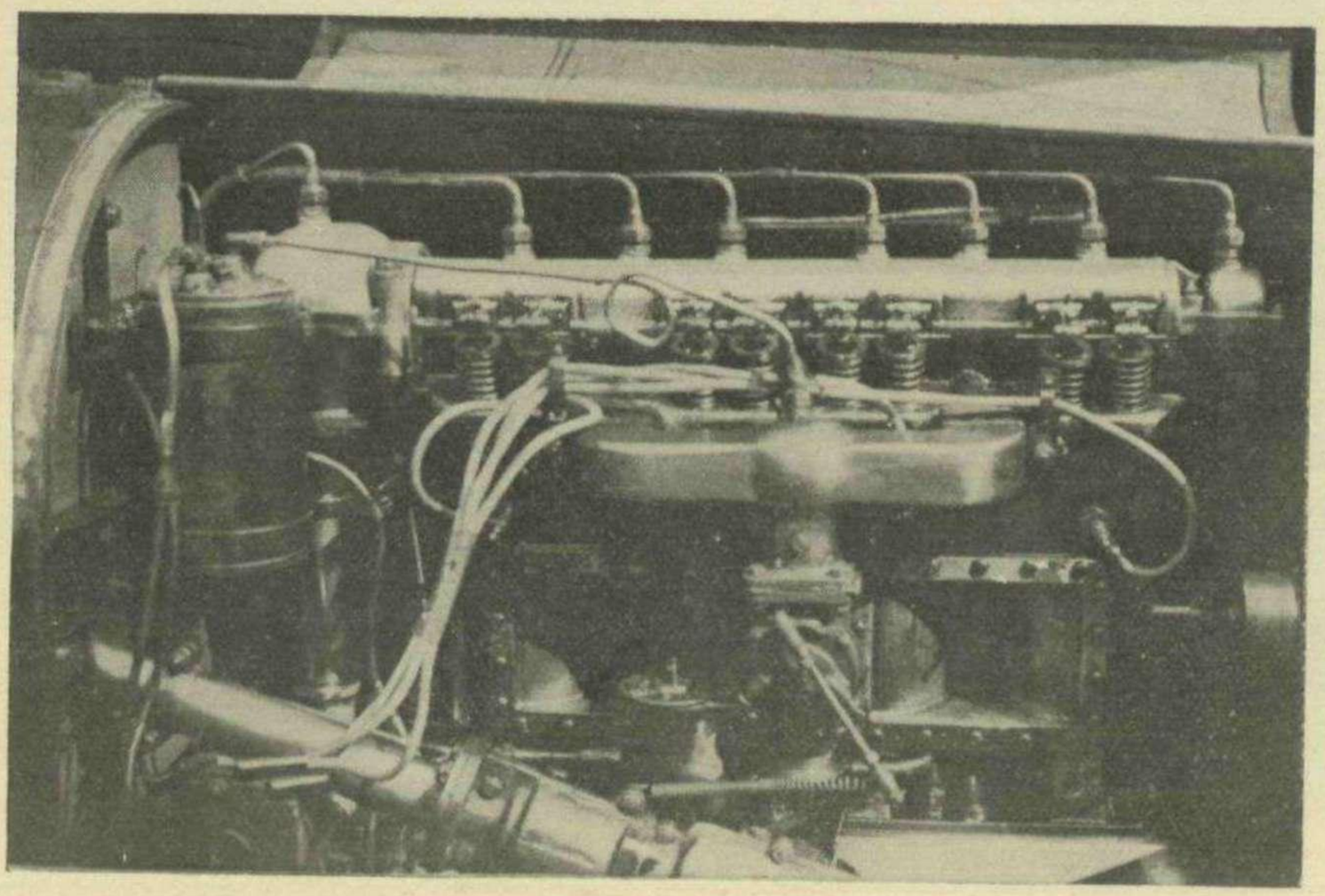
Side view of the 1914 Opel racer. Note the wings and hood.

built-up back-axle with a cast steel centre casing and drawn steel conical sleeves. There is no torque rod proper, but the back springs are partly relieved of this stress in a rather interesting manner. A metal band, the ends of which are joined by a stiff coil spring, is clamped round each outer end of the axle sleeves and is attached by short articulated rods to the chassis. This band, which under heavy stress can slip slightly on the axle casing, works as a shock absorber and also takes a proportion of the torque.

Four wheel brakes appeared for the first time on serious racing cars at Lyons, but they were not fitted to any of the German entries, and in the case of the Opel the foot-brake works on the transmission and the hand-brake on the back-wheel drums. The car has large Rudge-Whitworth wheels, which are, I think, those used in the Grand Prix, smaller ones being afterwards employed at Brooklands, and the tyre size is 880 x 120 m.m., the section appearing extraordinarily small to modern eyes. The general appearance of the car is satisfactorily completed by a narrow V radiator protected by a stoneguard, outside brake and gear levers and a huge outside exhaust pipe.

Having completed our inspection of the car we readily accepted an invitation to set off, and the engine, having been quickly started with the aid of the half-compression device, we clambered on board and shot out of the yard. Even while threading our way through the thick of the London traffic we were able to note that the engine although some seventeen years old, still had plenty of power, the acceleration when an opening presented itself in traffic, being colossal. The maximum engine speed is not of course very high—I doubt if it materially exceeds 3,000 r.p.m.—and the car gets away with a satisfactory series of distinct reports before settling down to its steady roar. Another feature which was soon noticeable was the remarkable silence of the valve gear, an attribute which is not shared with the double overhead camshaft 1914 racing engines of which I have experience, and the equal silence of the gear-box. I am inclined to think as a matter of fact that the mileage which this car has done is little higher than that put in by many a car nowadays in a year, an impression which is fortified by the fact that the Palmer Cord tyre gracing one front wheel may very well have been of about the same age as the car.

At last we were free of the London traffic and were well away on one of the better by-pass roads. It is as well, however, for anybody who does not like such noises that the gear-box is quiet, for the greater part of one's time is spent on the indirect ratios. The cone clutch is apt to be somewhat fierce, and first speed is sufficiently low to make the first change up a slowish one, but once second is engaged the acceleration is terrific and third is a useful fast gear for ordinary work. The direct drive with the large wheels fitted is very high—the final ratio at Lyons was 2.5 to 1, and I should judge that it has not since been altered—with the result that it can only be profitably used when the way is fairly clear. The maximum speed on this gear is of course very high, something I should imagine between 90 and 100 m.p.h., and with the high ratio is not easily reached except on a good route nationale or the



[*Motor Sport Photographs*

The Opel's engine which, in spite of its seventeen years, has several features which are popular on present-day productions. The valves are operated by a single overhead camshaft.

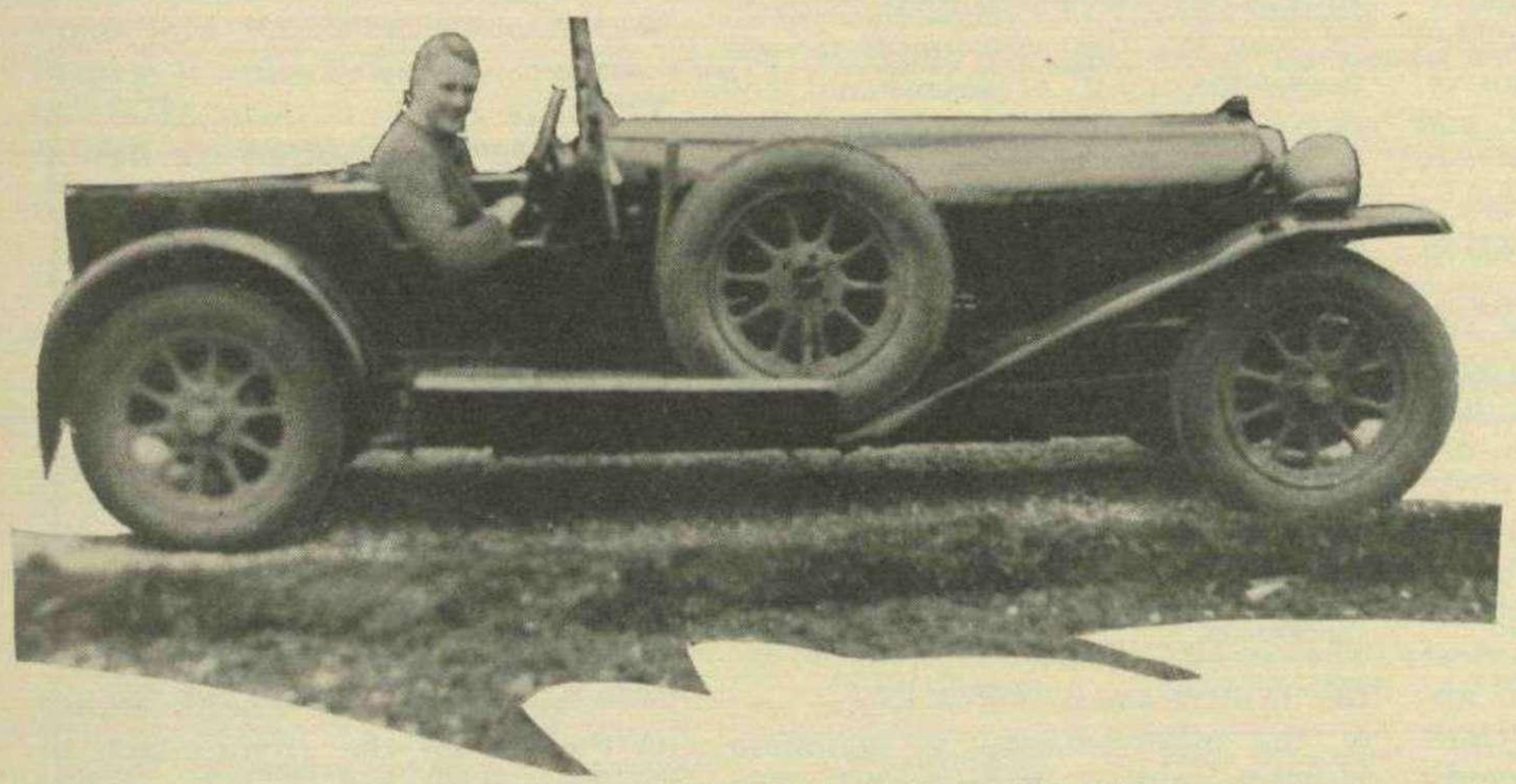
VETERAN TYPES—continued.

Great North Road at night. The car is fitted with a speedometer mounted between the scuttle and the steering column, but it is of the type which merely wags dizzily at over about 50 m.p.h., and is thus almost completely useless. I should judge, however, that in the course of our run we attained about 75 m.p.h. at which speed the car is a little inclined to wander, due perhaps to the fact that the front wheels fitted do not appear to be of exactly the same size.

Roaring along with the wind whistling by our ears and the steady boom of the exhaust echoing behind us we were almost inclined to believe for a moment that we had been transferred to that long straight on the Lyons course called " la montagne Russe " and that the date was the 4th July, 1914. Now the driver was applying the brakes, but with feet firmly braced against the dashboard we were suddenly aware that this was not " les Sept Chemins " hairpin, but an ordinary cross-road where an A.A. scout was directing a swarm of boxes on wheels and we were once more on the outskirts of London. Back at Messrs. B.M.C.'s we regretfully climbed out of the car on which one of the greatest of English drivers first made his name ; and as we murmured our appreciation we reflected that the Opel might yet teach a future owner how to win the Grand Prix.—F.K.H.K.

TWO HOME-BUILT HYBRIDS

An Amateur's Efforts at Car Building.



The first attempt. This chassis was mainly Waverley.

IN the early days of the motor-car and its now defunct offspring, the cyclecar, home-made vehicles were quite common, but the introduction of cheap and serviceable mass-produced cars has reduced the ranks of amateur builders to an almost negligible quantity so that rare and nameless hybrids are scarcely ever seen.

Nevertheless, the construction of a motor from odd bits and pieces is an absorbing and amusing pastime for the man who is mechanically minded, and with the second-hand market in its present state, it is one which does not entail much layout of hard cash.

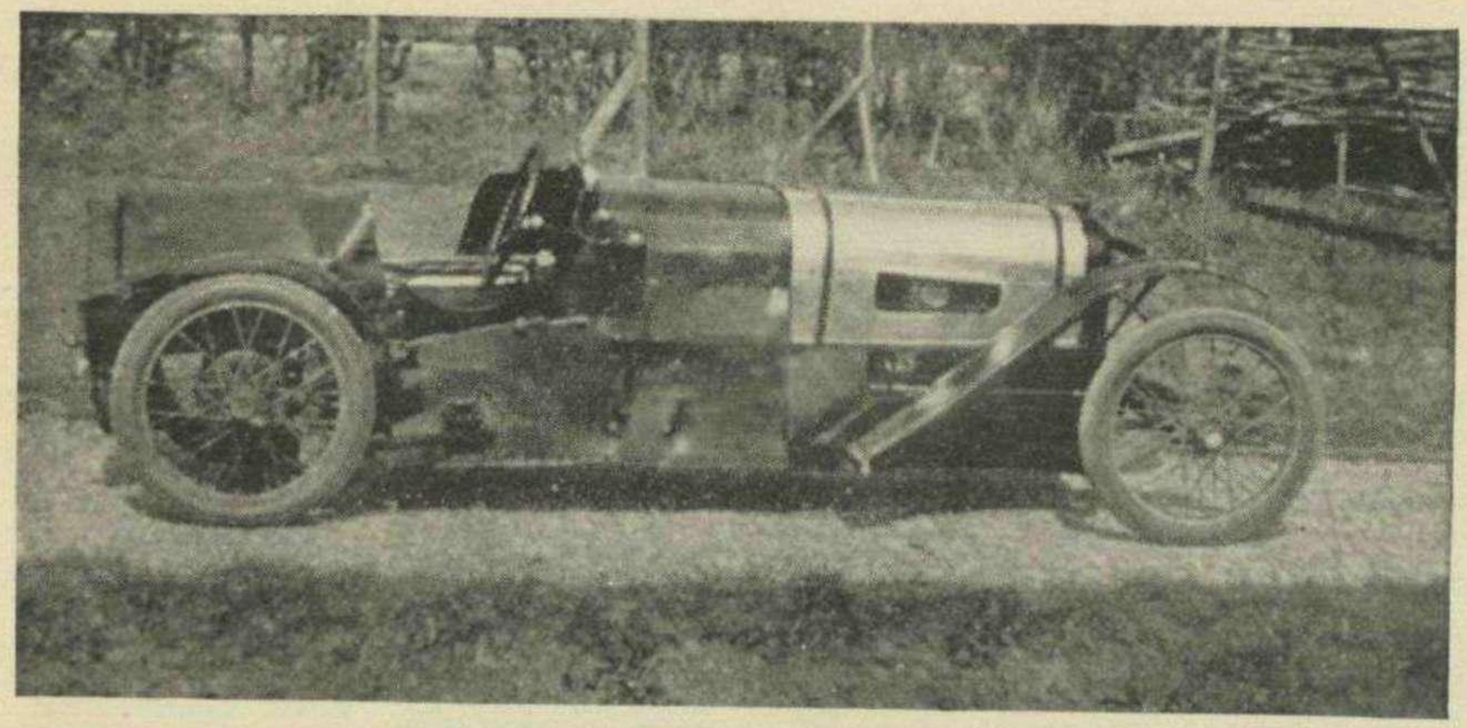
Realising this, the writer decided to try his hand at the game, and after a judicious search in junk yards and the darker corners of local garages eventually secured something which was to form the basis of his own " special." This was a Waverley chassis which had been built up to try out a six-cylinder single sleeve valve engine on the track. Owing to a change of policy this idea was not carried out ; instead, a four-cylinder engine of similar type and of 1½-litres capacity was installed, and it was in this condition when the writer acquired it, the whole chassis being almost unused.

A few days hard work with wood and sheet aluminium produced what was intended to resemble (and did to some extent), a four-seater Le Mans type of body. During the succeeding weeks such necessary articles for this climate as mudguards, wind-screen, and hood were added, lighting set completed, some dark red Robbialac applied, and the motor was more or less serviceable. Its appearance was rather imposing, the wind-screen being 6 feet from the radiator cap and but 4½ feet from the stern. The effect was somewhat spoilt by opening the bonnet to disclose a comparatively minute engine ! The body was equipped with Sorbo sponge upholstery, tonneau and hood covers, while the dashboard carried speedometer, clock, rev. counter, oil gauge, and radiator thermometer. To complete the car, duplex Hartfords were installed all round, and Whitehead type front brakes fitted, operated in conjunction with one pair of rear brakes by a lever outside the body, the remaining pair of brakes being connected to the pedal.

The performance hardly did justice to the appearance, though as serious competition work was never intended no great disappointment was felt. The gear ratios were 3½, 6, 11, top gear giving 25 m.p.h. per 1,000 r.p.m. As the engine gave but 30 b.h.p. at 3,000 r.p.m., it will be seen that it was somewhat stifled—about 42 m.p.h. was attainable in 2nd gear, and on engaging top it was always a moot point as to whether the car would gain speed or not !

A headwind invariably produced

TWO HOME-BUILT HYBRIDS—continued.



The G.N.-Waverley-Benjamin which acquitted itself well, and incidentally cost only about £15.

deceleration down to forty, no wind and a level road realised about 48-50, while downhill with a following gale, 65 or more was attainable! Still, it was an amusing car to drive, its low build, short wheelbase, and light steering making it extremely handy, a point which has always carried more weight with the writer than high speed.

In this guise the car was run throughout 1927 and went through several adventures, the worst moment being during a practise run in some speed trials at Hatley Park, near Cambridge. Breasting the rise at about 50 disclosed a motorcyclist astride a stationary machine across the narrow road, apparently deaf and entirely oblivious of our approach. At this time the front brakes were not fitted, and the only hope was hard braking, resulting in a broadside skid which took the car on to the grass beside the road, where we stayed.

Vauxhall engine installed.

Towards the end of the year the writer's irritation at the lack of power grew to unbearable dimensions, and after some search, a 20 h.p. "Prince Henry" Vauxhall engine was unearthed, dating from 1912, and was purchased, with a four-speed gearbox for £8. Some hard work saw this installed, and the motor was on the road again by January, 1928. This engine proved an amusing contrast: it was reputed to develop 40 h.p. at 2,000 r.p.m., and was distinctly undergeared—its pulling power was tremendous, and a cruising speed of about 48 was not too much for it. The maximum obtainable was about 62, but this invariably resulted in a broken valve so was seldom utilized! Of course, the consumption was poor—15 m.p.g. of petrol and 150 m.p.g. of oil proved expensive, and it was chiefly for this reason that an offer of £10 for the engine was accepted in September of that year.

The tenner served to purchase and overhaul an old G.N. which served as a hack while the writer was engaged on other work until Christmas, when further leisure and an inspection of "stock" induced him to commence the construction of a "sprint model" with a view to the 1929 Inter-Varsity Hill-Climb. The stock consisted of the G.N., the 1½-litre sleeve valve engine out of the other chassis, a Benjamin radiator, and a scrap-heap! The G.N. engine, windscreen, and hood were exchanged for a wide-track front axle and some extra front springs. The 4-cyl. engine was mounted in the chassis by its rear bearers and a bolt through the starting handle bearing, the G.N. side-starting gear being retained instead. To save machining, the Waverley clutch was retained and the propellor shaft shortened to suit. The front springs were duplicated, and the back reset with a negative camber, so that the bevel box was about 6 inches from the ground, the chassis sloping considerably towards the rear. This layout, of course, made it impossible to swing the starting handle without jacking up the frame at the side, but the engine could usually be started on a pull-over through the 3¼ to 1 bevels. A "Manx" body was built of stringers, aeroplane fabric and dope, so designed as to disguise the sloping chassis. The petrol tank held 6 gallons and was carried in the tail, fuel feed being by hand pressure pump. The dash carried only speedometer, oil, and air pressure gauges. The car was generally known as the "1½ model," both on account of its cylinder capacity and its seating accommodation! Two sets of gear ratios were available, 3.4, 4, and 7.3, or 4, 5.8, and 7.3, the former for touring, the latter for sprints. For this purpose a special 21t. sprocket was made and bolted to the hub of a standard 36t. sprocket by six ¼ inch studs—sliding this duplex sprocket and altering the length of the chain gave the alternative ratios of 3.4 or 5.8: the other two were never disturbed. As the total cost of this conversion was about £15, some satisfaction was felt when it secured 3rd in the 1,500 c.c. racing class and 4th fastest car time of the day at Branches Park, in February, 1929.

Another power unit.

Shortly after this the other chassis was taken in hand again. A six-cylinder sleeve valve engine, of the type the chassis was originally built for, was purchased from Argylls of Glasgow, with a unit four-speed gearbox. This unit was installed without much difficulty, except that the bracket for the right-hand gear-lever occupied all the space available on the car for the driver's feet, so the bracket was cut off and a central ball-mounted lever was designed and fitted. The braking system was altered so that the pedal operated the front brakes, the rear brakes remaining connected to the hand lever—the system used on the 1924 Aston-Martins. The car was now capable of about 70 m.p.h. and was very pleasant to drive, being almost dead silent, both mechanically and as regards exhaust system. Unfortunately, as the writer then had to turn his attention to other and more lucrative pursuits, certain details remained unfinished, and a year of hard work and neglect made the car somewhat decrepit, and it had, regrettably, to be exchanged for something less pretentious and more economical which will have to last until sufficient money and leisure are available to give him a chance to try his hand again.—H.P.B.

MOTOR RACES IN 1931.

DATE.	EVENT.	COURSE.	FIRST.	SECOND.	THIRD.	DISTANCE	WINNER'S TIME H. M. S.
Aug. 17th.	Coppa Acerbo		Campari (Alfa-Romeo)	Chiron (Bugatti)	Nuvolari (Alfa-Romeo	306 kms.	2 19 49⅘
,, 19th	Grand Prix du Comminges	Saint Gaudens	Etancelin (Alfa-Romeo)	Czaikowski (Bugatti)	Lehoux (Bugatti)	394.5 kms.	2 48 55⅘
,, 22nd	Tourist Trophy	Ards Circuit	Black (M.G.)	Borzacchini (Alfa-Romeo)	Crabtree (M.G.)	343 m.	5 15 51
Sept. 3rd	Monza Grand Prix	Monza	Fagioli (Maserati)	Borzacchini (Alfa-Romeo)	Varzi (Bugatti)	150 m.	1 32 39⅘
,, 13th	Circuit Des Routes Pavees	Lille	Zehender (Alfa-Romeo)	Roca (Bugatti)	Ferrand (Peugeot)	631.547 kms.	6 0 0
,, 13th	Grand Prix de la Baule	La Baule	Williams (Bugatti)	Gaupillat (Bugatti)	Lehoux (Bugatti)	150 kms.	1 2 49
,, 27th	Czecho-Slovakian Grand Prix	Masaryk Circuit, Brno	Chiron (Bugatti)	Von Stuck (Mercedes)	Von Morgen (Bugatti)	300 m.	4 12 7
Oct. 3rd	500-Mile Race	Brooklands	Dunfee and Paul (Bentley)	Lewis and Saunders-Davis (Talbot)	Hall (M.G.)	500 m.	5 32 13
Feb. 28th	Swedish Winter Grand Prix	Raemshylton	K. Ebb (Auburn)	J. Ramsey (Chrysler)	C. Bergstrom (Chrysler)	210.5 m.	5 28 52
March 22nd	Argentine National Grand Prix	Buenos Aires, Cordoba, Buenos Aires	C. Zatuszeck (Mercedes)	A. Ansaldo (Hudson)	E. Blanco (Reo)	937.5 m.	15 44 40⅕
,, 28th	Tunisian 6-hour Race	Carthage	Castelbarco and Dreyfus (Maserati)	Corsini and Bellinciono Alfa-Romeo)	Pietrangeli (Alfa-Romeo)	707.2 kms.	6 0 0
,, 29th	Grand Prix of Tunis	Carthage	Varzi (Bugatti)	Fagioli (Maserati)	Lehoux (Bugatti)	294 m.	3 23 39
April 11th-12th	Thousand Miles Race	Brescia—Rome—Brescia	Caracciola and Sebastian (Mercedes)	Campari and Marinoni (Alfa-Romeo)	Morandi and Rosa (O.M.)	1,001 m.	16 10 10
,, 12th	Argentine Autumn Grand Prix	Buenos Aires	C. Zatusceck (Mercedes)	E. Blanco (Reo)	F. Fernandez (Marmon)	250 m.	2 54 32⅕
,, 19th	Grand Prix of Monaco	Monaco	Chiron (Bugatti)	Fagioli (Maserati)	Varzi (Bugatti)	198¾ m.	3 39 9⅕
,, 26th	Grand Prix Bordino	Alessandria	Varzi (Bugatti)	Minozzi (Bugatti)	Von Morgen (Bugatti)	175 m.	2 6 24⅘
May 2nd-3rd	Circuit of Sicily	Sicily	Rosa and Morandi (O.M.)	Gazzabini and Cantono (Alfa-Romeo)	Magistri and Fieri (Alfa-Romeo)	610 m.	11 46 14⅘
,, 8th & 9th	Double-Twelve Hour Race	Brooklands	March and Staniland (M.G.)	Gibson and Fell (M.G.)	Hamilton (M.G.)	1,547.9 m.	24 0 0
,, 10th	Targa Florio	Long Madonie Circuit	Nuvolari (Alfa-Romeo)	Borzacchini (Alfa-Romeo)	Varzi (Bugatti)	362 m.	9 0 26
May 17th	Grand Prix of Casablanca	Anfa	Czaikowski (Bugatti)	Etancelin (Bugatti)	De Maleplane (Bugatti)		2 41 52⅕
,, 24th	Italian Grand Prix	Monza	Campari and Nuvolari (Alfa-Romeo)	Minoia and Borzacchini (Alfa-Romeo)	Divo and Bouriat (Bugatti)	1,547.5 kms.	10 0 0
,, 24th-25th	Bol D'Or	St. Germain	Violet (Huascar)	Vallon (La Licorne)	Bourcier (Tracta)	1,835.03 kms.	24 0 0
,, 30th	Indianapolis "500"	Indianapolis	Schneider (Miller)	Frame (Duesenberg)	Hepburn (Miller)	500 m.	5 10 28
June 5th	Saorstat Cup	Phoenix Park, Dublin	Black (M.G.)	Horton (M.G.)	Gardner (M.G.)	220 m.	3 21 20
,, 6th	Eireann Cup	Phoenix Park, Dublin	Birkin (Alfa-Romeo)	Campari (Maserati)	Lewis (Talbot)	284 m.	3 21 31
,, 5th & 6th	Irish Grand Prix	Phoenix Park, Dublin	Black (M.G.)	Birkin (Alfa-Romeo)	Horton (M.G.)	220 m.	3 21 20
,, 7th	Prix Royal of Rome	Littorio Track	Maserati (Maserati)	Dreyfus (Maserati)	Biondetti (Maserati)	150 m.	1 34 32⅕
,, 7th	Grand Prix of Geneva	Geneva	Lehoux (Bugatti)	Cafiisch (Mercedes)	Kessler (Alfa-Romeo)	157 m.	1 47 42
,, 7th	Eifel Race	Nurburg Ring	Caracciola (Mercedes)	Von Morgen (Bugatti)	Braunschitz (Mercedes)	195 m.	2 50 47⅕
,, 7th	Circuit of Lwow	Lwow	Von Stuck (Mercedes)	Hardegg (Bugatti)	Holug (Bugatti)	96 m.	1 56 46
June 13th & 14th	Grand Prix d'Endurance	Le Mans	Howe and Birkin (Alfa-Romeo)	Ivanowski and Stoffel (Mercedes)	Rose Richards and Saunders Davis (Talbot)	3,017.65 kms.	24 0 0
,, 21st	Grand Prix of the A.C.F.	Montlhery	Chiron and Varzi (Bugatti)	Campari and Borzacchini (Alfa-Romeo)	Biondetti and Parenti (Maserati)	1,258.82 kms.	10 0 0
July 4th & 5th	Belgian 24-hour Race	Spa	Djordjadze & Zehender (Mercedes)	Pesato and Felix (Alfa-Romeo)	Sommer and Delmer (Chrysler)	2,543.5 kms.	24 0 0
,, 5th	Grand Prix de la Marne	Rheims	Lehoux (Bugatti)	Dreyfus (Maserati)	Czaikowski (Bugatti)	250 m.	2 47 37⅘
,, 12th	Belgian Grand Prix	Spa	Williams and Conelli (Bugatti)	Nuvolari & Borzacchini (Alfa-Romeo)	Minoia and Minozzi (Alfa-Romeo)	1,320 kms.	10 0 0
,, 19th	German Grand Prix	Nurburg Ring	Caracciola (Mercedes)	Chiron (Bugatti)	Varzi (Bugatti)	311 m.	4 38 10
,, 26th	Dieppe Grand Prix	Dieppe	Etancelin (Alfa-Romeo)	Czaikowski (Bugatti)	de Maleplane (Maserati)	297.6 m.	4 0 0
Aug. 2nd	Circuit de Dauphine	Grenoble	Etancelin (Alfa-Romeo)	Lehoux (Bugatti)	Zehender (Alfa-Romeo)	238.5 kms.	2 2 8
,, 2nd	Coppa Ciano	Montenero Circuit	Nuvolari (Alfa-Romeo)	Chiron (Bugatti)	Fagioli (Maserati)	200 kms.	2 23 40
,, 2nd	Avus Race	Avus Track	Caracciola (Mercedes)	Von Morgen (Bugatti)	Braunschitsch (Mercedes)	294.426	1 35 7

Club News

THE NORTH WEST LONDON M.C.

ON the 12th of this month the club will run the twenty-first London-Gloucester trial. Car members of the following clubs are eligible to compete :—

All clubs in the South-Midland centre (A.C.U.), Brighton and Hove Motor Club, M.G. Car Club, Riley Motor Club, Light Car Club, West Kent Motor Club, and Women's Automobile and Sports Association.

The start of the trial will be at Staines on the night of the 11th-12th, the standard starting time being 0.15 a.m. The course will be approximately 175 miles in length and will follow a route via Abingdon, Cheltenham, Birdlip and Stroud. The club points out that there will be no secret checks, while it is specially emphasised that noisy driving during any part of the event may entail loss of an award. Numerous prizes are offered for this year's London-Gloucester including the "Gloucester Cup," the "President's Cup" and silver and bronze medals. Entry forms and further particulars can be obtained from the Clerk of the Course, Mr. C. F. Dobson, 19, Carlyle Road, Staines, Middlesex.

THE BUGATTI OWNERS' CLUB.

The Bugatti Owners' Club have produced the second number of their little publication, known as *Buganics*. This is quite a bright effort and is graced by a handsome cover in the official Bugatti colours of blue and gold. It contains reports of the various events which the club have held recently, and other matters of interest to members.

The Bugatti Owners' Club has as Patron, M. Ettore Bugatti, while the President is Earl Howe and the Vice-President, Sir Malcolm Campbell. The Honorary Secretary is Mr. K. W. Bear of 5, Fenchurch Street, London, E.C.3., from whom particulars of membership can be obtained.

THE LIGHT CAR CLUB.

Early last month the Light Car Club rounded off the season by holding their annual dinner and dance at the Park Lane Hotel, London.

The President, the Earl of March was in the chair, and he was supported by Lady March, Sir Malcolm Campbell, Professor A. M. Low, Mr. Cecil Kimber, Captain Waite, Mr. H. F. S. Morgan, and Mr. T. W. Loughborough.

About 200 members, friends and guests were present at the function, and the proceedings went on until about 2 a.m.

HORNET CAR CLUB.

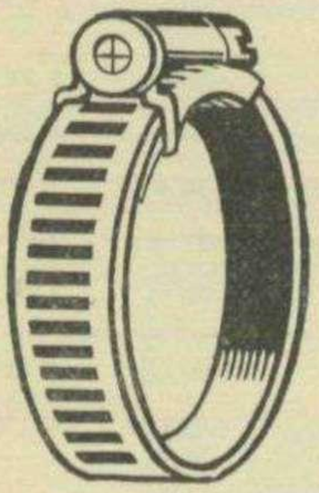
The first annual dinner and dance will be held at the Park Lane Hotel, London, on Saturday, December 5th, with the Earl of March in the chair. Tickets are available from the hon. secretary, Mr. F. S. Hutchens, 12, Berkeley Street, London, W.1.

ENFIELD AND D. M.C.

The annual dinner and dance will be held on Wednesday, December 2nd, at the Abercorn Rooms, Liverpool Street, London, E.C.2., at 7 p.m. Prof. A. M. Low will preside over the function.

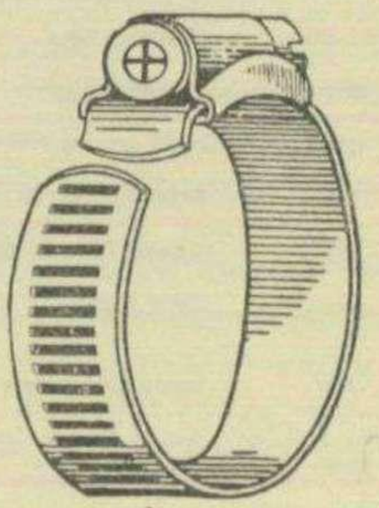
The Editor invites Club Secretaries to send details of their fixtures, sporting and social, for publication in these columns. These items should be sent to reach this office not later than the 16th of the month.

Jubilee Worm-Drive Clips



THE BEST POSSIBLE TO GET.

MAKE SURE YOU HAVE THEM FITTED ON YOUR RADIATOR JOINTS, LEATHER COVERS, ON UNIVERSAL JOINTS, AIR, OIL AND WATER HOSE JOINTS.



ALL IN ONE PIECE. NO PARTS TO LOSE.
EASY TO FIT. GUARANTEED NEVER TO LEAK.

A KEEN MOTORIST WRITES: *"I cannot understand anyone using any other pattern, as yours are the last word in satisfaction and efficiency."*

STOCKED BY ALL GARAGES & ACCESSORY DEALERS.

MANUFACTURERS:
L. ROBINSON & Co., 2, London Chambers, GILLINGHAM, KENT.

ITEMS OF INTEREST

FROM VARIOUS SOURCES

A Hill Climb Venue Wanted.

THE Light Car Club are desirous of organising a speed hill climb or a series of speed hill climbs during the 1932 season, but so far in spite of an intensive search, no suitable venue has yet been secured.

Mr. John Yule, the honorary secretary of the club, has written to MOTOR SPORT asking if we can help in the matter, and should any reader be in a position to put him in touch with the owner of a hill which, of course, must be on private property, and which could be used for the purpose the L.C.C., will be very grateful.

The club is perfectly prepared to consider any agreement that the owner of such a hill would care to impose, and to pay a reasonable fee for the privilege of organising a real sporting event. Correspondence in connection with this matter should be sent to Mr. Yule, whose address is "Kirkney," High Road, Whetstone, London, N.20.

Tax on Old Cars—A Suggestion.

IN a letter sent to the Press recently, Mr. Delpech, of the Triplex Company, points out that the prosperity of the motor industry depends greatly upon an improvement in the second-hand car market. As a remedy for this slump he proposes that when a motor-car or motor-cycle is five years old its tax should be halved.

Most potential purchasers of new cars, he explains, have second-hand cars to dispose of. Owing to the second-hand car slump, dealers cannot afford to give sufficiently large allowances, with the result that thousands of sales are lost.

The biggest cause of depreciation is the present high taxation. When the present horse-power taxation was introduced in 1921, cars built prior to 1913 were allowed a 25 per cent. reduction. To-day, cars have to be eighteen years old—not eight as formerly—before a reduction is allowed.

He suggests that the second-hand market can be improved by halving the tax of motor vehicles when they are five years old. The Chancellor of the Exchequer would gain on the deal. More cars, old and new, would be used, what little might be lost on horse-power taxation would be more than counterbalanced by increased revenue from the petrol tax, and more employment would be provided by the motor industry.

British Motor Traffic.

THE census of road traffic which is taken annually by the Automobile Association at over 100 points in Great Britain during a week of seventy-seven hours, reveals this year, for the first time since the War, a slight decrease in the number of vehicles using the roads.

In all 2,645,881 vehicles passed the census points, a decrease of 123,603 compared with those recorded in 1930.

The return indicates that private cars have decreased by 65,104, motorcycles by 69,888, but industrial vehicles (including motor coaches), show an increase of 11,389.

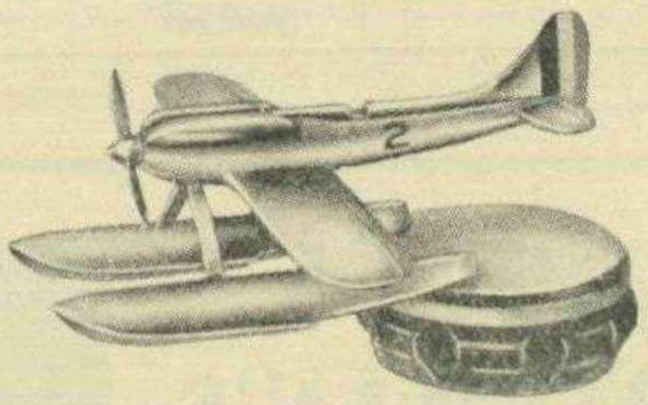
It is noteworthy that despite the reduction in road traffic, disclosed by the census for 1931, The Automobile Association's membership increased by over 18,000 during the past financial year.

The following table shows the average number of vehicles passing census points from 1923 to 1931 inclusive :—

Year.	Average number of motor vehicles passing census points.
1923	6,619
1924	7,613
1925	13,015
1926	16,772
1927	20,985
1928	22,751
1929	25,430
1930	26,630
1931	25,199

Sports Car Embellishments.

THERE is something particularly attractive about diminutive scale models of aircraft, and when made in the form of mascots they make a very pleasing embellishment for a car.



The Lejeune S.6. Mascot.

The Schneider Trophy winner, the Supermarine S.6B., with its wonderfully clean lines lends itself admirably for reproduction in model form, and A. E. Lejeune, Ltd., who are mascot specialists, are now listing an "S.6." in their comprehensive range. Cast in solid bronze, these mascots have a silver plated finish (chromium finish is 5s. extra), are in perfect proportion, and can be obtained at prices ranging from £1 5s. to £2 10s., according to size.

The address of the manufacturers is :—132, Great Portland Street, London, W.1.

The Wolseley Competition.

ACCORDING to Messrs. Wolseley Motors, the competition which they opened some time ago, in which a "Hornet" saloon is offered as first prize, has attracted an enormous number of entrants. It may be remembered that this contest is being run on a "best points" basis—the competitor is called upon to select what he considers to be the ten most important features on the new "Hornet" chassis, and the manufacturers have selected 100 distinctive features of the car; from these Sir Malcolm Campbell, assisted by a committee, has placed in order the ten most important points. His list, which has been sealed and lodged at the Bank, constitutes the solution of the competition, and the motorist who sends in the most nearly accurate list will be given one of the new cars.

Anyone who holds a driving licence may compete, but all entries must be received by the Wolseley Co. not later than 7th December. Entry forms may be obtained from the company or from any Wolseley dealer. The result will be announced as soon as possible after 16th of the month.

For Boat Enthusiasts.

A LITTLE booklet has been sent us on the care, upkeep and maintenance of outboard craft, and for the new owner and potential motor boating sportsman it should prove of real interest and help.

While it is quite brief, the publication contains a deal of information which should aid the tyro in his initial stages of the sport afloat very considerably, and it is written by that exponent of marine motoring, Mr. J. W. Shillan, Managing Director of Elto Outboard Motors, Ltd.

Copies can be obtained free upon application to Shell-Mex, Ltd., of Shell Corner, Kingsway, London, W.C.2.

Trying Out a New Type.

SOME time ago it was announced that a motorcycle of revolutionary design—with unit construction of engine and gear-box and car-type springing front and rear—was being built by the New Imperial Company. This novel machine has now passed all its bench and road tests, its final trial being in the form of a strenuous tour of the West Country.

The first three machines to come off the assembly track were seized by the works manager, chief tester and another member of the staff, who promptly set off from Birmingham for the famous test hills of North Devonshire. Riding at high speed they soon reached Porlock, Lynton and Beggars Roost hills. These gradients, once the terrors of London-Lands End Trials, were ascended in middle gear, whilst innumerable stop and restart tests were made on them.

On the second day's trip over the moors of Devon and Cornwall, torrential rain and a 60-miles-an-hour gale were encountered, whilst the machines were drenched by waves during a rough ferry crossing at Plymouth. The last 200 miles were covered at an average speed of 40 m.p.h.

This severe final test recorded no defects in any of the three mounts, and the riders testified as to the qualities of the car-type springing.

The prices of the new models have just been fixed at £57 for the "350" and £59 10s. for the "500." The smaller machine is capable of 70 m.p.h. and the larger of 75 to 80.

SYKES SILENT EXHAUST

(NO BACK-PRESSURE)

FREEDOM FROM VALVE TROUBLE
LESS CARBON
BETTER ACCELERATION
COOLER RUNNING

IT WILL DO A LOT FOR YOUR CAR

Latest Models, Flange or Flexible Fittings.

Prices. **Up to 10 h.p. 40/- (Morris 11.9 h.p. included); up to 15 h.p. 50/-; up to 20 h.p. 55/-; above 20 h.p. 60/-**

London Agents:
Messrs. CADISCH Ltd.,
5-6, Red Lion Square,
LONDON, W.C.1

SYKES SILENT EXHAUST LTD.
12—16, Cross Jerry Street
(End of West Street),
'Phone 25665. LEEDS.

Scottish Agents:
Messrs. CAR ECONOMIES
15, King Street,
DUNDEE

THE MOTOR SPORTSMAN'S DIARY - 1932

READY ON MONDAY, DEC. 7th.

Bound in polished Crocodile Leather, with pockets and pencil. Many pages of sportsman's matter including Land, Water and Air records, and all other information useful to the Sporting Motorist.

AS ILLUSTRATED 3/6

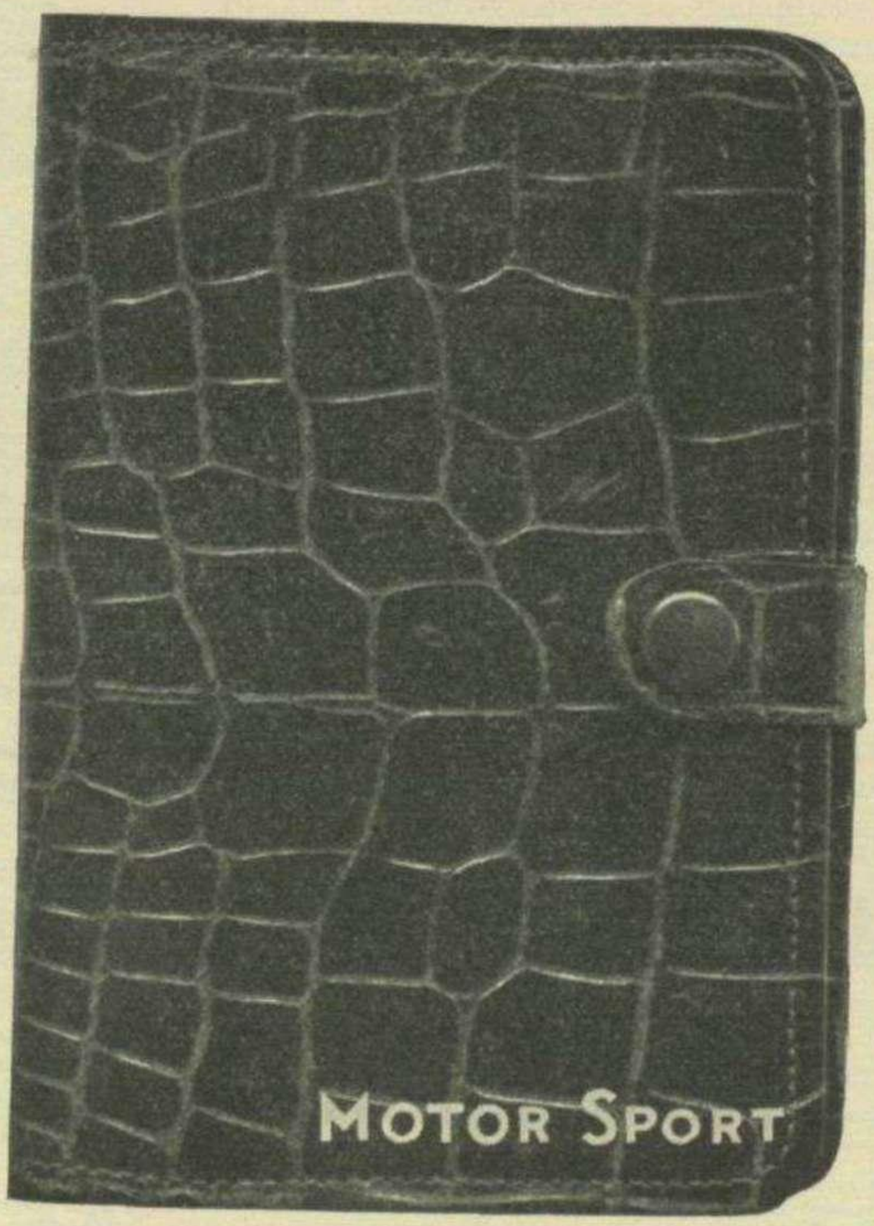
" (Without Pockets, Pencil & Button Fastener) " 2/6

Post Free 2d. extra.

Apply to—

MOTOR SPORT (1929) LTD.,

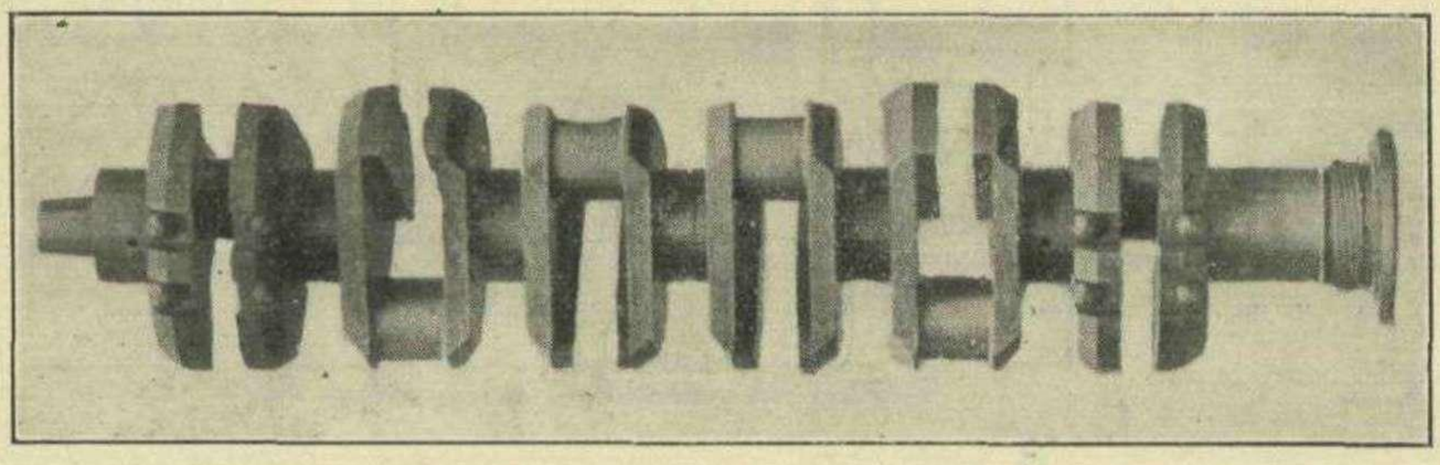
39, VICTORIA STREET, LONDON, S.W.1.



ACTUAL SIZE

A TECHNICAL TALK ON—

CRANKSHAFT COMPROMISES



A design which approaches the ideal—the six-cylinder Talbot counter-balanced crankshaft, which combines rigidity with compactness and which is supported at no less than seven points.

IN the earlier days of the internal combustion engine the question of crankshaft design had not attained anything like the importance it has today. This was due to the fact that revolutions per minute were extremely low, and as long as the crankshaft was stiff enough to stand the punches of the burning mixture without breaking, or distorting sufficiently to break the crankcase, it was considered a good design. Some attempt at balance had, of course, to be made, but here the problems were comparatively simple, as the shaft could always be regarded without much error as being rigid. Therefore, if the shaft was in static balance, which can easily be done on knife edges, it was likely to be satisfactory.

Recent developments in the "upper works" of the internal combustion engine, that is in piston, combustion chamber, and valve gear design, in addition to the general introduction of supercharging on racing engines, has pushed the r.p.m. of the modern engine up to such a pitch, combined with a very high M.E.P. that the crankshaft has become the governing factor in many engines.

In spite of the way one hears motoring enthusiasts laying down the law about the rights and wrongs of various designs, the problem is far from being as simple as they seem to think. This fact is borne out by the great variation in many designs by different manufacturers who are anything but foolish, and whose products are astoundingly successful.

Practically the whole difficulty in crankshaft design lies in the fact that shafts are not rigid and cannot be made so. Therefore, the only course is either to support the shaft in such a manner as to minimise its contortions, or to make it stiff enough to keep within bounds with the minimum o support. All designs are a compromise between these methods, and the elasticity of steel and its deflection under load has caused engine designers much thought and trouble.

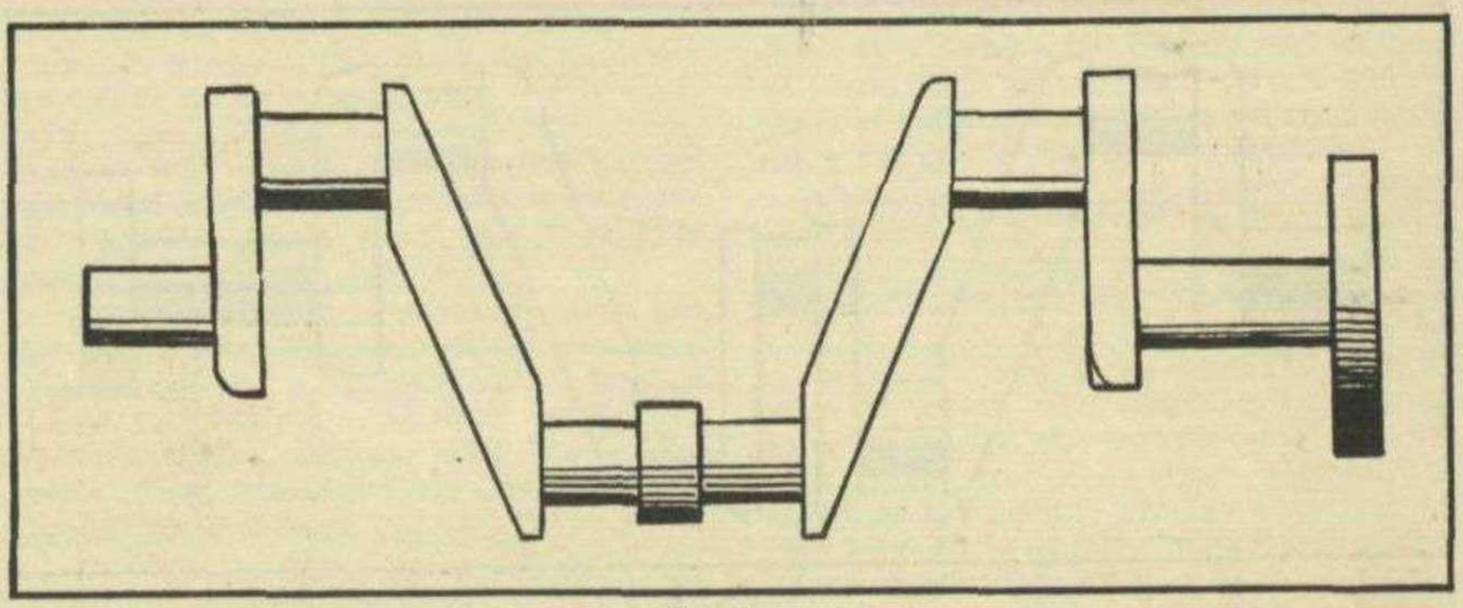


Fig. 1.

The perfect crankshaft is a myth, and while the properties of materials continue as they are now, it is likely to remain so. Thus, although there are almost numberless wrong ways of making crankshafts there is no absolutely right way. Some crankshafts are better than others, and the best are those where designers strike the most effective compromise in the various problems involved.

Having arrived at this depressing conclusion, it is interesting to see the snags in the various types of design, and the way in which they may be, to some extent, avoided. Leaving the question of single and twin cylinder engines for [the] moment as being unusual in car practice, and taking the normal 4 cylinder shaft as the simplest example, we can consider what happens to it when the engine is running under load. It has two main distortions, consisting of bending and twisting, the latter being the rotary deflection of any one crankweb relative to the others.

There are various ways of avoiding each of these, but in general it is true that with similar shaft dimensions, the less it bends the more it twists. The simplest form of shaft is that in Fig. 1, and at high speeds the centrifugal loading due to the rotating portion of the connecting rods, added to the similar loading of the crank webs and journals themselves, will tend to bend the shaft. The bending effect of the two centre journals will be the greatest, and the shaft will tend to deflect as shown by the dotted line in Fig. 2.

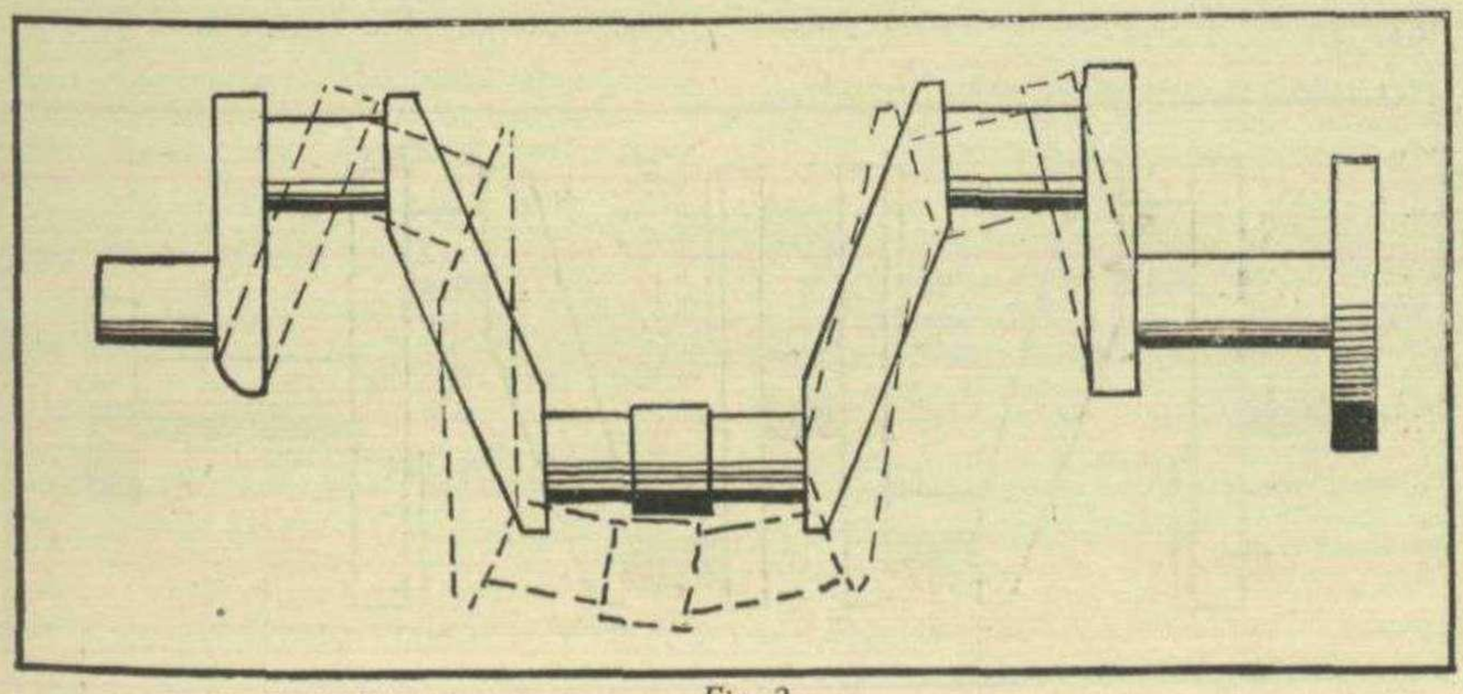


Fig. 2.

Twisting is chiefly caused by the fact that each cylinder fires separately, and the one that fires, naturally tries to "get on with it," regardless of the others, with the result that in imparting its motion to the whole there is a momentary rotational movement of each web relative to the others. Owing to the elasticity of steel each part of the shaft springs back to its correct shape. If, however, the frequency of the explosions coincides with the natural torsional frequency of the shaft, it will set up greatly amplified vibrations which, apart from being very bad for any auxili-

CRANKSHAFT COMPROMISES—continued.

ary drives, such as the camshaft, which are driven from the crankshaft, will probably break the crankshaft by fatigue of the metal.

Fortunately, the natural torsional frequency of a simple shaft is very high and trouble is not likely to come from this source.

From the point of view of bending, it will be obvious that this shaft is not too good, but if the sections of the webs are robust it is fairly satisfactory. Also the freedom from torsional troubles is no mean advantage, and this simple type should not be so utterly and swiftly condemned as it is so often.

As the lightest possible conrods have already been assumed to be fitted, the only way of increasing its resistance to bending is to increase its size. This, unfortunately, also increases the weight, which is the cause of the centrifugal weight which causes it to bend. Already the art of compromising is coming into play! Therefore, the weight must be increased in the right places, i.e., near the centre of the webs, and not too much at the big-end journals, as this will also mean heavier big-ends. Here the compromise is chiefly between weight and rate of wear or load factor of the bearings.

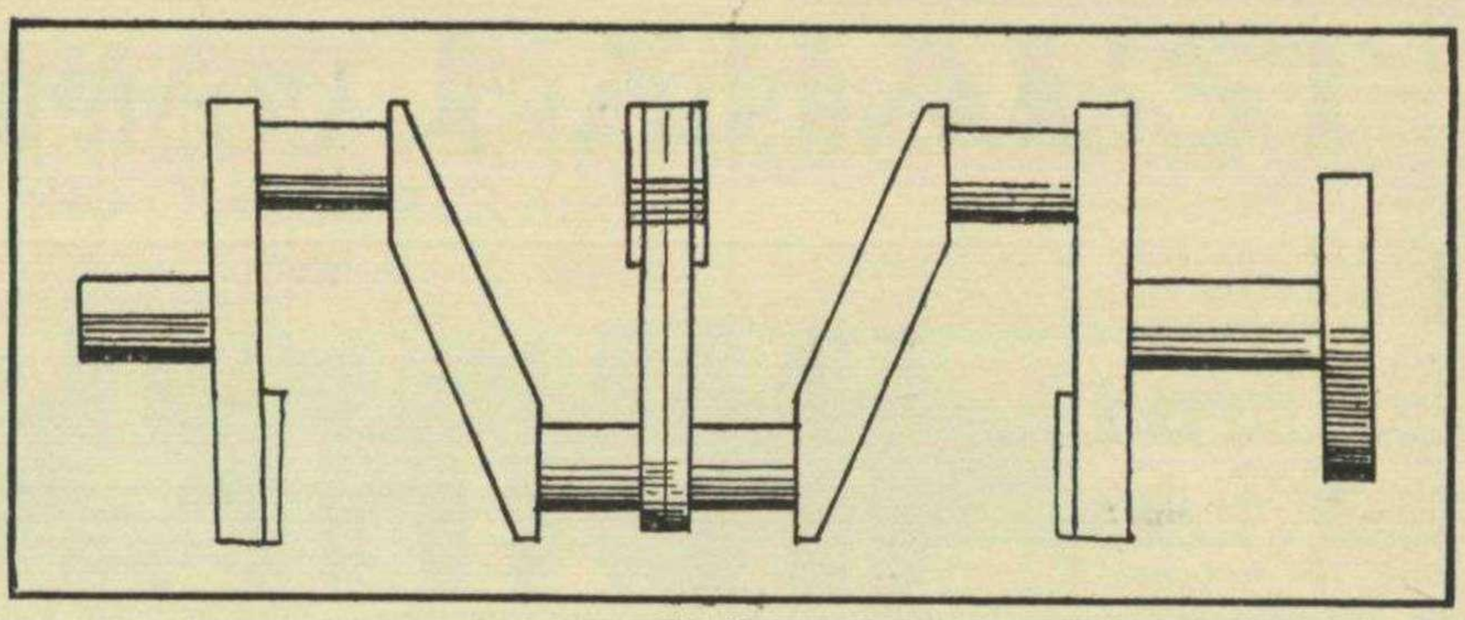


Fig. 3.

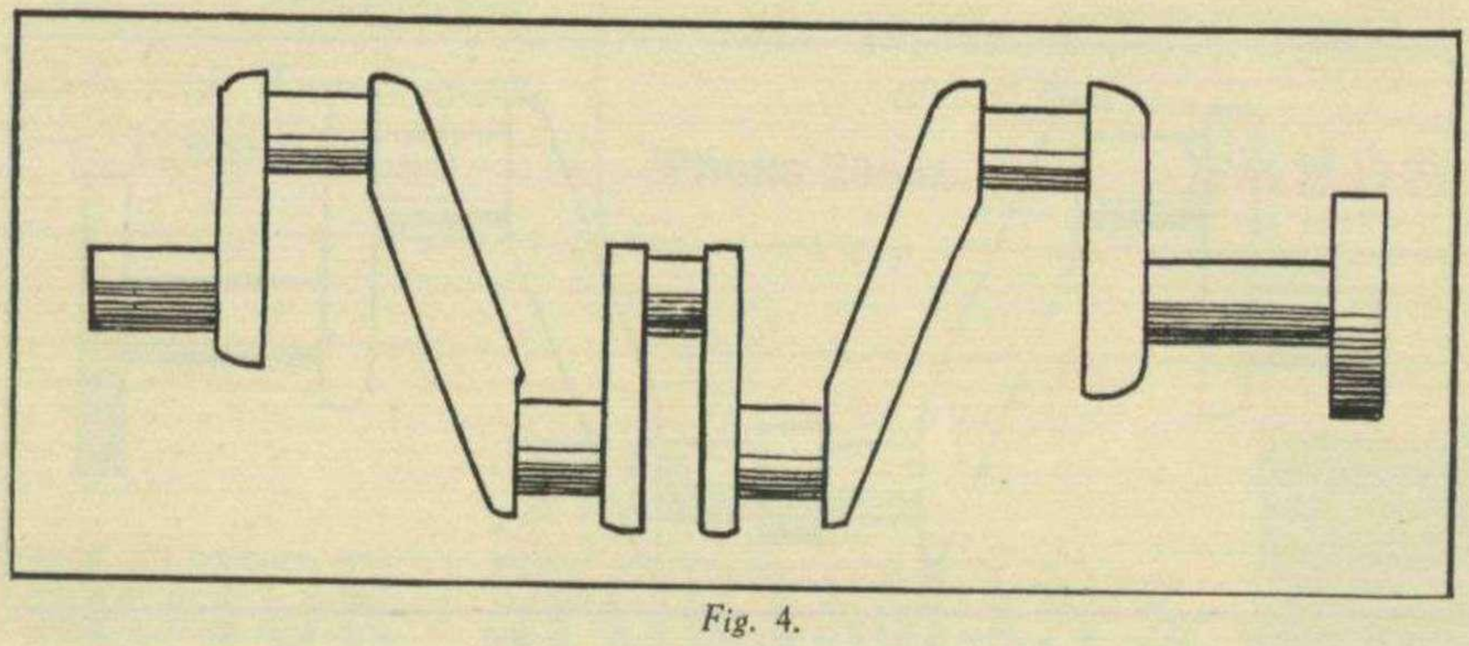


Fig. 4.

In this shaft each big-end and its accompanying reciprocating parts is approximately balanced by its opposite, but off-set, number. It is this "off-set balancing" which leads to the suggestion that all centrifugal loading troubles can be got over by balancing each big-end and its rod and piston separately by balance weights opposite each web. Reciprocating parts cannot be correctly balanced by rotating parts, as one's single cylinder experience has pointed out in the past, but it can be done very nearly by placing about 0.6 of the reciprocating weight at crankpin distance from the shaft centre on the opposite side to the crankpin, plus, of course, a weight equal to the rotating weight of the big end. Here some cunning estimation, which need not be gone into here, is required to determine how much of the con-rod is rotating and how much is reciprocating.

The result of this is a crankshaft on the lines of Fig. 3, the position of the balance weights for the end and centre journals being shown. This gets over, to some extent, the bending due to centrifugal loading, but as is usual in this world, brings corresponding disadvantages, apart from extra cost.

The extra web for balancing means that the shaft can no longer be made as a simple drop-forging (as Fig. 1 can be made), and must be cut from a solid billet.

In Fig. 1 the "grain" of the metal will follow the webs and journals of the shaft throughout, making for strength and toughness, while in Fig. 3 this grain will only follow the journals and will be at right angles to the webs.

This is a fairly minor disadvantage however, and increased safe revs., and consequently more power, will be obtained. In the case of the simple two-bearing shaft of Fig. 1, we only mentioned the bending force due to centrifugal loading, as this was the most potent.

Having coped with this and duly increased the power it will be found that the bending forces due to the explosion pressures will become more important and will cause deflection in the shaft due to its considerable unsupported length.

Whereas Fig. 3 obviates only one source of deflection, it would appear that both centrifugal and explosion forces can be simply dealt with by supporting the shaft at its centre, giving a crankshaft of the form of Fig. 4. It also removes the obvious objection to the method of balancing used in Fig. 3, where the balance weights although an improvement, are not correctly opposite to the parts they are supposed to balance, and therefore each producing a local couple between each pair of crankpins.

Although Fig. 4 provides support for the centre of the shaft and so avoids the deflection shown in Fig. 2, the forces are still there as in the simplest shaft of all. This means that the load on the centre main bearing of a 3-bearing shaft without balance weights is excessively high. Even if it does not cause failure it causes loss of power, and therefore balance weights are really just as necessary as in the first case.

This gives us Fig. 5 which has balance weights which will ease the load on the centre bearing, but in this apparently logical development we are steadily increasing the one trouble from which Fig. 1 is comparatively free. That is the chance of torsional vibrations being set up in the shaft. The torsional stiffness of the shaft is mainly governed by the size of the journals, especially the centre main journal.

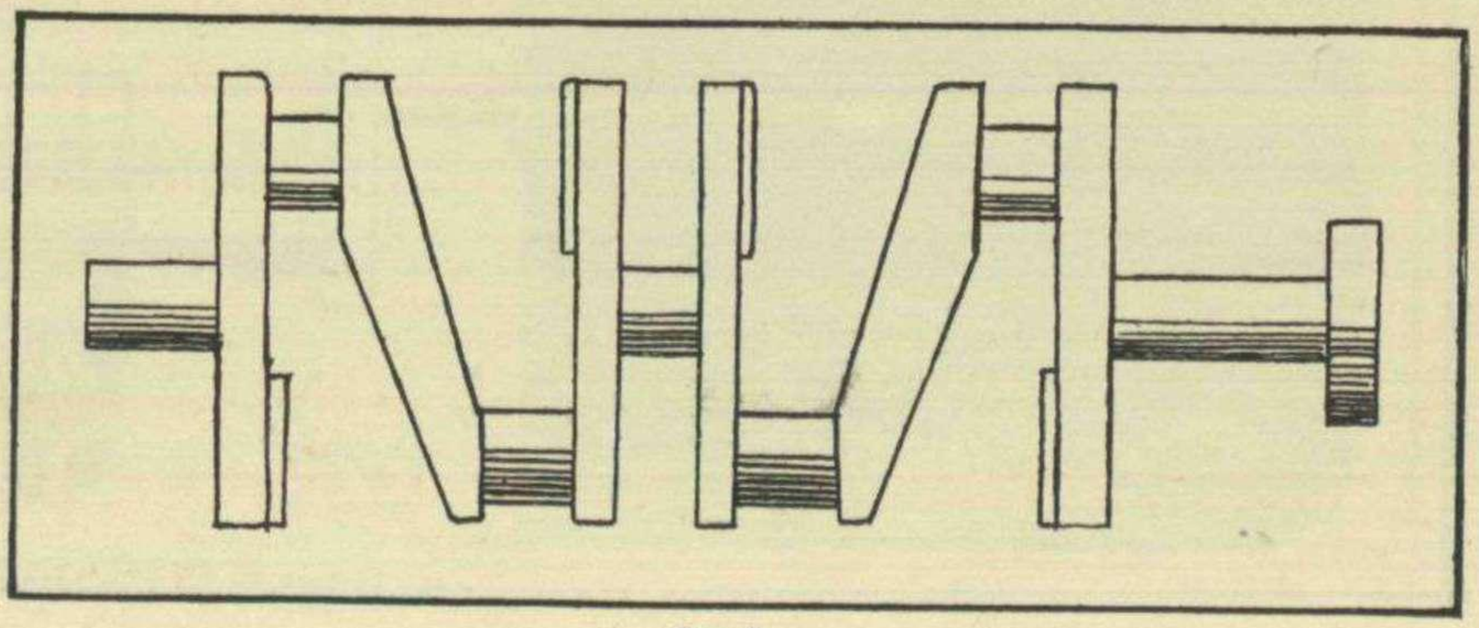


Fig. 5.

CRANKSHAFT COMPROMISES—continued.

The character of this is already hinted, as an undue increase in this leads to a dangerously high rubbing speed in the bearing surface, and at very high engine speeds the rubbing becomes the most important consideration.

Adding balance weights, therefore, increases the weight of the shaft while its stiffness remains unaltered. The result is exactly the same as when a spring of fixed strength is loaded with a larger weight. Its natural period of oscillation becomes slower. This means that the natural period of torsional vibration of the shaft is being brought nearer the danger point.

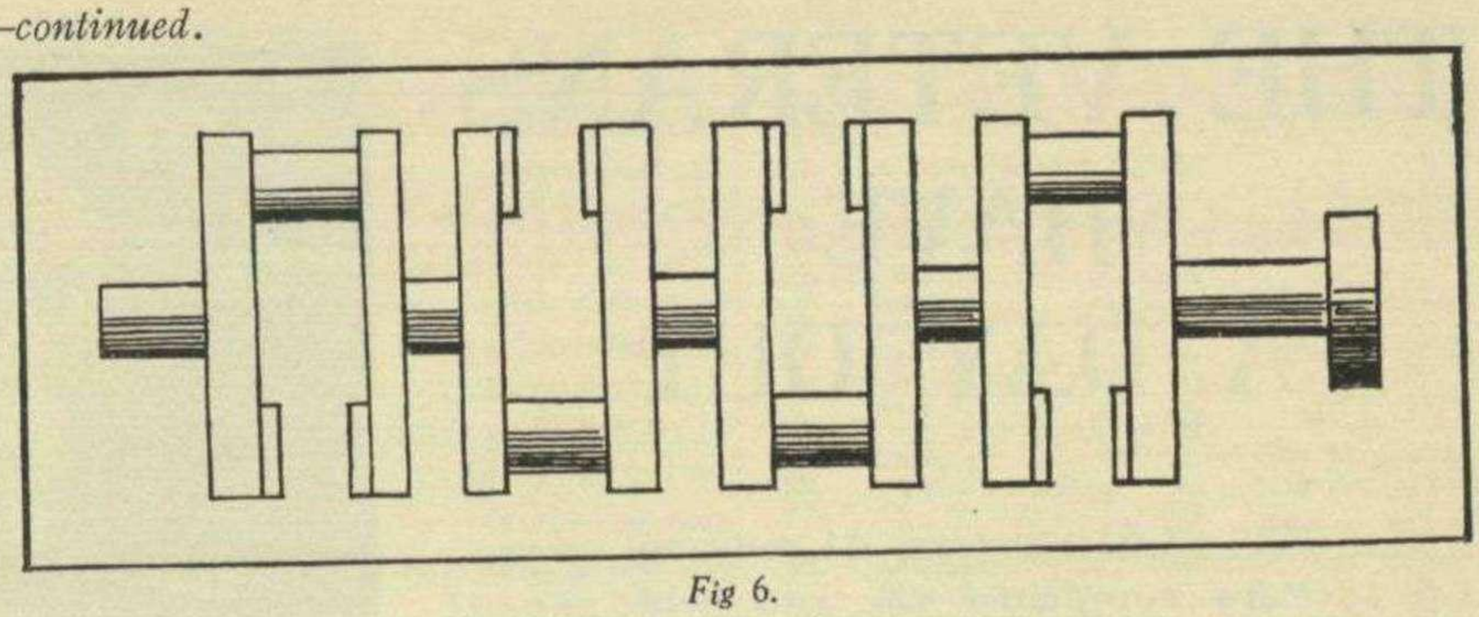


Fig 6.

Fig. 5 also suffers from the trouble of the balance weights not being directly opposite the reciprocating parts, and therefore produces local stresses between Nos. 1 and 2, also 3 and 4. It is naturally impossible for the balance weight to be in the same plane as its conrod, but the same effect can almost be obtained by splitting the balance weight and having half on each side of the rod opposite the crankpin. This necessitates a main bearing on each side of each crankpin so that we have a set of single cylinder crankshafts each with its balance weights, joined together to form a complete unit.

This gives us Fig. 6, a 4-cylinder 5-bearing shaft with balance weights. Of the possible variety of 4-cylinder shafts this is the best in its freedom from bending, and far the worst in its liability to torsional vibration. All crankshafts are a compromise between the types suggested, and it is not correct to condemn a crankshaft because it has few main bearings. A multiplicity of bearings is no merit in itself, but only in so far as the undesirable complication, length, weight, and expense, which they entail, is compensated for by improvements in other directions.

We have only so far considered the four-cylinder type as it sets out the problems involved. Actual engine balance except in so far as it directly affects the crankshaft has not been mentioned, and it is far too big a subject to be included as a side line. It is sufficient to note that owing to the fact that in a 4-cylinder engine the pistons going up do not correctly balance those coming down, and that a six-cylinder engine is much better in general balance. Owing to its lighter reciprocating parts in an engine of the same capacity with only four cylinders, the possible r.p.m. are higher.

As far as the actual crankshaft of the "six" is concerned the same problems occur as in the "four," only the torsional difficulties are greater owing to the greater length of the shaft.

If the shaft has the full number of bearings (seven in this case), the tendency to twist will be considerable and if made with heavy crank webs and small journals it will almost certainly break from torsional vibration if racing speeds are attempted. Apart from this it will be rough at ordinary speeds.

The moment of inertia of the shaft can be kept down, and its resistance to twist kept up, if the main journals are kept as large as possible consistent with their other limiting factors, and the crank-webs kept comparatively thin, though broad, viewed from the end of the shaft.

Another point to be considered is the question of the flywheel, which is usually mounted on the rear end of the crankshaft and the auxiliary drives taken from the other end. This gives the worst possible combination, for if the flywheel is heavy, that end of the crankshaft will rotate at an even speed, while all uneven angular movement will be greater at the front end, so causing chatter and excessive wear on the camshaft and other drives. If a flywheel is required at all, the correct place for it is the centre of the crankshaft, with the camshaft drive taken from the same spot, but this is a complicated and expensive method of construction.

Actually, in racing or even fast touring with a smooth engine of six or more cylinders, a flywheel is superfluous and undesirable. The modern stiff and heavy crank shaft is a flywheel in itself, and as long as some plate is mounted on the crankshaft of sufficient strength and rigidity to carry the clutch, no more is required.

When one considers the numerous limitations with which the designer is faced in designing an engine, such as overall dimensions, weight, and especially cost, it will be seen that crankshafts are no mean problem, even from the point of view of shape. In addition to this we have to thank the metallurgical experts who have produced steels capable of standing the terrific stresses imposed, so that instead of calmly telling the maker of our particular car just how he should build his engine (as so many do) we might well be thankful that it goes as well as it does.

Traffic Signal Developments.

NO motorist likes unnecessary delay in the way of traffic hold-ups, but what exasperates him most of all is "standing by" for a red light to change, via amber, to green, and so permit him to cross a road junction which has been devoid of traffic for the whole time he has been waiting. This is the drawback of the "fixed time" traffic control signal, which in spite of its advantages, cannot adjust itself to the volume of traffic in any given direction.

The latest development is a signalling system which is automatically controlled by the traffic itself, and has very special advantages in the case of an intersection between an arterial road and a minor road crossing it. The signal itself is the normal red, yellow, and green, but it is operated by means of contact plates let into the surface of the minor road a short distance from the main road, and operated by the approaching car.

Contrary to present practice, the signal on the main road is normally at green, and remains so until a car approaches from the side road. This car passes over the plate and in so doing changes the main road signal to red, the side road signal being at red when the car arrives. From then everything is operated automatically by condenser-controlled time switches, and after an interval suitable for the main road traffic to obey the red light, the side road car receives the green signal and proceeds across the main road. After a specified interval the lights change back again and the main road fast traffic proceeds.

A succession of cars from the side road will not hold up the main traffic indefinitely as there is an automatic control which stops the green showing to the side road for more than a definite time. If sufficient traffic appears from both roads the device becomes similar in its time of operation to the fixed time signals at present in use, so that it is perfectly suited for town work, and is used as such all over the U.S.A. If a car turns off the arterial road to go down the side road, and happens to run over the plate from the wrong direction nothing happens, as the switch is so arranged that it can only be operated from one side, being hinged in the middle.

Bodywork Construction.

THE thousands of people who saw the Lord Mayor's Show in London last month, would be surprised to learn that many modern motorcars are still built in very much the same way as the Lord Mayor's ornate coach.

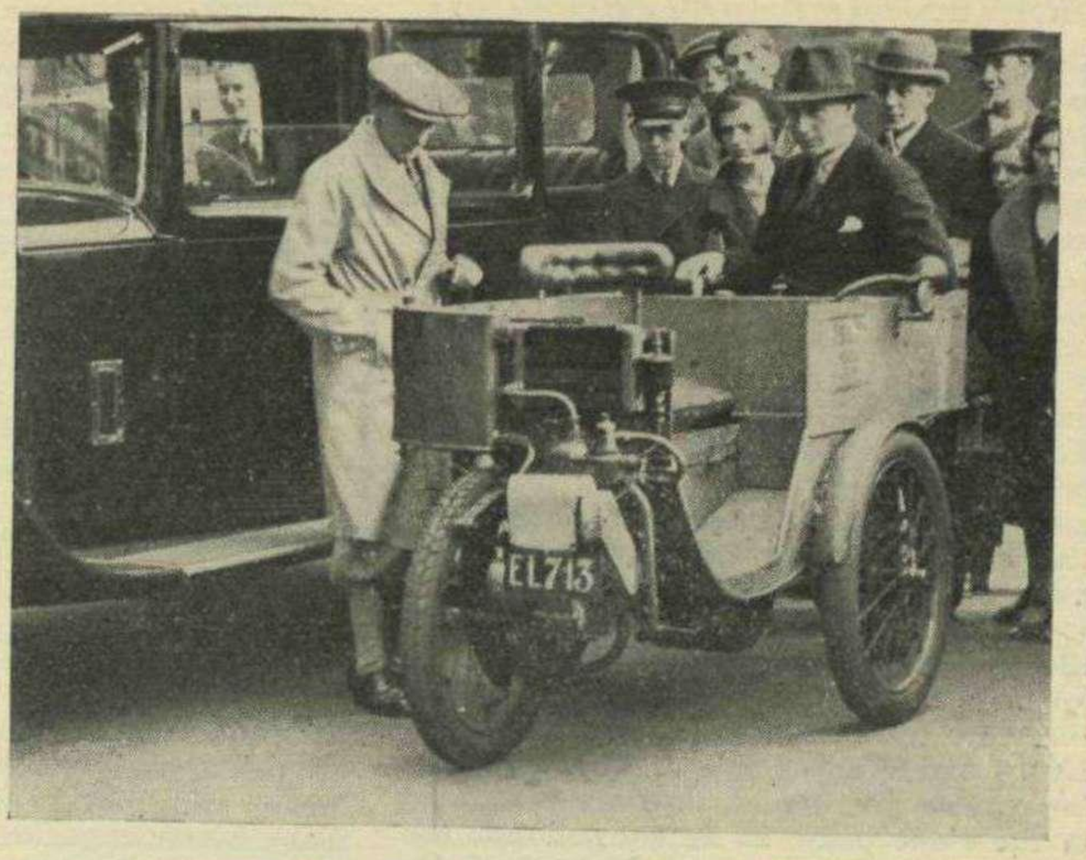
The old coachbuilding ideas of a bulky wood frame, heavy and splinterable, with a cumbersome wooden sill to hold it down to the steel chassis are still used by some manufacturers.

Now, however, with the growing popularity of the one-piece steel body, new methods are coming into use. This form of body, which is produced in the Pressed Steel Company's works at Oxford, makes body and chassis into one. The pressed steel body consists of four main units welded together and fixed direct to the chassis. With no intermediate wood frame between body and chassis, the whole car is lighter and, at the same time, stronger, and greater stability is assured by the lowered centre of gravity.

THE VETERANS HAVE A DAY OUT

Out of 51 starters, 44 veteran cars completed the run held to commemorate the 35th anniversary of Emancipation Day.

By E. K. H. KARSLAKE.

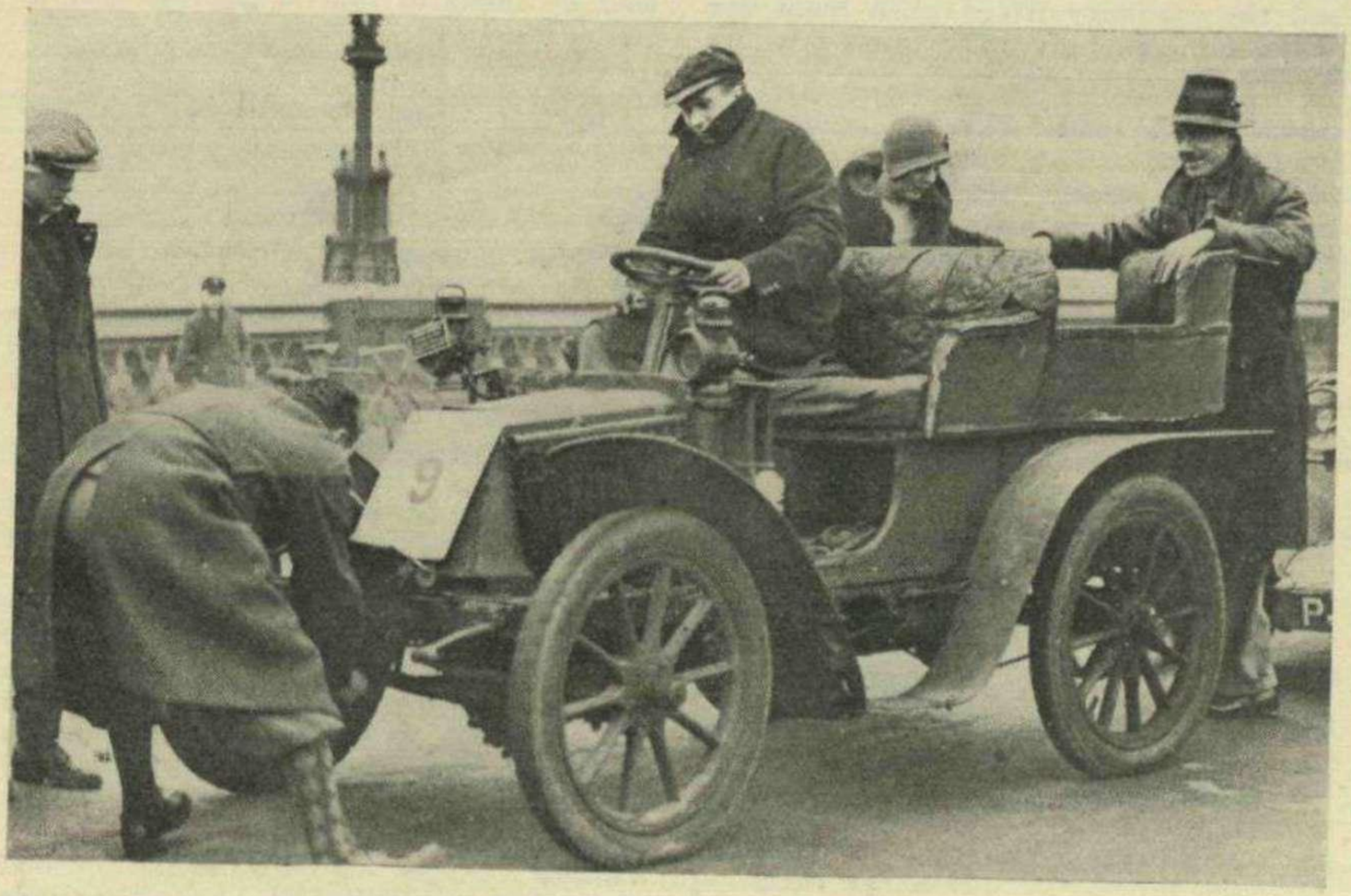


Brian Lewis took the matter seriously, judging by this photograph. The strange-looking vehicle in which he is seated is the Sunbeam Mabley car—born in 1901 and still going strong. It put up the dazzling average speed of 13 m.p.h.

ANYONE who had chanced to penetrate to the first floor of Messrs. Moon's Super Service Station in the Buckingham Palace Road on the morning of Sunday, 15th November might well have imagined that they had been transported back to the early days of the century. On every side the eye was met by strange monsters of the past, ancient Benzes, a giant Mercédès, stubby De Dions, lofty Panhards for here were gathered together 51 cars, all more than 27 years old and all being started up to take that long road to Brighton which they and their predecessors had covered thirty-five years before to celebrate the repeal of the 2 m.p.h. speed limit. Everywhere the crews were busily engaged starting up their ancient engines and filling the air with black malodorous fumes; while others not so fortunate were engaged in carrying out major adjustments. Just before the start we noticed that the 1902 Dürkopp Dog-cart had had its carburettor removed, and then just when the confusion was at its height there burst forth a sheet of flame and amid shouts of "Fire!" men rushed with Minimaxes at the White Steamer. It seemed, however, that the trouble was only a blaze up of some parafin which had been spilt, and one by one the veterans were taken down in the lift and despatched, more or less willingly, on their way.

Non-starters proved to be an 1895 Cannstadt-Daimler, a 1900 De Dion, a 1901 Gladiator, a couple of 1902 De Dions and a 1904 Panhard et Levassor. Our own De Dion Bouton, however, started up obediently, and donning the more weighty portions of our massive clothing we clambered into the driving seat and chugged out through the dense crowd into the Buckingham Palace Road. It was a grey morning, but the clouds looked high and we hoped against hope that the rain would hold off. All along Victoria Street, over Westminster Bridge and away towards the Croydon by-pass one felt almost like royalty as each policeman held up the other traffic and waved one on.

E. Martin's 1903 60 h.p. Mercédès, probably the fastest car in the run, was an early casualty, for at Brixton the magneto struck, and the car had to be abandoned. The earlier cars in the meantime were struggling painfully up Streatham Hill, and at last swinging to the right away from the tramlines and traffic onto the Croydon by-pass. The faster 4-cylinder cars which had started behind us now began to come past and at the same time we occasionally overhauled one of the earlier cars jogging along on its solid tyres. Near Merstham we came upon a sorry sight, the 1898 Stephens, driven by the son of its designer at



F. Harvey's 1902 Renault passed out temporarily on Westminster Bridge, nevertheless it averaged nearly 18 m.p.h. to the finish at Brighton.

THE VETERANS HAVE A DAY OUT—continued.

an awkward angle in the ditch, with one of its wheels at some distance away. Luckily no one was hurt as the result of the accident, and there being several other cars already in attendance, we proceeded on our way. It seems that the old car's back axle had broken, one of the back wheels had come off, and the car had lurched into the ditch.

To enumerate all the adventures which befel the competitors in this arduous run would require volumes. R. R. Marker's car, made in about 1898 by Charles T. Crowden of Leamington, was put out of the running, and its example was followed by E. E. Duncan's Cyclon, that amazing early German machine which has now taken part in many Veteran Car runs and has only once completed the course, the same unfortunate record being kept up by B. J. Smyth-Wood's 1899 Renault, which has set out for Brighton five times and only once got there. Other unfortunates who fell by the wayside were R. E. J. Townsend's 1896 Benz and L. Wilson's 1900 Panhard voiturette, but somehow or other all the others triumphantly checked in at the Acquarium Garage in Brighton. Last of all, at a quarter past four arrived Mrs. Shuttleworth in her 1900 Wolseley, after being at the wheel over 7 hours and having experienced the most incredible adventures, a performance which fully entitled her in the opinion of all to the special certificate which she was awarded although arriving after the official time limit. The full list of finishers with their official times and average speeds is as follows :—

Official Number	Time h. m. s.	Average m.p.h.
1. G. J. Allday (1894 Benz) ...	3 15 0	17.60
3. F. S. Barnes (1896 Léon Bollée)	3 43 42	15.35
4. Capt. E. de W. S. Colver (1896 Benz)	6 31 24	8.77
6. E. L. Wood (1896 Léon Bollée)	3 16 30	17.45
7. R. O. Shuttleworth (1897 Panhard et Levassor) ...	2 36 18	21.95
8. R. C. Blake (1897 M.M.C. Daimler)	4 4 20	14.04
9. F. Harvey (1902 Renault)	3 24 42	16.78
11. F. S. Rowden (1898 Star Dog-cart)	3 51 39	14.82
13. W. H. C. Blake (1899 Benz)	6 37 50	8.63
14. S. A. McCarthy (1899 De Dion Quad)	2 58 10	19.28
17. C. S. Burney (1900 Benz)	4 11 26	13.65
18. S. G. Cummings (1900 Peugeot Voiturette) ...	2 35 5	22.12
20. H. J. F. Parsons (1900 De Dion Bouton)	4 0 7	14.30
21. Mrs. R. O. Shuttleworth (1900 Wolseley) ...	7 6 30	8.04
22. R. O. Shuttleworth's (1900 Peugeot)	4 1 48	14.20
24. V. Balls (1901 Oldsmobile)	4 13 50	13.51
25. Messrs. Fiat's 1901 Fiat ...	2 21 34	24.30
27. W. Keppel (1901 De Dion Bouton)	2 29 35	22.95
28. Brian Lewis (1901 Sunbeam Mabley)	4 21 15	13.14
29. G. Burtenshaw (1902 De Dion Bouton)	4 1 40	14.20
30. H. C. Butterfield (1902 Daimler)	4 25 55	12.91
32. — (1902 Durkopp) ...	4 41 10	12.20
33. E. K. H. Karslake (1902 De Dion Bouton) ...	3 33 15	16.11
35. "Quickmore" (1902 Panhard et Levassor) ...	2 14 0	25.65
36. S. Sutton (1902 Darracq) ...	2 28 35	23.10
37. J. A. Turner (1902 Panhard et Levassor)	2 25 5	23.68
38. F. L. Wiginton (1903 Wolseley)	2 22 32	24.10
39. — (1903 Rover) ...	2 24 9	23.85
40. A. H. R. Fedden (1903 Mercédes)	2 21 40	24.24
42. D. Holmes (1903 Rover) ...	2 22 13	24.18
43. R. G. J. Nash (1903 Oldsmobile)	4 54 20	11.66
44. Sir Malcolm Campbell (1903 Rolls Royce)	2 25 32	23.60
45. — (1903 De Dion Bouton)	3 57 34	14.45
46. J. H. Wylie (1903 Wolseley)	2 26 12	23.48
47. A. H. Pass (1903 Sunbeam)	2 33 35	22.34
38. G. Southon (1903 Decauville)	3 49 32	14.96
49. V. Riley (1904 Riley) ...	6 11 41	9.24
51. D. E. Calder (1904 L'Aster)	2 36 20	21.95
52. C. de Lisle Hewitt (1904 Humber)	2 15 14	25.35
53. H. C. A. O'Rorke (1904 Darracq)	3 15 1	25.45
54. W. G. Lowther (1904 Panhard et Levassor) ...	3 0 25	19.03
55. H. Solomon (1904 Swift De Dion Bouton) ...	3 42 5	15.44
56. S. J. Upton (1904 Clement Talbot)	2 18 29	24.80
57. F. C. White (1904 White Steamer)	4 0 31	14.27

TEN YEARS *of* MOTORS
and
MOTOR RACING
BY
LT.-COL. CHARLES JARROTT
(The famous Pioneer Racing Motorist)

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

Price 3/6 (Post Free 6d. extra).

MOTOR SPORT (1929) LTD.
39, VICTORIA STREET, LONDON, S.W.1.

TALISMAN OILS
TRADE MARKS REG?
Assembly & Running-In Compound
("T.R.I.C.")

"Talisman" R.I.C. reduces Running-In period and risk of seizure.

Levels up bearing surfaces and produces a glassy, graphoid finish readily "wetted" by lubricating oil, thus preventing "dry spots."

Supplied by your Garage or the Sole Makers :—
TRIER BROS. Ltd.
Sole manufacturers of "Stauffer's Lubricant" *Reg. Trade Mark.*")
36, VICTORIA STREET, LONDON, S.W.1
Established 1882



WHAT AMERICA IS DOING

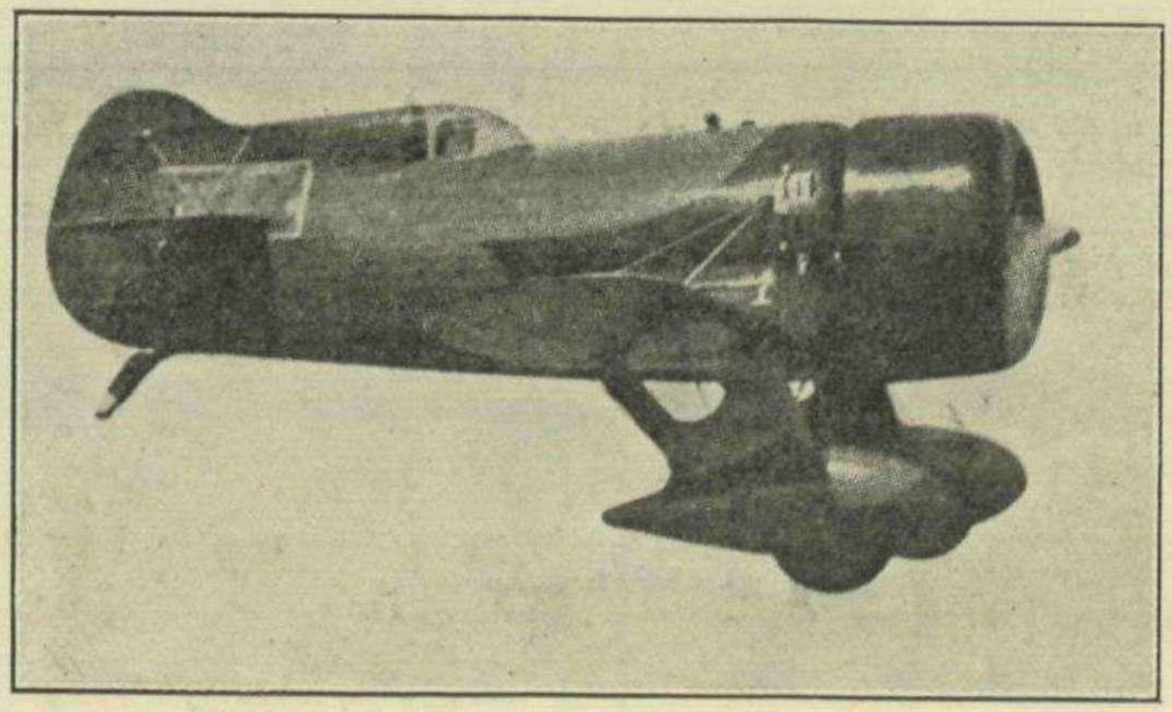
TREND OF AVIATION IN THE U.S.A.

WHILE England can claim with every justification to be the builder of the World's fastest aircraft, the finest aero engines, and to be the pioneer of the light aeroplane and flying club, we have to look to America to find a whole-hearted move towards "air-mindedness," and a fearless attitude on the part of designers and constructors in producing machines which do not always slavishly follow conventional practice.

There is no doubt that the U.S.A. is going ahead in the business of aeronautics. Their air lines are extensive, well equipped and run on efficient lines. And flying has become an accepted form of travel. Ordinary people who are not flying enthusiasts and who have no desire to be pilots are, nevertheless, regular passengers and take aerial transport as a matter of course. Compared with this state of affairs, our own internal commercial aviation is quite insignificant. This is easily explained, of course, since America with its vast territory offers tremendous scope for the commercial aeroplane, while at the same time, it does not have to compete with the railways to the same extent as is found in Britain.

In spite of the derision so often meted out to our rail system, it is a fact that we have 20,000 miles of rails whereby one can go to nearly every part of the country; in America, Texas has the most complete railroad system of any of the states, with 16,890 miles. Yet Texas is about five times as big as this country. Therefore, the American "air liner" has, to a large degree, a distinct pull.

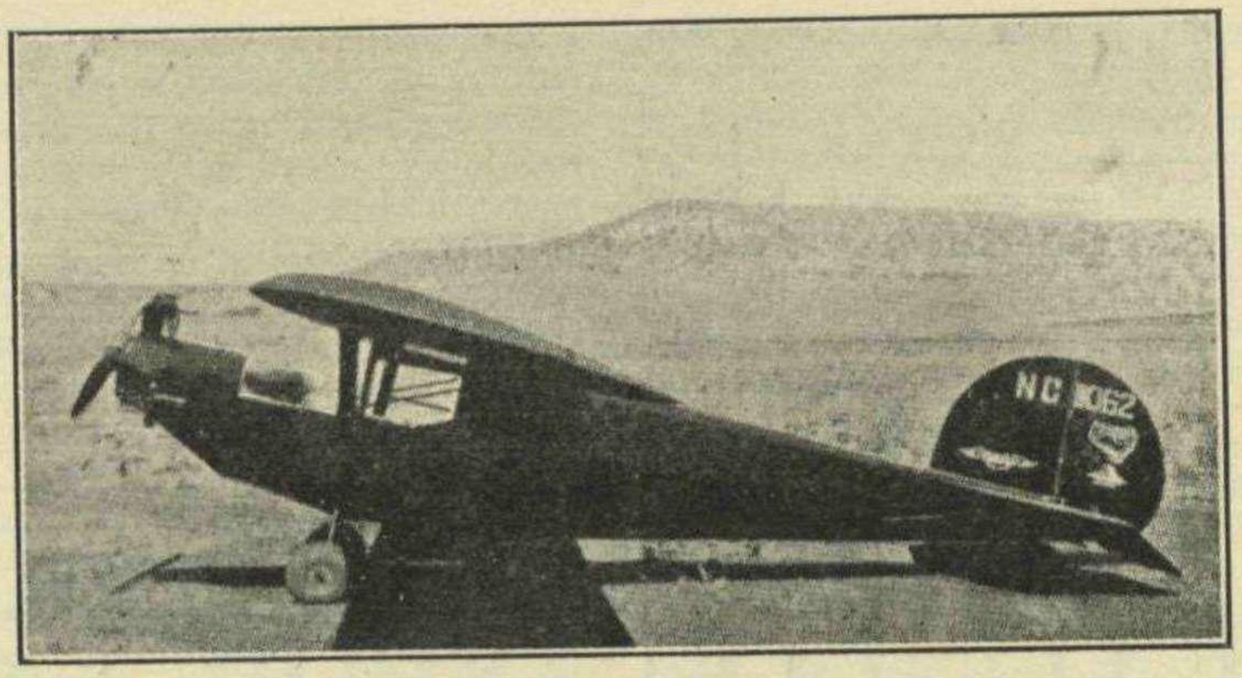
The progress thus being made in commercial aviation is helping flying all round, and the demand for machines suitable for private owners is steadily on the increase and it is in this field that one finds many interesting developments. The variety of types is remarkable, and while in this country light aeroplane design has settled down to follow stereotyped practice, in America the range is far more extensive. The conventional single-bay biplane with an engine of about 100 h.p. is found in considerable numbers, and it is gratifying to see that the Avro "Avian" and the D.H. "Moth" are both being made there under licence. But in addition to these, there are many other types. The low-powered "pip-squeak," which was long ago rejected over here, finds a place in the U.S. market and some firms who make them have met with notable success. There is the little Heath parasol monoplane for example, which is powered with a modified four-



270 m.p.h. for those who want it. The remarkable Gee Bee "sportster." The boots, N.A.C.A. engine cowl and covered cockpit are notable features.

WHAT AMERICA IS DOING—continued.

cylinder Henderson motor cycle engine. This 'plane has been manufactured for several years now, and its practicability has been demonstrated on many occasions in some of the most important races and competitions. It is interesting to find that its manufacturers, the Heath Aircraft Corporation of Michigan, not only sell it as the complete article, but offer to supply it in parts to be " built at home." Incidentally, the amateur constructor is well catered for in the U.S.A., and numbers of firms supply materials, and small engines to such enthusiasts. There are also several firms now who build gliders and sailplanes, and most of them are ready to supply their products in parts, as is done by the Heath concern.

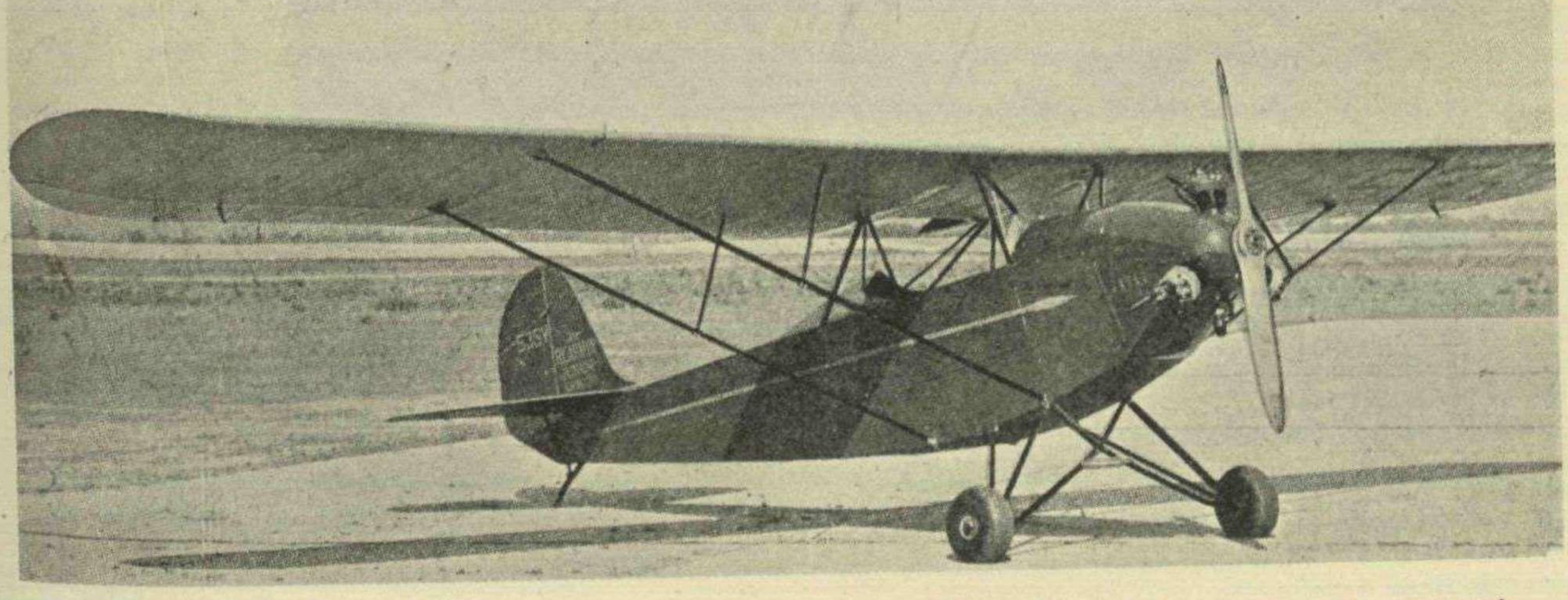


The Alexander, a cabin monoplane of only 38 h.p.

Midway between the " pip-squeak " class and the 100 h.p. type of machine, comes another form of light 'plane, a typical example of which is found in the Eaglet high-wing monoplane, built by the American Eagle-Lincoln Aircraft Corporation. Mainly of metal, this craft is a two-seater of very simple design and powered with a 45 h.p. three-cylinder " Y " Szekely motor. Another machine of rather similar build—a high-wing monoplane, is the Rearwin " Junior." This has wings of wooden construction, but the fuselage is built up of welded steel tubing. The Rearwin is obtainable with either a 37 h.p. or a 45 h.p. three-cylinder " Y "-type engine. Both these aeroplanes are of the open cockpit type and fitted with dual control, but there are also one or two examples of low-powered cabin monoplanes, and some of these are astonishingly low in price and yet very completely equipped, as for instance, the Alexander. This craft is a strut-braced high-wing monoplane with a 38 h.p. Continental power unit. Airwheels, dual control, and a full set of instruments are included in the standard specification, and the whole is a well-built job. Yet its price is round about £360. Of course, these machines of modest horse-power are not wonderfully fast or good on the climb, but they are safe, quite comfortable to fly and cheap in upkeep and first cost. They, therefore, fill a definite need.

But the " pip-squeak," the low-powered two-seater, and the orthodox light aeroplane do not complete the entire range of machines which are being offered to the American private-owner. What might be called super-sports models are being developed, and a very astonishing 'plane which comes into this category is the Gee Bee Senior Sportster two-seater. Built very decidedly as a speed outfit, it is a low-wing wire-braced monoplane with a Pratt and Whitney " Wasp " engine, and it has a speed of 200 m.p.h.

Its manufacturers have recently introduced a single-seater, and flown by Lowell R. Bayles, it won the Thompson Trophy Race, during the National Air Race meeting held at Cleveland some time ago, at an average speed of 236.239 m.p.h. As with the two-seater, the engine is a Pratt and Whitney " Wasp " tuned up to give off 535



The Rearwin " Junior " is a typically American aircraft of relatively low power. The arrangement of the wing struts, the centre section and the undercarriage design are interesting. Simplicity is the keynote of the layout as a whole.

WHAT AMERICA IS DOING—continued.

h.p., and in general arrangement the two machines are similar. As can be seen from the illustration, the pilot is placed well back in the fuselage, in fact one could say that he is sitting on the tail. A streamlined domed celluloid cover drops over the top of the cockpit to make it completely enclosed. The fuselage, which is of welded steel tube, is very plump and gives an impression of being abnormally close coupled. The wings are wooden and fabric covered with metal ailerons, operated by torque rods and fulcrums. The span is only 23 feet 6 inches, and with a lifting surface area of but 75 square feet it is not surprising that the landing speed is in the neighbourhood of 80 m.p.h. and the top speed is 270 m.p.h. The Gee Bee is obviously not a machine for anyone but an experienced pilot, but it is interesting both from the engineering standpoint, and as an indication of how private flying may progress in America in the near future.

CLUB VISITS—III.

STAG LANE— AND THE LONDON AEROPLANE CLUB

THE names of Stag Lane Aerodrome and the London Aeroplane Club are synonymous—one cannot think of one without the other, for both, to a large extent, have grown up and advanced through various stages of development together, and both are prominent in the annals of aviation.

Stag Lane as an aerodrome, in fact, has been in existence for something like fifteen years. During the War it was used by the Warran School of Flying, and there a goodly number of R.F.C. officers received their elementary training on Caudron biplanes powered with 45 h.p. Anzani and 50 h.p. Gnome engines—machines which would seem strangely antique nowadays beside their modern descendants.



A group of London Aeroplane Club members looking thoroughly pleased with things. Fourth from the left (with folded arms) is the club's secretary, while behind (standing in line with the rear centre-section strut) is Major Travers, the chief instructor.

In the year immediately following the Armistice, in common with practically all business associated with the aviation industry, the school closed down, for flying then was, to all intents and purposes, dead. Nevertheless, in that extremely difficult period, the aerodrome was still carried on as such, for Captain Geoffrey de Havilland, with commendable courage, established himself there as the de Havilland Aircraft Co. It was one of our very first post-War aviation concerns, and one which had a very modest beginning. Where now stand extensive workshops, offices and hangars, one found in those days but two or three Bessanau hangars and a few humble wooden buildings. All the aircraft used were War-time machines converted for commercial purposes, and the light 'plane, the private owner, and the club member existed only in dreams—perhaps of "D.H." himself. But as the years passed Stag Lane crept onto the map. Things were happening at the little obscure aerodrome which lay back from the busy Edgware Road, and over the roofs of the sedate London suburb which sprawled around it, Cobham and Barnard and Broad set off on their several epoch-making flights.

In time it became a centre of British commercial aviation—the stepping-off place, as it were, not only of some of our most famous pilots, but ultimately the private-flying-cum-light 'plane movement itself, for there the first "Moth" appeared and there the London Aeroplane Club made its home.

That was in 1925, when the Government system of subsidising flying clubs was first introduced. The Club in the first place owned two Mark I "Moths," which, of course, were powered with the early-type "Cirrus" engine of 27-60 h.p. The machines were housed in a diminutive shed just large enough to contain them when the wings were folded, and alongside this building was the "flight office." The whole was, perhaps, not particularly imposing, but that did not matter; it was the beginning of a movement which was later to be copied all over the world, a movement which was to bring flying within the reach of all with moderate means.

And contrary to the sceptics, the demand for membership was immediate, and the inaugural meeting on 19th

STAG LANE—AND THE LONDON AEROPLANE CLUB.

August, 1925, was remarkable for its enthusiasm. This keenness must have been a little embarrassing for the overworked instructors and the ground-engineer, for the records of the Club's activities during the first month show that in that time, 72 pupils received instruction and over 100 hours were flown. Both the "Moths" were continually at work, and their daily average time in the air was between five and six hours.

The past six years have wrought a good many changes in the London Aeroplane Club; the original instructors, Messrs. Sparks ("Sparkie") and Whitcomb are no longer to be found at Stag Lane for the former is now flying in Canada and the latter has given up aviation; the original equipment was long ago abandoned for the later editions of the "Moth," and the little wooden shed has been replaced by spacious hangars and a club house (with bar) worthy of the name.

But the character of the club, which now has a membership of between 500 and 600, remains unaltered, and with no less than seven machines available, and flying taking place on every day of the week, it is one of the busiest and keenest centres of private flying in the country.

Certainly for anyone living in the London area who is anxious to fly or to learn to fly, one would have difficulty in recommending a more satisfactory, cheerful or convenient place than the London Aeroplane Club, Stag Lane, with Major H. G. Travers as chief instructor, the maintenance of the aircraft in the hands of Mr. A. E. Mitchell, and the business side of the club presided over by Mr. M. P. S. Spencer, the genial and obliging secretary. Moreover the rates, fees and so forth are quite reasonably low as the following will show:—

Entrance fee—flying member, £3 3s.; associate member, nil. Subscription—flying member, £3 3s.; associate member, £1 1s. Flying charges—dual, £2 per hour; solo £1 10s. per hour.

AERONAUTICAL LECTURES.

SOME time ago the Royal Aeronautical Society started an experimental scheme of lectures at public schools on the history of flying and other aviation subjects.

The response has been so good that the Council has decided to continue their scheme, and so, during the coming months lectures will be delivered at over a hundred schools and colleges.

The arrangements have been thoroughly carried out, the R. Ae.S., having made a whole series of lantern slides with notes, data and so forth to accompany them; thus, the prospective lecturer has very little to do in preparing his address.

So far, a large number of the principal public schools have either made use of the facilities offered by the Society in this way, or intimated that they wish to do so, but in the meantime, it is understood, additional applications for the loan of the lantern slides and the lecture "copy" will be given every consideration.

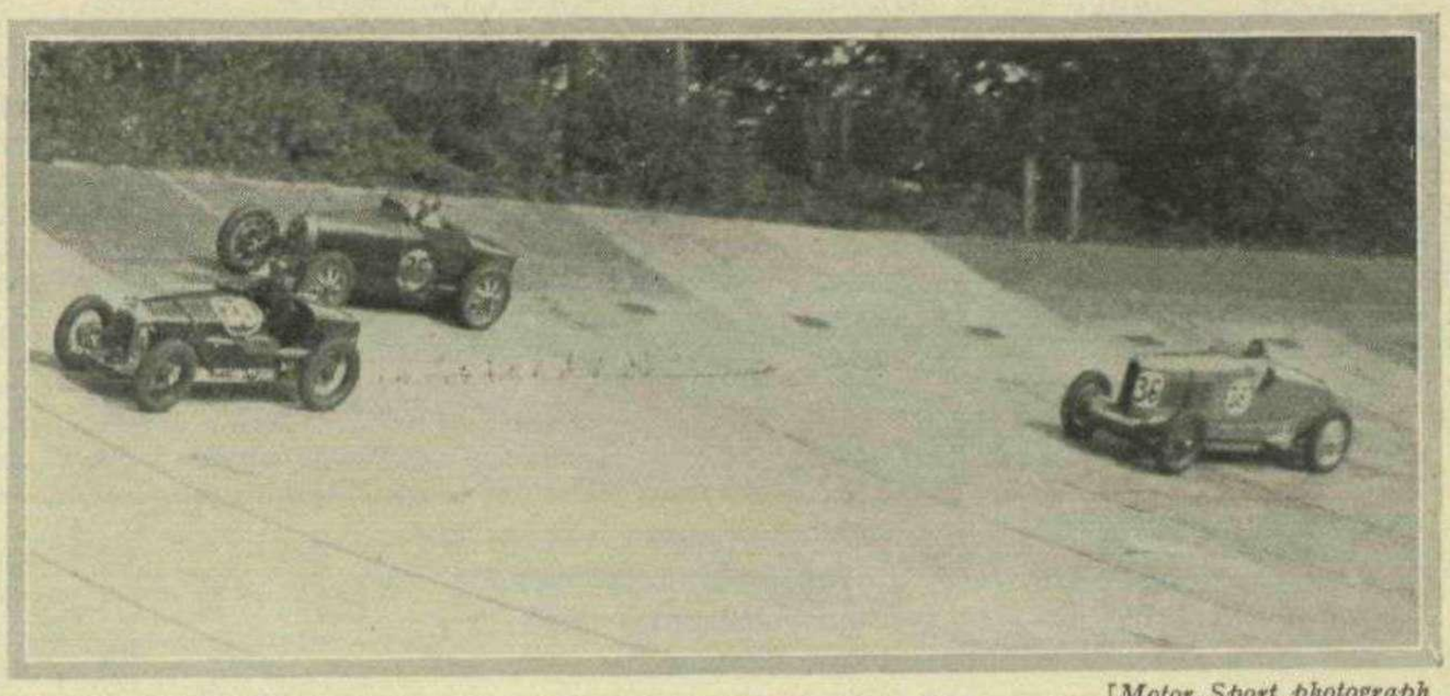
MOTOR SPORT PHOTOGRAPHS

PRINTS ARE AVAILABLE OF ALL PHOTOGRAPHS PUBLISHED IN "MOTOR SPORT."

Sizes:	Prices:
8in. x 6in. - -	2/-
10in. x 8in. - -	3/-
OR	
15in. x 12in. - -	7/6

CASH WITH ORDER.

THE B.R.D.C. "500," 1931.



[*Motor Sport photograph*

Carr takes his Bugatti high on the home banking to pass Humphrey's Amilcar, causing Lewis to pull his Talbot down to pass below them.

We have many photographs taken throughout the year at the various meetings at Brooklands, Trials, etc., which owing to pressure of space we are unable to reproduce in "Motor Sport." Particulars will gladly be sent to anyone interested in these photographs. Details of requirements should be stated, and a stamped addressed envelope enclosed.

MOTOR SPORT (1929) LTD., - - 39, Victoria Street, London, S.W.1

A "SWIFT" FLIES to AUSTRALIA

BUTLER'S MAGNIFICENT FLIGHT.

THE complete practicability of the ultra-small and comparatively low-powered aeroplane for really serious work was demonstrated as it never has been before when, on the 9th of last month, Mr. C. A. Butler completed a flight from this country to Australia in 9 days 2 hours 29 minutes in a Pobjoy-engined Comper " Swift."

Not only is his performance outstanding by reason of the fact that it breaks the previous record set up by C. W. A. Scott by 1 hour 42 minutes, but it is also noteworthy since the " Swift " is the smallest, lightest and lowest-powered British aircraft in regular production.

It was on 28th October that Butler took off from Heston to travel to Lympne with the intention of leaving the latter aerodrome on his record-breaking attempt. His departure, however, was delayed for three days owing to the non-arrival of a permit to allow him to fly over Persia, He left on 31st October at 5.17 a.m. and reached Naples at 6 p.m. on the same day ; the next day he resumed his flight at 7.10 in the morning to arrive at Athens at 4.15 p.m., after a stop en route for fuel. Keeping to the schedule he had fixed for himself, Butler continued on 2nd November, and reached successively Aleppo and Bagdhad. Then, on the next day (3rd November) he sped on to Basra and Jask—a distance of over 1,000 miles.

Early morning on the 4th found the little " Swift " still going strong at Karachi, where after a brief halt, it proceeded to Jansi and Calcutta.

At the latter aerodrome, Butler was held up for some time by very bad weather —heavy rain and high winds ; nevertheless, he managed to put in an appearance at Akyab on the afternoon of 5th November, and on the following day he took off once more on the hop to Rangoon, where he filled up with petrol before carrying on to Victoria Point.

Here again the weather conditions were against him, and a very strong head wind jeopardised his hopes of retaining the lead he had gained over Scott's time. But, both pilot and machine were in fine fettle, and after a very trying flight he got to Batavia on the evening of 7th November. Butler was now nearing the most hazardous stretch of his wonderful flight—the long over-sea crossing to his destination. Leaving Batavia in the early hours of



Two star performers. Mr. C. A. Butler standing beside his Comper " Swift " with which he flew to Australia. Except for extra fuel tanks the little craft is absolutely standard.

morning on 8th November he carried on to Koepang, and there he landed. A brief rest, a final look over engine and airframe, and he headed for the open sea and Darwin on the following day. Good luck was with him, and at 4.23 p.m. he glided down and landed safely on Australian soil, to receive the cheers and congratulations of a large crowd who had been anxiously awaiting his arrival.

As has been said, his time for the whole long journey of 10,425 miles was 9 days 2 hours 29 minutes, and he thus holds the record for the England-Australia route, which by now has been flown quite a considerable number of times.

Mr. Butler is a native of Birmingham, but several years ago he went to Australia where he took up flying as a profession. Having trained as an engineer, he joined the Larkin concern, and after qualifying as a ground engineer he learned to fly, bought an old Avro and started on his own account in the " joy-riding " business. Ultimately he returned to the Larkin Company, piloting machines for them on the Murray Valley Line. Besides being a skilful pilot and ground engineer, Butler is also something of a designer and constructor, for last year he built a single-seater high-wing monoplane of his own. Of metal construction and fitted with a " Cirrus-Hermes " Mark II engine, this machine flew with considerable success, and was remarkable for its wide speed range.

In regard to the " Swift " which performed so splendidly, with the exception of the installation of extra petrol tanks, both engine and machine were quite standard. Put into production sometime last year, the " Swift " is a 24-foot span high-wing monoplane, with several clever features. The fuselage, for instance, which is made of wood, is built up in three separate parts ; the front portion is secured to the centre part by four bolts, and is therefore easily removed for reconditioning or repair, and all three sections are replaceable as separate units. The main planes and tail plane are also made of wood, the former being of the folding type, and braced by vee-struts. When folded back, the width is only 8 feet, 6 inches.

The Pobjoy engine, which is fitted to the machine, is made by the Comper Company's associated concern, Pobjoy Airmotors, Ltd. It is a seven-cylindered air-cooled radial of 75 rated h.p. and is light for the power it gives off. For an aircraft engine, the Pobjoy runs at high r.p.m., hence its high-power weight ratio. The propellor is geared, and besides being an extremely dependable unit, as Butler's flight has abundantly proved, it has as another salient feature, extreme flexibility and smoothness of running.

WIRELESS WEATHER REPORTS.

UNDER a special licence issued by the Postmaster General, The Automobile Association will now broadcast eight times daily, by wireless telephony, weather reports and forecasts on a wave length of 833 metres.

The information will be broadcast from Heston Airport, and the service is intended for aircraft pilots, either in flight or at ground stations. The messages are the result of observations at the Air Ministry Meteorological stations grouped along six main air routes, and as the service develops it is hoped that the number of these stations will be increased.

The *reports* give the general state of the weather and visibility at each station followed by the direction and force of the wind, and lastly—of particular value to air pilots—the amount and height of the base of low cloud.

The *forecasts* cover England, Scotland Wales and Northern Ireland, and give information as to visibility and the likelihood of rain, hail, snow or sleet with wind conditions both on the surface and at 2,000 feet.

Messages have been clearly received as far as Newcastle in the North, and Exeter in the South, and to facilitate transcription special forms to enable reports and forecasts to be recorded with ease, may be obtained from The Automobile Associarion (Aviation Department), Fanum House, New Coventry Street, London, W.1, or from any A.A. Office.



" Shilling-a-week " Clubs.

I HEAR that the membership of the L.G.O.C. Flying Club is now round about 1,300, and that things are going well with them. Whoever is responsible for the organisation is certainly to be congratulated, for it can be no easy task to run a club of such a size with only one machine available and yet keep individual members happy and satisfied. But the L.G.O.C. crowd seem to be as cheery as any one can find anywhere ; enthusiasm is obviously the main essential of a club run on such lines, and that is exactly what is so noticeable at Broxbourne where the L.G.O. Club's Redwing is in operation.

Members pay a small sum each week, and a shilling or so per hour for instruction. All, of course, are not flying members, but those who are, have already got quite a good few hours in, and about a dozen have gone solo and are ready to take their " A " certificate. Such enterprise deserves to meet with success.

The L.G.O.C. Club, by the way, is not the only weekly-subscription club, for a group has been formed in Watford, and they propose to operate on similar lines. Each member pays a shilling a week, and as a " kick-off " they have managed to acquire the old Sopwith " Swallow " ; this is not exactly a suitable machine for club use as, of course, it is a single-seater and decidedly tricky to fly, but as Mr. Landon who is the prime mover of the Club, explains, they intend to recondition it to A.M. requirements and exchange it for some sort of two-seater. In the process of overhauling, members (who are nearly all in the engineering and kindred trades) will gain a good deal of aircraft experience and at the same time have plenty to interest them.

A Harry Hawker Memory.

The old " Swallow " is a machine with a rather interesting history. Originally it was a Sopwith " Camel," and at the end of the War the late Harry Hawker acquired it when it was in France. He flew it home to Brooklands—and during the journey suffered seven forced landings through dirt in the petrol tank ! Eventually it was converted into a wire-braced monoplane, in which form it appeared at the first R.A.F. Display.

After being owned by two or three people it came into the possession of Dudley Watt, who flew it with some success at various flying meetings. Then Staniland had it, and he in turn sold it to someone else. And now it is to be found at Watford in a workshop, where it is being cleaned and re-fitted and furbished up by its new owners.

An Emotioning Visitor.

The War produced a whole lot of exponents of super-stunt flying, and though many of the capers cut by members of scout squadrons were frankly foolish and thoroughly dangerous, one or two pilots were absolute artists at aerobatics.

The late Captain Armstrong, to my mind, was unsurpassed at carrying out the most perfect evolutions near the ground. His judgment and skill in doing rolls with his wing tips practically touching the blades of grass, and his loops off the ground were amazing—and terrifying to watch. And although thirteen years have passed since I witnessed it, I have yet to see anyone equal Armstrong's stunting.

It was, therefore, much to my regret that I was not present at Heston last month when Herr Achgelis gave a display of inverted flying near the ground. Friends tell me he was simply astounding. Herr Achgelis uses a specially-built Focke-Wulf " Kiebitz " biplane, with wings of bi-convex section. His *piece de resistance* is to approach the aerodrome in an inverted dive, flash across the ground at a height of about 25 feet (with his arms outside the cockpit !) do a bunt into the upright attitude and then half loop onto his back again. Another trifling effort of his was to zoom the hangars upside down ! I don't think I'd care to be his passenger,

Barnard's Next Effort.

Having brought his " circus tour " to a successful conclusion, Barnard has now arranged another enterprise. Using the famous old Fokker " The Spider," he proposes to set out this month on a winter cruise to Egypt and Palestine, taking with him a number of passengers. The cruise, which will be an easy-going affair, will include Italy, and while in Palestine and Egypt, Luxor, the Pyramids and the Valley of the Kings will be visited. This aerial cruise scheme strikes one as being very sound, and I should not be surprised if it develops very greatly in the future.

Anyway, Barnard deserves to do well out of it for he is certainly a man of bright ideas, and projects, and he ploughs a rather lonely furrow in the difficult business of profitable commercial aviation.

The King's Cup, 1932.

It is good news that the Royal Aero Club's Racing Committee has decided that for next year any type of British aircraft shall be eligible to compete and that the ban on professional pilots shall be removed.

After all, the King's Cup is our sole aviation race of note, and the rules which were put into force this year made it a pretty mediocre affair. It is gratifying to find, too, that no machine which cannot keep up a sustained speed throughout the course of 110 m.p.h. can be entered, for this ought to ensure some pretty high-speed stuff coming onto the starting line.

" RUDDERBAR."

THE SPORT AFLOAT.

A FORERUNNER OF THE SPEEDBOAT

A CRAFT WHICH CLOSELY RESEMBLED THE SEMI-DISPLACEMENT BOAT OF TO-DAY WAS DESIGNED AND BUILT FORTY YEARS AGO

THE advent of the semi-displacement type of speedboat in this country came in the form of an invasion from America and like former invasions was soon accepted as part of the community, so that in quite a short while we were building speedcraft ourselves. But the home of the speedboat is definitely America, owing to her miles of inland waterways, and it is only an overflow of her trade that reaches this country. We have to rely upon our own constructors to produce boats especially suited to this country's local conditions.

Literally hundreds of speedboats are sold annually in the States, and it is, therefore, with a certain amount of regret that I learnt recently that this country might have been in a position to have introduced the semi-displacement type of boat into America instead of vice-versa. Had this happened, the consequent benefit to our motor boat industry would have been immense, for at the best, American builders could have manufactured only under licence of the patent holder. I do think, however, that at even this late date we may justifiably pride ourselves on having had the first hard-chine boat in the world, as far as our knowledge goes, invented, built and sailed by an Englishman.

"The Albatross."

Commander Hodgetts was the man, and the first of Hodgetts' Patent Non-Rolling Ships built in 1891-92 was known as the "Albatross." This name was not idly chosen, for the gyrations of this bird were responsible for the first rudimentary idea.

Commander Hodgetts was a naval man and thus viewed all progress of marine design from the point of view of naval significance. He was, therefore, much concerned with the overwhelming weakness of our cruisers when in action in bad weather. This weakness was due to the rolling of the vessels, so much so in fact, that in even a moderate sea they could not use their heavy guns abeam, and were it slightly rougher, the oscillations of the boats caused their armour belt to roll high out of the water, exposing the vulnerable wooden hull to any stray missiles. Commander Hodgetts was on watch in the Indian Ocean one day about 1888 and was watching an Albatross skimming round the boat, when the thought suddenly occurred that the bird's flight was remarkably steady considering the gusty nature of the day. He had thought of designing a vessel with a steady gun-platform for some time, and he immediately seized upon the notion of incorporating any ideas that might be gleaned from the Albatross. The conclusion arrived at was that the air caught under the steep curves of the wings, imparted a cushioning effect, and hence the steadiness.

Hodgetts' design was, therefore, a rather mixed example in which hard-chine and ordinary displacement constructions fought for mastery, but as events proved he was willing to suffer a prolonged experimental period. About this time he associated with another inventor who was working on an uncapsizeable lifeboat. A disagreement arose over the particular kind of curve to be used to form the arms of the V, and so, following this waste of time and money, Hodgetts had to continue alone. Experiments on an extensive scale with models were conducted in the Royal Aquarium by Mr. Walter Philips, M.I.N.A. during the summer of 1890, before a distinguished gathering including Admiral Sir Reginald Macdonald and Vice-Admiral Sullivan. These experiments were so satisfactory that the world patents were completed. The "Albatross" was completed in 1892, and a Mr. W. A. Scott was so pleased with the performance of this boat on trial that he immediately ordered a boat on similar lines from Marvin of Cowes. Below is an extract of the trial of this second boat named "Jack Heron," taken from the *Isle of Wight Herald* of 24th February, 1894.

". . . The phenomenon of non-rolling is due to two forces; on the weather side there is in the channel between the keel and the new side keel a volume of water which must be raised to the surface for the ship to roll, but this is not possible on account of the molecular attraction, which renders this water for the moment as it were, a part of the ship, and is too heavy to lift, while to leeward the same form acts as an outrigger or lee board, preventing that side from going down; thus, between the two, the vessel is rendered stable, while the channels being open at each end the water continually passes aft and prevents her being too stiff.

The experiments at Cowes with Mr. Scott's "Jack Heron" showed:—

1. Remarkable steadiness with great ease of motion.
2. Extreme delicacy in steering.
3. Quickness in going about.
4. Great diminution of pitching.
5. Good speed.
6. Great power of going to windward.
7. Avoidance of leeway.
8. Reduction of bow wave and side-wash.

The last quality, on account of the side keels not having been brought so far forward as in the former experiments with the "Albatross" was not so remarkable as in that vessel, where the side-wash almost entirely vanished and the bow wave was reduced to an almost imperceptible ripple."

Being before the days of the internal combustion engine, and thus of engines with a good power-weight and size ratio, the increased speed was not at once apparent, as 10-12 knots was considered high at that date. Nevertheless, even with the "Albatross" the difference was appreciable. Witness to this is the account published in *The Isle of Wight Herald* for 24th September, 1892:—

"Arthur Scott, Esq. . . . invited the party to meet the inventor on board his s.s. 'Elsie,' and took the 'Albatross' in tow. The speed of the 'Elsie' never exceeds 9 knots, but with the 'Albatross' in tow she ran the measured mile at 8¾ knots and when she stopped, the acquired momentum carried the 'Albatross' on beyond the point reached by the 'Elsie,' so that the new form of ship's bottom is proved to be conducive to increase of speed."

Commander Hodgetts had naturally looked to the Admiralty to take up his invention, but this body proved reactionary, for which attitude they were severely criticised in the public press by Admiral Sir George Elliot. Curiously enough, in the light of our later knowledge, the bone of contention with the Admiralty was the speed of vessels constructed on these lines.

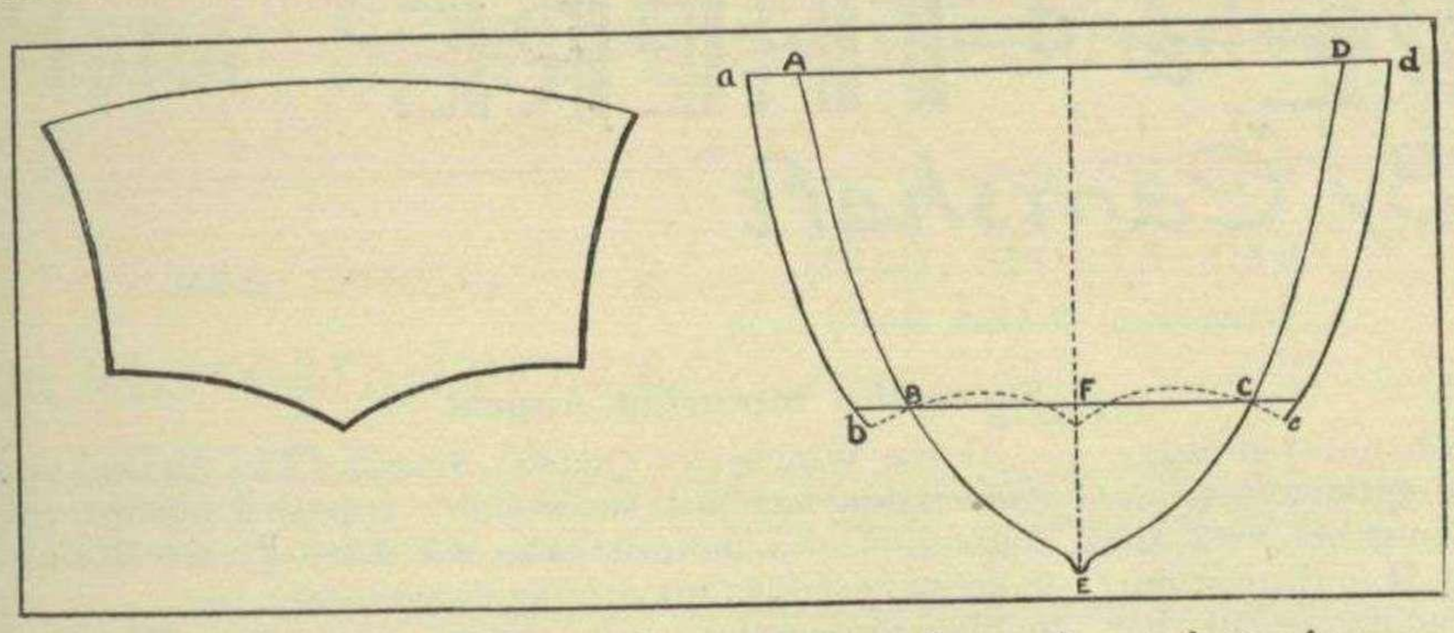
The official body had found that the fitting of bilge keels had affected the speed of a vessel, by as much as a knot in some cases, and it was beyond Commander Hodgetts' power to persuade them that it would be otherwise with his craft. The matter became quite a public controversy and below is reproduced one of the many letters to the public press siding with the inventor. Although the supposed proof is a little weak as are the mathematics, I am including it chiefly for historical interest. This letter, together with the accompanying illustration, appeared in the issue of *The Engineer* for 23rd August, 1895.

"The Rolling of Ships."

SIR,—

I read with great interest the letter from "M.T." on this subject, and hoped to have seen it fully discussed in your columns, on account of its great practical importance. Admiral Elliot in a remarkably able letter to *The Morning Post*,

A FORERUNNER OF THE SPEEDBOAT—continued.



Amidships section of a modern hard-chine constructed speedboat, and a reproduction of a drawing which appeared in "The Engineer" in 1895 with reference to the superior speed of Hodgetts' "non-rolling ship."

August 10th, has brought attention to the evil effects of rolling in causing the unarmoured sides of a ship below the water line to be exposed to enemy's fire. If ships of war can be built so as not to roll without corresponding disadvantages, it seems to me it would be the blindest folly on our part not to do it. It appears beyond dispute that Mr. Hodgetts' new form of ship, so far as it has been tested, has reduced rolling to an amazing extent. If the same results can be obtained with big ships as with the small yachts tried last year at Cowes, when tried in all weathers and waves, the practical benefit of adopting this form of ship, if the expense is not too great, seems to me beyond estimate, especially as the speed of the vessel does not seem to be reduced by the shape. In fact, I understand that it is claimed by the inventor that the contrary is the case, and that the experiment at Cowes showed a decrease rather than an increase in the resistance of this form of ship to towing. This, I admit, puzzled me when I first heard it; but I think it can be explained as follows:—It is well known that a great part of the resistance to the motion of a ship is due to what is called skin-friction, which depends on the external area of the ship below the water-line. Under certain conditions it can be shown that the new form of ship will have less surface in contact with the water than a ship of triangular section of the same displacement. For the purposes of this letter the following is a sufficient geometrical illustration of this problem: A B E C D is an imaginary section below the water line of an old style of ship, and a b F c d a section of the new style. In the latter the line b c is not really straight but curved as shown by the dotted line, the curve being a catenary; but this does not appreciably affect the problem. To compensate for the slightly longer line, it is only necessary to make the sides a b and d c a little longer. Now the displacement being the same in the two ships, the area A B E C D must be equal to the area a b F c d. And since the area A B F C D is common to both, we get the area a b B A=B E F and d c C D=C E F. Then it is obvious that b B is shorter than B E, and e C than C E. Consequently since A B=a b and D C=d c: a b+b c+c d is shorter than A B E+E C D. As this must be true of every other section, the external surface below the water-line of a ship of triangular section must be greater than that of the new form of ship, and consequently the surface resistance must be greater. It is manifest, however, that this does not hold good when the comparison is made with the Hodgetts' ship and a ship of the present box shaped section.

Mr. Hodgetts has, I am told, found in experiments with models, that the resistance ot a force tending to make the models of his form of ship keel over is greatly in excess of the resistance given by models of the usual shape. This indicates that in the models of his ship the centre of gravity was low and the stability great. In an ordinary shaped ship, under these conditions, we should expect it to roll violently; but the trial with the yachts at Cowes showed that this was not the case. If the centre of gravity was as low proportionally in the yachts as in the models, it seems obvious that we must attribute their great steadiness to their external form. Mr. Froude has shown experimentally that by the addition of bilge keels the period of roll may be very considerably increased.

For example, with a model of the Devastation by the addition of a sufficiently large bilge-keel, the time of a double roll was increased from 1.77 to 1.99 secs., while the number of rolls before coming to rest was reduced from 31½ to 4. In this case the model was made to heel over in smooth water through an angle of 8½ deg.—("Encyclopaedia Brittanica" Vol. XXI, page 813). The external form of Mr. Hodgetts' yachts must, I think, act in increasing the time of roll in exactly the same way as bilge-keels, and is evidently in many ways a far superior method of obtaining the desired result.

There are two points among others which it would be interesting to know with regard to these ships: (1) Were there any great constructive difficulties to be overcome in building them of large size? (2) Whether any experiments have been made with the yachts to find out their period of roll by making them heel over in smooth water? Perhaps your correspondent, "M.T." could kindly answer this last question.

C. E. Baseri.

8, Norfolk Square, W. August 17th.

We know to-day that Mr. Baseri was right when he assumed that a reduction of wetted surface accounted for the extra speed, but I am afraid his explanation of the decrease of skin-friction was somewhat far from the mark. However, a letter had been written to the *Pall Mall Gazette* in the April of 1895 giving the precise reason why an increase of speed was stated. As the letter was signed "A Field Officer," and the explanation was in the form of a supposition, the letter unfortunately did not receive the attention it merited—people probably thought it a case of fools rushing in where angels feared to tread. Here is the material part of this letter.

SIR,—

. . . Having noticed that torpedo catchers at full speed rise considerably out of the water, it at once struck me that this ship (Hodgetts') which has all the advantages of a flat bottom on the point, must rise considerably and to some extent skim, for it cannot dive; if this be the case I can readily believe the architect's opinion, as to the greatly increased speed of this type, since in her case "the greater the speed the less the resistance," whereas in the ordinary ship the exact reverse to this is the case, as by doubling the speed the resistance of the water is increased fourfold. . . .

"A Field Officer."

April.

In 1895 a company was formed to exploit the invention, but as the Admiralty had in their ignorance definitely turned it down, this company was not a success. Thus, we have another case in which a worthy invention coming only a few years too soon, is lost to the world owing to the reactionary principles of the accepted school of thought prevalent at the time.

F. M.

The "Sea Snipe."

THE engine of the Humber Snipe—a six cylinder unit of 23.8 h.p. R.A.C. rating, developing 72 h.p. on the brake—has been adapted to marine purposes by Messrs. Thornycroft, who have marketed it under the name of "Sea Snipe." Certain modifications have, of course, been necessary to adapt the engine to this purpose, but the bare power unit remains as fitted to the car. For marine use, an extension of the crankshaft is made to contain a special Thornycroft reverse gear, with single lever control, and adjustment of either ahead or astern clutches is effected through a large inspection cover.

The weight of the complete engine and reverse gear is only 670 lbs., and the price, with skin fittings, spares and tools, is £225. An additional £12 covers the cost of the stern gear. This new departure has caused much favourable comment in yachting circles.

HERE and THERE

By "Camshaft"

Father of the Motor Industry—

IT is difficult to realise that the British motor industry, now so important a factor in the national scheme, is actually an infant concern compared with the majority of our leading undertakings. It is thrown into strong perspective, however, by the announcement that one of its pioneers has recently celebrated his eightieth birthday.

This is Mr. William Riley who, rather over 40 years ago, took his first step to becoming a motorcar manufacturer by purchasing a cycle manufacturing business. The history of the Riley concern from that date is an illuminating record of the growth of the motor industry.

William Riley was a man of foresight. He controlled a prosperous weaving business in the days when weaving was Coventry's leading industry and yet, standing as he did at the threshold of the speed age, he saw its promises so clearly that he chose it, instead of his own established trade, as a career for his sons.

At first the manufacture of cycles exclusively occupied the father's attention, but the sons were eager to turn to the motoring side, and with slender resources but much enthusiasm, themselves equipped a factory with plant for the production of engines. Later on, cycle manufacture was ceased, and both senior and junior branches concentrated on the development and production of cars. Such widely accepted features of modern design as detachable wire wheels and the " silent third " four-speed gearbox were Riley innovations.

William Riley adopted the industry in its earliest days, has followed its progress for forty years and is still actively in touch with it.

—And a Pioneer Motorist M.P.

Motorists will find a warm champion in the new House of Commons in Mr. Reginald G. Clarry, who was returned as Conservative member for Newport (Mon.).

Mr. Clarry was a pioneer motorist himself and in the early days drove a Benz with tiller steering.

Born in Derby, Mr. Clarry was trained in civil engineering and chemistry and had a successful business career before taking up politics. During the War, he had a high position in the Ministry of Munitions, and afterwards became interested in road problems. He is a recognised authority on non-skid roads and last year was appointed chairman of the British Road Tar Association, which has a membership of well over 700 firms and municipalities. The Association under Mr. Clarry's guidance has been continually seeking to improve the standard of British roads.

Mr. Clarry is also Chairman of the International Road Tar Conference.

Successful Motoring Appeal.

At the Winchester Quarter Sessions The Automobile Association has just successfully appealed against the conviction of a motorist who was fined by the Basingstoke magistrates for driving dangerously.

The prosecution had alleged that the defendant travelled at an excessive speed when passing a detachment of troops, and failed to slow down on being signalled to by the officer in command.

The evidence of the defendant and his passenger was that the car was slowed down but that when passing the column of soldiers at reduced speed, the officer in charge ran alongside and struck the defendant in the face. A summons for assault against the officer was dismissed at the original hearing, and the motorist was fined £5 and costs.

The Justices upheld the view put forward by Counsel instructed by the A.A. Legal Department, and allowed the appeal with costs against the police.

More Road Signals.

An interesting experiment in traffic signalling is to be tried out by the Croydon Council, whereby traffic will be controlled at various points in the borough by pedestrians.

The scheme is that red lights shall be installed, and when a pedestrian is desirous of crossing the road, he will press a button fixed on a post. This will switch on the " stop " signal, and motor traffic will have to come to a standstill on a line marked on the road some 20 feet from the walker in both directions.

Unless certain rules are laid down concerning the use of this signal, I can foresee plenty of complications, however. What, for example, will be the result if half-a-dozen amblers seek to emulate the chicken of riddle fame in quick succession ? And surely that button will be an irresistible attraction for the small boy ? Still, it will be an interesting experiment.

British Motor Development in India.

The new company—Allied Motors Ltd.—which was recently formed to distribute and service Rolls-Royce, Humber and Hillman cars, and Commer commercial vehicles, in Western India, Delhi and United Provinces has now opened its Showrooms in Bombay and Delhi. A distinguished and influential gathering numbering over 200 attended the function, including many prominent Government officials.

The showrooms at Bombay are at Hughes Road, Cumballa Hill, and at Kashmir Gate in Delhi. The Managing Director of Allied Motors is Mr. Raymond Chandler, late Manager of Rolls-Royce (India) Ltd., while Mr. J. W. S. Milnes, late of Rootes, Ltd., Devonshire House, London, is Sales Director.

Motor Sport Classified Advertisement Section

HEAD OFFICES :

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

Telephone : VICTORIA 5218

Rates (prepaid) - 1/- per line (minimum 3 lines).

CLOSING DATE first post on the **23rd** of the month, for publication on the 1st of the following month.

USED SPORTS CARS FOR SALE.

ALFA-ROMEO.

£55 !!! 22-90 h.p. 4-seater sports ALFA-ROMEO, 1925-6, just overhauled, amazing performance, 85 m.p.h., taxed, tonneau cover, all-weather equipment. Apply Box R507, c/o MOTOR SPORT.

BENTLEY.

1924 BENTLEY 3-litre short chassis, f.w.b. speed model, mahogany and aluminium boat body, cycle-type wings, entirely modernized in 1927, late property of royalty, offered at £150. Gatehouse Motors, Highgate Village, N.6. 'Phone Mountview 4444.

BUGATTI.

BUGATTI, Genuine 1930 1½-litre type 40 Grand Sports 4-seater, cream and blue, carefully used, small mileage, exceptionally fast, first-class condition throughout, £195. Apply Box A511, c/o MOTOR SPORT.

1929-30 BUGATTI special Grand Prix 4-seater, close ratio 4-speed box, black and red, spotless condition, taxed, 12,000 miles. £145. S. D. C. Taylor & Co., Ltd., 6, Kendrick Place, near South Kensington Station. Kensington 8965.

USED SPORTS CARS FOR SALE (*continued*).

BUGATTI.

GRAND PRIX two-litre Bugatti, fitted unique English two-seater, ample luggage accommodation and grid ; chromium plating, Triplex, every accessory ; full touring equipment ; terrific performance, but perfectly tractable in traffic ; no oiling up, any trial or examination welcomed, £110.—A.415, c/o MOTOR SPORT.

FRAZER-NASH.

FRAZER NASH cars, Falcon Works, London Rd. Isleworth (Hounslow 3172) always have for disposal reconditioned and guaranteed cars, fitted with new tyres and F.W.B. Prices from £125.

HISPANO-SUIZA.

1926 (late) 37-8 h.p. HISPANO-SUIZA sportsman's 2-door saloon, fitted with starter, dynamo lighting, clock, speedometer, petrol gauge, illuminated dash, 3 interior lights, high-beam headlights with dimming device, windscreen wiper, electric horn, 2 spare wheels, 2 concealed luggage boxes, powerful front-wheel brakes, disc wheels,

A FASCINATING HOBBY

The acquisition of a 30 year old car will bring you intense fun and pleasure. You can garage your car with us and use it on our private roads without any licensing formalities.

CARS FOR ADVERTISING PURPOSES

An antique car displayed at your business premises will attract considerable attention which generally leads to further custom.

RECENT SUCCESSES

1930 Brighton run. No. 10, Benz, driven by one of our staff, gained certificate. 1931 Eastbourne run. No. 22, Peugeot, supplied by us and gained certificate. 1931 Brighton run. Three cars supplied by us, No. 17, Benz, No. 43, Oldsmobile, and No. 48, Decauville gained certificates.

Patronise the only firm which deals exclusively in Antique cars.

Veteran Cars Limited

BROOKLANDS AERODROME,
BYFLEET, SURREY

Telephone : Byfleet 582.

USED SPORTS CARS FOR SALE (*continued*).

adjustable arm-chair and bucket seats, Triplex glass throughout and every conceivable fitment and refinement, finished white with black moulding, head, wings and wheels, chromium plating and upholstered in hide ; the car has only done a very small mileage, is definitely indistinguishable from new and has a really marvellous performance in running, will certainly appeal to the most critical eye as being the last word in motor luxury, cost nearly £3,000, offered by us at £295. Apply O502, c/o MOTOR SPORT.

ITALA.

1928 2-litre 4-seater sports ITALA, taxed, very fast, adjustable seats, sound condition throughout. £100. Apply Box R508, c/o MOTOR SPORT.

LAGONDA.

275 Guineas. 1929 2-litre low chassis speed model super-sports 4-seater LAGONDA, actual Le Mans car, special throughout, close-ratio box, large capacity rear tank, quick-release filler caps, stone guard, full touring equipment, black-green, exceptional. Apply Box Y509 c/o MOTOR SPORT.

LAGONDA 2-litre Speed Model Sports 4-seater, close ratio gears, fast and economical to run, mechanically perfect and very attractive appearance, maroon and black, soft leather, pneumatic upholstery, taxed year ; £175.—R. S. Currie & Co., 18, Hereford Road, Westbourne Grove, Bayswater, W.2. Park 1846.

LEA FRANCIS.

LEA-FRANCIS 1930 Ulster T.T. sports 2-seater, supercharged, exceptional condition throughout. £195. Apply O.P.503, c/o MOTOR SPORT.

M.G.

1929 M.G. 14/40 2-seater. Red and aluminium, very clean, small mileage. 70 m.p.h. £105. C. H. Wells, Mount Arlington, Shortlands, Kent. Ravensbourne 1295.

RILEY.

£165 !!! RILEY, 1930 Brooklands sports 2-seater, in beautiful condition throughout, taxed to December, guaranteed speed 85 m.p.h. Apply Box M510, c/o MOTOR SPORT.

SALMSON.

VADUM Co. Specialise in the Speedy and Economical 9.5 h.p. Salmson, 35-40 m.p.g., insurance from £1 0s. 6d. service, spares, repairs. Open Saturdays.

69 Guineas.—1928½ Grand Prix, underslung, dropped front axle, large F.W.B., low streamline body, twin o.h.c., really smart, taxed.

67 Guineas.—1928½ Grand Prix Special, twin o.h.c., 4 speeds, F.W.B., balloons, chromium, handsome Manx sports 3-seater body.

VADUM Co., 352, High Road, Willesden Green, N.W.10. Willesden 2469.

Motor Sport Classified Advertisement Section—*continued.*

USED SPORTS CARS FOR SALE (*continued*).

SALMSON

1929 Reg. SALMSON Brooklands racer, cycle wings, 70 m.p.h. on 3rd gear and about 90 on top. Apply H504, c o MOTOR SPORT.

1926 Skiff SALMSON sports, black and red, fast, £18. Apply A505, c/o MOTOR SPORT.

1928 SALMSON Grand Prix 2-seater fabric sports, fast, £50. Apply Box No. R506, c/o MOTOR SPORT.

SCHNEIDER.

LATE 1928 Th. Schneider, special low seater body by Corsica. 20, 40, 55, 70 in gears. Perfect condition. 5,000 miles since re-bore. Brakes just relined. Chromium. New tyres. Taxed year. Insured to May. Quiet, quick, comfortable, £150. Apply H421, c/o MOTOR SPORT.

VAUXHALL.

OWNER wishes to sell very super 30/98 Vauxhall, O.E. model, F.W.B. Attractive Mulliner 2-seater, flared wings and many extras. Exceptional condition and appearance. £85.—Apply Box H104, c/o MOTOR SPORT, 39, Victoria Street, London, S.W.1.

30/98 VAUXHALL, 1923, F.W.B., Velox body, colour black, tonneau cover, good condition, fast, £47 10s. Gatehouse Motors, Highgate Village, N.6. 'Phone, Mountview 4444.

VOISIN.

1928 VOISIN 16-50 h.p. sports 2-seater, black and red cellulose, leather upholstery, wire wheels, full equipment, exceptionally comfortable, very fast, year's guarantee, licensed, £95. Apply S501, c/o MOTOR SPORT.

REPAIRS, Etc.

WE Specialise in 30-98 h.p. Vauxhall Overhauls of every description, tuning a speciality, high speeds guaranteed; call or write.—Crackington Motors, 35a, Hertingfordbury Rd., Hertford.

PARTS AND ACCESSORIES.

30-98 h.p. Vauxhall Spares of Every Description 50% below Maker's Prices, both for s.v. and o.h.v. models, engine gear boxes, back axles, etc. —Crackington Motors. Welwyn 154.

WANTED.

WANTED, without delay, G.N., 41 and 43 sprockets, single str., steering, spares, etc. Cash on approval. Communicate with H. Tregenza, Gooder Lane, Brighouse, Yorks.

D. GEORGE COLLINS, LTD.,
118 NEWGATE STREET, LONDON, E.C.1.
Works: Birmingham and Sheffield.

Manufacturers of Silver and Gold Trophies, Presentation Caskets - - and Keys, Cups, Medals, Spoons and Badges. - -

Coloured Artist's Sketches sent on request with quotations. :: Makers to the A.C.U. and many well-known Motor Associations and Outboard Motor Boat Clubs.

Telegrams: **"WORTHFUL, LONDON."** *Telephone:* **NATIONAL 1163**

Your used Sports Car will appeal to our readers——

ADVERTISE IT IN OUR CLASSIFIED SMALLS SECTION

AT **1/-** PER LINE

(minimum 3 lines)

439, Ltd. BARGAINS

SPORTS SPECIAL H.E. 3 seater 1924 model. Exceptional condition throughout. Recently thoroughly overhauled. Exceedingly fast and reliable. smart, attractive appearance, taxed. Great Bargain, £35.

MORRIS-MINOR Brand New 1932 Sunshine C.B. Saloon, just delivered listed, 135 gns. Our price **100 gns.**

LEA-FRANCIS 4-seater, late 1925. Exceptionally good order. Gift at £18.

MORRIS-OXFORD 6-cylinder Sports Tourer (£25 just spent on overhaul, receipts given). **Insured to May. Remarkably good car.** Our Price **£19.**

WOLSELEY 6-cylinder Late 1927 Drop Head Coupe. Beautiful, in perfect order, fully equipped, **£32.**

MORRIS-COWLEY 1929 4-door Saloon, Cellulosed Brown and Fawn. Absolutely as new. Taxed. Leather upholstered. Exceptional bargain, £68. Ditto 1928 **£50.** Ditto 1927 **£32.**

MORRIS-OXFORD 1926 Drop Head Coupe, indistinguishable from new. Beautiful car, £25; recen- overhaul cost more.

MORRIS-OXFORD 1927 4-door Saloon. Perfect. Taxed. **£37.**

STANDARD Big 9 Fabric 4-door Saloon, late 1929, absolutely as new. Taxed. **£75.**

SINGER 8 h.p., late 1927 Tourer, as new, **£29.**

RILEY SPORTS 12 h.p., 4-seater, excellent order, **£15.**

SWIFT 2-seater, perfect order and condition throughout, **£8.** Several cars at **£5.**

ESSEX late 1927 4-door **Saloons** as new, **£22** each; ditto 2-doors, **£19** each; ditto, **£10.**

AUSTIN late 1927 G.E. Saloon, excellent order, **£38.**

BENTLEY 4-door Saloon, 6½ litre, late 1928, absolutely as new, £325.

ROLLS-ROYCE Modernised 2-seater, excellent order, £30.

MANY OTHER CAR BARGAINS.

16ft. SPORTING 5-SEATER OUTBOARD SPEED-BOAT, fitted with almost new Elto Quad Engine. Remarkable outfit. Capable of 35 m.p.h. As new £90 complete.

TWELVE ELTO SPEEDSTER ENGINES throughout, in perfect condition, with boats complete, in perfect order, £27 each.

MANY OTHER REMARKABLE BARGAINS.
EXCHANGES CARS & BOATS.
CASH & DEFERRED TERMS.

439 Ltd. 439, Edgware Road, W.2.
Telephone, Paddington 0439.

BELLEVUE GARAGE
AND SERVICE STATIONS LTD.
18 & 19 BELLEVUE ROAD, WANDSWORTH COMMON, S.W.17.
Manager: Mr. D. G. EVANS

Planned, constructed and fitted with every modern equipment in - order to ensure efficient service for Sports car owners -

Large Showroom. Breakdown Ambulance. Repairs, and High Efficiency Tuning
Any make of Sports Car supplied. Inspection invited. *Telephone:* **BATTERSEA 0479**

INSURANCE.

INSTALMENT INSURANCE PREMIUMS accepted by CARJAX, LTD., covering all motor risks, third party or fully comprehensive; full benefits, best companies and Lloyds; instalments unaffected by claims; immediate certificates.—Carjax, Ltd., 27, Old Bond Street and 13, Albemarle Street, London, W.1. Regent 3200.

Leading Houses for Sports Cars

JACK BARCLAY
—LTD.—
THE BENTLEY SPECIALISTS
12 GEORGE STREET
HANOVER SQUARE
LONDON, W.1.
Mayfair 4152/3/4
PART EXCHANGES DEFERRED TERMS

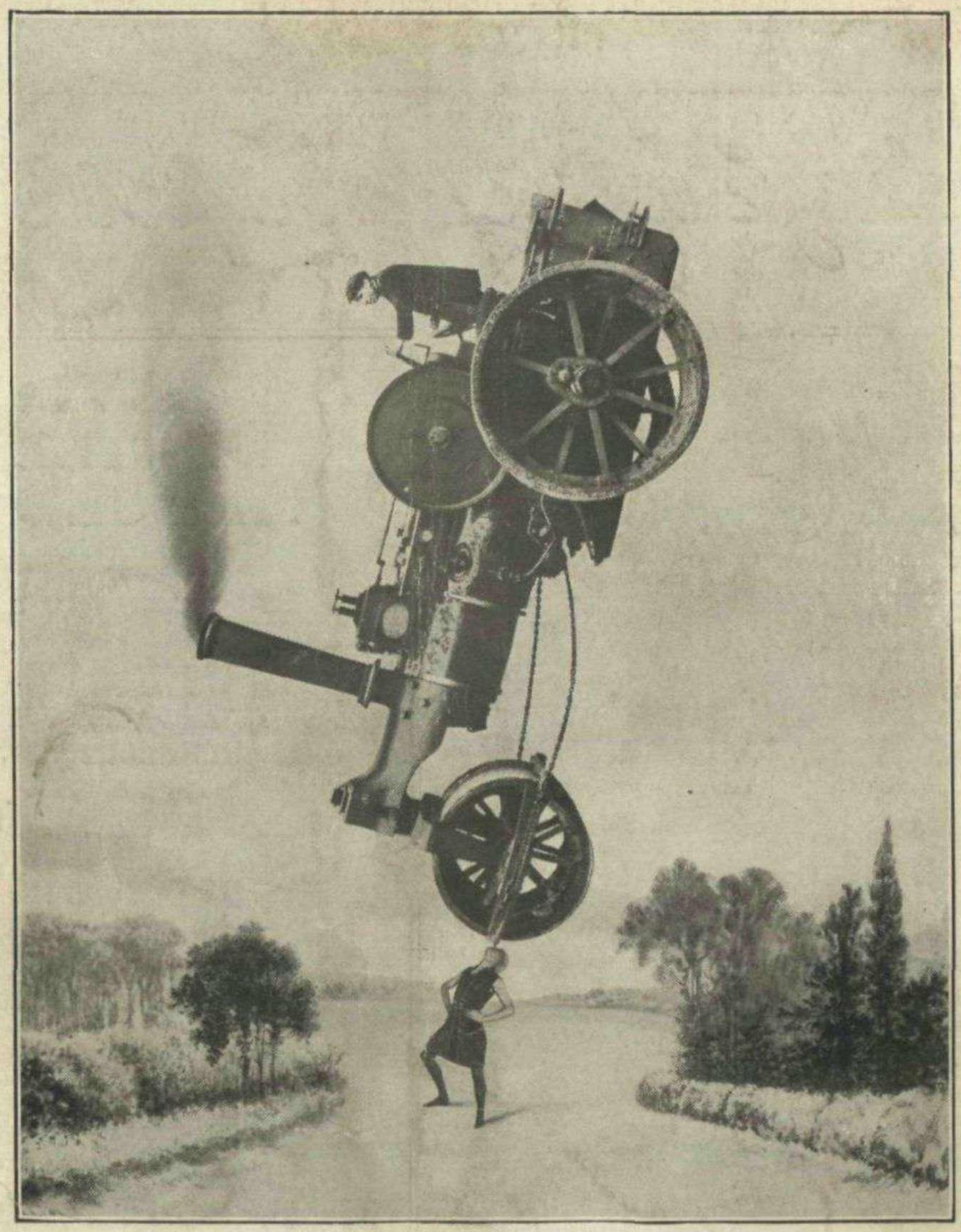
ALVIS
BENTLEY
MERCEDES
The World's Best Fast Cars are always in stock at
CHARLES FOLLETT LTD.
Sole Alvis Distributors London and District
18, BERKELEY ST., W.1
Mayfair 6266.

J. H. BARTLETT
for Guaranteed Sports and Competition Cars
Largest Stock in Great Britain
SHOWROOMS:
27a, Pembridge Villas, W.11
PARK 0523
BUYING DEPT.: Mus. 7915/6

KENSINGTON-MOIR and STRAKER Ltd.
Agents for Bentleys
Agents for Aston-Martin
Agents for Delage
23 GEORGE STREET
HANOVER SQUARE, W1.
Phone Mayfair 1464.

INDEX TO ADVERTISERS

	PAGE
A.F.N. Ltd.	72-73
Britannia Batteries Ltd.	70
Charles Follett Ltd. ...	53 and iii
Clement-Talbot Ltd.	64
Dunlop Rubber Co., Ltd ...	ii.
Ferodo Ltd.	front cover
Jack Barclay Ltd.	iii.
Jarvis	62
J. H. Bartlett	iii.
Kensington-Moir & Straker, Ltd.	iii.
R. T. Horton	62
Robinson & Co.	78
Riley (Coventry) Ltd.	49
Shell-Mex Ltd.	back cover
Sykes Silent Exhaust, Ltd. ...	80
Trier Brothers Ltd.	85
V. W. Derrington...	62



THEY SAID IT COULDN'T BE DONE

Experts said that it was impossible to produce an oil which had the advantages of castor oil (an extra reserve of lubrication) without its disadvantages (gumming, heavy carbon and a messy engine).

But Shell have done it with Aeroshell. An entirely new process largely contributes to this magnificent result.

AEROSHELL
LUBRICATING OIL

For all high-efficiency engines

Shell

Printed by W. Mate & Sons (1919) Ltd., Bournemouth, and Published by the Proprietors, Motor Sport (1929) Ltd., 39, Victoria Street, London, S.W.1. Agents for Australasia: Gordon & Gotch (Australasia) Ltd.
Copies obtainable and subscriptions received by W. H. Smith & Son, 248, Rue de Rivoli, Pari ; and W H. Smith & Son, 78, Rue du Marché-aux-Herbes, Brusselles Belgium