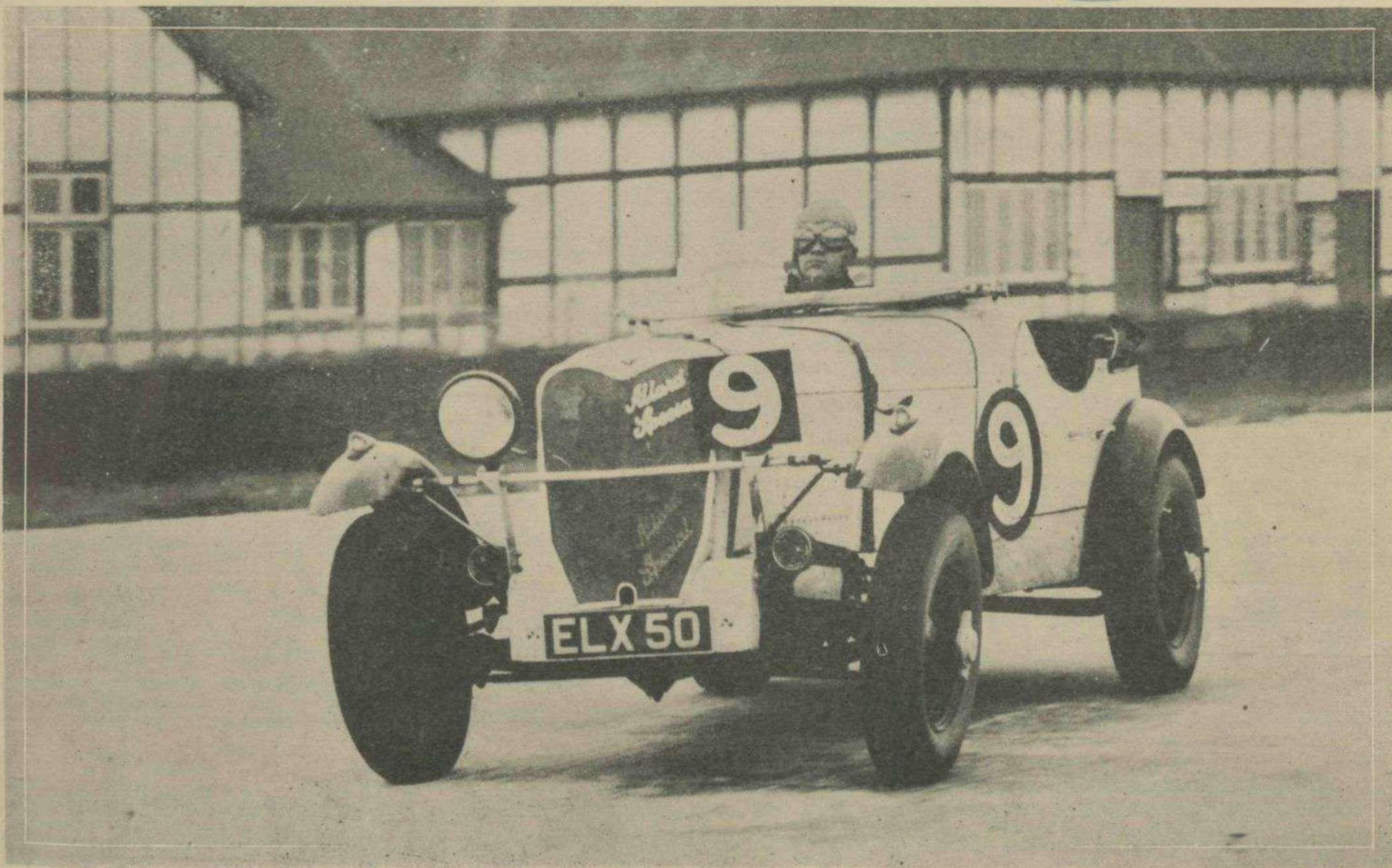


MOTOR SPORT

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Norman Riddell



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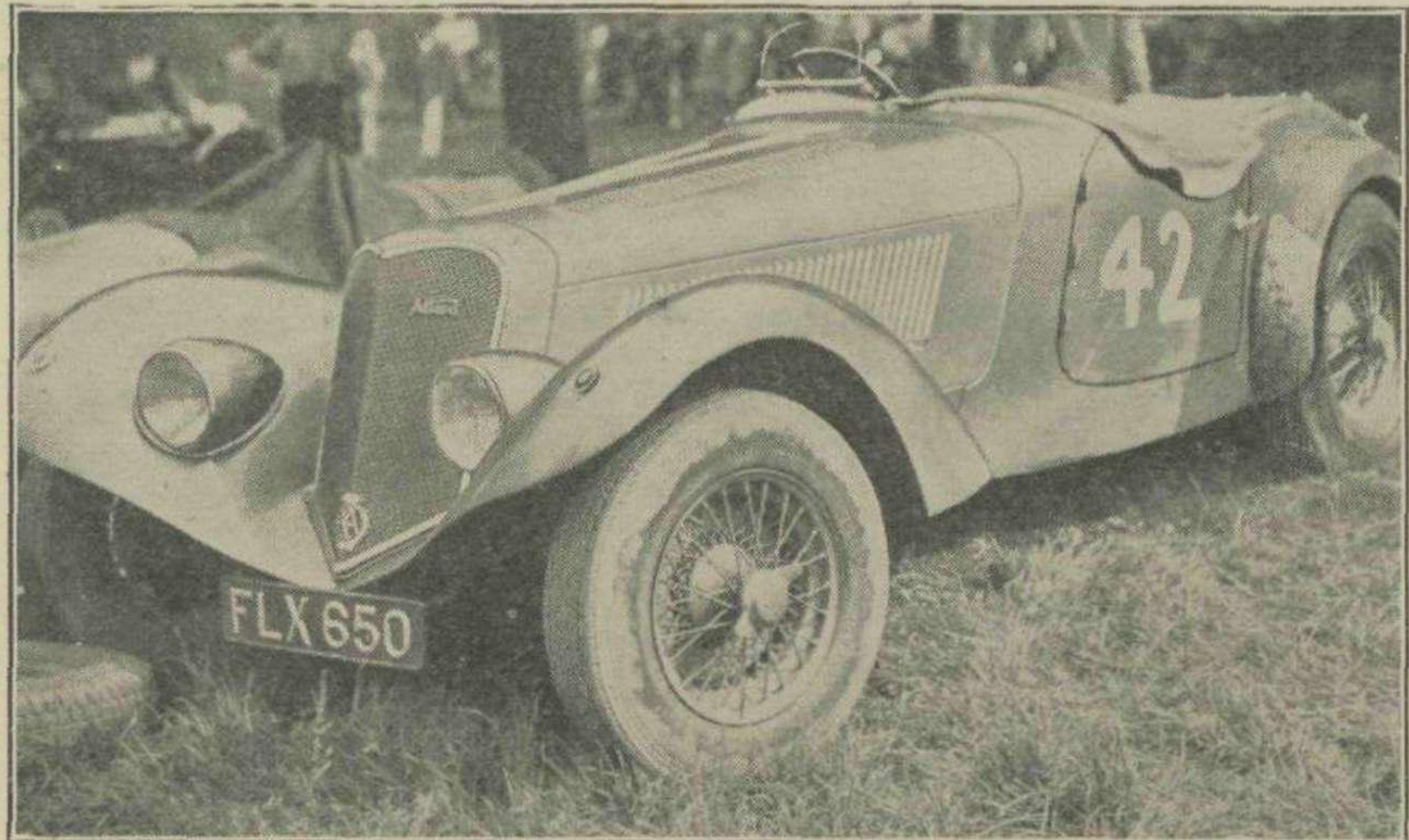
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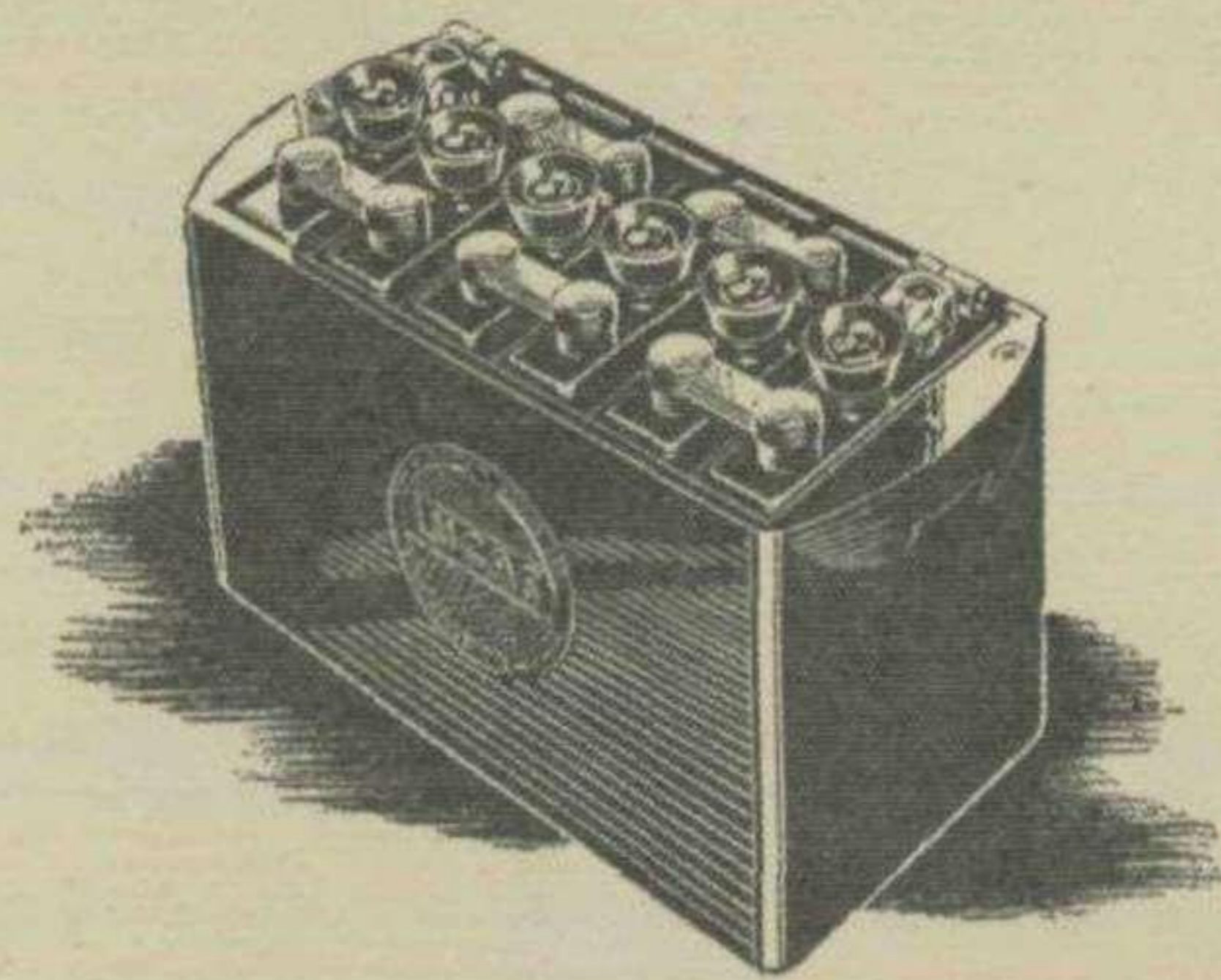
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HOW TO BUILD YOUR OWN CAR

WHAT is a "Special"? A "Special" is a car built by an amateur, either entirely to his own design, or by combining the essential parts of a number of makes. There are two kinds of "Special": the out-and-out racer, and the "road car." I am going to concentrate rather on the racing side, because I have had most experience of that, and your secretary wants me to wax reminiscent.

What is the object of building a "Special"? Because you can't afford to buy a car to give you the characteristics you require. It is most unlikely that the impecunious amateur, working in his spare time, will in any way compare with works jobs, but some astonishing things have happened.

How to set about building a "Special." In getting down to the general layout, a little elementary mathematics will avoid a lot of useless effort and disappointment. Much work has been wasted on cars fundamentally incapable of giving the required performance. In order to have some sort of "mental yardstick" of performance, try to find out the exact details of the b.h.p., weight, frontal area, etc., of as many cars as possible, so as to have a fairly close estimate of what the proposed device will, or will not, do. It sounds a hit or miss method, but is actually more accurate than any of these formulæ, in which you seem to be able to make your motor-car go as fast as you like, on paper, by "mucking about" with the constant "K."

Design. Detailed drawings should be made of the complete car, and of every individual part. Work out from these if there are any impossible assemblies or inaccessible parts normally requiring servicing. To take an extreme instance, it is undesirable to be compelled to remove the engine from the chassis in order to clean a plug.

Design is conditioned by the facilities which are available, and by the amount of time which you can spend on the job. If you have the use of all sorts of elaborate

John Bolster's talk, lecture, paper, opus, or what have you, was so very well received by everyone present that I deem "Motor Sport" fortunate indeed to be able to publish it.—Ed.

workshop equipment, go right ahead with all the most advanced ideas. If you haven't, getting work "done out" will cost a fortune, so you must curb your enthusiasm. It is sometimes possible, by the use of unconventional methods of fabrication (e.g., welding, brazing), to avoid a lot of expensive and accurate machining (e.g., splines). Don't be down-hearted if your facilities are very meagre. I took a number of course records and "fastest times of day" with a car which

.....
A Précis of the Informal Talk given before the I.A.E. (Graduates' Section) on February 13th, 1944—published by kind permission of the author, John Bolster, and J. B. Perrett, secretary of the I.A.E. Graduates' Branch.
.....

had a wooden chassis frame (like the Mosquito!).

A most important point is ease of servicing. A really "hot" motor will require a great deal of dismantling and titivating between each event, and anything very complicated will be too much for the single-handed owner-designer-driver. I have found that one's driving ability just goes to blazes if one has to work too late every night before racing, and that's a thing I have suffered from very much since making my 4-litre job. However carefully prepared, the car needs a lot of work between practice laps and racing next day, alas!

Cost. After careful study of the design, make out an exact estimate of the cost of all materials, and of all outside jobs. It will horrify you, but the actual construction will eventually cost at least double what you estimated! In military parlance, "time spent in making a reconnaissance is never wasted." It is impossible to overdo the elementary mathematics and drawing side of the job. I personally know of various promising cars which were never completed because the cost got out of hand.

Don't spend so much on building a car that you can't afford to race it! Remember that entry fees are not the only expense. You will have to face hotel bills at all but local events, and may find, as I do, that the most attractive events are always held a long way from where you live. Then there are mechanics, and they are a problem. Even if you take "amateur" mechanics, you usually find that they expect you to pay at least their hotel bills. (Friends acting as mechanics can be very difficult, and may go after beer or blondes when they should be working on the motor.)

Never take any notice of anybody else's cost of building a car, because everyone's facilities vary. I have known cheap parts to come out of the back doors of factories. Write lots of letters to makers of equipment and parts. Some are immensely helpful, and the others can only say "No!"

Choice of engine. If you are in a position to make your own engine, you are rather beyond my class. Do try to use the simplest motor you can. A certain supercharged o.h.c. engine costs nearly £200 for re-rollering its big-ends, because of fantastic unbuilding of the built-up crank. Other jobs on that engine are *pro rata*. Make sure, therefore, that you are not biting off more than you can chew in that direction.

Do not get led away by the snob-appeal of an engine's name. That reminds me of a friend who was hypnotised into buying a foreign car by a lot of blah about

"racing pedigree" and "thoroughbred," and all that. It was a very bad car, so he took it to the concessionaire's service station, where an enormously exalted foreign mechanic, waited on hand and foot by lesser acolytes, consented to look inside the bonnet of the car. My friend, immensely impressed by this semi-religious ritual, felt that he must say something to show what a discerning motorist he was. "I say," he enquired, "why does it have sixteen sparking plugs and only one carburetter?" The high priest gave him one horrified look, as if a sacrilege had been committed in the temple, and said: "Monsieur le Patron say 'von carburateur,' so *von carburateur* you 'ave!"

However, to return to sanity. There are some very promising engines in the most unexpected places. Don't forget the smaller aero engines. Some of these are of awkward shapes for installation in a car, but there are some, particularly the American 4- and 6-cylinder horizontally opposed units, which are of convenient shape and size, and have a splendid power-to-weight ratio. Remember, though, that their limited range of revolutions may mean a heavy and elaborate gearbox, and acceleration may suffer accordingly.

My own experience has included the coupling together of various numbers of engines. This has been immensely interesting work, and it is certainly a cheap and light method of building a power plant of the required size. There are quite a lot of snags to be overcome, but the method I evolved was reliable and not unsuccessful.

Among the troubles which I experienced in the early stages was the failure of the engines to maintain their correct timing relative to each other, due to sheared keys, shock-absorber sprockets riding over their cams, and similar small mechanical failures. The first intimation I used to get that this had happened was that, on engaging an indirect gear, the gearbox casing would split right across, owing to the increased momentary torque of two cylinders firing simultaneously. The speed on top gear did not seem greatly affected. However, having overcome such difficulties as these, I eventually coupled four V-twin engines satisfactorily.

It would be all too easy to talk for hours on that subject, but I fear that it is of somewhat limited appeal, and as there are a lot of other aspects I want to discuss, I shall say no more about coupled engines.

Anyway, whatever type of power plant you fancy, ferret out real, and not fictitious, b.h.p.

Chassis. Try to make it so that the weight distribution can be altered if you have made a mistake. Some very brilliant people insist that chassis and body should be a monocoque, stressed skin construction. I don't agree. I think that the actual frame should be as simple as possible, because it is a melancholy fact, which must be faced, that one's motor-car is sometimes going to run out of road, and if it be so constructed that it can be "bent straight again" quickly, it will not entail missing some of the best events of the season. Of course, everybody knows that a good driver doesn't have accidents, but it's only too

easy to go into a corner with "Bira" and come out of it with a couple of buckled wheels. I am, in any case, not convinced that the body-cum-chassis is all that lighter for a racing single-seater.

You cannot mention chassis design without discussing roadholding. After giving a lot of thought to roadholding, I have come to the conclusion that no such thing exists among fast, light racing cars. However, the more nearly under control you are, the faster you will be able to negotiate the hazards of the racecourse, so it is worth doing an immense amount of work on "chassis tuning." The very closest attention to every little detail of the chassis frame, steering, and suspension, is infinitely worth while, and I have knocked more than two whole seconds off the time of a car up Shelsley by painstaking work of this nature.

When testing the car during roadholding research, it is very difficult to know whether you are really cornering fast, or whether it just "feels fast." The only way of telling is by direct comparison with other racing cars during practice, and you should ascertain from the drivers, if possible, whether they were "really trying" on the occasion when you motored in close company.

As regards points of design, the old "hard" suspension is finished, and one can say good-bye at last to the semi-elliptic leaf spring and the friction shock-absorber. I regret that I have wasted a great deal of my life with the solid, differential-less rear axle, but this cannot cope with modern systems at all on sharp corners, as it promotes unproductive skidding. This is a great pity, because the solid axle is so attractive from the point of view of the amateur "manufacturer" with limited machining facilities.

I have always found that when I have first completed a car, it seems absolutely impossible to drive, and this causes the greatest despondency till one gradually gets it to behave itself, by careful attention to small details. This need not worry the "specialist," because even E.R.A. and Auto-Union made a complete fiasco of their first races, due to roadholding bothers. Of course, roadholding has to be so much better for racing than for more normal use, that these difficulties are understandable.

Weight. Most people are bitterly disappointed at the great weight of their "Specials" when finished. Get yourself weight-conscious by spending an evening weighing every component you can think of. Personally, I was rather surprised at the great difference in weight of varying tyre and wheel equipment. On one 1½-litre car, the change from the old high-pressure to modern low-pressure tyres put the weight up a whole cwt., and unsprung weight at that. By the way, the complete electrical equipment of a road car is abominably heavy, and may form quite a large percentage of the weight of a small sports car. It is so easy to think that a car consists of an engine, gearbox, couple of axles, and precious little else. It's what one might term "the etc's." that make up the weight.

Engines are most deceiving things in the matter of weight. Some engines which are "all light alloy" are sur-

prisingly heavy, and one of the best production engines for power-to-weight ratio had no non-ferrous alloy except pistons. So you can't go by appearances.

Brakes. Brakes are a terrible stumbling block. They are *never* big enough, and always *much* too heavy. A great deal of weight can be saved by using lined light-alloy drums, but they are very expensive, and have given a lot of trouble. The very beautiful light-alloy drums of the racing Mercedes-Benz had to be thrown away after every race. As the weight of brakes is unsprung, it is suggested that an entire revision of the present method is due, such as liquid-cooled brakes inside the car, driven by shafts from the wheels. This would fit in very well with a four-wheel drive layout. In order to take the record for a rather bumpy sprint course, I removed my back brakes to get lower unsprung weight on the driving wheels, and was successful in taking the record. When adapting proprietary brakes to a "Special," never lighten the drums. They need to be as rigid as possible, and integral fins are best. Shrunk-on aluminium fins look very nice, but are usually rather a failure from the rigidity and heat-dissipation point of view. I have found cast-iron drums best. No lining that I have come across will give a really high coefficient of friction with hardened steel liners, and mild steel drums are hopeless. A lot of weight can be saved by judicious lightening of back plates, without spoiling their rigidity. Holes can be cut for cooling, but should be covered with gauze against ingress of dirt. The funnel affairs which are fitted to some cars to scoop up the air probably do no such thing, as the air flow round the wheels is certainly not as simple as that. Something may have to be done to stop water getting into the brakes. It is a good idea to make special arrangements for heat insulation and cooling of hydraulic brake cylinders to avoid boiling the fluid. It is very desirable to provide two leading shoe operation, but this can be of the simplest character for a racing car, as no provision need be made for reversing.

Any weight reduction in the car gives a great increase in braking power. Any very slight increase in maximum speed may make what you thought were a superlative set of brakes into totally inadequate ones; "inertia increases as square of speed." Brake and brake-lining firms have an immense amount of experimental data, and braking is becoming an exact science. So also is the use of them by racing drivers, and the Italians called Taruffi "il frevatore."

Modern suspension systems, which aim to keep all wheels on the road all the time, render even heavier braking possible, and this, of course, places an even heavier load on the brakes. The very slightest tendency for the front wheels to bounce will enormously increase braking distances, and if you have a light car without i.f.s., much experimenting with tyre pressures and shockers is worth while. I am most careful of this, and balancing. Rear brakes are not so powerful, but can cause instability.

Transmission. This is often unnecessarily heavy. If you have a light car, the greatest stress you can apply is to spin the wheels at the getaway, so there is no

need to use such a hefty gearbox, etc., as if the same engine were propelling a limousine. It is important to keep the flywheel as light as possible, and there is no need for a flywheel, as such, on a multi-cylindered job. There are numerous reasons for this, particularly less shock to transmission on a snap change, and the engine will slow instantly if you take your foot off for wheelspin. Back wheels and tyres should be as light as possible for the same reason, and twin wheels and tyres can just add that little extra inertia that will cause transmission failure.

Do not have any more gears than you need. At least four are essential with small blown engines, but with engines giving good power at the bottom of the scale it is waste of time to keep shifting gears. My last "Special" was a 4-litre, 200-b.h.p., 11½-cwt. job, and only had two gears. On some courses I didn't change at all. Racing has rather grown up on a legacy of constant gear-changing, but it's a vice, not a virtue, and if one were privileged to watch the famous Bergmeister, Hans Stuck, in his short-chassis Auto-Union, it was just like a Buick—only faster.

As for type of gearbox, I love handling the Cotal electric, and whatever you say about the Wilson box, it has the advantage of not needing a hand at an awkward moment. There is still a great deal to be said for a really good "crash" box, provided it's robust enough to stand pulling through the up-changes with the throttle open. Propeller shafts should be short and well balanced, with universals ample to carry the urge. Fabric universals are quite useless for a racing car. Do not forget that a propeller shaft adrift may easily have fatal consequences, so do not economise over this item any more than you would over steering parts. The best is good enough—just! I have had a great deal of experience with chain drive. This is very light, is reliable if properly carried out, and efficient, but requires fairly frequent replacement. Most people regard chain drive as being very pre-last-war, but I refuse to believe that it is finished, and shall continue to use it. Look at the very light unsprung weight of the old chain-drive racers. They had everything that the much-boosted De Dion system has, and each chain incorporates its own constant velocity universal joints! I have never had to retire with chain trouble.

Bodywork. On my last car I had the whole bonnet, front cowling, and scuttle as one unit. This was very light and strong, and when removed left a virtually stripped chassis for quick and easy repairs. The tail was located on pegs, and required only two bolts to be undone for complete removal. Except on courses that permit very high speeds, I do not advocate a full-length undershield. It gets in the way of work, and in the event of things going wrong, can get filled with blazing petrol and oil which would otherwise fall harmlessly to the ground. I have seen a disastrous accident caused thereby.

A streamlined body totally enclosing all wheels, lamps, etc., is a certainty for sports cars, but not for racing cars except for very high-speed events. Reason: the front mudguards and headlamps, plus their brackets and supports, may reduce

the speed of a fast sports car by as much as 20 m.p.h., so you *must* incorporate them in the body streamlining. It is cheaper than fitting a blower. On racing cars, however, low weight, tyre and brake cooling, and good visibility, are the things that matter. Do concentrate on doing everything possible to reduce frontal area. Reducing wind resistance of a car also makes it steadier at high speed, because you get less high-speed wheelspin in pushing the thing through the air. Also, rear tyres last longer.

Future trend of design. One must incorporate the very latest ideas in a "Special," because they take a long time to make, and may be out of date when finished. Of course, if the post-war racing car is to have an i.c. or closed-circuit mercury-vapour turbine, with four-wheel electrical transmission and brakes, then "we've had it." However, that seems almost as unlikely as jet propulsion. Personally, I feel that classification of cars by engine capacity has produced unfortunate results. There is no virtue whatever in a small engine giving great power per c.c. It's the power-to-weight ratio that counts. For instance, equal speeds have been obtained by small-capacity blown motors and considerably larger unblown ones. Difference? Small machines did 5 m.p.g. of expensive "dope," and their immensely expensive little engines needed constant expert servicing. A big, cheap, simple engine could give the same performance on 20 m.p.g. of pump fuel, with great reliability. Yet most people would say that the small car was the better motor! I hope that regulations can in future be drafted to avoid this worship of overstressed small engines.

It is obvious that the next development is four-wheel drive for racing. For obvious reasons nothing like the power can be transmitted through the front wheels in comparison with the rear—for a typical light racing car it would be of the order of 20 per cent. under average conditions. However, wheelspin, even at high speeds, is the limiting factor nowadays, so we will eventually have to make the front wheels do their share. So far it has not been applied without marring controllability of the car, but the first really controllable four-drive job, with brakes mounted inboard for reduced unsprung weight, will sweep all before it in sprints, hill climbs, and the more tortuous road circuits. (But *not* just a supercharged Jeep!) This matter of transmitting the power to the road is not generally fully understood by people who have not had the good fortune to handle a really quick light motor. With my 4-litre car, one is virtually always embarrassed by wheelspin or incipient wheelspin, even accelerating downhill. Quite apart from waste of power and loss of acceleration, this has a very bad effect on the stability of the car, and I have found it necessary to concentrate more weight at the back of the car than is desirable from other weight-distribution standpoints. One does not always know that wheelspin is taking place, till taking the foot off the accelerator before a corner, one obtains sudden acceleration momentarily instead of deceleration. This always frightens me.

Details affecting driving. It is most

important to tune the engine of a light, fast car so that response to the accelerator is always the same, always instantaneous and smooth. A slight "miss" which suddenly rights itself may give a sufficient sudden increase of power to spin you off the road. The Mercedes-Benz racing drivers found the big 5½-litre straight eights troublesome in this respect, if they were not in absolutely impeccable tune, and the greater fluency of the 12-cylinder engines was one reason why the later 3-litres compared so well with the larger faster machines in their lap times.

Steering gear ratio. This depends on various factors, especially the weight distribution. If this is such that the car goes into, and comes out of, its skids slowly, quite low-geared steering is adequate, but if you have a car that skids suddenly you need high-geared steering to keep up with it. There is no feeling so hopeless as trying to keep the rear wheels behind when they want to come in front if your steering is too low-geared. I have a preference for rack and pinion steering which I used in my last car, but in any case I like a fabric universal joint in the steering column in case racing stresses put things out of line. A spring-spoked wheel is a splendid thing for avoiding injuries in a crash. I can assure you that a broken rigid spoke in the tummy is no joke at all. Caster angle is usually very critical with a conventional front axle, and different values should be tried, but "independent" seems fairly indifferent to this. Violent vibration is very tiring indeed for the driver in all but the shortest events. It may seem incredible, but when I had trouble with a bad vibration period during engine coupling experiments, I found that the violent shaking of one's head affected the eyesight, everything appearing as through a mist. Another difficulty with eyesight was the splashes of alcohol fuel which were blown back through the bonnet louvres. During tuning and racing, one seems to absorb a good deal of alcohol fuel into the body, and one must be careful if one resorts to stimulants afterwards, or drunkenness will quickly result. A certain engine, with exposed drive to the overhead camshafts, used to live in an atmosphere highly charged with castor base oil, which was absorbed by the driver with embarrassing effect.

General summary. I do not, of course, know what form racing will take after the war, or what cars one will have to compete against. A large number of the cars which were racing before the war were Continental machines, built for Grand Prix racing some years previously. Although potentially formidable, most of these cars failed to live up to their famous names because, without the works behind them, they just weren't properly prepared. In that, of course, they underline my previous remarks advocating a simple type of engine, perfectly tuned. However, some of these cars were in the habit of jettisoning certain of their most vital parts when travelling at speed; but the British public loves a foreign car, and apparently doesn't mind being mown down by runaway wheels off same. A famous foreign designer can produce racing cars in which, if a tiny chain loses a pin, the machine becomes brakeless.

Continued on page 76

AMERICAN ANGLE

AN ardent motorist for many years, I have been extremely fortunate in coming across your most interesting publication a few months ago. The motoring experiences of your many enthusiastic correspondents have influenced me in writing in quest of advice.

Perhaps a list of most of the cars that I have owned might be of some interest.

My first was a Trumbull—this was an American cycle-car of about 1915, with a friction transmission and double-chain final drive. This machine was then about ten years old, had no engine; with great youthful enthusiasm I pulled it completely to bits, intending to re-assemble it with a new engine. However, the pieces drifted away, I never obtained an engine, and that was the Trumbull.

Next was a Model T Ford, which I completely took down. It was put together with undersling irons, Hartford shockers, wire wheels—and I fitted an 8-valve push-rod head with a horizontal Zenith carburetter, high-tension distributor ignition, and a so-called racing body. This car had a lot of acceleration (or so it seemed to such a youthful novice), but since it had been assembled with no cotter pins, it had a disconcerting habit of shedding things like a right front wheel.

A year or so later I was given a new Model T roadster (one of the last). It was not long before the fenders and running boards were removed, and undersling irons and cycle wings fitted. I fitted a high-compression head (flat), alloy pistons, and a Winfield carburetter. This car would attain almost 60 m.p.h., but on long trips at speed had a tendency to loosen its big-ends, and transmission bands burned out. Nevertheless this Ford stood up well to hard driving, and would out-accelerate most of its contemporaries. At about this time I purchased a 1923 Ace motor-cycle (ancestor of the Indian Four). After a little use this machine was also dis-assembled, and wound up in a spare parts box.

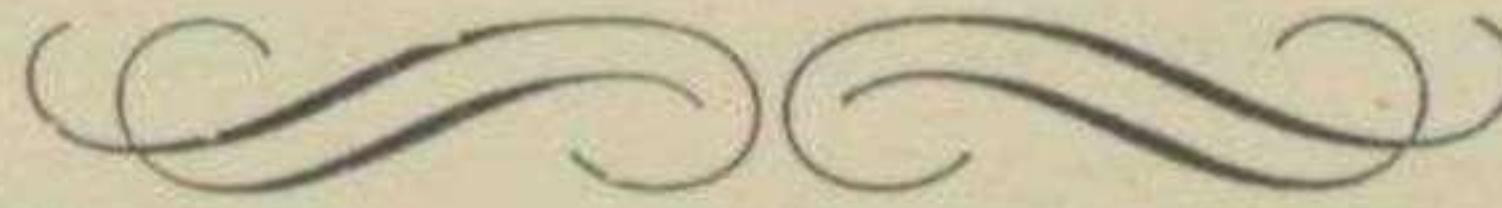
Next I had a 1927 Overland "Whippet Four," which had the body completely smashed. We built an aluminium 4-seater body and fitted a thin brass exhaust pipe (4" diameter) the entire length of the car. This car would easily pass (at speed) the then new Ford Model A, but could not equal it for take-off.

A little later I bought a 1925 JDCB 74" Harley-Davidson, which was a really serviceable motor-cycle. Next was a 1929 "A" Ford coupé, to which I fitted an 8-valve push-rod head—but this combination was somewhat of a disappointment after the "Whippet."

Then a 1928 JDH Harley Two-Cam was purchased (at that time one of the fastest stock American motor-cycles). In 1930, while in London, I bought a Dunelt motor-cycle with a 500 o.h.v. Sturmey-Archer engine. In about 3,000 miles on the Continent this machine gave no trouble, and instructed me on the handling and finish of British motor-cycles.

While on this trip, in Geneva, I acquired a "501" Fiat coupé. Though about five years old and slightly tattered, it was a remarkably tough little car. Back in the States I degenerated to a

This article was written by 1st Lieut. David L. Cliff, of the American Army Air Corps, while he was in hospital in this country. We wish him a speedy recovery, and hope readers will be able to advise him on the points raised. Letters can be forwarded. We have often wondered what could be done with American engines and the special heads, etc., sold in the States, and perhaps someone over here will derive amusement in such experimenting after the war.—Ed.



completely stock Buick convertible coupé, but had also a 1931 Ford 2-door phaeton on which I installed a 7-to-1 flat head, a large downdraught Winfield, and solid-skirt alloy pistons. It had also double-breaker ignition and slightly modified camshaft timing. I was never passed on acceleration with this car (and I came up against about everything on the American market). The brakes were useless after one or two applications at speed.

I then went into a series of conventional stuff, including a 45" Harley, a 619 Graham-Paige, a "Blue-streak" Graham, a big-eight Chrysler, several Dodges, and one or two others. At this time I bought a Stanley steamer, but was prevailed upon to sell it before I ever had it running; what a mistake!

By 1940, although then driving a Chevrolet, I decided to build another "special." I searched everywhere for a British or Continental 4-seater in which to install a V8, but had no luck. I could have had an ancient Lancia "Lambda" tourer, but the bodywork was too poor.

I finally took a 1931 Model A Ford drop-head coupé and went to work with it. I installed the front and centre cross-members from a 1932 V8 (on which the engine is rubber-mounted). I substituted a complete front-axle assembly from a 1932 V8 which gave me the larger front brakes (and the front radius rods mounted on the cross-member instead of the bottom of the clutch housing). I then obtained four large Houdaille shock absorbers from a Lincoln and installed them in place of the standard equipment. I removed the steering gear and replaced it with one from a Buick, and I lengthened the Pitman arm so as to give just under two turns of the steering wheel from lock to lock. I replaced the front seat with two air-cushioned individual seats from a custom-built American sportsman's coupé. I obtained and fitted an almost unused 85-h.p. V8 engine and gearbox from a smashed 1939 Ford. This "special" looked exactly like a 10-year-old Ford, but proved to be the best-handling motor-car I have ever owned. It was dubbed "Dangerous Dan MacGrew" and its interesting performance was rather belied by its somewhat aged exterior. The rear axle ratio was 4.11 to 1, and I got a Columbia 2-speed axle (which I still have), but enlisted before installing this.

I also have, in the States, a Mercury club coupé and a conventional '39 Ford; I like the later V8 Fords. The Mercury has about the same engine as the Ford with a larger bore.

Incidentally, since coming to England some time ago, I purchased a 1939 Ariel 1,000 "Square Four" with sprung rear wheel, but have not, as yet, had any chance to use it.

Now, as to the advice I should like. I want to obtain my British or Continental 4-seater tourer and equip it with a Mercury engine. I know that I can obtain the engine and install it, even if I should have to increase the frame length slightly. What I want is a chassis with excellent handling characteristics and good appearance, and of fairly good size. It should have brakes which will not be greatly disturbed by a change of power plant (hydraulics, or mechanicals with unobtrusive cross-shafts and parking levers). I have wondered whether or not to use the British gearbox, but this is more or less dependent upon what I finally wind up with. I should also like to use my 2-speed axle, but if the final drive of the "stranger" is somewhere around 3.7 to 1, that should do. Most 2-speed axle cars I have encountered will move faster in the low ratio, anyway. Although I know very little of British cars, I like the looks of the short-chassis Aston-Martin "Le Mans" 4-seater, but fear that it is just a little too small, and that owners may be anxious to hang on to same, even if power plant should have exploded (no implication against the marque intended, since I know nothing of the machine, but simply that I will probably want a car—otherwise in good shape—which has had expensive power-plant complaints!) The Invicta of some years back looked good in the magazines, as did the Alvis and Lagonda. The Jensen seems to be using the Ford motif, but looks (in illustrations) too high and too long—and too Yank.

One of the trickiest parts of installing a V8 in a chassis is to clear the cylinder head of the steering gear housing. The radiator core is not very difficult, since in northern climes (my home is in Massachusetts) the V8 will run cool enough even with a smaller core and no fan (the V8 fan may be mounted either on the crankshaft or generator nose, anyway). Instrument outlets are rather straightforward; a tach. may be driven from one of the water pumps; the exhaust system is inclined to be a little difficult—but a good welder and some tubing can do the job. Incidentally, even a firmly rubber-mounted engine bounces around a bit, and adequate clearance of all engine parts must be allowed, or some rather alarming noises will develop under certain conditions! I also realise that increasing power-plant weight may change handling characteristics—but am prepared to take a chance.

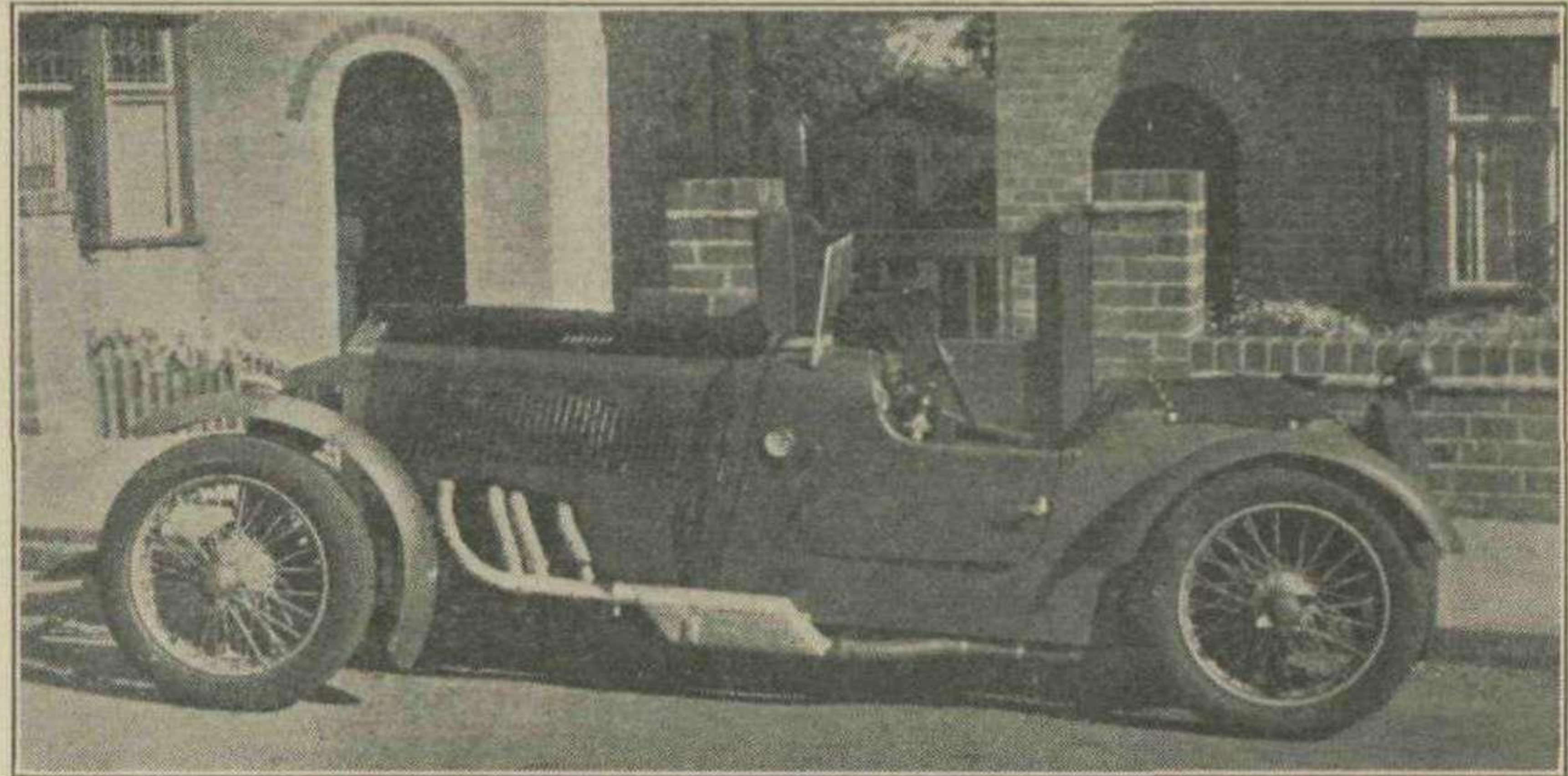
With some of these things in mind, what do your readers think would be a good basis to work on? Where would be a good place to obtain one at a reasonable (meaning "low" in the States) price?

Mostly Frazer-Nash

When R. P. Gordon Jones, who, incidentally, is a nephew of the late J. G. Parry-Thomas, offered to write this article, he apologetically said it would be mostly about Frazer-Nashes owned by himself and friends. I retorted that you can't have too much about Frazer-Nashes.—Ed.

I HAD my first driving lesson on my mother's 1925 "Grand Sport" Amilcar. This came to an abrupt end when I attempted to engage reverse when travelling forward at some 35 m.p.h.; fortunately the gearbox resisted my efforts, but not before the exhibition had convinced my brother, who had himself only just reached the official driving age, that for me the time had not yet come. Some three years later my education continued, this time on one of the early Wolseley Hornets, again under the instruction of my brother. This car had a rather awkward gear shift, or so it seemed then, and after one lesson on double-declutching, his verdict was: "If you want to learn you must go by yourself; it's more than I can bear to sit here and listen to that." (The car was his.) So I went by myself and had some pretty exciting times until sheer necessity taught me to change gear and steer simultaneously. Steering was some feat, as it was necessary to do a sort of tack across the road to gather in the play in the box and get "on the right side of the gear." (Please note that these remarks are directed at one particular Wolseley, doubtless a grossly maltreated one.) Never again is driving quite such a thrill as it is those first few times; apart from the novelty, there is the inevitable lack of a driving licence. But perhaps, in any case, we couldn't stand that tempo for long.

My first car was shared with a friend with whom I was enduring an apprenticeship. This was a 1921 air-cooled Rover Eight flat-twin, bought for 30s. Our ambition was to do it up and, on the occasion of our summer holidays, drive it home—some 180 miles—where it would be sold for a good £10. (A fairly normal outlook for apprentices in their early stages; the scheme being a progressive one, finally leaving the salesman in possession of an Alfa-Romeo—the acme of motoring!) We worked hard on it for some two months, but I cannot for the life of me remember what we did apart from painting it and setting the slow running. Setting the slow running was a mighty task, probably due to aspiration through the valve guides, and if I remember aright it was never achieved, as the engine always went straight to its modest but frightening maximum speed as soon as it started—which was never very soon. The cash having been raised, the Rover was taxed and insured a few days before



First effort—the Anzani-engined G.N. with Frazer-Nash radiator and axles, on which the author and a friend spent some £200, and rather wished they hadn't.

the holidays and placed on the road; "placed" is the word, as it was lifted over a hedge by a vast assembly of apprentices who knew a good laugh when they saw it. For three wonderful days this car, between the periods when it was on fire or suffering from over-flooding, actually ran. The maximum speed was all of 25 m.p.h.; the engine r.p.m. and gear-ratios were calculated by counting the power impulses between telegraph poles, but this data is lost to memory. Finally, on the great day, having driven out to fill up with fuel, the back axle failed, leaving us stranded unpleasantly close to our place of employment. "Unpleasantly close" because we had taken the afternoon off, quite without permission, in order to effect a good start on our marathon. With the inevitableness of all such events, our tow car arrived just as the blast of the "bull" discharged the 20,000 employees. To make matters worse, the Rover would only move backwards, a matter of thrust on one of the misplaced differential pinions, and there was I, proceeding aft, uncertainly, at some 5 m.p.h., to be absorbed in the maelstrom of 'buses, cars, motor-cycles, trams and push-bikes. Finally we gave it up, and sat down in the ruins to eat, disconsolately, our sandwiches—sandwiches which we had hoped to eat the other side of Oxford. That was the end of car number one, which later reached the scrap yard.

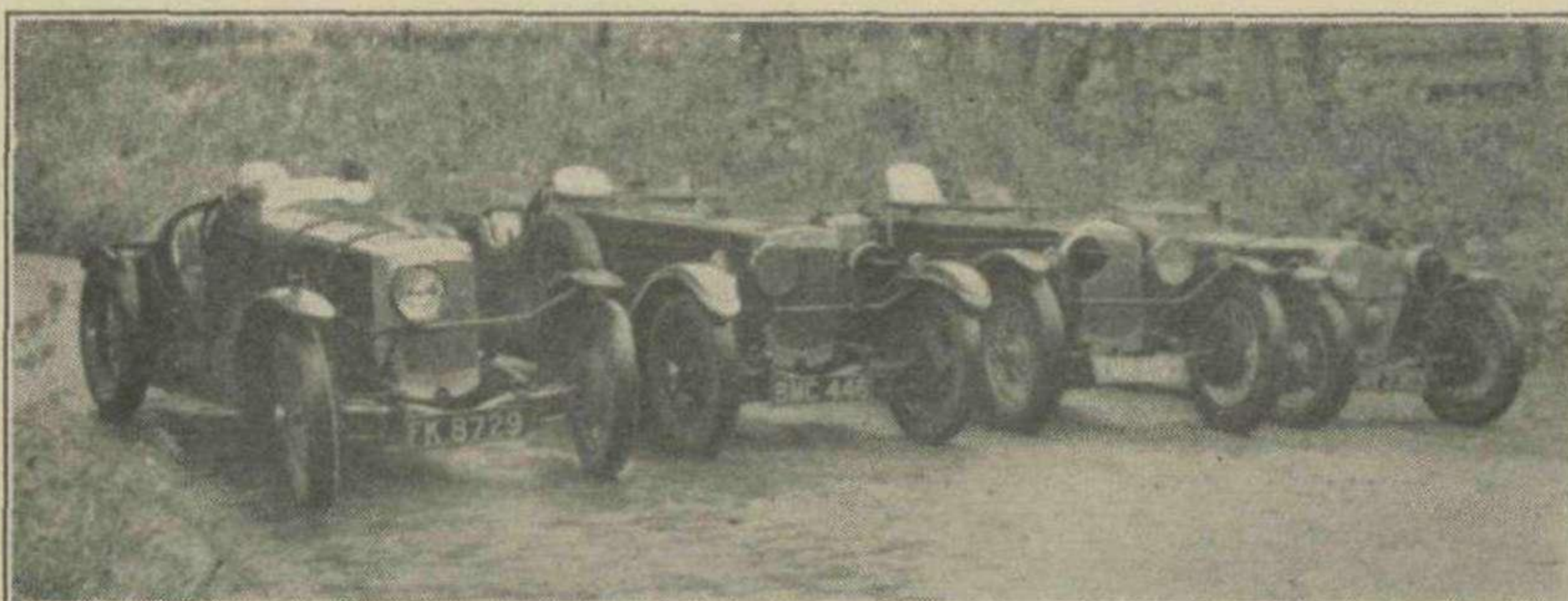
However, the effort, misdirected as it was, had its beneficial consequences in that my friend's father presented us with the necessary funds to buy "a good, reliable vehicle, something that will bring you all the way home." This resulted in the purchase of a 1926 12-h.p. side-valve Riley "Redwing." This car had had only one owner, and although it was then some seven years old, it looked nearly perfect. Unfortunately the spit and polish administered in the showroom had not penetrated to the internals of the engine, which were tired and rather put out. But it functioned pleasantly for some 7,000 miles, during which time it took us home more than once and enabled us to get some idea of how to drive. My friend's driving lessons and my own changes down at 50 hastened the inevitable, which occurred one dark night, fortunately just near Banbury, in the

form of a run big-end. After this the rot set in, and "one damn thing led to another." When the back axle finally began to miss a beat we got shot of it, with the loss, relatively, of a lot of money.

This loss of funds was serious, but probably in the long run the training was well worth it. When you have lain for hours under a car struggling with split pins, when your wrist aches so that you just long to put your hand down, then you drive ever after with much more discretion and sympathy.

Our next car was an Austin "12/4" which had first seen the light of day in 1922. This cost us £11, and no words can describe the behaviour of this wonderful car; it was a paragon of reliability and fetched £12 10s. approximately one year later, after 12,000 miles, during which time only the clutch-thrust race was replaced. In spite of its lack of speed (53 in neutral down River Hill was the all-time high), remarkably good averages were achieved owing to its acceleration to the cruising (and all-out-level maximum) speed of 45. On one occasion 40½ miles were managed in one hour on the Coventry-London road. High-speed cornering (a relative term) was merely a matter of whether the stomach muscles could take it; if you could turn the wheel the car would go round, but you were advised to remember that it took some turning.

During the year that we ran the "old 12" I had many miles in a rather unique Austin Seven. This was a 1925 model, run for the first two years by the makers for experimental purposes, and was of the original "Brooklands" type; not to be confused with the "Ulster" of some years later. This model was guaranteed by the firm to do a timed 75 with one carburetter, or 80 with two, in racing trim. The car in question was of the two-carburetter variety, these being fitted on the underside of the composite inlet and exhaust manifold. This manifold was pleasant in conception, but very thin, and every now and again a spot of awkward welding had to be applied to keep the exhaust gases inside. The cylinder head was aluminium, the pistons of the type fitted to the "Ulster," as also were the valves; tappet adjustment being by shims. The connecting rods and crank-



Breath-taking! From left to right: Roy Cutler's Meadows-engined 'Nash, Peter Douglas Osborne's Six, Bickerton's short-chassis six-cylinder, and Pat McCormick's "Nurburg."

shaft were, so I was given to understand by the makers, a one-off job. The big-ends were fully force fed (45 lbs./sq. in.), the oil being conveyed across the long crank webs by external copper pipes. The shaft was only $1\frac{1}{8}$ " diameter, and quite why it never collapsed is a complete mystery to us. As is well known, these early shafts were very flexible and subjected to considerable vibration, which led eventually to crystallisation and subsequent failure. It was certainly no lack of r.p.m. that saved it; 6,000 was a frequent occurrence in second as well as bottom, and 6,500 appeared on the "clock" whenever the good name of Austin was in dispute. Several people disbelieved the rev.-counter in spite of truly amazing speeds in the gears with a standard gearbox, and one of them even went so far as to remove the rev.-counter from his "Ulster" and substitute it for our suspected unit. (Actually a Rolls-Royce speedometer converted.) We were exonerated, however, when the ever-willing Seven shot it round to the "S" of "Smith" in the twinkling of an eye.

Maximum speed was a genuine 66 m.p.h., in full road trim, and rather more could have been obtained on a lower axle ratio. Much more was certainly obtained down hill, which, in conjunction with the brakes and steering, was remarkably exciting. One occasion stands out forcibly in my memory. Coming fairly leisurely back from Brooklands one summer evening, a lady in another Austin Seven crossed our bows, having emerged from a very minor cross-roads. We navigated a right-angle turn—our only possible manoeuvre to avoid collision—and proceeded parallel to her for some 40 yards, after which we managed to disengage and turn round. Throughout the proceedings the lady never so much as acknowledged our presence! On another occasion I was motoring very steadily, well above "maximum" speed, tucked in behind an Alvis Speed Twenty on the Slough road. Unseen by me a road obstruction occurred ahead and the Alvis came comfortably to a standstill in front of the barrier in a space and manner which we could not possibly emulate. So we flashed by on the *inside*, with barely diminished velocity, to halt, 20 yards further on, just in front of the final plank and the deep pit it guarded. Only the nature of the obstruction saved us from an unpleasant end.

If the brakes were poor, the acceleration was excellent. One afternoon, while

waiting for the lights to change at the beginning of the Purley Way, a very smart Ford V8 coupé drew up alongside. The three occupants were much amused by the Austin. However, even if we looked funny, we did not intend our performance to be a laughing matter, and when the lights changed we went through all the gears and were in top before the Ford V8 caught us. When it did come by it was gathering the knots in no negligent manner and, unfortunately, the driver was tempted to turn round for a further view of our radiator. "Unfortunately" because he apparently got caught up in his two girl friends, and the Ford V8 crossed the road crabwise and connected with the opposite kerb. However, nothing was coming the other way and the driver regained control and proceeded, leaving us in the rather rare possession of the last laugh!

At this time most of our friends ran Austin Seven "Specials" with the special emphasis on the engine, the height of bad form being to put a standard engine in what looked like a sports chassis. There was opportunity for considerable experimental work and, in the face of limited finance, we took it. One "65" with the aid of an "aluminised" cylinder head, Delco-Remy coil, and down-draught S.U. carburetter, would go gaily up to 61 in third on its very uncertain, ribbon-type speedometer, but the improvement in torque at lower r.p.m. was insufficient to cause much increase in top gear. The "75," with its lighter body, appeared a better proposition, especially when relieved of its rather futile V-screen. I well recall the occasion when the owner of one "special," having stalled his engine in the middle of a traffic jam in New Street, Birmingham, calmly climbed out, produced a jack, lifted the car on to it and swung the rear wheel. There wasn't any room to push, there wasn't any starting motor (naturally) and the front suspension balked the entrance for the starting handle. Another Austin Seven which went very creditably was a standard 2-seater with the addition of two S.U. carburetters, the usual valve-gear modifications, and a 7 to 1 compression ratio. For actual performance, personally, I should classify the "Ulster" as the fastest of the various types of Sevens, and certainly the one with the most endearing manners. The characteristic valve clatter, amplified by the thin-section outside exhaust, will always remind me—and may I hear it again

often!—of those wonderful week-ends, which commenced with that rush to the car park at 5.30 on a Friday evening to warm up. At this time we had a number of informal talks from the late T. M. Jamieson, who told us many interesting things about the white "works" Austin side-valve; how its engine started life in a road-equipped "Ulster" which could accomplish 0-60 in 11 secs., and how the ultimate size of the crankshaft was some $1\frac{11}{16}$ ", the limiting factor being the con.-rod/camshaft clearance, which was only about $1/16$ ".

Before passing on from the Austin Seven, which gave place to an open Talbot Ten, as being better fitted for my friend's business purposes, I should like to recount one memory which has nothing to do with brakes or r.p.m. or compression ratios, but everything to do with motoring Sport. Every now and again in our lives some event occurs to remain, as it were, filed in our minds. Usually the happening is not of particular importance, not very remarkable in itself, yet it persists, and I can only think that it persists because, generally, it holds in it the ingredients for an unusually vivid recollection of how one lived one's life at some period in the past. The occasion was a night drive to London in order to see the Hendon Air Display. We had borrowed an Austin Seven owing to trouble with the "old 12." (A surfeit of "Never Leak" having rendered the radiator of that car non-operational.) The Seven had just been fitted with Specialloid pistons and Nitralloy liners, and required running-in. This, coupled with an almost complete lack of lights and a very late start, saw us still some 50 miles from town when dawn broke. Somewhere in the region of the Stratfords, on the Coventry-London road, a serious accident had occurred, and all the traffic was held up, the queue of lorries being nearly a mile long. An obliging driver, however, leant out of his cab and shouted down to us that there was a road round, a narrow one where his E.R.F. could not pass. After some five miles we came to a "Y" junction and the signpost, which stood in a triangle of grass, was old and indistinct, and could not be read from the road. With much labour my friend climbed out and waded through the grass, and it is this picture of him trying to decipher the legend on the post that remains with me so clearly. The dew on the grass was silver in the oblique rays of the sun; his footsteps black pits in the tall grass before the post; his figure quite shapeless, draped in two macs, the outer being torn and revealing the other inside it, his left arm soaked dark brown with mud and moisture from the country road. Not a very inspiring picture, deserving of no other name than commonplace, and yet—doesn't the interpretation of "motoring Sport" hinge on just such a scene?

Before selling the Austin Twelve we had bought a side-valve Anzani engine, which was to be the power unit of a special. We liked the engine for its simplicity and light weight, added to which we were financially restricted to a narrow choice. At first it was intended to use the engine in conjunction with a Riley gearbox; this, however, finally gave place to chains. In order to purchase the chassis it was necessary to sell the Austin, thereby

leaving ourselves without transport. The chassis was a G.N.; the side members and the two cross members, which together compose the frame, were new and the engine-mounting had to be effected from scratch. Our troubles were increased, in this matter, by having been sold an A.C. Anzani, the engine arms of which overlapped the G.N. chassis by some inches. Much argument ensued as to the necessary gauge of the angle-pieces to hold the engine at the rear and also as to the most advantageous spot at which to cut the engine arms. Finally, with the aid of two spirit levels at right angles on the block face, the engine was roped in and tied down. The next job was replacing the front and back axles with Frazer-Nash components, these having been obtained from two enthusiasts who lived at Mill Hill. My first real run in a Frazer-Nash was with one of them; the car was a 1926 three-speed "Boulogne," in very good condition, and it performed in a most becoming manner. The rock steadiness and instantaneous ratio-change delighted me then, and has continued to do so to this day.

A detailed account of the 18 months' work which was needed to get the "special" on the road would make very tedious reading. Much of that done in the early stages had to be undone later, as a more practical understanding of engineering in general was reached. Some of the ramifications of that all-important word "compromise" made themselves unhappily apparent. In all we spent some £100, used parts from nine makes, had specialists from nearly every department in the works to put us right, wrote 156 (to my definite knowledge) letters of enquiry, and, perhaps most important of all, made countless new friends. The one outstanding lesson was *never try to build a car from the component parts*. This is, of course, a well-known rule to most enthusiasts, and even we, at the time, realised that the method was fundamentally incorrect, but we just hadn't the patience to wait and save.

During these 18 months our trips to Brooklands, or London for such events as the Motor Show, depended on the good will of our friends, whose motor-cars varied from an "Airstream" Singer to an S.S. Jaguar "100." All our journeys to "teck" (Birmingham Central Technical College), some seven miles, were made in an old but staunch Lea-Francis which, according to the owner, would do "97 on its Pride and Clarke radiator thermometer!" The qualification—"on its . . ." was usually uttered in an undertone inaudible at more than a few feet, with the result that what went before often evacuated a bar-room of would-be sightseers eager to inspect this "fast" car.

For two weeks during this period we ran a 1928 Super Sports Anzani Frazer-Nash. This was bought with my friend's "untouchable" savings, and was by way of a speculation. This motor had been very badly treated; the engine stammered and the sprockets were not particular about keeping their place radially on the back axle. After a de-coke and some new keys—pushed in with the fingers without taking the sprockets off—the performance was quite refreshing, a good 70 m.p.h. being obtainable in third and top. We

had a grand run to London in this car, cruising flat out until we thought a big-end had run. This fortunately turned out to be a blown exhaust joint, that created a forbidding noise. When we reached Mill Hill the noise had just achieved that motor-boat "beat" which is so apt to attract the attention of the strolling constabulary, so we called in on some friends to do a general tighten up. They were, unfortunately, away, and the garages locked up, but their wives supplied us with something to eat, and did a highly successful combined action on a couple of cops, who had settled round the parked car in the belief that it was some sort of device for swelling the funds of the exchequer. Actually I have always found the police most reasonable and helpful, even in the presence of an old and suspicious-looking sports car; when I have had trouble for "too much noise" or "no sidelights," on every occasion it has been the result of a report from some member of the non-driving public.

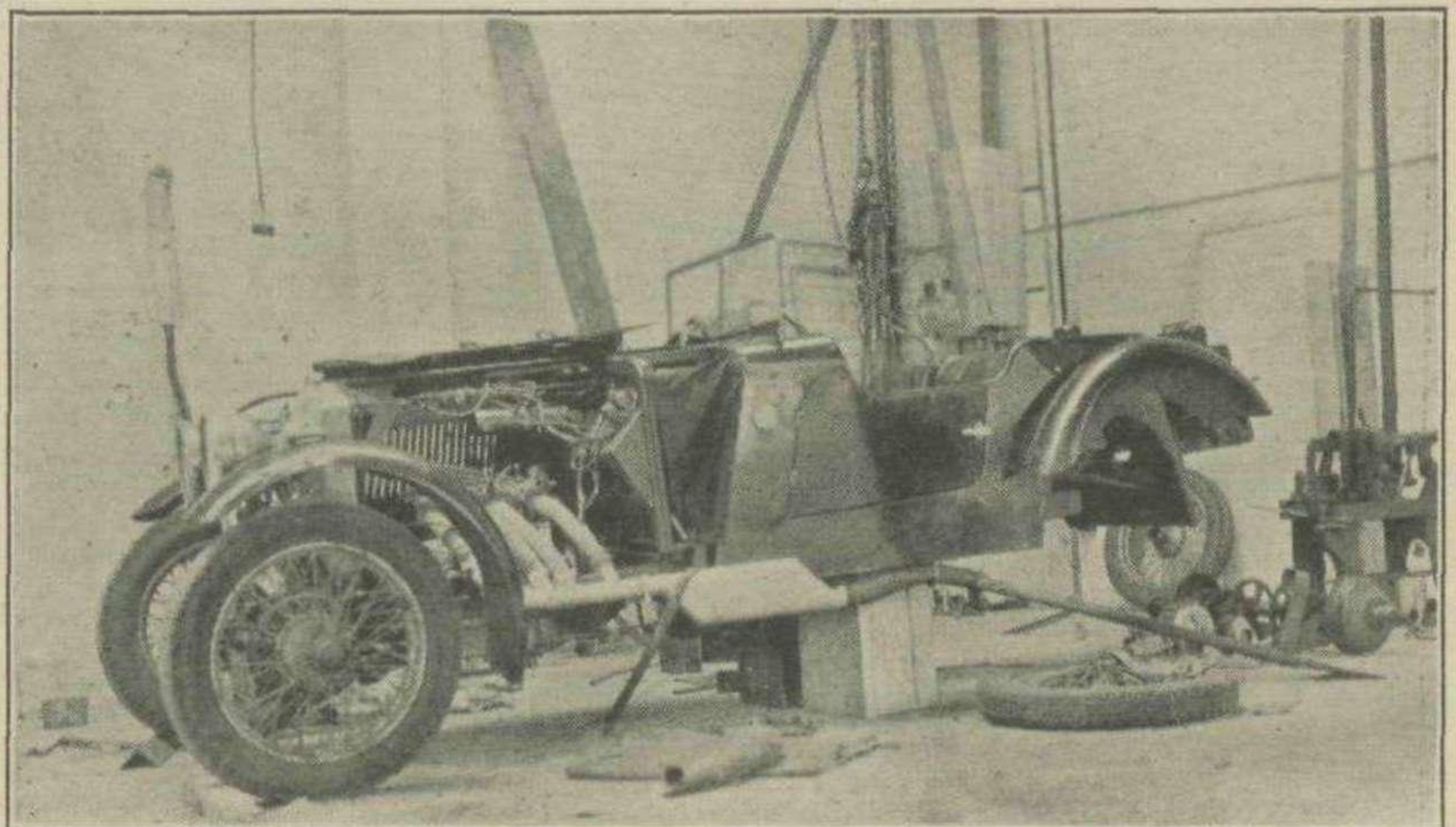
After the 'Nash we ran an Austin Ten for some time. This was a good, reliable, unexciting motor-car, which went just as a new car should, and requires no comment here. It was rather a drain on our resources, deducting much from the weekly input into the 'Nash Fund.

During this time we became acquainted with several 'Nashes, which made us very impatient to get our own on the road. One was a four-speed 1928 "Vitesse," then owned by Bill Grace. At a later date, when in different hands, the engine in this car was changed for a Meadows, and we procured the crankcase with its much-coveted "Boulogne" camshaft. Another car which turned us green was the Alvis-engined G.N.-'Nash built by H. Whitfield Semmence. This car achieved 0-50 in 8 2/5 secs. and a timed 94, which was good for an unblown 12 h.p. even if stripped to the extent that it had no spare wheel. For some time Semmence also had a very attractive deflector head Meadows "T.T. Replica" (blue) of about 1934 vintage. This car had the less usual third ratio of 5.2 to 1 that made confined motoring, such as the round-the-

houses variety, most pleasing. On one occasion we circumnavigated the Marble Arch at a rather impulsive speed in second gear; this irritated the driver of a Morris Eight, who followed to the best of his ability and got "gonged" in the act. We did a vast tour of London, to my delight, to eliminate the possibility of running into trouble.

After a year of building the "special" we became known as "Frazer-Nash repairers" and, as such, attracted the attention of the late Philip White, who lived at Great Barr and ran a "Colmore." Philip had driven this car some 56,000 miles in two years, using it every day for work, and I think his driving was better than that of any other amateur with whom I have motored. I had some wonderful runs to Littlehampton (160 miles, usually completed in four hours with stops) in this car, where on one occasion we met another Philip White (tragically killed in an air raid recently), who was then about to become the owner of the "Alpine" Frazer-Nash MV3079. Actually, the introduction of the two Philips passed an awkward moment while a chain was being replaced on the latter car.

When returning from our first week-end at Littlehampton, it was a dirty evening with a Highland-type drizzle, which had covered the roads with a dangerous slime. Ahead, the road changed direction by about 45°, choosing to do this in the middle of a hump-back bridge. The approach was downhill between high hedges, and, the vision being limited, our speed had been reduced to some 55 m.p.h. from the usual cruising 65. In the middle of the hump the back-end decided to slide and, for what seemed an unbearably long time, I studied the near side bank as it rushed at us. Quicker than it takes to tell, fortunately, we were proceeding again approximately parallel to the hedges, and Philip was saying, "That's what I like about a 'Nash; so long as you don't provoke the front-end there is absolutely nothing to worry about!" I remember sinking my hands further into my pockets and thinking: "It must be a — when the front goes!"



The author's original Anzani-engined Frazer-Nash in dock. A 2nd speed sprocket was changed in three hours on this occasion.

Our hybrid 'Nash in its early form was probably the slowest example that ever bore that name; 0-50 took 21 secs., and the maximum speed was 63 in top; 60 could be obtained in second after miles of trying. The trouble lay chiefly in the engine, which was to pure A.C. specification and, as such, not intended for a sports car. The situation was so serious that I went to town and persuaded Semmence to come to Birmingham and have a look. Not many people would have shut up shop for the day and gone 120 miles to examine an extremely elementary 'Nash just for the fun of it. The latter statement is brought into line by the fact that the "fee" did not even cover the travelling expenses. However, we had a grand run down and I know Semmence enjoyed all of it; that is, apart from a five-mile walk on the way back as a result of having run out of petrol. The car Semmence used was a 1933 Meadows "T.T. Replica," one which MOTOR SPORT had tested a few days before and brought in with a seized rear brake actuating arm. [The steering column also collapsed when at speed on Kingston By-Pass!—ED.] No blame attached to them for this; the fault lay with the makers, who failed to supply (until the 1935 model) any means of lubrication for the bearing of this brake arm which, after working dry for some 3½ years, decided to seize at just that moment. Semmence fixed it in short time, while I stood by like a small boy, proffering various spanners and praying that all would be well.

As a result of this visit we lowered the chassis, redesigned the anchorage for the rear shock-absorbers, fitted a spiral bevel crown wheel and pinion in place of the straight-tooth G.N. drive, altered top speed, and later fitted a proper "Boulogne" engine. In its ultimate form the car had a maximum speed of a shade

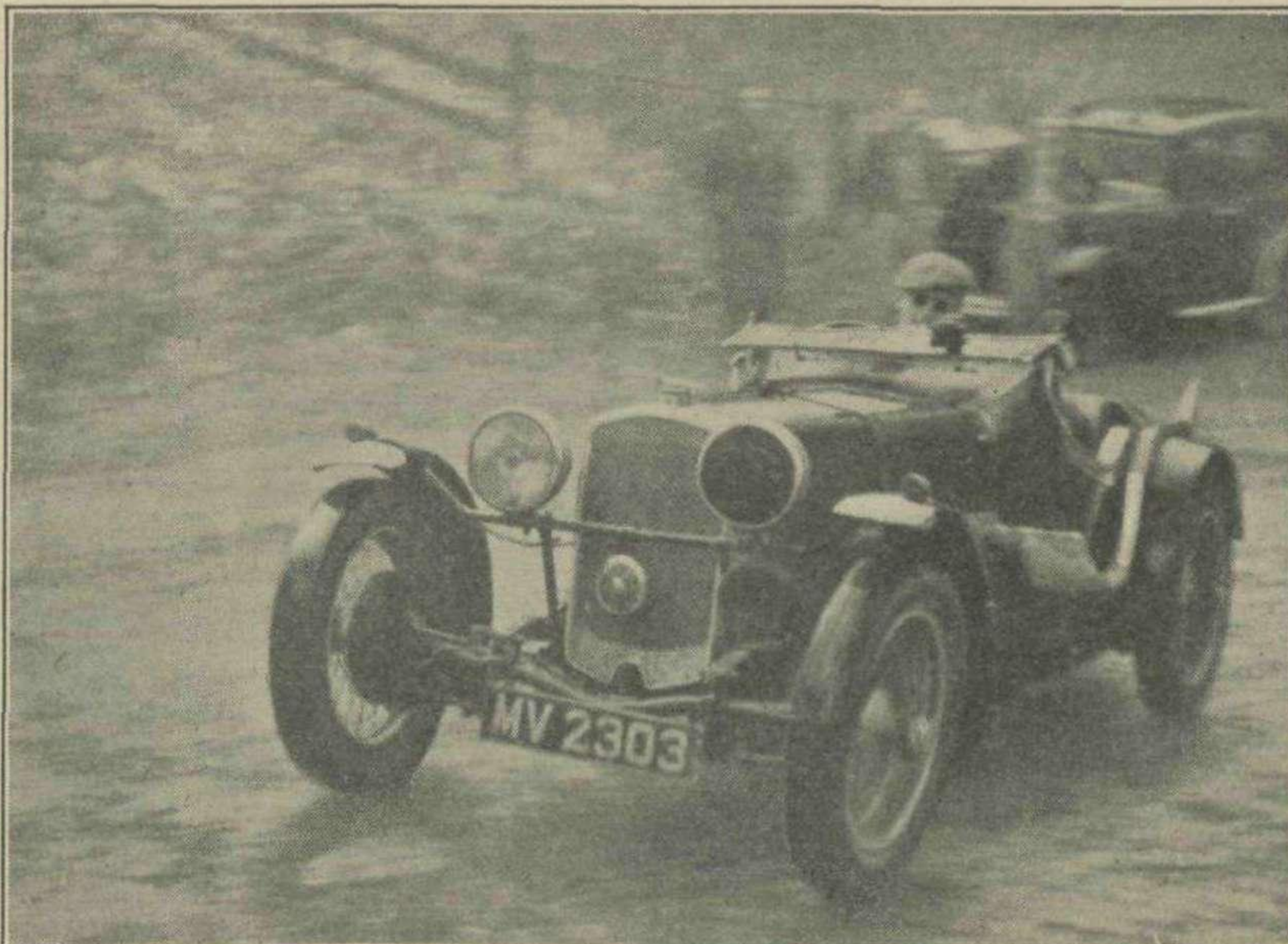
under 75 (mean on level with correction for speedometer) and reached 50 in 12½ secs. Although this performance is not very impressive on paper, it gave pleasant results on the road, and the top-gear acceleration was smooth and attractive, provided the prop.-shaft was in adjustment. We had many runs in close company with another Anzani-'Nash, a rebuilt 1925 car. The total cost of this motor was probably half that of ours and says much for the system of buying an old car, rather than building one up from scratch. This car had an unusual second speed on which 68 could be obtained against our 58; top-gear performance left nothing between the two. Some of our driving was done in the company of an M.G. Magna coupé, but although this car was faster on actual maximum, it was considerably slower on a point-to-point run, and I cannot recall any occasion on which it challenged either 'Nash. A friend's 600-c.c. solo Scott, however, performed very differently and, aided by his riding, invariably showed us a clean pair of heels. He was, of course, quite mad! I remember one occasion when he drew alongside and yelled, "Stop at the next village, I want to buy a headlight." Later he emerged from an ironmonger's with a shilling torch, which he said was all that was needed for riding at 60.

A sudden loss in oil pressure on the Anzani whilst on holiday at Haywards Heath took me to Littlehampton to investigate. This was found to be due to a broken oil pipe feeding the front main (always anneal a copper pipe on sight!) and had resulted in cutting up the bearing a little. While waiting for a replacement I was stung by a mosquito—never more conveniently, because my hand became swollen and the local doctor gave me a note to say that I wasn't fit for work for a further week. This was very necessary as I had not had my first

job very long at the time, and to extend my holiday without leave would have been unwise. During the week I went to the Poole speed trials, the run down being conducted in a twin-o.h.c. (R.I.) Anzani "T.T. Replica" 'Nash. An unusual engine for a 'Nash, having the "revving" characteristics of a six. On the way back I had the rather doubtful pleasure of being towed in the Semmence "Special," which had made fastest unblown time that day. The driving position, having been built for Semmence, did not suit me and I found my knees almost under my chin, but the factor that made the situation serious was the consumption of two fried eggs and two bottles of pop at about 1 a.m. In the face of the harsh suspension I found retention of this ill-conceived meal a major problem. However, when the danger from that direction had passed, I had the misfortune to fall asleep on a bend. Fatty got out and apologised for cornering so fast!

Some six months after the termination of our apprenticeship the Anzani passed exclusively into the hands of my friend. He had moved from Birmingham, and it was hardly possible to share a car with someone living 90 miles away. Together we had covered some 12,000 miles and the car was destined to approximately double this distance before it finally fell to pieces. The cause of this early demise had its origin in the fact that my friend got entangled in this matrimonial business and had little time to do anything to it other than clean it—or, perhaps, just one side of it. My motoring for the next six months was carried out in the most orthodox types of saloon, and apart from being snowbound and taking seven hours to reach London in a Hillman Minx, I can only remember one incident. This was on Christmas night, 1938. Having spent the evening with Semmence at Littlehampton we set out to motor home, some 40 miles, at about 2 a.m. It was quite the coldest night I can remember and the roads had a thick layer of snow which was well frozen, and limited one's speed to 40 m.p.h. After passing through a cloud (at least that was the only explanation we could find) the engine just died and the car (it was the 1925 Anzani-'Nash referred to earlier) came quietly to rest. We were both so cold and miserable that we just sat there unable to make the first move. After what seemed like ten minutes, my friend pressed the self-starter and away went the engine as if it had never misbehaved in its long life. We were both so relieved that neither made any comment until we reached home.

In March, 1939, I bought a 1935 o.h.c. "T.T. Replica" Frazer-Nash—the result of the most arduous saving. The engine was in a pretty bad way. Although it had only seen 36,000 miles it had passed through the hands of several owners, and its 10½-to-1 compression ratio and high-speed capabilities had certainly knocked it about. If this hadn't been so, the price would not have been within my reach, and in any case I prefer to buy a car in poor condition and spend money on it, rather than spend to the limit on the initial purchase. At this time I was working in Coventry and had not got the necessary facilities for carrying out an engine overhaul. By good luck



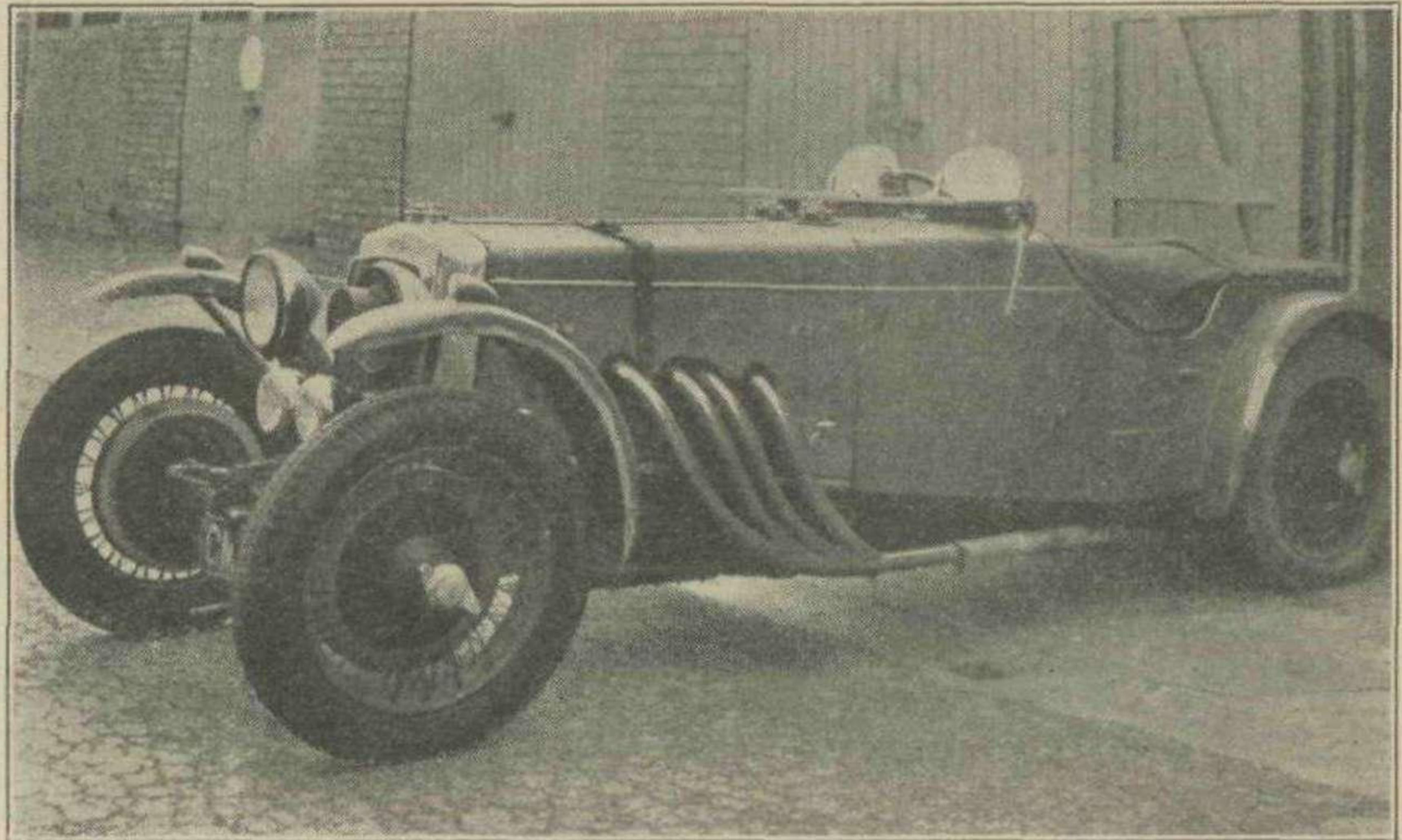
Pat McCormick climbing Shelsley Walsh unofficially in his "Nurburg" Frazer-Nash. He is now rebuilding this car with a Centric supercharger and Lockheed brakes.

I managed to get George Brown, of Warwick Road, Birmingham, to undertake the job. George is the sort of fitter whom one often reads about but is seldom fortunate enough to meet. Normally his business is limited to the old-type Bentley, and one rings up to make an appointment for one's car—perhaps three months ahead. I don't know why he eventually consented to overhaul my engine, although it may have been due to its relative rareness or, perhaps, to the slight similarity, outwardly, to the Bentley. (The history of the designer might account for this last.)

All the crankshaft bearings were replaced, the crankshaft re-ground, and the block rebored and fitted with Specialloid pistons. Two cracks in the cylinder head were welded and a piece of block, apparently removed by a wandering con.-rod at some time, put back at the bottom of No. 3 cylinder. The compression ratio was reduced from $10\frac{1}{2}$ to 1 to 9 to 1, as the former ratio was too high for pump fuel. The last step called forth many a gibe from my friends, one of whom was fitting a $10\frac{1}{2}$ -to-1 o.h.c. engine in the place of the Meadows in a short-chassis "T.T. Replica." (This unhappy car was none other than AHX495—the crankshaft-breaking special.) The valve gear was attended to, but no replacements made. New valves, springs and guides were fitted at a later date, when one of the exhausts burnt out. The usual trouble: a wafer-like periphery, a slight leak, and then—considerable distortion and much burning. (The final collapse occurred just after a dust up with a B.M.W., which, although we ended up in front, was a horrid exhibition of driving and one that makes me twitch a bit to think of even five years later.) This is an engine on which it is advisable to keep a careful check on the compression. If one turns one's car several times before starting, this can easily be watched.

The engine ran so quietly and smoothly that I determined to run it in for 4,000 miles before seeing how far round the revolution counter would go. This did not prevent me from cruising at 70 after 2,000 miles, and having a thoroughly good holiday in Scotland.

To the inexperienced driver, hills like "Rest-and-be-Thankful" or the "Devil's Elbow" are still great fun with a 'Nash, even if limited to 3,500 or 4,000 r.p.m. Many of them we went back and "did again." Scotland is certainly grand for variety; plenty of places to limit one, with a car having harsh suspension and poor ground clearance, to 10 m.p.h. and Lodge C.3 plugs for miles on end, and then some wonderful roads, like that alongside Loch Ness, where one can put the Champion R11s in again. One evening I had my head under the bonnet examining the progress of a certain oil leak, when I heard the scrunch of wheels on gravel and a loud voice saying, "Ah! my dear, here is the car and the young man who was conducting it." We had just driven in at a rousing pace as the roads round Loch Afrie had kept us in bottom and second all day. This, I thought, is going to be one of those occasions when someone much older than myself lays down the law about fast driving; occasions on which I never have much to say, always thinking of the correct remarks



The author's present 1935 o.h.c. "T.T. Replica" Frazer-Nash. Charles Rayner took the photograph.

some two hours later. However, I was wrong, and the owner of the voice turned out to be an enthusiast who was not satisfied until the floorboards were removed and the terrible chains revealed. During a week's holiday we covered 1,600 miles and put 56 gallons of petrol in the tank; our only failure was the death of the magneto (fortunately not fatal, as we had coil as well). This was due to a sheared long-pin connection. Some persistent person had forced in a pin with B.S.F. thread to the discomfort of the metric boss in the magneto.

After completion of my prodigious running-in period, I discovered an unpleasant flat-spot at 4,000 r.p.m. Until this had been eliminated there was little point in measuring the car's performance. The trouble was eventually cured when the valve springs were changed, but by that time the war and pool petrol had arrived. However, apart from the bad period, the performance was satisfactory on Discol, and the engine would pull away without a murmur from 25 m.p.h. in top gear. On one occasion I had 88 with someone sitting up in the back, and might have had more had it not been necessary to slow down for fear that he'd have been blown out; on another occasion I encouraged the needle round to 90 for a fractional space of time—both, however, were under favourable conditions. I imagine the timed maximum speed would have been some 85 m.p.h., but think that this could have been improved on with careful final adjustments; certainly, as new, the car achieved 90 in top and third, and my reduction in compression ratio, at the modest r.p.m. of 4,500, should not have subtracted more than 3 m.p.h., all other things being equal. The general performance was much improved in using the alternative third ratio of 4.8 to 1 in place of 5.4 to 1, as with the latter ratio it was not possible to exceed 60 consistently without a twinge of conscience, although I once went up to 78 (5,200 r.p.m.). On pool, plus one c.c. of T.E.L. per gallon, standstill to 50 occupied $10\frac{1}{2}$ secs. (mean), a disappoint-

ing figure, but one that suffered from retarded ignition; on benzole with the correct timing under 10 secs. should be possible. My second gear of 6.8 to 1, although useful for reaching 60 (and the first owner used it up to 72) results in a slight loss, in comparison with the standard 7.0-to-1 ratio, when initially changing from first to second. 5,600 r.p.m. are the highest I have ever used, and this was more by accident than design; being on a steep lane with a loose surface, considerable wheel-spin took place and the last 1,000 r.p.m. just arrived. Never before, or since, have I felt so like a racing driver! Actually, this engine should be quite safe at that speed, but the piston speed and the valve problem make it inadvisable; to my mind 5,000 r.p.m. is quite enough for the 100-mm. stroke. Should it ever be possible, I would like to add a mild boost, say 7 or 8 lbs./sq. in. in conjunction with a 6-to-1 compression ratio; at one time I also had ideas about a modern body, but now I rather fancy running the car as near standard as possible, apart from, perhaps, some slight weight reduction. [Certainly!—Ed.] With a blower I don't think the performance will be anything to be ashamed of for quite some time yet.

A word on chains might not be out of place. When I bought this car and took off the chains to soak them in boiling oil I found them to be the worst I had ever seen. When held out, with the links vertical, the result looked like the arc of a circle, almost a semi-circle. However, I was so exhausted financially that I just couldn't afford new chains, and it is an interesting fact that I covered 10,000 miles before one fell off! The chains are still on to this day, although there are now four new ones reposing in the back compartment, licking their links in anticipation of wearing down my sprockets. With the two earlier cars we lost some half a dozen chains, in every case due to lateral movement of the sprockets on the back axle. In the large mileage I covered with Philip White he lost but one chain and replaced it in exactly seven minutes.

Generally speaking, if the chains and transmission are looked after, that is, kept in adjustment and the sprockets kept tight on the axle, the chains will stay on indefinitely, but they are very human and may take a personal dislike to one, of which more anon. The worst transmission failure I have experienced was the occasion when all the rivets in my Anzani's clutch sheared. Actually, they went one by one over a period of some 200 miles, but we were not sharp enough to diagnose the source of the apparent bullets flying round under the floor boards. I have never before or since heard of a similar failure. What made things really disheartening was that I had to be towed in by an M.G. Still, it was a very sympathetic M.G.—it had sheared some five half-shafts itself!

Throughout the early months of the war, when I was having a modified engine-mounting incorporated by Paul Wakefield, of Messrs. Wakefield & Son, Worcester, I had many miles in a 1932 "Nurburg" Frazer-Nash—the ex-Fane car. This belonged to Pat McCormick, the owner of the 1925 Anzani referred to earlier, and was notable for its consistent reliability throughout all hardships. The night of the first real Bristol blitz—a Sunday—it had arrived back from Taunton beautifully repainted, shining like a new lawn-mower (green) and had to remain in the street throughout that memorable event, with shrapnel bouncing off the pavement all around. On one occasion the oil pressure was raised from zero by filling the "holes" in the big-ends with solder; other low tricks were played on the transmission from time to time, but in spite of all this "asking for trouble" the car never let its owner down. But with me the story was different. For some reason it took a great dislike to me, and this after I had spent long hours rigging up fancy controls for a Fram oil cleaner and doing other kind services. On one occasion I brought three chains off in as many miles and, on another, the magneto leapt from its pedestal and disorganised the timing, chewing up the Simms coupling in so doing; and on yet a third occasion, the distributor cover of the magneto came half off, situating itself just right for the still rotating rotor arm to swipe it and thereby cause its destruction. It showed its displeasure in other lesser ways, such as consistently nipping my fingers every time I opened the back to get out a suit case. However, in spite of all this I still have a warm regard for the car and hope to see it really cracking with its Centric blower and Lockheed brakes—modifications which have been progressing as time allowed.

Another 'Nash in which I have motored a considerable mileage is the ex-Fane, short-chassis Blackburn Six (the fact that my car is *not* ex-Fane takes some living down!). This is a beautifully smooth and well-behaved car with slightly better performance than my car, a state of affairs which will be reversed when decent fuel again becomes obtainable—I hope! When my car was up in Worcester, Bickerton, the present owner of the Six, ran me up two nights in succession to sort out some oil-pressure trouble. On each occasion we managed 53 miles in as many minutes without exceeding 75. I

don't want to start an average speed argument, and I had better explain that this performance owed much to deserted roads. With reference to the short-versus long-chassis controversy, the short-chassis is certainly quicker round acute bends—roundabouts are Bick's speciality—but I don't think that there is any difference on fast bends; the variation between one 'Nash and another is likely to be greater than any caused by chassis length. I have known some impeccable and some shock-horrid 'Nashes, quite irrespective of chassis length.

Whilst my crankcase was being modified we had the good fortune to meet the late Roy Cutler, whose successful 'Nash was "produced" by Paul Wakefield. This car, which weighed barely 10 cwt., had a terrific performance on the road, as can be imagined from its climb of Prescott in 52.44 secs. at the 1938 Bugatti Owners' Club meeting (August 27th). On one occasion we had an unofficial Shelsley meeting with Roy's car, the "Nurburg," Bickerton's short-chassis Six, and Douglas Osborne's long-chassis big Six. Roy was a grand person, and his death was a blow to all Frazer-Nash owners.

In 1941 I bought my last car, its sole purpose being to get me to and from work, for although at that time I could still get petrol for the 'Nash, the idea of running the latter through the winter did not appeal to me, from the cold corrosion aspect. So I bought a 1925 Austin Seven for £6. Another wonderful Austin! How or why it ran, week in, week out, without any attention, goodness knows. It proved to be the ideal car for getting in and out of the traffic; no wings to worry about and a remarkable amount of urge up to the maximum speed of 40 or so. I used to sail by all my confederates, in their highly respectable motor-cars, on the inside if there wasn't room on the outside, at well over 30, to the tune of an almost unsilenced exhaust—that had been eaten away by some 16 winters. One of the interesting features of this car was the speedometer. With one up the maximum speed was 42, with two up 35, and with four up, barely 5 m.p.h. On looking underneath the reason became evident. The speedometer was driven by a pulley on the prop. shaft, and as the car was loaded the distance between the pulley centre on the prop. shaft and the pulley centre on the frame got less and less; with four people up the piece of string (yes, it was driven by string) was quite loose and the pulley on the frame became disinterested!

Looking back on what I have written I find a terrible Frazer-Nash preponderance. This is naturally no surprise to me, but it may have been a little trying for some; to clear the air I feel I should put down my views on these cars. There are people to-day who are inclined to belittle the 'Nash; for example, one sometimes hears it said that 'Nashes don't really go round corners, that they are not really fast, or that the chains are very noisy. Ten years ago I should have got very hot round the collar about all this and argued very considerably. Now I am more tolerant and, I hope, more understanding. It no longer worries me if I meet someone who looks on the

'Nash as mechanical poison. For myself, I have known well 14 examples and have had acquaintance with a further 10, and in them have covered a good 70,000 miles, and I no longer have any need to convince myself, by means of arguing with others, that I still like the Frazer-Nash best of all—it's a foregone conclusion. I like the speed of the gear shift; the lack of tyre squeal when one goes round a corner faster than one should; the ease of altering gear ratios; the harsh suspension; the accurate steering and, above all, the handling qualities after a shower of rain—my favourite driving conditions! But I'm not trying to sell chains, and I would never advise anyone who was not prepared to put in a little work on their car to buy a 'Nash. The chains need looking after; some might hate that, I think it's rather fun. Furthermore, I don't necessarily consider the 'Nash as the best 1½-litre sports car; experience of Aston-Martin, 1½- and 1¾-litre Alfa-Romeo, and 1½-litre Bugatti, blown and unblown, revealed much that is attractive, but I still prefer the 'Nash and I would like, above all, to see how a really modernised version of the "Shelsley" would acquit itself in open competition. Personally, I think the best brand of enthusiasm is that which centres round one make, and the proof of this lies in the fact that certain names are associated with certain makes—I don't need to give examples in this paper. At the same time, I do feel that one should take an intelligent interest in all cars. There is so much to learn, and life is so short!

HOW TO BUILD YOUR OWN CAR

—continued from page 69

This, gentlemen, is the eccentricity of genius, but don't for a moment imagine that *you* or I will be allowed to get away with anything like that.

Race organisers view all "Specials" with suspicion, and, quite apart from all questions of personal safety, you *must* construct your car so that it has an enormous factor of safety in all steering, suspension, and brake parts. All parts connected with the steering and suspension of your car should be polished, and never painted. I used to throw away my steering arms after every few races, and fit new ones. Even after the slightest crash, one should be absolutely honest with oneself in replacing any part that might have suffered damage.

I think that in building a "Special" one should strive to obtain a pleasing appearance. Usually, one is running short of cash by the time the body is built, and, anyway, one is in a hurry to go racing with the new toy. However, a "Special" represents the expenditure of an immense amount of time and hard work, not to mention filthy lucre, and after it has won you some prizes, it will be one of your most treasured possessions, the joy of owning which will be all the keener if it looks the part. I must admit, though, that the greatest joy I got from contemplating my first "Special" was in counting the myriads of holes in the thing, and realising that I had drilled every single one of them with a breast drill of the variety which engineers call "gut-buster."

Detroit Magic

H. L. Biggs describes a run in K. N. Hutchison's Light Trials Allard-Special



Of the many basic Ford V8 sports cars which were built in this country up to the outbreak of war, undoubtedly the best known, and by far the most successful, was the Allard. Originally intended as a trials car pure and simple, the Allard had developed into a sports car of unequalled performance in speed events and hill-climbs.

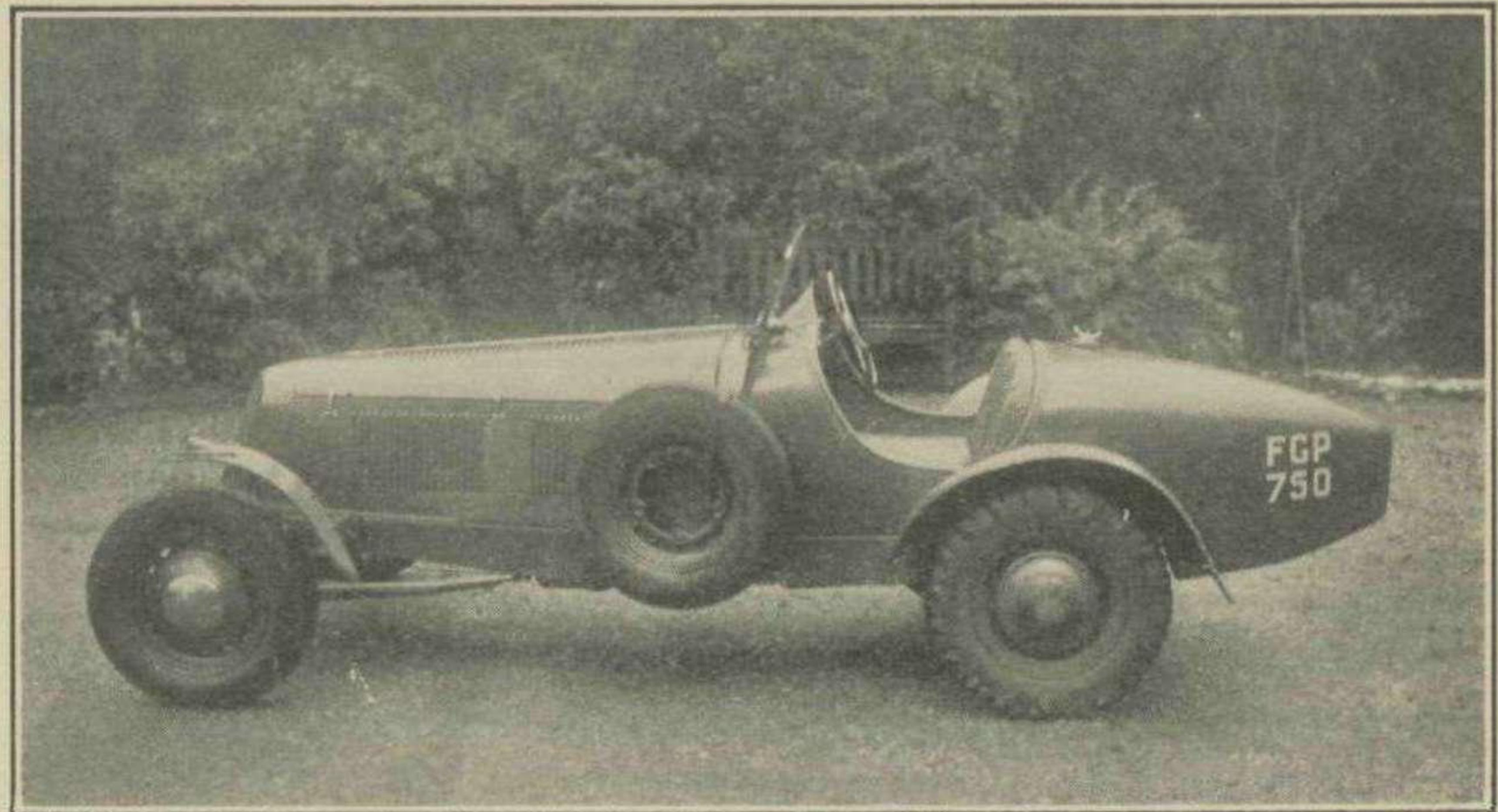
The particular Allard to found the marque's reputation as a sprint car was FGP750, the light trials job owned and driven by Sydney Allard himself.

This car was built towards the end of 1938, together with a duplicate for K. N. Hutchison, a fellow "Tailwagger," and made its first appearance in the North-West London-Gloucester trial, driven by the late Martin Soames. How well I remember that night, the colourful scene at the Anchor Hotel at Shepperton, lit with fairy lights and surrounded with the cream of trials entries. I can hardly do better than quote verbatim from my own diary: "Allard's new light Allard, driven by Soames. A beautiful job, very narrow, about two 'hips width' (actually it is 2' 10" across the body), latex seats, enormous rear tyres (7.50" x 16"), scuttle cowl and aero screen, much wider open grille for increased cooling, plywood flooring, small flaired front wings with tubular stays, car unpainted." That brief description will give an impression of the car as it appeared in its maiden trial, and it is a matter of history that it, and Guy Warburton's CLK5 (the original Allard), were the only two out of the huge entry to get through clean.

To enlarge on this brief description of its technical details, the wheelbase was 8' 4" and the rear track 4' 2", with a front track of 4' 8". In trials trim, using the standard 4.11-to-1 axle ratio, with no passenger and the screen down, it covered the standing quarter-mile at the Track in 17.5 secs., and the half-mile in 28.9 secs.

Its successes in trials are too well known to enumerate, but it is of interest that, out of 12 trials in which FGP750 started in 1938/9 season, it secured seven consecutive premiers, two cups, one first-class award, one second, and ten team awards. In one trial only it secured no awards, and even then it made the second-best performance.

During early 1939 much experimental work was done on carburation, and sweeping exhaust manifolds were fitted, and in June the whole car was rebuilt. The block was bored out to 80 mm., giving a capacity of 4.8 litres, the same as the well-known Ford "Mercury" unit, the crank was modified to the 91A type which carries the fan (this enabled the whole radiator to be lowered and the new and pleasing vee-fronted grille used), the generator, now an 8-h.p. type, nestled in a cut-away in the header tank, and a special induction manifold, bearing two double-choke Stromberg carburetters, was



The Allard, photographed by Hutchison, immediately after its arrival at Farnham, as described by H. L. Biggs in this article.

fitted. The fuel feed was boosted by the addition of an Autopulse, run in conjunction with the standard Ford mechanical pump to cope with the demands of four chokes; in addition, the flywheel was lightened by some 13 lb., and the ports ground out dead smooth. Using a 3.56-to-1 axle ratio, with 6.50" tyres, a 7.2-to-1 compression ratio, and carrying a 15-stone passenger, the standing quarter was improved to 16.8 secs., and the half to 27.2 secs. The best speed, at this time, was about 98 m.p.h.

In August, 1938, the compression was raised to 8 to 1, using new heads with 14 mm. plugs, and, on the standard gear ratio of 4.11 to 1 with 7.00" tyres and a 17-stone passenger, the standing start figures were again improved to 16.2 secs. for the quarter and 27 secs. for the half-mile.

About this time the frame was boxed and undershielded, and the total unladen weight stood at 16½ cwt. the addition of lead ballast to proportion the weight distribution, which varied with the course used, altered this weight by some 2 cwt.

At this juncture a list of the awards gained in hill-climbs may prove of interest. The year is 1939; in May, at Prescott, it was the fastest unsupercharged car, and made fastest sports-car time, and the fifth best time of the day. In July, at Wetherby, it was first in class four, a new class record and new sports-car record; at Backwell, in July, it made fastest time for sports and racing cars; again, at Prescott, it took the sports-car record. At Lewes, in August, it was third in the unlimited class, and at the Vintage S.C.C. meeting at Prescott, fastest in the racing class and second fastest in the all-comers class. Truly imposing!

Here are some ultimate acceleration figures which make one gasp, especially when a passenger: 0 to 60 in eight secs., 0 to 83 in 16.4 secs., and 0 to 96 in 27 secs. The ultimate maximum speeds on the 3.56-to-1 ratio were: flying lap at 100 and the standing lap at 90. The flying half-mile at 105 is pretty astonishing for a completely equipped car in trials trim.

Shortly after the outbreak of war this car was sold to Clarkson, of the Scottish Sports Car Club, and Hutchison sold his more or less similar job to C. Ian Craig, well known to Bugatti folk. During 1942

Hutchison purchased FGP750 from Clarkson and proceeded to beautify it. The car had always appeared naked and unashamed in its bare aluminium panelling. This was sprayed a particularly pleasing opalescent blue, by Abbots, of Farnham, and the engine ancillaries were chromium-plated, giving the Ford unit, always so compact, a most workmanlike appearance. At this stage it came up to the works for attention by the trimmers and electricians. Owing to the width of the body it was impossible to fit two bucket seats, and a single bench-type seat was built up, covered with a matching blue hide; the back squab was slightly raised in the centre to prevent the driver sliding sideways on fast corners, and the edges of the cut-away sides were covered with rubber tubing and finished with the same blue hide. Blue floor mats finished the ensemble, and the car looked quite "concours." Individual switches were fitted for all electrical equipment, and it was at about this time that I felt the urge to experience, first hand, some of the "Detroit Magic" in this car. Hutchison was, therefore, approached, and it was suggested that I meet him with the finished article at Surbiton and drive down to Farnham.

It was one of the coldest days of the year when I arrived at the works (complete with as many clothes as I could conveniently wear, including the famous cap, now some 20 years old), and settled myself in the Allard with the aid of a cushion as the seat is non-adjustable, and these "Tailwaggers" are a lengthy crowd. Thanks to the Autopulse, Scintilla magneto and pump carburetters, the car started up straight away and, after a few minutes warming up, was on its way. Coming straight off my Fiat 500 it was astonishing how quickly I accustomed myself to an entirely different type of car. The terrific acceleration is of paramount value under traffic conditions and, at the same time, 25 to 30 miles an hour can be maintained with no inconvenient sounds from the engine. The brakes, whilst being immensely powerful, are of the mechanical, cable-operated pattern and require considerable physical effort, in

THE OUTER CIRCUIT "200s"

(Continued from the March issue.)

Preparations for the 1922 RACE

THE first J.C.C. 200-Mile Race of 1921 aroused so much prolonged interest and admiration that the success of the event was assured, and it duly happened again in 1922. Indeed, the B.A.R.C. had even announced a 500-Mile Race for that season, but it never came about, so the Junior Car Club again gave Brooklands its only long-distance race of the year. As soon as the I.O.M. Fifteen Hundred T.T. had been won by the Talbot-Darracqs (with Maury's Crossley-Bugatti third) the motoring Press was hot on the scent of "200" news. Seventeen entries in the 1,100-c.c. class and 18 in the 1½-litre class came in at single fees, the invincible team of Talbot-Darracqs amongst them. It was decided to have two separate races as before, the small cars starting as early as 8.30 a.m. and the bigger cars having their show at 2 p.m. New lap-scoring arrangements and a new grandstand at the Fork were announced, and the ever-willing *Daily Mail* was installing a Magnavox loudspeaker system. Again the cars were to line up in rows, identified by coloured bonnets—red and green for the "1,100s" and white, blue and yellow for the 1½-litre cars. The race date was earlier—August 19th—and by July entries had come in of G.N., Salmson, A.V., Eric-Longden, Morgan, Bleriot-Whippet, Crouch, Reindeer, Fewson, K.R.C., and, in the 1½-litre class, Talbot-Darracq, Aston-Martin, A.C., Bugatti, Lagonda, Enfield-Allday, Eric-Campbell, A.B.C., Austro-Daimler, Crouch, Marseal, and Wolseley. Betting at this early stage was 3 to 1 Talbot, 4 to 1 Bugatti, 5 to 1 A.C., 2 to 1 G.N., 5 to 2 Salmson, and 4 to 1 Morgan. The Talbots were to be handled by Segrave, Lee-Guinness and Chassagne, and were almost as in the previous year, although the engines had been raised 3" to improve ground clearance, magnetos were supplemented by coil ignition, and the bonnets were slimmer. A.C. put in two of the 16-valve o.h.c. cars to be handled by Kaye Don and Joyce, and Pullin's s.v. car. The latter had a new Anzani engine and a Hawker body, the gear and brake levers being moved to the centre of the otherwise practically standard sports chassis to improve streamlining. All the A.C.s had twin carburettors (either Solex or Claudel-Hobson), Rudge wire wheels and Dunlop tyres. The s.v. car had a three-speed gearbox and two magnetos. It was considered to have a very fine chance indeed, because the works were so busy that the 16-valve cars, with new bronze heads, had to be rather hurriedly prepared, whereas Pullin worked on his own engine.

A new front suspension was used by A.C., the ¼-elliptic springs being slightly splayed and mounted on trailing clips, the axle being located by a central tubular member anchored to a spherical housing on an extension of the engine crankcase. The starting handle passed through the steering tie-rod. At the rear, ¼-elliptic springs were anchored just forward of the dash, and were set within the side-members, being shackled at the rear to a solid steel shaft mounted on top of the rear-axle gearbox, from which,

further to the rear, the drive shafts protruded, carrying brake drums close against the casing. The double hand oil pumps used in 1921 gave way to a single pump for adding oil to the engine.

Aston-Martin entered two of the Ballot-engined 16-valve twin-o.h.c. French G.P. cars to be driven by Zborowski and Kensington Moir, while Stead in the end had the 1921 s.v. car "Bunny," as an entirely new short-chassis car of this type was not ready in time. Special attention was taken to obviate the fuel tank damage which eliminated Stead in 1921, and an oil tank was connected to the sump so that the level in both remained constant. Hawker bodies were used for the o.h.c. cars, and much was made of the 6,000-r.p.m. 16-valve engines, which had vertical magnetos with ball bearings to take the load of the armatures, two-ring alloy pistons and Jaeger rev.-counters driven



During the early nineteen-twenties small cars were doing outstanding things in B.A.R.C. short handicaps and in the field of record-breaking, but perhaps they achieved their greatest allure in the J.C.C. 200-Mile Races, run over the Outer Circuit in 1921-4; the original race of this famous series being the first long-distance race in England. Previous articles in this series appeared in the February and March issues, when the 1921 race was dealt with—Ed.



from the off-side camshaft. The Bugattis were standard "Brescia" models, and had to be silenced for the race, yet were said to do 90 m.p.h. B. S. Marshall's entry was the car Maury drove in the T.T., fitted with a larger, semi-faired fuel tank, and Cushman's had a cowled radiator. Both had fascia oil-funnels.

Capt. A. G. Miller entered a sports Wolseley Ten, standard even to its pistons, although it had a special camshaft and larger carburetter. The fuel tank was in the streamlined tail, but gravity feed was retained and the hand-brake had a ratchet which only came into operation if the pawl was fully depressed. The oil filler had an extended neck to render replenishment possible without opening the bonnet, and the rear ¼-elliptic springs were streamlined.

Malcolm Campbell intended to run a fully streamlined, four-wheel-braked Austro-Daimler, but it was eventually scratched, not, it was said, leaving the Continent in time to be properly prepared; actually it looked from pre-race photographs suspiciously like a car which Campbell had already raced at Brooklands that year.

Despite its unfavourable engine size, Gordon England again ran his A.B.C., now with Philbrin battery-and-coil ignition, tubular push-rods retaining their rocker return springs, and Higgs' Specialloid pistons. The old square body was replaced by a beautifully streamlined shell, with two streamline head-rests, fairings over the rear springs and filler caps, and the nose almost entirely enclosed. Each cylinder was fed by a 35-mm. Solex, and the crankcase was kept below atmospheric pressure to assist the splash lubrication. Oates was using the same Lagonda that ran so regularly in 1921, but the Eric-Campbell was a very special job, with a round-section body of aluminium sheeting over a duralumin frame, this shell weighing only about 1 cwt. and being easily lifted, complete on the chassis frame, by one person. A special round-section radiator was used to assist the body lines, with which the full-length undershield blended, all the contours being scientifically planned. The 4-cylinder 72×83-mm. single-gear-driven o.h.c. engine ran up to 5,000 r.p.m. and had two Solex carburettors, a B.T.H. magneto and Specialloid pistons. The cast-iron cylinders were separate, joined by an alloy camshaft casing. There was a small oil radiator beneath the main radiator and two entirely separate fuel systems were installed in case one gave trouble. The 4-speed and reverse gearbox, like the other chassis components, was very carefully run in. The body, incidentally, was made in Hammersmith, and Smith was in charge of this delectable light car. Centre-point steering was used, and the wheelbase was 18" longer than standard.

Bertelli again produced his Enfield-Allday cars, two of them based on the T.T. jobs and the third a development of the sports model with s.v. engine; it had an oil cooler between the dumb-irons. The two special cars, identical except that one had a solid and one a "live" rear axle, had a curious engine with square water-jackets, cast in pairs and united by two water passages. Indeed, the cylinder blocks, each held to the crankcase by seven studs, resembled metal boxes, with deep aluminium lids in which hid the valve gear and plugs. The bore and stroke were 69×100 mm., the push-rod operated inlet valves were above the exhaust valves, and ignition was by a duplex Delco coil set with double distributors on the off side, a dynamo being chain-driven in place of the usual magneto. The standard components of the engine were considerably lightened, a special camshaft was used, and the compression-ratio was quite high. Peak speed was 4,600 r.p.m. To cope with the lowered, rather Talbot-like radiators (cowled on one car), a water-pump was gear-driven from the front near side of the timing case. The considerably dropped front axle was offset on the ¼-elliptic springs, and at the rear the chassis frame was cut off just behind a light tubular cross-member, the anchorages of which also served as a mounting for the springs, inside the channels of the side-members; these springs were ¼-

elliptics in place of the standard cantilevers and double Hartfords ran directly beneath them, mounted on the side-member of the side-frame channels, just behind the spring mountings. The bodies were fully faired and the front brakes used in the T.T. did not figure on the "200" cars. So much for 1½ technicalities.

Of the 1,100-c.c. cars, naturally the G.N. team aroused the most interest. Entirely new engines had been prepared, with a separate shaft running up each cylinder to operate the o.h. camshafts, which actuated four valves per cylinder. This type of G.N. engine afterwards became extremely well known, of course. The cylinder heads were held to the barrels by eight studs, and two magnetos were used, with two plugs in each head. The camshaft drive-shafts had a vernier coupling at the base and were splined where they passed into the bevels at the upper end. The camshafts rotated towards the valves so as to afford a means of lubricating the tappets. The magnetos were mounted on an aluminium bracket on the front of the crankcase, and the 84×98-mm. cylinders were set at 90°. The crankshaft, of KE805 steel, had 40-mm. diameter journals and roller big-ends were used. Under the seats a large saddle-type oil tank was located, the propeller shaft passing through it. Two immersed hand plunger pumps fed lubricant to the cylinder walls and to the main bearings respectively. The chassis followed normal G.N. practice, with the famous ¼-elliptic front suspension assembly and chain drive, and the bodies were the boat-like 2-seaters, with cylindrical fuel tanks accommodated in the tail. We believe three of the new engines were prepared, but in the race Capt. Frazer-Nash used the 1921 engine with the T-drive for the camshafts. Godfrey had the other works car, and Pickett, an Englishman resident in Boulogne, a third. They all had dummy open radiator shells and bonnet tops covering a vee-nose.

Salmson prepared a really strong team, consisting of Benoist, Devaux and Bueno. M. Lombard came over to look after them. The cars consisted of fairly standard chassis, but with ½-elliptic front springs, and had very well streamlined bodies. The engines were new units, having the now familiar twin o.h.c. valve actuation, with the camshafts driven by a vertical shaft at the front, and single carburetters. Ignition was by twin Salmson magnetos set transversely at the front of the timing case. The barrel-section bodies had very tiny screens, with folding wire-mesh shields, low on the scuttle side, and the seats were very low-set, the backs consisting merely of strips of webbing running up to two padded, streamline head-rests.

The crankshaft ran in ball-bearings, the 3-speed gearbox was in unit with the engine and the rear axle was bevel driven. Douglas Hawkes, Ware and Martin entered V-twin Morgan 3-wheelers, which were every bit as fast as the 4-wheeled cars. The first-named driver practised with Hagens, of British Anzani, in attendance, his car having a very special air-cooled Anzani engine with a shaft-driven o.h.c. to each cylinder, actuating two inlet and two exhaust valves in each head. This engine was covered in cooling fins, had two cable-controlled carburetters,

and twin magnetos, while a Best and Lloyd oil pump at the top of the near-side camshaft drive-shaft looked after oil circulation. The tail was pretty normal, with a flat tank immediately behind the seat, but the nose behind the engine was brought to a point. Ware's car had a lighter tail, and used a J.A.P. engine, tuned mainly by the works, while Martin's Morgan had a push-rod o.h.v. Anzani engine. All the cars had a hoop above their back wheels to provide anchorage for a Hartford shock-absorber.

Pressland and Tolladay both ran 2-cylinder Crouch cars which, although aged, were amongst the fastest of the normal light cars at the Track at that time. Tolladay's was a rear-engined, chain-driven job, which, two months earlier, had had a lucky escape when a near-side front tyre burst at nearly 80 m.p.h., causing it to turn two complete circles and knock down a 4" post at the side of the Track. Pressland's car first appeared at the Whitsun B.A.R.C. meeting and was at first entered in the 1½-litre class. Later, the stroke was reduced to 96 mm. which, with a bore of 85 mm., put it in the 1,100-c.c. category. It had one of the new 90° water-cooled o.h.v. engines, at the front, with twin Cox-Atmos carburetters, Flexekas valve-guide seals and Sparkekas plug terminals. A spare oil tank was carried under the dash with a hand-pump beneath it, and there was a cord-operated choke. The Bleriot Whippet Peaty was to drive had a special 85×88-mm. o.h.v. air-cooled V-twin engine with cylinders machined out of solid billets, the capacity being only 998 c.c. A Zenith triple-diffuser carburetter was supported by a tubular member running up from the crankcase. The engine was set motor-cycle-wise in the frame and drove by chain to a centrally-disposed 3-speed and reverse gearbox, final drive being by Bramton spring chain to a solid axle. Front suspension was by ¼-elliptic springs to a tubular axle, and similar suspension was used at the rear, special dampers, consisting of two thin leaves rigidly anchored beneath the frame side-member and carried on rollers beneath the main spring clip, replacing shock-absorbers of normal conception. The body, of 3-ply on an ash framework, covered in linen, weighed a mere 32½ lb. The bonnet was open-fronted to promote cooling, and to this end the gaskets were aluminium rings, while the rocker-posts carried fins. The body was well streamlined aft, and Peaty, who trained with a pogo stick, had Marchant, the Blackburn wizard, to tune his engine. The speedometer was gear-driven from the near-side rear wheel. The Eric-Longden was the car Longden used for Brooklands short handicaps, and a standard job. The engine, a water-cooled push-rod o.h.v. J.A.P., was set across the chassis and had an Amal carburetter and M.L. magneto. The centrally-controlled 3-speed gearbox was thoroughly run-in before being fitted, and various back-axle ratios were experimented with. Home-devised shock-absorbers, looking like Hartfords, were used and the wire-wheels had most ingenious locking hub caps. The radiator had a slightly V aspect, the body was very simple, and the rims carried 28"×3" studded Hutchinson tyres. Marchant himself was tuning and

driving the K.R.C., a shaft-driven chassis with 2-cylinder water-cooled Blackburn engine. Wasling had a Fewson, which turned out to be a G.N. "Vitesse" with a V-twin air-cooled Anzani 4-valve-per-cylinder engine.

Avey's tiny rear-engined A.V. bi-car was destined to be the production sports model from that time on, and differed from former bi-cars in having side-by-side seating and something of a wind-defeating stern. The air-cooled s.v. Blackburn V-twin engine drove a 3-speed and reverse gearbox. The Reindeer and Tamplin failed to materialise. As before, most people rigged up extra oil supplies, Oates's Lagonda having a very neat system, a cylindrical tank on the dash and partially under the bonnet enabling oil to be delivered by hand-feed to copper pipe over the rocker gear or to two inlets into the engine sump, according to the setting of a two-way cock. This car, of course, had o.h. inlet valves operated by rockers in line with the crankshaft; two square-section exhaust tracts left the engine on the near side, there was a single carburetter, and the rev-counter and a small air pump were driven from the timing gears. The Bugattis had the gudgeon-pins set very low in the skirts of their multi-ringed pistons, and had spare condensers for the Bosch magnetos, which could be switched in if required. Faired axles were used by some, notably Talbot-Darraeq, A.B.C. and Wolseley, and the A.B.C. had a lap indicator on the cockpit combing before the driver. The air intakes of the Aston-Martins projected from the bonnet side to afford a "scoop" effect, and little balance pipes were carried above each of them.

Before we look at the prospects as revealed by the practice period and consider something of the toil and sweat of that pre-race August week, let us briefly consider how some of the competitors had already shown up that year.

A.C. and Aston-Martin had taken long-distance records at around 75 m.p.h. for durations up to 19 hours, and England's A.B.C. won a short handicap at the Royal Brooklands meeting. The Eric-Longden won a race at Whitsun. The T.T. was, as we have said, a Talbot-Darraeq victory, with Bugatti 3rd, 4th and 6th, and Bertelli's road-racing Enfield-Allday 5th. Capt. Miller's Wolseley Ten next set up records at Brooklands, including 500 miles at 82.22 m.p.h., after which the gearbox gave trouble. It came out again the following day, but had magneto trouble after lapping at over 85 m.p.h. for 3½ hours. The car was said to be entered for the "200," but it seems more likely to have been one of the single-seater "Moth" cars, whereas the 200-Mile Race car was a 2-seater, considerably less streamlined—no confirmation is forthcoming, however, and this illustrates rather nicely some of the pitfalls that await the motor-racing historian. In the Strasbourg G.P. the two 16-valve Aston-Martins retired with duff magnetos, but were said to have achieved 98 m.p.h., Gallop putting up the fastest lap of all, at 75 m.p.h.

At an Essex M.C. Brooklands meeting Oates's Lagonda gained two seconds and a third, and Moir made fastest time of the day with his Aston-Martin at Shelsley

Continued on page 82

RUMBLINGS

Probably lots of new names will appear in motor-racing when it recommences, but so far not many people have taken their plans far beyond the stage of optimistic pipe-dreams. However, F/O Donald Parker, a young man with two 4½-litre Bentleys, tells me he recently acquired an 1,100 c.c. Riley from Parnell, who is keeping it for him for the time being. This car, and possibly a racing single-seater Salmson, he fully intends to race after the war, perhaps in partnership with Marcus Chambers. Later, Parker hopes to do bigger things, using an E.R.A., and it is even possible that he may persuade Raymond Mays to arrange for some magic to be instilled therein. Mays himself, I gather, has his all-black 2-litre E.R.A. and its spares wrapped carefully in the metaphorical cotton wool. Offered a pretty staggering sum for it, he carefully considered the offer, then sagely turned it down, deciding that at his time of life it would be foolish to start learning new lessons on a newly-acquired car. Not, of course, that Ray can have many lessons left to learn, and certainly he doesn't consider himself by any means past knocking down some of his numerous records, but the 2-litre was going very nicely, thank you, in sprint and long-distance events up to the outbreak of war, so Ray is going to hang on to it ready for the afterwards.

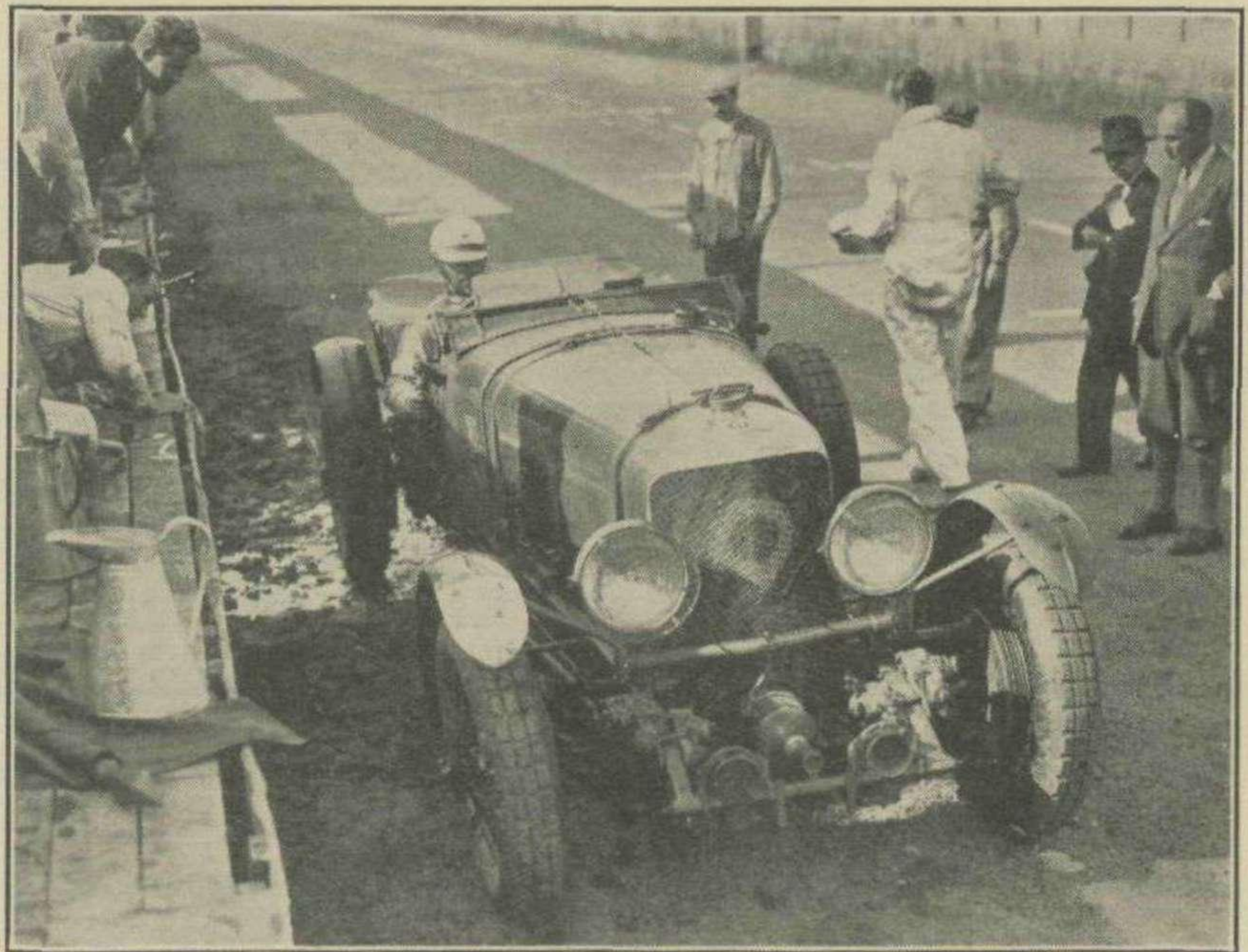
Parnell, of course, is open to offers for his Delage-engined Challenge, but will apparently keep, and exercise, the Seaman Delage. The "Bira" Delage, with i.f.s., is also in Parnell's care, but the Seaman car is entirely intact. A very attractive car for a beginner would be that ex-Bellevue Garage M.G. Magnette raced by Mortimer and which Rowland, of Byfleet, has for sale at £250. One only hopes that there will come good racing with the peace. To this end I would like to see new blood on the R.A.C. Competitions Committee, but whether that will happen all depends, I understand, on who is nominated at next A.G.M. as suitable to assist or replace existing committeemen who have served the Competitions Committee of the controlling body so faithfully in the past. I am sure Rivers-Fletcher would be welcomed by a great many people, and Raymond Mays could obviously do the sport a power of good in the right places if elected to this capacity.

* * *

Last month we published the stirring story of Flt./Lt. Crook's war-time motor-

Middle East ing, much of it in the East, and before that a letter from Capt.

Alan Southon, whose thoughts dwelt largely on motor-cars while he was exiled in the same locality. Now a letter comes to hand from Major O. R. M. Chichester, of the Rifle Brigade, who thought MOTOR SPORT had "gone under" for the duration, until he chanced on a recent issue, in a hairdresser's shop of all places, on his return to this country. In Cairo he had the Alfa-Romeo which used to haunt Southon in the early morning—the only time, Chichester explains, that the roads were sufficiently free of donkeys and Arabs to drive it at all rapidly. It was a 1932 1½-litre super-charged "Grand Sport" with a 2-seater fixed-head coupé body, probably by Fagoni, which he picked up for £50, hoping to ship it to England. Unable to resist, he paid the Egyptian Government a year's tax (£12) and ran it for a month, during which time camel dung and desert sand rapidly promoted the need for a rebore. To this end the car was stripped and, as the owner was ordered home at short notice, was sold in this condition to a fellow officer. Other cars Chichester saw in Egypt, and which others have also commented on, included 2-litre straight-eight unblown Bugatti, reputed by some to have won at Monaco in 1926 and to have been bought after the race by an Egyptian for £8,000; and, by others, to be merely a model sold by M. Bugatti to people who wanted a racing car but were not capable of driving one. There was also an open 1½-litre Alfa-Romeo belonging to Lt. Roger Keyes, which had exceeded 100 m.p.h. on the road by the Dead Sea, a £15 Isotta-Fraschini with a duff water-pump, and a "36/220" Mercédès-Benz 4-seater for sale in Alexandria for £140—very probably the car Crook hired for



Pit stop at Le Mans. The car is the Big Six Bentley which Clement and Watney drove into second place in 1930, behind the winning Big Six, averaging 73.33 m.p.h. Photo from the Rivers-Fletcher collection.

his leave. Apparently it was later repainted and offered for sale at about £600—a disease not unknown in this country! So far as MOTOR SPORT “going under” is concerned, it has, of course, kept cracking quite nicely since the outbreak of war, thanks to many willing contributors, but we would say, once again, that W. Boddy, who edits it, does so in his spare time only, and he once more apologises to those who have not received replies to queries or had acknowledgment of letters, etc. It is hoped that in the fullness of time all will be brought up to date; meanwhile, while we will not go so far as to say that letters not containing stamped, addressed envelopes will be ignored, certainly

the first replies go to those who send these time-saving, economic enclosures. Sorry to be sordid.

* * *

It is reported that Richard Shakspeare has been killed on active service in Sicily. He was a great enthusiast and a charming personality, best remembered for his associations with Bugattis. After competing in Bugatti Owners' Club events with O.M. cars, including a blown “2.2,” Shakspeare was very successful with his Type 55 Bugatti, and also drove the Club Type 51 at Prescott. He was also fond of the veterans, running his pre-1914 Enfield-Alldays and Mors touring cars at the Crystal Palace; both, incidentally, are still in a good state of preservation.

Obituary

THE OUTER CIRCUIT “200s”

—continued from page 80

Walsh, using a 16-valve engine in “Bunny.” The single-seater Wolseley Ten, incidentally, won from the Lagonda at an Ealing and District M.C.C. Brooklands meeting. Then came the Boulogne speed week. Salmsons carried the day, but the car Bueno was to have brought to the “200” crashed. At the August B.A.R.C. meeting Oates won a race at 80 m.p.h., afterwards turning completely round. Moir's 200-Mile Race Aston-Martin, presumably with its Track body, set tongues wagging by lapping at nearly 95 m.p.h., and the A.B.C., Crouch and Eric-Longden were all going well. The A.V. had taken short distance records at over 71 m.p.h. with an engine of only 700 c.c., smaller than that it was to use on August 19th. That, then, was the outlook the week practising opened, when “Long Tom” was laying 3 to 1 on Chassagne, 4 to 1 on Guinness and Segrave, and the same odds on Bueno and Devaux, and on Benoist, respectively. Pullin and Nash both stood at 5 to 1.

The usual last-minute work was inevitable. The G.N.s, probably because East Hill was busy with private orders, did not put in much practice lappery, whereas the Salmsons, carefully serviced in the old sheds behind the hill, apart

from some plug worries, were lapping at 84. The speed of the Bleriot Whippet increased noticeably as the week wore on, until it could lap at well above 60 m.p.h., and it held the Track very well into the bargain. Hawkes put in a lap in the Morgan at over 75 m.p.h., and was obviously not flat out, but in general the car was erratic. The knowledgeable considered it very likely that the 1921 winning average in the 1,100-c.c. class, of 71.54 m.p.h., would be handsomely exceeded. A sort of perspective, as it were, was established two days before the race, when the single-seater Salmson took the kilo. record at 91.04 m.p.h., and ran 10 miles at nearly 83. The A.C.s were not nearly ready in time, although Joyce lapped at over 85, but the Talbot-Darracqs and Aston-Martins were, lapping at 94 m.p.h. The Eric-Campbell was delayed by trouble at the works, but was showing promise, and in spite of its small engine the Wolseley lapped at over 85. *The Light Car* thought Guinness would win at 92 m.p.h., and said of the Talbot team: “These little cars are truly wonderful. They arrive about a week before the race, proceed to do four or five laps at about 90 m.p.h., their jet sizes are changed, they do one or two more laps at a slightly higher speed and are then put away until the day of the

race. There is no hustle, no bustle, no last-minute tuning, and nothing but well-prepared organisation—a model of how a racing team should be run.” Bertelli was held up for a while by flat batteries, and Oates experienced a worrying engine mishap and then, right on the eve of the race, Harvey, with the 4-cylinder s.v. Anzani-engined Marseal, had the bad luck to crash and wreck his car. Pullin's fast A.C. also failed to start.

On the eve of the great day every hotel near Brooklands had every room booked, and the 6.10 from Waterloo brought the first arrivals from town. A Vauxhall was to lead the cars rapidly from the Paddock to the Fork to obviate complaints of oiled plugs, and motor-cyclists were to patrol the Track, armed with Very pistols with which to summon the Pyrene squads if a car crashed and caught fire—one young lady thought the pistols were to shoot badly injured drivers or mechanics! Much thought was given to the three new lap-scoring boards. All, indeed, was set for the second Junior Car Club long-distance light-car race, in which 1,100-c.c. cars had to average over 57 m.p.h., and 1½-litres 66½ m.p.h. to avoid being flagged off. The regulations, of course, specified 2-seater bodies with the seats staggered not more than 9”.

(To be continued.)

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Club News

WE HEAR

It's rather incredible, but yet another s.v. Aston-Martin has to be reported on as coming to light; a rather poor specimen now being restored to really good order by G. E. Kitchen, of Sheffield, who estimates that the work will occupy the best part of a year. We gather that the polished aluminium and copper work is already coming up well. News comes in that Hugh Pelmore, who used to run a blower Bentley and a 328 B.M.W., and Ron London, of sprint motor-cycling memory, are both in the R.A.F., as, now, is Gordon Woods. The last-named has been in hospital, but looks forward to finding a "Shelsley" Frazer-Nash for use later on. Lt. J. P. Shenton, R.N., also seeks any sort of 'Nash of the better sort and, like many another, wonders where they have all gone to. Then cars have been changing hands. Boddy having sold his Lancia "Lambda" to Capt. Bill Bailey, who already owns a Seventh Series saloon, has acquired a 1928 big-port, short-stroke "12/50" Alvis 4-seater from F/O Donald Parker. He insists on referring to it as "a touring car pretending to be a sports car," and it does weigh 22 cwt., but it actually goes rather quickly and is smooth and unobtrusive withal. Nevertheless, Boddy has his eye on an O.M., they say. Sqdn. Ldr. D. H. S. Kay has bought Daniel's Fox & Nichol Talbot (PL4), and Dr. Warnock has acquired a 1928 1,500 c.c. Fiat and a 1937 Lancia "Agusta." All these owners seek instruction books, but some have been able to borrow from the MOTOR SPORT Library.

A model electric Bugatti has come to light in the North, where a G.P. or Type 40 Bugatti is sought, while Battersby has acquired a Ranelagh-bodied 1,500 c.c. Fiat and a 1925 Lancia "Lambda" Weymann saloon, nicely preserved. Out in Australia A. J. Roberts has found a 1932 "38/250" SSK Mercedes-Benz in many and varied pieces, and seeks general information or an instruction book as he is rebuilding it, and would correspond with any SSK enthusiast. Major Hordern, now with the M.E.F., would like to find a saloon Bentley (old school) for use on his return to England—he seeks a saloon as a dutiful married man, but says that his wife liked the open 4½-litre which he used for three years and which, he believes, is still in Cairo. He also had an early "Blue Label" in Quetta, engine No. 69M. S/Sgt. Norris, R.E.M.E., has come upon a rather hard-used 1933 M.G. Magnette (KO372) with E.N.V. pre-selector box, and seeks advice on rebuilding and especially on a means of obviating plug oiling. Norris rode a motor-cycle in competitions before the war and has a useful workshop and a lathe. Reginald F. W. Potter has nearly completed a 6½-litre Bentley rebuild, and would like a photograph or information about the

Gurney Nutting Weymann saloon owned by Capt. Woolf Barnato in 1932. And Roy French has bought a 6-cylinder Marendaz-Special from Whincop, while Grosseurth has John Cooper's Aston-Martin. So there is plenty going on.

Lt. R. I. Foster, R.N.V.R., would pay a good price for a nice 3-litre Bentley. Lt.-Col. T. Luxton, of Australia, who has owned or shared four Bugattis, two Lagondas, a blower 4½-litre Bentley, and some lesser things, now has a Type 43 Bugatti (engine No. 43169) which has run 20,000 miles, and is "in really splendid order." The original phosphor-bronze big-end cages have been replaced by steel cages carrying three fewer rollers than formerly, with very satisfactory results. Lt.-Col. Luxton would like to hear from other owners of these cars and to receive advice *re* carburation. His is apparently the only Type 43 in Australia. Capt. Harry Souter, who used to perform well with a Bugatti in Scottish events, recently returned home from the Middle East.

B. W. Cox, 263, Ware Road, Hertford, Herts, has copies of MOTOR SPORT, *The Autocar* and *The Light Car* from December, 1940, to date for sale, if anyone is in need of back copies.

A Liverpool firm is preserving a fine example of 1927 "12/50" Alvis beetle-back sports 2-seater, in polished aluminium with red upholstery, for a former salesman now in the R.A.F., and they have another similar car for sale at £75, finished black and red. The first-mentioned Alvis has a Claudel-Hobson carburetter and a Scintilla magneto. Leonard Potter drives a Fiat 500 these days, but dreams of his Type 55 Bugatti, which is, of course, the ex-Whincop car. Birkett motors again, most effectively, in his Type 40 Bugatti, and Ballamy, apart from having his fingers in all manner of unmentionable war-winning pies these days, still undertakes occasional jobs for the enthusiast, is experimenting with special suspension and improved ground clearance on a "4/4" Morgan, and retains his special Ford Ten and the i.f.s. Type 37 Bugatti. Foxlee's Alvis "12/50" has now done over 30,000 miles since war came and hasn't had the head removed yet; he is building up a "special" from a 1929 saloon chassis, 1932 "Silver Eagle" beetle-back body, and many other ingredients. Dick Caesar's scheme for a post-war production sports car proceeds apace, and Midge Wilby has Atalantas and two Meadows Frazer-Nashes in store. She intends to alter the power plot of one of the 'Nashes.

★

APRIL REMBRANDT MEETING

The Rembrandt Brains Trust will take place on April 16th, preceded by a lunch. Tickets for the combined function cost 15s., and attendance is limited to 100 souls, as the hotel cannot cater for more.

A limited extra number of tickets for admission to the Brains Trust only are available at 3s. each—if any are now left! The session starts at 2.30 p.m. approx. Lord Howe, President of the B.R.D.C. and E.R.A. Club, hopes to take the chair. He was asked to name a charity to which profits accruing should be paid, and he has nominated the Royal National Lifeboat Institution, of which he is Vice-President. At last Donald McCulloch, Bentley enthusiast, and B.B.C. Brains Trust Question Master, is to perform this function on behalf of the motoring enthusiasts—he has been too fully occupied to attend on previous occasions. Written questions are taboo this time, so think up some verbal ones before April 16th, because on you they will rely. All is set for a most imposing gathering, and these meetings, organised by A. Rivers-Fletcher, do a great deal of good for the Sport. Tickets are (or were) available from him at "Noddings," 4, Eversleigh Road, New Barnet, Herts.

★

I.A.E.

Mr. Cecil Kimber's postponed talk on "The Sports Car—Its Past and Future," will be given at the Graduates' Meeting of the Institution of Automobile Engineers, at Hobart Place, London, on April 23rd.

★

B.A.R.C.

Quite one of the best bits of current news is to the effect that the B.A.R.C. hopes to resume activities at Brooklands after the war. We had known for some time that certain motor-cycle riders had high hopes for Brooklands' future, and now an official statement has been issued by the B.A.R.C. It is likely that several years will be needed to restore all parts of the famous 37-year-old course.

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WANTED

We are desirous of obtaining old copies of *The Autocar*, *The Motor*, *The Light Car* and *Cyclecar* and *The Auto*, bound or unbound, to consolidate our records. If you can help, please contact W. B., 70, Bolingbroke Grove, S.W.11.

★

M.M.E.C.

The next meeting of the Midland Motoring Enthusiasts' Club is due on April 5th, at 7.30 p.m., at the "Windsor," Cannon Street, Birmingham. Some 45 members and friends attended the March meeting, when a film loaned by Mr. Chris. Southall and the Hagley and D.L.C.C. was shown.

★

V.S.C.C. of N.S.W.

An attempt is being made to form a Vintage and Sports Car Club in Sydney,

Continued on page 78

LETTERS from READERS

Sir,

I consider that the criticism of the Delahaye by Lt. Whalley is extremely harsh and rather unfair. He talks of the "publicity motor" as being something quite different from the ordinary Delahaye on the market; in my experience, and I own both types, this is quite untrue. The racing car is very similar to the ordinary model; it needs no special tuning, runs very well on Pool petrol, and if needs be is a very docile car to take to the theatre or a night club in the evening. On the other hand, it has lapped Brooklands at 127 m.p.h., and averaged 117 m.p.h. throughout the "500," besides many other achievements.

I very much doubt if the "4.3" Alvis and the 4½-litre Bentley could carry out both these achievements so successfully, although their engine capacity and running costs are somewhat greater.

I am, Yours, etc.,

R.N.V.R.

R. R. G. WALKER.

* * *

Sir,

May I take this opportunity of expressing my gratification (and, I may add, my surprise) at the interest that has been taken in my views on the post-war sports car, and of thanking those who have commented on my remarks.

Replying to these in the order in which their letters have appeared, S/Sgt. Truscott brings me down to earth with a bump, but it must be realised, I am afraid, that there is a good deal of truth in what he says. Here I must emphasise that when beginning my remarks, I was careful to say that it was the type of car that I should like to own—whether I am ever to be in a position to own one must be left to the future to decide.

Dr. Edisbury's remarks about the cooling system are most interesting, but I remain unconvinced of the desirability of a fan. The extra weight of a radiator with a greater cooling surface, but not necessarily with a larger water capacity, is, I feel, a lesser evil than the power loss involved in driving a fan at high speeds. Also, 70 b.h.p. should propel 15 cwt. of

motor through the air rapidly enough to keep a reasonable flow of air through the radiator even when indulging in "Alpinery."

In reply to Mr. Hambling, the 110 b.h.p. "Speed Model" 2-litre Aston-Martin and the 160 b.h.p. Type 57S Bugatti are examples of engine which are reliable, and which have piston sizes and speeds comparable to, if not greater than, those that I have quoted, thus showing, at any rate, that it can be done.

The differential is a piece of mechanism which I overlooked before. In place of the lock controllable from the driver's seat suggested by Mr. Hambling, I would, personally, prefer to see a self-locking device. I have a bias in favour of the Ballamy hydraulically-controlled differential, which should prove much better than the German ZF one, though I have had no practical experience of either.

The points raised by Sqn. Ldr. C. W. S. Marris are very interesting, and I should like to deal with them one by one.

To say, as I did, that unified body-chassis construction is out of the question in an open car, is a sweeping statement that is not justified. I maintain, however, that in the absence of screen pillars, door pillars and roof to brace the structure, the advantages and, in fact, the whole reason for adopting this construction disappear.

I do not agree that the design of the car has been compromised to the extent that Sqn. Ldr. Marris thinks by my requirement that it should be able to perform with reasonable chance of success in not too fearsome trials, though I am hoping that the post-war world will find trials' organisers with other hazards than rock-strewn tracks and deep mud, though I cannot think what.

The bottom gear-ratio was selected with a view to easy control in traffic as much as anything else, as with a small high-speed engine without much flywheel, continued restarting on any gear much higher than that selected becomes a matter requiring continued attention and

delicacy of control. In any case, it is now an exploded fallacy that trials conditions demand an ultra low bottom gear on a car having a good power-weight ratio. The five-speed transmission was specified to obtain an overdrive ratio in order to improve the car as a road car, which is what Sqn. Ldr. Marris is demanding.

I did specify the ground clearance as 7 in., a figure which I consider adequate for the trials which I had in mind, considering the moderate wheelbase of under 8 ft., and that there is nothing liable to damage underneath the car.

In answer to his third point, *re* weight distribution, I point to the Type 328 B.M.W. as an example of a car which is second to none in its class as a road car, and yet is by no means without honour as a trials machine.

I do not think that the third passenger's "reasonable" comfort would be unduly compromised by his having to put his feet on one or both sides of the clutch housing.

As regards his solution for all these difficulties that he has raised, obviously Sqn. Ldr. Marris is a front-drive enthusiast and I am not, and therefore it is unlikely that we shall ever agree. However, I should like him to consider the following points. If he adopts the Citroen transmission arrangement with an all-indirect gearbox mounted in front of the final drive and with the clutch-shaft passing over the final drive, as he is bound to do unless he adds about 18 in. to the wheelbase and puts the gearbox between the engine and the final drive, the height of the crankshaft from the ground will be some 3 in. to 4 in. higher than that necessary to give 7 in. clearance under the flywheel housing. This will probably necessitate increasing the bonnet height and also raising the seating position, thus raising the centre of gravity and increasing the frontal area. Also, even if he has the forward gearbox mounting, he will have to increase the wheelbase by some 9 in. unless he is prepared to

EATON MOTORS

(Ian Metcalfe)



Who, while possessed of the opinion that BENTLEY stands for all that is best in sporting motor cars, acknowledges the fact that there are also other good sports and racing cars, and we are now desirous of adding a few more cars to our existing stock.

We are interested in any good car, from a blown M.G. to the horsy 38/250 and 540K Mercedes. We also like—Alfa-Romeo, Hispano Suiza, Alta, Aston-Martin, etc., etc. We are not prepared to pay funny prices and will make a fair offer for any car that comes along.

Our experience of real motor cars dates back to 1928 when Bentley, Sunbeam, etc. upheld Britain's prestige in motor racing. We have many enquiries on our books for pukka vintage cars, and will see that the right car goes to the right home !!!

So write to us at
Dovercourt, Wood Road,
Shepperton-upon-Thames, Middlesex

have the cylinder block projecting into the cockpit where I had the clutch housing.

I am, Yours, etc.,
R.E.M.E., J. S. MOON (Capt.).
Home Forces.

* * *

Sir,

The opening of the "not far distant" Second Front is the occasion for a timely appeal from Mr. Arthur Deakin, acting general secretary of the Transport Workers' Union. It is timely because it may come as a reminder to many that a modern army would get nowhere without motor transport, and the thousands of peace-time motorists and lorry drivers who are running it.

The great work which British railways have done in the movement of troops and equipment has been brought home to most of us in the inevitable personal inconveniences of train travel in war-time. Even here, as the railways' job continues for the European invasion, hundreds of motor drivers are now being mobilised to co-operate in long-distance work on this side of the English Channel.

The actual landing on the Continent would, of course, be futile unless our armies took with them motor transport of the kind that brought the Eighth Army like clockwork from El Alamein to Tunis. Every 24 hours each of these armoured divisions which open up the Second Front will use 70,000 gallons of petrol; will fire 350 tons of ammunition; will eat 120 tons of food.

Let us remember, then, those whom the people at home are too apt to forget, the officers and men of the Royal Army Service Corps, those motorists and lorry drivers of other days, whose task it will be to deliver, exactly on time, all that petrol, ammunition, and food from the depots to the fighting units advancing towards the Rhine.

I am, Yours, etc.,
Rottingdean. STRATHSPEY.

[From which it would seem that motorists have a very firm friend in Lord Strathspey.—ED.]

* * *

Sir,

I cannot refrain from comment on the inaccurate assertions of your correspondent "Two-Point-Six." If I remember aright, Mr. Sutherland, of Aston-Martin's, tested and proved correct the rev.-counter alone from Mr. Thursby-Pelham's T-type M.G. Midget, and the latter gentleman stated that his speedometer and rev.-counter agreed exactly. It was left to another correspondent to point out that the rev.-counter on the T-type M.G. does not record the speed of the engine, but that of the dynamo, which on that model is driven at 1.13 times engine speed, and that therefore both the instruments must be reading 13 per cent. fast. This brings the claimed 96 m.p.h. down to approximately 84; the latter is not impossible, but the former definitely is.

I am, Yours, etc.,
Leicester. J. A. COOPER.

* * *

Sir,

I was very pleased to see the letter from E. J. L. Griffiths in your February issue giving some notes on the 2-litre Lagonda. I have been specialising on this model for about six years now and

would like to correct one or two errors and add a little further information.

Firstly, the b.h.p. of the 1926 high-frame model was about 60, the "Speed Model" with 6.8-to-1 compression ratio developing 65, and the supercharged engine 85 b.h.p. Maximum speeds were in the regions of 70, 75, and 90 m.p.h. respectively. In a road test by the *Autocar* the supercharged job had a mean maximum of 88 m.p.h., and the acceleration from 0 to 70 m.p.h. took 22 2/5 secs.

In the lubrication system of the early models, up to about 1929, the pump on the front of the timing case drew oil direct from the sump through a gauze filter and delivered it through a junction box to the rockers, idler sprockets and main bearings. There was a separate copper oil gallery for the main bearings connected to them by unions. The later engines had this oil gallery pipe cast into the crankcase and was above them with a separate cross-feed drilled to each bearing. On these engines also, the self-cleaning filter was fitted between the pump and main bearings only.

The standard pistons were Aerolites. On early engines the dynamo was mounted alongside the block below the exhaust manifold and driven by the timing chain. This was changed later to the more familiar position on the front of the timing case directly driven by the crankshaft.

When the supercharger was added it was placed between the dynamo and the crankshaft and driven by bevel gears. It was a Powerplus and the carburetter may sometimes be a Cozette, but was usually S.U.

Unblown models had originally a single Zenith "triple confuser," later changed to two, and later still to S.U.s. Only the single Zenith was water-jacketed, a pipe being taken from the centre of the rear coolant pump case to the induction manifold and thence to the rear of the cylinder head by copper pipes.

The blow-off valve fitted to the supercharger was later transferred to the top of the induction manifold.

Autovac petrol feed was employed until the advent of the supercharged model, when it was changed to A.C. pump driven by a cam screwed into the rear of the inlet camshaft, the rev.-counter being similarly driven from the exhaust side.

Most engines had a Lucas magneto, but the very late ones had coil ignition and supercharged jobs an inductance type magneto.

A point to watch is the fine threads used on the cylinder head studs, bearer foot bolts and shock-absorber bolts, amongst others. I think they are C.E.I. threads of 26 t.p.i.

I have had alternative axle ratios of 5.3, 4.6, 4.4, 4.1, and on the supercharged job 3.66 to 1 quoted to me at various times by the Lagonda Company. Three types of gearbox were available, all r.h. change, and the brake shoes were made so that shims could be packed under the feet for adjusting purposes. The drums are about 14" diameter. Steering is by Bishop cam, the speed model having a spring wheel. The ground clearance was: Standard, 10"; Speed Model, 7".

In spite of the unique points in its design, a considerable departure from previous Lagonda practice, it did not do

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83, Old Oak Road, Acton, W.3
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FIVE Lagonda 21-in. wheels, and set of cycle-type mudguards. P. E. Chaundy, The Cottage, Hook-a-Gate, Shrewsbury.

PISTONS, new, Fiat Five + .020, + .030; Riley Nine standard H.C.; Bugatti "Brescia" + .060. L. W. Avery, 41, Waltham Road, Boscombe East.

CARBURETTORS, Amal 32 mm., double float. Pair S.U., 30 mm. Self start, Solex, 26 mm. L. W. Avery, 41, Waltham Road, Boscombe East.

SIMMS 4-cylinder magneto, new, £5. Riley Nine, inlet manifold, 2 Solex, 2 S.U.s, exhaust manifold, £2 10s. A. T. Sayers, 58, Stanley Avenue, Dagenham, Essex.

PAIR Zeiss headlamps, Hartley mask, perfect, off Bentley. Pair tuned Lucas Alto Klaxons. Leathley, Brownings Farm, Cowfold, Horsham, Sussex.

COMPLETE Austin chassis, fitted unused "Ulster" suspension outfit (supplied by Austin's 1942), £18. 211, Southlands Road, Bromley, Kent. Ravensbourne 1028.

SCINTILLA AP4-A Mag., five 20 Rudge wheels, 14-in. bore S.U., "M" Midget spares. Routledge, Elmete Avenue, Scholes, Leeds.

FOUR-SPEED Synco. gearbox, diff. assy. 5 1/2 to 1, Bleumels wheel. Suit "M" Midget. Routledge, Elmete Avenue, Scholes, Leeds.

SERUAIS silencer, unused, 28 in. by 6 in., 2 1/2 in. o. dia. pipes. 50s. inc. carriage. 31, Carlisle Road, N.W.6.

SET Austin pistons, .025 o/s, 35s. Pair Hartfords Type 101, one incomplete, 15s. 9, Stephenson Terrace, Wylam, Northumberland.

WANTED

BUGATTI, 1 1/2, 2 or 2.3-litre Grand Prix, complete, or parts for same. F. O. Cleveland Harmer, 83, Old Oak Road, Acton, W.3.

SET of cycle-type mudguards, suitable for 18 by 5.50 wheels. P. E. Chaundy, The Cottage, Hook-a-Gate, Shrewsbury.

LUCAS P100 or P80, either pair or single lamp. Good price given. Major Vigors, Fosse Bridge, near Cheltenham.

ALVIS "12/50" or "60," in good condition. Full particulars and price. W. Snowden, 9, Coverdale Road, Sheffield, 7.

MOTOR SPORT, June and July, 1938, October, 1940. Cash or exchange other numbers. Yates, 50, Trafalgar Street, Healey, Batley, Yorks.

8-H.P. 1939 Austin engine, complete. State condition, price, to C. Bunbury, Rendlesham, Woodbridge, Suffolk.

BUGATTI, 1 1/2 or 2.3-litre, Grand Prix. Particulars and price to Bennett, "Burford," Holmwood Road, Cheam, Surrey.

SINGER-LE MANS petrol tank, windscreen. Crosby, 2, Lynwood Avenue, Luton, Beds.

REQUIRED, Bentley mudguards and stays for sh. chassis 3/4-litre. Good price paid. Leathley, Brownings, Cowfold, Sussex.

STONEGUARD 1935 Riley Nine gear change, M.G. self-change box, E.N.V. Ward Booth, Fairhaven, Beechwood Avenue, Coventry.

BENTLEY 3-litre, Van den Plas or rebuilt, must be good condition. Capt. F. W. Fletcher, Doniford Camp, Watchet, Somerset.

LANCIA, Fiat, B.M.W., or similar, in good condition, at reasonable price. J. E. Ralphs, 30, Ponsford Road, Minehead.

LAYSTALL crankshaft for 1 1/2-litre Meadows' engine. Gosnell, 30, Raymouth Road, S.E.16.

WANTED. Cylinder block, Sunbeam twin-o.h.c., 6-cyl., 3-litre. 27, Burgoyne Road, South Norwood, S.E.25.

Spares Section, MOTOR SPORT,
21, City Road, London, E.C.1

very well in races, usually only being put out by minor troubles and accidents. At rallies and in various trials, however, it did very well. W. M. Couper had a special model, and on looking back through some 1929-32 copies of various motoring publications I noted that it appeared frequently on the list of prize-winners.

I am, Yours, etc.,

F. G. DE B. HART.

London, N.W.3.

* * *

Sir,

Whilst hesitating to cross swords with an expert like Mr. Clutton, I feel I must challenge his statement in the March issue of MOTOR SPORT.

He states that to propel a T-type M.G. at 95 m.p.h. requires 70 b.h.p. per litre, which is a better output than that of the Bugatti type 57 S.C. which is recognised as the most efficient production sports car in existence.

In this case, how does he account for the performance of the "Musketeer" M.G. Midgets, which, I understand on very good authority, could top three figures?

They differed from standard only in respect of a Marshall blower, Laystall crankshaft, and higher compression ratio, which additions in themselves should not make a mass-produced car like a T-type more efficient than the 57 S.C. Bugatti.

Surely power-to-weight ratio should enter into Mr. Clutton's calculations somewhere, for to calculate the output of an engine on the frontal area of the

car without taking weight into consideration seems to me to be nonsense.

Lest you should think that I am taking the side of "Two-Point-Six" let me say that the idea of a standard T-type motoring at 95 m.p.h. is utterly ridiculous.

Do you happen to know where I can obtain two blower belts for a Marshall-blown P.B. Midget? Also can anyone tell me how fast the oil should run through the sight feed on top of the supercharger?

I am, Yours, etc.,

Potter's Bar.

A. G. SANDERSON.

* * *

Sir,

The nostalgic article on the 1922 Rolls-Royce "Silver Ghost," by A. C. Molyneux (December issue), prompts a few comments by way of a footnote. If the curious and, maybe, crude magneto brake was really an afterthought as suggested, it was at all events a very persistent one, for it dates from before the last war. The engine was so quiet that even the small noise caused by magnetic torque-fluctuations of the armature at low speeds was considered obtrusive, like the oil jet that kept tapping against the crankshaft of the experimental 8-litre Bentley. The small size of the front shock absorbers was deceptive: the miniature spring-loaded leather cone clutch was effective on both faces, so that it presented double its apparent area. The extra oil supply to the base of the cylinders was originally designed as a precautionary measure to operate at anything beyond about two-thirds throttle. Momentary blipping of the accelerator when the engine started would therefore provide any extra lubrication if it was really wanted (*e.g.*, after standing a long time) without opening the bonnet or plying a screwdriver. Incidentally, a curious recommendation prior to the last war was to cure sticking rings by injecting a little paraffin through the extra oil pipe. Shades of Redex treatment!

As might be expected, fuel consumption varied a good deal according to the performance demanded. The 15 m.p.g. quoted is probably a fair average figure for ordinary use, but the following authentic earlier data obtained under official observation are worth noting:—

1906 T.T. C. S. Rolls won at 39.4 m.p.h. and 25/26 m.p.g. (20 h.p.).

1908 2,000 miles R.A.C. Trial. Weight, 2 tons 1 cwt., 20.1 m.p.g. (40-50 h.p.).

1911 Top gear test, London-Edinburgh-London, 2 tons 7 cwt., 24.32 m.p.g., followed by 78.26 m.p.h., at Brooklands.

All this would be on a ratio near 3 to 1.

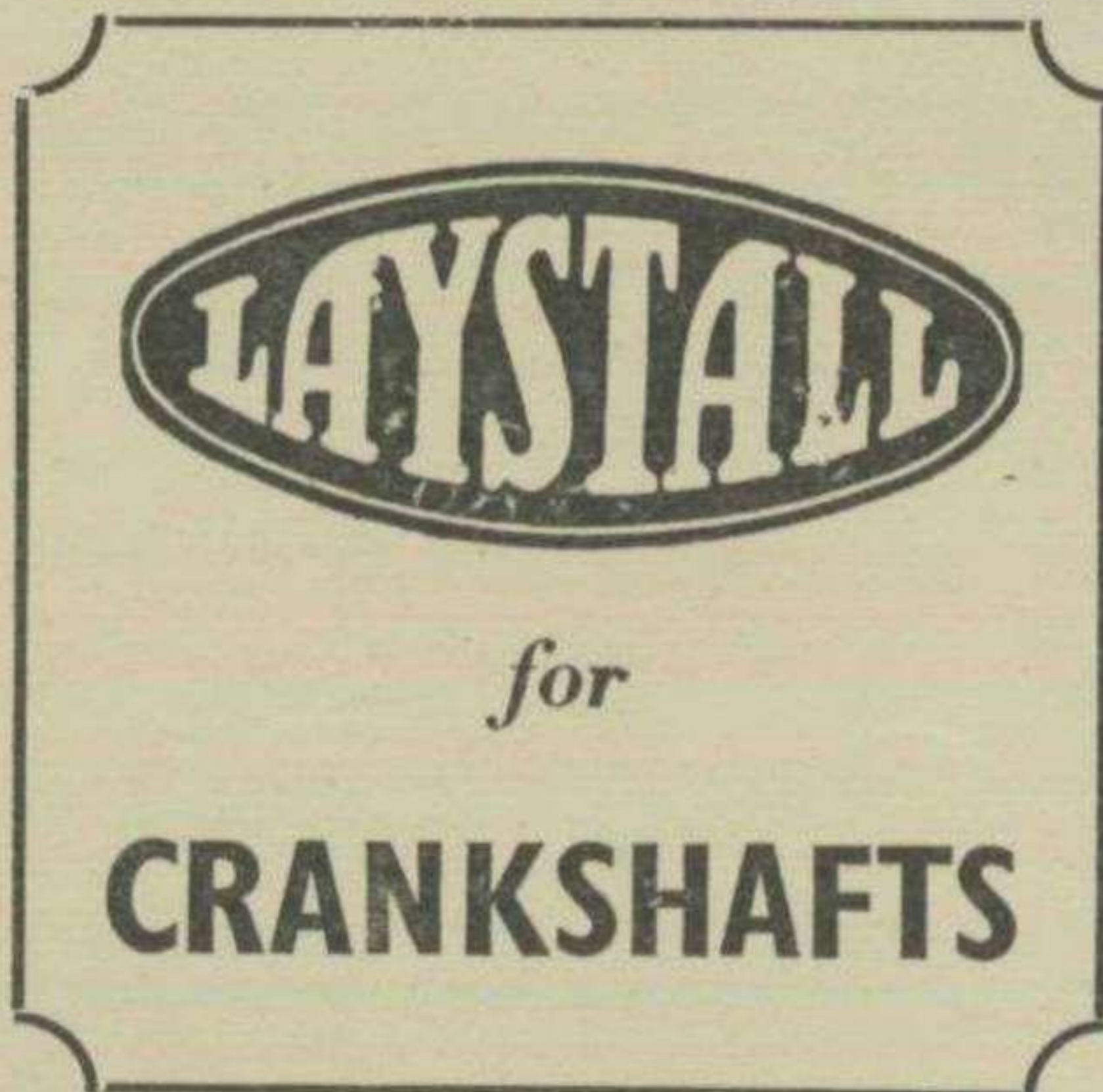
It makes you think. So does the naked copper inlet pipe and manifold, which looked really beautiful when burnished, and worked well, perhaps because of, rather than in spite of, its lack of heating. A cool mixture, if not too "blobby," means a heavier combustible charge, and hence increased torque. From the graph, engine torque was at its highest about 500 r.p.m., which explains the uncanny pulling power at 15-20 m.p.h. on top gear. Strangely enough, the falling torque at higher speeds was not unpleasantly obvious. After toying with the idea, however, I feel that the engine—or even half of it—would be too heavy in relation to its power output for installation in a light chassis as a synthetic vintage special, but I am open to conviction. Has anyone tried it?

An item that deserves mention is the exceedingly neat brake compensators, which consisted of miniature differential gears coupling the two halves of divided cross-shafts abaft the gearbox. The same arrangement was, of course, favoured by W. O. Bentley. Though perhaps unnecessarily expensive, there is something aesthetically satisfying about this feature, and it always seemed a pity it was normally hidden from view.

I am, Yours, etc.,

Cheshire.

J. R. E.



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1940 (July) Raymond-Mays Standard V8 Saloon. Guaranteed mileage 5,600. Fast and exceptional car with great possibilities. £345. Box No. 131, MOTOR SPORT, 21, City Road, E.C.1.

RILEY Nine, special 4s, £40; engine rebuild twin S.U., new hood, screen mask, £55. Shaw, 208, Chester Road, Sutton Coldfield.

AUTOSKETCHES. A further limited number of photographs accepted for pencil drawings at ½ gn. 9, Stephenson Terrace, Wylam, Northumberland.

BENTLEY—3 litre, late 1926 open 4-seater sports "Red Label"—reconditioned by Bentleys, including new cylinder-block, in 1935, and guaranteed by them, 10-11,000 miles since, seals still intact; seats, tonneau and hood re-covered. £235. Box No. 132, MOTOR SPORT, 21, City Road, E.C.1.

Continued in next column

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9-H.P. long-tailed Amilcar, overhauled, spare engine, gearbox, and parts; 2 new tyres. Letters only. 1, Page's Yard, Church Street, Chiswick.

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SPORTS CARS. T. & T. interested in purchase of good sports cars. Thomson & Taylor (Brooklands) Ltd., Portsmouth Road, Cobham, Surrey.

PRIVATE buyer offers up to £600 for racing or super-sports car. Any capacity or type. Box No. 129, MOTOR SPORT, 21, City Road, E.C.1.

OLD type Bentley wanted. 3, 4½, 6½ or 8-litre. Any year. Price according to condition. Box No. 130, MOTOR SPORT, 21, City Road, E.C.1.

RAILTON Light Sports tourer or tourer wanted. 111, Montgomery Street, Birmingham, 11.

CAN YOU HELP ME ?

WANTED—Model 18 or 40 Ford V8 Cabriolet or two-seater, condition unimportant, block must be sound.

For Sale—Ulster Austin Front Axle, completely reconditioned and unused, with special ventilated brakes and zinc interleaved spring, £10.

HAROLD BIGGS, 16, Fyfield Road, Enfield, Middlesex. Renown 1121.

Continued in next column

WANTED—continued

LOW mileage Type 57 Bugatti, Hotchkiss, Delahaye, Bentley, or similar required. Highest price offered. Major Vigors, Fosse Bridge, Cheltenham.

WANTED copies of *Speed*, 1935, January to May; 1936, January; 1939, May onwards. 146, Llandaff Road, Cardiff.

ALVIS Speed 20 or 25 chassis, radiator and steering column. Box 133, MOTOR SPORT, 21, City Road, E.C.1.

TYPE 35 or 37 Bugatti, less engine and gearbox, cheap for cash, must have aluminium wheels and large brake drums. Box No. 134, MOTOR SPORT, 21, City Road, E.C.1.

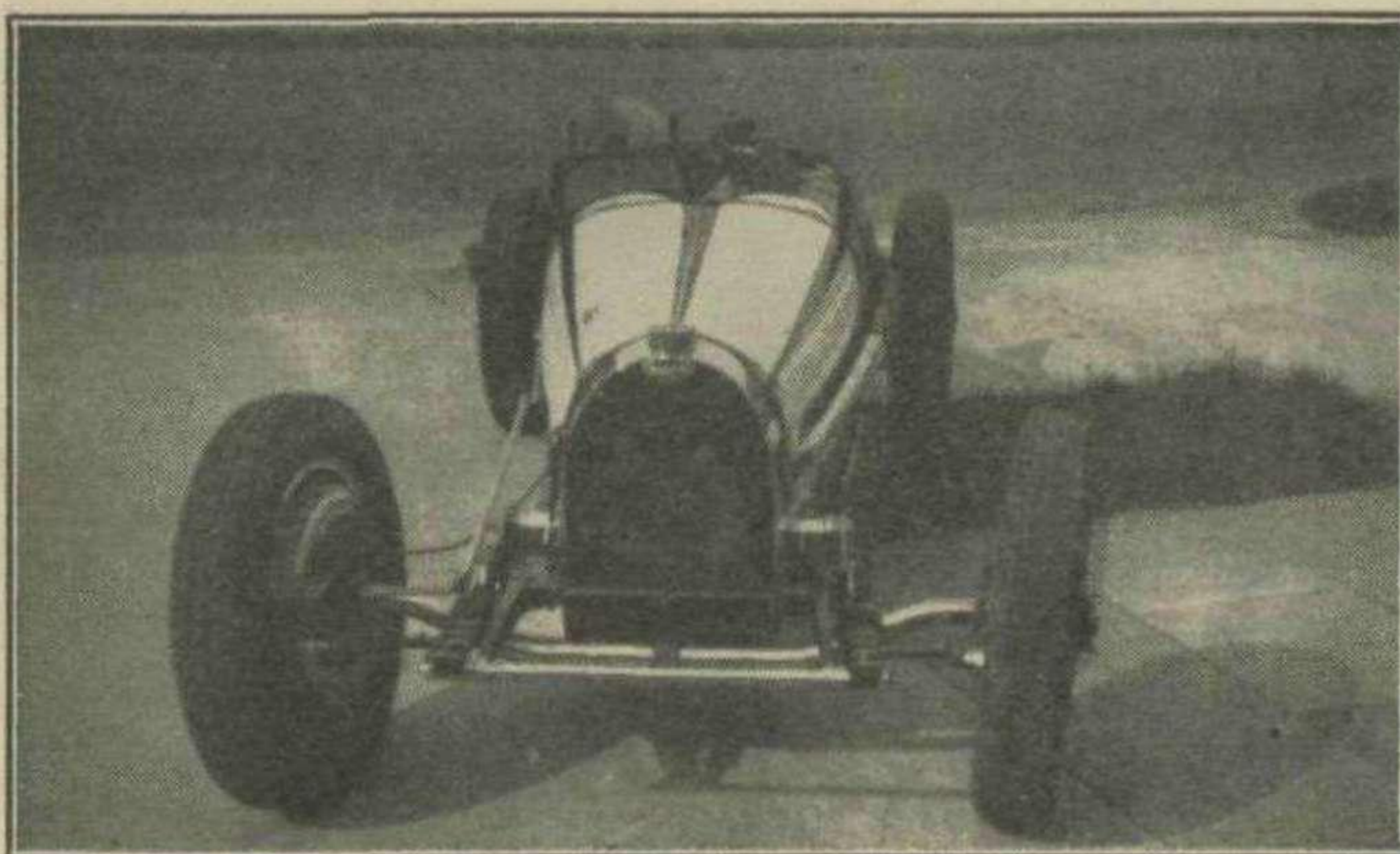
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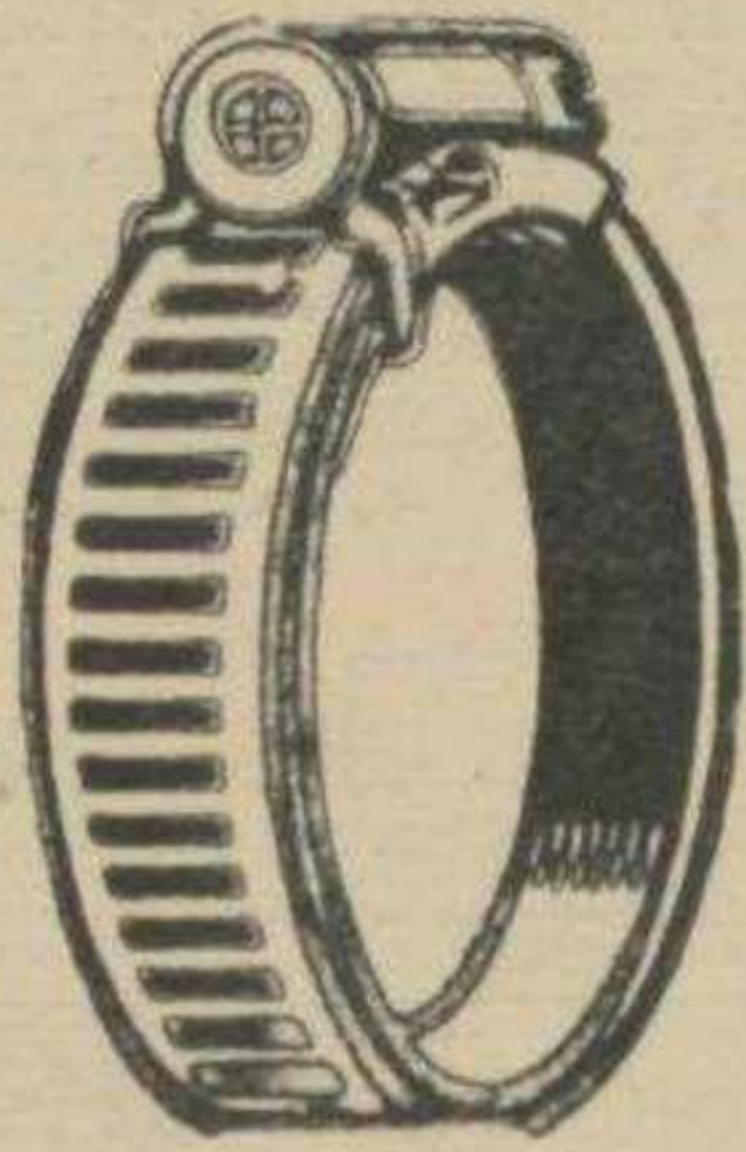
BUGATTI CLASSICS—No. 6

Photograph from the Jack Lawrence Collection

3.3-litre 8-cylinder twin-cam supercharged Grand Prix Bugatti. Produced with a plain bearing engine and not classified by Type No. The "3.3" was the culmination in orthodox design of le Patron's racing models. On many occasions the "3.3" scored notably against cars of superior speeds. With this particular Bugatti the Hon. B. Lewis secured first place in the 1935 MANNIN MOAR, and later the car's owners were C. I. Craig, Jack Lawrence and John Gaul.

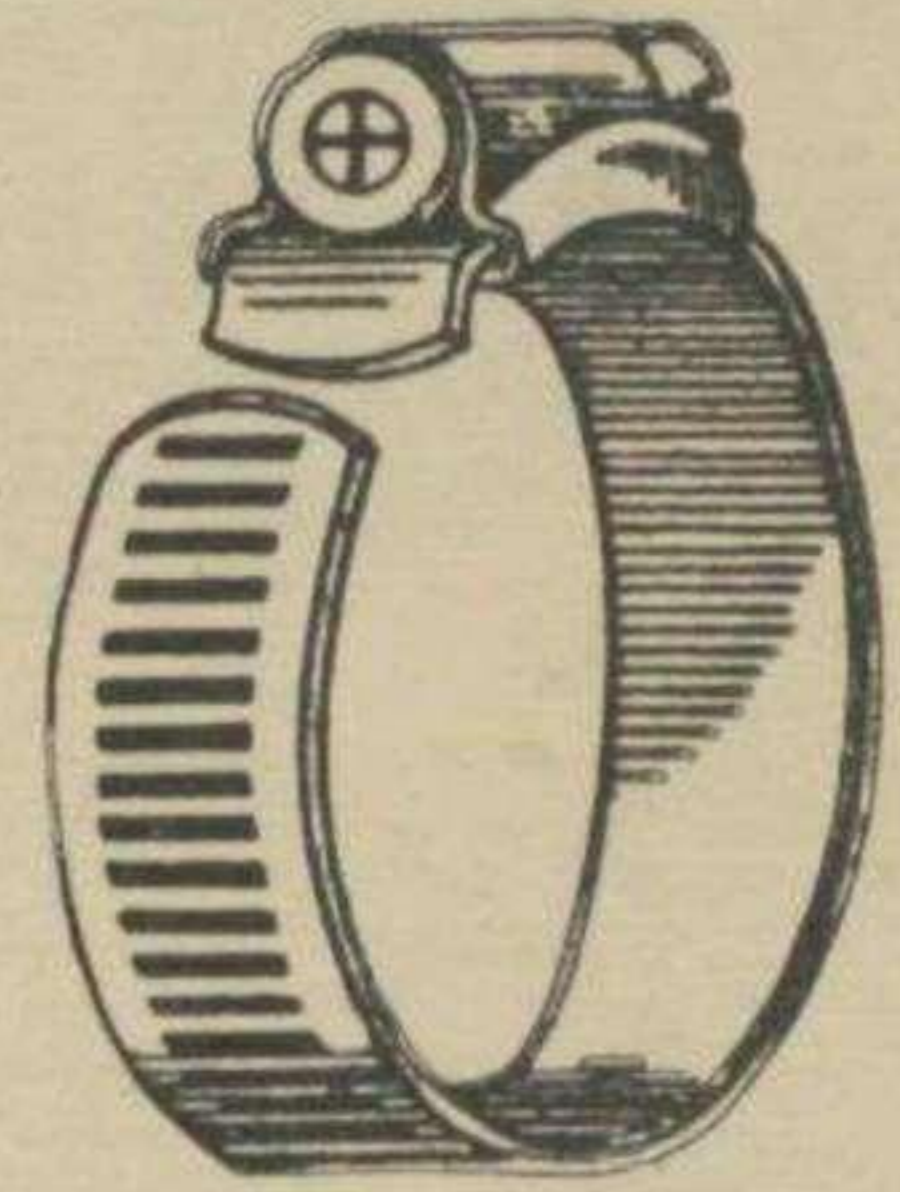
★ Cars illustrated in this series are not necessarily for sale, but shown for the interest of Bugatti enthusiasts by Jack Lawrence, of 166, Clarendon Road, Holland Park, W.11. Phone : Park 5705

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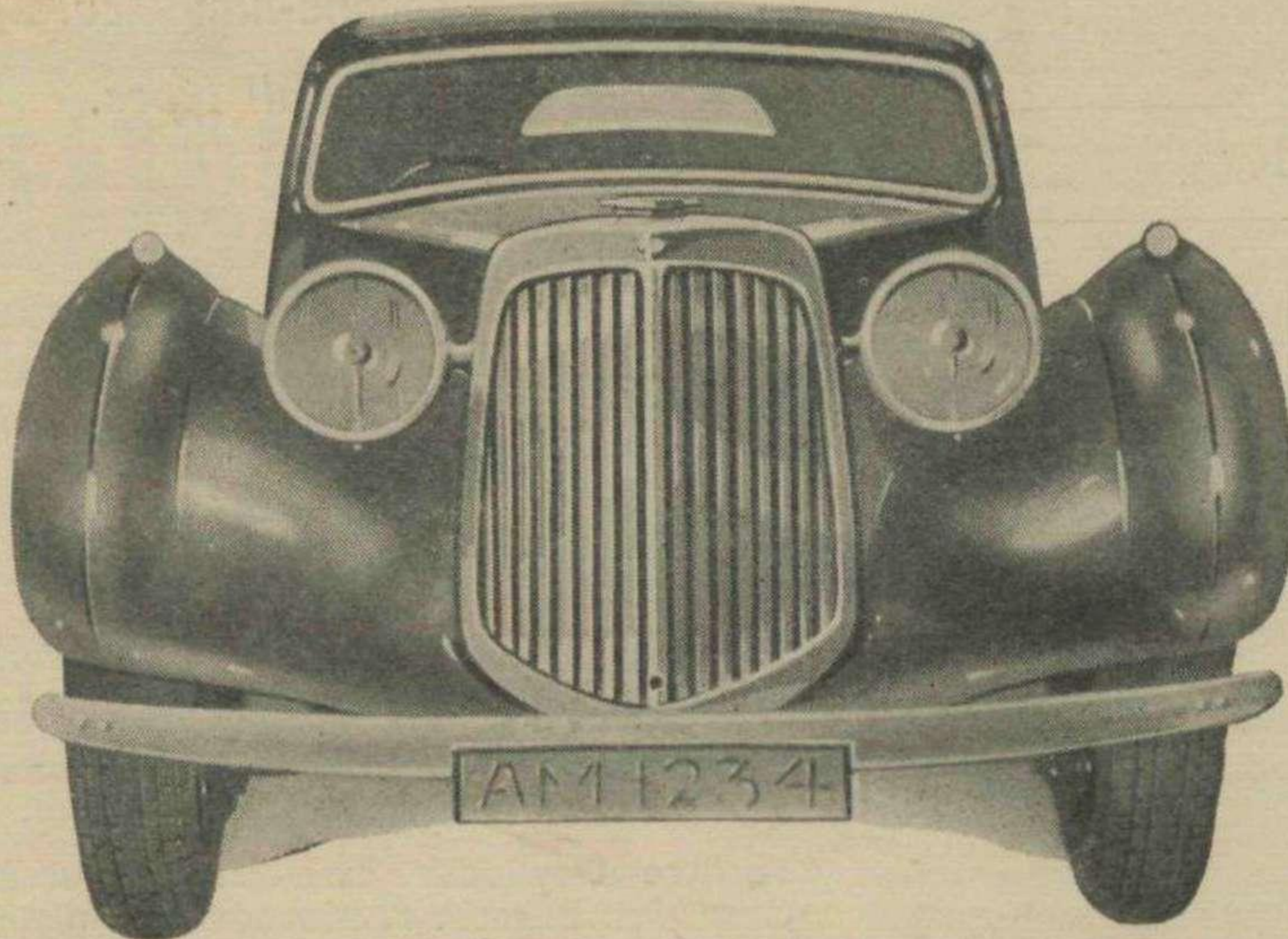
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