SATURDAY, MAY 31ST, 1913.

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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Notes.

The Commonsense of the Local Government Board.

As President of the Government Department which is empowered to make regulations under the Motor Car Acts, Mr. John Burns is constantly approached by anti-motorists and other prejudiced people to make regulations for anything and everything which will satisfy the prejudice or tickle the vanity of the small-minded people who are only happy when they are inventing some new restriction upon the conduct of their fellow-men. Now, while the President of the Local Government Board has been courtesy itself, he has never encouraged these busybodies: he has heard what they have had to say, and then has weighed the question carefully and painstakingly himself, and if he has taken action it has been because he has been convinced that it was right, but he has not done it drastically, nor in a way to interfere with industry, or to inconvenience unduly those who would be infringers of a new regulation when it should come into force. For instance, take the case of the exhaust cut-out restriction: some months' notice was given of this so far as the motor car was concerned, so that there was plenty of time for the unduly noisy cars to be reasonably silenced, and in the case of the motor cycle this same impartial attitude was taken. Admittedly the absence of proper silencers on motor cycles was commoner than on motor cars, but many people assured Mr. Burns that it was impossible to make motor cycles with quietened exhausts. He therefore took steps to have trials made by the Local Government Board officials, and it was not until these trials had been concluded that the prohibition of the cut-out for motor cycles was issued; then it was done with practically twelve months' notice, so that again there was plenty of time for both maker and owner to conform.

The Enclosed Driving Car.

Next there was an agitation about enclosed driving cars, it being alleged in Parliament that these vehicles were dangerous and should be stopped. It was also urged that warning signals other than the bulb horn should be prohibited. Both these matters are now under consideration by the Local Government Board, and we have no doubt that, if anything is done, it will be done in the same reasonable spirit; for instance, knowing the thoroughness with which the exhaust cut-out question was looked into, we have not the smallest doubt that Local Government Board officials have been instructed by their chief to make careful tests in traffic with enclosed motor cars, and it is equally certain that if these tests have been made it will have been found that the danger from the properly built enclosed body only exists in the imagination, so that we feel confident that any regulation which may be promulgated will be of a reasonable character.

Loud Warning Signals.

In the case of the harsh-sounding and penetrating warning signals, about which there has been agitation, we can only say that their abolition would not tend towards the public safety. Nowadays with traction engines, motor lorries, and heavy motor delivery vans, not to mention motor chars-à-bancs and other big passenger vehicles, there is nothing more dangerous than that a motor car which desires to overtake and pass one of these shall be unable to make the driver hear. The driver of the overtaking car must be able to cause a sound so penetrating that it will get through the din made by the heavy comparatively slow-moving vehicle ahead, otherwise he may be doomed to stop behind it for miles in a cloud of dust and in a deafening din. It is all very well to say that he need only wait

Notes.

a little while, as opposing traffic is sure to come before long, and then the traction engine and its train or the motor-lorry, as the case may be, will draw over to the left and the overtaking vehicle get through. This is just the very point; it is then the danger occurs, because the overtaking vehicle has not been heard. As soon as the traffic in the opposite direction has passed, the driver of the traction engine draws to the right again and a bad accident may result.

Often Necessary for the Public Safety.

However, the fact that the motorist is endangered and inconvenienced by the absence of a piercing alarum will not appeal in the least to the anti-motorist. It is, therefore, necessary to point out that in many towns it is most desirable to have a penetrating signal available. The necessity for its use depends upon the volume of other traffic, which in its turn is partly dependent upon the nature of the road surface and upon the nature of the loads carried by the traffic. For instance, in a manufacturing town with granite setts and waggons running about full of steel bars, an ordinary bulb horn is absolutely useless: neither vehicular nor pedestrian traffic hears it, and the note of the most powerful Klaxon only rises above the din in a mild manner. To prohibit these harsh-sounding signals would make it necessary to introduce a whole gamut of complex regulations. Personally we strongly object to making any unnecessary noise, and always use a bulb horn whenever we can, and this is what all considerate motorists do; they only turn to the strident signal when they find that the other has not been heard. The real trouble has been made by the thoughtless, inconsiderate drivers who rush about towns and villages at night, making night hideous by the wholly unnecessary use of their loud signals. There is rarely a reason for using these signals in the country after lamp-lighting time, because the driver of the noisiest traction engine is aware of the presence of a motor car behind him owing to its lights, but it may be necessary to use them occasionally much later in towns in consequence of the density of the traffic at certain points. Nevertheless the fact remains that the prohibition of the loud and penetrating signal would be a very dangerous act, and we feel convinced that the record for practical commonsense which has distinguished the Local Government Board during the past few years will not be broken to please a few who have no practical acquaintance with modern traffic conditions.

A Notable Record.

The bursting in among the world's records of the Argyll car is a particularly noticeable performance, because it has shown that it is possible to do that which many have asserted to be impossible; in other words, it has shown that the sleeve valve engine, or at any rate, the single sleeve valve engine, has an efficiency which is at least equal to that of the most highly tuned poppet valve engine, and that with a properly designed and constructed worm drive as good performances can be accomplished as with a bevel.

Till the Argyll got among the records no really high speed performance had ever been made with a sleeve engine or with a worm-driven back axle, and the fact that this has been done not only demonstrates the efficiency of the Argyll car, but it shows that, properly constructed, the sleeve valve and the worm drive can rival the efficiency of the poppet and the bevel, and for that reason we regard the Argyll performances as being of exceptional interest and value from an engineering standpoint.

HILL-CLIMBING ON A 12-15 H.P. MORS. A hill-climbing test was made the other day on a 12-15 h.p. Mors touring car; a member of the staff of the Sun Motor Co., of Llangollen, who are the agents for North Wales and Shropshire, accompanied by four passengers, not by any means light weights, essayed the climb known as the Old Bwlch at Pentre-dwfr, close to Llangollen. The road at first descends for some little distance, then rises abruptly and continues to rise for three-quarters of a mile with a reputed gradient at the stiffest point of 1 in 4; the surface is extremely rough and deep channels cross it at frequent intervals. The little Mors with the full load climbed it very easily, including a stop and restart on the stiff portion.

Useful Hints and Tips.

The Lubrication of Worm Gear. Back Axles.

IN his paper before the Institution of Automobile Engineers on "Worm Gear," Mr. Lanchester mentioned that the careful test which had been made of worm gear efficiencies on his Daimler-Lanchester testing machine had shown, among other things, that for the lubrication of gearing mineral oils were very inferior to animal or vegetable oils, and he also dwelt on the fact that the efficiency was lowered by the presence of too much lubricant in the gear box, owing to the churning of the oil. He also mentioned that a satisfactory lubricant was composed of a mixture of castor oil, sperm oil, and lard oil. This statement brought several enquiries from various readers; most of the enquirers wanted to know what proportions of the three oils Mr. Lanchester recommended. We, therefore, enquired of him on their behalf, and the reply which he has been good enough to send us is so interesting that we quote it in full. In his letter Mr. Lanchester states:

"I think I may say that, practically speaking, pure castor oil, sperm oil, or lard oil are equally good from the point of view of efficiency for the lubrication of worm gear, or any mixture of these oils is, apparently, as good as one or another of them alone, but they must be pure and free from acid.

"The advantage in mixing them is to get physical properties suitable for the occasion. Thus, where leakage is important an oil like lard oil with a tendency to solidify when not in use may be advantageous, or, for the same reason, a highly viscid oil like castor oil from its leaking less when at work may be indicated by the conditions. On the other hand, when leakage is effectively prevented it is better to add sperm oil in order to keep the oil constantly fluid."

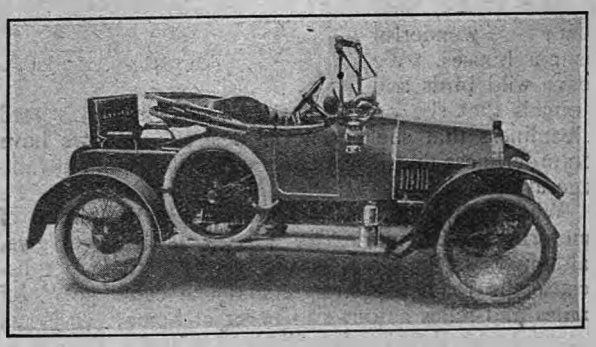
This practical advice of Mr. Lanchester's, which it must be borne in mind is based upon an immense number of carefully observed tests, will, undoubtedly, be of the greatest interest to those of our readers who are desirous of reducing the internal losses of their cars to the lowest possible figures. Incidentally, too, it shows the keen observation and practical deductions which always seem to result from any investigation which Mr. Lanchester makes. All the more observing motorists who have owned more than one car know very well that in some cases back axles and gear boxes leak when standing, but do not leak when running, while others are fortunate enough to possess axles and gear boxes which do not leak at all, but probably none of them would have thought of the simple method Mr. Lanchester has suggested for meeting the two kinds of leaks, as it will be seen that he prescribes lard oil for stationary leaking and castor oil for running leakage, not as remedies but as palliatives.

Incidentally it may be noticed that in some of the makers' instruction books the motorist is warned not to use engine oil, *i.e.*, mineral oil, in his gear box or back axle, and Mr. Lanchester's tests show the soundness of this recommendation, but, unfortunately, the majority of instruction books go no further than to point out the unsuitability of engine oil: they do not, as a rule, commit themselves beyond enjoining the use of a good brand of gear oil. But then, of course, we must remember that the average instruction book is always written on the assumption that there is no such thing as a leaky gear box or back axle, though, as a matter of fact, the majority of them leak more or less at the glands. In some cases these leaks can be stopped by adjustment or the fitting of new washers, but, as a rule, they are due to defects in design, and the curing of them is a matter of the very greatest difficulty; in fact, the renewal of the felt washers in the majority of gear box and back axle glands is so heavy a job that it would only be undertaken in the case of a very thorough overhaul indeed. The average car does not have glands which are readily accessible and that can be instantly reached for the purpose of being repacked, as is commonly the case in regard to the piston rod glands of steam engine cylinders.

Another point to be borne in mind, particularly with regard to underhung worms, is the importance of keeping the oil up to the proper level. If no constant leakage takes place the waste consumption of lubricant is very small indeed, and the car will run almost inconceivable distances without requiring any replenishment of the back axle, but quite a small leak at the gland makes a very great difference. In that case the owner should make a point of frequently ascertaining whether his oil is up to the level, as the quantity which can be carried is small and it may very soon fall below the worm, so that there would be no lubricant at all, and then there is, of course, a very great risk of the gearing and all its bearings becoming seriously damaged.

With bevel gearing and overhead worms, owing to the higher level of the gland, leakage does not have to be so carefully watched, for the simple reason that the gland is higher, and, therefore, there is less likelihood of the oil running out; in other words, the main point of leakage is above the level of the oil and not below it. However, this fact is usually provided for by the makers, as special care is taken with the glands of underhung worm gears, and in the majority of cases provision is made for making it easy to refill with oil and to ascertain whether the oil is up to the proper level.

Undoubtedly, the best form of level indicator is that which also provides the filling orifice for the oil, as it simply means that the removal of the filler cap not only at once shows the level of the lubricant but, also, makes it impossible when pouring oil in to overfill. Why all axles are not provided with this form of combined level indicator and filler we are unable to say, though there is no doubt that it will eventually become universal, as it saves so much trouble and time.



A 1913 model 10-16 h.p. Stoewer car which has been supplied by the Lancashire Motor and Engineering Co., Ltd. A two-seated dickey is fitted.

A Spring Tour in France.

By Owen John.

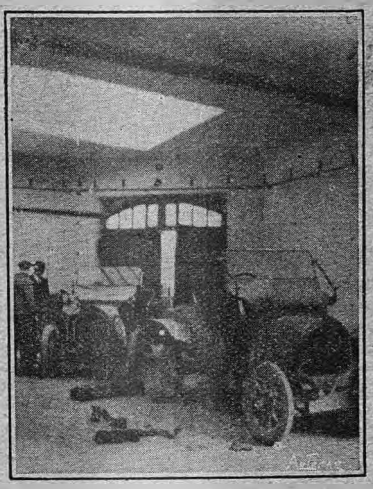
"And I intend to visit my bedutiful country, too. Do you know, I have never been across France yet except by train; and one cannot see much of France out of a railway carriage window." (From an interview with ex-President Fallières on the day of his leaving office.)

THOUGH Rudyard Kipling's line, "What do they know of England who only England know?" is true for us, yet the same sentiment could never be applied to our friends across the Channel, for to them France is France only, and in its wealth and diversity of beauty there is never-ending change and charm. Twelve times now have I crossed it from frontier to frontier, each time for the most part by a different route, and yet there is ever something new to see, something original to note, and always a fresh charm to come away with.

To motor in France is a very different thing from motoring at home. Not for one instant let it be imagined that I give to France every, or even the majority of, advantages. France has not, and can never have, the beauties of our English country villages, buried in high elms, drowsy in the sweet depth of summer. She has not our glorious grass, our sweet-smelling close-cropped downs, our perfect country churches, our exquisite parks, and our wonderful manor houses. We have wild birds and animals that she has destroyed; we have an outward cleanliness that she has never desired; and we have an orderliness that it has never struck her is an advantage at all.

Where, then, it may be asked, lies the charm of motoring in France? The answer is hard to give, although one knows it is a good one. It is not because the roads are straight and one can "get" for miles and miles as one can never at home. It is not because more days can be relied on to be fine than here. It is not altogether because one can be more sure of hotels that will please one than one can expect in the British Isles. But perhaps some of the reason is implied in each of these three, and the rest of it lies in the fact that it is a change. Something entirely different; in fact, something that is an absolutely new phase of existence.

It is surprising how, once aboard in a car on a French road, one forgets all worries and ordinary affairs. Such things as drains, bills, servants, taxes, work, indigestion, and all other minor evils are left behind. Try as one can it is hard to bring them to memory, while the knowledge that telegraphs are everywhere for use if required, and that letters take but little longer than at home to reach one, assure one that one's bliss is not entirely derived from ignorance. The sentiments of the "Lotus Eaters" are not imaginary, the mind does in some degree alter with the heavens.



Preparing the car in the garage at Pontarlier.

All of which foregoing being in the nature of a discursion, we will now proceed to my little tour itself, and I trust I may be forgiven if I moralise on, or draw comparisons from, the many little incidents that occurred during its all too brief sunny days. Sunny days! They tell me that with other English acquirements the Frenchman is beginning to talk about the weather. Personally, I have never noticed more than that he remarks either "*beau temps*" or "*mauvais temps*," except one waiter in Brussels who on the morn of my departure quite spontaneously and viciously volunteered the information that there was "*beaucoup de vent*," as he entered with our early morning coffee.

Yet, in the spring time, of a certainty south of Paris the weather is better than it is at home, for it is seldom that two really bad days follow each other there, while here the only assured fact to us is that any change for the better—if the weather be bad—is extremely unlikely. In short, it is the extraordinary difference that exists between "hope" and "no hope."

On this occasion I went to France without a car, but in an enormous box—on which I had to pay much overweight and hire a special 'bus across Paris because of—I took a pair of bucket seats, a screen, a hood, and a horn. The Customs on the whole treated us and it kindly, possibly imagining from our, and its, appearance that we were the new Tango rag-time duettists just arrived from Cahoose. I opened it once and the *douanier* sounded the horn and blushed at the noise. All was *bien*, so we took it on to Pontarlier, where, I may say, we were bound to pick up my new and beautiful twenty-five horse Zedel *chassis*.

It was there, waiting, but I did not take it because M. Graf—who is responsible for the Zedel and all its works at Pontarlier—suggested that if I waited a few

weeks longer I could have an even newer type, and for my trip he would be pleased to lend me their trial car that had already run forty thousand kilometres and never gave any trouble to anyone. All of which I gratefully accepted, and so we departed on disgraceful grey bucket seats, a raw unpainted back for the luggage, a screen that was much better than it looked, and no hood at all.

A back yard at Bourg.

But what joy a big car with no body to speak of is in a hilly country; one feels like a disembodied spirit, the car does everything on its top. Besides one need not trouble to have it washed; one can strike matches on it and chalk up one's petrol consumption and the prices paid for it. For me, in future, if possible let me always tour in France on a soap box—with a screen. It saves everything, and at Cannes one is looked on as a bold buccaneer.

Before we left Pontarlier for good we decided to visit Switzerland and see, at Neuchâtel, how motors and motorists are harried by the authorities. We went by train, and when we saw the roads by the side of the line all deep in snow where the brilliant sun could not get at them, we were glad. It is a glorious run for scenery, and the fact that the train takes over two hours to cover thirty miles gives one plenty of time to admire it.

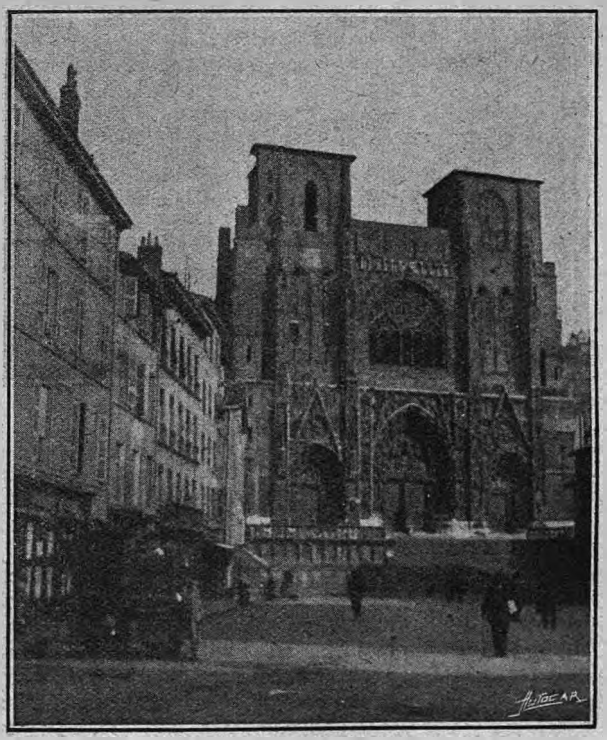
On the borders of the lake at Neuchâtel there is a *table d'orientation*, and on it is etched the panorama in front of it, with almost all the Alps that exist present. Many we could see, and the rest we took for granted, but it struck me then that if the A.A. or the R.A.C. want to do something useful they could not do better than place similar view-finders in many places at home. Already I believe some exist, but there are many places where others could be constructed, and all sorts of travellers would undoubtedly bless those who put them there. Such a point of interest would be a grand draw for any country hotel in England.

I was disappointed with Swiss motors; most of them had International plates, and they, one and all, went along quite as fast, as dustily, and as noisily as their brethren across the frontiers. Also I noted a municipal one, which looks as if commonsense were not entirely absent from the country. Police persecution in Switzerland is evidently, on the surface, exaggerated.

Pontarlier is a clean, quiet town, all amongst the mountains, and its chief industries are *absinthe* and Zedel motors. We were there on a market day, and by the look of the crowds I imagine that most of them had got out of being snow-bound in their *chalets* for the first time that day. But the men were of a very good-looking type, and I could see no such slacking or loafing as one notices further South. Perhaps because it is usually too cold to stand still.

The Zedel factory is of a modern type, constructed on the same plan as the Talbot manufactory in London. On a preliminary run I was taken up fearful roads into the forests, amid the snow, and where we turned there was a cross erected to the memory of a young officer killed there in the war of 1870. There are many such in those parts and elsewhere. Perhaps if we in England had ever-present memories of the horrors of invasion we might be keener to see it did not happen again; it has often occurred to me that we fail to realise what war is, because its battles and its sadness have, in recent centuries, always been elsewhere and far away.

The road from Pontarlier to Lons-le-Saunier is fifty miles of diversity, first across barren rolling uplands, very like our Salisbury Plain, where the brown grass lay flat and dead, killed by the frost or scorched by the sun. The surface was poor and stony, the villages were dirty, and only the view of the mountains round was interesting. Then came pine woods, glimpses of lakes, gorges, passes, sawmills, and, at last, two thousand feet lower down, France as usual, with bullock carts, vineyards, and every yard of ground tilled to within an inch of its life.



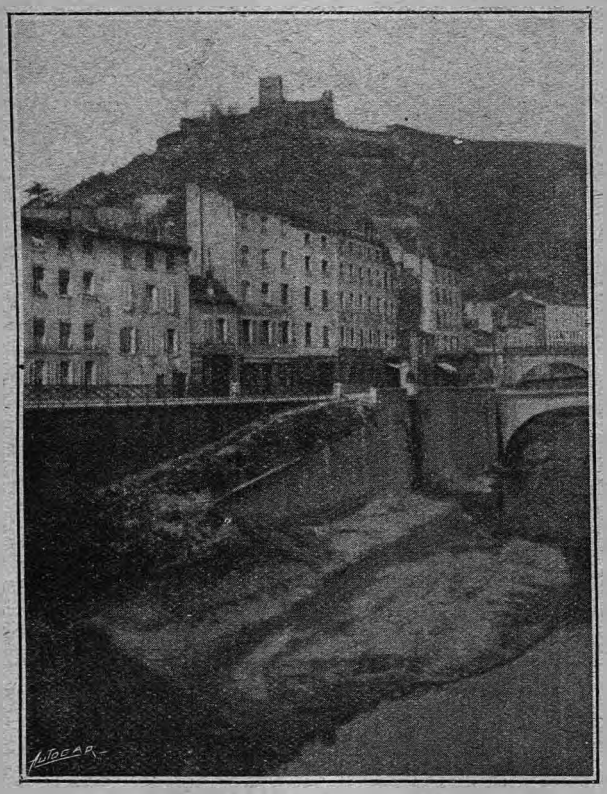
The cathedral at Vienne.

Lons-le-Saunier is a charming little town, a health resort in its way, and possessing, I hear, a very excellent hotel. It is a great centre for excursions to the miniature lake district that lies between it and the Jura mountains, and—lest I forget it—the best things to eat all round this part of France are the

A Spring Tour in

trout cooked as trout ought to be cooked. It may be considered greedy at home to talk of one's food; the French think otherwise, and I agree with them that it would spoil some folks' pleasure altogether if they found subsequently they had missed the special delicacy of a place they had been staying in.

From here we made more south, skirting the wide plain of Burgundy and running along a splendid and direct road to Bourg, where we lay the night. Bourg is a clean town with one great attraction, the Eglise de Brou, which is so famous and its interior is so perfect that the State has taken it over, and a guardian in a cocked hat sells you postcards, which he displays upon the steps of the altar itself. In all the world there are no finer carvings or stained glass, Burgos Cathedral itself has none better, and the tombs of Margaret of Austria and Philibert le Beau are exquisite in their carving. Personally I prefer Burgos



On the river side at Vienne.

because the building is still used for its original purpose, but, as a "show," Bourg is just as good. Outside also there is a movable sundial that is as full of tricks as a modern carburetter.

We stopped at the Grand Hotel de Paris, which was good, clean, and as inexpensive as all its type are. The food was original, and the company—including a lady in corkscrew ringlets and an ultra-motoring bonnet—amusing. Customers here take their eating seriously, and the wine—*compris*, of course—was excellent. The local delicacies are *pralines*, and the fat young commercial travellers seemed to eat a great many of them.

The roads into Bourg appeared to be undergoing repair, and a railway along one of them does not increase *circulation*. From here to Lyons, some forty miles, the route is dull but fast, and there are many little lagoons and dull villages. We bought our first lot of petrol at one, Villars, and five *bidons* came to fourteen francs, which works out at 2.80 (or 2s. 4d.) a *bidon*, very much the same thing as two shillings a gallon, for four *bidons* hold about five gallons, or should. I say "should," because very often, unless one looks for oneself, a can not nearly full is handed over, and on several occasions I made remark on the matter. With the smile of the good loser another can was always proffered in its stead, from which I deduce that the occurrence is an ordinary one and not unexpected.

Here I may remark that 2.80 francs was the highest price charged us anywhere outside an *octroi*, while near Marseilles it sank as low as 2.30, and by Cannes benzole was obtainable at 2.30 or *essence* at 2.50. The reason, I believe, that petrol is cheaper down South is that the refineries—France does all her own refining—are situated on that coast at Cette and elsewhere. All petrol on this tour seemed to me to be dirtier than usual, and to contain more water, but I daresay this is because its sale is more general. I did not measure the contents of any *bidons*—"It is better," said Benjamin Goldfinch, "to trust and be deceived than to suspect and be mistaken"—but I found some leaky ones. In England, according to a correspondent, many of our petrol tins cannot hold two gallons; this, he tells me, he found out when he took them to a benzole distillery to be filled. Has anyone else noticed it?

I have inserted this digression because the road to Lyons was dull, but after Lyons—an enormous and most regular collection of houses—dulness ceased, and all the way to Vienne was as undulating and open as one could desire. Yet Lyons is a pleasant city to drive through, because one follows the river all the way, and when two such great streams as the Rhone and the Saône make four wide main streets, it is easy to find one's way from one end to the other.

Between Lyons and Vienne we lunched on a hillside in a broiling sun. There were swallows, there were butterflies, there were lizards, and there were bicyclists who mopped their faces as they pushed up the dusty road. Thus we realised we had arrived in the South, and therefore we rejoiced. So to Vienne, which is a fine old town on the banks of the united river, with Roman towers, a splendid cathedral, sheltered terraces, and some picturesque bridges. The first time I visited Vienne it was bitterly cold, and the ice-floes growled all night as they fought their way down to the sea: this time all was balmy, and it was here I changed my motoring coat for my disgraceful summer "slip-on."

The main road—one of the mainest roads in France—along the left, or east, bank of the Rhone, from here all the way to Avignon is bad, and although some parts of it are passable, on the whole it may be described as heart-breaking. Principally that this was so was our excuse for coming home along the other bank, by a road not so well known but infinitely more comfortable.

But we must not anticipate; at present we are coming to Valence. Good or bad—and every kilometre varies on this well-known road—it was always dusty, and I tried to be less execrated by pulling up entirely, or slowing down extremely, whenever we met soldiers on the march. This is the least one can do, but, from the thanks we received, it was evidently the exception rather than the rule.

So in the evening we came to Valence, where we abode at the Hotel d'Angleterre, a small but comfortable inn looking over the big square, and in charge of a most charming young lady. My list of hotel

bills is coming later, but this one has a good place in it for comfort and moderation.

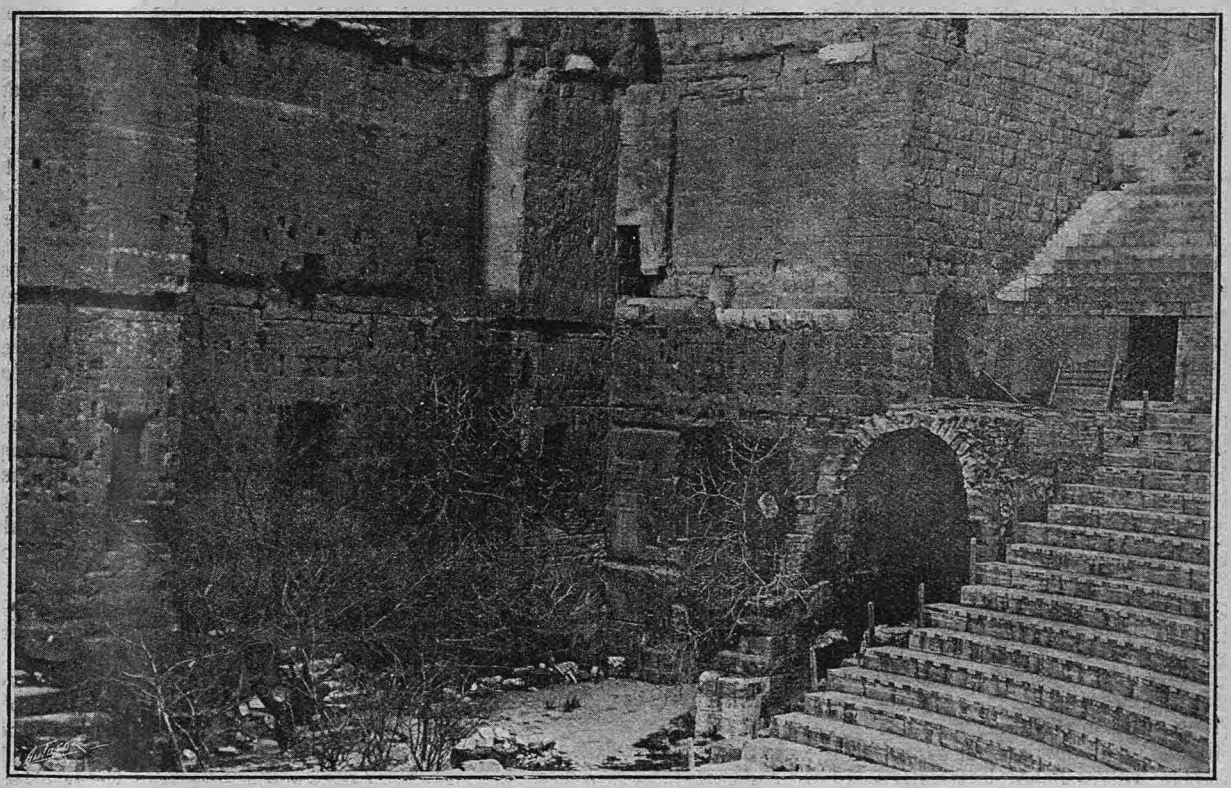
Valence has many railways; some apparently underground, one certainly in the main street. It has good boulevards and a fine modern bridge across the river, on which latter are inscriptions all about who built and opened it. I am no Roman scholar, but there were two dates given in Roman figures. One was MCMV., and the other was MDCCCCV. Now I take it that both mean 1905; are both correct or is one wrong? I have no authorities to settle the matter.

When we had inspected the bridge we looked westward, and behind the ruins of the old castle of Crussol perched high on the mountains of the Pilat range the sun was setting, throwing the high cypresses on the flats across the river into dark shadow and lighting up the glowing blossom on the peach trees in the water-gardens. It was very lovely, and after it there was a merciful twilight that disguised the odd looking statuary in the principal street. Valence is a picturesque and interesting town, full of old and half-old remains, and, because of its railways and motor 'buses, it is a very good centre from which to make excursions into the surrounding country.

After Valence comes Montelimar, which is noted for narrow streets and *nougat*. That, because of a too-tightened screw, I went through Montelimar on a market day with a clutch that was a fixture, must be one excuse for not saying more about it: that we slept here on our return is another. Less than thirty miles down the road is Orange, and here are well-known objects of interest. To begin with, as one approaches, the celebrated Roman *Arc de Triomphe* comes into view, and unless one is very careful, so impressed one can be that very likely one will run the car down a flight of steps, under the impression that the main road follows through it. But, in reality, it goes round, and one can admire and marvel without getting out.

Inside the town is the Roman Theatre, an equally interesting subject, still fairly perfect and of quite a different sort from the usual kind. How big it is one does not at first realise, and the presence of the original stage makes it clear how it was used by its founders. It is quite a different type of building from any other existing Roman remains, such as those at Syracuse, at Nîmes, at Arles, or at Rome itself. According to Baedeker, the back wall of the stage is 340 feet long and 118 feet thick. Colossal!

We lunched outside the town amid cork and olive trees and small vineyards. The dust was deep and all cars that passed had cut-outs. Now I consider cut-outs very useful things for some purposes, but was there ever a Frenchman in France who had one on his car and did not use it all the time—even going downhill? Their abuse is intolerable, and one never hates them so much as when in the early hours of the morning some beastly chauffeur is taking out his car. Vile brute, he doesn't mind who or what he wakes, and I feel sure that a soft-hearted French jury would acquit with kisses anyone charged with murdering such an one. He might even get a little ribbon.



Inside the ruins of the Roman theatre at Orange.

Although it is interesting to pass through the picturesque villages of Montdragon and Piolenc and many another, all the main road each side of Orange is in a shocking condition, and the dust from passing motors is never absent. All roads from the North to the South—or, at any rate, the traffic on them—seem to collect here, and our lunch would have been a wretched one had we not gone well inland to eat it. We gave a wall-eyed Dalmatian hound what was left of some Roquefort cheese that we had bought by mistake, and left hurriedly.

(To be continued.)

The 20-25 h.p. Studebaker.

Four Cyls., 105 × 127 mm. Gears on Back Axle. Electric Lighting and Engine Starting.

THIS car may be described as one of the most carefully and originally designed automobiles that come to us from the other side of the Atlantic. By reference to the side elevation of the chassis, it will be noticed that the frame is, as usual, of channel section steel, kept narrow, slightly inswept at the dashboard, and very smartly upswept over the back axle. The cross members are, save for that which carries the radiator, of channel section. The engine is supported by downswept deep section lanterned members of this character, while the frame is stiffened rearward by cross members in the usual way.

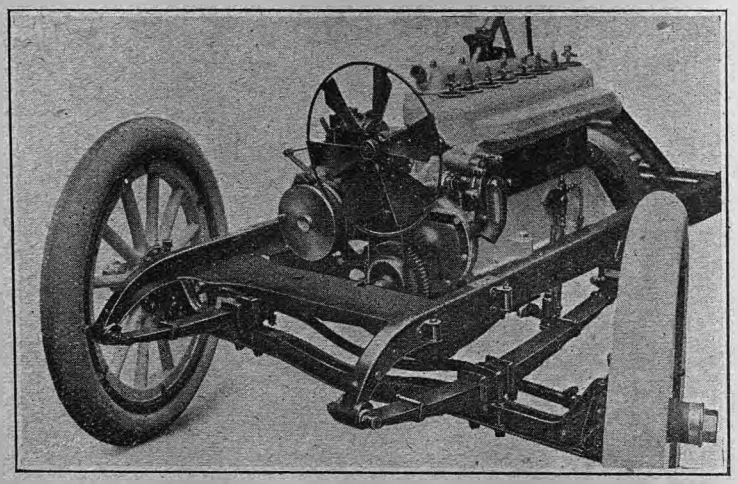


Fig. 1.—Three-quarter front view of the 20-25 h.p. Studebaker chassis, with the radiator removed.

The four cylinders of the engine are cast *en bloc*, the bore and stroke being 105 mm. and 127 mm. respectively. The valves are all on the near side, the valve stems and tappets being protected by a single cover plate. The exhaust trunk is formed in one with the cylinder casting. The water circulation is ensured by means of a centrifugal pump accessibly positioned on the left front of the engine. The upper part of the crank chamber is of cast iron, the under cover being of pressed steel, and forming an oil reservoir or sump, and being bolted to and forming an easily detachable bottom of the crank chamber. It thereby affords a ready means of inspection and facility for adjusting the bearings without dismounting the whole engine. The crankshaft runs in three long white-metal bearings. It should be noted that the cylinders are set *dèsaxé* on the crank case.

The valves have electrically welded heads, and the valve tappets are adjustable. The tappet heads are countersunk, and each fitted with a fibre pad to deaden the blow on the valve stem. The camshaft, with which the cams are integral, runs in three bearings, and includes a cam for operating the oil pump. A thrust washer is fitted at the forward end. The pistons are of unusual length, and have four rings, three above the gudgeon pin and a scavenger ring below. The gudgeon pin takes the form of a cross head, having the small head of the connecting rod fast upon it, and rocks in bearings carried in lugs formed on the piston walls.

With regard to the lubrication, a plunger pump, directly actuated from the camshaft, raises oil through a strainer kept well off the floor of the sump in a special suction chamber, and delivers it under pressure by suitable ducts to the crankshaft and camshaft bearings. It also supplies oil to four troughs, one under each connecting rod, into which the latter dip at each revolution, and by spray lubricate the gudgeon pin, cylinder walls, and cams. The pump is fitted with spring return to keep it hard up against its operating cam. An oil level indicator is fitted to the side of the crank chamber, which is easily visible when the bonnet is raised and shows the quantity of oil in the sump.

A further delivery from the pump runs to a sight gauge glass on the dashboard, and thence to the distribution gear case in the front of the engine.

The ignition is by the Splitdorf dual magneto and battery system. The magneto is set upon a table formed at the front of the engine, and is driven by a cross-shaft, which shaft at its other end rotates the water circulating pump. The working face of the

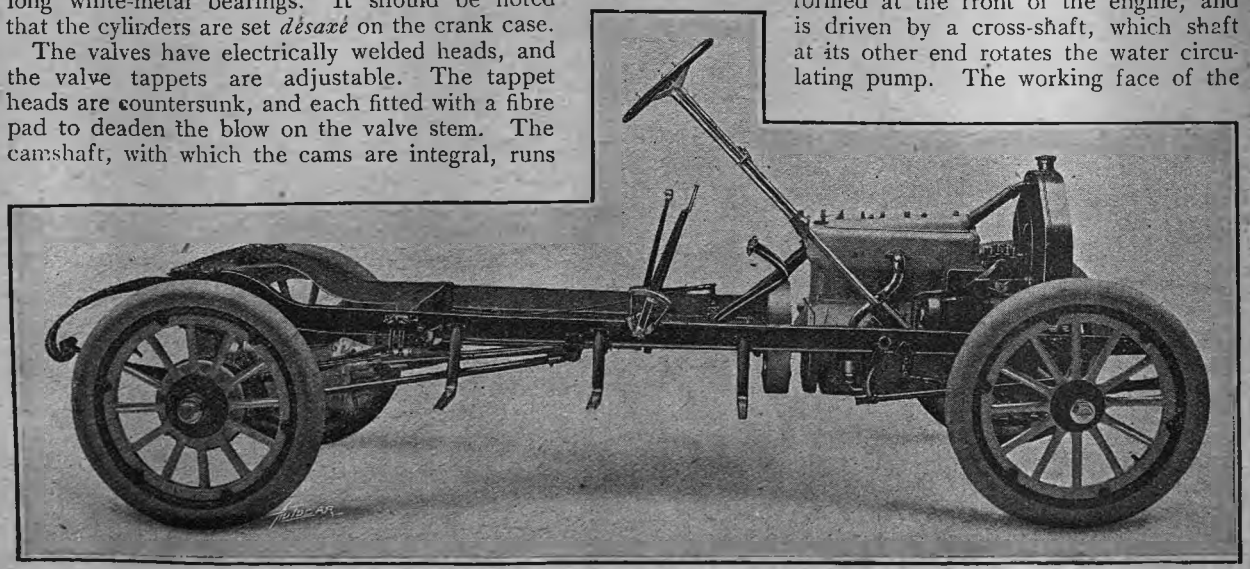


Fig. 2.—Offside view of the 20-25 h.p. Studebaker chassis.

magneto is set in a particularly accessible position facing to the offside.

The distribution gear, which is contained as usual in the distribution gear case in the forward portion of the crank chamber, has helically cut teeth. The driving wheel on the crankshaft and the driven wheel

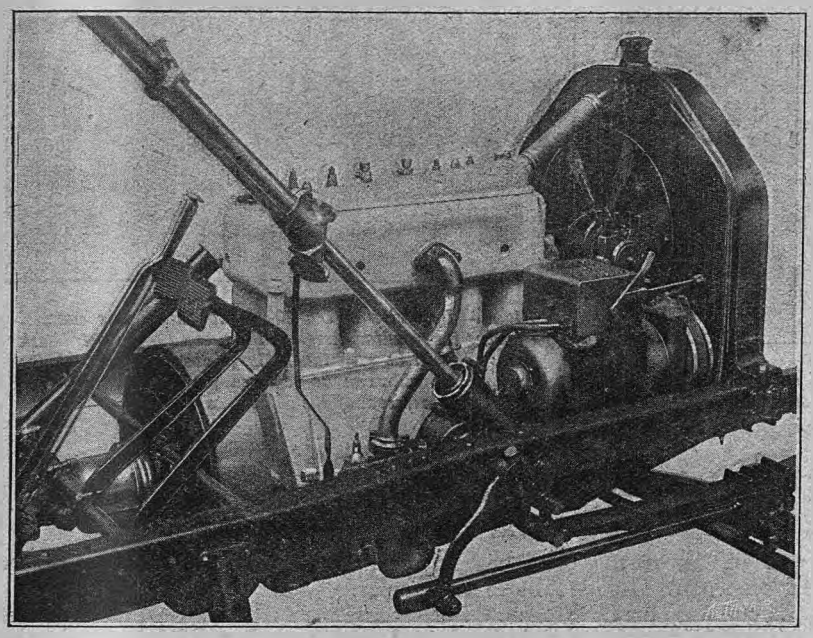


Fig. 3.—Offside view of the 20-25 h.p. Studebaker engine, showing the engine starting and car lighting dynamo, the magneto, top of the carburetter, steering gear, and other details.

on the pump and magneto spindle are drop forgings. The camshaft wheel is of cast iron. The magneto is driven through an Oldham joint with a Vernier adjustment disc coupling.

The carburetter is set low on the offside, the induction pipe communicating with a passage formed across the cylinder casting to the valve pockets. The carburetter has an automatic air valve fitted with two springs, one light for slow and the other stronger for fast running.

The drive is transmitted to the gear box through a leather-faced cone clutch of large diameter. The clutch cone is of pressed steel, and first intention springs are provided beneath the clutch leather. Holes are drilled in the spigot for feeding oil to the clutch sleeve. The universal joint is enclosed at the head of the propeller which is thus directly coupled to the clutch, the gear box being on the back axle. The propeller-shaft is unenclosed and connects with the intermediate gearshaft at the rear by means of a form of plunging joint.

The gear box, which is integral with the differential gear casing, contains gearing affording three speeds with direct drive on top. The gear is operated by a simple form of gate change.

The back axle will be noted as a particularly fine example of pressed work. It is formed in two sections with the edges turned over, and hydraulically pressed together and riveted below, making a remarkably strong job. The tubes carrying the bearings on which the road wheels rotate pass right through the casing.

Threequarter elliptical springs are carried on rocking tables furnished with lubricators. Tabs are formed on the lower leaves of the springs to prevent spreading, and the front wheels are provided with triple clips at the points where they are secured to the axle.

The steering gear is of the worm and worm wheel type giving ample adjustment. The wheels are 875 × 105 mm. Both sets of brakes take effect on the large brake drums which form the rear hubs; the pedal-applied brake is of the contracting order, and the side lever brake of the internally expanding shoe type. The contracting bands are lined with camel hair fabric. The internal shoes are enclosed by a steel casing.

An electrical engine starter is fitted, the dynamotor being placed on a table formed on the offside of the crank chamber, and normally, *i.e.*, when acting as a dynamo, driven from the crankshaft by a silent chain. For engine starting purposes the dynamo becomes a motor, and by operating a flexible coupling running up the steering column the driver can bring into action a train of epicyclic gearing through which the power is conveyed from the dynamotor to the silent chain, and thence to the crankshaft. With this arrangement, therefore, a very considerable gear reduction is obtained for engine starting. The dynamotor is capable of turning the motor at 300 r.p.m., and also supplies current for the

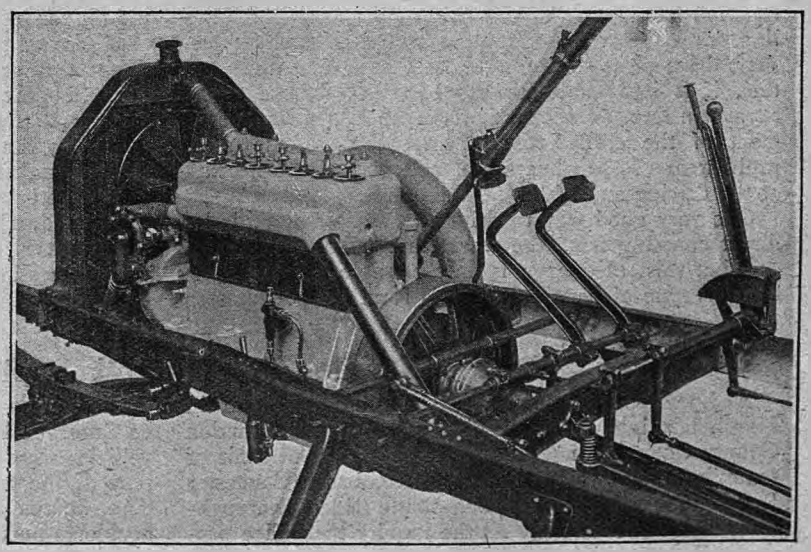
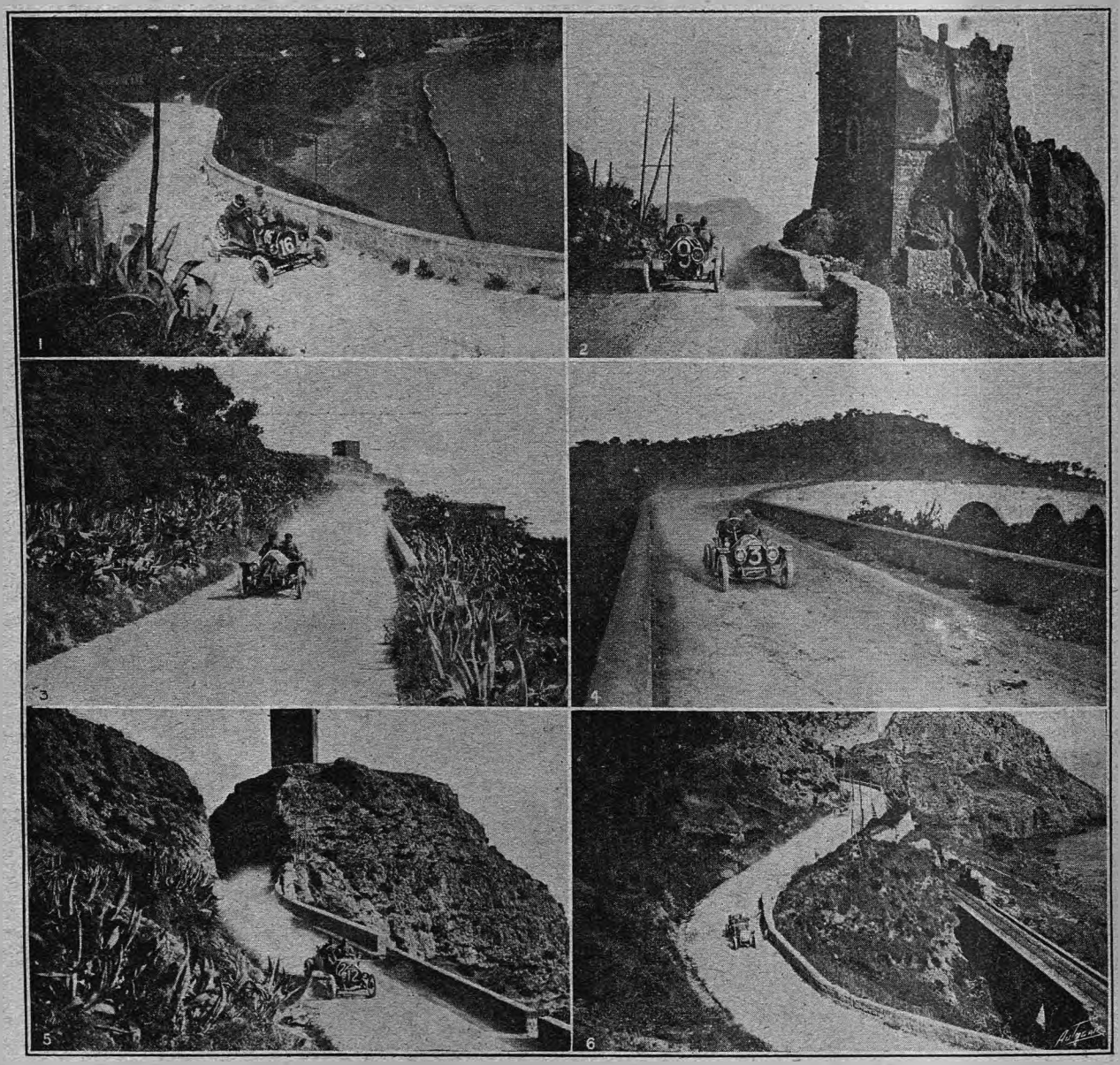


Fig. 4.—The engine and clutch of the 20-25 h.p. Studebaker from the near side. Anchored to the cross member behind the clutch can be seen the spring-suspended head of the torque member. It will be noticed that the propeller-shaft connects directly to the clutch through an enclosed universal joint. On the near side of the crank chamber is the cam-driven plunger pump of the oil circulation.

The Latest White and Poppe Carburetter.

that existing carburetter operating connections can be used. A plug is also set in the side of the float chamber body, so that the petrol level can be easily determined. The float spindle is provided with an adjustment so that the height of the level can be varied as follows. The collar which engages with the inward ends of the balancing arms upon which the rising float strikes in order to cut off the petrol supply is attached to the float spindle by means of a screw thread, so that by screwing the collar up or down the spindle, the necessary adjustment can be effected. The adjustment is locked by means of a split pin passed through an extension of the collar and the spindle. The balance weights at the end of the float striking arms are made in the form of rollers, so as to avoid unnecessary wear at the top of the float itself. Every part of the passage ways from the float chamber to the jet is capable of being easily cleaned out. A dirt trap is provided at the bottom of the float chamber. This trap is so attached to the body of the float chamber that it can be set to receive the petrol supply pipe at any angle in a horizontal plane.

Excellent workmanship is put into the White and Poppe carburetters, and it is worthy of note that all nuts which might in any way be exposed to undue corrosion are made from special phosphor bronze.



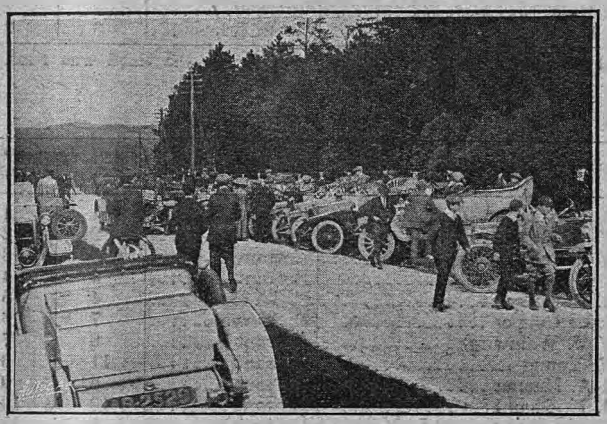
THE RACE FOR THE TARGA FLORIO. Examples of the difficult nature of the course, and some of the competing cars. These illustrations are referred to on page 1010. 1. Fracassi on the Ford. 2. Ceirano on a S.C.A.T. 3. Minoia on the Storero. 4. De Moraes on one of the F.I.A.T. team. 5. Giordano on another F.I.A.T. 6. Turne on a Renault.

A length of twenty-four miles of new road which is to encircle the whole of the Island of Anglesey has just been formally opened to traffic, by means of a trip over it in motor cars. Only about ten miles more remain to be completed. The section which has been opened was reported to be in excellent condition, though it is narrow in parts, and has several awkward turnings. The districts opened up are interesting from a scenic point of view; no one with an eye for natural beauty would use the road as a speed way.

The Open Hill-climb at Aston.

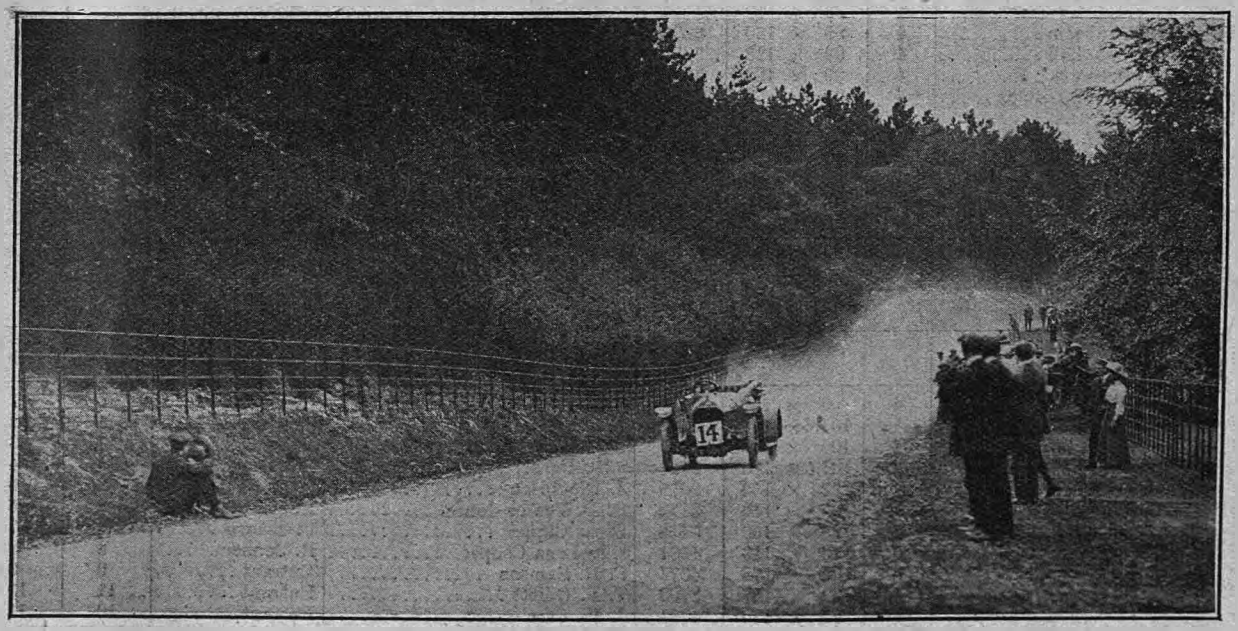
A Well-attended and Interesting Event Promoted by the Herts. County A.C.

THIS sporting competition, annually promoted by the Herts County Automobile Club, becomes more and more interesting every year. Certainly the fixture was blessed with the most perfect weather last Saturday; the hill itself was in as good condition as a flint surface hill can be in dry weather, with just enough wind blowing across to take some of the dust away, and the management and administration were impeccable from start to finish. The attendance was a record one for the occasion, cars being packed in lines all up the hill wherever they could be bestowed in safety. The spectacle of the afternoon was assuredly Mr. A. J. Hancock's sensational climb on the 30-98 h.p. Vauxhall with its 98 × 150 engine. We question whether it would have been possible to take the bends at any higher speed, as the car was dry side-slipping all round them owing to the tremendous pace it made. It is an interesting blend of one of last year's Coupe de l'Auto chassis with the new 98 × 150 mm. engine, and consequently the ratio of power to weight was in favour of speed. Indeed the machine was and looked a veritable flier. Mr. Kidner's car also produced some sensation at the bends, where it swept perilously near the line of cars at two or three points. It should be noted that Mr. Hancock's Vauxhall time is record for the hill. Also notable is the double win by Mr. W. O. Bentley on his 12-15 h.p. D.F.P., first on formula and first on time in Class II., repeating his performance of last year. Mr. S. S. Barber, on a 25 h.p. Talbot 101.5 × 140, is to be congratulated on his win on formula in Class IV., for he competed in very hot company, and was only 14⅘s. behind the fastest against the clock in his class. Mr. Barber is an amateur and a member of the Herts Club, and was pitted against two or three of the best drivers in the



ASTON HILL-CLIMB. Cars lined up at the side of the road before the start.

ASTON HILL-CLIMB. After the hill-climb Mr. Alfred de Rothschild entertained eight hundred visitors to the climb in a marquee 800 feet above sea level on his estate near by.



ASTON HILL-CLIMB. A scene on the hill with the D.F.P. car, winner on time and formula in Class II., approaching.

The Open Hill-climb at Aston.

industry. Mr. Barber also takes the Jay Cup, which is put up for simultaneous competition by the members of the Club driving their own cars. In this class second on formula fell to Mr. C. D. Pierce-Jones, who is also an amateur driver, on his 25 h.p. 95 × 140 Vauxhall. Incidentally these two gentlemen will form part of the team selected to represent the Herts Club at Brooklands to-day (Saturday). The best handicap performance, irrespective of class, was put on by C. Bianchi on a 15 h.p. Crossley. Although, of course, not in it for sheer speed, the performance of the 38-80 h.p. Métallurgique limousine was remarkable. Owing to its big body, huge tyres, and so forth, it was the heaviest vehicle which climbed the hill, and the speed

CLASS I.—For Cars up to 10 h.p. by Formula.

List H.P.	Car.	No. of Cyls.	Bore and Stroke.	Weight in lbs.	Entrant.	Driver.	Formula Placing.	Time Placing.
10-16	Baby Mathis	4	65 × 100	1848	J. W. Lenanton	Entrant	1	1
10-16	Baby Mathis	4	65 × 100	1925	E. E. C. Mackenzie Martin	Entrant	2	2
7	De Dion Bouton	2	66 × 120	1883	J. W. Stocks	W. B. Boyle	3	3

The time of the fastest car was exceeded by the second fastest to the extent of 16⅘ secs., while the third was 1 min. 54⅕ secs. slower than the first.

CLASS II.—For Cars of over 10 h.p. and up to 16 h.p. by Formula.

List H.P.	Car.	No. of Cyls.	Bore and Stroke.	Weight in lbs.	Entrant.	Driver.	Formula Placing.	Time Placing.
12-15	D.F.P.	4	70 × 130	2289	W. O. Bentley	Entrant	1	1
14	Humber	4	75 × 130	2618	W. G. Tuck	Entrant	2	2
13.9	Stoewer	4	75 × 88	2303	W. Turner Smith	Entrant	5	3
10-14	Grégoire	4	65 × 130	2681	S. C. Westall	Entrant	3	4
12-14	Vinot	4	70 × 110	2632	H. Ramoisy	E. W. Brooks	4	5
10-12	Métallurgique	4	75 × 96	2457	Oscar Cupper	B. Brown	7	6
*12	Rover	4	75 × 130	3192	W. J. Wainwright	Entrant	8	7
*12	Rover	4	75 × 130	3059	W. Young	Entrant	11	8
12-20	Brenna	4	70 × 102	2639	C. A. Macrae	Entrant	6	9
12	Laurin and Klement	4	70 × 115	2590	H. K. Chambers	Entrant	10	10
14-18	Adler	4	75 × 120	3241	Morgan and Co., Ltd.	E. Brandt	9	11
15	Iris	4	80 × 114	3106	H. F. Hodges	Entrant	12	12
14	De Dion Bouton	4	75 × 130	3304	J. W. Stocks	E. V. Fielder	13	13
*11.9	Arrol-Johnston	4	69 × 120	2765	F. G. Warwick	Entrant	14	14
10.9	Stoewer	4	65 × 118	2821	H. Booker	Entrant	15	15

The time of the D.F.P. was 7⅘ secs. better than that of the Humber, while the 13.9 Stoewer was 36⅕ secs. slower than the first-named.

CLASS III.—For Cars of over 16 h.p. and up to 25 h.p. by Formula.

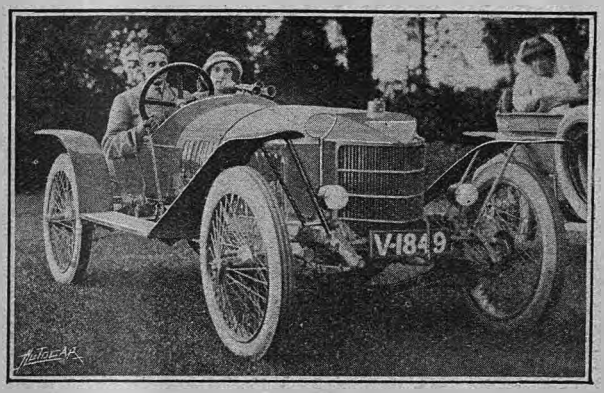
List H.P.	Car.	No. of Cyls.	Bore and Stroke.	Weight in lbs.	Entrant.	Driver.	Formula Placing.	Time Placing.
15	Talbot	4	90 × 140	3892	Earl of Shrewsbury and Talbot	H. G. Day	3	1
20.1	Vauxhall	4	89.6 × 120	3570	J. Barber Lomax	Entrant	2	2
15	Crossley	4	79.4 × 123.8	3108	W. M. Letts	C. Bianchi	1	3
12-16	Sunbeam	4	80 × 120	3094	E. Genna	Entrant	4	4
16.9	S.C.A.R.	4	82.5 × 140	3311	McL. Staight	C. J. C. Street	6	5
*15.9	Shelsley-Crossley	4	80 × 130	3213	H. O'Hagan	Entrant	5	6
*12-16	Sunbeam	4	80 × 150	3206	Miss Laura B. Starkey	Entrant	8	7
16-20	Vauxhall	4	90 × 118	2975	P. C. Kidner	L. Munro	12	8
16-24	Gregoire	4	80 × 160	3213	Donald Cohen	Entrant	11	9
15-18	Bedford-Buick	4	95 × 95	2912	General Motors (Europe), Ltd.	C. Catlin	10	10
15-20	Vinot	4	80 × 130	3080	Gordon Usmar	Entrant	9	11
15.9	S.C.A.R.	4	80 × 140	3668	C. J. C. Street	W. H. R. Walker	7	12
16	Ariel	4	80 × 150	2954	E. Herington	H. A. Hale	13	13
15-18	Hupmobile	4	83 × 140	2779	C. R. Clark	Entrant	15	14
*16-24	Unic	4	90 × 130	3724	Mrs. Punnett	Entrant	14	15
18	Florio	4	85 × 130	3248	E. Gillett	Entrant	16	16

The fastest car, the 90 × 140 Talbot, occupied 2⅗ secs. less than the second fastest, the 89.6 × 120 Vauxhall. The third on time, the 15 h.p. Crossley, was 6¼ secs. slower than the Talbot.

CLASS IV.—For Cars of over 25 h.p. by Formula.

List H.P.	Car.	No. of Cyls.	Bore and Stroke.	Weight in lbs.	Entrant.	Driver.	Formula Placing.	Time Placing.
30-98	Vauxhall	4	98 × 150	2282	A. J. Hancock	Entrant	4	1
20-25	Crossley	4	101.6 × 140	3052	G. H. Woods	C. Bianchi	3	2
27	Métallurgique	4	105 × 165	3367	Oscar Cupper	Entrant	7	3
*25	Clément-Talbot	4	101.5 × 140	3794	S. S. Barber	Entrant	1	4
30-98	Vauxhall	4	98 × 150	2975	J. Higginson	P. C. Kidner	5	5
*25	Vauxhall	4	95 × 140	3178	G. D. Pearce Jones	Entrant	2	6
38-80	Métallurgique	4	125 × 150	5418	Oscar Cupper	B. Brown	6	7
48	Rolls-Royce	6	113 × 119	4991	Miss Lena Cooper	R. Jenner	8	8
25.6	Hutton	4	102 × 178	4074	F. R. Samson	Entrant	9	9
25	Paige	4	102 × 127	3703	T. F. Gillett	Entrant	11	10
26	De Dion Bouton	8	75 × 130	4781	J. W. Stocks	Entrant	10	11

Second and third fastest cars took 10⅗ secs. and 14⅗ secs. respectively longer than the Vauxhall driven by Hancock. The fourth on time, the 25 h.p. Talbot, was only ⅕ sec. slower than the third.



ASTON HILL-CLIMB. Hancock on the 98 × 150 mm. Vauxhall, which made fastest time of the day.

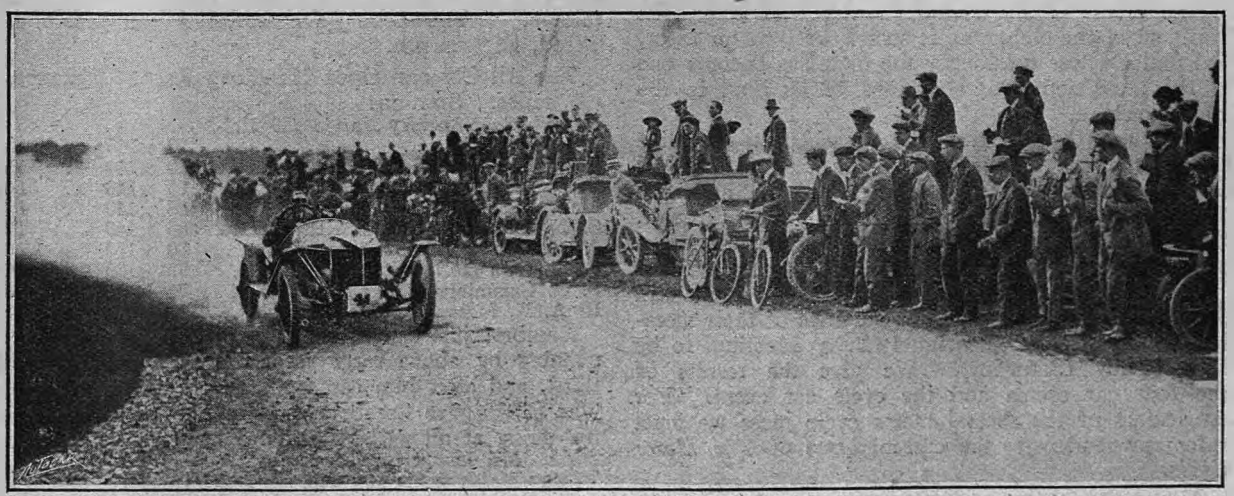
it made would have been impressive on any other occasion than that of a competition in which semi-racers were predominant, so far as the faster times were concerned. The competition was expeditiously carried out and was over in excellent time to allow the members of the Club and their friends and the competitors to enjoy the hospitality of Mr. Alfred de Rothschild. The thanks of the competitors and the public are due to the following gentlemen who worked hard throughout the day for the success of the competition: Mr. E. H. Godbold, clerk of the scales; marshals at foot and top of hill, Messrs. C. R. Andrews and G. Lambert; timekeepers, Messrs. F. T. Bidlake and T. D. Dutton; and last, but not least, the hon. secretary, Mr. A. J. Salmon, whose directing hand was over everything, and to whom the rest of the success is undoubtedly due.

ASTON HILL-CLIMB. Miss L. B. Starkey, an enthusiastic participant in many hill-climbing competitions, at the wheel of her 12-16 h.p. Sunbeam.

ASTON HILL-CLIMB. The start of the climb. Mr. J. W. Lenanton on the 10-16 h.p. Baby Mathis. The first to ascend the hill and fastest in Class 1.

ASTON HILL-CLIMB. Bianchi on the 20-25 h.p. Crossley at the finishing point. Second fastest time of the day.

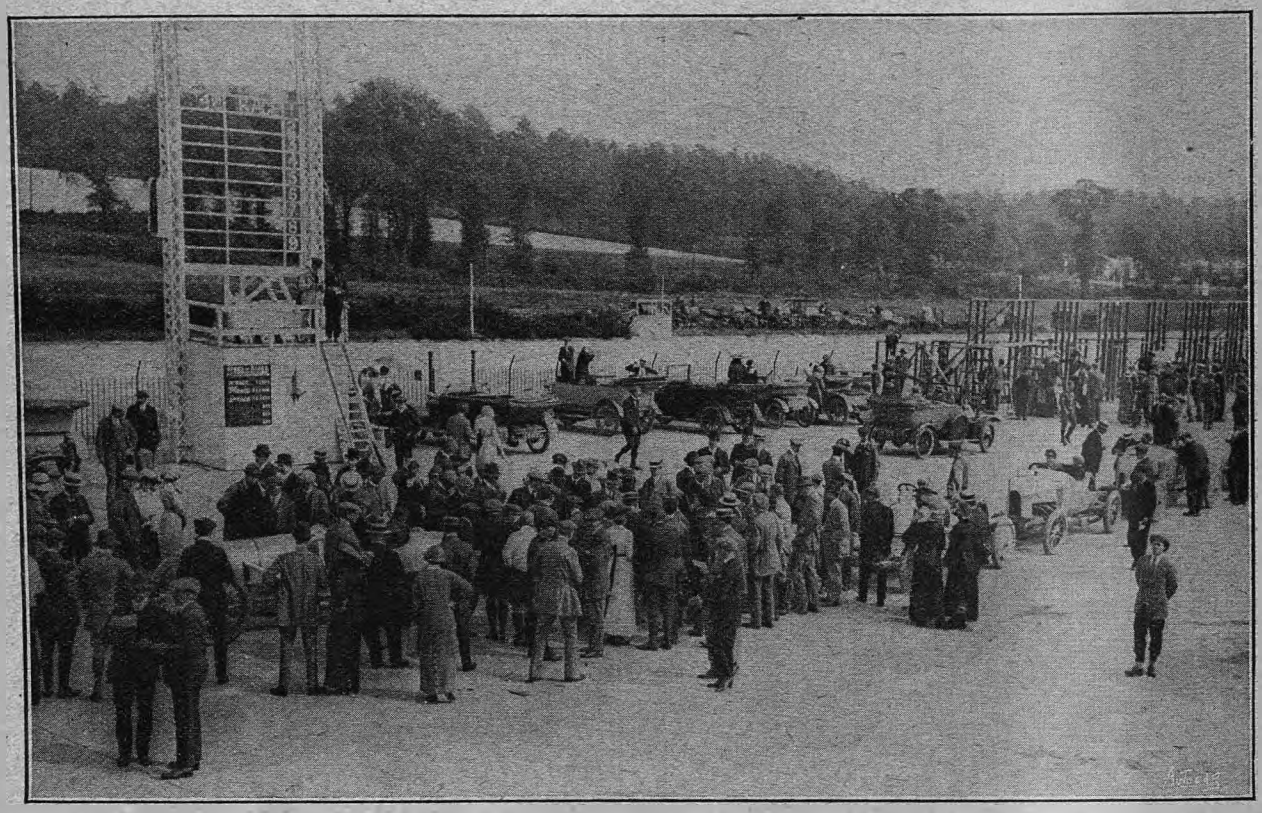
Among the spectators on the hill during the competition was Madame Melba, the great "Cantatrice," who was a guest of Mr. Alfred de Rothschild, the host of the day.



ASTON HILL-CLIMB. Hancock at full speed on the 30 98 h.p. Vauxhall, which made fastest time of the day.

On the Track.

The Essex Motor Club's Meeting. World's Record Breaking by the Argyll.



A scene in the Paddock during the race meeting organised by the Essex Motor Club at Brooklands last Saturday. Cars lined up for one of the open events.

THE second annual race meeting of the Essex Motor Club was held at Brooklands on Saturday in glorious weather. An ambitious programme of eleven events was carried out punctually and in good style. Many of the entrants were seasoned Brooklands racing men, like Mr. Percy Lambert, Mr. A. G. Brown, Mr. Shersby Harvie, Mr. S. G. Cummings, and Mr. Pollak, to name only a few.

Everyone voted the meeting a great success, and there is talk of another meeting in September. Much of the credit is due to Mr. S. G. Cummings, the president of the club, who is such a keen motor racer, and under whose presidency the club has become one of the most active organisations of its kind in the home counties.

It is well known that the Brooklands executive offered the use of the Track free this year to all county clubs associated with the R.A.C., and, the proposed Kent Club meeting having fallen through, the Essex Club is the only one that has managed to organise a meeting by itself.

We say "by itself," as no doubt other clubs will find an outlet for the racing proclivities of their members in the R.A.C. Associated Clubs' Meeting, to be held to-day (Saturday). We give the results of the four car events and the cycle car event. For particulars of the several motor cycle races we must refer our readers to the current issue of *The Motor Cycle*.

It was not clear why Mr. Cain was allowed to run his Calthorpe in the second open race, but apparently it was permitted to be substituted for a similar car entered by Mr. Read.

The Members' Touring Car Handicap. Distance, 5¾ miles. Starters:

	Bore and stroke.	Handicap. m. s.
F. W. Keddie (24.8 De Dion) ...	100 × 140 ...	scr.
R. C. Fish (24.8 Berliet)	100 × 140 ...	scr.
D. S. Parsons (8.9 Turner)	60 × 100 ...	1 50

The Berliet got away very smartly, and won by about 100 yards apparently with plenty of speed in reserve. The Dion gave up after the first lap. Speed, 46½ m.p.h.

The All Comers' Open Handicap Race. Distance, 5¾ miles. Starters:

R. Robertson-Shersby-Harvie (30 Rolland Pilain)	110 × 165 ...	scr.
Percy Lambert (15.9 Singer)	80 × 149 ...	16
O. D. Pollak (17.9 S.C.A.R.)	85 × 140 ...	50
McL. N. Staight (17.9 S.C.A.R.) ...	85 × 140 ...	54
S. N. Beattie (17.9 S.C.A.R.) ...	85 × 140 ...	54
A. G. Brown (15.9 Hispano-Suiza) ...	80 × 180 ...	1 0
G. T. Cain (15.7 Calthorpe)	79½ × 150 ...	1 10
S. G. Cummings (13.9 Cummikar) ...	75 × 150 ...	1 42
R. A. K. Mason (8.6 Marlborough) ...	59 × 100 ...	2 48

Lambert just caught the limit man in the straight, winning by about forty yards. Pollak was a good third, and after him came all the others in a bunch. The Pilain gave Lambert very little trouble, as it was not going at all well. Result:

1. Mr. Lambert's Singer.
2. Mr. Mason's Marlborough.
3. Mr. Pollak's S.C.A.R.

Speed, 83¼ m.p.h.

The Members' Handicap. Distance, 8½ miles. Starters:

	Bore and stroke.	Handicap. m. s.
O. D. Pollak (17.9 S.C.A.R.) ...	85 ×140 ...	scr.
G. C. Street (17.9 S.C.A.R.) ...	85 ×140 ...	0 6
McL. N. Staight (17.9 S.C.A.R.) ...	85 ×140 ...	0 6
A. G. Brown (15.9 Hispano-Suiza) ...	80 ×180 ...	0 15
G. T. Cain (15.7 Calthorpe)	79½ ×150 ...	0 30
J. W. Read (15.7 Calthorpe)	79½ ×150 ...	0 30
S. G. Cummings (13.9 Cummikar) ...	75 ×150 ...	1 18
R. C. Fish (24.8 Berliet)	100 ×140 ...	2 27
E. Garton (13.9 Stoewer)	75 × 88 ...	3 3
D. S. Parsons (8.9 Turner)	60 ×100 ...	5 12

The Berliet again got away very quickly, soon passing the Turner and the Stoewer, and Mr. Fish won with the straight to himself. Cain and Pollak made a good struggle for the second place. Then after a short distance followed the Cummikar and Hispano-Suiza. Staight jammed his throttle lever and gave up, as did Read. The Berliet was run in touring trim with a torpedo body, and is a 1913 car. Result:

1. Mr. R. C. Fish's 24.8 Berliet.
2. Mr. G. T. Cain's 15.7 Calthorpe.
3. Mr. O. D. Pollak's 17.9 S.C.A.R.

Speed, 59¾ m.p.h.

The All Comers' Open Handicap. Distance, 8½ miles. Starters:

	Bore and stroke.	Handicap. m. s.
R. Robertson-Shersby-Harvie (30 Rolland Pilain)	110 ×165 ...	scr.
Percy Lambert (15.9 Singer)	80 ×149 ...	0 16
O. D. Pollak (17.9 S.C.A.R.)	85 ×140 ...	1 15
McL. N. Staight (17.9 S.C.A.R.) ...	85 ×140 ..	1 21
S. N. Beattie (17.9 S.C.A.R.) ..	85 ×140 ...	1 21
J. T. Cain (15.7 Calthorpe)	79½ ×150 ...	1 45
S. G. Cummings (13.9 Cummikar) ...	75 ×150 ...	2 33
R. A. K. Mason (8.6 Marlborough) ...	59 ×100 ...	4 12

Lambert would probably have won again had his engine not missed during a part of the second lap. Except for this it was almost a repetition of the former open race. Result:

1. Mr. Mason's 8.6 Marlborough.
2. Mr. Lambert's 15.9 Singer.
3. Mr. Cain's 15.7 Calthorpe.

Speed, 54¼ m.p.h.

The Cycle Car Open Handicap. Distance, 5¾ miles. Starters:

	Bore and stroke.	Handicap. m. s.
A. W. Lambert (2-cyl. Morgan) ..	—— ..	scr.
B. Alan Hill (2 Humberette)	84 × 90 ..	1 44
Henry Jones (2 Super)	85 × 85 ...	1 44

The Morgan caught the Super in the middle of the second lap, but one of its wire terminals came adrift, and running on one cylinder it had to give place to the Super. Result:

1. Mr. Jones's Super.
2. Mr. Lambert's Morgan.
3. Mr. Hill's Humberette.

It is not often that there is any divergence from the standard Brooklands programme of events and the conditions applicable to them. We note in the sheet announcement for the June meeting now before us that the 70 m.p.h. handicaps are no more—in name at least. They are replaced by the 75 m.p.h. handicaps, as we understand that the former description will not admit many of this year's cars. As the minimum speed for the senior events is still 70 m.p.h., there is the proviso that in these the preference is given for cars not entered in the 75 m.p.h. events.

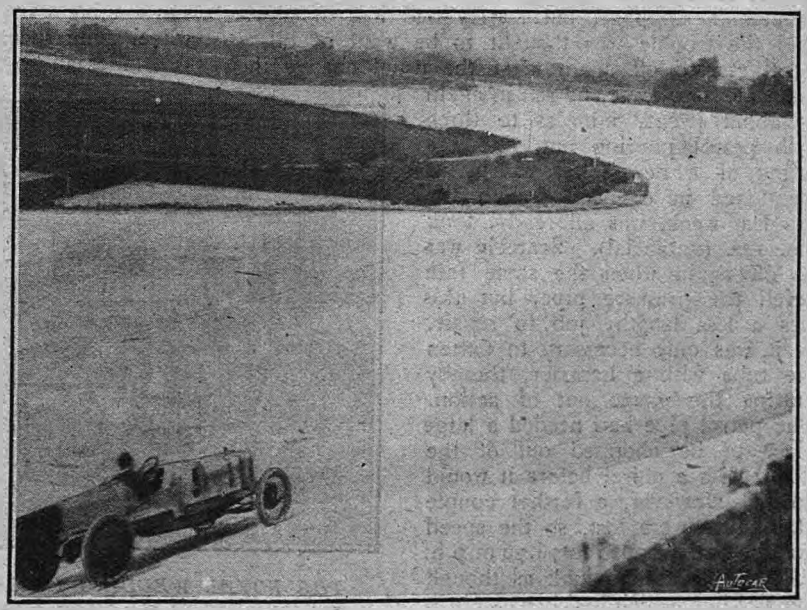
The Benzole Handicap is to be run off again, but there is to be no cup for the competitor whose speed on benzole compares best with his speed on petrol.

World's Records by the Argyll.

Every world's record from 7 to 14 hours and 600 to 1,000 miles beaten by the 15-30 h.p. Argyll with a single sleeve-valve engine and worm drive.

We believe that no car has ever made attempts on long distance records twice within so short a time as eight days. Yet such is the case with the Argyll that did so well last week (May 19th to be exact). It will be remembered that on that day the car ran for fourteen hours, breaking the world's record for that time, while it also created a record in Brooklands Class D for twelve hours and the longer mileage distances. However, the speed attained was a little less than that made by the 15 h.p. Sunbeam last autumn, *i.e.*, 72.59 m.p.h. for the Argyll fourteen hours and 75.99 m.p.h. for thirteen hours by the Sunbeam. It must not be forgotten, however, that the Argyll engine is the smaller by no less than nineteen millimetres of stroke, for the dimensions of the Sunbeam were 80 × 149 mm., against which the Argyll is 80 × 130 mm.

On Tuesday of this week, therefore, the Argyll Co., having fully established the efficiency of their sleeve valve engine, decided that they would push the little car a bit harder and try to make a new world's record for twelve to fourteen hours, and, of course, for the thousand miles. Nothing had been altered in the car since the previous week, except that new Triou shock absorbers had been fitted, and these the drivers said made the strain of driving over the bumps of the track much less severe than on the previous record run.

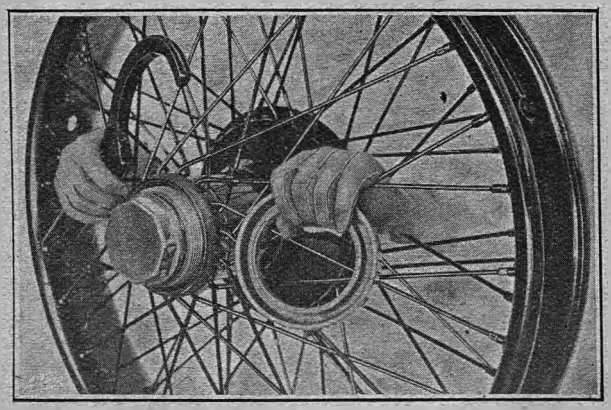


THE ARGYLL RECORD RUN. The car on the banking by the Members' Bridge A driver's view of the fastest stretch of the track.

Starting at five minutes to six o'clock, in the most brilliant sunshine of an even then hot summer morning, the pace was set at a little over 78 m.p.h., and the hours ran by without incident of any kind till just after the second change of drivers.

As before, Mr. W. H. Scott started first, and Mr. L. G. Hornsted took over the wheel at 7.55 a.m. When Scott was driving on the commencement of his second spell he found one cylinder not firing; a pull-up at the depot showed a faulty plug, and when this was removed it was found that the electrodes had become fused together. The time lost on this was, of course, trifling, but there was a far more serious delay at two o'clock owing to the petrol pipe breaking. The

THE ARGYLL RECORD RUN. All wheels changed and the petrol and oil replenished in 1 m. 20 s. Every man had his appointed work and carried it out expeditiously.

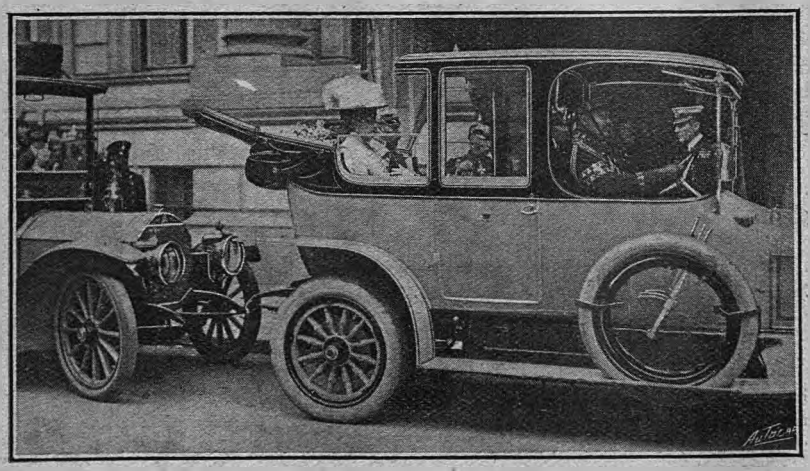


A specially arranged photograph to show the simple components of the 1913 Rudge-Whitworth detachable wheel. It will be seen that the detachable parts comprise only the outer hub and wheel complete, and the self-locking ring; two parts only. In one hand is seen the lock ring and in the other the special spanner.

Argyll people having had the forethought to put a rubber tube over every copper lead, this did not cause immediate stoppage, but merely bad loss of power, and the trouble was thought to be want of oil, so Scott started off again after the usual change then just due. However, he ran in again at about twenty minutes to three with petrol pouring out, and the fitting of a new pipe, which, as mentioned in connection with the run last week, was all ready, took 7m. 12s. (unofficial). Scarcely was he off again when the same fate befell the pressure pipe, but this was a less lengthy job to repair, as it was only necessary to flatten the tube with a hammer, thereby putting the gauge out of action. The petrol pipe had needed a large piece to be chopped out of the shield with a chisel before it would go in. However, a further couple of minutes were lost, so the speed average had dropped to 76.76 m.p.h.

It now began to look as though the weather, which had been so brilliant, would yet end the run prematurely, as the sky had become heavily overcast and there were frequent growls of not very distant thunder. Just as Hornsted took the wheel, at four o'clock, the sun had come out again, and everyone thought that the danger was past, but almost as he let the clutch in a tiny drift of cloud seemed to burst, and there fell such rain and hail as is seldom seen in England.

Hornsted once completely skidded off the track at the commencement of the railway straight, but managed to pull the car back, and in a few seconds the sun shone again gaily. The whole track, however, was under water, and the next few laps were necessarily slower. Things soon dried under the hot sun, and all went well till about five o'clock, when two more plugs fused and had to be replaced, this being done with remarkable expedition. At five minutes to six the 15.9 h.p. Sunbeam twelve hours' record was beaten by 3 miles 626 yards, or at a speed of 76.2 m.p.h. as compared with 75.92, and Hornsted came in rather knocked about on the face and hands by the hail, but otherwise seeming remarkably fit. Then Scott ran on for the thousand miles, which he finished in 13h. 5m. 45.6s., or 2m. 39.5s. better than the Sunbeam time, and Mr. J. A. Took, who had not driven previously, took the wheel at five minutes past seven. At this stop only oil was put in the reserve tank and in the axle. Again, at a quarter past seven, the edge of a thunderstorm licked the track, with somewhat less violence, however, the sun shining warmly all the time. Took stuck to the wheel quite successfully, only slowing enough to lose two miles an hour on one lap.



THE ROYAL WEDDING IN GERMANY. Their Majesties the King and Queen leaving the British Embassy at Berlin in one of the German Emperor's cars.

Thenceforward there was no incident until the completion of the fourteen hours. So now the Argyll car has beaten all world's records above 500 miles of distance and from seven to fourteen hours inclusive. The world's records from seven to eleven hours inclusive were held by the 30.1 h.p. six-cylinder Sunbeam, although the twelve hours' stood to the credit of the 15.9 h.p. Sunbeam, as stated.

The following table shows all the figures:

TIME FOR DISTANCE.

50 miles	...	38m. 22.03s.	= 78.19 m.p.h.
100 ,,	...	1h. 16m. 32.78s.	= 78.38 ,,
150 ,,	...	1h. 54m. 36.42s.	= 78.53 ,,
200 ,,	...	2h. 34m. 23.15s.	= 77.73 ,,
300 ,,	...	3h. 48m. 46.75s.	= 78.68 ,,
400 ,,	...	5h. 8m. 31.59s.	= 77.79 ,,
500 ,,	...	6h. 26m. 22.74s.	= 77.64 ,,
600 ,,	...	7h. 40m. 49.63s.	= 78.12 ,,
700 ,,	...	9h. 6m. 53.76s.	= 76.80 ,,
800 ,,	...	10h. 23m. 14.67s.	= 76.40 ,,
900 ,,	...	11h. 49m. 18.61s.	= 76.13 ,,
1,000 ,,	...	13h. 5m. 45.68s.	= 76.36 ,,

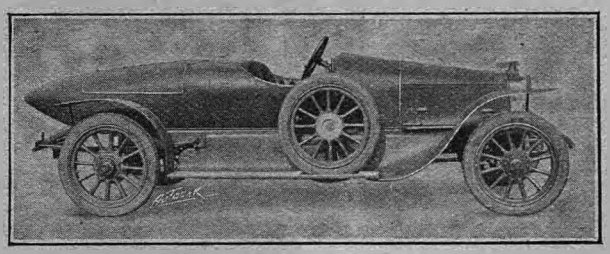
DISTANCE FOR TIME.

1 hour	...	78 miles 5 03 yards	= 78.29 m.p.h.
2 hours	..	157 ,, 2 07 ,,	= 78.56 ,,
3 ,,	...	234 ,, 6 35 ,,	= 78.12 ,,
4 ,,	...	315 ,, 37 ,,	= 78.76 ,,
5 ,,	...	388 ,, 11 77 ,,	= 77.93 ,,
6 ,,	...	466 ,, 16 36 ,,	= 77.82 ,,
7 ,,	...	544 ,, 11 71 ,,	= 77.81 ,,
8 ,,	...	622 ,, 5 23 ,,	= 77.79 ,,
9 ,,	...	690 ,, 12 84 ,,	= 76 74 ,,
10 ,,	...	766 ,, 15 04 ,,	= 76 69 ,,
11 ,,	...	837 ,, 59 8 ,,	= 76 12 ,,
12 ,,	...	914 ,, 6 04 ,,	= 76 20 ,,
13 ,,	...	992 ,, 48 3 ,,	= 76 33 ,,
14 ,,	...	1,070 ,, 57 ,,	= 76 43 ,,

Best lap, 82.45 m.p.h.

As on the previous run the Dunlop tyres stood up well, not seeming to heat up much despite the really very high air temperature. All the wheels were changed at each stop as a precaution, but some of the used tyres were put on again after careful examination. This time there was only one tyre stop, Scott again, as last week, losing a rear cover completely and coming in on the rim, the valve being in place with a bit of the tube attached. All the stops for replenishment were carried out with the same commendable celerity as on the last run, the Dunlop wheels seeming to be very easy to handle.

In our description of the Sunbeam Grand Prix car last week we mentioned that it was fitted with B.N.D. shock absorbers. This was a slip of memory: we should have said Derihon; but the B.N.D. special steels, which are used so much in high efficiency engines nowadays, and the Derihon shock absorbers, are both sold by the same firm.



ASTON HILL-CLIMB. The 15 h.p. Talbot which, driven by Mr. H. G. Day, made fastest time in Class III.

The R.A.C. Brooklands Meeting.

TO-DAY (Saturday) the meeting promoted by the Royal Automobile and Associated Clubs will be held at Brooklands. There are a number of interesting events to be run off, and we give below the list of entries received for the events named. A motor cycle race will also be held, as well as a skilful driving race and hill-climb combined and a blindfold driving competition. The programme starts at 2 p.m.

HILL-CLIMB.

For teams of four cars with touring bodies, propelled by internal combustion engines, the combined R.A.C. rating of which must not exceed 100, entered by associated clubs.

Essex M.C.—McL. N. Staight (15.9 S.C.A.R.), O. D. Pollak (15.9 S.C.A.R.), R. C. Fish (24.0 Berliet), and S. G. Cummings (13.9 Cummicar). Reserve: Mr. C. J. Street (15.9 S.C.A.R. or 24.0 De Dion).

Hampshire A.C.—Miss Laura B. Starkey (15.9 Sunbeam), Capt. A. Duka (15.9 Austro-Daimler), L. C. L. Geach (22.5 Vauxhall), and C. E. S. Gillett (20.1 Talbot). Reserve: H. C. Lafone (15.9 Chenard-Walcker).

Herts County A. and Ae. C.—G. D. Pearce-Jones (22.5 Vauxhall), R. H. Cobb (20.1 Vauxhall), Leslie Munro (20.1 Vauxhall), and S. S. Barber (25.6 Talbot).

Middlesex County A.C.—(1) Raymond T. Hartmann (12.8 Benz), L. W. Cox (13.9 Crossley), W. J. Jones (18.8 Straker-Squire), and E. J. Harrison (18.8 Straker-Squire). (2) A. C. Toler (26.8 Talbot), B. Hunter (15.9 Sunbeam), Chas. R. Clark (17.1 Hupmobile), E. I. Everett (22.4 Ford). Reserves: H. W. Holer (15.9 Talbot) and A. Page (38.8 F.I.A.T.).

North Berkshire A.C.—Lord Exmouth (20.1 Vauxhall), Mrs. Hippisley (20.1 Sunbeam), H. A. Barrett (22.4 Hotchkiss), and Francis Cayley (20.1 Wolseley). Reserve: W. Whittall (22.4 Rochet-Schneider).

RELAY RACE.

For teams of two cars with touring bodies, propelled by means of internal combustion engines, the combined R.A.C. rating of which must not exceed 50, entered by associated clubs, and owned and driven by private competitors only. Two circuits, one car of each team to start for the first circuit.

Essex M.C.—O. D. Pollak (15.9 S.C.A.R.) and McL. N. Staight (15.9 S.C.A.R.). Reserves: R. C. Fish (24.0 Berliet) and F. W. Keddie (24.0 De Dion).

Hampshire A.C.—Capt. A. Duka (15.9 Austro-Daimler) and C. E. S. Gillett (20.1 Talbot). Reserve: H. C. Lafone (15.9 Chenard-Walcker).

Herts County A. and Ae. C.—G. D. Pearce-Jones (22.5 Vauxhall) and R. H. Cobb (20.1 Vauxhall).

Middlesex County A.C.—(1) W. J. Jones (18.8 Straker-Squire) and E. J. Harrison (18.8 Straker-Squire). (2) Raymond T. Hartmann (12.8 Benz) and E. I. Everett (22.4 Ford). (3) H. W. Toler (15.9 Talbot) and A. C. Toler (26 8 Talbot). Reserve: B. Hunter (15.9 Sunbeam).

North Berkshire A.C.—(1) Francis Cayley (20.1 Wolseley) and Lord Exmouth (20.1 Vauxhall). (2) H. A. Barrett (22.4 Hotchkiss) and W. Whittall (22.4 Rochet-Schneider).

OPEN HANDICAP RACE.

For motor cars, the observed speeds of which have been over sixty miles an hour for a Brooklands flying lap, or, in the case of cars which have not competed before, which are likely, in the opinion of the handicappers, to exceed this speed. In this event the cars may be stripped for racing.

O. D. Pollak (15.9 S.C.A.R.), R. H. Townshend (48.4 Sheffield-Simplex), N. S. Hind (35.7 Berliet), Percy Lambert (15.9 Singer), H. Nelson Smith (8.9 Hillman), W. G. Barlow (15.9 Sunbeam), Harold Lambert (15.9 Crossley), H. Streatfield (35.7 Benz), Louis Coatalen (23.85 Sunbeam), S. F. Garrett, driver C. S. Westall (16.24 Grégoire), H. A. Barrett (22.4 Hotchkiss), Lord Exmouth (20.1 Vauxhall), W. R. McBain (52.8 Lorraine-Dietrich), and H. G. Perrott, driver W. H. Scott (15.9 Argyll).

OPEN CYCLE CAR HANDICAP RACE.

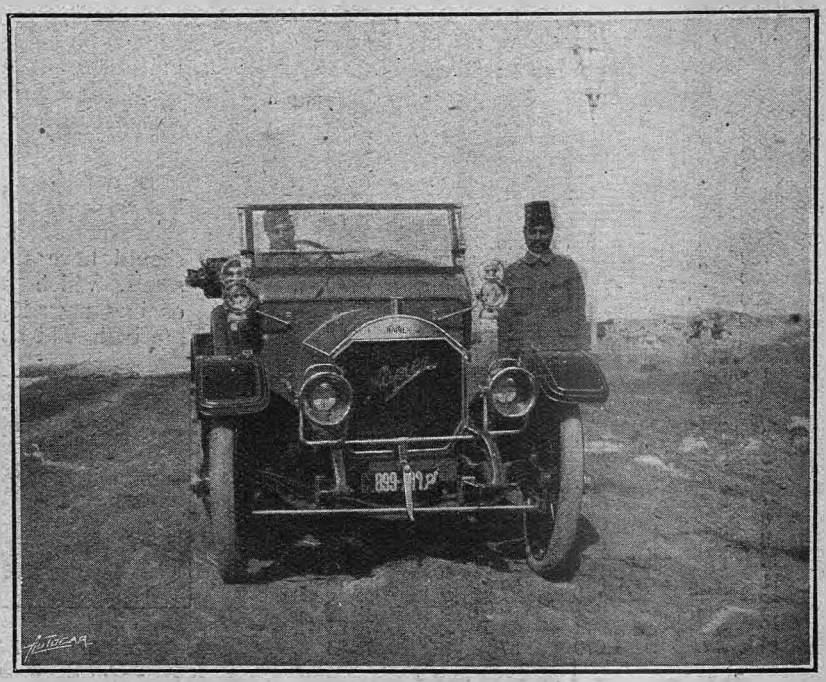
J. Talfourd Wood (G.W.K.), L. M. Bennett (Whitgift), A. W. Lambert (Morgan), A. G. Frazer-Nash (G.N.), B. Haywood (Singer), and A. W. Lambert, driver E. Holloway (Morgan).

The price of admission will be 1s. as on ordinary non-racing days. The catering will be in the hands of the Army and Navy Stores.

Fatal Accident Near Dieppe.

IT was only in our last issue that we referred to the fact that Signor Bigio, the technical director of the Itala Co., of Turin, had visited Brooklands Track with the view of testing one of the Itala cars which had been built under his direction for the forthcoming Grand Prix race in France. On leaving this country Signor Bigio visited the Grand Prix circuit near Amiens, but as practice on the course is not being at present permitted, he returned to Dieppe to test his car on the old Grand Prix circuit.

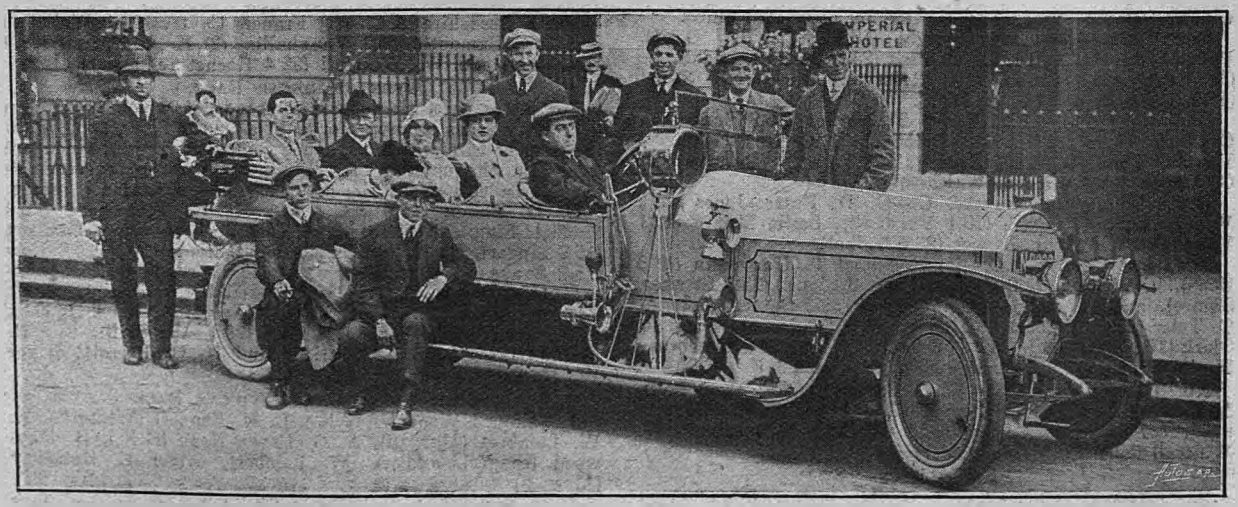
Setting out with a mechanician named Ardezzone, at about 3 a.m. on Thursday of last week, nothing was heard of Signor Bigio, and some mechanics of the Itala Co. who had accompanied him on his journey from England set out in search of him. On reaching Miromesnil, near Eu, they were astounded to find the car upside down, with Signor Bigio (who was 31 years of age) lying dead beneath and the mechanician unconscious by the roadside. The latter was quickly conveyed to hospital, but as he died within a few hours, nothing definite can be stated as to the cause of the accident, as no actual witnesses have been found. M. Meyer, the proprietor of the principal garage in Dieppe, who has visited the spot where the accident took place, and who has also inspected the car, considers that the deceased must have taken one of the turns at too high a speed, causing the car to overturn. The front of the vehicle was quite intact.



The 15 h.p. Colonial Napier, shown above, was recently driven by Mr. E. W. Flower from Cairo to Alexandria, a distance of 144 miles, in 5 hours 17 minutes, which is stated to be a record run between the two towns. The photograph gives some indication of the nature of the road, which in many places is excessively rough.

Hants A.C. Hill Climb.

The Hampshire Automobile Club held a closed hill-climb on Saturday last at Brook Hill, Bramshaw. A good number of entries were received, the small car class for cars between 10 and 20 h.p. being very well supported. Fastest time of the day was accomplished by Mr. N. S. Hind on a 120 × 140 mm. Berliet, and other cars that performed well were a Brenna, a Vauxhall, and a long stroke Mass (90 × 170 mm.) It was a purely club event, and a very successful and enjoyable one at that.



The team of American motor polo players who are to play at Ranelagh and at the Stadium, Shepherd's Bush, during the summer, and who arrived in London this week. It may be remembered that the car, which is a 65 h.p. Mercédès with three seats in tandem, belonging to Mr. Charles Lane, was illustrated in our issue of March 1st.

A.A. and M.U. Notes.

Communicated by the Secretary, The Automobile Association and Motor Union.

Whitcomb Street, Coventry Street, W.

"Scotland for the Motorist."

The volume entitled "Scotland for the Motorist," which has been compiled specially for A.A. and M.U. members' use, has been revised and brought up to date. Copies of the new edition may be obtained by members (gratis) from the head offices, the City offices, or any of the branch offices of the Association. The book is a very complete motorists' gazetteer of Scotland, and contains a considerable amount of information and descriptive matter relating to interesting historical places, etc.

Special Road Warnings.

The local authorities at Cambridge have recently instituted several prosecutions for "driving dangerously," also for leaving cars standing in roadways. Members are therefore advised to drive very carefully when passing through the city.

Complaints have been very prevalent of late regarding the high speed of cars passing through Dunton Green (Kent). The Association has been asked to lend its aid towards checking undue fast and dangerous driving through the village.

Latest Road Information.

CHESHIRE.—Northwich-Altrincham Road: Half width of road is up for the laying of pipes at Lostock Gralam, lights at night.

GREAT NORTH ROAD.—Remetalling full width at North Parade, Grantham, also tar-spraying nine miles north of Grantham. Tarring between Casterton and Stamford. Care is necessary through Aycliffe, seven miles north of Darlington, also care is necessary through Gosforth. Under repair between Morpeth and Felton full width, no lights at night.

LANCASHIRE.—Preston-Lytham Road: Very rough surface and frequent holes between Freckleton and Lytham. Blackpool-Poulton Road: Members are warned to drive slowly through Poulton-le-Fylde and district. Preston-Garstang Road: Members are warned to drive with caution between Withy Trees and Broughton Village, also through Garstang. Preston-Wigan Road: In rough condition between Bamber Bridge and Standish, owing to bad surface and frequent holes. Preston-Blackburn Road: Full width in rough condition on Brockholes Hill, two miles east of Preston. Preston-Liverpool Road: Special caution is advised between the Windmill and Tarlton Bridge.

YORKSHIRE.—Otley-Skipton Road: Timing through ten-mile limit at Burnley-in-Wharfedale. Leeds-Harrogate Road: Controls working in Chapeltown Road, Leeds, also at Moortown, one mile further north. Leeds-Wetherby Road: Control working in Roundhay Road, Leeds. York-Scarborough Road: Motorists are being stopped for failing to give warning on approaching corners. Half width under repair between the 10th and 11th milestones east of Malton. Remetalling and rolling full width between the 3rd and 4th milestones north of Wetherby. Otley-Bradford Road: Repairs to main water supply still in hand on a dangerous bend of the road, occupying three-quarters width, special care is advisable entering Otley by the Bradford Road, lights at night. Leeds-Tadcaster Road: Remetalling and rolling operations full width between the 1st and 2nd milestones from Leeds.

COVENTRY ROAD.—In bad condition right through. Tarring at south end of Dunstable. Under repair between the 77th and 78th milestones, also trapping is likely to be in hand where the road is clear and at Stretton on Dunsmore. Under repair between Willoughby and Dunchurch.

LICHFIELD-BIRMINGHAM ROAD.—Tarring in hand at Doe Bank between Four Oaks and Sutton Coldfield and will be continued through to Sutton Coldfield.

LONDON-YARMOUTH ROAD.—Members are warned to interrogate the patrols on the Colchester Road. Roller working, and full width under repair at the southern approach to Woodbridge. Road being tarred in High Street, Melton.

ROYSTON-CAMBRIDGE ROAD.—Control likely to be working at Harston. Tarring between Cambridge and Trumpington. Under repair between Royston and Melbourn.

NORWICH-AYLSHAM ROAD.—Temporary bridge at Hevingham. Roller working at Harsham full width of the road. Ingworth Bridge under repair.

NORWICH-YARMOUTH ROAD.—Tarring at Thorpe; two rollers working between the 6th and 8th milestones.

SHREWSBURY DISTRICT.—The widening of the two bridges on the main road leading to Whitchurch and Chester is in hand, and motorists are advised to travel *viâ* Ellesmere or Wrexham.

NORTH WALES.—Bettws-y-Coed-Llangollen Road. In a shocking condition for at least fifteen miles at the Llangollen end.

EXETER-BRISTOL ROAD.—Foundations are being laid for 200 yards full width two miles north of Bridgwater; lights at night. Tarring at Highbridge seven miles north of Bridgwater, half-width; also gas pipes are being laid.

BATH ROAD.—Tarring half-width one mile east of Slough for about fifty yards, roller at work; also in Sussex Place, Slough, for a quarter of a mile, half-width. Patching in hand at Pont Hill, Maidenhead, to Thicket Corner: members are warned to drive slowly. Tarring on the Henley-Nettlebed Road. Tarring between Castle Hill, Reading, and Calcot, about a mile.

BERKS.—Wokingham-Reading Road: Tarring through the main road, Wokingham, full width.

BRIGHTON ROAD.—Roller working between Kingswood and Reigate Hill, Reigate Hill to Woodhatch, Woodhatch to Horley; Hooley-Merstham and Redhill main road is being tarred. Tarring from Reigate to Dorking and Reigate to Gatton Point.

KENT.—Tarring is in progress at Farningham Hill; West Malling; near Ashford, Hythe side, and at Sellindge. Also under repair one mile from Ditton on Maidstone side, and two miles from Maidstone on London side.

LONDON DISTRICT.—Controls are likely to be working at Camberwell New Road, between the Oval and Camberwell Green; Anerley Hill; Crystal Palace Parade; Morden; Sutton; Banstead; Hounslow-Staines; Bedfont-Staines.

PORTSMOUTH ROAD.—Tarring in hand from Guildford to Petersfield, and it is badly covered between Hindhead and Liphook and between Liss and Butser Hill, Petersfield. The road from Butser Hill to Horndean is in a very bad state.

SOUTHAMPTON AND BASINGSTOKE DISTRICT.—Winchester-Bournemouth Road: Tarring one mile north of Hursley; also at Hinton St. Michael, three miles north of Christchurch. Southampton Road: Tarring in hand at Staines; also between Virginia Water and Sunningdale, half width. Care is necessary over Staines Bridge, as it is under repair half width and there is only room for one car to pass at a time. Basingstoke district: Remetalling full width between Basingstoke and Hook; loose metal left at night unprotected. Tarring in hand at Basingstoke. Salisbury Road: Tarring in hand between Worting and Oakley. Winchester Road: Tarring between the 1st and 2nd milestones from Basingstoke.

SURREY.—Controls likely to be working between Kingston and Esher. Flashlight controls are likely to be working from Weybridge, Hampton, etc., between Walton High Street and foot of Walton Bridge on the Weybridge side, behind walls of Mount Felix and gates.

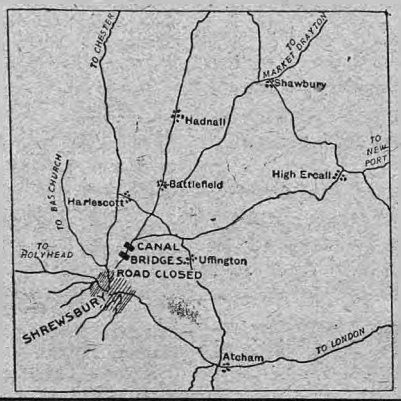
SUSSEX.—New gas main is being laid in High Street, Uckfield; great care is essential. Control likely to be working in the ten-mile limit at Uckfield. It is intended to repair the main roads between the following points: Forest Row-Kent Water, Easons Green-Framfield, Mayfield-Five Ashes, Steelcross-Eridge, at Beckley, Broadoak-Cripps Corner, Hurst Green, Etchingham, Uckfield-Nutley, Horsham, Road-Cross in Hand, Cross in Hand-Blackboys, Buxted, and Hadlow Down.

The Local Government Board held an inquiry the other day into the application of the local council of Paignton, Devon, for an order prohibiting motor car traffic on the upper esplanade of the sea front during the summer months. It was contended on behalf of the council that the increasing traffic made the road dangerous to visitors. On the other hand, five ex-chairmen of the council gave evidence against the proposal.

A New Gospel of Lubrication.

All-round Economy in Oildag.

SUCH a conversation and such demonstrations as we enjoyed and witnessed at the lips and hands of Dr. Edward G. Acheson, the discoverer of that wonderful and now widely used substance Carborundum, are fain to make one feel that the last word in lubrication is far from having been said, and that oil is not the thing to say it. Dr. Acheson is at present putting a graphite lubricant upon the market called Oildag, a term which it will be admitted conveys little or nothing to the lay automobile mind. Very shortly, Oildag is a mixture of oil and graphite, but not graphite as commonly understood, and against the employment of which as a lubricant to most parts of a motor car motorists have been from time to time gravely warned. The graphite which forms the active portion of Oildag is a manufactured article, and, to put it shortly, is what remains in the electric furnace in which Carborundum is made, after the temperature at which Carborundum takes form has risen beyond something measurable by a pyrometer.



the bottom of the tube, and when the contents of the tube are poured through a filtering paper the graphite will remain on the paper. After drying, this graphite can be polished with a spatula until it acquires a brilliant burnish and is immeasurably smooth to the touch. We have instanced these experiments to show that the graphite in the first instance is absolutely diffused in the water or oil. This molecular graphite is during the process of manufacture transferred from the water to oil.

So prepared, a wonderful lubricant results, and, further, the deflocculated graphite possesses the remarkable property of preventing the water in which it is diffused from rusting or corroding iron or steel. Now it is well known that water exists in even the best lubricating oils, and rust has frequently resulted to bearings which have stood for some time. The Acheson-Graphite in diffusion would assuredly prevent this.

In an address before the Auto Club of America, May 17th, 1910, Dr. Acheson stated: "The earliest

On Saturday last the road from Shrewsbury to Chester, via Hadnall, was closed to all vehicular traffic, probably for some months, as the two narrow bridges which span the Shropshire Union Canal are to be replaced by wider ones. The map above indicates the position of the bridges and also the routes which may be taken either on leaving or entering Shrewsbury to avoid the blocked road. The photographs show, on the left the Factory Bridge and on the right the Comet Bridge which are to be replaced.

In the words of Dr. Acheson's most interesting pamphlet, "Seventeen Years of Experimental Research and Development," Dr. Acheson says: "Early in the history of its manufacture (Carborundum), I discovered that when it was heated to a very high temperature decomposition occurred, the contained silicon was dissipated in vapour, and a beautiful graphite left as a pseudomorph, or, as I was pleased to call it, a skeleton of the original Carborundum crystal." This is the graphite which is the component of Oildag, and it is so imponderable that it will remain in suspension in water or oil that is free of acid or alkali. Suspended in water, it will pass with the water through the finest filtering or blotting paper, so that it would appear that the constituent parts of this graphite must very nearly approach the molecule. If, however, acid or alkali be introduced into a test tube in which there is pure water and graphite in diffusion, the graphite will be thrown down to

practical use of Oildag was in the lubrication of the cylinders of motor car engines, and these experiments have now extended over three years. Two of the cars were 30 h.p. Packards and the other was a Peerless touring car. One of the Packards—the 1908 model—has now covered 23,000 miles, while the aggregate of the three machines amounts to 42,000 miles on their own power. During this period and distance there has not been occasion for the regrinding of any one of their valves, nor has a sparking plug been cleaned or renewed."

Dr. Acheson claims that a part of the small amount of graphite dust carried into the exhaust becomes embedded in the metal of the valves, and has the remarkable effect of preventing pitting or corrosion; further, that the surfaces produced at the end of the above period on these valves were of a character that could not be equalled by any machining process, resulting in the holding of the compression to a degree

not possible of previous attainment. Moreover, while the makers' allowance of cylinder oil for one of these engines was the altogether excessive one of a gallon per two hundred miles run, Dr. Acheson found that, after using the graphited oil, the consumption continually decreased, so that the feed to the crank case had to be continually reduced until (the words are Dr. Acheson's) "the car was operating a distance of 750 miles while consuming one gallon of Oildag."

Dr. Acheson points out that assertions have been made to the effect that the use of Oildag causes a carbon deposit in the cylinders of an automobile, but he shows that if all the graphite contained in the oil used in six hundred miles were to pass altogether into the combustion chamber and there be condensed on the four piston heads there would result a layer about one hundred and twenty-six one-thousandths of an inch.

Dr. Acheson claims that after commencing the use of Oildag the oil level will be found to rise when the splash system is used, and he claims that this is due to the fact that a veneer of graphite being formed on the walls of the cylinders, the surface of the piston rings and so on, a more complete wiping down of the oil on the cylinder walls occurs at each stroke of the piston, and ultimately the veneer is so good, and the fit between the piston rings and the cylinders so perfect, that the wiping down of the oil is so complete that the greatly increased economy above referred to is obtained.

In conclusion, we are bound to say that our own personal experience of the use of Oildag is *nil* at the moment, but we are so impressed by Dr. Acheson's demonstrations that, as soon as we can obtain the necessarily free-from-acid or alkali oil, we propose to make a test of it on one of our cars, a 15 h.p. Crossley. Automobilists in the States appear to find all its claims substantiated, but at present we do not know personally of a user in this country. If there be any such perhaps they will give their experiences for the benefit of their fellow motorists.

A point which particularly interests us is that with the modern engine the actual consumption of oil is almost *nil*. For instance, we have a six-cylinder Sunbeam, 90 × 160 mm., that runs a thousand miles on less than half a gallon, *i.e.*, less than half a gallon of oil is required at a pint or less at a time to keep it overflowing at the level tap. Consequently, the main consumption of oil is due to the fact that every thousand miles or so we empty the crank chamber and refill with fresh clean oil, and this means that a gallon and a half is thrown away each time the crank chamber is emptied. It is obvious that if the actual consumption were reduced to *nil* we could only save half a gallon, as Oildag or no the oil would get dirty just as soon and require draining off and renewal just as frequently.

Therefore the great claim to settle is not economy of consumption, but whether the use of Oildag reduces wear by reducing friction, besides possessing the other virtues in regard to the valves mentioned by Dr. Acheson in his tests. As a piece of rule of thumb evidence in favour of this expectation, we may mention the well-known fact that if piston heads be black-leaded they carbonise far less quickly; also that careful mechanics always use graphite on the valve guides when reassembling an engine after overhaul or after removing the valves for regrinding.

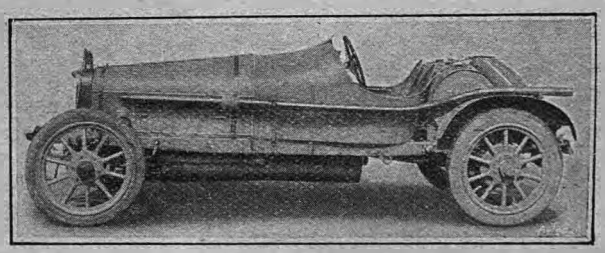
A Twelve-cylinder Sunbeam for Brooklands.

Bore and Stroke, 80 × 150 mm.; Cylinders Set at 60 Degrees.

SOME time after the Grand Prix Race the Sunbeam will be making a big onslaught on world's records at Brooklands. The chassis used will be one of the 1912 winning Coupe de l'Auto chassis, but Mr. Coatalen is preparing an engine which will be altogether a novelty, capable of developing over 200 h.p. with ease. It will be of the twelve-cylinder V-type, with the cylinders set at 60° to each other; this gives a comparatively narrow engine of low wind resistance, and the combination of the small light chassis with a light, compact, though tremendously powerful engine of nearly perfect torque should be of exceptional interest. The engine will come into Class H, being somewhat too large for Class G. The maximum capacity allowed in Class G is 7,784 c.c., and in Class H 13,929 c.c.; the twelve-cylinder Sunbeam will be just over 9,000 c.c., as it will have the famous Sunbeam dimensions of 80 × 150. The 60° V-engine is quite a novelty so far as ordinary full-size car work is concerned, but on motor cycles the 60° two-cylinder engine is used extensively both for two and four-wheelers, that is to say, both on motor bicycles and on cycle cars.

The twelve-cylinder Sunbeam engine with very small modifications should also be perfectly suitable for motor boat and aeroplane propulsion, and, no doubt, its work on Brooklands will be of great service in developing the type.

With regard to this particular engine we may say that a single camshaft is used, though, of course, with a double set of cams, as the same cams cannot serve two cylinders as in the eight-cylinder Sunbeam aero engine in which the cylinders are at 90°. A six-throw crank is used, two connecting rods working on each crank pin, the inner big end taking the full load and the outer merely bearing upon it and giving the necessary swing, or pivot, action. The torque will approximate a straight line, as there will be an impulse every 60°, *i.e.*, six impulses per revolution of the crankshaft, and this combined with correct weight distribution should have a great influence on the speed attainable on Brooklands. In other words, the twelve-cylinder Sunbeam should have the chance of using a bigger proportion of its power than any other very powerful engine yet used on the track, so that the limiting factor may be that imposed by the design of the track itself, and not through the inability of the car to go any faster.

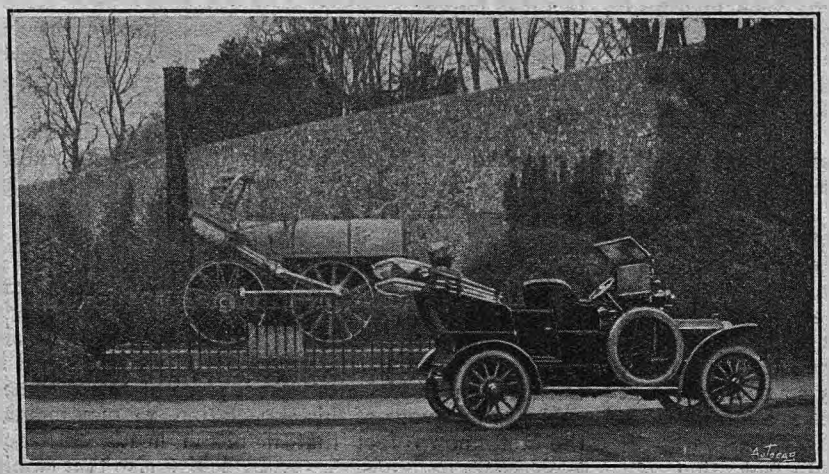


A near side view of one of the Sunbeam Grand Prix cars dealt with fully in our last issue. In this illustration the long exhaust pipe is noticeable.

On the Road.

A United Association of Motorists: Subscription Half-a-Guinea.

AT this pleasant time of the year, when everything in the garden is lovely, I had hoped to have been able to write only of the joys of motoring. But duty is duty, and when correspondents desire me to open up subjects of great import (and get the blame for so doing), I feel it is my business to do so, even at the price of making myself disliked.



EIGHTY YEARS OLD. Old locomotive "Invicta" at Canterbury, used at one time on the Whitstable line. The car is a 12-14 h.p. Singer.

One particular gentleman puts the following case before me. He was, he says, a member of the Motor Union (deceased, or married, at any rate without benefit of the Married Women's Property Act), and as such he insured with the Motor Union Insurance Company—a firm the A.A. and M.U. (joint) has been at pains to point out it is financially unconnected with—and received 2½% advantage as a member. Also, under the marriage settlement or alimony arrangement of the A.A. and M.U., members of the M.U. paid only one guinea a year subscription to the amalgamated societies for three years. Now it seems that this period is up this year, consequently my correspondent, in order to get his 2½% off, will have to pay two guineas a year in future. But he wants to know if it is worth the extra guinea. I may remark that he lives in the depths of the beautiful country, does not tour abroad, seldom goes where "traps" used to be set, and, like many others of us, got all the saluting he wanted when he wore the King's uniform. I gather from his letter, or from the part of it in which he appeals to me, that he does not wish to continue as a two-guinea member, for it is obvious that two guineas otherwise expended would represent a very large extra mileage in petrol, while his M.U. insurance is no cheaper than many others and of no greater benefit. Therefore he pays me the compliment of asking my opinion on the matter.

I am not a hypocrite. I have made no secret for some years past that my thoughts on the subject of motoring organisations are in no way similar to those of their officials. To be sure, I have an admiration for their talents and their adjustability, but in the matters where they cannot be expected to agree with me I am miles away. To begin with, I am more than suspicious of their faculty for agreeing to differ with each other, and of their content in remaining unconnected. It may be said that the A.A. has amalgamated with the M.U., which union was a proof of the desire for one head and one body. But it is right to remember that the M.U. was in poor health as regards organisation and management, while financially it had a "dot" of something like eleven thousand pounds, a nice little sum to come into the hands of either of the young fellows that courted her. So the M.U. did not join with the A.A. dowerless; indeed, things were very much otherwise, although the A.A. had the use of the money from the moment the agreement was accomplished.

Very well, then. Now the R.A.C., by means of its associates and associated clubs, has a large following, and, quite rightly, as the pioneer body of automobilism, professes to lead the movement. Its followers are not so numerous as those of the A.A., possibly owing to its not having gathered in the M.U., but it affords many of the same facilities, including, in my opinion, the only useful one, that of easing the way of the British motorist who desires to tour abroad with his car. This, with the same other problematical benefits that the A.A. affords, it gives its associates at one guinea per annum, which is a whole guinea less than its rival charges; also its badge is more artistic, and its menials, though fewer in number, are undoubtedly more polite. To this latter remark exception may be taken: I am

UNALLOYED ENJOYMENT. Electors being driven to the poll, probably their first experience of motoring.

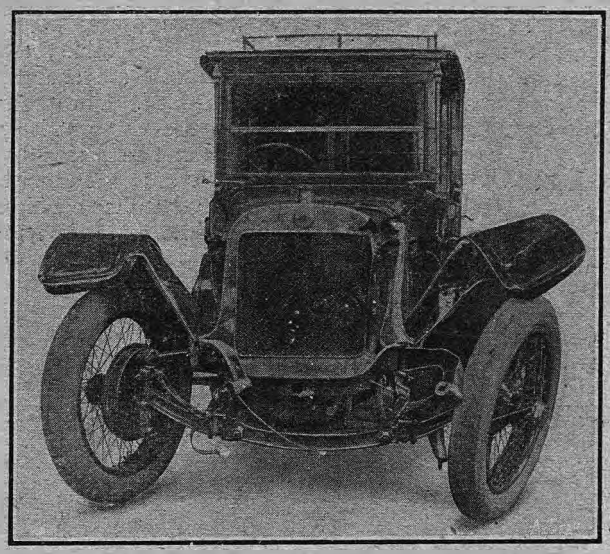
speaking from my personal experience as an entirely unbadged motorist for a year.

Why, then, pay two guineas where one will suffice; and why pay even one where nothing is equally useful? My advice, at present, is to say, A plague on both your houses, though, if by reason of the said plague, commonsense should ensue, my counsel would be to every motorist to join the one, only, and undivided association or society that represented the best interests of automobilism and did not waste its substance on superfluous objects and things of absolutely no importance to the vast majority of intelligent and ordinary users of motor cars.

Let us consider what these ordinary folk want and will not object to pay for. Do they desire to be defended in the police courts? Do they want to be saluted *ad nauseam* in all the exits from London? Do they want to be treated as babes without understanding in the matters of map reading, signposts, hotels, or gradients? Do they want a reading-room? Do they want charts and routes other than those they can obtain in guide books and on maps? Do they want a Club Journal? Do they want "get-you-home" badges, or clean towels, or members-only hair brushes?

I venture to think the answers are mostly in the negative, but I also venture to suggest that six out of every ten motorists would have no objection to paying half a guinea a year to a society that was the only one, that would afford the same facilities for foreign touring, that would represent them at ridiculous inquiries, and that would impress on Parliament what a lot of driving-force it had behind it.

I will guarantee—to meet the most obvious objection—that the aggregate subscriptions would be greater and not less, and that not one of those who at present are engaged in looking after the many interests of motorists would be out of employment.



A 25-50 h.p. Argyll landaulet after colliding with a Sunbeam car near Balfron, Stirlingshire. Although the impact was sufficiently severe to damage the front portion of the Argyll considerably, which is undoubtedly a sturdy car, yet the Dunlop detachable wire wheels came through unscathed.

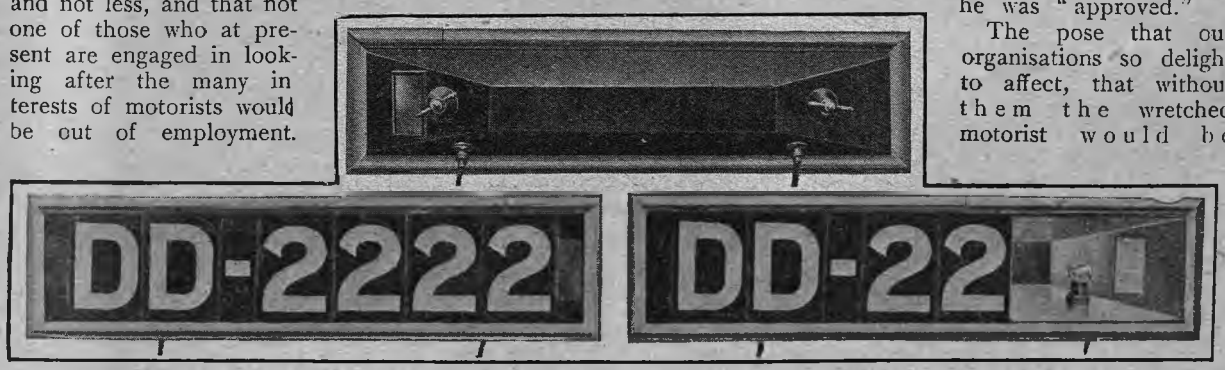
On the Road.

True, good men who now hang about on high roads doing little might suffer, but we read that trade was never better, and that useful hands are wanted everywhere. It may be said that many members would miss the *feu de joie salutant* that greets them every week-end on their holiday jaunt. So be it; personally I have much sympathy with those who have to salute any but their betters. In the Service it is different: there one salutes the King's uniform and not the thing inside it, but here I suppose if a drunken chauffeur in a car with a badge on it gave a couple of tramps a joy-ride, the poor scouts or guides employed under that badge would be under necessity to salute the party.

I do not wish to be unpleasant, but the majority of motorists have outlived any desire or need for patrols and mock military organisations. When there were unfair police traps these had their uses, but now, when police traps are as a rule only set in those places where habitual motorists seem to be lost to ordinary decency, and when scouts are warned not to be of use to members in informing them of traps, I fail to see any value in them at all.

I do not think I have ever seen one of these good folk in a place where there was no other human being in sight; certainly never at cross roads or forks where there were no signposts. I do not remember ever having found an hotel the better on account of any plates it was ornamented with outside; certainly I have never found my bill any smaller because my car was similarly disguised. Nine years' membership of one or other has never enabled me to save money on accessories through it, and certainly I have never found a certificated repairer to be the better because he was "approved."

The pose that our organisations so delight to affect, that without them the wretched motorist would be



A combined illuminated back number plate and red rear light. The left view shows the device complete with the two wires leading to the two electric bulbs inside. The right-hand view shows a slide on the beading displaced to uncover a slot which allows the interchangeable letter and number plates to be withdrawn, as well as the red end pieces. The plates each consist of two sheets of glass cemented together with a transparent number or letter between. The white side light is also shown. Above is a back view showing the electric connections, wing nuts for attachment, and the off side white light. Drainholes are provided below the casing, and stiff springs in the beading prevent rattling of the plates. This arrangement has been designed by Mr. R. C. Briggs, 108, Foleshill Road, Coventry.

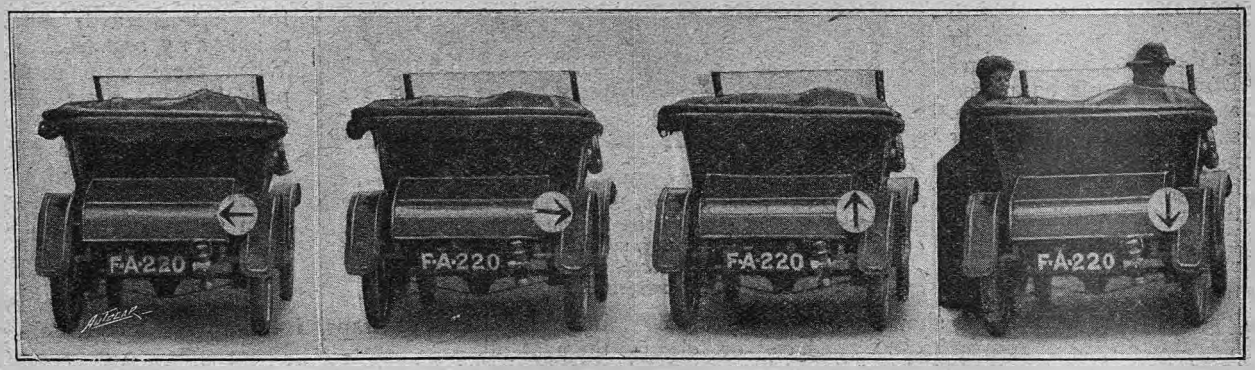
On the Road.

harried and persecuted out of existence, is a poor compliment to those in authority who have the settling of matters which concern local traffic and circumstances, while it is beyond a doubt true that in many cases impertinent and untoward interference has resulted in an effect exactly contrary to that intended.

We tolerate governments and laws we do not approve of, and we pay taxes to their support, because it is all part of the Curse of Adam. But, as that all-embracing punishment was never intended to apply to voluntary organisations, we are but lacerating ourselves additionally by not taking the trouble to make the best of the jobs we have and seeing if we cannot induce them to give their members their money's worth. It is notorious that members of any of them are not perfectly satisfied with what they pay for. That discontent is rife amongst the associates of the R.A.C. seems to be common talk, which is all the more to be wondered at when it is remembered that the R.A.C. itself, as regards the Club, has become a model for all the world to admire and marvel at. If one section, they say, can be a triumph of organisation, why should not the other be equally satisfactory? have nothing to gain by being uncharitable, while just as clearly I have much to lose in many ways by being plain-spoken.

As a matter of fact, our chief fault lies in being too confiding and lazy. We go on contributing to organisations that were once absolutely necessary, but which, because of the extraordinary development of automobilism, have become as effete and supernumerary as the buttons on the backs of our tail coats. Eight years ago the R.A.C. and the A.A. and the M.U. were all invaluable; to-day they have served their purpose and are anachronisms—as far as road work is concerned. For other purposes they are still of use to the comparatively few who motor abroad or who cannot read signposts or maps. I do not desire in the least to see them become extinct, but if it were possible that they could be less costly, less "swankish," and at the same time remain equally well organised, I feel sure they would become far more popular and representative of modern automobilism.

The development of modern automobilism is not in the direction of greater extravagance. The rich almost all have their cars, and the probability is that



Four photographs showing the various positions of a warning device designed by Mr. J. N. D. La Touche, M.I.C.E., a retired Indian railway engineer, of Strefford, Craven Arms. The device consists, it will be seen, of a disc on which is painted an arrow. This disc is suitably connected to a handle placed close to the steering wheel of the car in a position where it can be easily operated by the driver. The object of the disc is to indicate to the driver of any overtaking vehicle the intention of the driver of the car. Obviously, when the arrow is pointing to the left it indicates that the driver intends to turn to the left. When it points to the right, a turning to the right is to be taken. The vertical positions of the arrow are not so obvious in their meaning. Mr. La Touche suggests that when the arrow is pointing upward it should notify the intention of the driver to steer straight ahead, and this would be the normal position of the disc. When the arrow is pointing down it would denote that the driver is about to stop, or intends to reduce speed. The disc is, of course, provided to remove the necessity for the driver to indicate his intention by holding out his hand, or otherwise signalling, and it is suggested that the arrangement might be utilised not only on motor cars, but on all forms of road vehicles.

I am often accused of being in my criticisms purely destructive. If I were merely a critic I could reply that it is not part of my job to be otherwise. But I wish to remark that I am not content to be a mere critic, for a critic who is content to be merely a critic is a most useless beast. I have not failed at motoring. Without being a mechanic or an engineer, I have made cars in my charge go and keep on going, while it cannot be purely by good luck that up till now I have escaped disaster or prosecution. I describe myself as one of the public, and I am proud to be included in the mass of ordinary motorists who use their cars to carry out their ordinary businesses. I know when anything is amiss in a car, and from experience I know if I can right it or if it requires a more expert hand to put it right. Therefore I am not boasting when I call myself a typical automobilist, and from that standpoint avail myself of this means of presenting the views of those of my kind. If anyone suggests that I criticise with ulterior motives, all I ask is to know what those motives can be, for clearly I never again will they buy machines of larger horse-power than those they already have possessed. Its future lies in the hands of the less wealthy classes, and in the fact that the motor has ceased to be a pleasure vehicle only, but is also as necessary as a railway or a taxicab.

OWEN JOHN.

A Cambridge correspondent calls our attention to a case in which the St. Neots fire brigade on being summoned to a fire at Croxton did not arrive until two hours after the call was received. The delay was due to their having to wait an hour and ten minutes before they could secure horses to draw the fire engine; after the horses had been procured it appears that a further fifty minutes were occupied travelling to the scene of the fire, which was only three and a half miles away, along a main road. "Surely," adds our correspondent, "this is a case in favour of a motor fire engine."

The Acme Shock Absorbers.

Multiple Springs of Varying Periodicities to Prevent Harmonic Vibrations.

THE desired function of shock absorbers of the spring shackle type is to provide a sensitiveness which is absent in the comparatively unyielding springs of the car, but from the point of view of the inventor of the Acme fittings "these devices have hitherto stopped rather short of the mark, inasmuch as they merely provide additional springs which in themselves have a marked periodicity, and are utilised for the absorption of shocks as well as the carrying of weight."

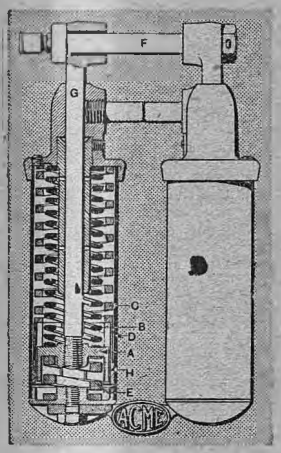


Fig. 1.—Part sectional view of the Acme shock absorber.

A, plunger disc upon which the spring B rests
B, first action spring
C, second action spring
D, outer casing
E, buffer spring
F, shackle bolt
G, coupling rod
H, guide carrying spring C

Before proceeding to the discussion of the Acme shock absorbers, we must remind our readers that the views quoted above are those of the gentleman responsible for the springs now under review. In designing them we are informed that a two-fold object has been kept in view—(1) to arrange that the normal weight-carrying springs should be comparatively weak, in order that they shall be able to flutter to the more rapid tremors, further displacement by coarser shocks being met by stronger springs; and (2) so to arrange matters that the yield is divided between springs of different strengths, and therefore different periodicities, in order that cumulative vibration, due to the road shocks getting into phase with the springs, should be eliminated. Reference to the accompanying section (fig. 1) by the light of the following description will permit the reader to follow the construction and operation of this device. It will be seen that a plunger disc A, which has four castellations, is attached to the end of the spring shackle bolt by the rod G, the disc A working up and down within a guide of corresponding section H.

Mounted concentrically with the rod G is B, the lighter of two rectangular section helical springs, this spring being of such length as to be always in action. It is made of such tension that it will respond to the high frequency shocks when the car is running light. Further displacement by greater loads or shocks causes the disc A to travel upwards until it encounters the base of the spring C, which is resting on the thickened end of the guide H. This spring C is sufficient to check all ordinary disturbances when running, but any extreme shock would cause the disc A to come to the end of its travel and throw the load on the laminated springs. In the event of a violent rebound the buffer spring E comes into action.

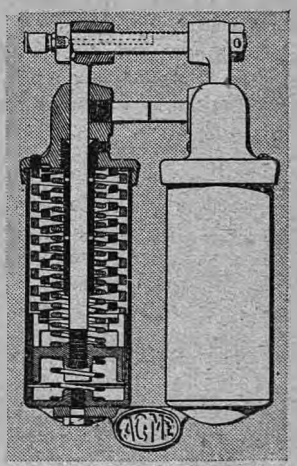


Fig. 2.—A second model of the Acme shock absorber for specially heavy cars and containing three concentric springs as shown.

The inventor suggests that the manner in which the sway, periodic swinging or bouncing, is eliminated is of some interest. In order to arrive at a cumulative bounce the necessary conditions are that the spring and shock must have the same periodicity. It is unfortunate that the road bumps very often happen to be evenly spaced, and synchronise with the natural rate of vibration of the springs, so setting up most unpleasant oscillation, the cause being that natural vibrations are of a harmonic order, and so is the vibration of a spring. To combat this the Acme absorber is so designed that no sooner has vibration of a particular periodicity started on one spring than it picks up another of quite a different character, and bouncing is immediately repressed.

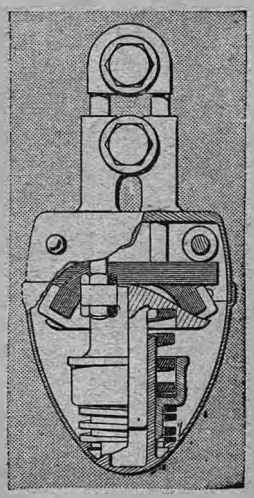


Fig. 3.—The triplex type of Acme shock absorber in which laminated springs are used in addition to helical springs.

The device, as can be seen, is totally enclosed, and is intended to be half-filled with oil. There is a certain amount of clearance left between the disc A and the guide H, so that a dashpot action is obtained which is effective in checking the rebound. Another type with three springs is made (as shown in fig. 2) for heavy cars.

Another series, the Triplex, one of which is shown in fig. 3, while being based on the same principle has the duties of the lighter spring performed by two laminated springs, wherein the natural friction between the blades is relied upon for part of the damping action. These fittings are the production of Car Springs, Ltd., 19, Fairfield South, Kingston-on-Thames.

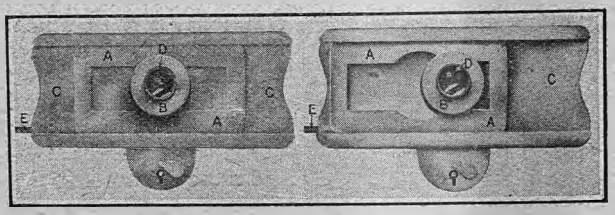
A New Valve Grinding Compound.

We have recently been using a new valve grinding compound sold by Mr. Robert Scaife, A.M.I.A.E., Winchester Mount, Armley, Leeds. This is a compound which Mr. Scaife has evolved owing to his dissatisfaction with previous grinding mediums of which he has had experience. We must say that the compound in question is really most effective. It enables a badly pitted valve very quickly to be satisfactorily reseated, and gives a compression to all intents perfect without the aid of any finishing medium. We have merely found it necessary to give each valve a finishing turn or two, with a spot of oil on the cone surface, after having cleaned it thoroughly. Mr. Scaife intimates that he will be pleased to send a small sample tin free to any reader of *The Autocar* who will apply to him at the address given.

The Wardell Interlock.

A Device to Prevent an Engine being Started with a Gear Engaged.

THERE are, indeed, few motorists of any degree of experience who have not at some time or other left one or other of their speeds in gear when hurriedly quitting the driving seat and then subsequently attempted to start up their engine without remembering to shift the change-speed lever back into the neutral position. The terrible catastrophe which took place in Paris only a few weeks ago, and by which two charming young children and the nurse of a celebrated French actress lost their lives, and which resulted from similar forgetfulness on the part of the unhappy driver of the car, is too fresh in the public memory to need recapitulation. Since this lamentable occurrence a device now being put on the market by Messrs. Wardell and Son, Carshalton Park Road, Carshalton, Surrey, has been brought to our notice, and this is so easily fitted, and so efficacious against any such happening as that recited above, that we have pleasure in drawing attention to it here. A few words of description, in addition to the accompanying illustrations, are alone necessary to its complete comprehension. The Wardell device consists of a sliding plate A fitted to the front of the car in any convenient manner immediately behind the starting handle. This plate is made with a slot segmentally enlarged at its centre to allow the passage of a collar B (which is fixed in a suitable position on the starting handle-shaft D) through it when it, the collar, is concentric therewith. It will be seen that the plate A is capable of being traversed in its guides in the back plate C from right to left and *vice versa*. It is attached to the change-speed lever by a Bowden wire E in suchwise that the collar B on the starting handle-shaft D is only concentric, and can only pass through the segmental orifice in the sliding plate when the change-speed lever is in the neutral notch. At all other times the sliding plate A occupies the position on the right hand, when it is obvious that the starting handle cannot be made to engage with the projecting end of the crankshaft, and starting up is impossible, while the motorist has an instant intimation of his forgetfulness with regard to the change-speed lever. A lock is added to the device, so that the sliding plate can be locked permanently in the closed position, rendering it impossible for any unauthorised person to start up the engine.



The view on the left shows the normal position of the slide A, whilst the right-hand view shows the slide drawn to the left owing to the gear lever being out of the neutral position.

A, sliding plate
B, collar on starting handle-shaft
C, base plate
D, end of starting handle sleeve
E, casing of interlocking wire

The Proposed Croydon Relief Road.

THE proposed motor relief road between Thornton Heath Pond and Purley was the subject of an inquiry by Mr. A. A. G. Malet, an inspector of the L.G.B., at Croydon Town Hall recently. The matter has been one of strong local controversy, principally on the part of tradesmen who fear that the diversion of traffic will take away some of their present customers, and there was considerable opposition on the score of expense to the ratepayers.

The scheme is estimated to cost £55,493, towards which the Road Board has offered £30,000. The Ecclesiastical Commissioners, over a portion of whose land the road will run, offer to give the necessary land —about thirteen acres—and £5,500. A grant of £250 from the London, Brighton, and South Coast Railway Co. has also been promised. This leaves an estimated cost to the Croydon Council of £19,743. If the scheme be approved the proposed road will be nearly four miles long. The route is in almost a straight line, passing near Waddon railway station and through open country to Russell Hill, thence into Purley and joining the main road at the present tramway terminus. Averaging about 60ft. in width, the carriageway will be tarred macadam, to minimise dust, and the footways bordered with trees. The road is designed to traverse the least possible gradients, the steepest being 1 in 20 for 700 yards. The building of two new railway bridges is included in the scheme, one of these being to supplant the present narrow bridge over the Epsom line, and the other doing away with the level-crossing over the Croydon and Wimbledon line at Waddon Marsh.

On the second day the Inspector said he had heard that morning, on good authority, that the Road Board considered the question of a satisfactory outlet at Purley to be so important that, if necessary, they were prepared to contribute a further sum of £16,000 to meet the estimated cost of amending the scheme or adding to it in that respect. Mr. W. J. Chamberlain, a member of the Council, and one of the most active opponents of the scheme, said that the opposition was mainly based on the question of expense. An additional grant might cause a change in their attitude, and much more so if the Road Board would render appreciable financial assistance towards maintenance and upkeep. Mr. E. F. Morgan, the borough road surveyor, who planned the proposed road and was largely concerned in the negotiations with the Road Board, said that, while being unable off-hand to name an instance of such a grant for maintenance, he nevertheless looked forward to getting assistance of that kind. At the same time, every effort would be made by the Council to secure from the Road Board an additional £10,000 for widenings at Thornton Heath.

It was suggested that the inquiry should be adjourned till the intentions of the Road Board were definitely known, but the Inspector decided to continue, preferring to take the proposal as it stood. The Local Government Board would not come to any definite decision until all considerations had been taken into account. Mr. J. C. Joseph, appearing for the principal objectors, remarked that it was quite possible that much of the opposition would be abandoned if any material contribution for maintenance was promised.

Application for a West End Speed Limit.

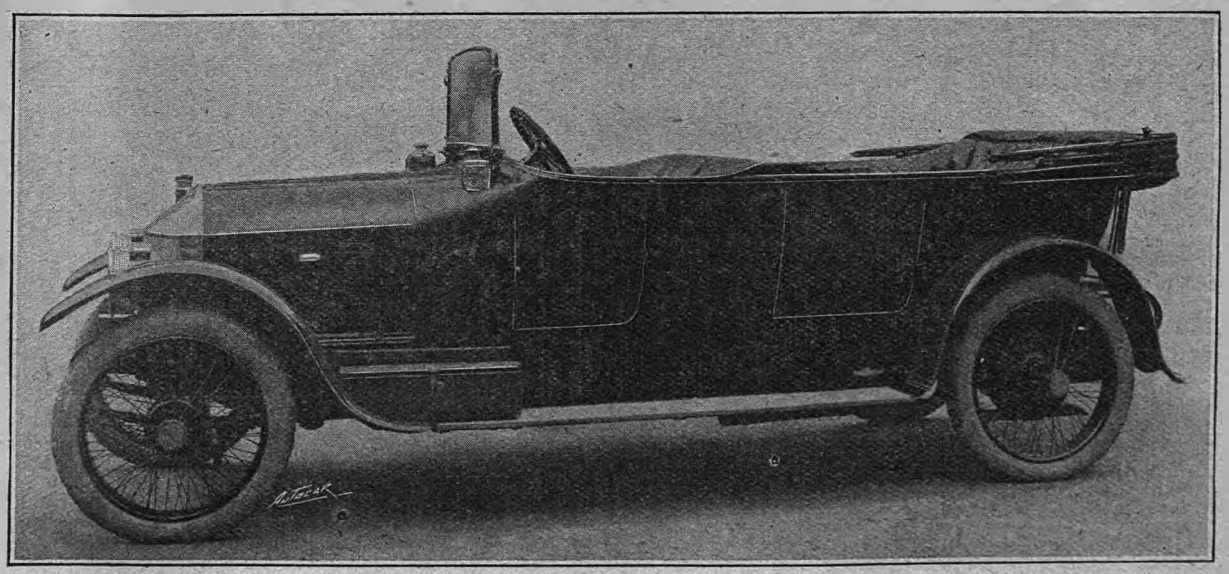
Permanent Officials' Feeble Support. Police Evidence against the Proposal.

A LOCAL Government Board inspector spent a long day on Friday enquiring into an application by the London County Council for a ten-mile speed limit in the greater portion of Grosvenor Place, Grosvenor Gardens, Buckingham Palace Road, Buckingham Gate, and Lower Grosvenor Place. The streets scheduled form practically a V, with Bird Cage Walk at the top of the right hand leg, the junction of Knightsbridge and Piccadilly (Hyde Park Corner) at the top of the left hand leg, the junction of Grosvenor Gardens and Buckingham Palace Road forming the lower point of the V.

The London County Council was first minded to move in the matter by the receipt of complaints from Mr. H. W. Reeves, a solicitor of Chapel Street, Belgrave Square, as to dangerous driving in the area mentioned, but the County Council has undoubtedly placed itself in a very remarkable position. In the first place, its own General Purposes Committee, presumably on the advice of the permanent officials, has twice reported against this application being made, but the Council having refused to adopt the advice of its own committee, which went fully into the matter, the officials nevertheless had to make out a case for the application! That they found it difficult to do so was obvious from the very guarded and non-committal answers which were given to the representatives of the R.A.C. and the A.A. and M.U. in cross-examination, whilst the most that Mr. C. A. Baker, the principal official witness of the Council, could say in favour of the application was that such congested traffic as exists in this part of London should be dealt with differently from traffic on country roads; a remark which, as was promptly pointed out, could be applied to any congested traffic area in London, with equal force. Another astonishing fact was the admission that in working up the case the L.C.C. officials had not taken into consideration, as a factor, the number of point duty policemen for directing the traffic, and Mr. Baker did not know, for instance, at Hyde Park Corner, if there were any, or how many. The Council's evidence also consisted of a number of local witnesses, several of whom allowed their imagination to stray to such an extent as to make the suggestion that speeds of forty and fifty miles an hour are indulged in along Grosvenor Place. Finally came an old gentleman who claimed to be the representative of the Public Safety League, alleged to be of international character, and yet, withal, having the magnificent membership of sixty. The inspector also courteously allowed the driver of the four-wheeled horse cab in which the old gentleman habitually rides to express his views.

Apart from the weakness of its own case, there was a very formidable opposition to the scheme, not the least important opponent being the Commissioner of Metropolitan Police himself. He was supported by the R.A.C. and A.A., and, in addition, there was the Westminster City Council. Putting on one side the R.A.C. and A.A., perhaps, as interested parties, it is refreshing to find the Commissioner of Police still holding the commonsense views expressed before the House of Commons Committee now dealing with motor traffic, that speed limits are useless for the proper regulation of traffic in London, and that the proper application of Section 1 of the Motor Car Act is by far the greatest safeguard against danger. When the authority responsible for the handling of London traffic comes forward with such views, and is supported by the local governing authority, it seems to us that the L.C.C. is face to face with difficulties of a more than ordinary character in making out a case for an arbitrary speed limit of ten miles an hour. At busy points the police theory, shown to be right in practice, is to get the traffic through as quickly as possible, and the imposition of a ten-mile limit only adds to the congestion. On the point of danger, a strong argument against a ten-mile limit is that in all the streets proposed over 90% of the accidents during the past three years have occurred in connection with vehicles which were proceeding at ten miles an hour or under.

The Inspector will report to the L.G.B., who in due course will announce their decision, but we shall be surprised if the application succeeds.



A Van den Plas flush-sided body of very pleasing design fitted on a 26-50 h.p. (102 × 150 mm.) Métallurgique chassis.

The New Michelin Tyre Levers.

Enabling Tyre Removal and Replacement to be Accomplished with Greater Ease.

THE introduction of the Michelin bolt valve which enabled security bolts to be dispensed with has, indeed, been a boon to those tyre users who adopted it, but now the Clermont-Ferrand firm, untiring in their efforts to ameliorate the lot of the pneumatic tyre user, has gone considerably farther.

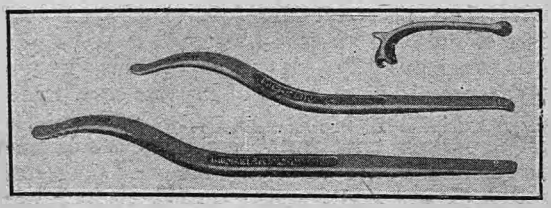


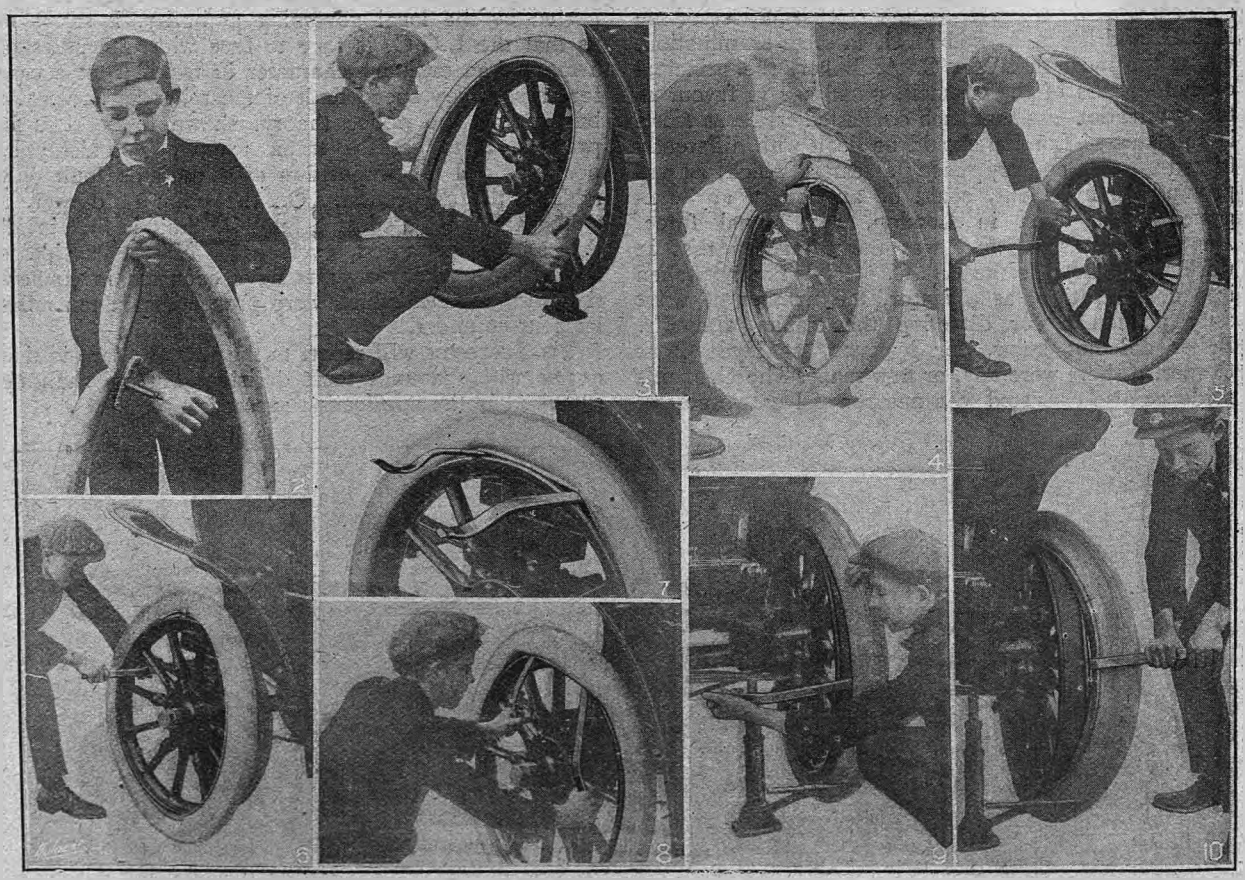
Fig. 1.—The set of three new Michelin tyre levers.

Its latest introduction consists of three specially-shaped levers, which render the mounting or dismounting of the biggest and stiffest covers surprisingly simple and easy. For some time past we have known of this latest means of fitting Michelin tyres furnished with the bolt valve, but the fact that the British firm has only now become in a position to supply the necessary tools has kept us silent hitherto.

In devising these tools it has been the aim of the Michelin Co. to discover a means so simple that any motorist could grasp its details at once and without difficulty by simply following the directions set out in an illustrated booklet. That they have been successful in this will, we think, be agreed after the perusal of the following illustrated matter. The advantages claimed and possessed by the new system are: (1.) Extreme simplicity and rapidity of operation. (2.) Elimination of the danger of nipping or puncturing the tube—secured by the provision made for fitting tube and cover at the same time. (3.) Avoidance of undue physical effort—which we have proved conclusively at the first attempt.

It should be noted that the tools and method apply to all types of Michelin tyres so long as, of course, no security bolts are used. The levers, which are shown in fig. 1, are of simple form and three in number, and identified by code words—(1.) A large lever called "Fusil." (2.) A smaller lever called "Forum." (3.) A hook lever called "Fez." Either of the first two may be used for fitting, but for detaching both are required, as will be explained.

The method of fitting a tyre by their use is as follows: The tube is slightly inflated and allowed to



2. When a tyre is to be fitted the air tube is partially inflated, and with the valve loose the tube is held as shown and all the air that will naturally find exit is allowed to do so. 3. Entering the valve in the rim when commencing to fit a tyre. 4. Using the small hooked lever. 5. The hook lever in position holding the tyre on the rim on one side of the valve while a long lever is being used to force on the other side of the tyre. 6. Pressing up the valve so that the security plate clears the beads before refitting the second half of the tyre. 7. Removing a tyre with the new Michelin levers. The first section ready to be lifted over the rim. 8. Forcing down the first section to be removed. 9. Using the long lever at the back of the tyre after a portion of the front bead has been detached.

hang, simply supported by the hand as shown in fig. 2, until no more air is felt to issue from the valve stem. When the air escape can no longer be felt the valve is tightened and the cap screwed into position. It will be noted that in addition to avoiding tube nips, the new system of preliminary tube inflation calls for a very much lower air pressure than formerly. The tube should then be wiped over with a chalk-sprinkled rag, and the excess removed by shaking the tube, which is then placed inside the cover beginning at the valve, care being taken to see that the valve body lies in the valve cuts in the cover. The tyre is then held in both hands as in fig. 3, with the works number facing outwards, and is placed on the rim, the valve being passed through the hole in the rim as shown. The lower half of the tyre is now drawn outwards and allowed to return to its natural position, to make sure that the section of the inner bead which is near the valve fits closely into the rim clinch. Care should be taken that the security plate of the bolt is well inside the cover. After this the beads are fitted into the rim by three operations. The tyre, so far as it is fitted, is first secured to the rim by means of the hook lever "Fez," as in fig. 4. Then about 15in. to the right of the valve the wall of the cover is pushed towards the car until the outer bead is over the rim clinch. The cover should be held in this position, and the hook lever slipped in the clinch, see fig. 5. If the projecting nose of the hook lever be pressed against the bead and the handle raised, the cover will slip into position.

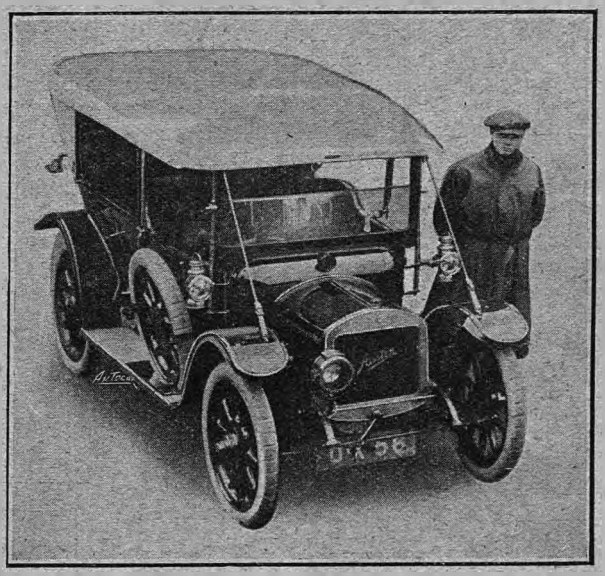
Both beads on the left of the valve are fitted at one and the same time by the use of one of the long levers, the larger for preference. Holding the cover in position, the lever is inserted to the left of the valve to engage both beads as in fig. 5, and being pressed over sharply every six inches or so, always engaging both beads, the cover will be found to slip easily into the rim until both beads are completely fitted. The lever should be slid over the rim as far as it will go at each operation, and should be pressed over as far as possible. Each time the lever is inserted and each time it is withdrawn the cover should be held in position on the rim.

When the cover to the left of the valve has been properly fitted, the valve should be pushed up with the flat end of the lever as shown in fig. 6. This allows the outer bead to slip under the bolt valve security plate and to take its proper position in the rim clinch.

When the tyre is completely on the rim an inspection should be made to see if the inner bead be securely fitted all round. If it should have come out of or failed to enter the rim clinch at any point it must be pushed back into position with the hand. The tyre being then securely fitted, all that remains to be done is to remove the hook lever by pulling it to one side and to finish off the fitting by tapping the tyre here and there with the flat of the lever.

To Detach a Tyre.

Just as the cover and tube have been fitted at one and the same time, so they can be detached together by similarly releasing both beads. The operation is as follows: The valve hood must be partly unscrewed and pushed up with the flat of the lever, so releasing the beads from the grip of the security plate. Next the valve hood is removed, and with the smaller of the long levers the outer bead is pushed inwards all the way round to ease it from the clinch. The wheel is then turned until the valve is at its lowest point, and the removal commenced at the top of the wheel. To detach the first length of the outer bead opposite the valve with the old levers, the great difficulty was to work the levers in under the bead, but with these new levers the operation is perfectly easy. The end of the lever "Forum" (the smaller of the two large levers) is inserted between the clinch and the cover; it is raised as far as possible to allow of the introduction of the larger lever, which is held by the straightened end with the word "Michelin" uppermost, by its side. Now the bead is raised by pressing down the large lever, and the small lever "Forum" is turned so that the code word is on top and driven in so that its end rests on the inner bead. When this has been done it will be in a horizontal position, and by virtue of its slightly lipped end will remain fixed under the bead. It is now left in position until the larger lever is inserted eight or ten inches further on as in fig. 7. Both levers being then pressed down as shown in fig. 8, the bead should at once leave the rim. If this do not happen, the levers are too far apart;



One of a batch of twenty-five 10 h.p. Austin cars fitted with Austin-Sankey detachable wheels which have been supplied to the Crown Agent for the Colonies.

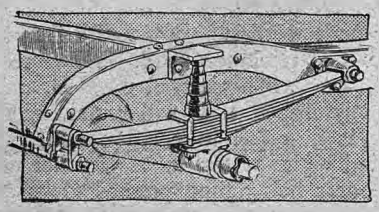
if the bead leave the rim but slips back into the clinch when the pressure is relieved, the levers are too close together. Subsequently another ten inches or so of the outer bead to the right and left respectively are then disengaged, after which both beads can be operated at the same time. The wheel is turned round until the detached portion of the bead is clear of the mudguard, and working from the car side of the wheel the large lever is driven under the inner bead at the middle of the detached section until, as in fig. 9, it rests on the outer rim clinch. This lever is then pulled towards the operator, and, as seen in fig. 10, the cover and tube leave together. Should the mudguard extend so far down the wheel as to prohibit comfortable work with the long lever, the short one can be used at a convenient point under the mudguard or where there is sufficient clearance to operate it.

It may be realised from the foregoing that the processes of fitting and removal are not in themselves novel, the special features are in the design and use of the three new levers, which so greatly facilitate the operations

The Nevajah Shock Absorbers.

To Co-operate with the Main Spring in Dealing with Severe Inequalities of the Road.

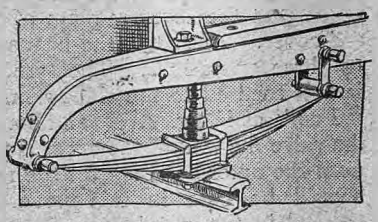
IN the paper recently read by Mr. G. H. Baillie before the Institution of Automobile Engineers, the lecturer strongly advocated the use of some form of buffer spring so that a somewhat more flexible leaf spring could be used without the risk of the axle touching the frame on a severe inequality of the road.



The Nevajah shock absorber or spring buffer fitted to a back spring.

Probably the most widely used of these buffer devices is the Nevajah, sold by Messrs. Thomson-Bennett, Ltd., Arden Works, Cheapside, Birmingham. Rubber buffers have, of course, been used for many years by a number of motorists, but they are certainly not so satisfactory as the coiled spring of flat steel which forms the Nevajah, for the rubber is bound sooner or later to perish, and even when new it has not the range of action of the spring. The Nevajah spring buffer, or shock absorber—perhaps the former conveys a better idea of its function—may be fitted either to the front or back axles, or both, the methods of fitting being shown in the accompanying sketches. Where, as is usual, the back spring lies outside the frame, a bracket may be riveted to the frame member, as illustrated, but in the case of the front axle, where the springs usually lie immediately under the frame member, there is no need for this bracket, but the top of the Nevajah may impinge directly upon the frame or upon a suitable distance piece formed of hard wood. These distance pieces are also supplied by Messrs. Thomson-Bennett, Ltd., when required, being necessary in cases where the distance between the frame and the centre of the spring exceeds 6in. Each buffer is mounted on a base plate which is intended to be passed under the spring clips securing the leaf spring to the axle, and a solid head is provided to the buffer to form the contact piece with the frame or distance piece. Nevajahs are supplied in six types and various sizes, the smallest type being for cars up to 15 cwts., whilst the heaviest type is effective for cars up to 4 tons in weight. The over-all heights range from $3\frac{3}{4}$in. to 6in. The prices vary from 16s. 6d. to 27s. 6d. per pair, according to the type and size.

In addition to the Nevajah shock absorbers or spring buffers the same firm have a supplementary spring, termed the "Glissade," the function of this device being the reverse of that of the Nevajah, for whereas, as suggested, the last-named is intended to back very flexible springs, the "Glissade" is a supplementary spring coming into action when the smaller road shocks are met with. A special feature claimed for this device is that it is absolutely frictionless, which makes it so sensitive that it absorbs every slight vibration due to the irregular road surface. The "Glissade" shock absorbers can be supplied in sizes and styles to suit practically any type of spring suspension, the prices varying from £3 10s. up to £5 10s. per pair.



The Nevajah shock absorber on a front spring.

Hotel Accommodation for Grand Prix Visitors.

A REPRESENTATIVE of the R.A.C. has just returned from Amiens, which he visited with a view to making final arrangements for the accommodation of members and associates who propose visiting Amiens for the Grand Prix. Unfortunately, the accommodation for visitors available in Amiens is extremely inadequate. The hotels, not numerous, are limited as regards sleeping accommodation. There is no really modern first class hotel in the town, and the proprietors of the better class hotels are evidently under the impression that they will be able to become millionaires in connection with the Grand Prix. The majority of hotel proprietors absolutely refuse to reserve any definite number of rooms or to quote a definite price. They obviously believe that visitors are bound to come to Amiens, and they think that they will be able to get any price they like to fix for their rooms later on. In these circumstances, the Club representative was only able to obtain limited accommodation. At one primitive little hotel a few rooms have been reserved at an inclusive price of fifteen francs per person per day for three days. A few more rooms have been reserved at a little hotel close by at an inclusive charge of twenty francs per person per day, to be reserved for three days.

As regards the larger hotels in the town, only one proprietor would agree to reserve a definite number of rooms at any fixed price. He is demanding an inclusive price of fifty-six francs per day per person, and the rooms have to be taken for not less than three days. This price is much higher than has been charged before at any similar event, and therefore only a limited number of rooms have been reserved.

Judging by present indications the number of English visitors to the Grand Prix will be extremely limited.

Another serious difficulty arises in connection with the garaging of cars. The accommodation available does not appear to be adequate. Apparently, the few garages that exist are already full up with cars belonging to the inhabitants of the town or neighbourhood, and nobody seems to have any idea of arranging special accommodation for visitors' cars during the Grand Prix. None of the hotels possesses accommodation for more than about six cars.

Unfortunately, anyone who wants to see the Grand Prix is practically forced to stay in Amiens, as no suitable accommodation is available anywhere in the vicinity, the nearest place of any importance being Abbeville, which is about forty-five kilometres off. The whole district is particularly poor in accommodation for visitors, and the resources of the town and every village in the district will be stretched to the utmost.

Probably some visitors will elect to stay in Dieppe, as it only takes about 2½ hours by car to travel from Dieppe to Amiens.—*Communicated by the Secretary of the Royal Automobile Club.*

Correspondence.

EDITORIAL NOTICES.—No letters from members of the motor industry will be published when they deal with subjects which may be regarded as advertisements for the writers, or their business interests. At the same time as many of the most practical suggestions come from those engaged in the motor industry, their letters will be inserted when possible, though the names of the firms they represent may be expunged, and the initials of the writers substituted.

Letters of a personal nature will be withheld.

The Editor, although accepting no responsibility for the opinions expressed by correspondents, reserves the right to publish a portion of a letter, and to omit any part which he does not consider interesting or essential.

All communications under a *nom de plume* should be accompanied by the name and address of the writer, not necessarily for publication, but to assure the Editor as to good faith.

Enquirers who ask for the experiences of private owners with specified cars, parts, or accessories, are requested to enclose a stamped addressed envelope, so that replies which space will not permit us to publish may be forwarded to them. Circulars or letters from interested parties will not be forwarded.

THE ISLE OF MAN RACE.

[19581.]—With reference to your article on page 924 of *The Autocar* of May 24th, I am sure hundreds of your readers will join me in complimenting you upon your attitude in this matter of the Society's "ban." As you say, "If a man has bought and paid for his car, surely he can do what he likes with it without the consent and approval of the Society of Motor Manufacturers."

Like everything which prospers over well from small beginnings, the Society has been tempted to forget its real importance in the cosmic scheme, and not succeeded in resisting the temptation.

It takes itself far too seriously, and will continue to do so just as long as everybody but yourself (and, I might add, the ingenuous, but far from myopic scribe who conducts the motoring section of *Sporting Life*) says, "List! list unto the Society, all genuflecting!" whenever a Society deliberation is announced.

I could give you many matters in which it has been a positive clog upon progress, and it is becoming a positive "Mr. Bumble" (witness the past two or three years), swelling with parochial flatulence as it shakes its rod at any poor little urchin of a motor trader who dares to withhold his subscriptions.

Now to another matter. The majority of manufacturers who are members of the Society seek to get one to sign, when purchasing one of their cars, an undertaking not to exhibit that car at any exhibition other than one held or approved by the Society, under a most considerable penalty. You know this, of course, as do the majority of your more serious readers.

May I ask your opinion of the legality, or tenability, of this undertaking business? Should I, having weakly signed such an undertaking, be open to legal process if I broke my undertaking and allowed my car to be exhibited at a local horse, dairy, flower, or poultry show, to fill an otherwise empty space in a marquee?

I quite realise the necessity of bolstering up the Society shows in every conceivable manner. Their dulness, overcrowdedness, and general inefficiency of management (from the view-point either of the exhibitor or the mere car buyer attending them to see and select cars) must be manifest to all men, but has the Society the legal right to enforce such undertakings from its members, and can it legally enforce or secure the enforcement of penalties incurred by the violation of the undertaking I mention?

It seems to me that the Society is an almost Obean affair, and that its council-members are very largely people who would be well advised to devote to setting their own houses in order the time which they devote to brain-waving in Arundel Street. I am almost confident that if the pleasure of hearing themselves talk were denied to councillors, the council chamber would be empty; that is to say, that the wise gentry who formulate these enactments simply like to play at parish-council. That they neither know nor care what is really beneficial to the automobile movement as a movement is amply evident from their dog-in-the-manger behaviour in connection with this poor little Manx Race.

BURST THAT BUBBLE.

IRRESPONSIBLE USERS OF THE ROAD.

[19582.]—The motorist who uses his car each and every day of his life, as I do, acquires the habit of being surprised at nothing which may happen on the road. He knows full well that it is up to him to look after all the other traffic, that, should an accident occur, whether it is his fault or not, he will most likely have to stand the racket all the same.

A curious incident happened to me the other day whilst driving along a broad road, and I would like to know definitely what my position would have been legally in case of an accident.

Sitting next me was a friend who contemplates purchasing a car, and at the time I was putting him through his paces in the matter of gear changing. A few cyclists were about, keeping their own side of the road, and I had the car on second gear, literally crawling, when suddenly a lad of perhaps sixteen or seventeen years of age passed us in the same direction as we were going, and, in spite of having ample room to do so properly, he nearly touched the offside front mudguard. We proceeded slowly, keeping well to our side while the cyclist did a rather curious performance across the breadth of the road, swerving in a most alarming fashion. One of the first points noticed was that his right pedal was much off the true, and possibly this was the cause of his acrobatic display. After a few more swerves lad and cycle mounted the pavement and crashed with much force into and through a hedge. We ran forward to render assistance—the car had been stopped for a few seconds—expecting to pick up a badly bruised and damaged cyclist. In this we were disappointed, however, for the lad had regained his feet and was looking with dismay at his damaged bicycle. As a medical man I saw at once that we were dealing with an individual suffering from St. Vitus's dance, who was practically not responsible for his actions whilst undergoing vigorous physical exercise such as cycling.

As things turned out it was more by good luck than by good guidance that the car was at rest when the incident happened. Had we been moving at the time there is no saying what might have occurred. Then, of course, there would have been added to the wonderful and fearful lists published by the anti-motorists "Another Motor Accident."

When so much attention and needless worry are given to motorists it seems high time that those in authority should insist that the other traffic met with on the road should be at least fit and able to take care of itself in a reasonable fashion.

AKE-AKE.

INCONSIDERATE DRIVING.

[19583.]—I feel it my duty to call attention to the following: Last Sunday afternoon, May 25th, I was driving from Lyndhurst to Southampton. About 100 yards from Lyndhurst Station I met a large heavy car. The chauffeur forced his way between my car and a pony trap coming towards me, and, had I not jammed on my brakes for all I was worth, we should have had a terrible smash, as he was coming at a great speed, although the road was clearly mine. If it were an error of judgment on his part, I can only say there was absolutely no excuse for it. A doctor sitting by me said he had never seen a more scandalous piece of driving, nor have I, though I have been driving since 1899.

These are the people who make motoring dangerous. They seem to have no regard whatever for the rights or feelings of others.

SIX-CYLINDER STANDARD.

[Our correspondent should communicate the facts and the identification number of the car (which he informs us he noted) to the R.A.C. and the A.A. and M.U. with a view to some action being taken against the offender.—ED.]

POLICE TRAPS IN ESSEX.

[19584.]—I notice a reference in *The Autocar* to a so-called "epidemic of timing and fining." The epidemic lasted on one Saturday and Sunday between Widford and Ingatestone. Every one of those proceeded against exceeded 25 m.p.h. over the four and threequarter miles, and several exceeded 37 m.p.h. In the distance there are three corners, where one can only see a short distance, and where 15-20 m.p.h. is amply fast enough. The trap included the villages of Widford, Margaretting, and most of Ingatestone; the latter has a narrow street with several blind turnings into it. The driving on this length of road has, for some time past, been most objectionable, especially on Sundays, and the worst offenders appear to be coming from and returning to London. Sunday is the only day on which hundreds of people can get an afternoon walk, and they ought to be able to use the road without being bespattered with mud and slush or blinded or choked with dense clouds of dust.

Correspondence.

People in Ingatestone are tired of this sort of thing and are now asking for a ten-mile limit, and will probably get it. Many of the motorists in the locality are now in favour of it, and I do not think one will oppose it, which fact, perhaps, speaks for itself. F., INGATESTONE.

CAMBRIDGE AND MOTORISTS.

[19585.]—Some little time ago I wrote warning fellow motorists that action was being taken in this town (Cambridge) for driving offences, but that I thought it was mainly directed against reckless undergraduates.

Recent events appear to show that I was wrong and that a campaign is being carried on against motorists in general.

I may mention, however, that I understand numerous cycle and car owners have already decided not to take out any licences in Cambridgeshire.

Personally, I shall pay my licence duties in the neighbouring county of Suffolk, where I am also a ratepayer, and where I find motorists are treated with courtesy, and where I have seen, even since last year, great improvements in the roads by the removal of one or two dangerous corners, and also by the importation of granite to make up roads instead of the usual flint, although this must cause the county of Suffolk considerable expense. ROBERT C. PIERRE.

MOTORISTS AND MOTOR CYCLISTS.

[19586.]—Your correspondent "Fair Play" [19544] definitely states his wish to be reasonable. This, together with his *nom-de-plume*, induces me to put forward an opposite point of view.

As a keen motor cyclist of ten years' standing, and one who rides almost daily, I have good opportunities of watching the behaviour of most types of self-propelled vehicles; and, though I confess to having seen incidents such as he describes, they are, in my opinion, far less frequent than cases of the bullying (I can call it by no other name) of motor cyclists by car drivers. I have frequently been forced on to the greasy and heavily cambered side of a good broad road when there was plenty of room for both machines to pass in comfort, and this practice of leaving motor cyclists just room to pass, to their great danger, appears to be getting more common.

Quite recently, when riding from Evesham to Cheltenham, a car travelling at high speed, in the opposite direction, forced me right into the edge of the road, and flung the contents of a large pot-hole straight into my face. Apart from the discomfort caused by this, the behaviour was quite unnecessary, as the road at that spot was wider than the average.

If a few more car drivers would realise with "Fair Play" that, though the motor cycle is the poor man's mount, it has a right to the road, it would help to create a better feeling between the two types of motorists. I cannot quite agree with the writer that trapping for motor cyclists "has hardly existed," but perhaps he is not in touch with motor cycling matters. UBIQUE.

ELECTRIC SELF-STARTERS.

[19587.]—Does not Mr. Bell in his article in *The Autocar* of May 17th (pages 880-2) somewhat exaggerate the power required for a self-starter? Most of us can start an engine of 110×130 mm. easily enough, but, personally, I am certain that I cannot develop anything like 2 b.h.p. by turning the ordinary inconveniently placed starting-handle, though there are possibly men who can do so. In a description of electric starting systems given in the American *Automobile* it is stated that the power required by the Gray and Davis and Ward-Leonard systems, which are two of the most largely used, varies from about 80 to 120 ampères at six volts; that is to say 480 to 720 watts or, say, two-thirds to one electric horse-power. This is for the average American car of good fair price, which will therefore have an engine far larger than 110×130 mm. F. STRICKLAND.

An advance proof of the above letter was submitted to Mr. Bell, who makes the following reply:

Mr. Strickland takes exception to my figures with regard to the power an electric self-starter is required to develop, and in his letter he mentions 2 b.h.p., which I take to mean brake horse-power. In my article I distinctly state that a "battery power to the extent of 2 h.p. will be required,' and as Mr. Strickland is an engineer he will understand the great difference in the two terms, more especially when the large gear reduction is considered. I would also call his attention to the qualification of this statement that this amount of power will only be required for the initial effort.

In connection with the reference to the American *Automobile*, I take it that the following reference is the one Mr. Strickland has in mind: "The Gray and Davis cranking motor takes current at the rate of 80 to 120 ampères *under normal conditions*. These are only relative values, and are not specific." The italics are mine.

The figures given in connection with the Ward-Leonard system are identical.

I need hardly point out that the amount of current taken by an electric starter will be proportional to the amount of effort it is required to exert. The strength of a chain is the strength of the weakest link, and so the power required from an electric starter connected to an engine by gearing of fixed ratio will be equivalent to the maximum load it is called upon to overcome, and in this particular case the maximum effort is required—momentarily, no doubt—at the very beginning of operations. In the *Horseless Age*, a chart was published showing the power required to turn a 4¾×5¼ (say 120×135) engine at various speeds and at temperatures of 32° Fahr. and 75° Fahr., and the initial effort shown to be required at 32° Fahr. is 100 lb. feet, and at 75° Fahr. 95 lb. feet. The starting handle of such an engine would be, say, 9in. long, so that the pull required would be 125 lbs., and. suppose the first pull up were accomplished at the rate of one revolution per second, something like a horse-power would be exerted. Allow in the case of the electric starter 50% for gear efficiency losses and another 50% for electrical efficiency losses—for it must be remembered a six-volt motor cannot be made as efficient as one of higher voltage—and the 2 h.p. battery power are accounted for in this particular case without any reserve.

The chart shows to turn this engine at 100 revolutions per minute an effort of about 43.5 lb. feet is required when the temperature is 75° Fahr. At 100 r.p.m. 43.5 lb. feet = 27,300 ft. lbs. per minute, or .825 h.p. At 32° Fahr. 56 lb. feet are required for the same rate, *i.e.*, 35,200 ft. lbs. per minute, or 1.055 h.p.

Allowing for a reasonable reserve of power, I think the 2 battery h.p. will be required for all but the smallest of engines. J. DALRYMPLE BELL.

[19588.]—My curiosity is aroused as to why "Lieut.-Col." should be astonished, for in his letter [19573] he states this effect without giving the cause.

I have looked carefully over my article again, and I cannot see that any other construction can be put upon what I have written than the fact that in the design of an electric starter there are certain difficulties encountered. I do not say that these are insurmountable, nor that they have not been overcome, and the fact that these difficulties have been overcome to "Lieut.-Col.'s" satisfaction is all the more creditable to the manufacturers of his car. But, when writing an article of a technical nature, it has to be kept in mind that it may possibly be read not only by owners or prospective owners, but by those concerned with production, and surely the difficulties met with require not only mention, but detailed attention.

I quite disagree with "Lieut.-Col." when he says that "no owner-driver who has experienced the convenience of one of these self-starters would ever again buy a car without one. . . ." In many cases the cost of the convenience is prohibitive.

Finally, as a distinct expression of my opinion, let me quote a sentence from an article I wrote, and which was published in *The Autocar* in March last year: "If a really elaborate and absolutely certain system be required, and if expense is a secondary consideration, the electric system stands alone." I have not had cause since then to alter this opinion J. DALRYMPLE BELL.

[19589.]—In view of certain animadversions which appeared in the several motor papers some months ago on self-starters, and in particular those electrically operated, perhaps my experience with the latter may be of interest. This is the device standardised on the Cadillac. We were warned of the sorrows in store for those bold spirits who plunged into the unknown with any of these innovations. What a picture of misery was painted for them at the end of a year, after bitter experiences, where specialists only could alleviate the exasperating tortures! For all electric systems there was only one end: The accumulators completely wrecked, sulphated, plates buckled, and a host of other disasters. A perfect chaos of wiring and generally a hopeless state of confusion In fact, one could vividly picture the wild-eyed, distraught wretch, who had wrestled with one of these "inventions of the devil" for twelve months taking a trip over the Styx for a rest cure, after

savagely tearing the heart out of the beast and rending it to bits.

Well, now that I have lived out the magic twelve months, perhaps I am qualified to paint the real picture. I have done getting on for 8,000 miles, and never once has the starter ever hinted at failure. The sole attention I have given to it has been to carry out the very simple instructions of the makers—to fill up each cell with distilled water every two weeks and at the same time set back the finger of the charging meter. This is the beginning and end of the "delicate treatment" so essential to success. The lighting is perfect, and the whole apparatus works precisely as it did the day I got the car. As regards the condition of the accumulators, they charge and discharge at the same rate as at first; the terminals are all absolutely clean, though I have not once touched them, and in no direction can I find any deterioration. This was to be *the* chamber of horrors according to the theorists. I think my ounce of experience outweighs considerably the tons of theory that have been advanced on the subject. In spite of a critical eye, after the ominous warnings, I have failed to discover a single weak spot in the system. If a novice can handle it successfully, as I have done, for over a year, it is good evidence that it is sound in principle. I wonder whether we shall ever recognise the fact that good American manufacturers do not experiment on the public, as many English and French firms do. They do not adapt as standard anything until it has been tried out and proved. I believe in the Cadillac case they spent two years on tests before putting it on the market. The wisdom of this is shown by the unique results. There is not the slightest doubt that self-starters will win the day, and as far as I can see the electric system has distinct advantages over all others in being able to embrace lighting and ignition as well.

I have no interest whatever in the above, beyond being an agreeably surprised "victim." E. B. GRINDROD.

FUEL TESTS.

[19590.]—Perhaps the following may be of interest to your readers. I am driving a 38 h.p. Daimler landaulet, weight unladen 2 tons, and have been making a series of trials with benzole.

No. 1 Test.—After putting one gallon of "King" Shell II. in the tank, I did exactly 12⅕ miles; highest speed, 44½ m.p.h.

No. 2 Test.—I fitted a Saunders petrol saver, and put in the tank one gallon of the same kind of spirit as before, this time using the saver, and did 15½ miles; maximum speed, 45 m.p.h.

No. 3 Test.—I put one gallon of 90's benzole in the tank, and fitted two smaller jets; result, 17½ miles, on exactly same road as before; maximum speed, 47½ m.p.h.

No. 4 Test.—Wishing for a longer run to see if the engine became hotter than usual, I put three gallons of benzole in the tank, and covered 55½ miles (18½ m.p.g.), with a quarter of a pint left in the carburetter and pipes; maximum speed, 52½ m.p.h., four up.

The above tests were carried out on four consecutive days, and some rather severe gradients were specially chosen. Immediately after the engine started I drove out on to the road, giving it no time to "warm up." PAID DRIVER.

GUARANTEES.

[19591.]—The recent correspondence in your columns has been so interesting that perhaps you will kindly grant me space to place upon record the manner in which the Sunbeam Co. fulfil their obligations. My car, a 25-30 h.p. six-cylinder 1912 model, was delivered in July last and carried a twelve months' guarantee. In December I wrote to the company and reported that the rear springs had become flat and ceased to work properly. They replied that they would put a new set in hand and fit them, free of cost, at any time that it was convenient for me to take the car to the works. I recently drove down to Wolverhamption for this purpose, and at the same time pointed out one or two minor details which I asked them to attend to. Amongst these details were:

(1.) A loose baffle plate in the silencer. (2.) Brass showing through plating on beaded edge of footboard. (3.) Drip from tap on pipe to carburetter water jacket.

I returned to the works five days after and found that, besides supplying a complete set of new springs, front and rear, the company had (1) fitted a 1913 pattern silencer, (2) replaced the worn beading with a new one of white metal, (3) reground seating of water tap, and added the extra lubrication to the magneto shaft bearing, as in 1913 models, all free of cost to myself.

I have no interest in the Sunbeam Co. except as a

SATISFIED OWNER.

Correspondence.

[19592.]—In your correspondence columns of May 10th, we notice a letter [No. 19514], by "S.C.," under the heading of "Guarantees" in which the name of the Austin is mentioned in a complimentary manner, and we are gratified to learn that the company's interpretation of its guarantee has created a favourable impression amongst purchasers, but it is with the last sentence of all that I particularly wish to deal, and accordingly quote it in full:

"We all receive courteous treatment when buying the car; it is after the car is bought that we really require consideration."

This is the keynote of the Austin policy, as I will endeavour to show, and it is likewise where so many firms fail.

Our view of the matter is that, when we have sold a client a car, our dealings have just commenced, not ended. It is essential, we consider, to keep constantly in touch and ensure not only that the client shall have permanent satisfaction with the car he already possesses, but that he shall come back again when he wishes to purchase a second car; while the recommendation of a satisfied customer is well known to be a firm's best advertisement, although this axiom is too frequently lost sight of.

The Austin Co. begins at the beginning—the proper place to commence one might think; but the trouble is that everyone does not know where the beginning lies; we refer to the instruction of the owner or his chauffeur, as far as time will permit, in the art of driving, adjusting, and caring for a car.

After our salesman has, in the words of a customer, given the client "great and patient attention," and has secured the order, the owner is entitled to send his driver to our factory for a complete course of instruction in a properly equipped school for as long as he can spare him and free of all charge. Alternatively, the owner can come himself if he be an owner-driver.

The man does not have to wander about the works and pick up what he can, but is placed in charge of an instructor, who, in a department containing dismantled and finished cars, gives him both theoretical and practical tuition, which is varied by driving instruction both in the country and traffic.

The car delivered, the owner is then placed upon the list of those to whom our house organ, the *Austin Advocate*, is sent regularly every month.

By means of the *Advocate*, the firm is in touch with its customers all the year round, gives them further instruction in the running of their cars, keeps them informed as to the latest improvements, either in chassis design, bodywork, or accessories, and provides for them much reading matter of general interest.

Apart from the magazine, and in order to show clients that we do not wish to see the last of them when once we have sold them a car, I would instance the Austin Club, which has been established at 479-483, Oxford Street, London, W. This institution comprises a drawing room and a combined smoking room and library, also dressing rooms for both sexes.

All Austin owners whose names we have are sent membership cards if they so desire free of all charge or obligation, and both the owner and his family may use the club or introduce friends on signing the visitors' book.

A client arriving from afar can garage his car, go upstairs to the club, change his clothes, take some light refreshment, telephone, read, or write. His wife can do the same and meet her friends there before going shopping, while her parcels can be addressed to the club, and in the afternoon she can take tea in comfort.

A family desiring to run in from the country and go to the theatre can change at the club, leaving their car there, while the chauffeur will find a recreation room and billiard table provided for his amusement while waiting for his employers.

An Austin owner coming from abroad can use the club as a sort of headquarters and have his letters addressed there.

In connection with the garage there is a repair department, a complete miniature factory, which is open day and night, Sundays and holidays, while the manager resides upon the premises.

From this centre, a travelling expert is constantly going round the home counties calling on clients with a view to finding out if their cars are running satisfactorily, and giving advice and tuning the machines up to concert pitch.

From this you will see that the policy of the company is as much devoted towards retaining customers as obtaining them, and in practice the former helps the latter.

H. WELSH-LEE,
Editor of *The Austin Advocate*.

Correspondence.

THE S.M.M.T. AND PRICE MAINTENANCE.

[19593.]—Some months ago you were good enough to publish a long letter from me on the above subject, signed "A Fair Trader." A week or two later this letter was referred to by one of your contributors, who suggested that as Mr. A. W. Gamage and Mr. Yarworth Jones, of the Victor Tyre Co., were not members of the Trade Society, and were against its principles and methods of trading, these gentlemen should hold a brief for free competition, and that some leaders of the Trade Society should oppose them through the correspondence columns of *The Autocar*.

Both Mr. Yarworth Jones and Mr. Gamage intimated through your columns that they were ready, and in fact the former gentleman stated that he hoped in the expected discussion to be able to prove that the Trade Society did not benefit the motor agent even. It is surprising that there has been no response by the trade; surely they do not imagine that this matter is not one of interest to the motorist, without whom there could be no motor agent.

That it is recognised even in the inner circles of the Trade Society that there is another side to the advisability of price maintenance is shown by the published report last week in the Trade Society's journal of a meeting of the Motor Trades Debating Society, held at the Royal Automobile Club. (Why at the R.A.C., I wonder?) The subject under discussion was "Whether the establishment of fixed prices for proprietary motor goods is to the interest of the trade and public alike." The quotation is from the Trade Journal's report. The meeting decided almost unanimously that it was to the advantage of trade and public.

It would appear, however, that the trade do not care to hear what Mr. Gamage and Mr. Yarworth Jones have to advance from the other side. A FAIR TRADER.

THE WORM GEAR CHALLENGE.

[19594.]—As there seems to be little headway being made in the worm drive challenge controversy, please permit me to remind the parties interested that it is from the purchaser's point of view that the question is of the greatest moment. Therefore, any tests conducted should be as near as possible to road conditions, with worm gear as fitted to the stock cars; therefore fresh tests would be most valuable to the public.

Now I asked this question in my letter [No. 19262] in *The Autocar* some time ago: "Will Mr. Lanchester enlighten the readers of *The Autocar* as to whether the worms in his tests had their lead correctly ground after being hardened?" (of course, I mean on a lead grinding machine).

If they were not, and they had to be specially prepared, then his tests are of little value to an intending purchaser. H. HATTON.

MOTOR OMNIBUS DEVELOPMENT.

[19595.]—The article on the above topic (page 934) is very timely, and, being an *Autocar* article, very sound. A few days ago I was reading in the general press of the "management" and "organisation" of London's motor omnibuses by a gentleman who had had "considerable experience in America and Canada."

The London omnibuses—capital vehicles—are about three times as numerous as they need be, and are run with spasmodic attempts to adhere to a schedule or time-table, which presupposes the existence of three or four times as many potential passengers as greater London contains.

I challenge Mr. Stanley, of the London General Omnibus Co., to state the number of 'buses running on his No. 19 route, the number of seats (inside and outside) available for passengers upon them, and the number of tickets issued upon them in either a day, week, month, or year.

Plenty of 'buses let us have by all means. Many motorists, like myself, make considerable use of them, but at present there are close upon three times as many as London needs. The same number would appear to be run in the slack as in the busy hours. Let Mr. Stanley run down to Wormwood Scrubs and see twenty or thirty 'buses ranked up there, earning nothing, *at any time between 9 a.m. and 10 p.m. daily*, particularly upon Sundays. Then let him wait at the Oxford Street end of Charing Cross Road for a No. 22 'bus at any time in the day, and count the number of successive No. 19 'buses which will pass him, all practically empty, between each pair of 22's. He will be astounded at his own "organisation."

I realise that he cannot be everywhere, and that even in "America and Canada" one cannot learn everything, but a public service vehicle organisation calls for something more than innumerable vehicles and an over-sufficiency of nigger-driving "'Urry hup, there!" time-keepers and inspectors.

As at present conducted the London 'bus service is often a tiresome, time-wasting service from a passenger's point of view. The drivers alternately laze and tear along, and traffic in general, and light autocar traffic in particular, is actually hampered to a greater extent than it would be by an equally needless surplus of horse-drawn 'buses.

Your contributor is quite right. Car driving in London becomes more tiring and worrying every day, and the condition of road surfaces is scandalous. Everywhere one meets those transversely-ridged stretches of macadam rendered absolutely ruinous to our tyres, chassis, and coachwork by the hogging, the alternate crawling and blazing of these 'bus drivers.

They presume on the weight of their vehicles; they hog, and crowd, and squeeze lighter vehicles in the most ruthless manner. 'OLD TIGHT, LIDY.

LONG V. SHORT STROKE.

[19596.]—Your correspondent Mr. Percy Kearne [letter No. 19530] expresses his disappointment with the result of the controversy between Mr. Coatalen and myself. I think, however, that, if he will read the arguments again carefully, he will find that on both sides certain definite claims were made which, whether acceptable or not, are much more far reaching than his cursory view of the discussion would indicate. I need hardly say that my opinions on the points at issue are the same now as then. Mr. Percy Kearne seems to think that the stroke-bore ratio can be settled by building a series of engines of varying strokes, but with the same bore. It is a source of ever increasing wonder to me to notice the manner in which this and allied points in petrol engine design and horse-power rating have been obscured by utterly irrelevant and fallacious application of mathematical and physical science. The fundamental mistake in these applications has been that generalisations have been evolved without reference to the actual magnitude of the factors in question. It is a simple matter to prophesy the result of building a series of engines as Mr. Percy Kearne suggests. The maximum torque developed by each engine would be directly proportional to the stroke, so that the horse-power developed would be likewise proportional up to the point where the torque fell off due to valve area restriction. The engines would, of course, be designed with the stroke as the only variable. The maximum horse-power being a function of the valve area would be the same in each case, except in so far as a given valve has a slightly higher discharge for a large piston displacement than for a small one. The anticipated increase in maximum horse-power for an engine of 90 × 160 mm. against 90 × 120 mm. would probably not exceed 10%. The suggested comparison between a Vauxhall 90 × 120 mm. engine and a Maudslay 90 × 130 mm. is impossible for me to make, as I have no knowledge of the power of the Maudslay, and horse-power depends on a good many other things than bore and stroke. Vauxhalls made a 90 × 120 mm. engine and a 90 × 130 mm.; the 90 × 130 mm. would give the same horse-power at 1,200 r.p.m. as the 90 × 120 mm. at 1,300 r.p.m., and for this difference in stroke length the variation in maximum horse-power would be negligible. The variation in the maximum horse-power developed by the engines under normal productive conditions would entirely mask the difference between the types. Mr. Percy Kearne can rest assured that when dealing with the average high-class toruring engine, the horse-power developed at touring car speeds is proportional to the cylinder capacity and independent of the bore-stroke ratio. Thus, if engines of varying cylinder capacity are fitted to cars with the same gear ratio, the horse-power exerted at the same car speeds will be proportional to the capacities. This does not take into consideration the fact that certain cars are designed to take advantage of large power output, obtainable from moderate sized engines when their low gears are in mesh. This quality, however, is not the prerogative of any particular bore-stroke ratio. L. H. POMEROY.

INEFFICIENT MUDGUARDS.

[19597.]—We have read with interest all you say in last week's Notes and think you are quite right to call attention to the inefficient mudguards which some makers still supply on their cars.

As mudguard specialists, we thoroughly endorse your opinion that unless a front mudguard fits snugly and is continued well forward round the wheel, there is considerable opportunity for the mud thrown off from the wheel to rise. On a windy day this would, in many cases, result in the car being considerably spattered.

There is no difficulty in designing a mudguard on the lines indicated by you. In point of fact, the Frankonia domed one-piece mudguard which has been on the market

for some time now, is made in this way. We speak from experience when we say that the advantage of a domed guard, which fits snugly and follows the curve of the wheel, is that the wheel is covered to a point where it is almost impossible for mud to be splashed in front of the car.

It is much to be hoped that the Royal Automobile Club will act on your suggestion and conduct a mudguard trial at an early date, and, for your information, we may say we have written to the secretary of the Royal Automobile Club intimating that we should welcome such a trial, and would promise our support by entering the Frankonia. The Secretary of the R.A.C. has since replied that the matter is being considered by the Technical Committee, and that he will write further in due course. BARIMAR, LTD.

[19598.]—In your Notes in last week's *Autocar* you refer at some length to the defects which are present in the majority of mudguards. You point out that the average deflection of front springs is but three inches, whereas wing clearance is six or more inches *minimum* clearance. I would suggest that you mean six or more inches *maximum* clearance, and am inclined to the opinion that the average clearance, say, between the top of the front clips and under side of the frame is rather more than three inches—probably nearer four and a half inches—and allowing, say, half an inch only for mud and the subsequent fitting of larger tyres, five inches would not be an absurd clearance for many cars. However, the motor body builder should get into the habit of looking for this clearance and basing his wing design on it in the same way that some builders already design the hind wings and wheel-house by noting the vertical distance between the hind axle or its projections and the under side of the frame. Still, as the body has often to be made without the chassis, the shape of the hind wings has partly to be decided before the chassis arrives, and the blue print very seldom actually states this hind axle clearance, while the subsequent deflection of the springs is a matter which cannot always be depended upon.

Your remark regarding the inside guards is timely, but some motorists are prone to put up with a little mud-flinging in order to save some of the "acreage" of the wings. H. J. BUTLER.

[Our correspondent does not quite follow our meaning. In using the words "minimum clearance" we refer to the distance between the top of the tyre and the average flat mudguard. Unless the mudguard be curved in section the *minimum* clearance is at the *maximum* wheel diameter, and this is the inherent defect of the flat guard. As to the average clearance between the frame and the top of the front spring clips we think if existing cars of all years be taken our correspondent is nearer right than ourselves, but for 1913 cars only we think our figure of some three inches is not far out. However this may be does not matter much, and we are pleased to find that so practical a coach-builder as our correspondent so thoroughly endorses our contention as practical motorists that needless clearance is too often given to the front guards. We think he is rather begging the question when he says some motorists in their desire to reduce windage will put up with mud flinging. We never disputed this, but were dealing with the ordinary average guards supplied by motor car and body builders to their clients, who fondly believed they were buying mudguards and not devices for passing the mud. These clients simply ask for protection from mud and do not stipulate at all about the "acreage" of the guards. The few who specially order small guards know that those guards will be inefficient and need not have been brought into the question at all.—ED.]

ACCELERATOR *V.* DECELERATOR.

[19599.]—Permit me to thank you for allowing the discussion of this matter in your paper. As an "Owner-driver" I am greatly interested, as I am desirous of obtaining a maximum of efficiency and comfort with a minimum of work and mental wear and tear. Personally, I have never understood why a car should be driven by the feet, as with an accelerator, and have never received an intelligent (to me) reason why it should be so driven. It strikes me as being analogous to Paderewski playing a sonata or minuet with a pianola. Of course, there would be music, but ——!

In letter 19561 "Governor" says: "If one suddenly jams down a decelerator pedal beyond the limit of reason, one stops one's engine. That is true." Permit me to say that this is not true if a carburetter be used which is capable of being set for slow running. My carburetter is so "set," and is one which is extensively advertised in your paper, and is, I believe, in use on more cars than any other make.

I personally believe in a decelerator as an adjunct, but as an adjunct only. I am still using a 1906 car with satisfactory results, but, of course, it is considerably altered since it left the factory. One of the alterations is that when I press my clutch pedal about two-thirds of the way the clutch is out, and when I press it fully my throttle is closed to the slow running position. Conversely, when I let up my pedal the engine speeds up, and then the clutch is engaged. I have never had any trouble in starting on an incline with this arrangement. G.D.M.G.

[19600.]—Do not your correspondents lose sight of the fact that in the case of the accelerator pedal being released through accident, sudden illness, or carelessness, the engine stops, whereas with the decelerator release the car would probably be driven to destruction? Surely, on this account alone, the decelerator will never be popular. T.J.W.

THE FOUR-INCH DARRACQS.

[19601.]—In reply to Mr. Campbell's letter [No. 19567], I, too, have now fitted Bosch dual ignition, and my engine nearly always starts on switch, frequently from the cold, and always with one pull of the starting handle.

G. R. N. MINCHIN.

PERPETUAL MOTION (?).

[19602.]—Your correspondent, Mr. Jas. W. Perrott, in referring to a previous letter on the subject of perpetual motion (?) evidently has a misguided idea on the topic. That a respectable journal such as *The Autocar* should give publicity to such a scheme seems out of the bounds of reasonable possibility. Since you, sir, have seen fit to give publicity to such a mad idea, it is up to you to furnish further details, the patent number, illustrations, and so forth, since you must presumably know the address of the inventor. This would interest many readers, including ENQUIRER.

[19603.]—Mr. J. W. Perrott, in his letter in your issue of the 24th May, on behalf of the "Sandor's Motive Power Co., Ltd.," has very neatly proved that in 492 hours the clockwork has wasted by winding and unwinding itself all the power (and a bit more, although I don't know where it got it) that was originally put into it. The 18 h.p. spring may only cost 50s., but my money is going in petrol, as I can't afford to waste 18 h.p., and it would make me cry to see it wasted; and, what is more, I am certain I should get bored with watching the contraption curl and uncurl itself for 492 hours. I do not doubt that it is patented, or that someone has offered to buy it, as we all do silly things at times. I don't think motorists will "have any." G.M.

[19604.]—Mr. Perrott [letter No. 19575]. in describing the Sandor spring motor, seems to give an account of something almost more wonderful than "perpetual motion."

Provided the springs, when wound up, are the sole source of energy (which is clearly implied), Dr. Sandor must have discovered at least two things hitherto unknown.

(1.) A marvellously cheap method of producing the power to wind up his springs.

(2.) A wonderfully efficient and cheap material for storing and giving out energy.

If by "useful life" is meant the continuous production of power for this period (it is traced in the example for 492 hours), a simple calculation will show that springs, capable of giving 18 h.p. for one year on one winding, 100% efficiency, must store in round numbers some 310,000,000,000 foot lbs. of energy.

To wind them in a day of twenty-four hours represents a continuous application of work at the rate of 6,500 h.p., no loss.

Their weight, one ventures to suggest, would prohibit ordinary means of handling, except perhaps on "launching ways."

At a cost for 18 h.p. springs ready wound of £2 10s. each, presumably two required, the ultimate tension would seem to fall heavily upon the finances of the concern attempting to arrange their supply. CHARLES H. HOLE.

THE VICTOR TYRE TRIAL.

[19605.]—It is difficult to please everybody. In your last issue two letters appeared, both critical of my communications upon the Victor tyre trial. One writer, I gather, complains that I am too explanatory, and the other seems

Correspondence.

to have the grievance that I am not explanatory enough. I am very willing to endeavour to please everybody, but it is just a little wearying.

To Mr. Quentin O. Grogan [19578], of Mongalla Province, Sudan, I have only to say, with all respect, first that he has not read the correspondence, or he would know that all his points have been dealt with very exhaustively and, I think, very conclusively; and, second, that he has no cause for complaint about letters he has not read.

I note, also, that Mr. Grogan suggests we shall have to beat a dozen other tyres named (some of which I confess I have never heard of) before we can claim to be best. We took the three most advertised firms, all of whom claimed to have the best tyre, and we beat them.

Mr. Grogan's point about one bad tyre not affecting the high general average of that particular make is a point we have made ourselves. Mr. Grogan should really read the correspondence. Our point, however, went further. It explained that the test must be a comparative test and must be a protracted test. It was. If Mr. Grogan wishes to argue that over the 15,000 road miles and all kinds of road conditions, which were covered by the trial car, and during which three tyres of each make were tested to destruction, twelve tyres in all, it is not possible to get a reliable indication of average results to be expected from a particular make of tyre, why then he is arguing flat in the face of all motorists' experience and methods. I hope he can now see that his parallel of a certain tyre bursting at racing speed on the track in a very short distance, considered by itself and not by comparison, has nothing to do with the case.

W. YARWORTH JONES,
Managing Director the Victor Tyre Co., Ltd.

MOTOR SPIRIT MADE AT HOME.

[19606.]—Having spent several months in experimenting on heavy hydro-carbon fuels as a substitute for petrol, I should be pleased to place the results of my experiences before your readers, if I am not taking up too much of your valuable space.

From practical experience, I consider that there are great possibilities for the use of paraffin and other cheap hydro-carbon oils, and, in my opinion, they will be universally used in the internal combustion engine when they are made more volatile by an economical and simple chemical process.

The great failure in the use of paraffin so far has been the crude types of paraffin carburetters, vaporisers, etc., that have been placed on the market, the expense of fitting them to a car and the difficulty in starting the engine cold, unless by first starting on petrol.

The most scientific heavy fuel carburetter is bound to foul, carbonise, or choke sooner or later by using indiscriminately heavy oils of no uniform specific gravity. The only chance of success is to utilise a simple process of distillation of the heavy oil before putting it into the tank, and thus producing a more volatile oil or spirit of a uniform specific gravity, and at the same time adapting the existing petrol carburetter of the engine without wasting money on so-called paraffin carburetters and vaporisers.

When every motor car owner is able to manufacture his own fuel at home from crude material it will be possible for him to snap his fingers at the petrol combines. Having this object in view, I have been experimenting with a simple and cheaply constructed home still with a four gallon capacity of crude oil.

With an ordinary gas ring or petroleum lamp, at a cost of 2d. for gas or 1½d. for oil, this will distill four gallons of crude paraffin, naphtha, or coal tar oil into 3½ gallons of highly volatile motor spirit in two hours. As the cost of crude paraffin, naphtha, or coal tar oil is only from 6d. to 7d. a gallon, a fuel can be produced at less than a third the present price of petrol.

The apparatus is automatic in its action, it takes less than 2ft. square floor space, and once the burners are started will distill the heavy oils into light volatile motor spirit without further trouble.

A model apparatus can be seen here, 38a, Quill Lane, Putney, London, S.W., and samples of crude tar oil will be converted into practical motor spirit and used on any car using petrol that cares to be sent here. W. HIGGINS.

GARAGE AND MOTOR SCHOOL TRAINING.

[19607.]—I should like to point out that, in addition to the troubles enumerated by your correspondents, there are other troubles in connection with the motor school business which are as serious as those mentioned—if not more so. The man who goes as instructor to them must be wary. He is generally a man who is indisposed to adopt the methods required. If this prove to be so, there is no satisfaction, no reference; out he goes. The next prospective employer receives no answer to his letter enquiring for so and so's reference, is afraid he will not be suitable, and so forth.

I was instructor to one of the motor schools that have brought all this discredit to companies engaged in the same business on straightforward lines, and, after using the "best that was in me" on their behalf as long as I could compel them to allow me to do so I was eventually found unsuitable. On writing for a reference there was, of course, no result. On calling at the offices a comic looking man, well-known to pupils who have been to these offices to lay claim to what they spent money on, raced up and down the room, indulged in remarks that would have earned a saner man a broken nose, and immediately called upon a much harassed looking lift attendant to assist me from his presence. Although I was prepared for this pantomime, which I am assured by other instructors and pupils is "standard," I was very much disgusted that it was allowed by law to be practised.

Although technically I have a grievance it does not count much in my letter, as in the matter of references I have found it best to say as little as possible to future employers as to having been in the service of a motor school, so unsavory a reputation has the sort of dealing brought upon the business as a whole.

I consider, however, now that many men may be paying down money to this same company to make them efficient motor car drivers within a specified time, which is all that most of the men are able to spare, an arrangement should be forced upon the motor school to adhere to its contract both with pupil and instructor.

During my experience I did not come across any of the actual staff that were dishonest, but I was, in common, I believe, with others, utterly dissatisfied with the tone of my "job."

E. HAMMOND.

REPAIRS.

[19608.]—In reply to Mr. Graves's letter [19499] and "H.C." [19541] *re* the cost of repair to back axle of my car, I wrote to the George Garage, Winchester, asking for details of the work, and received the following reply:

"Dear Sir,—Replying to yours 17/5/13, I beg to inform you the time taken by our mechanic who took the work in hand was fourteen hours, assisted by an apprentice.

"The work was carefully and thoroughly done, and how anyone could spin it out to thirty hours on a similar job is ridiculous.

"I can assure you we made a fair and legitimate profit.

"G. J. Pettit."

Trusting these particulars will explain to Mr. Graves and "H.C." the charge for the work (the new bevel was supplied free by the makers of the car under their guarantee).

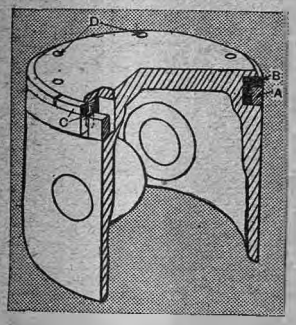
DOUGLAS STUART.

Some Recent Patents.

By Eric W. Walford, F.C.I.P.A.

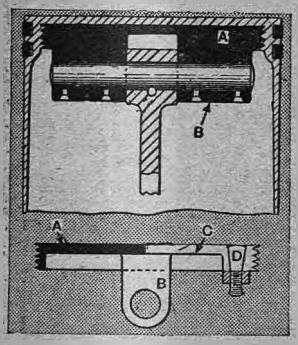
A Compound Piston Ring.

THIS piston is provided with a compound ring comprising a plain member A and an L-shaped ring B which partially embraces the ring A, the two being pegged together to prevent rotation by means of a peg C, which engages a recess in the piston and prevents the whole ring from turning round. The space at the back of the ring is in communication with the combustion chamber through vents D, so that the pressure in the cylinder tends always to force the ring outwards and keep it expanded during firing and compression strokes.—A. G. Ionides, No. 21,371, 1912.



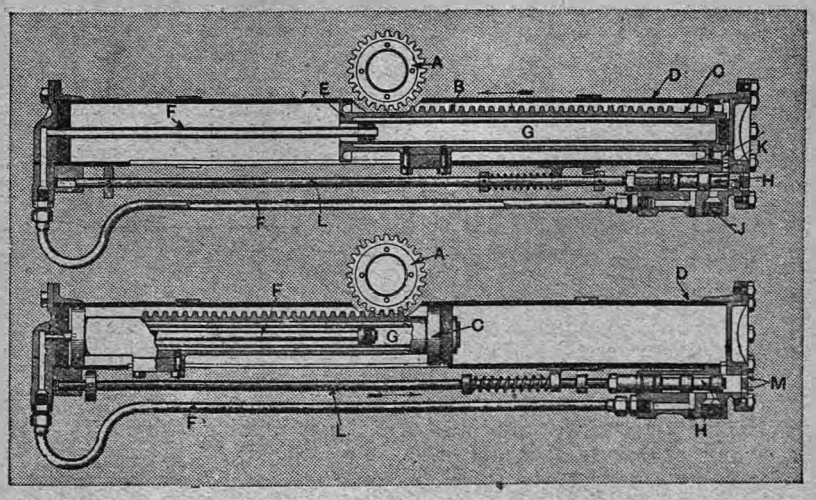
A Built-up Piston.

Into the piston shell screws a disc A which carries lugs B for the gudgeon pin bearings. The gudgeon pin is put into place in the lugs and the connecting rod, and is locked to the latter by a locking pin. The disc is then screwed home so as to butt firmly up against the underside of the piston, and is then locked in position. For this locking the disc is provided with a radial slot C in which lies a wedge-headed D. On tightening up the nut on this screw the wedge is drawn in endwise, expanding the slot and jamming the disc tightly in position in the piston.—R. R. Bullard and H. R. Weichman, No. 2,072, 1912.



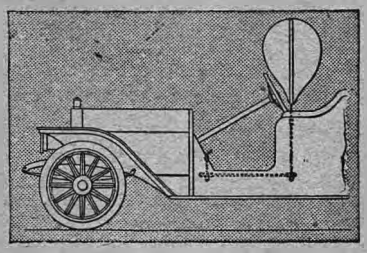
A Pneumatic Starter.

This device takes the place of the usual starting handle, and is fitted across the front of the engine, the gear wheel A being mounted upon the engine crankshaft. This gear wheel is of the free wheel or over-running type, and is adapted to engage rack teeth B formed on a piston C which is moved endwise in a cylinder D by means of compressed air. At the left hand end of the rack B is a second piston head E which cushions the air before it as the rack moves to the left. The compressed air has also access by way of a tube F to the space G for the purpose of returning the rack to the out of gear position shown in the top view. The supply of air is controlled by means of a sliding valve H, which in the usual position allows compressed air from the inlet J to pass through the passage K into the starting cylinder D. The rack, therefore, moves rapidly to the left, rotating the pinion A and crankshaft, and when it reaches the end of its travel it automatically strikes a trip device which moves the valve rod L into its second position. The cylinder D is then in communication with the air through the outlets M and the air supply is put into communication with the space G through the tube F so that the rack is returned to its primary position.—W. Allday and C. E. Simms, No. 1,633, 1912.



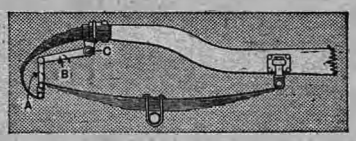
To Assist Turning.

To facilitate turning corners, particularly at high speeds on racing cars, this inventor proposes the fitting of one or more vanes or deflectors which are normally inoperative, but which, when one turns a corner, can be deflected so that the air pressure upon them resists the centrifugal tendency of the car and prevents side-slip. The illustration shows one of these deflectors, and it is connected to a pedal so that when the driver wishes he can twist the deflector in either direction. Woe betide him if he should turn in the wrong direction!—A. C. Dunlavy, No. 14,626, 1912.



Spring Suspension.

The rear spring shackle at each side is connected by a link A to an arm B, which is fixed to a shaft C extending across the car. Consequently, when both springs move simultaneously the shaft moves freely, but if there be any tendency for the car to roll one arm B endeavours to turn in one direction and the other in the opposite direction. Hence this construction resists rolling and enables supple springs to be used.—Wolseley Tool and Motor Car Co., Ltd., and A. A. Remington, No. 1,886, 1912.



Impressions of the Grand Prix Course.

Many Narrow Stretches and Bad Corners.

I HAVE just returned from a visit to France, and while in Amiens I took the opportunity of travelling over the Grand Prix course. The starting and finishing point is about five kilometres S.E. of Amiens, and the district has evidently been selected by the Automobile Club de France owing to the fact that it is very thinly populated. This is the best feature of the course, against which there are several objections, the most important being the comparative narrowness of the roads, which will render it somewhat difficult for one competing car to pass another, particularly if the driver of the car ahead persists in keeping to the crown of the road.

The majority of the important roads in France are particularly broad, and in addition there are usually wide stretches of grass on either side on which trees are planted at the far edge, and it is usually possible for one vehicle to pass another at any point if the driver has no objection to going on to the grass, which may be done without incurring danger. On the greater part of the Picardie Circuit, however, it will be necessary to keep strictly to the road proper, for although the usual grass margin exists, on the greater part of the course the trees grow right up to the edge of the road on both sides. The circuit is over 31 kilometres in extent. For the first 10 kilometres the road is straight and fast, practically without a building of any description upon it, until the hamlet of Domart is reached.

This tiny place presents no difficulties, as the road goes straight through it and continues in a bee-line for another three kilometres, where there is a sharp right hand turn to be negotiated, and some of the competing cars travelling at a high speed will certainly leave the road at this point, but no harm is likely to arise as it will only mean running on to an open field free of ditch, hedge, or fence. For the next five kilometres the course follows a third-class cross-country road to Moreuil.

This is, perhaps, the worst stretch on the circuit. At present the surface is extremely poor and cut up, but I presume that it will be put in order before the great day arrives. There are pleasant woodlands on the right of this road, with several open spaces which could be utilised as delightful picnic sites if the owner of the land offer no objection. I consider that this part of the course presents great attractions for those who want to see the race from the roadside without utilising the grandstands, for not only is it shady on the right-hand side, but also it is farthest removed from Amiens, and therefore comparatively inaccessible to the crowds which are sure to throng out from the town, but it would entail an early start to get there on the race day. In the village of Moreuil there is a sharp right-hand turn, rendered dangerous by the presence of houses and a stone wall. This will prove a nasty spot requiring skilful driving, especially if the road surface be in a skiddy condition.

No special difficulties are presented on the next ten kilometres, and the villages of Thennes and Berteaucourt, which appear to be really one, are easily negotiated, but there is a bad down hill corner under a railway bridge about a kilometre out of the hamlet of Boves. The worst of all, however, is a tricky double twist in the road, with a railway arch at the end, about one and a half kilometres on the west of Boves, after which all is plain sailing up to the finishing point at the fork roads where the official grand stands of the A.C.F. are to be erected.

The foundations for the stands are already well advanced, and the site presents the appearance of a clearing for a garden city. By erecting the grand stands at the fork of the roads, the obvious intention of the A.C.F. is to allow spectators a view of the competing cars coming and going, but, unfortunately, the corner is somewhat sharp, and in order to get round it safely competitors will have to slow down considerably.

The general impression left upon my mind by my trip round the circuit is that it cannot be compared as a speed track with the Dieppe circuit. There are one or two nasty turnings which will require considerable skill in driving. The surface, generally speaking, is good, with the exception of the five kilometre stretch at the extreme east, which is at present very bad. Finally the greater part of the course is considerably narrower than could be desired.

Amiens is the one and only town near the course, and the accommodation available there for visitors and their cars appears to be hopelessly inadequate. From the enquiries which I made I am afraid that the gentle inhabitants of the town are "out for blood" and intend charging visitors as much as they can stand, if not a little more.

Intending visitors who leave all arrangements for accommodation to the last moment will fare very badly indeed. I would seriously recommend those who want to save money and who are not anxious to place themselves at the mercy of the local inhabitants, to take camping outfits, arrive a few days in advance, and bargain for camping sites in the neighbourhood of the woods about five kilometres from the starting point, or, better still, near the five kilometre stretch at the extreme east end of the course.

The motor cycle course is only about half the length of the car course, being 17½ kilometres round instead of about 31½ kilometres, and this is arranged by practically cutting the larger course in two. I did not have time to explore the connecting link. H.M.

Tyre Life Insurance.

Until the present moment, the St. Albans Rubber Co. have guaranteed their Grimston tyres for 3,000 miles against everything, but after six months working of this guarantee they have become convinced of two things, one is that their new model tyre will always run 4,000 miles, on properly tyred cars, barring accidents or defects of manufacture. Secondly, their offer is not merely a guarantee, but an absolute and definite insurance. They have, therefore, decided to discontinue guaranteeing their tyres, and to issue in the place thereof policies insuring the life of every Grimston cover for 4,000 miles against all damage, whether due to accident, ill-usage, failure of materials or faulty workmanship. They have sent us a draft of the actual policy showing how the risk is covered. It is too lengthy for reproduction, but we may say that we are unable to criticise it in any way. It seems very equitable from start to finish.

Flashes.

One hears of peculiar things being lost from cars on the road, but for the first time we have heard of a presentation sword being picked up. This was in North Wales, the sword having fallen apparently from a large car which had just previously passed our correspondent.

* * *

The Town Council of Bromley, Kent, calls attention to the disregard of the ten miles per hour speed limit in Bromley, and to the lack of caution shown by many motor car drivers in turning dangerous corners and passing through narrow streets. Lately, the motor traffic in the town has greatly increased, and the disregard of the speed limit and the lack of caution have become so noticeable that unless a marked improvement takes place stringent steps will be taken to enforce the observance of the speed limit.

* * *

The Mayor of Croydon announces that the justices of the borough find that fines of 40s. and costs imposed on motorists for excessive speed through the narrow main street of the town are not effective in reducing the number of cases, and that in future it is intended to inflict penalties more in accordance with the special circumstances of each case.

* * *

According to some statistics lately issued, the number of horses in Paris has declined from about 98,000 in 1900 to roundly 60,000 at the present time.

MOTORING IN INDIA. A 12 h.p. Talbot at the entrance to one of the public parks of Bombay.

We are informed that a 14-16 h.p. (80 × 110 mm.) Miesse car which is now three years old has just run from London to Stranraer by way of the North Road, over the Pennines, the Yorkshire moors, and through the Lake District. The weather was bad and the hood was up nearly all the way, but in spite of this and of the fact that the car carried a full load the petrol consumption worked out at 26.1 miles to the gallon. The car ran from Carlisle to Stranraer (111 miles) on $3\frac{3}{4}$ gallons, or $29\frac{1}{2}$ m.p.g.

* * *

The Eastbourne Town Council have under consideration a proposal to apply for a speed limit of ten miles an hour upon motor cars driven in the borough.

* * *

Another reduction in the freight charges for cycle cars has been obtained from the Isle of Man Steam Packet Co. The charge for the conveyance of a vehicle weighing not more than 12 cwts. is now £1 1s., compared with the previous minimum of £2 2s.

* * *

It has been arranged to hold the first conference of the representatives of the branches of the Roads Improvement Association at the Royal Automobile Club on June 21st, the council entertaining the delegates to dinner at the Club in the evening.

* * *

The general principles of the proposed horse-shoe competition in connection with which a prize of £100 has been offered by the R.S.P.C.A. have been approved by the Roads Improvement Association, and full details will be issued shortly.

* * *

What is probably the heaviest penalty ever meted out to the driver of a motor car as the result of an accident was recently imposed in Chicago, when an employee of a motor garage was sentenced to fourteen years in the penitentiary on a charge of murder, he having, when travelling at thirty-five miles an hour, knocked down and killed a man.

THE VICISSITUDES OF EMPIRE TRAVEL. A 16-20 h.p. Wolseley car crossing the Gogra River on a temporary boat bridge, in the course of a tour in India.

Flashes.

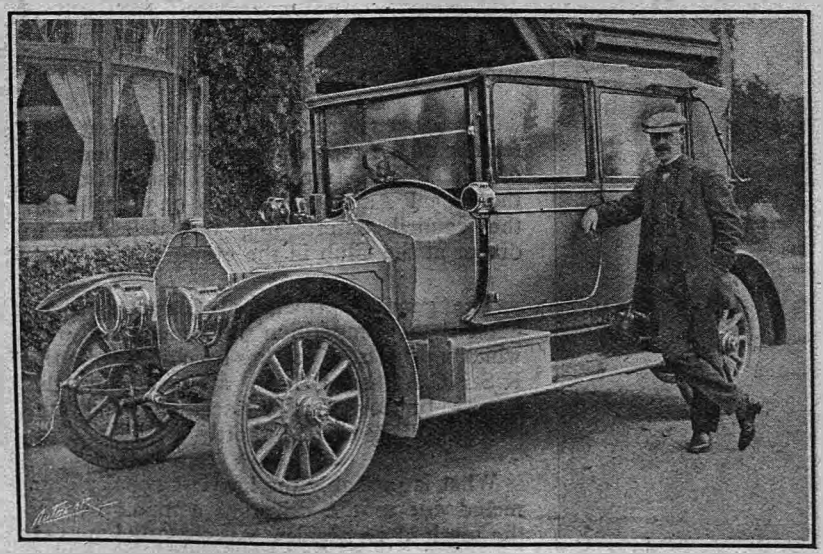
No fewer than eleven motorists were recently summoned before the Southampton County Bench for exceeding twenty miles an hour at various times and places in the neighbourhood of Southampton. The fines inflicted ranged from £1 to £5 and costs.

* * *

Some of our readers may remember that a considerable while ago we published an illustration of an extraordinary motor car belonging to a Calcutta motorist; it was remarkable for its body, which was of a highly ornate character, and the front portion was made in the similitude of a swan, what would have been the bonnet being the body of the bird. All sorts of legends appear to have grown up around this quaint car. It is said that it was only used once in Calcutta, as the police stopped it, and the swan is alleged to emit a hissing sound instead of the usual horn note, and then, if the people do not get out of the way, boiling water is emitted upon them. No doubt in time we shall hear that the car has taken to the water, upon which it would certainly look far less foolish than it does upon the road, although even then a huge swan with a motor car body and canopy trailing behind it would scarcely be regarded as a thing of beauty.

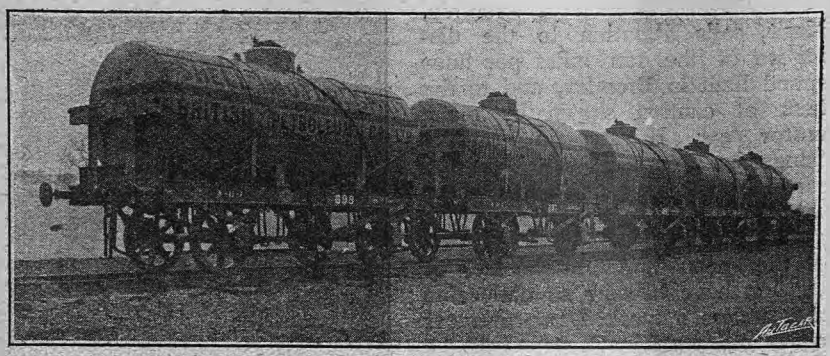
* * *

When motor cars first made their appearance and began to sell there was a wail on the part of the manufacturers of pianos that motoring and the attractions of the open air militated against the sale of musical instruments. It would appear that the piano trade has now recovered from that shock, for at the annual dinner of the British Musical Trades Convention at Buxton on Monday evening last Mr. W. F. Mill, chairman of the Buxton Council, said the output of British pianos had greatly increased during the past few years.



Mr. P. Ll. Naish, the author of "Rollings of a Mossless Stone," which was reviewed by Owen John in "On the Road," on page 495 of our issue of March 22nd. His car is a 22 h.p. S.C.A.T. with a Salmons All Weather body. It will be noticed that the treatment of the scuttle design is most uncommon.

Captain H. C. Stockwell, Chief Constable of Colchester, writes that he has been notified that motorists have recently been passing through Colchester at an excessive speed, especially along the Lexden Road, which is a continuation of the London Road; and he hopes that motorists will be good enough to remember to drive at a moderate speed when passing through the borough.



Enough motor spirit for 300,000 miles running, assuming 20 m.p.g. Five tanks for the conveyance of petrol by rail built by Messrs. R. I. Pickering and Co., Ltd., for the British Petroleum Co. The tanks shown are capable of holding together about 15,000 gallons of spirit.

Motorists crossing to France by the Newhaven and Dieppe route will learn with pleasure that the day service has been greatly accelerated owing to the new twenty-four knot turbine steamers, which have been placed upon the route, and which cross the Channel from Newhaven to Dieppe in two hours. The Dieppe and Paris trains now run by the new Pontoise route, which saves some twenty miles in the journey between the coast and the French capital. Motor cars are carried on the steamers.

* * *

Some people have objected to the proposed race in the Isle of Man, having alleged that the course was not safe. What must they think of a race like the Targa Florio round Sicily—a race of twenty-four hours' duration with much of it over roads far more dangerous than anything the Isle of Man course can offer, and a considerable portion of it in the dark? It appears to us that it is only a matter of driving skill and judgment: Italians and Frenchmen seem to be able to drive in Sicily without any accident over a far more dangerous course, much longer distance, and partly in the dark, and, for the matter of that, at least one Englishman has done the same, as last year's Targa Florio race was won by an English driver on a S.C.A.T. The fact of the matter is that any race is dangerous if the driver does not know how to handle his car; even driving alone on Brooklands is dangerous under those conditions. In fact, anything requiring judgment and skill is dangerous if the participant possess neither quality. Some examples of the difficulties of the Sicilian Circuit are given in the illustrations on page 980.

Some Queries and Replies.

Readers seeking the experience of users of specified cars, parts, or accessories are invited to insert their queries in these columns, and their fellow readers are invited to reply.

Querists are asked to enclose a stamped addressed envelope, so that replies may be made direct if the subject is not considered of sufficient general interest to publish.

Letters should be addressed to the Editor, "The Autocar," Hertford Street, Coventry, and replies to queries should bear the number of the query to which they refer.

Editorial advice is at all times willingly given to our readers.

REPLIES.

No. 2651.—20 h.p. Two-seater 1913 Ford

I venture to suggest that a slight closure of the aperture of the jet will economise "T.W.M.'s" consumption of petrol.—S. S. POWNCEBY.

No. 2648.—Adams 1913 Self-starter Car.

I can assure your querist of the wearing qualities of the Adams car, as mine is a 1910 model and has not begun to show any signs of wear yet. I have driven it a great distance, and so far, if I dare say so, have been quite free from trouble, excluding ordinary tyre misfortunes. The springing is wonderfully good, and my lady passengers are always delighted with it. I do twenty-one miles per gallon with standard Claudel carburetter. The engine runs very smoothly. It has a good turn of speed if required and will climb anything. Finally, it is delightfully easy to steer.—F.H.M.

No. 2544.—Carburetter for 28-36 h.p. Daimler.

I have fitted a Mills economiser jet to the original carburetter on my 28-36 h.p. Daimler and now get 18 m.p.g. as against 13 before fitting the jet. I also find that the engine runs slower and picks up better. I should advise "T.F.F." to fit one before going to the expense of a new carburetter.—N. FAULKNER.

No. 2523.—10-12 h.p. Belsize.

Last year I purchased one of these cars. It was delivered at the end of April and I have driven it 4,090 miles; during that time I have not had an involuntary stop. Cost of petrol (157 gallons), £11 13s. 2d.; oil and grease, £2 1s. 6d.; cleaning cylinders, grinding valves, and generally adjusting, so as to have it always in the pink of condition, £3 15s. 11d.; cleaning and garage, £2 9s. 2d. These particulars, I think, will answer your correspondent's query. I have nothing but satisfaction to express with regard to this car. So far I have had no expense with tyres, not having even had a puncture. I drive myself for pleasure, and I always see that the tyres are inflated to the proper pressure as per makers' instructions. The tyres are Michelin. The car has a dickey seat, and as often as not carries four adults or a family of five or six persons.—T. COXON.

No. 2659.—Carburetter for 14-20 h.p. Renault.

I have a Renault limousine landaulet 14-20 h.p. 1912, weight about 37 cwt. I can only obtain in London about 11 m.p.g. Are the adjustments mentioned by "L.B." in *The Autocar* of May 17th easy to make, and would they increase petrol consumption in London?—D.B.

An advance proof of the above was submitted to "L.B.," who replies as follows: "The adjustments mentioned are quite easy to make. I explained how to adjust the carburetter and the valve tappets. The timing of the magneto is altered by first getting No. 1 cylinder a quarter of an inch from the top of the compression stroke; loosen the magneto coupling, put a piece of paper between the platinum points of the contact breaker, turn the magneto round by hand till the paper can be moved from between the points. Directly the platinums release the paper fasten the magneto coupling up tight. I often drive in London, but it does not make much difference to my petrol consumption. I always get about sixteen miles to the gallon there. It must not be forgotten that I use a heavy spirit, 'Taxibus,' and my car runs better on it. A good deal depends on how a car is driven. Always drive with the throttle lever set so that the engine just turns over."

No. 2653.—1912 14-18 h.p. Alldays.

I have fitted two Zeniths with excellent results to Alldays cars, both having given better power and consumption.—ALFRED BILL.

No. 2616.—Carburetter for 14-16 h.p. Belsize.

With the carburetter originally fitted I had great difficulty in starting in the morning, especially in cold weather, when I would have to let it run free for several minutes until it warmed up. I decided to have a Zenith put on, and it was a different car in starting and picking up, but I cannot get more than 13 m.p.g. on short runs, and not more than 16 to 18 m.p.g. on long ones. I am glad to know that extra air inlets make no improvement, as I was thinking of trying one. I also cannot get more than 35 m.p.h. on the level, and that must be under the most favourable conditions. Still, I like the car immensely, and would not change. I have had absolutely no trouble since I have had it, and it is easy to drive and look after, and runs as sweetly as any car of its size on the road. The car's power on hills since I put on a Zenith is all one could wish for. I found that with the petrol tank under the near seat the petrol did not reach the carburetter on hills, although there was ample in the tank. I, therefore, had an auxiliary tank fitted on the dash which I can turn on when going up steep hills. This also considerably increased the engine power.

QUERIES.

No. 2694.—Openings in India.

I WONDER whether any of your Indian readers could tell me the best way to obtain a post as chauffeur in that country.—KHUDBA NISHTA.

No. 2695.—Removing Carbon from Cylinders.

WOULD any reader give me his experience of removing carbon in cylinders by the aid of the Cyclean process?—W. R. CHILL.

No. 2696.—Dodson Valveless Car.

WILL any readers let me know their experiences and opinions of the Dodson Valveless car? Is it fairly quiet? Is it efficient? How much oil and petrol does it consume over certain mileage? Has it any weaknesses? Is the car well sprung? What are the concessionnaires or manufacturers like to deal with?—HILLSIDE.

Some Queries and Replies *(Continued)*.

No. 2697.—Removing Tar Stains.

I SHOULD be much obliged for hints as to removing tar stains from body and wings of my car; it is a light colour and the tar shows greatly.—E.R.C.

No. 2698.—Kettle Boiling by Electricity.

I HAVE installed on my 45 h.p. Sheffield-Simplex a C.A.V. dynamo lighting outfit, and I should very much like to avail myself of this equipment to boil a kettle. Can any of your readers tell me if they have at any time been able to employ their electric installations in this way? I have certainly read somewhere of it having been done.—I.S.W.

[Probably "I.S.W." refers to the concluding paragraphs of an article in *The Autocar* of December 21st, 1912, pp. 1245-6.—Ed.]

No. 2699.—18-22 h.p. Buick Car.

I SHOULD like to secure from an owner of an 18-22 h.p. Buick car his experience on the following points: Is the springing of the chassis satisfactory? Is the seating comfortable on a lengthy journey? What is the average petrol consumption? Is it a good hill-climber? Is it steady on the road at speed? Is it economical in upkeep?—S.G.

No. 2700.—Pearson-Cox Steam Car.

I SHALL esteem it a favour if any motorist who has had practical experience with the Pearson-Cox steam car for a period of reasonable duration will be so kind as to give his candid opinion on the following points: Running and upkeep costs, repair bills, whether the car requires much attention, facility of control, and reliability of working parts of the engine, if noisy on any occasion, etc.—W.A.C.

No. 2701.—Benzole on Bedford Car.

I SHALL be much obliged if any private users of the Bedford car will give me their experiences of its running with benzole instead of petrol. The makers do not approve of benzole, but I am rather inclined to try it. I should also like to know if any private users have found the carburetter of this car so difficult to adjust that they have replaced it by one of another make, and if so, whether they have found it an improvement?—W. Cranswick Noad.

No. 2702.—Light Two-seaters.

I SHOULD much value the opinion of readers as to the virtues (or otherwise) of the following light cars: Singer, Baby Peugeot, Swift, Standard, Morris Oxford, or Bayard. Has any one of these been tried for some considerable distance, or are they all in the experimental stage like the cycle cars? I want a light two-seater to go at a moderate pace, such as an average of twenty-five miles an hour, but do not want anything experimental. The specifications of all these cars seem excellent, and there appears no reason why they should not be everything that is desired, but it is difficult to hear of anyone who has given them an exhaustive trial.—X.Y.Z.

QUERIES AND REPLIES.

No. 2703.—The Trimming of Hedges.

WILL you kindly inform me what powers (if any) a local authority has to order hedges at dangerous corners to be cut? Also, what the "local authority" in question is, and under what statute or order it obtains its right to take action?—Simplex.

A local authority has power under the Highways Act, 1835, Sec. 65, to require an owner to trim hedges that prejudice the highway by excluding the sun and wind, or that cause any obstruction. The request, if not complied with, may be supported by a magistrates' order, which, if disregarded, renders the defaulting owner liable to a penalty of 40s. The local authority means the council having control over the particular highway in question.

No. 2704.—Commercial Traveller's Car and Taxation.

MY firm run a small car wholly and solely for taking on his rounds one of our travellers and just a few samples. We have had our name painted on the side of the car to conform with Act, and contend that we are exempt from taking out a licence. The local tax collector says we must pay. Can you kindly tell me how we stand, and greatly oblige?—E.B.

It is not sufficient merely to paint the name on the car, in order to be entitled to exemption; the car must be "constructed or adapted for use," and must be used "solely for the conveyance of any goods or burden in the course of trade or husbandry." You appear to be conforming to the necessary conditions in so far as using the car solely for the purpose named is concerned, but it would be necessary also to adapt or reconstruct the body so as to make it look like a business vehicle, and not merely like an ordinary private car. If you do this, and make a declaration that the car is used solely for business purposes, you will be exempt.

No. 2705.—Carburetter for 16-20 h.p. Rover.

CAN anyone give experiences of the running of the 16-20 h.p. Rover car (1910 type) fitted with any other type of carburetter than that fitted by the makers? Also experiences of an extra air valve of any sort fitted to the standard Rover carburetter of that year. At present the car is very wasteful of petrol. With a large jet it chokes at once on opening the throttle, while with a smaller one it seems to lose all its power. The petrol also comes from the jet in liquid form, and I cannot get an adjustment to obtain a spray. I should be very much obliged for any suggestion to help me.—G.S.B.

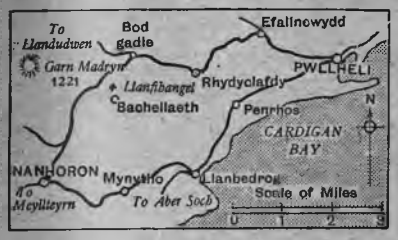
The Rover Co., Ltd., to whom we submitted a proof of the above query, write, in reply: "We have had no experience of a carburetter other than that fitted as standard to the 16-20 h.p. Rover. An extra air valve would not effect an improvement, as it tends to upset the carburetter, it being equivalent to having a leaky joint in the suction pipe. The wastefulness referred to is probably caused through a defect in this direction, while as regards the loss of power, this may be due to slightly worn cams or pistons. We think your correspondent could not do better than communicate with us direct, giving as many details as possible, so that we could go fully into the matter."

Week-end and Touring Notes.

A Short Tour in South Carnarvonshire.

By Thos. Griffiths.

A series of tours in Carnarvonshire is certainly incomplete without a visit to the lovely Vale of Nanhoron, the most attractive way to which, as regards scenery, is undoubtedly that over the Mynytho mountain.



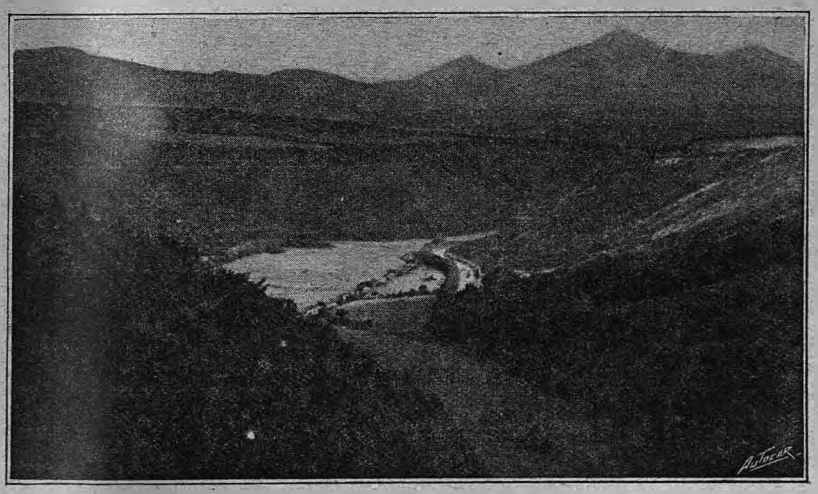
Starting from Pwllheli, the route lies through Efailnewydd, leaving the Rivals and Bodvean Woods on the right. Proceeding through Rhydyclafdy village and climbing up the hill, we should look back, for Snowdon is seen in the distance, while glimpses are obtained of Holyhead and the Anglesey coast.

From this point the journey is made by the lovely valley of Nanhoron. Leaving Garn Madryn on the right, we are soon passing the famous Inkerman Bridge. At the end of the valley the Balaklava four cross roads are reached. Here there are something like a dozen different signposts, pointing to nearly all the villages in this part of the country. A glimpse of Nanhoron is obtained on the right.

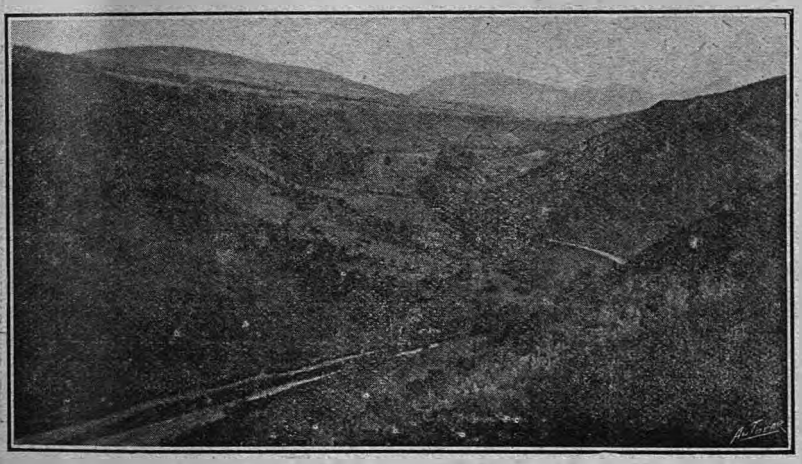
Leaving Nanhoron Hall on the right, we turn off to the left on the Llanbedrog Road, which rises gradually to the summit of the heather-clad Mynytho. The views from this point are superb, Harlech and Barmouth seeming to lie at one's feet, though fifteen and twenty miles away respectively. A short stop should be made here on the flat near the school, as this spot is a fine vantage ground, and alone well worth making the journey for the sake of the lovely and extensive views.

Given fine and clear weather, the view from the summit is an experience of a lifetime, the whole of the peaks of the Snowdonian range in North Wales, Cader Idris and Plynlimmon in Mid-Wales, and the Wicklow Hills in Ireland being visible.

The return journey is continued through Llanbedrog, past the Glynyweddw Pleasure Grounds, and to Pwllheli or Criccieth *viâ* the coast road.



The Rivals from the Nanhoron Valley.



The Vale of Nanhoron.

Flashes

The Austin Motor Co. are sending a representative to Canada to open up agencies in the Dominion for Austin cars. The representative appointed is Mr. Donald Gooch, who is sailing at the end of this week with a 20 h.p. demonstration car.

On account of the increase in their business Palladium Autocars have been compelled to move to a larger factory. They have, consequently, taken premises at Normand Road, West Kensington, where they have about half an acre of floor space, and where, in future, Palladium cars, both pleasure and commercial, will be built. The company's showrooms and chief selling address, however, remain at 378 to 384, Euston Road, as heretofore.

The Internal Combustion Engine Cleaning Co., Ltd., 3, London Wall Buildings, London, E.C., send us an interesting pamphlet dealing with their now well known method of decarbonising engines. Their chief depot is at 1, Brick Street, Piccadilly, W. We can speak most favourably of the process from personal experience, particularly in the case of a 12-14 h.p. Crossley, which was in our possession in 1910, and was found to be very badly carbonised just before sale. The decarbonising process was performed upon it in not much over half an hour, and the engine was immediately a new thing and a joy for quite a long time afterwards. It is interesting to note that over 500 licences have been granted for operating this process.

When brought together into booklet form it is surprising what an imposing array of successes the Continental Tyre and Rubber Co. can show for their tyres in the great events of the past year. These include firsts, secured on Continentals, in the Grand Prix de Belgique, Grand Prix de la Sarthe, Coupe de la Sarthe, Targa Florio, Coupe d'Espagne, Mt. Ventoux and Mt Gallion Hill - climbs, Austrian Alpine Tour, Swedish Reliability Trials, Russian Imperial Trials, Tour de France, the Monaco and Sebastian Rallyes, the Spa Meeting, etc. A copy of the booklet, containing records and photographs of these and other events in which Continental tyres have scored, can be obtained on application to the company's British headquarters, Thurloe Place, London, S.W.

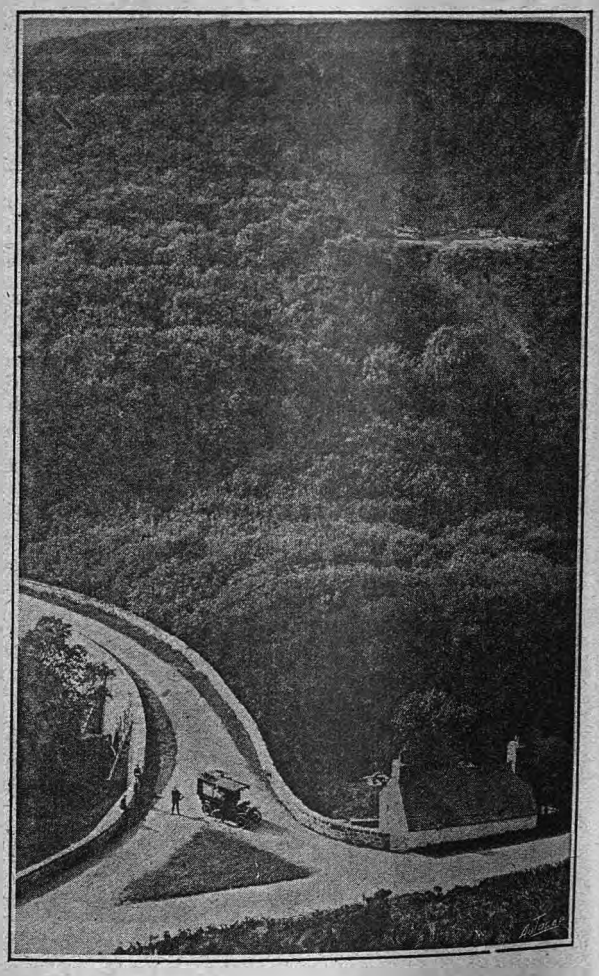
Continued).

We are informed by Messrs. G. H. Smith and Co., Ltd., late of 14a, Great Marlborough Street, London, W., that they have removed to larger premises at 12, Mortimer Street, W.

To-day (Saturday), May 31st, is the last day on which coupons may be sent in for trial tins of the new double purpose gear box lubricant, Ambroleum, offered by the Stern Sonneborn Oil Co., Ltd., Finsbury Square, E.C.

It may interest many of our readers to know that the Woodstock Motor Co., Woodstock Street, Bond Street, London, W., are open to hire cars to motorists without drivers, and on very reasonable terms. A correspondent who has had experience of this firm in this way speaks very highly of the fair treatment he has received at their hands.

We are informed by the Endrick Engineering Co., Warwick Road, Olton, near Birmingham, that, owing to their having been repeatedly asked by users of the earlier pattern Endrick decompressors to supply a lever handle for fitting on the disc, they have now arranged to do this. The handle is adjustable radially to any desired position, and can be fitted in a few seconds without removing the decompressor from the engine and without tools. The price of the adjustable handle is 1s. 6d. post free.



A bird's eye view of the road through the Vale of Nanhoron at Inkerman Bridge. (*See Week-end and Touring Notes*).

Catalogues and Booklets Received.

We have received a copy of the latest Vermorel catalogue, which contains specifications and illustrations of these small French cars, marketed in this country by Messrs. W. G. James, 14, Mortimer Street, Regent Street, W. There are two models, the 12-16 h.p. four-cylinder 74×120 mm., and the 8-12 h.p. four-cylinder 66×110 mm. Both have four forward speeds.

The Rotax Motor Accessories Co., 43-45, Great Eastern Street, London, E.C., issue a folder illustrating and describing new features of the lamps and switchboards in connection with the well-known Rotax dynamo car lighting equipments. Copies of this can be obtained on application to the leaflet can be obtained on application to the above firm at the address given.

Nanhoron Hall and Garn Madryn in the distance.

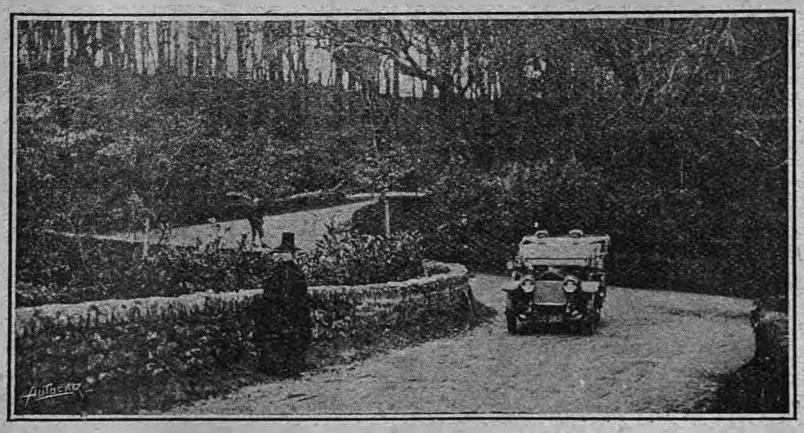
The Stepney Spare Motor Wheel, Ltd., have issued a separate illustrated price list of Stepney wheels for cycle cars and miniature cars. Two models in each of various sizes are marketed, one suitable for artillery wheels and the other for wire wheels. Details are also included of the special Stepney running board brackets and well for carrying the Stepney wheel when not in use. For those cars which have no running boards carriers are made for the tail-end of the car for carrying the spare wheel.

Quite a large range of models are listed by Bayard Cars, Ltd., the sole concessionnaires for the famous French car of that name. The 1913 catalogue has recently been issued, and it is a well produced work containing illustrations and specifications of the 8 h.p., 10 h.p., 11 h.p., 12 h.p., 14 h.p., 18 h.p., and 20 h.p., all with four cylinders, and the 15 h.p. and 20 h.p. six-cylinder models. From this it will be gathered that M. Clement-Bayard is specialising in small and medium-powered cars. Copies of this catalogue can be obtained from the showrooms at 98, High Street, Marylebone, London, W.

Messrs. Turner and Co. (Garage and Works), Ltd., 4a, Cambridge Street, and 12a, Porchester Place, Marble Arch, London, W., send us a well produced and most interesting catalogue of the Marathon cars for which they are European agents.

The Electric Ignition Co. have recently issued their 1913 catalogue, and anyone interested in the E.I.C. productions may obtain a copy on application to the company's offices at Sampson Road North, Birmingham. The E.I.C. specialities are so well known that to enumerate them is unnecessary beyond pointing out that they include coils, plugs, distributers, switches, and small non-electrical accessories.

Messrs. Peto and Radford, Ltd., 100, Hatton Garden, London, E.C., send us a copy of their catalogue of accumulators or storage batteries, dynamos for motor car lighting, engines, and electric lighting plant, together with numerous accessories and apparatus for electrical, automobile, railway, telegraph, and mining engineers. The catalogue is of great interest and should be in the hands and office of every individual interested in the industries named.



The Balaklava Cross Roads. The walls and bridge were built in memory of Capt. Lloyd-Edwards who fought at Balaklava and was killed in action during the Crimean War. *(See Week End and Touring Notes.)*

"The Autocar" Share List.

The following table of some of the companies connected with the motor, motor cycle, and allied trades, is not published for the benefit of speculators, but for the information of investors. The speculative buyer is referred to the daily financial press.

Issued Capital.	Amt. of Share	Name of Company.	Present Prices.	Last Year. Highest	Last Year. Lowest.	This Year. Highest	This Year. Lowest.	Last Div.	Div. Payable
£								%	
2,520	1/	Abingdon-Ecco, Ltd.	2/6 3/6	3/-	2/3	3/6	3/-	Nil	Nov.
45,000	£5	Alldays & Onions (£3 paid)	3⅛ sellers	4¼	3⅞	3⅜	3⅜	5	Ap/Oc
50,000	£5	,, ,, 6% Cum. Pref.	5 5½	5⅜	5 5/32	5⅜	5⅜	6	Ap/Oc
209,802	10/-	Argylls, Ltd.	5/3 5/9	6/-	4/-	6/-	4/9	Nil	Dec.
150,000	£1	Belsize Motors, Ltd.	25/9 26/3	28/1¼	25/-	27/6	26/-	12½	My/Nv
100,000	£1	,, ,, Cum. Pref.	19/6 20/-	20/9	20/-	20/3	20/-	6	Fb/Au
44,771	£1	Bowden Brake, Ltd.	5/- sellers	7/-	3/1¼	5/-	3/-	Nil	Dec.
766,982	£1	Birm'gham Sm'l Arms, Ld.	47/- 48/-	53/3	46/3	50/-	47/6	10	Mr/Sp
203,150	£5	,, ,, Cum. Pref.	5¼ 5½	5 11/16	5 7/16	5⅜	5¼	5	Mr/Sp
75,000	£5	Brampton Bros. Cum. Pref.	4 sellers	4⅜	3 11/16	4	5⅛	6	Oct.
100,000	£1	Brooks, J. B., & Co., Ltd.	36/- 37/-	37/6	31/-	36/6	35/-	5	My/Nv
100,000	£5	,, ,, Cum. Pref.	5⅛ 5⅜xd	5¼	5¼	5 7/16	5¼	5	My/Nv
100,000	£5	Brown Bros. Cum. Pref. ..	4¾ 5	5	4½	4¾	4 1/16	6	Ap/Oc
380,000	£1	Charron Par. Pref. Ord. ...	13/3 13/9	11/6	8/-	14/-	7/9	9	Ju/Dc
200,000	£1	Clément-Gladiator	3/3 3/9	3/-	1/6	6/-	2/1¼	Nil	Dec.
100,000	£1	,, ,, 6% Cum. Pref.	14/6 sellers	14/9	10/4¼	15/-	12/6	6	Ju/Dc
55,000	£1	Components, Ltd.	5/9 6/9	6/9	4/-	7/9	6/-	Nil	Dec.
25,347	£1	,, ,, 7% Cum. Pref.	12/6 13/6	15/-	11/4½	13/-	12/-	7	Dec.
275,000	£1	Darracq, A., & Co., Ltd. ..	14/- sellers	18/4½	8/9	15/-	9/9	Nil	Ju/Dc
375,000	£1	,, 7% Cum. Pref. Ord.	15/6 16/-	19/1½	11/10½	16/-	13/-	7	Ap/Oc
159,229	£1	De Dion-Bouton, 7% Ord.	8/- sellers	11/3	8/9	10/-	7/6	6	Dec.
1,000,000	£1	Dunlop Rubber	39/- buyers	56/9	27/6	39/6	35/6	12½	Ap/Oc
200,000	£1	,, ,, Cum. Pref.	20/- sellers	21/-	17/-	20/-	18/6	6	MJSD
312,785	£1	,, ,, Income Stock	17/9 18/6	19/-	15/6	19/-	17/6	5	Ju/Dc
624,995	£1	Dunlop Parent Co. 8% Ord.	15/9 16/6	18/7½	10/-	18/-	13/9	10	Ju/Dc
994,990	£1	,, ,, 5% Cum. Pref.	12/9 13/3	16/9	10/6	15/1½	12/7½	5	Ju/Dc
499,962	£1	,, ,, Deferred	11/3 sellers	15/-	6/3	11/-	8/-	Nil	Ju/Dc
99,977	£1	Enfield Cycle	21/3 sellers	19/9	13/9	21/9	18/-	5	Oct.
24,985	£1	,, ,, Cum. Pref.	21/- buyers	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	£1	Humber, Ltd. (New)	10/6 11/3	7/6	3/7½	14/-	6/9	Nil	Nov.
331,495	£1	,, ,, 6% Cum. Pref.	15/6 16/-	11/-	6/9	17/9	10/1½	Nil	Nov.
50,000	£1	James Cycle	12/- sellers	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	£5	Lucas, Joseph, Ltd.	9⅛ 9⅝	9⅞	9	9⅝	9⅛	5	Ap/Nv
100,000	£5	,, ,, Cum. Pref.	5⅛ sellers	5⅛	5¼	5⅛	5¼	5	Mr/Sp
72,385	£1	New Hudson Cycle Co. ...	23/6 24/-	24/6	14/6	28/-	24/6	10	Nov.
18,033	£1	,, ,, Cum. Pref.	18/3 19/3	20/-	18/-	19/6	19/-	6	Mr/Nv
50,000	4/-	Premier Cycle	4/3 4/6	5/-	3/-	5/6	4/4½	15	Sept.
125,000	10/-	,, ,, Cum. Pref.	7/4½ 7/6	8/9	6/9	8/6	7/3	7½	Sept.
31,000	£1	Riley (Coventry), Ltd.	5/- buyers	8/9	5/3	7/4½	5/-	Nil	Feb.
200,000	£1	Rolls-Royce	44/- 44/9	47/3	36/3	48/6	44/6	30	Jn/Ju
138,662	£1	Rover	38/9 39/-	31/3	12/6	40/-	30/9	10	Nov.
100,000	£1	Rudge-Whitworth, Ltd. ..	19/- 20/-	24/-	15/-	25/3	19/9	5	Oct.
100,000	£5	,, ,, 6% Cum. Pref.	3⅝ 3¾	5 1/16	3⅞	4	3⅜	*12	Oct.
41,621	6/-	Siddeley-Deasy	10/6 11/6	10/6	6/-	11/-	8/10½	8½	Dec.
50,007	£1	Singer & Co., Ltd.	17/6 18/6	19/6	6/6	19/1½	16/-	Nil	Oct.
70,000	£1	Star Engineering, Ltd.	11/- 11/9	18/6	10/6	17/-	11/6	5	Mar.
69,157	£1	,, ,, Cum. Pref.	16/6 sellers	18/-	15/4½	17/6	16/6	7	Mar.
87,550	£1	Stepney Wheel	29/6 sellers	35/-	30/-	32/6	29/6	20	Mr/Oc
120,000	£1	Sunbeam Motor Car	56/- 57/-	59/-	37/6	59/-	52/-	25	Nov.
30,000	£1	,, ,, 6% Cum. Pref.	21/6 21/9	23/3	20/4½	22/6	21/6	6	Ap/Nv
80,000	£1	Swift Cycle	20/- sellers	21/9	13/-	24/-	19/9	6	Dec.
100,000	£1	,, ,, 6½% Cum. Pref	15/9 buyers	17/3	14/10½	17/3	16/3	6½	Ju/Dc
80,000	£1	Triumph Cycle	76/- sellers	71/6	43/9	82/-	68/-	30	Nov.
50,000	£1	,, ,, 5% Cum. Par. Pref.	23/- sellers	23/6	20/7½	24/6	21/6	6½	Nov.

* Including all arrears.

Business has been dull during the past week; and prices generally are easier. Triumphs, Stars and New Hudsons have been weak. Dunlop Rubbers, Humbers and Parent Tyre issues have been firm with a harder tendency. Rovers continue to change hands freely, with practically no alteration in price.

"The Autocar" Diary.

May.

31.—R.A.C. and Associated Clubs' Gala Day, Brooklands.

June.

4 and 6.—Tourist Trophy Races, Isle of Man (see *The Motor Cycle*).

7.—Shelsley Walsh Hill-climb.

19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly.

21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Porthcawl.

22-29.—Austrian Alpine Tour.

28.—Notts A.C. Clipstone Speed Trials.

July.

5.—Yorkshire A.C. Speed Trials on Saltburn Sands

12.—Grand Prix Race. Picardie Circuit.

19 and 20.—R.A.C. of Belgium Grand Prix Race.

26.—Notts A.C. Inter-club Hill-climb for the Du Pre Cup.

28.—Grand Prix de France and Coupe de la Sarthe. Le Mans.

August.

10.—Mont Ventoux Hill Climb.

September.

21.—Coupe de l'Auto, Boulogne Circuit.

25.—International Stock Car Race, Isle of Man.

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