

# THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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An Index to Advertisements appears on page 5a.

## Notes.

### R.A.C. Road Guides and A.A. Patrols.

On this subject a letter appears on page 627 of the present issue from Mr. Booth Grainger, the honorary secretary of the Nottinghamshire Automobile Club. Unlike so many criticisms of the R.A.C. and its actions, it contains a constructive suggestion. This suggestion is to the effect that, instead of the R.A.C. General Committee competing with the A.A. by extending its road guide scheme, the R.A.C. should pay a large contribution to the A.A. on condition that the A.A. scouts recognise the R.A.C. badge and treat the R.A.C. members as they do the A.A. members.

This is an excellent suggestion, although by no means a new one, and at first sight it always appeals to the reformer as a commonsense way of overcoming the competition, or overlapping, which now occurs between the R.A.C. and the A.A. Unfortunately, there is one vital objection to it which, so far, no one has been ingenious enough to overcome. It is simply that the A.A. subscription is two guineas per year. Although it does other work besides its road patrolling, and a great deal of other work, nevertheless the bulk of its expenditure is upon the road patrol work. Not only so, but, as its balance sheets show, the A.A. spends its revenue royally and does not hoard money; in other words, the greater proportion of each two guineas subscription is spent as received upon the patrol system. Obviously, this being the case, the A.A. cannot afford to extend its benefits to any motorists who are not prepared to pay the same price as its own members pay for these benefits.

### A Difficulty.

This is the whole difficulty in a nutshell, and up to now no one has been able to suggest any means of overcoming it. In saying this it should be clearly understood that we are not in any way blaming the Nottinghamshire Club for bringing up the idea again, because, short of amalgamation of the R.A.C. and the A.A., the best thing that could possibly happen is that some such arrangement as that proposed by the Nottinghamshire Club should be made. It is true that the number of R.A.C. guides is much smaller than the number of A.A. patrols, but for the services of the R.A.C. guides the individual associated members of the R.A.C. are only paying a guinea per annum, while the members of associated clubs, such as the Nottinghamshire A.C., are paying at the rate of five shillings per head. It is true that, in addition to this small sum, some of the clubs are making a special grant of a few pounds to the R.A.C. road guide scheme over and above their capitation fee, but the fact remains that even with this their members are paying vastly less than the A.A. subscription for the services of the guides. The A.A. cannot be expected to put members of R.A.C. associated clubs on a different financial basis from its own members, who are paying the full two guineas per annum. If all members of the R.A.C. associated clubs were willing to pay two guineas the difficulty would be at an end at once, but while they are only prepared to pay five shillings or so there does not seem to be any likelihood of this overlapping being stopped.

The Nottinghamshire Club secretary's letter also contains a reference to the overlapping of the legal work of the two organisations. It is conceivable, therefore, that a readjustment on this score, by which the R.A.C., in addition to paying the suggested contribution for A.A. scout attentions, should take over the combined legal work of the two organisations, might help to overcome the difficulty, but, unfortunately, the legal activities of the A.A. are much less costly than the patrol work.

# Useful Hints and Tips.

## Valve Tappet Adjustment.

**D**ELICATE and correct adjustment of the valve tappets is of some consequence in view of its direct effect upon the quietness of running. If there be a big gap or clearance between the tappet and the valve stem the former will be moving rapidly when it strikes the valve stem, and a metallic "tap" will be heard. In the older types of engines provision for varying this clearance was not, as a rule, made, but means for effecting this is now almost an essential, and is often arranged as shown in fig. 1. Furthermore, the top of the tappet is now often provided as shown with a fibre surface to prevent any metallic sound as the tappet strikes the valve. This fibre is, however, relatively soft, and becomes recessed in a short time, calling for re-adjustment of the valve tappet. The correct gap or clearance varies with different makes of cars, but it is generally about five-thousandths of an inch.

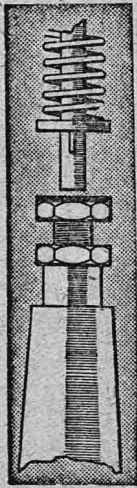


Fig. 1.

If the valve be at the side of the engine the gap can be as small as this, but with the valve arranged over the head the clearance must be greater. In the first case the expansion of the cylinders, as they warm up, tends to increase the clearance. When the valves are arranged above the cylinders this is not the case, and a clearance of eight or ten thousandths of an inch should be left.

One may say, "How can I measure five-thousandths of an inch?" For this purpose what are called "feeler gauges" should be bought from some accessory maker. A feeler gauge consists of a number of strips of metal somewhat resembling blades of a knife, each being of different thickness, which is marked on the strip. The blades are set in a handle as shown in fig. 2. To ascertain the valve tappet clearance one of these feelers is inserted between the tappet and the valve head. The largest feeler which will just pass represents the tappet clearance.

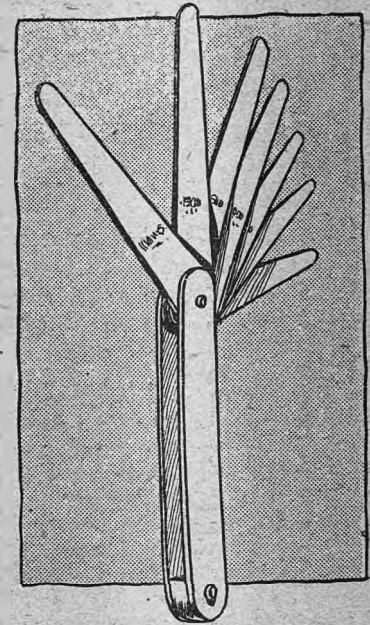


Fig. 2.—A set of feeler gauges.

As an alternative the following can be done. When the engine is hot the locknut should be slacked off and the tappet head screwed up so as to be as close up to the valve stem as possible, without actually touching. As the engine is hot no further expansion of the parts will take place. The adjustable head of the tappet should always be locked very securely by means of the lock nut, and the valve tappets should be examined from time to time as the adjustable parts frequently move, with the result that one or more valves fail to seat, or one or two tappets may become noisy owing to the clearance having increased.

An inlet valve is not always arranged (by reason of the camshaft timing) to open exactly at the top of the induction stroke, nor does the exhaust valve shut actually at the top of the preceding up stroke, for reasons which do not enter into the subject at present being discussed.

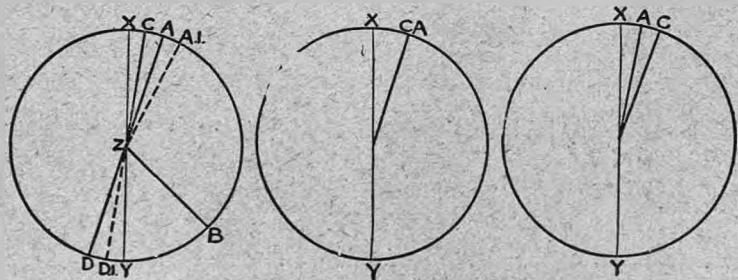
In the accompanying diagram (fig. 3) the circle represents the path of the crank round the crankshaft Z, X being the

top dead centre, and Y the bottom one. As a rule the inlet valve commences to open, not at the point X, but later, i.e., at a point which is a few degrees past the dead centre and is marked A in the diagram. (The exact position of this point A varies with different engines.) The exhaust valve opens generally about the point B, that is in advance of the bottom dead centre on the firing stroke, and closes at C.

It is obvious now that if the clearance between the inlet valve tappet and the valve stem be changed, the exact location of point A at which the inlet valve commences to open will be changed also. The greater the clearance between the tappet and valve stem the later will be the point A until the valve may open as late as point A<sub>1</sub>. The correct point of closing of the inlet valve is D, we will say, if the tappet adjustment be correct. If the clearance be too great, in addition to the valve opening as shown at A<sub>1</sub>, it will also close earlier as shown at D<sub>1</sub>. The total period of opening of the valve is, therefore, reduced, and the engine cannot develop its maximum power. The same applies, of course, to the exhaust valve, so it will be quite clear that correct adjustment of the valve tappets is important if maximum power be desired, and that the adjustment must be the same in all the cylinders of a multi-cylinder engine.

In most engines, the point A, which represents the point of opening the inlet valve at the beginning of the induction stroke, is only a few degrees after the point C, which represents the point of closing of the exhaust valve.

In other engines, the inlet valve commences to open immediately the exhaust valve is closed, in which case the points C and A coincide, see fig. 4. In other cases the exhaust valve does not close till after the inlet valve has opened slightly, as shown in fig. 5,



Figs. 3, 4, and 5.

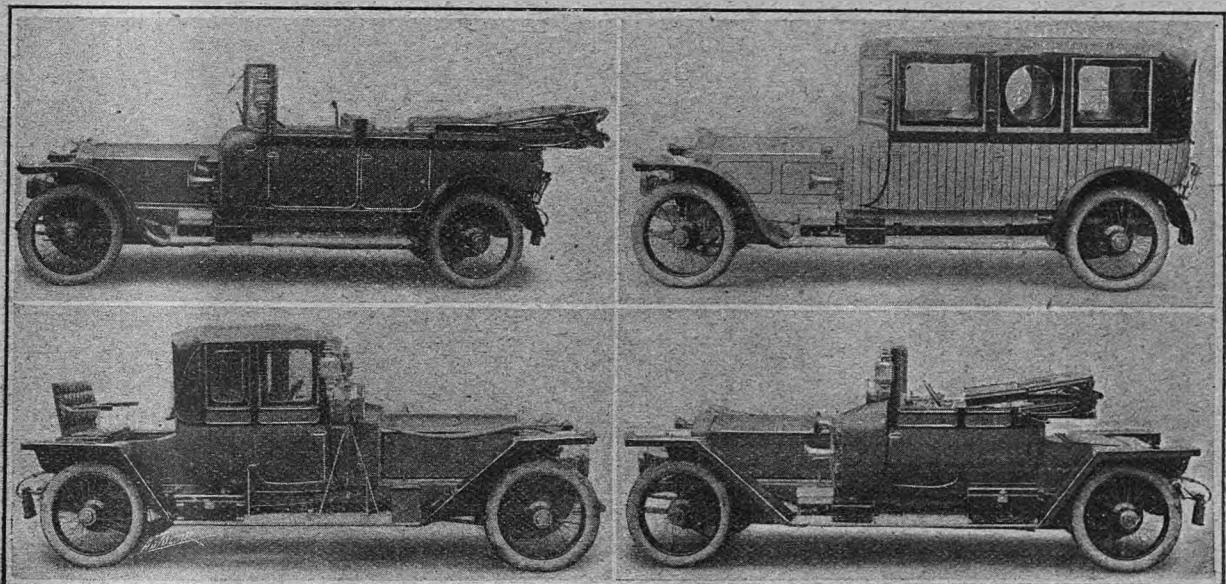
from which it will be seen that the point C, representing the closing of the exhaust valve, follows the point A which represents the commencement of the lifting of the inlet valve.

It may appear strange that engines vary in this respect, as shown in figs. 3, 4, and 5, but the reason for this variation may frequently be found in the shape or dimension of the inlet and exhaust pipes. That is to say, an engine with a certain arrangement of piping will be found to give the best results with the valve setting shown in fig. 3, whilst the same engine, with a different arrangement of piping, may give more power with the valves opening and closing as shown in fig. 4. If, however, the valve tappet adjustment be not correct, the position of the points A and C will be varied, and there is a possibility that,

#### Useful Hints and Tips.

instead of the setting shown in fig. 3, that shown in fig. 4 may be obtained as regards the closing of the exhaust and the opening of the inlet, with the consequence that the best results would not be secured from the engine. The best setting is not obtained, and in addition there is the loss of power by reason of a shorter period of opening than is possible and requisite. Valve tappet adjustment has, therefore, an important effect upon the valve timing, and in this way on the maximum power.

Sometimes the fibre head of the tappet becomes recessed, and a comparatively big clearance results, although this is not indicated even by the passage of a "feeler gauge." In such a case the valve tappets should be removed and the fibre heads filed flush before being re-adjusted.



Three Rolls-Royce cars, the bodies of which have been built to the order of H.S.H. the Maharajah of Alwar. The two upper cars are saloon cabriolets similar in general outline, but somewhat different in detail and style of finish. The dark car is D-fronted, and the striped one has a V-front. The D-fronted car and the coupé cabriolet are finished in peacock blue, with black mouldings and gold lining, the striped body being finished in yellow, striped with green lines edged with gold lining, the upper portion and the mouldings being also green. The powerful searchlight on a special tripod on the running board of the coupé should be noticed. These three bodies were built by the Regent Carriage Co., Ltd., 158, New King's Road, Fulham.

### The R.A.C. Road Guides.

The honorary secretary of the Nottinghamshire Automobile Club, Mr. Booth Granger, has sent the following letter to the secretary of the Royal Automobile Club and to the honorary secretaries of the Associated Clubs on the subject of the R.A.C. Road Guides:

2, Friar Lane, Market Place, Nottingham.

March 19th, 1913.

Sir,—In reply to your circular letter of the 14th of March, we had a special committee meeting last night to consider it. We had a very full committee, who were interested in the statement leading up to the proposed new arrangement of contribution to the General Committee, and each one had been supplied with a copy of the report of the special committee and extract of minutes, and after very careful consideration the committee were unanimous in recognising the great benefits received for motorists from the R.A.C. and General Committee and wished to give them all possible support.

The only objectionable feature in their mind was the "Road Guide Scheme," which is the cause of the present difficulty, and they do not approve of the scheme at all, but at the same time consider that a modified scheme of road guides

might be of some advantage, although not such a scheme as would attempt to compete with the A.A., such competition being, in the opinion of my committee, absolutely beyond the powers of the General Committee.

Eventually, the following resolution was passed:

"That this committee do not approve of extending the 'Road Guide Scheme.'"

This resolution was carried on the proposition of one of our members owing to the Touring Guides balance sheet, which sets out a cost for 1912 of £5,856 5s. 7d. with an estimated expenditure for 1913 of £9,500.

My committee are of the opinion that, even if we agreed to the proposed increase of 5s. 6d. per member, it would very soon be inadequate, and would mean doubling subscriptions.

One of our vice-presidents suggested that the time had arrived when, instead of the General Committee further competing with the A.A., they should pay a large contribution to the A.A. on condition that benefits be bestowed on members and associates in return for that contribution, that the A.A. should give up its legal work, which is done much better by the R.A.C.

I am instructed by the committee to forward a copy of this letter to all associated clubs.

BOOTH GRANGER,  
Hon. Sec. Nottinghamshire Automobile Club.



## From Salzburg to the Lake of Zell.\*

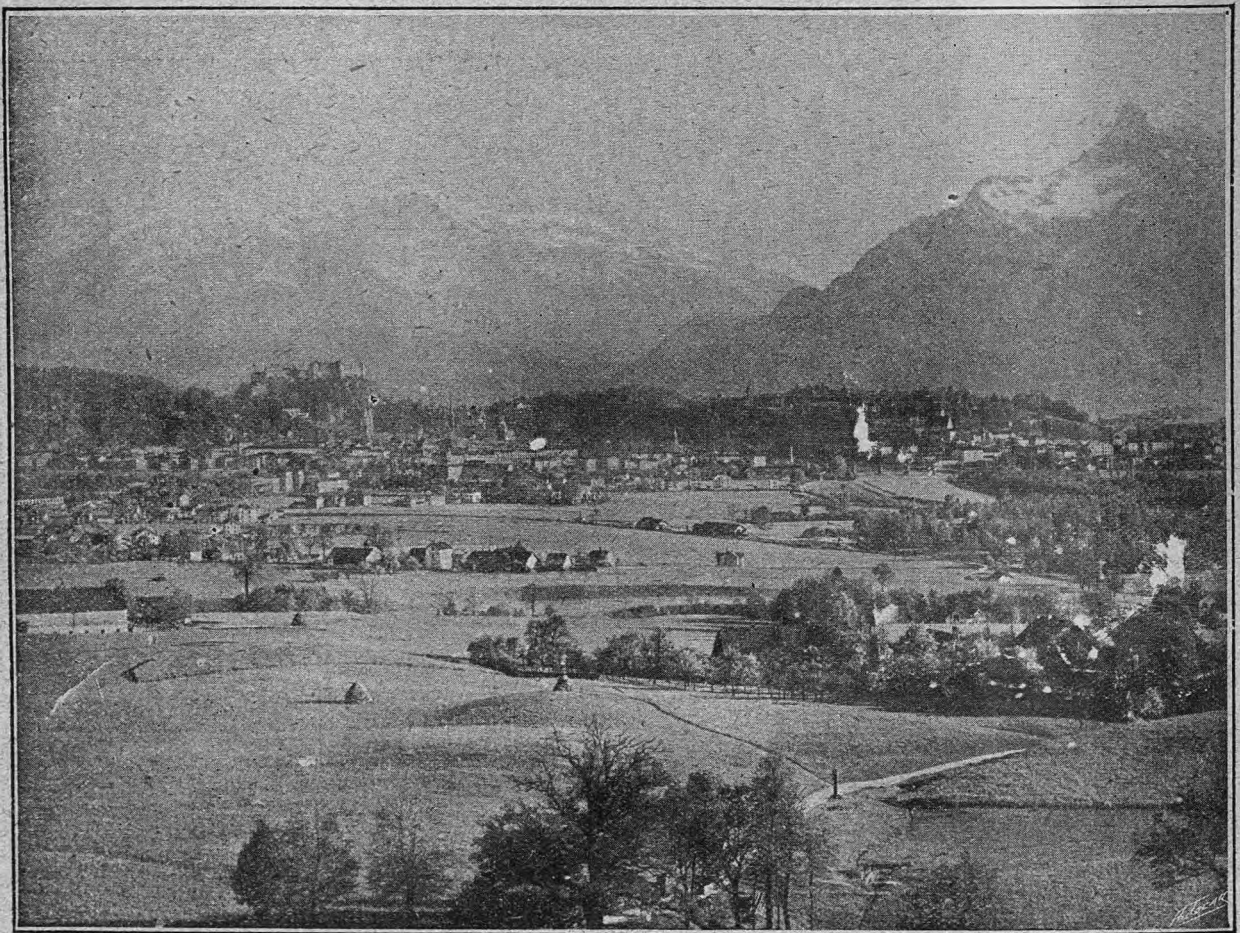
A Valley Run of almost Endless Charm.

By Chas. L. Freeston, F.R.G.S., Author of "The High-roads of the Alps," "The Passes of the Pyrenees," etc.

UNLESS bent on mountain climbing by road, for its own sake as well as for the scenery which the pastime affords, I could name few spots, if any, at which I should more willingly pitch my camp for a series of radial tours than Salzburg. The town is remarkable in itself; the province of which it is the capital is picturesque throughout; while last, but not least, it closely adjoins two districts of quite exceptional charm—the Salzkammergut on the east,

hood as they would appeal to the motoring tourist, both as regards the scenery and the roads by which it may be reached.

These, it may at once be ceded, are not invariably as good as one could wish, I state the fact frankly, because it is no wish of mine to mislead my fellow tourists and expatiate upon panoramic glories which, when visited, can only be viewed under conditions that go far to discount, if not entirely destroy, the



Salzburg as seen from Maria Plain.

and the lovely corner of Bavaria which includes the towns of Reichenhall and Berchtesgaden, and the unrivalled lake known as the Königsee.

Now this entire region, though centred amid mountains, involves the crossing of no high passes, and is therefore supplied with railways according to its needs. To the Viennese, and to Germans from over the frontier, it is a favourite holiday haunt accordingly; to some extent, moreover, it is becoming known, as it well deserves to be, to English travellers. As a field of enjoyable touring by road, nevertheless, its fame has yet to be earned, and I cannot do better, I think, than describe the resources of the neighbour-

pleasures of the undertaking. But I do ask the reader to accept the word of an old tourist that, if I say of certain roads that they are not super-excellent, they are at the same time not removed from the ideal to a degree which would make the case one of "*le jeu n'en vaut pas la chandelle*." Whenever this could be said with truth I should simply decline to advise any tourist to proceed in that direction, whatever the attractions of the scenery itself.

No motorist can logically expect, however, a ceaseless continuity of broad and "sand-papered" roads; and really the only things at which one may cavil in the district under notice are the occasional lack of signposts and the too frequent presence of loose stones

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It does not follow, moreover—and, indeed, is highly improbable—that those which I encountered in the month of June are to be met with all the year round. It is usual in Alpine districts to repair the roads at that time of year, and, as steam-rollers are not often available, the roughness merges into smoothness more slowly than on English high-roads. And the salient fact must also be impressed that, even in the very same district, as in the present instance, which offers occasional tracts of more or less undesirable surface, there are also to be found long stretches of magnificent highway. One must refrain, therefore, from the ineptitude of condemning a whole region because its roads are not superfine throughout.

But, firstly, of Salzburg itself. It has been likened to Rome and Florence, and is claimed by its inhabitants to be the "gem of the Austrian Alps." Humboldt even went so far as to say that it ranked with Naples and Constantinople in the beauty of its approaches. The eclectic tourist will find Salzburg striking enough, however, whether he accepts these comparisons or not. But there are few places of which he could form so imperfect or delusive an idea if he contented himself with driving in and out of it. For the town is almost wholly modern, owing to fires and warfare having destroyed the majority of its ancient buildings. Even from the modern standpoint, however, it is wonderfully handsome, while among the old structures which still remain is the proud fortress of Hohensalzburg, which dominates the town and plain from the summit of the Mönchsberg.

To appreciate Salzburg and its splendid situation, nevertheless, one must not fail to ascend the ivy-clad slopes of either the Kapuzinerberg or the Mönchsberg, 800 feet and 433 feet respectively above the plain. The town lies between the two, on both sides of the river Salzach, and from either summit alike the *coup d'œil* is extraordinarily effective, and, indeed, almost without a rival. And inasmuch as probably every visitor to Salzburg will previously have seen a photograph of the Hohensalzburg fortress as viewed from the Kapuzinerberg, the desirability cannot too strongly be impressed upon him of making the ascent himself, for in no other way can the town be seen to such advantage. Among more distant views, the one from the pilgrimage church of Maria Plain is noteworthy.

Within the town the note of modernity is omnipresent, and particularly in respect of coupled trams with clanging bells and the constant hissing of brakes. As with all towns, moreover, which are large enough to have abundant interests of their own, one may seek in vain any information as to the attractions of places within measurable distance, and hotel porters can tell you nothing about the all-important item of the roads.

Of its interesting past one may leave the ordinary guide-books to tell the story, but the reader may be reminded in passing that Salzburg was the birthplace of Mozart, and is still famous as a musical centre. The house where he was born may be seen in the

*Getreidegasse*, and is now used as a museum, in which the maestro's skull and his harpsichord are preserved.

The first excursion which we have to consider from Salzburg as a centre is the one of 156 kilometres to Zell-am-See and Lofer, near the boundary of Tyrol, as was described in the preceding article. It is a valley route throughout, bordered by one river or another, and even at its highest point does not exceed 2,475 feet, a rise of only 1,125 feet from Salzburg in 110 kilometres. There is hardly a mile of road, however, which does not command attractive and often magnificent mountain views, with a series of picturesque villages, old castles, waterfalls, and gorges.

To Hallein, our first objective, there are alternative roads, one on each side of the river Salzach, and before a choice is made it is advisable to enquire whether either is under repair, lest one may have to drive over stretches of loose stones. In my own case I was advised to take the left bank, which runs, by the way, much closer to the river than the other. A fine retro-



The Collegienplatz, Salzburg.

spective view of the old fortress is obtained soon after leaving Salzburg, and then one crosses a broad plain, with well-wooded foothills ahead surmounted by noble peaks. For a time the road is bordered, in English fashion, with hedgerows, and further on there are beautiful green slopes on the right.

A slight rise above the river brings Hallein into sight. Descending to the narrow main street we follow it for some distance before discovering the exit. The old town is not only a health resort, but is famous for its salt works. After bearing to the right we take the road to Golling at a fork, and shortly afterwards encounter two level-crossings, with yet another still further on. The road is good, but soon becomes winding, and must not be taken at speed. Far ahead are lofty crags with snow crevices, and the running generally is very pleasant.

In the village of Kuchl a sharp turn to the right must be made by a narrow exit. More hedgerows accompany the journey to Golling, which is nicely situated and has a picturesque main street, dominated

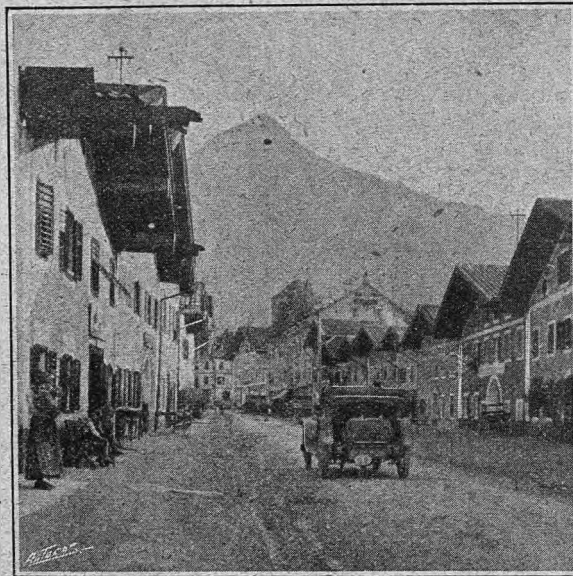
*From Salzburg to the Lake of Zell.*

by a peak. An old castle on the outskirts is now devoted to municipal purposes. Keeping to the right at the next fork we enter upon a most interesting stage of the journey; and incidentally it may be mentioned that, if time permits, it is worth while to explore the Salzach-Oefen, a series of ravines some four kilometres beyond Golling. The massive rocks through which the Salzach has had to force its way are remarkably impressive, and one may amuse one's self to advantage by passing from one to another, as paths and bridges have been provided for that purpose.

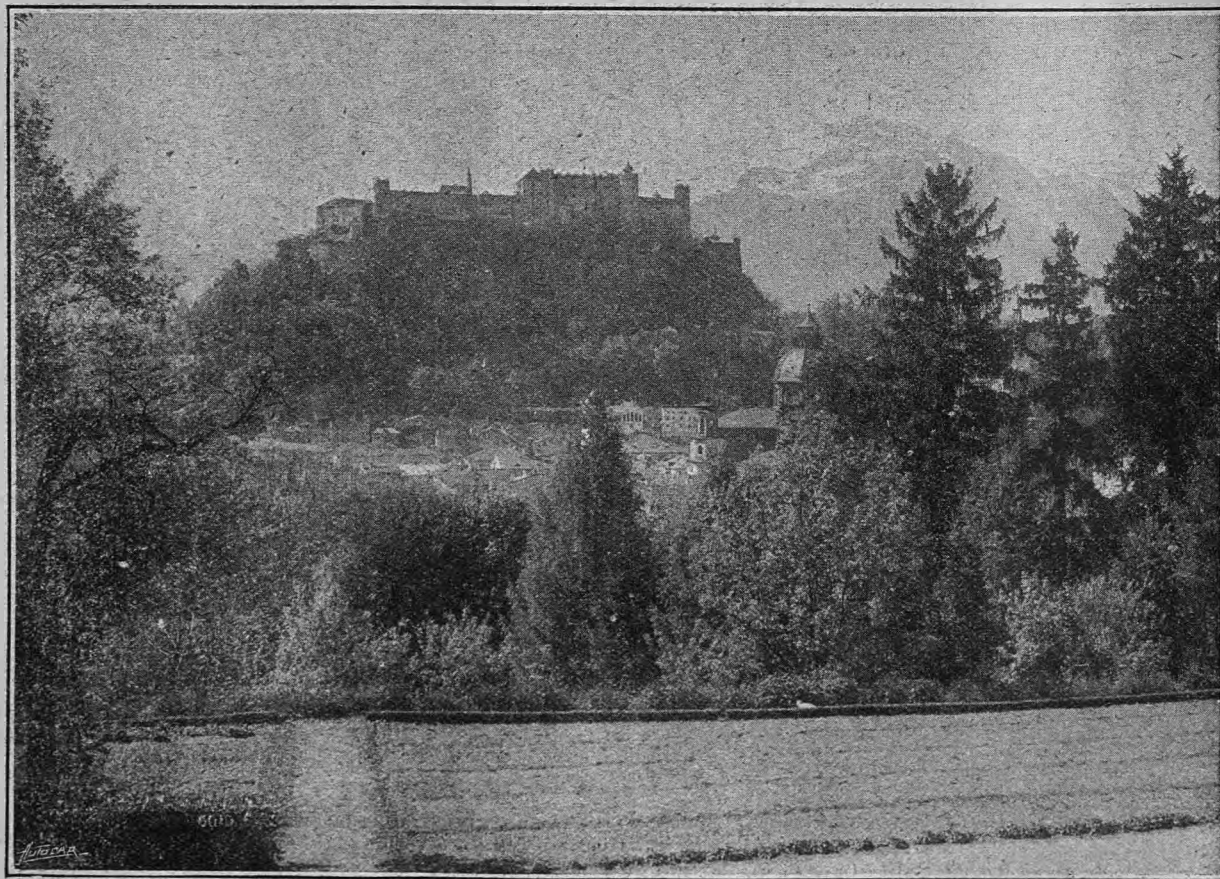
The main road rises through a wood for nearly a kilometre, and enters the picturesque ravine known as the Pass Lueg. A steep drop follows, and the road winds between rocks, with only just room for itself and the adjoining railway. Though the way is winding the road surface is very good. Soon the railway enters a tunnel through the rock, but the road skirts it, and continues through a striking gorge. It is no less than ten kilometres in length, and was the scene

of several struggles in the war of 1809, as may be gathered from the presence of a monument erected in 1898. After the ravine has been left behind, a big limestone crag is seen on the left. What the eventual state of the road may be I cannot say, as railway operations were in progress in 1912, but the haulage was being done by trucks on small rails, and these had to be watched for, as they occasionally crossed the road. It is to be hoped, however, that no permanently ill effects will have followed the operations of the engineers.

At length we cross the Salzach by a wooden bridge, and, after a slight rise and gentle fall, over an excellently surfaced road, find ourselves confronted beyond Sulzau by a change of scene, with the finely posted castle of Hohenwerfen, belonging to the Archduke Eugene, on a wooded hill. The building can be viewed from a long distance, but is seen to the best advantage at close quarters further along the road. After another rise a fresh view is opened out on descending



*The main street, Golling.*

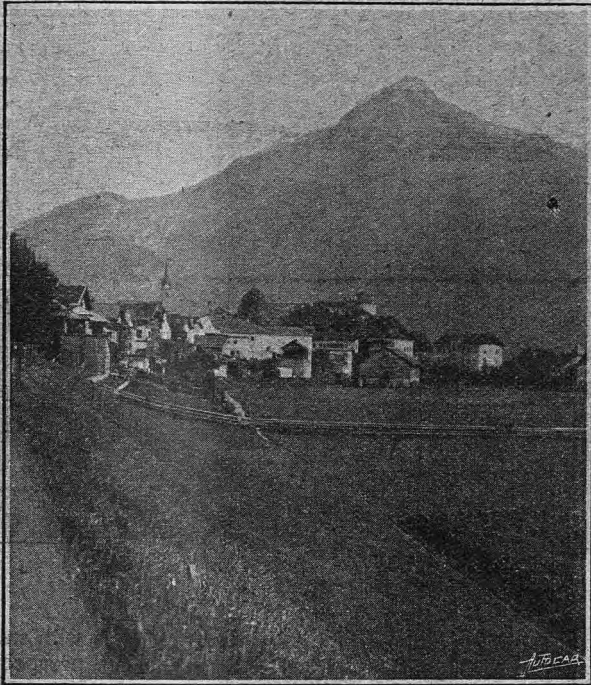


*The Hohensalzburg Fortress, Salzburg.*



to Werfen, a charmingly situated town, nestling beneath the Ewige Schnee ("Perpetual Snow") mountains. On the opposite side of the river is the Erzerzog Eugen-Klamm, a fine gorge with several cascades.

Beyond Werfen we avoid a road to the left, leading to Dorf-Werfen on the opposite side of the river, and



The charming little town of Golling.

cross the river and railway further on, but at a fork beyond we bear to the right and cross back again to the right bank, at a point 50 kilometres from Salzburg. Throughout this district one frequently encounters pedlars, in picturesque costumes, carrying quaint packs of small wares. Three kilometres beyond the fork, after several slight rises and falls, we reach the village of Bischofshofen, a quaint and straggling old place, with a narrow entrance and exit.

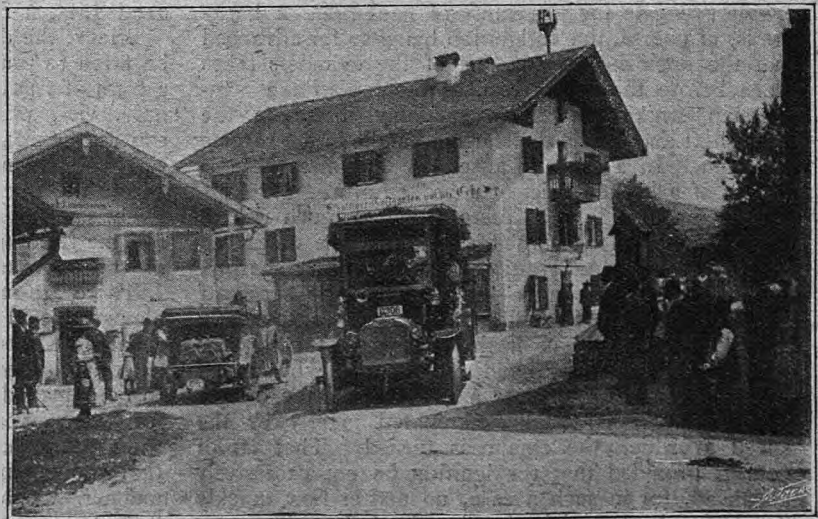
The road now becomes rougher in surface, a fact accounted for by the presence of a timber siding to the railway; the valley itself, however, becomes wider. In a few kilometres we arrive at S. Johann-im-Pongau, a small town with an attractive environment and various available excursions. One of these is to the Liechenstein-Klamm, a wonderful gorge, or series of gorges, through which the Ache river tumbles and forms several cascades. The second gorge has been described as one of the finest in the Alps, and is certainly more impressive than the famous gorge of the Aar on the Grimsel Pass. To anyone whose itinerary leads him to stay at S. Johann-im-Pongau I can recommend the Hotel Pongauer-Hof, close by the station, below the village. The landlord speaks English and is

very obliging, and, though the hotel is not much to look at from the outside, it is comfortable within.

Very soon after we leave the village the hitherto southward run veers westwards, and thence follows a lateral route all the way to Bruch. The road is mostly good, and has the river in close attendance all the way; occasionally, however, the railway lines are too obtrusive for the enjoyment of the picture. Away on the left, nevertheless, there are fine mountain ranges throughout the whole journey. Some minor undulations bring one to Schwarzbach, beyond which the road runs through a short ravine and then crosses to the left bank of the river. Soon afterwards one swings round under a railway bridge, which must be approached with caution.

At Lend, at which place we have imperceptibly risen to 2,070 feet, the road again passes under a railway bridge, and brings into view one of the very few eyesores to be met with in Austria—namely, an aluminium factory of conspicuous ugliness. It not only impairs the landscape, but has also affected to some degree an adjoining waterfall. This, however, is still very striking, and the car should be slowed down in order that it may not be missed. It may be mentioned in passing, too, that at Lend there is one of the numerous *cul-de-sac* roads in this part of Austria which lead up to some mountain resort without being continued over the range. In this case the road ascends the beautiful Gastein Valley, in which are situated Hof-Gastein and Bad Gastein, two very popular health resorts; the latter, indeed, is visited by many thousands annually. It is celebrated for its springs, which contain radium, and for its waterfalls and charming promenades.

A level crossing is met two or three kilometres beyond Lend, and the road runs for a time between the river and the railway. The river is then crossed to the right by a stone bridge, and rises to Taxenbach, with its two castles, and then descends to the level of the river. It now improves in quality and width alike, and passes between two long lines of mountains, prominent among those on the left being the snow-capped Hochtenn. On arriving at Bruch (2,475 feet), the option is afforded of going straight on and reaching the foot of the Thurn Pass at Mittersill, or of turning to the right for Zell-am-See. We choose the latter route, and in five kilometres find ourselves at that bright little town and its truly charming lake.



Cars in a village near Zell-am-See.



*From Salzburg to the Lake of Zell.*

The Lake of Zell, indeed, though standing by itself, in contrast to the series of the Salzkammergut, is in every way worth a visit for its own sake, and tempts one to stay for an indefinite period. It is not surprising to find that numerous hotels have sprung up here, the surroundings being singularly beautiful yet peaceful. To see the lake at its best one must resort to a rowing boat and paddle at one's leisure, though a small steamer is also available. The lake is 2½ miles long by a mile in breadth, and commands glorious views of the Kitzsteinhorn, the Tauern, and other striking peaks.

We have now to effect a link with Lofer, by way of Saalfelden, and the earlier stages of the journey are over somewhat stony roads. If the steam roller be unknown, however, the horsed roller is not, and I met a huge example drawn by a team of four. A Government motor diligence, I may add, plies between Saalfelden and Lofer. Though one has to proceed with some degree of caution owing to the narrow roads and bad surface, and the prospect of meeting a frightened horse, it is pleasant to note the civility and contented appearance of the inhabitants, the young women being comely, while on holidays they adopt the custom of going about *décolletées*.

Saalfelden is reached through a broad valley, with high wooded mountains on the left and an imposing range of snow-flecked, jagged peaks ahead. These form the Steinernes Meer, or "Stony Sea," and are particularly impressive when enkindled by the glow of the setting sun. Expansive views unfold themselves when the town has been left behind, and the road

itself becomes wider, although in June it may be strewn with new metal. Beyond Weissbach a wood of firs and pines offers a welcome shade. Some distance further on a fork is encountered with no signpost; the road to the left is the original route, but that on the right is a new one, only built in 1912, and is straighter than the old. When nearing the next village, S.



*In Saalfelden.*

Martin, one enjoys a majestic view of peaks, with snow crevices, high up on the left. Still finer prospects, however, are those which greet the eye after Lofer has been approached through an avenue of trees.

Rain, or a beclouded outlook, of course, would spoil this or any other run; but I have described in detail the chief features of the road from Salzburg to Lofer because it is so little known.

## The Risk of Back-fires.

THE accident which occurred recently to Mr. Lowther, the Speaker of the House of Commons, has once more brought into prominence the risk which may attend the starting of a car engine owing to the possibility of back-fire. A back-fire is, of course, due to ignition being so far advanced that the explosion in any one of the cylinders takes place before the piston reaches the top of the compression stroke and tends suddenly to rotate the crankshaft and with it the starting handle in the reverse direction. In a case of a serious back-fire there is danger of a broken wrist or a broken arm.

With magneto ignition there is not so much risk in this way as with accumulator ignition, for, unless an engine with magneto ignition be turned fairly sharply, no spark will take place—at any rate, no spark of sufficient intensity to ignite the charge—consequently no back-fire can occur if the engine be turned very slowly. On the other hand, if the engine be turned quickly enough to generate a good spark, the danger from back-fire is usually eliminated merely by the speed at which the engine is turned. That is, of course, provided that the ignition be not excessively advanced, for in such a case, no matter how quickly the engine be turned by hand, a back-fire will occur.

Some time ago—in September, 1911—we described in detail the design and construction of a patent safety

starting handle, which had just prior to that time been put on the market by Messrs. G. T. Riches and Co., 19, Store Street, Tottenham Court Road, and although the device has since appeared in the firm's catalogues, it has not received the notice it deserves.

Briefly, the design of this starting handle, which can be fitted to practically any car in existence, comprises a form of friction clutch which drives in one direction only, viz., when the power is applied through the starting handle. When a back-fire occurs an external ratchet momentarily resists the reverse pressure, but before the ratchet can take up more than a comparatively small portion of the force exerted by the back-fire the friction clutch slips, so that the hand or wrist of the operator receives no backward thrust at all.

There are many owner-drivers and others who may almost be said to live in a constant state of dread lest a back-fire should occur with its resultant damage, and such nervous ones are, as a matter of fact, more likely to be damaged than those who have more confidence, for their nervousness actually inclines them to hesitate when commencing to swing an engine, with the result that the compression is only overcome in a halting manner. Such motorists would be well advised carefully to consider the advantages of the Ormo safety starting handle we have referred to. It is sold at 30s. in plain steel finish and 35s. with brass finish.

## The Del Monte Process.

By W. R. Ormandy, D.Sc.

HAVING regard to the claims that are made for this process in its bearing on the supply of motor fuel, and the publicity which has been given it of late, it would seem desirable to refer to it at some length. In the first place, the low temperature distillation of coal is not novel. It may be said that the most recent work on the carbonisation of coal, that of Professor Vivian B. Lewes, is one long plea for the application of low temperature carbonisation, and there are in scientific publications many records of the increased yields of volatile spirits and oils, and the superior nature of the pitches produced, when coals and coal-like shales are distilled at a temperature lower than those customary in gas manufacture.

There is nothing novel in the passage through carbonisation retorts of inert gases, sent in with the object of removing the distillation products rapidly from the heating zone. The passage of washed and cleansed coal gas through ordinary gas retorts, and the passage of blue water gas through ordinary gas retorts, has been tried on a small commercial scale. The whole operation of distilling Scotch oil shales is carried out at a comparatively low temperature, and in the latest type of large diametered vertical Henderson retort large bulks of superheated steam are passed through the retort with the object of rapidly removing the products of volatilisation, and with the further object of conserving the ammonia produced in the high temperature zone, which is liable to destruction if left long in contact with heated surfaces.

### A Main Feature of the Process.

So far as one can gather from the meagre information published, the main feature of the Del Monte process is the passage through the retort of highly heated gas, originally generated in the retort and first treated for the removal of the valuable products. It is possible that a specific claim to a combined low temperature distillation conjointly with the passage through the retort of the cleansed and heated gas might be valid. As far as comparative figures enable one to judge, it is, however, a question as to how far the passage of this hot gas through the retort increases the value of the yield. Unlike steam, the gas has not the same influence in protecting, and consequently increasing, the ammonia yield. The statement that the use of such hot gas enables larger diametered retorts to be used is one which no experiments are produced to substantiate. That the use of highly superheated steam has enabled larger retorts to be used in the shale oil industry is no analogy, because in the shale industry we are dealing with a material which remains open and porous, so that the heat which the steam picks up from the red hot mass on its way to the discharge end of the retort is transmitted to the body of the shale in the higher portions of the retorts.

In the case of retorts intended to turn out coke, we presume that caking or coking coals alone can be used, and this is certainly the case if the residue from the distillation is to be sold as a material for household fires. In such a case it is hard to understand how the hot gas is going to penetrate through the mass of material which has clinkered or coked together. It is much more probable that the gas will pass along the outside of the retorts between the shell and the coke mass.

It would seem, then, that the main claim to novelty in the Del Monte process lies in the application of a feature which, *a priori*, does not seem likely to exert much influence on the final result. In so far as the added gas merely serves to sweep away the products of combustion from the top of the retorts, the same end might be attained by introducing the diluent gas just above the coking level.

It is strange that in the various publications so little reference is given to scientific opinion on the value of the patents, the numbers of which are not even in the advertisements which have come before me. I have stated elsewhere that there is a legitimate and desirable opening for the production of Coalite type of fuel with the simultaneous production of benzoles and improved pitches, but this object is not likely to be furthered by putting half proved or half explained processes before the public. Indeed, it may be said that the limited success of the Coalite process did much to damage this class of flotation in the opinion of the public.

### The Question of Ash.

In the estimate of costs, etc., contained in the prospectus of the Del Monte process in the *Daily Mail* of Tuesday, April 1st, coal is taken at 12s. 6d. per ton delivered in London. The consumer of coals in London must wonder where the difference goes between the price he pays and the price at which the sanguine promoter hopes to get his material in bulk. If the answer be made that the material which it is proposed to use is a slack so fine that it is not available either for household use or for boiler firing, then the rejoinder is that such fine dust to reach London at 12s. 6d. per ton will probably contain a very high percentage of ash.

Generally speaking, the cost of any coal in England, however fine, bears a close relation to the amount of ash it contains. A fair boiler slack which is fetching 8s. to 9s. per ton at the pit will contain 10% to 12% of ash, and such quotations can only be obtained for very large contracts. When one bears in mind that the whole of the ash contents pass into the coke, where the percentage grows proportional to the reduction in weight of the coke compared with the coal used, one doubts whether even the London householder would continue to pay 24s. per ton at the London works for a coke containing 15% to 20% of ash. At the moment gasworks coke made from best Arley coal is about 12s. per ton at works.

The price at which the coke is to be sold is one which could only be realised for a really good product, and such a product could not be made from any burnable material obtainable in London at 12s. 6d. per ton, unless the Del Monte people have been able to make contracts much more favourable than those made by the large coal dealers.

Then, again, on the sales side, sulphate of ammonia is taken at £14 per ton, whereas large contracts have been made for sulphate of ammonia naked at the works, future delivery, at £13 5s., less 3½%, bags, of course, extra. Having regard to all the circumstances of the case, it would have been much fairer to have taken the price of £12 10s. per ton as one likely to obtain over a considerable period. It is quite true that sulphate of ammonia's greatest competitor, nitrate of soda or Chili saltpetre, is being produced at such a rate that the fields are approaching

*The Del Monte Process.*

visible exhaustion, but there is no reason to expect within the next forty to fifty years that the cost of production of this material will seriously increase. There are certain markets for which nitrate is more suited, and others for which sulphate of ammonia is superior, but the largest market is the intermediate one where the two materials compete, and this fact is the farmers' safeguard as providing a healthy competition. Investors who take a long view will also have to consider the tremendous progress that is being made in the production of the artificial nitrogen compounds from the air, which are destined in the not too distant future to imperil the position of supremacy of the two above mentioned products.

**The Price of Spirit to the Motorist.**

With regard to the volatile portion of the liquid distillate, this is taken into consideration at 1s. per gallon, but we are told that it could be sold at 3d. This, of course, assumes that the coke, pitch, sulphate of ammonia, etc., retain the prices taken in the provisional estimate. It is not likely, however, that either the first or the second or the tenth Del Monte process works installed will sell their motor spirit at less than the maximum market price they can obtain. With 1s. per gallon plus 3d. tax—for this will be applied sooner or later—plus 2d. per gallon to the retailer, plus 2d. per gallon for tins and distribution, the cost to the motorist will be 1s. 7d., against 1s. 6d., the present price of Taxibus spirit. The motorist then must console himself with the thought that he is encouraging British industry and British shareholders and British company promoters.

It has been proposed that the Del Monte process should be applied to Cannel coals, and the statement has been made that such coals are a drug on the market, since the gas world does not now desire to make use of them. With regard to this I would point out that best Cannel coal is now 25s. per ton, and common Cannel, rich in ash, about 18s., both free on rail at pit. The fact is that the easily won Cannels of the South Lancashire coal fields are mostly gotten. Quite recently a colliery in South Lancashire hit on a comparatively thin seam of Cannel of fairly good quality, and this lucky find of this despised material, said to be a drug on the market, was regarded by the shareholders as a veritable windfall, which came in time to prevent the colliery from being shut down or from working at a loss. The fact is that the present method of coal gas manufacture is so efficient that a gas, meeting all legal and all ordinary requirements, can be made by a good bituminous caking coal. Cannel of decent quality is more expensive than the bituminous coal, and reduces the value of the coke very considerably, even when it is mixed with the bituminous coal, and for this reason it is no longer required in the English market.

**Where Cannel Coal Commands a Good Price.**

Fortunately for the English producer a very large number of the Continental gas works in Germany, Sweden, Russia, and France, and elsewhere, depend on British fuel for gas making, and owing to the high cost of freight it pays them to make use of Cannel, owing to the larger amount of gas which can be obtained from it, and also owing to the fact that the surrounding populace—not having the choice which the more fortunate population of England enjoy—are willing to pay a reasonable price for the inferior coke produced from such Cannel. It is true that there are considerable quantities of Cannel-like shales which con-

tain high percentages of volatile matter and yield large amounts of oils on distillation which could be efficiently dealt with by the Del Monte type of plant, or probably more efficiently by modern shale distilling plant, but as the percentage of ash in these fuels may be anything from 30% to 60% the large item of smokeless fuel must be crossed out from the asset side of the balance sheet.

The proper place for low temperature distillation plant undoubtedly is in the neighbourhood of the coal-field. If the object be to produce a high grade smokeless coke then reasonably good fuels must be employed, and it is, indeed, a question whether it would not pay to use washed fuels, as the washing operation can now be carried out at a few pence per ton, and the plant might be used to dispose of the finest washed materials. It is much better to pay carriage on the reduced amount of finished coke to London rather than on the whole weight of the coal that would be used to commence with.

If the Del Monte plant were started and proved to make profits I see nothing to prevent innumerable other companies starting on almost identical lines of low temperature distillation and producing oils capable of being cracked, using apparatus subject to no royalties and floated on terms much more favourable to those connected therewith.

**The Production of Shale Spirit.**

If the boom which the Del Monte process has experienced serves to draw attention to the fact that there are considerable quantities of shale-like coals which can be treated, as are the Scotch oil shales, it will have served a good purpose, but until better proofs are offered of the superiority of the Del Monte process in essential patented particulars it does not seem likely that the application of low temperature carbonisation will receive any permanent impulse for good from this flotation. In any case, it would be interesting to know whether, and if so how far, the directors of the company have investigated what has been actually done in the past with a view of seeing whether this process has up to the present produced commercial results, and, also, whether they have looked into the actual conditions under which the various tests were made.

In an advertisement supplement dealing with the Del Monte process the concluding paragraph states that the Del Monte process inaugurates a new era—by simply using up all the waste and unprofitable output of our coalfields, it provides:

1. An efficient and economical home-produced motor spirit: relief from the present deadlock.
2. A wholesome heat-giving, smokeless fuel: cleaner, healthier cities.
3. A home-produced substitute for foreign fertilisers: benefits for agriculture.
4. The nucleus of an industry of national importance.

Where the relief from the present deadlock comes in I fail to see, unless the spirit is to be produced in such quantities as will reduce the price of the whole of the fuel employed by the motor industry, and of this we see no signs. If the Del Monte people can make good heat-giving fuel from the waste and unprofitable output of our coalfields they have, indeed, achieved much, but for the reasons given I do not think that there is a sufficient supply of any waste in the coalfields at present low enough in ash to make a coalite which will be acceptable at a price rendering the process profitable.



## Leaves from a Sportsman's Notebook.

By J. Fairfax Blakeborough.

### The Other Side of the Question.

SOME days ago I heard a comparative remark meant to convey supreme delight, which, though hackneyed, may serve a turn. It was: "If I could pick up a little race with that mare of mine I should be as pleased as a dog with two tails." Why a dog *should* find joy in the possession of two extremities I am at a loss to know. Indeed, the fashion seems to be to rob many of them of the greater portion of the one tail which nature gave them. The simile has given me a text for a note, though possibly the old truism, "One tale is good until another is told," might have been more appropriate. One story is contained in a letter to me a few days ago:

"You have had a good deal to say of late in *The Autocar* regarding hunting and motor cars, and how the latter are occasionally inimical to the former. I have no doubt what you say is quite correct, but has it ever struck you there is another side to the question? I was motoring the other day near York, and was hurrying to the city to keep an appointment of an important engagement when I met the York and Ainsty hounds and field coming along the high road in long procession. I was compelled to stop for the sake of safety till the whole cavalcade had passed (not one of the field, by the way, said "Thank you"), and this delay caused me to be late for my engagement, to find that the gentleman I was to have met had not waited for me, and financial loss was the result. So you will see there is another side to the question; and if motors are an inconvenience to hunting people, so hunting people are not infrequently a cause of annoyance and inconvenience to motorists."

This is one tale. The other, which possibly refers to the self-same incident, reads somewhat humorously after the foregoing. The second point of view is from an account of the day with the York and Ainsty to which my correspondent refers, and I take it from a report of the day's sport as recorded by "Farrard On" in a Yorkshire daily newspaper:

"Coming to the left from Askham Bryan village; ran up to the Mill Hill, the fox got turned to the right, and for some distance ran the road. Here a motor car would have been better within the city of York than following hounds, causing horses to shy into the ditches or crush some other rider's legs."

### Ladies and Motoring.

In the world of sport the sex feminine have during the last year or two more than ever come to the fore. One sees this in connection with the turf, in the show ring, and in the hunting world—especially in the latter—and it would seem that in the motor world the lord of creation will have to watch his p's and q's or he will find his position taken from him. It has generally been supposed that anything to do with wheels is a sealed book to women, who have not been given the bump of mechanics. The rule, however, is not infallible, and not only does one discover more ladies driving private cars nowadays, but also one notes more and more advertisements for ladies to be trained as motor drivers. No doubt there is an increasing opening for them in this direction. There was a time when comparatively few folks had typewriters, but as they become essential to business men, so grew the demand for lady operators. So may it possibly—indeed probably—be in the case of motor drivers. In the near future we shall probably see

advertisements, "Governess wanted, able to drive a motor," "Lady secretary wanted who can drive a car," and so on. A knowledge of motor mechanism will undoubtedly be an accomplishment in the near future for the feminine sex, who will rise to the occasion as they have done in so many other undertakings requiring nerve, skill, and quickness of action. It is sometimes urged that we are a decadent race, unable to endure as much as were our forbears. There has undeniably been evolution; womenfolk do not now stay at home working samplers and drinking tea.

It is urged that our girls of to-day have become too masculine. We have not space to argue the matter here, but the fact remains that as time progresses they will be more and more so, and the increasing popularity of the motor offers an additional outlet in this direction. One might as well try to stop the ebb of the tide as evolution, and evolution points to women chauffeurs in the future. The sensations of the future in the matrimonial market will not be the marriages of opulent merchants and typists, but prominent and wealthy men and their chauffeurs.

### A Link with the Past.

Speaking of evolution reminds me that an hour or two before I wrote these notes I had a most interesting visitor in the person of the nonagenarian, Mr. Thomas Parrington. Those interested in evolution, in sport, and in Yorkshire, will be interested to hear that this wonderful old gentleman is ninety-four or ninety-five years old; still hale and hearty, and as keen as ever in matters sporting. He was born at Middlesbrough when his father's farmhouse was the only dwelling on the site upon which now stands the industrial town of Middlesbrough. He was for some years secretary of the Cleveland Hounds, one of the early promoters of Stockton races, afterwards huntsman of the Hurworth Hounds, later agent for the Earl of Feversham and Master of the Sinnington Hunt, at the headquarters of which pack (Kirbymoorside) he now lives. I was staying at Kirbymoorside on sport bent, and he did me the honour to call upon me and ask me in to see him. Mr. Parrington is one of the most interesting men in the world of sport to-day—a link, indeed, with the past. He it was who did so much to promote agricultural shows, and he it was who practically originated hound shows. He can remember the introduction of railways, and personally knew the earliest promoters of them. Unlike most of his aged contemporaries, however, he has advanced with the times, and has no selfish, childish, warped antagonism to motor cars. Indeed, were he a Master of Foxhounds to-day, one would probably find him amongst the number (which will be increased next season) who employ motor hound vans for fixtures wide of the kennels. It was in Mr. Parrington's day with the Sinnington that another famous sportsman was in his hey-day—the late Jack Parker. Jack was a quaint character, and on one occasion when out fishing with a certain titled Yorkshireman he failed to gaff a salmon, and in response to a torrent of strong abuse very quietly said: "If you hadn't been born a gentleman what a fine nattered blackguard you'd 'a'e made." On another occasion, when lunching with a shooting party, he was passed a pot of *pâté de foie gras*. He plastered some on his bread with his pocket-knife, and on tasting it asked, "What is this stuff? Pig's liver done up in a new way?"

## On the Road.

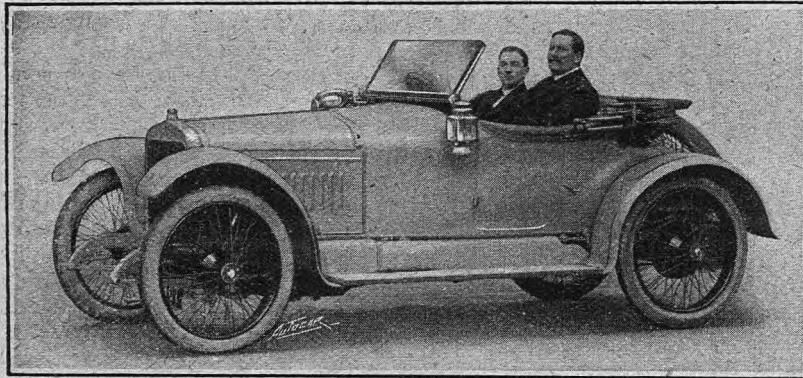
### Visits to Motor factories. Heredity in Trades. Engineering and Art.

**A**S a change from foreign parts, I spent last week in the more or less "Black Country," and took the opportunity to visit the seats of some of its most important industries. I began with the Austin factory, because I had received an invitation to inspect and admire the manner in which it had grown since I last saw it in 1907. I must admit

team that won in France and some new ones for the next French events. Also—and I am devoutly thankful that I was too late to be present at the demonstration—a new aeroplane engine which had been banging off in the "running" shop without a silencer all the afternoon. These things may be very wonderful; but I prefer the comparative quietude of the wing-hammering department.

I concluded my little tour with a call on what I dub "the pioneer motor carriage of the world," and I use the term "motor carriage" advisedly and as differentiating from motor car.

For will anyone, and I do not care what he may be interested in, deny that ten years ago the Lanchester car was ahead of all others in comfort as well as in intricacy? It was in those days that the Irishman's advice concerning them was founded, to a certain degree, on fact. "If," said he, "you are capable of performing the operation of appendicitis on the interior of a woodcock you may have a Lanchester." But now all is altered, and what goes



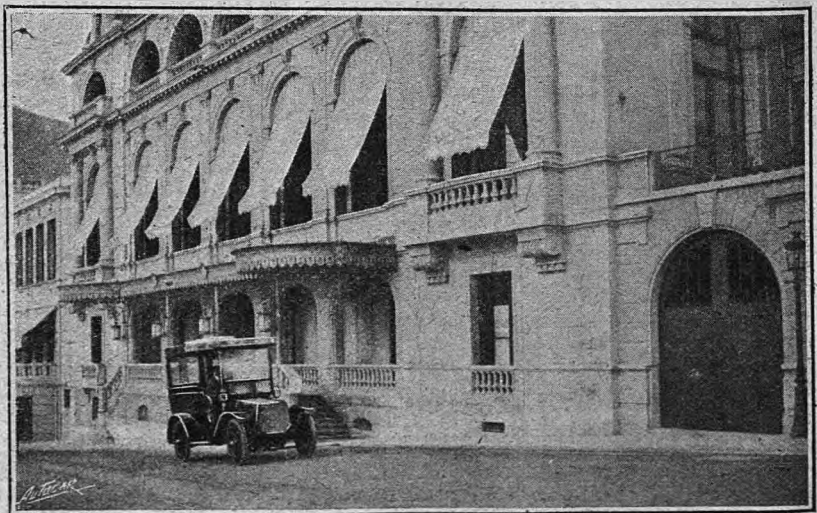
*A 15.9 h.p. Hispano Suiza, lately delivered by Messrs. F. W. Berwick and Co., Ltd., 18, Berkeley Street, London, W., to Mr. Higgins, Clumber House, The Park, Nottingham. The car is finished in biscuit colour and upholstered in leather to match, accommodation being provided at the rear for the spare wheel.*

I was amazed, and when I peered inside its interior I made the criticism that even now it is much too small for its inhabitants and its industries.

But I am wrong in placing Northfield in the Black Country, because it is in exactly the opposite direction, and, though the factory began by trying to make a town of its own in the country, yet Northfield is still amid the fields, although, by recent legislation, it has found itself inside "Greater" Birmingham.

As a layman, in inspecting engineering works I am always most impressed by the automatic machines, and here some were so new that my guides—whose business it is to waste their time over people like me—came across new ones since their last tour, and had to confess that even they were strangers to them. Austin Town—to judge by its busy inhabitants—is doing well, and it is all one can do at its gates to prevent getting run over by its many testers. To save bother it has another happy device. Three times a day a 40 h.p. car runs in and out of Birmingham, which is very convenient and must almost encourage visitors—if visitors are wanted. In order to be impartial, on the day following I went to call on the Sunbeam folk near Wolverhampton, and here again I found signs and portents that all is well with another of our best English motor makers. Perhaps it is because there is more room here that there seems to be less crowding, but as I was told in both that the masons had not been out of the factory for many years, I do not think one can compare. In the Sunbeam works there were many racing cars, including the immortal

on inside a Lanchester goes on in other cars, and there is nothing at all new that one cannot pick up in the course of an hour's explanation. The very fact that in this car the engine is made to take a back seat (in position) is a proof that its designers are satisfied that it does not want to be tinkered with eternally, and because of this the body builders are able to give private owners a body wherein they can be comfortable and happy in realising that they alone—or almost alone—of all car owners occupy the best part of their cars, instead of being cooped up behind a six foot tin coffin and four feet more of box seat. They have doors, too, that are doors, and not hinged apologies, which means a great deal to the prosperous and well-favoured. I often think the advantage of large doors is overlooked; possibly because they who write



*MOTORING ON THE RIVIERA. The Sports Club at Monte Carlo, a centre of activities during the Monaco races. The car is a Panhard*

of motors are, as a rule, thin and spare—of course, there is an exception—but ample width for entrance is undoubtedly of enormous advantage, especially for town work.

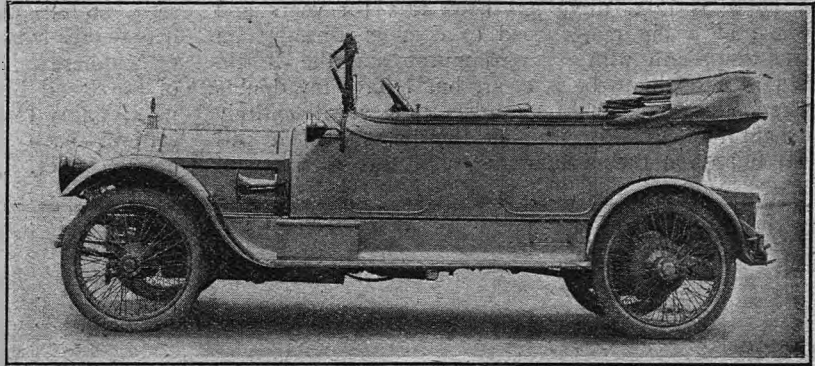
I fear my eulogy of the Lanchester as a comfortable car may give the impression that as a touring or open car I do not think it is at its best. Which is quite wrong, for the remembrance of a run among the Cotswolds on a bright May day in a 38 h.p. six-cylinder is always one of my most precious, and I do not know of another car that equals it in ease, especially going round corners on a hill.

When I departed I told Mr. Lanchester my chief criticism of him and all his works. "You made a great mistake," I said, "in not advertising your car as the most expensive one manufactured. If you had done so you would—in addition to your present customers—have had the custom of all those who do not care what they own as long as they have paid the highest price possible for it." I think he agreed, so, if the price goes up, everyone will know who to blame.

During my researches I came across a curious idea, and I give it in order that I may find out if it is correct or not. Possibly it may lead to a discussion; there is a chance that it may provoke civil war. I was told by a Birmingham district man that the mechanics of Birmingham and the Midlands do not think much of Coventry workers. "Coventry men," they say, "are not born engineers; many of their fathers never saw steel or iron in all their lives. We are the only people to work it properly." Now I wonder if there is any truth in this at all, because it is an accepted fact that in other trades heredity counts for a great deal, and the men of the Black Country were engineering "of a kind," or at any rate working on metals, so far back that "history telleth not to the contrary." We know how soldiering runs in the blood, as does statesmanship, fishing, and art. But art and engineering craftsmen-

ship are things not generally allied. For instance, I went into the Wolverhampton Art Gallery one day out of the rain, and "when the rain did stop, I soon came out again." I am sorry, but, with the exception of some old and small Low Country pictures, I was very disappointed, and I can sympathise with the duty of those who love Art and yet have to accept and hang pictures that are bequeathed—or thrown in—with money for the buildings or extensions.

*On the Road.*

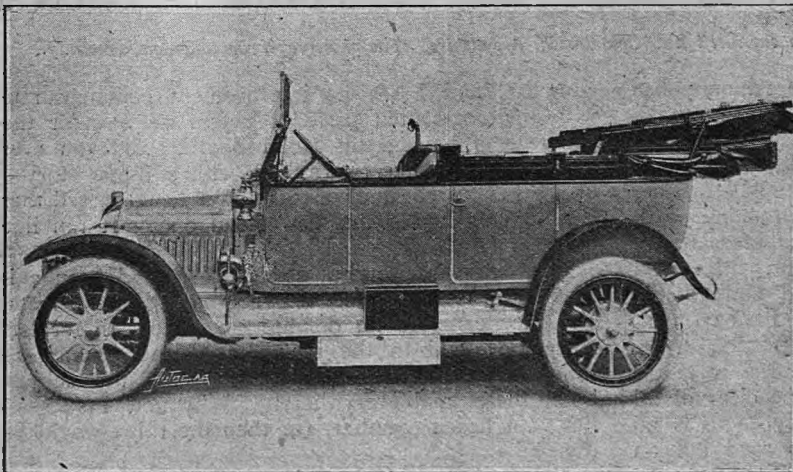


*A 15 h.p. de luxe Napier with a four-seated body, built by Messrs. Mann, Egerton and Co., Ltd., of Norwich, specially for Mr. C. E. Hodges, of that firm. Boxes are suspended between the frame members for spares, etc. A Magician dynamo lighting set is installed.*

Many provincial towns suffer similarly, though, as a rule, there are grains among the chaff. Curiously enough, Birmingham Art Gallery is too High Art, and its owners may wake up some day to find that most of their most cherished valuables are not Art at all—in the fashion of that day. Wednesbury has an Art Gallery. It has a terra-cotta exterior, with two busts of citizens, also in terra-cotta, above the door. I did not go inside, but passed on, through Moxley, to Bilston.

I have often written of this district, and confess to a sneaking admiration of it. To see it at night, as I have seen it, with fresh-fallen snow all over its broken and seamed fields, its black chimneys and furnaces belching smoke and flame, its parts of white hot metal, and the waters of its inky canals steaming and gleaming under a full moon, is to behold something new, something rather uncanny.

For centuries its surface has been scratched and tickled; even now there are coal pits small enough to be run by a man and a boy. Now, in the centre of its ugliest part, they make Mond gas, and by its power any number of engineering works are run entirely. Also, for some reason, a huge sausage factory, conducted on the most up-to-date lines, is a feature of Dudley Port, while there are tramcars of every kind and shape all over the place, so that one—if one should feel so disposed—can go from Walsall to Stourport by means of them. Black Country tramcars have improved of late. Once upon a time there were fearful steam ones, and the early electrics very often got off the rails altogether, and it was the duty of their passengers to help them on again.



*A new 14-18 h.p. Adler cabriolet recently delivered to Mr. W. H. Berry, of Daly's Theatre, London, by Messrs. Morgan and Co., Ltd., 10, Old Bond Street, W., and 127, Long Acre, London, W.C., the sole concessionaires for the Adler chassis. The coachwork was designed and constructed by Messrs. Morgan & Co.*



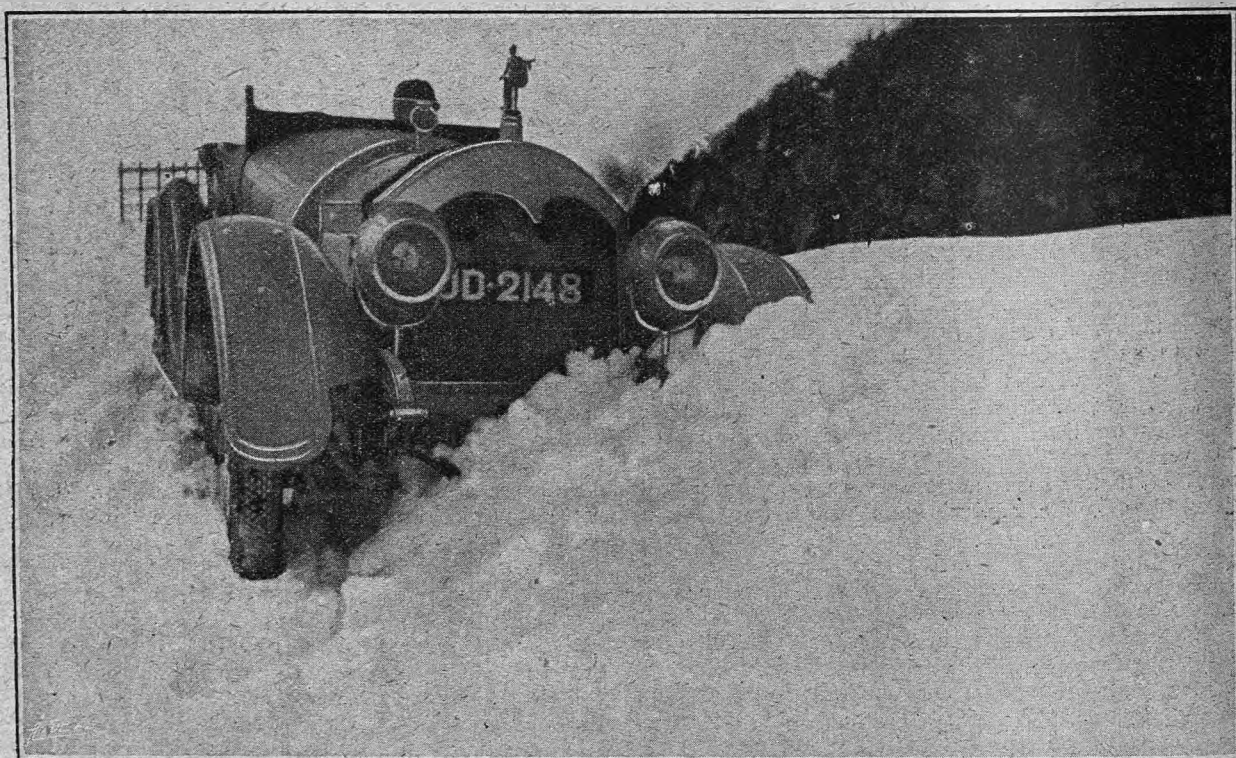
*On the Road.*

South Staffordshire is a county of contrasts. Very few miles west of all this blackness and grime lies one of the most beautiful bits of England that exists; indeed, the road from Wolverhampton to Kidderminster passes through it, and on the side between it and the river Severn would be hard to improve on. Perhaps it is the dark red colours of the rocks and the soil, perhaps it is only because of the contrast, but no other part of our country seems to change so suddenly, so entirely, as here.

There is talk, there has been talk for years and years, of a big motor road to connect Birmingham and the South with Wolverhampton and the North. Where it ought to be is clear, but I have my doubts whether any amount of motorists' money will entirely benefit motorists, or whether the benefits of it will not fall upon the ordinary users of the district, and

even for this improvement, for undoubtedly the most popular thing the Road Board can do is to suggest to Mr. Lloyd George—or his successor—that it cumbers the ground, and that motorists would be much happier without it and the threepence a gallon tax they have to pay on their petrol for the privilege of waiting to see what is going to be about to be done at some future time.

I am embittered about our roads. Recently I drove out of London on the Bath Road, and never have I seen, or felt, anything like the corrugated section of it that runs from Hounslow to Colnbrook in the county of Middlesex. I have a great respect for the members of the Road Board individually, and the selection of its secretary from one of our leading motoring organisations gave me and others at the time great hope. Yet, little by little, year after year has



**SNOWED UP.** A 60 h.p. Ariel car in a snowdrift near Crianlarich, Argyllshire. The photograph was taken quite recently.

heavy traction in its worst forms will not monopolise and ruin the projected highway.

Convenient and rapid as this suggested link would be for dwellers in the centre of Birmingham, I doubt if it would be of much advantage to anybody else. For it would be an urban district with many small towns on it all the way, and no end of cross roads, canal bridges, and railways to surmount. It could never be in any degree beautiful, and undoubtedly would be the cause of extending by its own convenience the length of the inhabited portion of it. If one lives outside Birmingham and desires to motor or cycle north, a slight detour takes one clear of all large towns, while if there is any hurry there is no objection to the ordinary and existing road but an æsthetic one.

If, then, the Road Board wants to spend our money in these parts, let it improve the road from Stonebridge towards Brownhills, and thus leave out Birmingham altogether. I do not suggest that there is much need

gone by, and I see no improvement commensurate with the augmented price of petrol we pay for the privilege of having this Road Board. Did you ever hear—I always like to wind up with a pretty story—of the famous chestnut concerning a Local Board that existed long before this new Road one? It ran like this:

For years and years a certain town had been agitated over the project of wood-paving the streets. Yet they came to no definite conclusion, till at last some wag said to the members of the Council as follows: "Gentlemen, you still discuss the subject here, there, and everywhere. Why not, I suggest, put your heads together, for then the thing would be done?"

Not for one moment, of course, do I suggest that the story is applicable to any of the organisations that look after the interests of motors or motoring. I merely tell the tale because it came into my memory *apropos* of nothing at all. OWEN JOHN.

## The Canty One-man Hood.

Opened Out or Folded with Facility. Front and Back Seat Entries Unimpeded.

**T**HIS hood, which is the production of Hoods and Bodies, Ltd., Northampton Grove, Canonbury, London, N., presents so many interesting points that it should have the consideration of any intending

any stays. There are clear and unimpeded ways beneath the hood above both doors. When extended and secured each length supports its neighbour, and great rigidity obtains throughout. Nothing could be

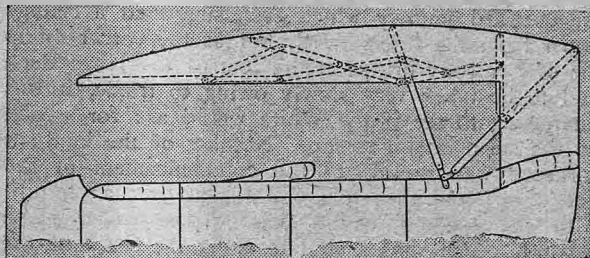


Fig. 1.—Diagram showing the arrangement of the various sticks of the Canty hood when opened out.

purchaser of an open touring car to which the fitting of a hood is intended.

By the accompanying diagram, fig. 1, it will be seen that the hood frame is a clever combination of the cantilever and lazy-tongs systems. The extending and

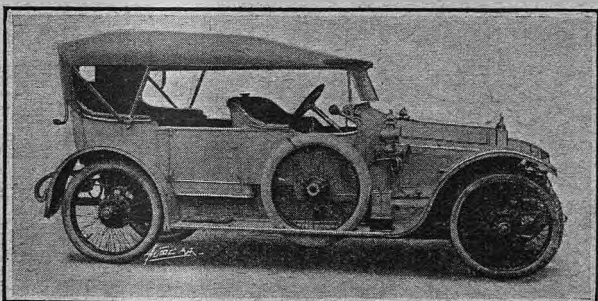


Fig. 2.—A car fitted with the Canty hood which is shown fully extended.

closing portion of the frame permits the extension to be carried forward until the peak of the hood is over the top of the wind screen, in one operation and without the necessity for straightening any struts or attaching

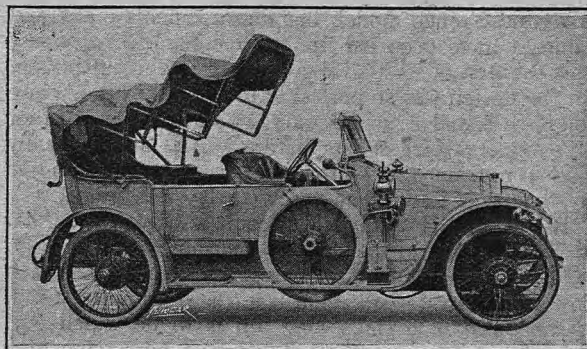


Fig. 3.—The Canty hood half extended.

simpler, for there are no stays to disengage from their sockets or locking nuts to manipulate.

The accompanying illustrations (figs. 2, 3, and 4) show the clearance given when the hood is up, and the neat and compact manner in which it stows away

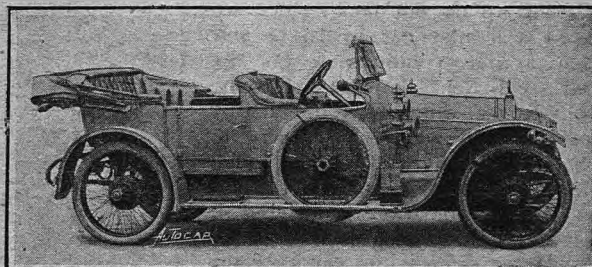
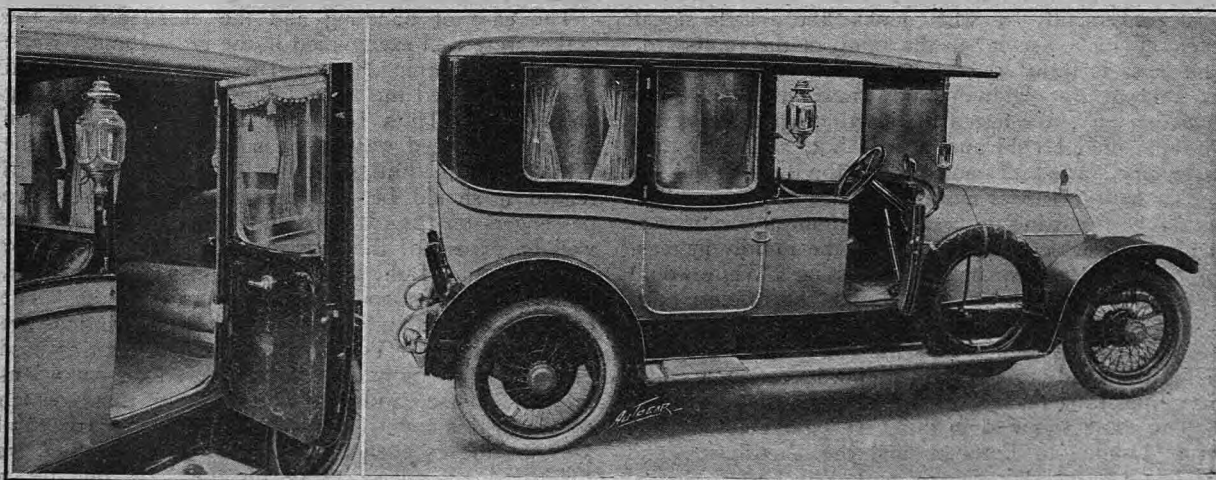


Fig. 4.—The Canty hood folded back.

when lowered. The intermediate position is also shown. The Canty hood complete ranges in price from £16 for the 7ft. 6in. extension with black fittings to £22 for the 8ft. 6in. extension with plated fittings.



A handsome 30 h.p. Lancia with a Lookers body, the property of "Wee Georgie Wood," a music hall performer. The specification includes a Rushmore dynamo lighting set, Klaxon horn, bollless wings, three interior lights, and the usual companions, etc. The interior is upholstered in figured silk, and the panelling is inlaid with multi-coloured woods. The finish is yellow with black roof and wings.



## The 20-30 h.p. White Petrol Car.

**A Week-end Run constituting a Trial under Many and Various Conditions.**

**A**LTHOUGH the White petrol car comes to us from the other side of the Atlantic, it is, so far as American cars are understood on this side to-day, about as un-American in design as it well can be. We believe that originally it was conceived on a good French model, but improvements many and manifold have occurred in its mechanical economy since the first of its kind was brought under our notice. But the design was so perfected in 1912 that the White Co. have found it unnecessary to make any further improvements of a salient nature. And after a really good in and out test of the 1913 car we are bound to say that they have done wisely to let well alone.

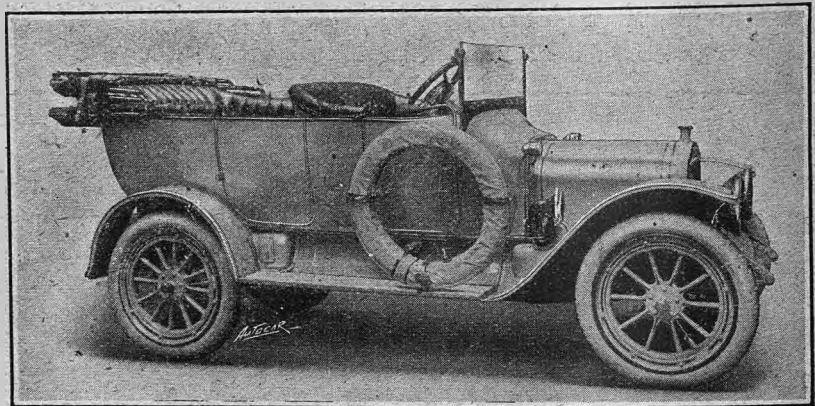
The engine is a fine production and makes a neat *en bloc* casting with cylinders 95 mm. x 130 mm. (3,680 c.c.), giving a good reserve of power, which it is a pleasure to call upon when a spurt is required, or the *ennui* of a steep long hill is to be wiped out. A further attraction of this car is the possession of a geared-up fourth speed, the enjoyment of which in use must be experienced to be realised. In driving on the level or down falling grades, even if no great speed be desired, a solidity and steadiness accrue to the running, when the fourth speed is nicked in, that we do not recall since we tested a similar car in 1911, and used a like combination on the four-cylinder Tourist Trophy Rolls-Royce which was our happy possession in 1905. Contrary to what might be expected, although the engine when propelling the car on this combination is driving it through spur gearing as well as the bevels, no one on the car save the driver is conscious of the change up from the direct third

The presence of the White electric combined lighting, ignition, and self-starting equipment is a great boon in connection with this car. The dynamo is beneath the bonnet on the right hand front of the engine, and for starting up, ignition, and switching off, is operated most conveniently by what looks like a little signal lever set in a sector on the ramp of the footboard. The lever is thrust right forward for engine starting, set midway for ignition, and drawn right back for switching off. We tested the starting again and again with the engine cold and with it hot, and each time the engine started off immediately, the dynamo did not appear to turn it over more than once or twice. This certainty of starting up under all circumstances is particularly valuable in these days of the rapidly increasing cost of petrol, for no one possessing a White would hesitate to switch it off even during the briefest halt.

The springing and steering are all that can be desired, and at high speeds the car is very fast, and holds the road, even over bad pot-holes, in a confidence-inspiring manner.

The route followed in this very enjoyable run was from London to Farnham and the Frensham Pond Hotel, by the Portsmouth and Winchester Roads, then *via* a cross-country and somewhat trying route to Brighton, including Churt, Thursley, Wormley Hill, Hambledon Aldfold, Bucks Green and Warnham Place to Horsham, thence by Monks Common,

Cowfold, Henfield, Pyecombe, and Pangdean to Brighton. The return journey to London was made by Clayton Hill, Burgess Hill, Haywards Heath, Balcombe, Pound Hill, Horley, Reigate, and Ewell. There was nothing between London and Guildford on the outward journey which even suggested a change down from the direct third, but as the corner on to the over-railway bridge at the foot of the Hogs Back had to be taken very slowly owing to traffic, it was interesting to see if the White would ask for second on the steep bit higher up. Nothing of the kind; it gathered way rapidly to the commencement of the bad slope, and then took all this at over 23 m.p.h. with the greatest ease. Gaining the easier slope beyond, which runs shelf-like along the scarp of the Hog's Back until it joins the old road on the summit, the White demanded its geared fourth and got it, accelerating all the time. Darkness fell before Farnham was reached, and the convenience of immediately lighting up without moving from the seat, and



The 20-30 h.p. White petrol car used for the trial run described on this page.

also the excellent penetration and definition of the White lamps, was amply demonstrated on the narrow, winding dark road that connects Farnham with Frensham. On anything like an open road, day speed can be maintained at night with White head lights.

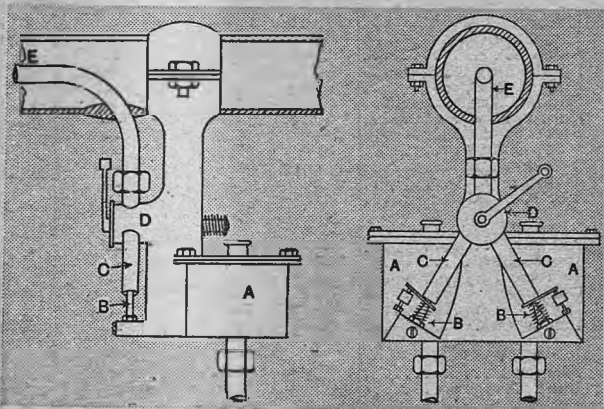
The ease of handling and the excellence of the brakes were well exemplified in the cross-country route of the next morning, for until the Horsham-Guildford Road was joined the route followed was very winding and through lanes. On the return from Brighton the second speed was only resorted to once, for the White held its third right up Reigate Hill. In this regard it should be said that there were only two passengers on the car, including the driver. As may well be expected, the four-seated body, which is by Messrs. Cann, Ltd., is up to date in every particular, both as to lines and seating accommodation. The car, too, is excellently sprung—indeed, the springs are specially fitted for English roads, and are not as used on the White cars in the States, where road conditions are, of course, widely different from those which obtain in this country. As the result of our trip, and knowing the excellence of the White construction, we unhesitatingly advise those on the look out for a soundly constructed and speedy high class car, refined in its running, comfortable in its accommodation, and offered at a reasonable price, to give the 20-30 h.p. White their most careful consideration.



# The Noble Petrol-paraffin Carburetter.

Petrol for Starting. Paraffin the Normal Fuel.

THE accompanying part sectional illustrations show a petrol-paraffin carburetter which has been designed and made by Mr. W. Noble, of Noble's Garage, Warwick. As will be seen, the carburetter has two distinct float chambers, and from each of these leads a jet, these jets being shown at B in the drawings. The tip of each jet passes into a choke tube C, which at the bottom has means of adjustment whereby the amount of air passing the jet can be regulated. Both the choke tubes run into the chamber D, which is provided with a rotating sleeve valve so that either the petrol supply or the paraffin supply can be cut off, or both can be used together.



Figs. 1 and 2.—Part sections of the float chamber portion of the Noble petrol and paraffin carburetter.

- A, float chambers
- B, jets
- C, choke tubes
- D, two-way valve chamber
- E, rich mixture vaporising tube

From this point the rich mixture is led into the vaporising tube E, which passes into and along inside the exhaust tube branch, finding exit through a packing gland at the front end of the engine, whence it is led to a mixing chamber, which is shown in fig. 3.

The gas from the vaporising tube E passes through a slot F in the wall of the mixing chamber and a corresponding slot G in the sleeve H, which is provided for adjusting the proportion of gas and air to give a correct mixture. Additional air enters the mixing chamber by way of the pipe J from an open ended warming jacket round the exhaust pipe. The slots K and L correspond more or less according to the position of the sleeve H, which has a rotary movement, so that these slots also work in conjunc-

tion with the slots F and G. The slots on both sides of the sleeve H are uncovered internally by a piston M, which rises or falls according to the negative pressure in the mixing chamber, this negative pressure being, of course, governed by the position of the throttle and the speed of the engine.

In the piston M are provided holes communicating with the slots in the walls of the chamber, these holes allowing the air and gas to pass through to the engine. Below the piston is a dash pot space N provided with the adjusting screw P. A hot water jacket R is also embodied in the mixing chamber casting.

An adjustment of the mixture for slow running is effected by moving the sleeve H vertically; when the correct adjustment has been found it can be fixed by means of the wing nut shown. A butterfly throttle Q is provided above the piston.

By means of this design the engine can be started on petrol, and as soon as the exhaust pipe is hot the two-way valve in D can be thrown over so that the paraffin is brought into use. In either case a rich mixture is provided, and the fuel is vaporised in its passage along the vaporising pipe E, which, as stated, passes through the exhaust pipe. Petrol and paraffin are, of course, controlled as to level in the float chambers by means of floats and needle valves of the ordinary type.

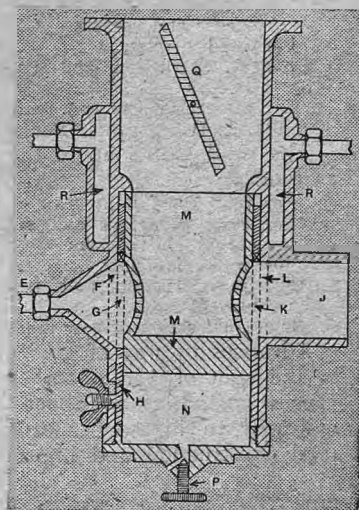


Fig. 3.—Section of the mixing chamber of the Noble petrol and paraffin carburetter.

- E, rich mixture vaporising tube
- F, rich mixture slot in wall of mixture chamber
- G, mixture slot in sleeve H
- H, mixture regulating sleeve with vertical and rotary movements
- J, main air inlet
- K, air slot in sleeve H
- L, air slot in wall of mixing chamber
- M, suction actuated piston
- N, dash pot
- P, dash pot regulating screw
- Q, butterfly throttle
- R, hot water jacket

## The Rotary Valve Itala.

The rotary valve Itala is earning a fine reputation for itself in Austria, where, as our readers know, the conditions are very severe owing to the Alpine passes. Among the most prominent owners of the 35 h.p. rotary valve Itala is H.I.H. the Archduke Joseph Ferdinand, who, we understand, has covered over 16,000 kilometres in the first twelve months of ownership, this including the ascent of almost all the most difficult mountain passes in that land of passes. We have other testimony from scarcely less distinguished sources to the same effect, and we mention the matter with particular interest because when we first tried the

35 h.p. nearly eighteen months ago we were so much struck with the power it developed. The silence, of course, is a natural quality, and is taken as read, as, obviously, a rotary valve is bound to be noiseless; but, unlike some noiseless valve gears, the power of the engine is not sacrificed to quietude. Before the Itala rotary valve was put on the market at all its makers had given it a most searching test both on mountain and plain, but, now that numbers have been in the hands of private owners for over twelve months, even those who did not regard the durability of the system as sufficiently proved can no longer refuse to accept it.

## Road Board Grants to Highway Authorities.

Previous Lists appear in "The Autocar" of Feb. 11th, May 6th, Aug. 5th, Oct. 7th, 1911; Jan. 6th, April 13th, July 13th, Oct. 12th, 1912, and Jan. 11th, 1913.

**D**URING the months of January, February, and March, 1913, the Road Board, with the approval of the Treasury, have made advances amounting to £237,199 from the Road Improvement Fund to county councils and other highway authorities as follows:

### AGGREGATE AMOUNT OF GRANTS FOR DIFFERENT PURPOSES FIRST THREE MONTHS OF 1913.

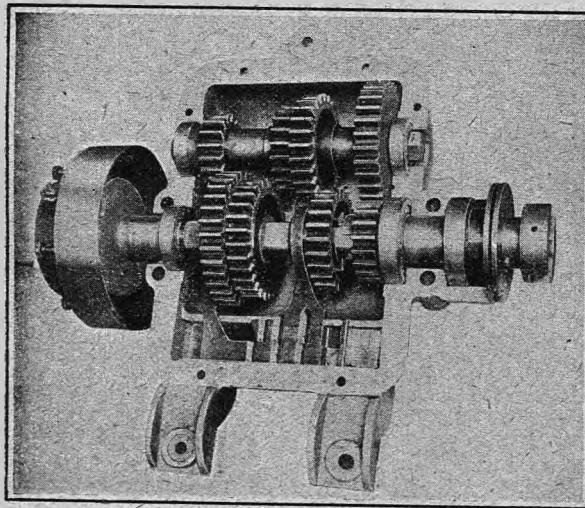
For road crust improvements ...	£178,098
For road widenings and improvement of curves and corners ...	9,106
For road diversions ...	£00
For reconstruction and improvement of bridges ...	4,995
For construction of new roads and bridges ...	44,000

### WHOLE PERIOD SINCE FORMATION OF ROAD BOARD.

The total grants up to the 31st March, 1913, are as follows:

For road crust improvements ...	£913,400
For road widenings and improvement of curves and corners ...	88,008
For road diversions ...	24,299
For reconstruction and improvement of bridges ...	44,477
For construction of new roads and bridges ...	60,578

Advances by way of loan have also been arranged to the sum of £140,060. In addition, further advances amounting to about £1,579,438 have been indicated to highway authorities towards works of road construction and improvement.



The above illustration shows the interior of the gear box of the Vauxhall car which completed the R.A.C. 2,000 miles trials in 1908 without the loss of a single mark for mechanical shortcomings. The car has now run over 61,000 miles, and yet during a recent overhaul it was found necessary to renew only two ball races. Although the reproduction is not sufficiently clear, the original photograph, with the aid of a magnifying glass, shows the gear wheels to be in perfect condition with the exception perhaps of the tooth edges, which show slight signs of wear.

Much to the regret of the members, Mr. Granville M. Kenyon, after ten years' service, has resigned the post of honorary secretary of the Kent Automobile Club, and the committee express their hearty appreciation of the great services he has rendered to the club. Mr. Kenyon's successor is Mr. P. H. Ashton, 41, Cambridge Road, Bromley, Kent.

### Advances from the Road Improvement Fund. TENTH LIST.

County.	Improvement of Road Crusts.	Widenings, Corners, and Diversions.	New Roads and Bridges and Reconstruction of Bridges.	TOTAL.
<b>ENGLAND.</b>				
Perkshire	909	—	—	909
Cheshire	15,168	—	—	15,168
Lancet	107	—	—	107
Essex	—	452	470	922
Hastings Co. Borough	—	1,382	—	1,382
Leeds Co. Borough	9,311	—	—	9,311
London (Area of the Metrop. Police Dist.)*	21,600	—	30,000	51,600
Monmouth	4,600	400	—	5,000
Norfolk	15,343	—	—	15,343
Nottingham	—	—	13,500	13,500
Oxford	7,512	—	—	7,512
Plymouth Co. Borough	—	2,000	—	2,000
Salop	418	—	—	418
Southampton	9,753	52	—	9,805
Suffolk, East	4,500	—	—	4,500
Suffolk, West	5,000	—	—	5,000
Sussex, East	8,877	—	—	8,877
Sussex, West	—	300	—	300
Warwickshire	—	500	—	500
Westmorland	200	—	—	200
Wiltshire	34,700	—	—	34,700
Yorks, N. Riding	7,589	861	—	8,450
<b>WALES.</b>				
Anglesey	—	86	—	86
Breconshire	—	335	—	335
Denbigh	—	26	—	26
Glamorgan	—	467	1,000	1,467
Merioneth	1,000	—	—	1,000
Pembroke	—	2,084	—	2,084
<b>SCOTLAND.</b>				
Aberdeen	2,291	—	—	2,291
Banff	2,306	—	—	2,306
Perth	—	189	3,111	3,300
Dumfriesshire	2,191	—	—	2,191
Highland	961	89	—	1,050
Inverness	2,996	—	1,321	4,320
Lothian	8,006	383	—	8,389
Midlothian	5,000	—	—	5,000
North Ayrshire	22	—	—	22
Perth	761	—	—	761
Perth	567	—	—	567
Argyll	1,100	—	—	1,100
Highland	1,168	—	—	1,168
<b>IRELAND.</b>				
Cavan	735	—	—	735
Down	263	—	9	272
Kildare	124	—	—	124
Kilkenny	1,170	—	—	1,170
Wexford	1,800	—	—	1,800

\* This amount of £51,600 is part of a total sum of £280,000 now in course of distribution in Greater London, and is made up as follows: Battersea, £7,500; Basing, £1,100; Hampstead, £1,000; Holborn, £1,000; Hornsey, £1,000; Poplar, £10,000; Croydon, £30,000.

Replying to Mr. Eugene Wason, Mr. Masterman (Secretary to the Treasury) stated in the House of Commons, on Thursday last week, that the aggregate amount of the advances by way of grant and loan indicated by the Road Board to highway authorities in Scotland up to 31st March, 1913, was £222,269. Grants amounting to £148,696 have been formally made, and grants amounting to £51,750 have been indicated, of which the details either have to be supplied or are under consideration and discussion. Loans amounting in the aggregate to £21,823 have been indicated, of which loans amounting to £8,473 have been formally accepted.

The following appeared in the *Daily Mail* of Tuesday last: "There is a strong feeling in the City that Mr. Lloyd George in his Budget may seek a fresh source of revenue in the taxation of paraffin. Importers freely enquired at Lloyd's yesterday (Monday) for insurance against this, the rate quoted being twenty-five guineas per cent."

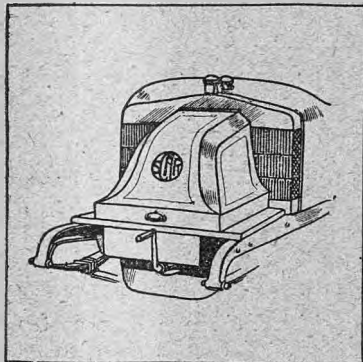


## The Overland Electric Starter and Lighter.

The Flywheel of the Engine Displaced by the Armature of the Dynamotor.

**R**ECENTLY we witnessed a demonstration of an electric starting and lighting system fitted to an Overland car, and to be fitted to all future Overland cars by the Anglo-American Motor Car Co., Ltd., Heddon-Street, Regent Street, London, W., the British agents for these cars.

The apparatus is certainly a distinct departure from the starting and lighting equipments which have



**RADIATORS AND BONNETS.** Sketch showing the radiator and bonnet of the latest S.C.A.R. car. This varies somewhat from the design shown in our Appearance Number, the principal alteration being the form of the name plate.

hitherto been put before the public, inasmuch as it utilises the integral parts of a car as originally built, in lieu of mounting the dynamo in one of various places with specially arranged drive. In this case the flywheel of the engine is converted into an essential part of a motor generator, so that it functions for starting the engine and for producing current when once the

engine is running. The flywheel is replaced by the generator armature which rotates in the same manner and performs the duty of the flywheel.

The field coils and brushes are stationary and mounted on the crank chamber casing, and the armature-flywheel, which is bolted to the crankshaft flange, revolves round them. No gears being interposed between the self-starter and the engine, the latter is

rotated by the self-starter at its own speed. An automatic regulator is mounted on the dashboard, which controls the charging rate of the storage battery, and automatically connects generator and storage battery during charging, and disconnects them when the speed of the armature becomes so low as to be insufficient to generate current. In breaking the circuit in this way the regulator prevents the accumulators from discharging current to the dynamo, except when required for engine starting. A tell-tale is fixed upon the dashboard which shows the driver when the accumulators are being charged. The charging can take place at speeds varying from eleven to fourteen miles per hour on different cars, but at a lower car speed than ten miles per hour the automatic regulator cuts out. The automatic regulator is so designed that when the accumulators are fully charged it only permits sufficient current to pass to compensate for the consumption. The accumulators are used for supplying the current for engine starting and for the lamps.

We are informed that the dynamotor will rotate the engine at from 150 to 400 r.p.m. for more than half an hour before the accumulators are exhausted. It is also said that the apparatus will propel the car to which it is fitted on its first or second speed without releasing the compression. We have seen this apparatus function several times most satisfactorily, although it should be said that the engine had already been running and was warm at the time.

The annual report of the Comptroller-General of Patents shows that the motor car and allied industries were responsible for the most prominent group of inventions last year, particularly if applications dealing with internal combustion engines and with wheels for vehicles be included in the category. Over twelve hundred inventions relating to internal combustion engines were received during the year.

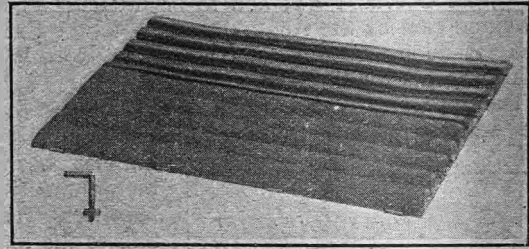


**THE CLOSING MEET OF THE SEASON.** The meet of the North Shropshire hounds near the village of Rushton for their last hunt in the neighbourhood of the Wrekin, which is seen in the background.

## A New Step Mat.

THE accompanying illustration shows a new step mat now being sold by Messrs. G. T. Riches and Co., 19, Store Street, Tottenham Court Road, London, W.C. It is termed the Orno scraper mat, and is formed of ten lengths of a rubber and fabric composition. As indicated in the illustration, the section of the composition is almost that of a square cut diagonally, the result being that as five lengths on each side have their vertical faces toward the centre the scraper properties of the mat are equal whichever way the boot be drawn across. Not only is mud easily removed, but the rubber has a squeegee effect in removing moisture also from the boot. The dirt passes down between the lengths of material which are spaced on pliable metal strips. The mat is intended to be secured to the running board by four right angle headed bolts, one of which holds the mat at each corner. To remove the mat from the running board it is only necessary to lift it up at the centre

line and then pull it away from the fixing screws. The dirt can then be washed or brushed off the step underneath. Owing to its construction there is no



*The Orno scraper mat.*

need to remove the mat before the car is washed—as is advisable with fibre mats—but the water improves its appearance by removing the dirt remaining on it.

## Central Tramway Standards.

The Automobile Association and Motor Union has recently had under consideration certain Bills which are being introduced in the present session of Parliament in respect of the construction of tramways in London, Derby, West Bromwich, Southport, Huddersfield, Leeds, Bradford, Folkestone, Sandgate and Hythe, Mexborough and Swindon, and Rhondda. In the Bills in question the promoters seek comprehensive powers in connection with the erection of standards, shelters, waiting rooms, etc., and in view of the danger and inconvenience caused by obstructions of this type, the A.A. and M.U. has been in communication with the Board of Trade urging that the Board

should oppose the provisions of these Bills so far as they relate to the erection of central standards and other permanent obstructions on the carriage way. The A.A. and M.U. has been informed by the Board of Trade that steps are being taken with a view to securing that any power conferred by such Bills for the erection of tramway standards or other apparatus shall not be exercised in carriage ways except with the consent of the Board.

The Baron van Zuylen has again been elected President of the French Automobile Club for the eighteenth consecutive year.



*An Enfield van supplied to the North Staffs. Colliery Owners' Association. It has been specially fitted for service at the mining rescue station at Stoke-on-Trent, being arranged for carrying the rescue party and their apparatus.*



# The Autocar Imperial Year Book.\*

Indispensable to Overseas Motorists and of Considerable Interest to those at Home.

THE rapid growth in the numbers of motorists overseas, and the belief in the great part that automobilism will play and is playing in the development of our possessions, have prompted the publication of a year book under the above title that will appeal to all motorists abroad, especially those in the British Dominions and Colonies. The fact that *The Autocar* is so well-known and influential abroad fits it to undertake the publication of a work of this description, and the result is the production of a standard reference book on automobile subjects for the use of colonial motorists, British motorists resident abroad, and the many prospective car users in countries overseas who desire a means of making a reliable comparison of various makes before acquiring a car or, any of its appurtenances. In the majority of cases, as matters stand at present, the advantage of making a personal trial of or procuring full information concerning a car or accessory within a short period is denied to them on account of distance. There is a vast amount of information in the publication under review, besides articles which make the book nearly equally attractive to the motorist at home.

The book opens with a well considered review of current practice in chassis design, and this is followed by an article dealing with coachwork in a similar manner. Both these articles should prove of real service to automobilists in far distant parts who have few opportunities of keeping in touch with modern practice. "The Autocars of 1913," or "The Buyers' Guide," is so well-known that it need only be mentioned that it is reprinted as given in *The Autocar* just previous to the last Olympia Show, with minor alterations and additions to bring it up-to-date. The Buyers' Guide is followed by a table of freight charges and import duties on cars shipped abroad, so that a prospective purchaser of a car can easily obtain an accurate idea of the total cost of buying a car in Great Britain and importing it into any country.

Brooklands and the racing thereon affords such a great deal of interest to almost all motorists that a work of the description of "The Autocar Imperial Year Book" would not be complete without some particulars of the track itself, and the records which have been made there. There is, therefore, an illustrated description of the track, together with a list of Brooklands rating and cubic capacity class records as standing at the beginning of the year. Following on the Brooklands records is a list of world's records as standing at the beginning of 1913, and the results of the principal hill-climbs and races held during 1912. In view of the interest aroused by the announcement of the Tourist Trophy Race, to be held by the Royal A.C. next September, a short review with results of similar events in the Isle of Man is included in this section. From the foregoing it will be gathered that the book will prove an extremely valuable work of reference, especially to those abroad who find it difficult to keep in touch with home doings.

Quite a feature of "The Autocar Imperial Year Book" is the series of articles describing electric car-lighting systems, self-starters, shock absorbers, "loose" carburetters, and lubricating systems. Each of these is fully illustrated, and the most widely used devices in each section are concisely described.

Considering the increasing number of Colonials who come home with the intention of buying a car, touring in England, and probably on the Continent before returning with the car, it was considered that an article setting forth the taxation and customs systems in Great Britain and on the Continent would be appreciated. The why and wherefore of local taxation licences, international travelling passes, etc., are explained, so that a motorist from a distant Dominion using a car for the first time in Great Britain or on the Continent would know from this article exactly what legal enactments he has to comply with.

Another article of interest is that entitled "Cycle Cars and Miniature Cars." This reviews the growth of the small type of car to which special attention is being paid nowadays, and contains illustrations and brief specifications of typical machines. The possibilities and limitations of the miniature car in the Colonies and Dominions have not been very clear, as comparatively few have been exported. This article would give Colonial readers interested in this type of car some idea as to whether it would suit their individual requirements.

There are numerous pages devoted to such subjects as reports of R.A.C. certified trials, clubs (home and colonial), and other subjects, miscellaneous tables, etc., and short articles that will appeal to the man abroad. It only remains to be added that the book is well illustrated and also supplied with a good index.

**Canterbury Automobile Association**

OBSERVER'S REPORT  
On Car entered by Messrs. MERVYN W. STEVENSON & Co. Christchurch

— FOR A —

## 1000 Miles Trial of Reliability

Held 30/1/13 to 4/2/13 inclusive

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**PARTICULARS OF CAR**

Makers—NEW PICK MOTOR COMPANY, Stamford, England.

No. of Car—No. 680.

Weight (including driver and observer)—4 ton 3 cwt.

No. of Cylinders—Four.

Bore and Stroke—4 1/2 x 4 1/2 in.

Tyres—Continental 1 1/2 in. dia x 1 1/2 in. dia.

Type of Body—Three-seater with hood and screen.

Weather—Fine throughout trial.

**UNAUTHORISED STOPS**

The only unauthorised stop occurred on the fifth day of the 1000 mile trial, caused by a high-tension wire slack lag loose from the magneto. Duration of stop four minutes.

**ROUTES**

1st Day—Christchurch to Rainier Springs and return.

2nd — Christchurch to Temuka and return.

3rd — Christchurch to Hurvick and District Springs and return. Rangiora, Woodend, Waipara, Syde and return to Christchurch.

4th — Christchurch to Ashley Gorge Out Stagers, Rolleston, Waipara, Christchurch.

5th — Christchurch to Akaroa, Christchurch, Southbridge, Christchurch.

6th — Christchurch to Springfield, Lower River, Sumner, Leithfield, Christchurch.

**ENGINE AND TRANSMISSION**

Ran consistently well throughout. The engine coolant was only refilled once during the whole trial, to attach the new air pressure nozzle. The South air-burner fitted required no tinkering whatever; the engine starting in every instance on the first pull of the starting handle.

**MILEAGE**

1st Day	378 Miles
2nd	310
3rd	378
4th	327
5th	364
6th	350
<b>Total</b>	<b>1907</b>

**HILL CLIMBING**

The time taken from Christchurch to Akaroa Post Office was 2 hrs 38 mins, and from Little River to the Hill Top 25 mins. From foot of Barry's Bay Hill to the actual top 1 1/2 mins, but no attempt was made to drive at actual 1000 a touring speed.

**TYRES**

The 5.25 Continental Tyres fitted required no attention whatever during the entire journey.

**PETROL**

The average petrol consumption was 20 1/2 miles per gallon.

**OIL**

The whole distance was covered with a consumption of 5 pints 13 oz of Monogram oil, fed to the engine through an adjustable drip feed sight gauge.

**SPEED**

The average speed throughout was 20 miles per hour.

F. N. SINCLAIR, Observer.  
MAURICE G. LOUISSON, President Canterbury Automobile Association

Christchurch, 5th February, 1913.

OFFICIAL TRIALS IN NEW ZEALAND The first certificate issued by the Canterbury Automobile Association in connection with official trials, which it is prepared to carry out on the lines of those of the Royal Automobile Club to which the Association is affiliated. It will be seen that the certificate relates to a 1,000 miles trial of an English car, a 20 h.p. New Pick, the only involuntary stop being due to a detached high tension wire.

\* Published by Hiffe & Sons Ltd., 20, Tudor Street, London, E.C. Price 2/6. post free 2/11

## The 30 h.p. Six-cylinder Napier.

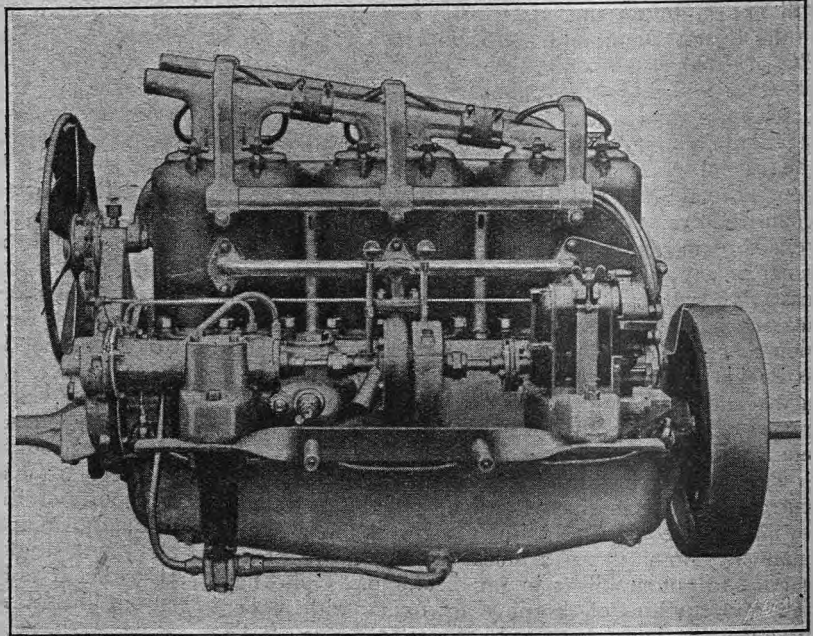
**Dual Water Delivery Pipes. A New Plate Clutch. Under Worm Drive.**

**T**HIS well-known and much-appreciated chassis, which has done so much in the past towards upholding the reputation of Napier cars, exhibits several new and interesting features in its 1913 form. The engine is composed of three pairs of the 15 h.p. cylinders, the bore and stroke being 82 mm. x 127 mm. respectively. The cylinders are cleanly cast with ample water jackets, and big heads of water maintained over the combustion chambers. All the valves are on the off side, the valve stems and tappets being enclosed by three very easily removable covers. The exhaust trunk, which is upswept and has separate rear swept leads, is secured with the induction branch to the cylinders by six bolts and cross heads.

It will be noticed that the exhaust pipe connects with the exhaust trunk in the front of the engine, and is turned down through the under apron, being carried along outside to the silencer, so that the cold air passing under the car impinges upon it and assists in the cooling and silencing of the exhaust gases. The portion of the pipe which is down-turned within the bonnet is also subject to the back draught from the radiator fan.

The carburetter is the two-jet Napier with graduated rotary throttle controlled by a lever on the steering wheel and by a pedal placed properly and conveniently outside the brake pedal. Both jets are in operation with a fully open throttle, while an extra air inlet is controllable from the dashboard. The float chamber

is easily dismantled, and both jets can be withdrawn from beneath the carburetter. The mixing chambers are exhaust jacketed and provided with a silencer to prevent hissing. The jets are countersunk on their



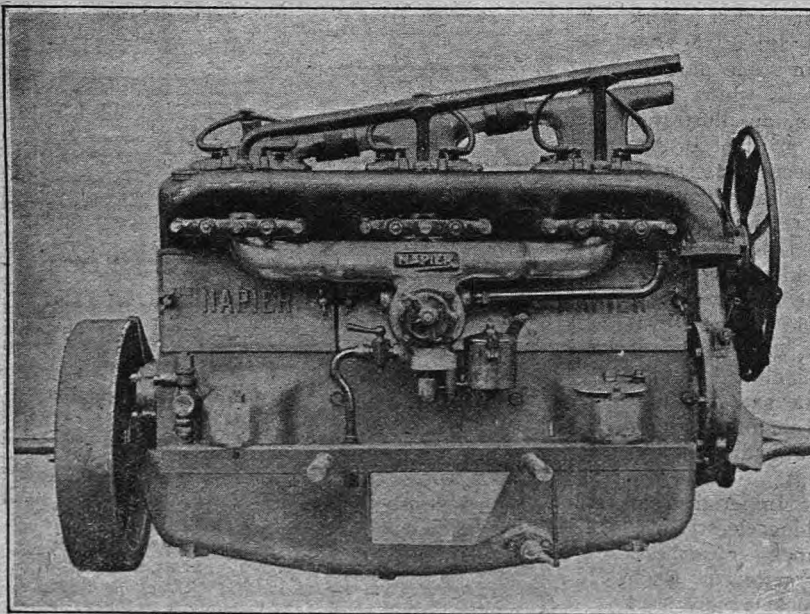
*Near-side view of the 30 h.p. Napier engine showing the water pump and magneto drive and the oil pump below the crank chamber.*

tops to afford a starting modicum of petrol.

The throttle chamber and carburetter are part and parcel of the induction branch, and can be detached with it. The oil pump drive, water circulating pump, and magneto are all lineable on the left-hand side of the engine, and are driven from the distribution gear.

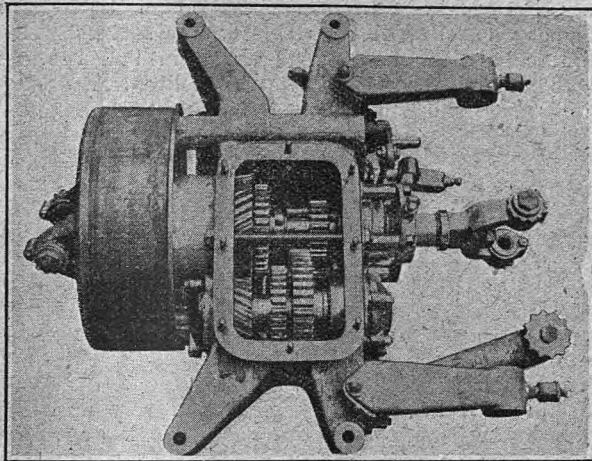
The magneto is set on a bed plate formed to receive it on the crank chamber bracket. The water pump feeds water to the near side of the water jackets, and delivers it by twin delivery pipes from over the centres of the combustion chambers and the valve chambers respectively. This is a special feature of Napier engines, and is adopted in the case of both forced and thermo-syphon systems. With the latter in connection with three 15 h.p. Napier cars we have found it most satisfactory and efficient. Even in ascending the very severe and trying lacets of the Col des Aravis with our last 15 h.p., four up and baggage, no sign of overheating was noted.

The cast iron pistons are of excellent length, and have three piston rings above the gudgeon pins. The crankshaft rotates in four long white metal bearings, carried entirely by the upper part of the crank chamber, the lower part being merely an oil sump.



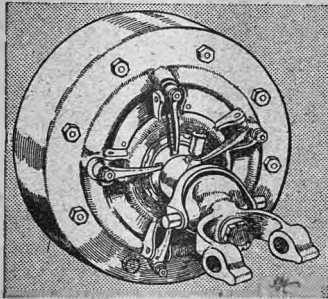
*Off-side view of the 30 h.p. Napier engine showing the carburetter and the upward and forward swept exhaust branch. Above the cylinders can also be seen the two water uptake pipes, the small one carrying the water from the valve jackets.*





The gear box of the 30 h.p. Napier. It will be noticed that the constant mesh wheels have helically cut teeth.

As may be presumed, the engine lubrication has had the most careful consideration. As already indicated, the pump is on the left of the crank chamber and quite separate

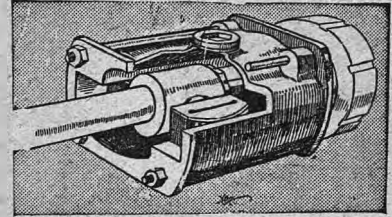


The enclosed single plate clutch of the 30 h.p. Napier. Four springs are fitted, and these are acted upon by the four fingers seen in the sketch.

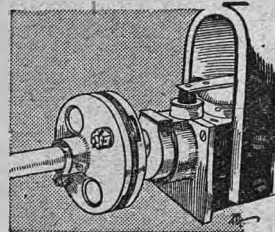
and skew gear driven off the water pump and magneto shaft. The oil is retained in the sump formed in the undercover of the crank chamber, and is drawn thence by the pump through a filter in a rising chamber, and then delivered through outside leads to each crankshaft bearing, and through suitable ducts drilled on the crank arms to the big ends. The remainder of the lubrication is by spray, suitable catch-pits being formed over the camshaft bearings. Oil is splayed on to the meshing of all the distribution gear wheels through jets suitably placed for the purpose. The magneto spindle is driven from the water

*The 30 h.p. Six-cylinder Napier.*  
pump spindle through a flexible leather disc coupling.

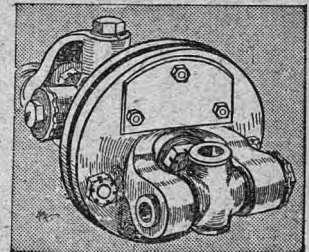
A new departure in Napier practice is found in the adoption of a simple form of floating plate clutch, the plate being faced with Ferodo, or a similar material. The clutch runs unlubricated. The driving and driven discs are held together by the springs contained in thimbles, the clutch being released by four rocking fingers operated by a sliding cone. The clutch sleeve is connected to the gearshaft by a double universal joint connected by a double flange with a leather insertion. The three-speed gear box is slung by brackets directly from the longitudinals. The shafts are of large diameter, and very short, the primary shaft being castellated. The intermediate or constant mesh wheels have helically cut teeth to ensure silence. Both shafts are carried in double ball bear-



The flexible and sliding joint at the rear end of the propeller-shaft.



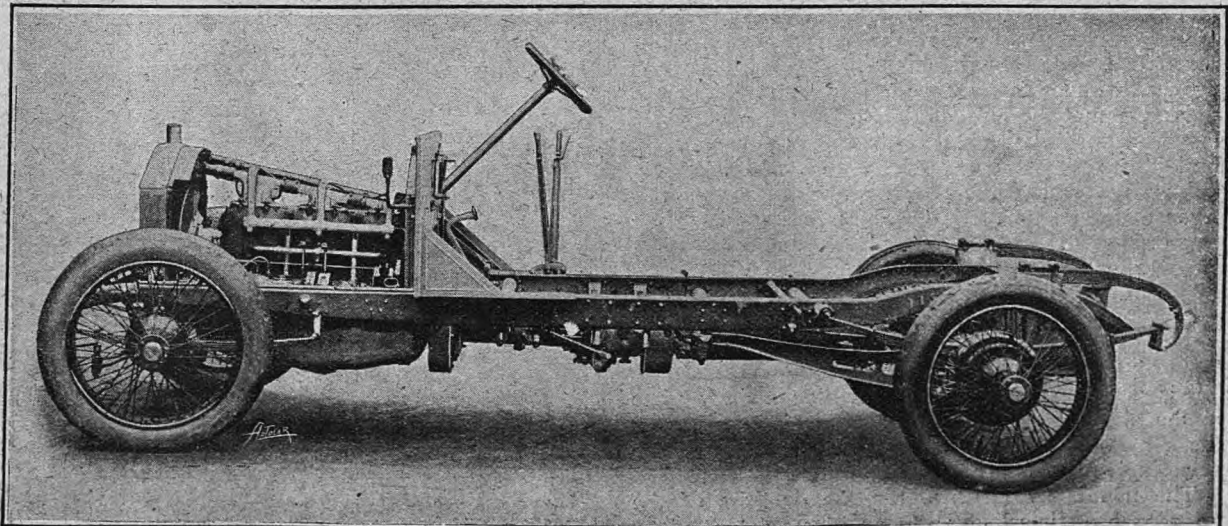
Sketch showing the leather coupling of the magneto drive at the end of the water pump-shaft.



The double universal joint and leather coupling between the engine and gear box.

ings, having outside stuffing boxes with adjustable glands.

A wide rimmed brake drum of large diameter is mounted on the rear end of the intermediate gear-shaft and carries the forward portion of the universal joint to the propeller-shaft, the brake cam-rod being carried in a casing cast with the gear box. The universal joint is made with adjustable greasers, by



The 30 h.p. Napier chassis.

*The 30 h.p. Six-cylinder Napier.*

which the lubricant is forced to all the frictional surfaces. The unenclosed propeller-shaft runs back to a sliding block joint, which is encased and provided with a lubrication cup. The propeller-shaft joint connects with an underhung worm, the wormshaft being carried in double ball and thrust bearings. The worm

wheel centrally surrounds the parallel type (four planet wheels) of differential gear, the sockets of the differential gear box being carried in ball bearings with suitable thrusts. The tubular live axle casings are flanged and bolted to the casing of the differential gear.

**The Running of the 30 h.p. Napier.**

Time and again we have enjoyed the handling of various new types of Napier cars, from the sweeping 60 h.p. of 1906 to the latest 30 h.p. six-cylinder and the 15 h.p. four-cylinder. Each and everyone in its season has had its good points, and each succeeding type has shown advances due to consideration and experience over those that have gone before. Messrs. D. Napier and Son, Ltd., or, as we should now write, Napier Motors, Ltd., have served a long apprenticeship to motor car building, with the result that to-day they put out a car which has no superior for all-round excellence. After most satisfactory ownership of four, a 26 h.p. and a 15 h.p., in 1909, a 15 h.p. in 1910, and another 15 h.p. in 1912, we are fain to say that no car more than a Napier becomes increasingly appreciated by an owner-driver till he is loth to part with it. There is an individuality, a docility, and a real kindly willingness which reveals itself to the owners of these cars, and which must be experienced to be completely understood.

One of the latest Napier productions to come under our hands was the new 30 h.p. six-cylinder 1913 type, fitted with the new Napier single-plate clutch, which, tested to the utmost sufferance of a clutch, seems to show itself superior even to the multi-disc Napier clutches, which have been hitherto one of the best features of the Napier chassis.

Time was when we played "cup and ball with a sixty," but that is an old story. Perhaps we might retell the tale for the benefit of those who knew not Joseph. In the course of a test run, accompanied by Expert Macdonald, who has Napier mechanism in the blood, we were dropping declutched down a fairly stiff hill. The car was running at 18 m.p.h. by the speedometer, when Macdonald, without any preliminary, said, "Put in your reverse." We stared aghast, but he repeated, in tones that admitted of no denial, "Put in your reverse." Always ready to obey orders, though we broke owners, we did as requested, and then said Macdonald imperiously, "Drop in your clutch." With a feeling of despair we did as suggested. But the entirely unexpected, which does not always happen, happened. The big car, without jerk, without complaint, without a suggestion that the most brutal thing that could have happened to it had occurred, gradually slowed up until it became stationary on the hill, and then just as sweetly, and without a murmur of complaint, began to reverse up the hill. No such severe test had ever been asked of a clutch before, and what there was particularly special about this one, which permitted this wicked act without remonstrance, we never knew. But assuredly a firm who so long ago could make a clutch capable of sustaining such treatment should know something about clutches to-day, and that this is so (although we did not submit the single plate to the above Draconian treatment) is quite clear by the silky but certain and progressive take up of the new single-plate clutch.

The trip lately made to test the qualities of the 1913 30 h.p. six-cylinder was an itinerary formed by a course-running from the West End by by-roads to

Ewell, then *viâ* the Leatherhead and Guildford Road to West Clandon and the summit of Newlands Corner (the northern slope of which the car just swept behind it); then to Albury and over the hills by a by-road and Blackheath to join the upper Horsham-Guildford Road, the Worthing Road being taken to Worthing. The climb up Washington was a mere circumstance to this car, for, notwithstanding the very necessary slow at the bend, the slope was taken on top at a very smart pace and quite smoothly. The next climb of any moment was the Castle Hill, Arundel, which was carried in a most satisfactory manner on the second with half throttle. The descent of Bury Hill gave us an opportunity of testing both brakes, and these, though applied violently and at good speed, showed all the smooth, gradual, but nevertheless powerful, traits for which Napier brakes have long been famous. Once clear of Pulborough, speed was essayed on the long, lonely stretches of the Stane Street, and the evidence of the speedometer showed that this car has all the pace for which any sane man can wish. Only on the *ligues droites* of France could its speed be really enjoyed. Threading the late afternoon traffic of the West End afforded us many examples of this car's wonderful handiness in a press, the celerity with which speed can be gathered and reduced, the ease of handling by reason of the lightness of the steering, and the amplitude of the lock. The man who desires a more comfortable, sweet running, or satisfactory car than the 30 h.p. six-cylinder Napier would be hard to please, could he be pleased at all.



**LIGHTNESS IN BODY CONSTRUCTION.** A demonstration of the light weight of the basket-work body mounted by the Beacon Engineering Co., Hindhead, Surrey, on their Beacon runabout.



# The Roads Improvement Association.

## Annual Report.

**T**HE following excerpts from the annual report of the Roads Improvement Association, to be presented to the annual meeting on the 17th inst., at 15, Dartmouth Street, Westminster, S.W., will be read with interest:

The increased support accorded the Association during the past year has enabled it correspondingly to increase its activities. The branches have been extended, and have initiated and successfully carried through a number of local improvements.

The suggestions for what might be called "national" schemes for road improvement are making good progress, and one entailing an expenditure of £55,000 has been adopted.

[The scheme referred to is the relief road from Thornton Heath to Purley, on the Brighton Road, towards defraying the total cost of which the Road Board will contribute £20,000 and the Ecclesiastical Commissioners and other interests concerned £5,500, leaving approximately £20,000 to be provided by the Corporation of Croydon.]

Success has attended the Association's Parliamentary work, and the propaganda for conciliating the interests of various forms of road traffic and joining together all classes of road users in the common cause of obtaining improved roads and additional facilities for traffic thereon has made considerable headway. New and extended offices have been taken to cope with the Association's increased work.

The income for the past year shows an increase—approximately 46%—over that for 1911. The greater increase has taken place in the grants made to the Association from its constituent and supporting bodies; there is still an urgent need for much wider support to be accorded the Association by individual road users.

### The Dust Problem.

The increased attention now being paid to the condition of road surfaces and the prevalent damp weather doubtless account for the reduction in the number of complaints of the dust nuisance during the year. An outcry has arisen, however, concerning the alleged slipperiness of the tar-treated roads in wet weather; the Association is unable, from the facts at present before it, to formulate a general reply which would give useful information and prevent recurrence of the difficulties, as it is evident that the causes are many, and each case requires to be dealt with individually and separately. Investigation, however, has shown that much of the slipperiness complained of was due to faults in the tarring process, and particularly to the tar or tar preparations, being applied when the road was not in a fit condition; consequently, the material never became properly incorporated with the surface metal. In the North of England it was found that the abuse of the use of calkins on horses' shoes had aggravated the trouble by piercing the surface of the tar and allowing water to get underneath it. It is pleasing to report, however, that an increasing number of authorities are using a bituminous or pitch material for binding purposes in the repair and reconstruction of road surfaces.

The unsatisfactory repair of pot-holes aggravates the dust and mud nuisance; some of the best road surfaces are spoilt by lack of attention to this important detail. All pot-holes should be repaired carefully with a tarrad material specially hammered in. The practice of filling in with loose stones and binding with road scrapings and water is worse than useless; after the first horse or vehicle has passed the material is scattered, and merely adds to the loose material on the surface, whilst admitting more water to the crust and foundations.

### Damage to Road Surfaces by Horses' Shoes.

It is evident that the modern hard road surface suitable in every way for mechanical traction is not so suitable for horses shod as they are at present, and steps that can usefully be taken to adjust this difficulty have been occupying the attention of the Association for some time. The calkins fitted in horses' shoes in various parts of the country, it is stated, cause serious damage to waterproof road surfaces. The Association held a conference with representatives of leading horse-owning interests and discussed with them a suggestion that a new type of horseshoe should be evolved that would afford the horse the necessary foothold upon the modern waterproof road surfaces and at the same time minimise the puncturing action of the calkin. The Association proposes to offer a prize or premium for a new type of horseshoe that will meet modern road conditions satisfactorily, and a detailed scheme is being prepared in consultation with horse owners.

### The Great West Road Scheme.

The Association has continued its campaign for the provision of a new western exit from London. The Road Board's scheme issued in 1911 embraced two county areas—London and Middlesex. The London County Council have intimated that they are not disposed to develop their section of the scheme, viz., from Kensington to Kew Bridge. As the crux of the present congestion is in Middlesex—Brentford High Street—the Association has confined its immediate attention to this county, and has been in negotiation with the County Council and the other authorities concerned. The Road Board, largely as the outcome of the Association's activities, is now willing to contribute more than the 50% of the cost which it originally offered.

### London to Brighton Main Road.

The adoption by the Croydon Corporation of the scheme for the reconstruction of a relief road from Thornton Heath to Purley to enable through traffic between London and the South to avoid High Street, Croydon, is a great triumph for the R.I.A. This scheme had been fostered by the Association for some time, and although the necessity and soundness are fully recognised, much difficulty has been encountered in successfully negotiating the scheme through owing to the opposition of local interests, which adopted a very parochial and unreasonable attitude.

### Regulation of Traffic in Cities and Towns.

The campaign for the more efficient organisation of all traffic—especially of slow-travelling vehicles in our city and urban areas—to enable the traffic capacity of the carriage-way to be utilised to the fullest extent has been continued. The frequent habit of drivers of slow-travelling vehicles to echelon all over the roadway causes much obstruction. In 1911 the Association had a special conference with the Commissioner of Police for the Metropolis upon this subject, and experiments have been in progress on the road between Hyde Park Corner and Hammersmith to demonstrate the effect of requiring all vehicles to keep as near as possible to the kerb. The London County Council have recently intimated to the Association that the Home Secretary has expressed his willingness to approve a byelaw to be made by the County Council under the provisions of Section 23 of the Municipal Corporations Act, 1882, and Section 16 of the Local Government Act, 1888. In the first instance, the byelaw is to be applied experimentally to thirty-seven important streets in the Metropolis, and the question of adding to these streets will be considered from time to time as experience may show to be desirable. The experience of the Association is that drivers of slow-going vehicles are generally willing to travel as close to the left kerb as possible, and their main reason at present for not doing so is the excessive side-fall on a number of roads and streets; in addition to the increased risk of side-slip in greasy weather, excessive side-fall necessitates the exercise of greater power to pull or propel vehicles than is necessary on the centre of the highway where an almost flat surface is afforded. The reduction of the big camber seen on so many roads has long been advocated by the Association.

### Roman Roads.

The Roman Roads Committee have been enquiring into the whole system of the old Roman roads in this country to decide whether, in view of the facilities now afforded by the Road Improvement Fund, means can be found to bring any roads not now used into service again. The stability and thoroughness of the old Roman roads are well known, but during the railway era a number became obsolete. It has frequently been suggested that now traffic is rapidly returning to the roads many of the old Roman highways might be made up and utilised for cross-country travel. Investigation has proved, however, that, speaking generally, all the Roman roads that are of any real service to present day traffic are at present in use, and that it would not be a very satisfactory expenditure of public money to revive many of those that are now grass-grown and fallen into disuse. It is, unfortunately, a fact also that many of the old roads have been relieved of their foundations by adjoining landowners, and, consequently, would be very costly to revive.

"COMPLETE HINTS AND TIPS FOR AUTOMOBILISTS." Under this title "Useful Hints and Tips" have been reprinted from *The Autocar* in booklet form. The fifth edition now on sale has been thoroughly revised and brought up to date. The book can be obtained from *The Autocar* Offices, 20, Tudor Street, London, E.C., post paid 2s. 10d.

## Preston to Blackpool.

### New Stretches of Road to Eliminate Many and Dangerous Turnings.

**L**ONG stretches of road under repair between Kirkham and Blackpool." This warning has been given to the motorist now for twelve months past, so that one may be pardoned for wondering whether it is the normal state of things in the district. To see exactly what is being done, therefore, the writer went over the ground a few days ago.

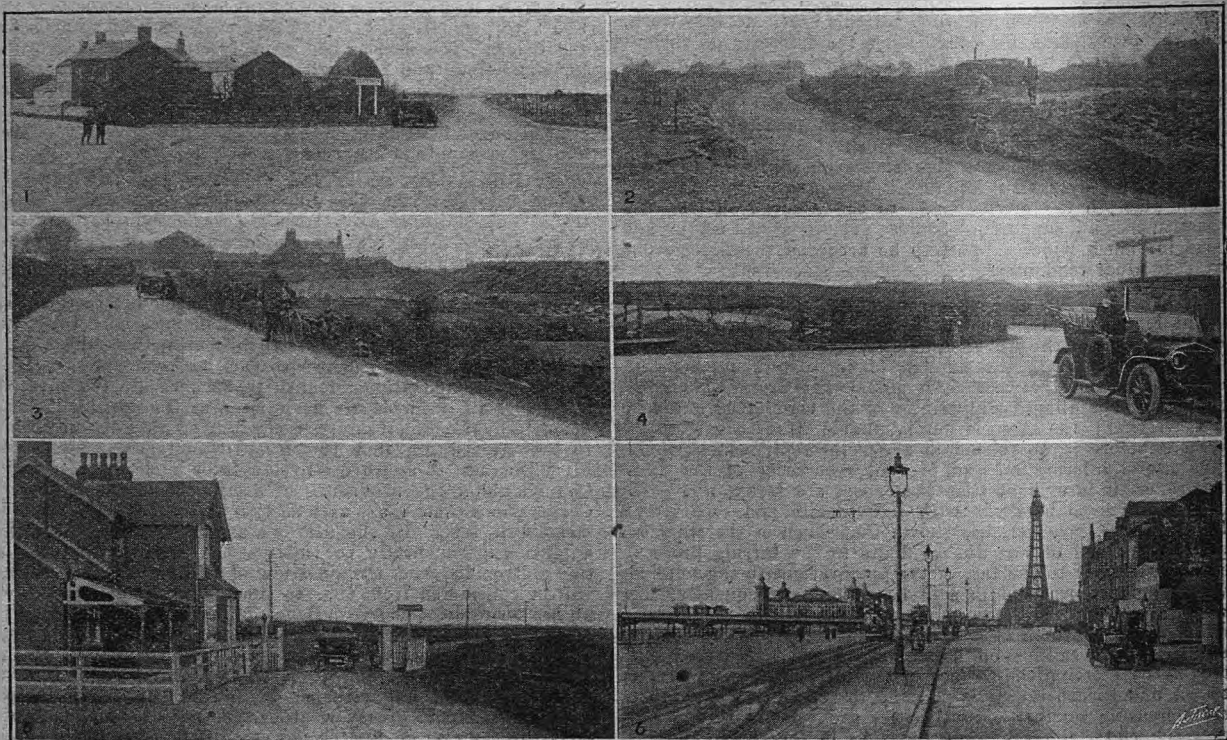
Motorists have complained bitterly, and with ample reason, of the vile stretches of road and the numerous perils between Preston and Blackpool, but the transformation that is now being rapidly brought about is really remarkable.

The extremely dangerous corners and twists encountered on the road between Kirkham and Black-

Other new sections—in the Marton district—are shown in course of construction in photographs Nos. 3 and 4.

Another extensive alteration included in the scheme, but not yet commenced upon, is the well-known and detested "Hell Hole," as it is locally called, near Kirkham. This dangerous dip and twist is to be entirely done away with.

To avoid a portion of this route between Preston and Blackpool, the road over Freckleton Marsh to Lytham for many years has been popular with many motorists. It is one of the few remaining roads with a toll gate (photograph No. 5), and the charge for a motor car is sixpence.



Five views of the roads between Preston and Blackpool, and one of the promenade at Blackpool where part of the road is reserved to tramcars.

pool were the outstanding impressions of former tours in this district, but most of these are even now a thing of the past. A long stretch of the old road at Mythorp will ere long be pasture land for cattle, for an entirely new road has been cut and is now in use.

A little distance further on and the splendid new road shown in No. 1 photograph is entered upon; at the corner shown is a huge board with the one word "Blackpool" in ten inch letters and a hand pointing straight ahead. The original road was around the farm on the extreme left, and thence through devious turnings, until it emerged at the point shown in No. 2 where the A.A. scout is seen standing.

A recommendation made by the Ferries Committee of the Birkenhead Town Council to discontinue the practice of conveying motor cars on the passenger boats of the ferries gave rise to an animated discussion in the Council Chamber last week, and in the end the recommendation was referred back for further consideration. The reason assigned for the proposed

The surface of the road, however, has never been particularly good, and no doubt the majority of motorists will in future prefer the new road now open to them, notwithstanding the fact that to Lytham the distance will be a mile or two farther than by way of Freckleton Marsh.

Photograph No. 6 shows a section of the promenade at Blackpool, a portion of the road being reserved specially for the electric trams. Indeed, so enterprising is the Corporation of the deservedly popular and famous health resort that it would not be at all surprising to learn of a movement on foot to reserve a portion for motor cars!

discontinuance was the number of accidents occurring, and it was proposed that motors should be carried by cargo boats only. The inconvenience of such an arrangement, especially to medical men, who frequently desire to cross the ferry to see patients, was pointed out, and the amendment to refer back the recommendation was carried by 16 votes to 14.



## Motor 'Buses and Road Maintenance.

### Suggested New Departure in Legislative Requirements.

**A**N important departure from previous Parliamentary practice in regard to contributions by owners of motor 'bus services towards the cost of maintenance of the roads over which they run was indicated by a House of Commons Committee during the consideration of the Coventry Corporation Bill. There was, however, no opportunity afforded of putting it into practice, as the Corporation withdrew the particular clauses of their Bill upon which the new departure centred. One of the sections of the Bill in question would, if passed in its original form, have empowered the Corporation to run a service of motor 'buses over four routes which to a small extent are outside the city boundaries. Opposition was offered by the Warwickshire County Council, who asked that the Corporation should pay a contribution towards the extra cost of the upkeep of the county roads which it was alleged would be occasioned by the running of the motor 'buses. Hitherto it has not been the practice of Parliament to impose such a condition, although a large number of provincial municipalities have powers to, and in fact do, run motor omnibuses. Last session a considerable controversy took place in Parliamentary Committee Rooms as to whether such contributions should be made towards the maintenance of roads in respect of trolley omnibus schemes, but in no case was the compulsion put upon the promoters to do this, although in one instance, at any rate, an agreement was come to between the promoters and the county authorities for such a contribution to be made, the particular arrangement, in this case being on a car mileage basis. In the Sheffield Corporation Bill last year, so far as trolley omnibuses were concerned, the county authorities were granted protection to the extent that in the event of their surveyor holding the opinion that the trolley omnibuses caused extraordinary wear upon the roads he was entitled to go to the county court, should the claim be less than £250, in order to recover, or to the High Court when the amount of the claim was more than that sum. Again, in connection with the Light Railway Act which was passed last session, considerable controversy took place on this point, and a clause was inserted in Grand Committee providing that promoters of trolley omnibus schemes should pay contributions towards the upkeep of the roads, but the House, on third reading, deleted the clause.

#### No Precedent for Direct Contributions.

As far as motor omnibuses were concerned, however, no case has arisen in which contributions towards the maintenance of the road were either put upon promoters compulsorily or were agreed to by them. An interesting feature of the position in Coventry is that the Corporation, which has recently taken over the tramway service, has decided, in view of the narrowness of the majority of the streets and the rapidly increasing traffic on the tramway system, that it is the soundest policy to supplement the tramway service by a motor omnibus service over the same roads rather than to undertake expensive street widenings in order to lay a double line of track. As a matter of fact, only four routes were involved which ran beyond the city boundaries in the county of Warwick, but it was this circumstance which gave the Warwickshire County Council an opportunity of appearing before the Committee and asking for a contribution towards the maintenance of the roads. It was admitted by the

Corporation's advisers that outside the city it would be perfectly feasible to lay a double line of track, but that the use of motor omnibuses was fully justified owing to the sparse population to be served, and the fact that the districts beyond are only just beginning to develop.

#### Excessive Damage to the Roads.

The case for the County Council was that motor 'buses caused damage to the roads out of all proportion to their user, and that in consequence a contribution was justifiable on the ground of extraordinary traffic. On the other hand, for the Corporation it was argued that, except for the fact that the Corporation was bound to come to Parliament to get the necessary financial powers, the County Council would have had no voice in the matter, and that any private company with the necessary means could have run the 'buses. Much was also made on behalf of the Corporation of the fact that Coventry, above all cities in the kingdom, suffers from an extraordinary amount of motor traffic, especially from motor vehicles under test, and that the extra amount of wear upon the roads under these circumstances from a service of twelve motor 'buses would be insignificant. Nevertheless, on behalf of the Corporation, the County Council was offered a clause similar to that which was inserted in the Sheffield Corporation Bill last year, but the offer was not accepted.

At the close of the case for the Corporation, and before that for the County Council was put before the Committee, the Chairman hinted that the feeling of the Committee at that moment was that if the powers with regard to the 'buses outside the city boundary were to be granted, the Corporation ought to try to come to an arrangement with the County Council with regard to the question of the increased cost of road maintenance likely to result.

#### The Legislative Position Unchanged.

Conferences between the parties were held with a view to arriving at some compromise in regard to the Chairman's stipulation, but without avail, and in the end it was announced that the Corporation had decided to withdraw the proposal to run motor omnibuses outside the city boundaries. This having been allowed by the Committee, clauses were inserted providing for twelve motor 'buses to be used inside the city. The legislative position, therefore, still remains unchanged—that in no case does a motor omnibus undertaking pay towards the maintenance of roads, except, of course, indirectly by means of the Excise duty on motor spirit and garage rates and taxes.

We think motorists as a body will agree with the contention of the Warwickshire County Council, for few can have failed to notice the additional wear and the more rapid breaking up of the crust on those roads which are used by motor omnibuses than upon roads which are free from such traffic.

A police trap is being operated between the Express Dairy Co.'s Farm and Cyprus Road, on Regent's Park Road, Finchley, N. The usual procedure is to catch two or three motorists, and then to move the trap first to a point near Church End Station, and then further on near Granville Road, all the timing stretches being on different portions of the high road.





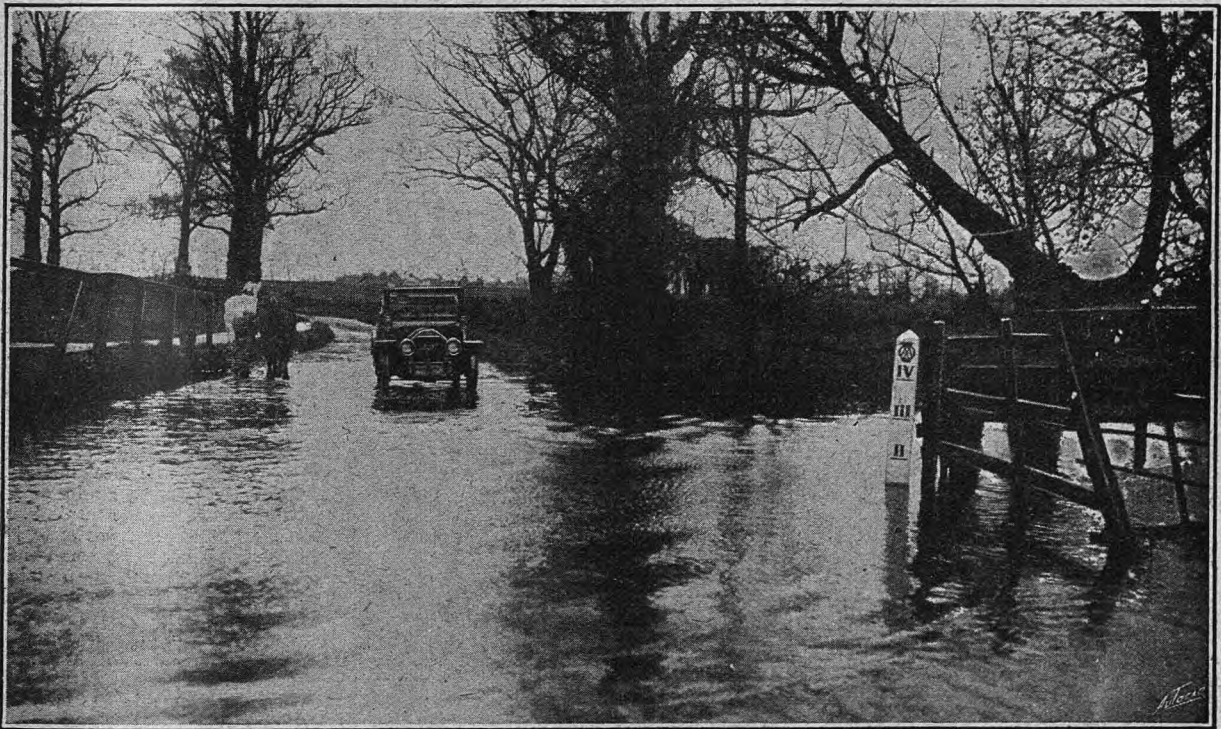
although the temperature will remain correct, as the proportions are not interfered with, simply the quantity.

This valve can be readily examined while the car is under steam by undoing the unions Z and X seen at the right hand. The seating of the valve can then be removed and cleaned and the valve examined. This operation takes only a few minutes. When the valve seat is replaced and the large union Z refitted, the engine should be run slowly and the valve watched. No water should pass with the engine running at a moderate pace. If the engine is run fast the valve comes into operation and water will pass. The small union X can be refitted after the test.

After long use the seating L of the fuel needle is liable to become worn, and may need replacing. When this is done a new needle should also be fitted,

*Steam Car Topics.*  
the two together costing only a few pence. The needle E is screwed into the piston rod H and locked by the lock nut U. The needle and seat can both be removed through the hole filled by the plug W, but it is better to remove the whole fuel end if anything has to be done to it. This can be done in a few minutes by merely undoing the unions K and M and one lock nut at the back of the gland, after unscrewing the fuel needle out of H.

The complete Flow Motor can be removed from the car while it is under steam—a little matter, perhaps, but one that shows how carefully the design of the car has been thought out. The results given by the Flow Motor are very remarkable, and if a carburetter could only be made that would give equally close results on a petrol engine, it would be a great improvement on anything yet on the market.



*The first of a series of water splash depth gauges to be erected by the A.A. and M.U. This one is at Ruxley Splash, near Epsom, where the water has often reached a depth of five feet, to the discomfiture of many motorists who have attempted to rush the splash without being aware of the real depth of the water.*

### The 1913 Paris Salon.

The question of holding the Paris Automobile Salon in October is still in abeyance owing to the difficulty in obtaining the Grand Palais at that period. Another important question has been brought up by one of the motor manufacturers' syndicates, and a petition has been distributed by them to reduce the duration of the Paris Show from fifteen days to ten. The Exhibition Committee has replied stating that this would considerably reduce the receipts, but the syndicate maintains that, if the receipts be reduced, the expenses for the exhibitors would also be considerably reduced, as instead of being in attendance at their stands for a fortnight, they would reduce this time by five days. On the other hand, they have suggested that the doors should remain open until 7.30 p.m., and not be closed at six o'clock as hitherto. In this manner persons in

business would have the time to visit the exhibition. Consequently this additional hour and a half would compensate to a certain extent for lessening the duration of the exhibition without probably affecting the receipts to any very great extent.

The syndicate in question also wishes to make the Paris Salon more of an industrial show than a decorative enterprise. It argues that it is quite unnecessary to attract a class of public that the illuminations alone interest. The expenses incurred in illuminations are totally unnecessary, and this item of expense alone would counterbalance any loss that might be felt by reducing the duration of the show. This proposition has been set on foot, and it will be interesting to see what the result of it will be upon the character of the show.

# The Wheel and the Road.\*

By Col. R. E. Crompton, C.B., M.Inst.C.E., Engineer to the Road Board.

IN these days of mechanical transport of passengers as well as of goods, we hear on all sides of the immense damage done to our roads by the new form of locomotion.

On all sides demands are made that all mechanically-propelled vehicles should be heavily taxed in order to pay for the damage they do to the roads they traverse, but the unfairness of confining the taxation to one class of vehicle only is obvious, and can only have the effect of retarding the progress of modern development, so that things are quite certain to right themselves eventually.

It is probable, however, that the mere fact that such statements are made in the columns of the daily press shows that the public have insufficiently considered the real difficulty, which is that, whereas on a railway one authority controls not only the railway track, but the vehicle which rolls over it, in the case of the ordinary road, vehicles are owned and maintained by one set of persons and the roads are maintained by another set, and, unfortunately, the two interests have hitherto been considered antagonistic.

In his former papers and writings, the author has always urged the advantages of using wheels of large diameter. This is particularly necessary when the tyres are comparatively rigid, as are the steel tyres used by traction engines, traction engine waggons, motor waggons, and the trailers they draw behind them. The same is true to a lesser extent when the wheels themselves are fitted with elastic tyres, which, as Mr. Mallock pointed out in his paper read before the Institution in the 1910-11 session, has practically the same effect as increasing the wheel diameter of a rigid tyred wheel.

Notwithstanding this, the author regrets much to have to say how little the designers of commercial vehicles have studied this question. The makers of the heavier class of motor waggon appear to have adopted a standard driving wheel diameter of 40-41 in., practically the same for the steel wheel as for the rubber-tyred wheel of the motor omnibus, although undoubtedly at the speeds at which these vehicles are run, the diameter of the rigid steel motor waggon wheel should be at least three times the diameter of the rubber-tyred one carrying the same weight in order to be equally fair to the road surface.

The chief cause for the non-adoption of large diameter wheels has, in the past, been their great weight, and the difficulties in loading the vehicles which are introduced by their use when such loading has to be carried on over the side; now, however, when so many of these vehicles run long journeys in which convenience of loading and unloading is not nearly so important as the reduced wear and tear both of vehicle and road which follows on the introduction of large diameter wheels, the author hopes that what he is about to say in this paper may bear useful fruit, and that the ingenuity of these designers will overcome the constructional and loading difficulties that have been alluded to.

It is common knowledge that the elasticity of the wheel surface has played a most important part in helping forward the introduction of mechanical transport.

## The Elasticity of Road Surfaces.

The author believes that we are now in a fair way to render the surfaces of our highways sufficiently elastic to enable them to stand up to the destructive forces which lead to their permanent distortion, deterioration, and wear, and certainly to the rapid wear of the wheel tyres when these are composed of that expensive material, rubber.

Our "well-informed" daily press has frequently pointed out that the ideal road of the future will resemble the carriage way under the entrance to Euston Station, where a short length of rubber-surfaced road has been laid down for many years. We are told that the ideal road must eventually be faced with rubber. What such a road would cost, even if rubber was reduced to 6d. a pound, the author leaves to the imagination of the members.

The author's belief is, however, that sufficient elasticity can be introduced into the surface of our carriage ways to make them a practical proposition, and that the chief reason for the success of the methods which have been introduced during the past eight or nine years, and which have resulted in reducing the mud, the dust, and the noise of travelling, has been really due to the small amount of elastic cushioning which has been already introduced into the surface of these roads. Thus, the main direction in which still greater improvement is being sought for is in perfecting these methods.

The elastic factor of the old style of waterbound macadam was very small, consequently most of the work done on the road was expended in displacing the upper surface of the road, partly in the form of a slight forward displacement or rocking of the particles, which road surveyors are in the habit of calling "push," and which tended to loosen these particles in their bed, and partly in the grinding up or pulverising of the particles which had become detached from their bed in the surface, and which grinding action is so characteristic of a steel wheel rolling over gravel, or whenever loose, gritty material covers a harder surface such as when our streets are gritted with gravel, which is ground down by the traffic into finer material.

## Surface Wear not the most Important.

Many people, including a considerable proportion of the road surveyors, have, up to quite recently, looked on the question of the wear of road surfaces rather superficially; that is to say, they have always considered that surface wear was the most important matter, and have selected for their macadamised roads the stones from those rocks which offer the greatest resistance to attrition. In this, however, they are wrong. The main source of the mud and dust found on our roads arises from the inter-attrition of the stones of which our macadam roads are composed. This inter-attrition arises from the rocking action above alluded to, which is caused by a rolling wheel, and which, again, causes the sides of the stones to rub against one another, and thus gradually removes the angles and changes the stones from the familiar angular shape in which new road metal is seen previous to its being spread on the road to the rounded form in which it is to be seen when a road is broken up for recoating and repair; in other words, the wear of the road material, far from being confined to the surface, as would be the case, if the stones were firmly held in position and subjected only to attrition on their upper surface, goes on by grinding away the whole surface of the stones, and this affects the stones next the surface to the greatest extent; in winter weather, however, the inter-attrition extends to a considerable depth, the quantity of mud produced increasing in direct proportion to the depth to which the rolling or rocking action extends.

All improved pavements have for their object the reduction of this interstitial wear, and the confining of the wear as far as possible to the upper surface of the blocks or of the sheet-asphalt. Taking these in order, granite blocks or sets were first used bedded on sand, and afterwards in pitch, and either close jointed or with cement or other non-elastic joint between them; this, although it resulted in small inter-attrition, and small surface wear, transferred the effects of the work done on the road very largely to ear-splitting noise or to the destruction of the vehicle itself.

When wood blocks were substituted for granite, the elasticity of the material itself at once led to an improvement. The streets became more silent, the vehicles lasted longer, and the extension of wood pavements has only been restricted by considerations of cost.

Sheet-asphalt pavements attack the question in a different manner. A sheet-asphalt pavement may be considered as a macadam road in which the particles are of extremely small size, and are prevented from rocking and consequent interstitial wear by the interposition between each particle of a very thin film of bituminous cementing matter, and as the surface of an asphalt pavement is thoroughly well sealed and the entrance of water prevented, it does not suffer as a water-bound macadam road does by the lubricating action of the water causing "wet grinding" of the particles, which always goes on in a water-bound macadam road during the wet season.

Unfortunately, the early asphalt pavements were very expensive, as the material of which they were formed was artificially ground up natural asphalt rock, of which the supply is limited and on which the carriage from abroad is heavy. About twelve years ago, however, our American friends found that artificial asphalt could be produced, at reasonable cost by binding together mixtures of graded sand with a small proportion of limy matter and with the purer bitumens which are found in various parts of the world, notably in Trinidad, Venezuela, and Mexico. As in this case the sand and the finely-ground lime dust can be obtained anywhere locally at comparatively low cost, the expense of the pavement was chiefly confined to the cost of the bitumen itself, and hence the production of artificial asphalt increased largely in the United States, so that most of the sheet-asphalt pavements in the American cities have

\* Extracts from a paper read before the Institution of Automobile Engineers on the 9th Inst. by Col. R. E. Crompton, C.B., M.Inst.C.E., Engineer to the Road Board.



been gradually developed and improved on these lines. About five years ago a still further improvement was introduced by an English company on the Thames Embankment, and other pavements of the same class have been tried here and have found increasing favour, and their further development seems likely to help us in producing our ideal road in which the elastic factor will be sufficient for our purpose.

The reason for the rather tardy development of sheet-asphalt pavements made from rock asphalt has been its admitted slipperiness for horse traffic, and no doubt it would never have been further developed but for the fact that, as we now see, the motor vehicle traffic is likely to form the most important fraction of the whole.

Going back to the stages of improvement of road surfaces, as will be remembered, the prevention of dust by surface tarring began to be introduced about eight years ago, and has since gone steadily on. Owing to the abundant supply and the low price of tar in this country, this was the first practical method by which the particles of the surface of a macadam road could be held in position by a partially elastic binding material, for although it is not correct to say that tar, or the pitch which remains on the surface of our roads and binds the fine particles together after the lighter oils of the tar have dried out, is truly elastic, yet when this pitch becomes combined with the finer particles of the road surface, such as the sand or the limestone dust, it does behave to a limited extent as an elastic but extremely viscous liquid, and as it has the effect of preventing the entrance of water into the road, it also reduces the inter-attrition between the stones, thus allowing of dry-grinding only under the rocking action of the traffic instead of the destructive "wet grinding" which always takes place in wet weather.

#### Different Requirements for Various Districts.

The pitch which is employed for our roads is very slightly elastic, and when combined with sand is plastic within certain limits of temperature. It is brought to the requisite consistency to give fair average results, *i.e.*, not to be too soft in summer or too hard and brittle in winter, by the process of tempering it, or adding what is called fluxing oil, so that at a fixed temperature, which the Americans usually take at 77° F., and which the author prefers in this country to take at 60° F., its consistency and its ductility should approach a certain figure which must be determined by experiment; but the use of pitch in our roads must nevertheless, on account of its considerable temperature variation in consistency, always be a difficult matter. It is not possible to specify pitch of a consistency which will be equally suitable for the Brighton sea front and for the Scotch roads, as a medium consistency would be too soft for Brighton but too hard for Scotland.

Fortunately discovery has kept pace with the demand. We are now offered materials found to some extent in Nature, when Nature itself distils and hardens the asphaltic oils which are found in considerable quantities in the central portion of the American continent, and which are also available as a residual product when the asphaltic oils are distilled from the crude oil wells of the same region to obtain from them petrol as well as the illuminating and lubricating oils. After these oils have come over from the still, the process can be stopped at a point at which the residual substance is practically pure bitumen, which can be tapped off and shipped to use for road binding purposes. This substance is most distinctly elastic or resilient, and does not lose its resilient properties if to it be added an equal mass of fine powder (which may be lime, clay, Portland cement or similar substances, which can be readily reduced to an impalpable powder) which appears to add to the bitumen what painters call "body" and also to increase what painters call its "covering power," that is, the area of sand or stone particles which can be covered with a thin film of it. This process of combining bitumen with a fine powder, technically called "filler," is somewhat analogous to the fillers used in the preparation of vulcanised rubber for our tyres, and in both cases a certain fixed amount can be added without materially decreasing the resilience or the mechanical strength of the product.

The next step is to use this bituminous binder combined with its filler to the best advantage, by a very careful study of the stony substance which must be used to give good foothold and to resist attrition at the surface of the pavement. Many substances, such as crushed granite, basalt, and other finely divided stones, have been tried for this purpose, but it appears likely that angular particles of silicious sand, such as is found in nature on our sea shores, river estuaries, or in inland sand pits, or which can be produced by the

#### The Wheel and the Road.

disintegration of sandstone rocks, or by the grinding up of flint, gravel and shingle, form, on the whole, the most suitable material to be bound into a pavement by the bituminous binder.

Much thought and study have been given to this question on the American side, and the author is greatly indebted to Mr. Clifford Richardson, Messrs. Smith and Dow, Professor Blanchard, and others, who have heartily co-operated with him in this matter, and placed before him without stint the results of years of investigation, which have enabled him to prepare specifications and to design machinery for carrying out these specifications, in which work he would have been delayed for years if it had not been for their kind co-operation.

The point aimed at in producing a road surface which shall be durable, sufficiently resilient, non-slippery, water-proof, and which can be produced at reasonable cost, is that the road should be built up on a foundation or strength crust strong enough to carry the weight of the traffic, and in order to distribute the weight on the wheels over a sufficient area of the sub-soil to prevent settlements or permanent depressions being formed at points where the sub-soil is soft or plastic, and on this foundation or strength crust to lay a wearing crust similar to a sheet asphalt pavement and constructed chiefly of sand bound together by bitumen. The strength crust may be practically similar to the wearing crust, but larger and cheaper material is generally used for it, and it is not so necessary that this strength crust should be so perfectly watertight, as it is protected from the entrance of water from above by the impermeable nature of the upper sheet pavement, but as the considerations which govern its structure are very faithfully reflected in the requirements for the sheet pavement itself, the author confines himself to stating briefly what these latter are as far as our knowledge at present extends.

Our sheet pavement must consist of sand with the particles so graded and so interlocked that, when combined and cemented together by the bitumen and the filler, the surface resembles a natural gritty rock of a nature sufficiently resilient to recover the temporary deformations caused by the rolling over it of a wheel, and this condition is best obtained when the grading of the grains of sand is so contrived that they approach one another so closely that the interposed elastic film of bitumen and filler combined forms from 20% to 30% of the total mass. The author feels that he shows considerable temerity in laying down these two limits, as he is aware that some of the most successful sheet pavements formed from natural rock asphalt are supposed to contain very much less bitumen, but he believes that he will be supported by those who have closely studied this matter.

#### The Breaking up of Bituminous Bound Roads.

Considerations of expense and the costliness of the bitumen point to the desirability of approaching as closely as possible to the lower limit. Unfortunately it is a very serious matter to experiment on the roads themselves. If too little bituminous matter is used, the surfaces are not sufficiently sealed against the entrance of water, wet grinding between the sand grains takes place, the sand particles become loosened and grind against one another, and the interposed film of bituminous matter becomes detached and is washed away at each succeeding rainstorm. This process, which we have called "denudation," is the chief cause of the break-up of all classes of bituminous bound roads during wet seasons. We are most familiar with it in the case of surface tarred roads, but it has also occurred to a great extent in America and in this country, even where the better class of bitumens have been used in insufficient quantity, or without due consideration for combining the proper proportion of filler with the bitumen or pitch.

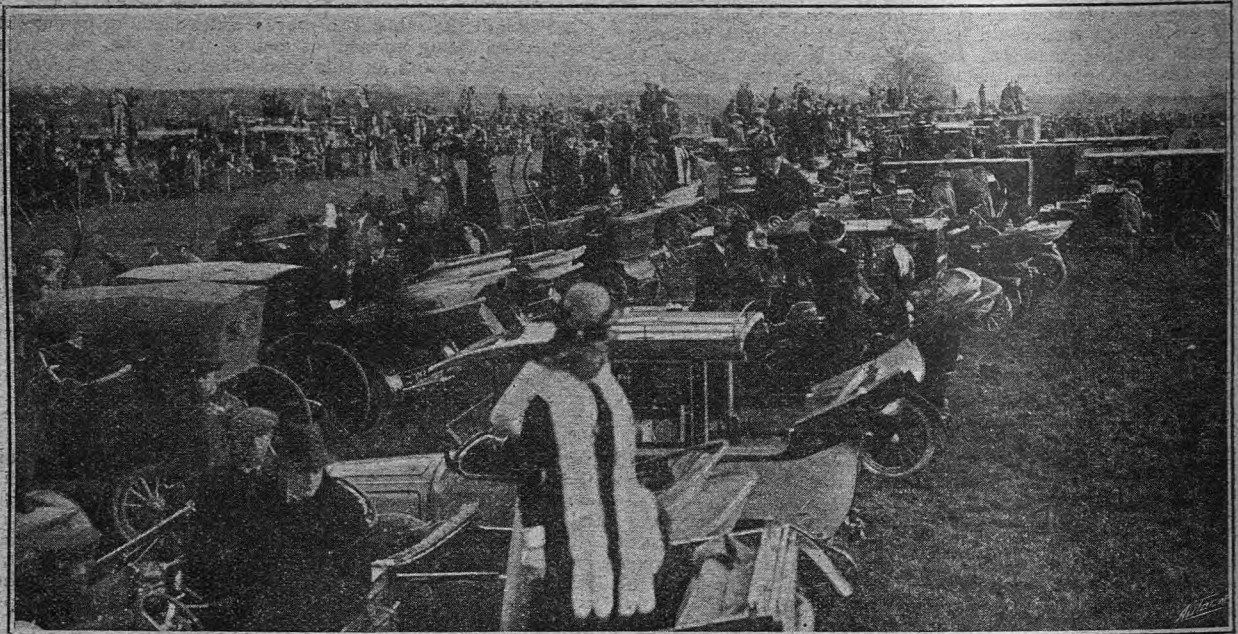
So long as heavy traffic was confined to the principal roads or streets of large towns, the cost of wood block or asphalt pavement, although extremely heavy, was cheerfully borne by the street or road authority, but now that in this motor era the traffic has to spread itself widely over the roads that radiate from all our cities, the consideration of maintaining these roads in a satisfactory condition at a reasonable cost has become the problem of the moment.

Our Road Board has already done a good deal to promote the study of these improved road surfaces by laying down twenty-three comparative experimental roads near London at Sidcup, in Kent, five lengths of the Portsmouth Road in the borough of Wandsworth, and twelve lengths in parts of Fulham; but the difficulty of obtaining results from any class of experimental roads, even on those where the traffic is extremely heavy, is greatly enhanced by the variable nature of our climate, by variations in traffic, and by the very considerable time which must elapse before any notable changes in the surface can be observed.

*The Wheel and the Road.***A New Testing Plant**

Hence it is with great pleasure that the author is able to announce that the Road Board, seeing this, has sanctioned the design and construction at the National Physical Laboratory of the first large-scale road machine, that is to say, a building containing a circular track on which experimental lengths of roads can be readily laid down and tested to destruction by the passage over them of wheels driven by motors which are guided and steered in a circular track by a revolving framework. This machine, which has taken a year to design and construct, is now complete and has been set to work, and the preliminary difficulties have been overcome. The track has been filled with four lengths of waterbound macadam made up in four different ways, and the behaviour of these lengths will be compared with one another, and each of them tested to destruction almost at the time that this paper comes before you for discussion. The designers hope that by means of this machine, which

At this laboratory and in the author's own private laboratory a good deal of minor apparatus has been provided to enable the value of the materials used to be tested and compared, but so far means have not been found to enable the small scale experiments of the laboratory to be effectually correlated with the practical durability of the materials when used on the roads themselves. The author believes, however, that the road machine just described will form the necessary connecting link for this purpose, and he has great hopes that it will enable the Board to settle quickly a number of very important points which have always been open ones to road surveyors on account of the uncertainty of the various weather and traffic factors which have in the past prevented any correct comparative data being obtained. With this road machine, as the variable factors may be eliminated in turn, it ought to be possible to put a value on each of these factors with far greater accuracy than has ever been possible up to the present.



**THE GARTH HUNT POINT-TO-POINT RACES.** This fixture, at which Prince Christian and Princess Victoria of Schleswig-Holstein were present, was held at Arborfield Cross, near Reading, last week. A great many cars were present.

is the only one as yet put down in any country, they will be able to arrive rapidly at conclusions which otherwise it would have taken years to reach by actual use on the roads themselves. As the roadway is under cover and protected from weather influences, they will be able either to eliminate the weather conditions entirely, or introduce them one by one and study their effect. For instance, the track can be heated by hot air blown on to it; rain can be imitated by spraying devices; it can be artificially cooled to the freezing point. The wheels used can either be standard wheels with plain steel tyres carrying a fixed weight of one ton each: the diameters and widths of these wheels can be varied, solid rubber tyres or pneumatic tyres, plain, corrugated, or studded, can be substituted in turn and the effects of each on a road surface noticed. This will be an effective manner of testing the durability of various classes of tyres.

The paper is already too long, but as, no doubt, the author will be asked the important question whether it is reasonable to suppose that the covering of any considerable length of our roads by sheet pavement resembling asphalt is a practical possibility, he unhesitatingly answers "Yes" to this question; that he personally thinks that the gradual introduction of methods of covering our roads with a satisfactory and smooth running wearing coat or carpet of sand or other silicious matter bound by pitch or bitumen at a cost which can be borne by the ratepayers is only a question of engineering study, of the use of suitable machinery and suitable methods of rolling, and of the organisation of staff and workmen, and he feels confident that he is supported in this, his personal opinion, by all the best of the English as well as of the foreign road engineers who have paid close attention to the subject.

**The Grand Prix de France.**

The entries for the Grand Prix of the Automobile Club de France are definitely closed. The cars entered number twenty, composed of nine French cars, four English, three Italian, two German, and two Belgian. The sporting committee of the Automobile Club has fixed the exact starting point. This will be at a corner where two grand stands will be erected, so that the public can witness the starting preparations. The starting point forms an angle of two long stretches of road, so that the spectators in the stands will see the cars coming towards them for nearly half a mile, will see them turn the angle, and watch

them disappear for a further half mile. This will be an excellent position from which to witness this race. As it is impossible to finish the race at the exact point of the start, it has been decided to finish at about 250 yards before the corner. The cars will, therefore, have to turn the corner before the grand stands after the finish of the race. The distance that the cars will cover has now been measured. The course is practically a twenty miles circuit, and the cars will cover the course twenty-nine times, with the exception of the last lap, which will be 250 yards less. The total distance to be covered is therefore about 580 miles.



## The 20-25 h.p. Berliet.

Four Cylinders, 100 × 140 mm. Bore and Stroke. Four Speeds. Bevel Drive.

THERE is no motor car of French extraction which can boast a sounder reputation in this country than the Berliet, and one of the most interesting models is the 20-25 h.p., which has four cylinders with bore and stroke 100 × 140 mm. The cylinders are cast *en bloc* with valves enclosed on the near side, tappets being accessible by the removal of two accessible and easily removable covers. Forced

oil of good length, and each has three rings above its gudgeon pin. The latter are solid. The crankshaft rotates in three long white metal lined bearings, carried entirely by the upper part of the crank chamber.

With regard to lubrication, a sump is formed in the bottom of the crank chamber in which is a rotary pump driven off the crankshaft. The pump forces oil under pressure through suitable leads to the three

crankshaft bearings, and thence by ducts formed in the crank arms to the bearings

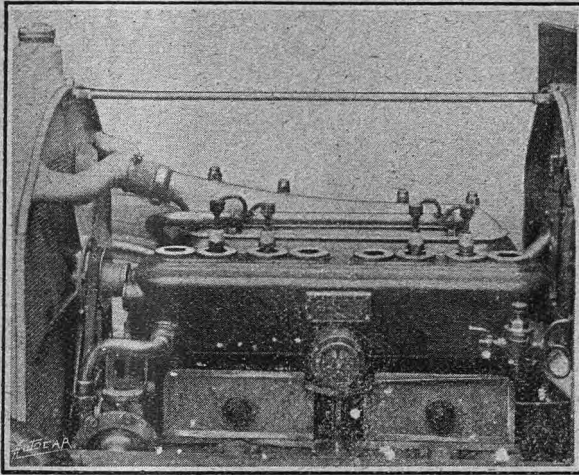


Fig. 1.—The near side of the 20-25 h.p. Berliet engine.

water circulation is adopted, the delivery pipe from above the crowns of the combustion chambers being branched to each side of the radiator so that the hot water is delivered to what are usually the coolest parts of the radiator, the sides. The camshaft is gear wheel driven from the crankshaft, and the centrifugal water pump and the Bosch magneto are rotated by a cross-shaft in front of the forward cylinder, skew gear

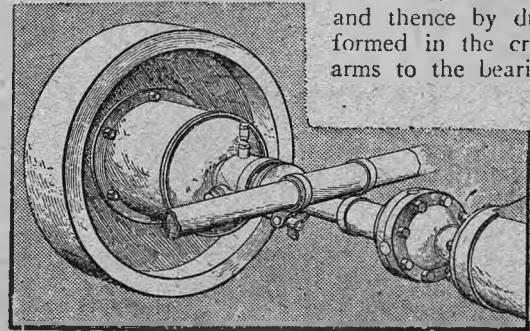


Fig. 3.—Sketch of the clutch and coupling-shaft showing the star universal joint at the rear end of the latter.

of the big ends. A by-pass valve is fitted, and the surplus oil is led to a triple drip feed on the front face of the metal part of the dashboard. The three pipes drawing away from these feeds run one to the universal joint, one to the gear box, and the last to the back axle, an unusual but nevertheless most advisable arrangement. The carburetter is on the offside, and its throttle and mixing chamber are formed with the cylinder casting.

Referring to the offside view of the engine, it will be seen that a capped outlet of generous dimensions is provided at the front of the water jacket for draining the water when necessary. The radiator is carried

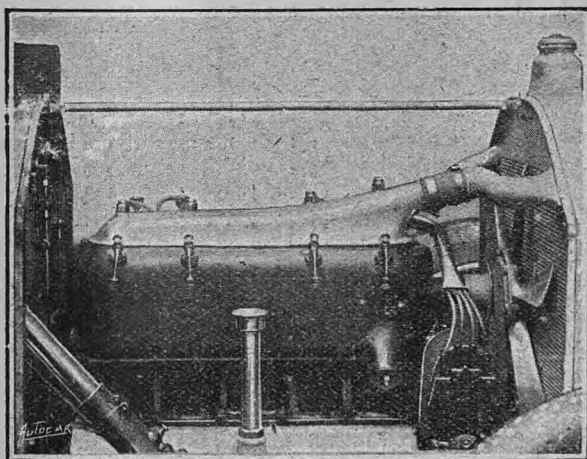


Fig. 2.—Off-side view of the 20-25 h.p. Berliet engine, showing the branched water pipe to the radiator.

driven from the camshaft. It will be seen from the side views of the engine that both the magneto and the water circulating pump are in accessible positions. The exhaust trunk is formed integrally with the cylinder casting, so conducting to a neat entity and ensuring the water cooling of the exhaust. The pistons are

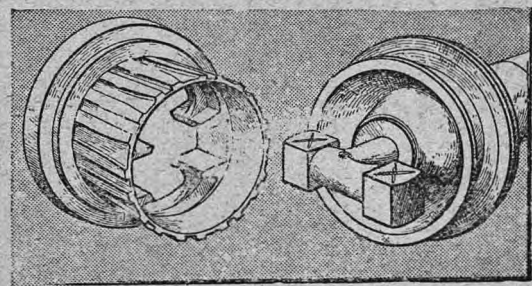


Fig. 4.—The sliding block universal joint at the front end of the clutchshaft.

on locking trunnions, and is tied back to the dashboard by a pivoted tie rod. This important unit is thereby relieved from all the stresses consequent upon frame torsion. The petrol tank is set between the rear ends of the side members of the frame, the fuel being pressure-fed to the carburetter. The pressure valve is placed accessibly on the near side of the engine.

The drive is transmitted from the engine to the gear box through a multi-disc clutch, the coupling shaft to the gear box being provided with a square block joint

*The 20-25 h.p. Berliet.*

at its forward end and a star joint at the rearward end, the former being shown taken apart in fig. 4.

The gear box is set upon two channel section down-swept cross-members, and contains gears giving four speeds, operated by a well-designed form of gate change. The selecting and striking gears are all contained within the gear box, and the shafts are stiff and kept very short, running on ball bearings. A large circular inspection lid is fitted.

From the enclosed universal joint at the rear of the gear box the propeller-shaft runs through a tubular casing with a ball bearing at its forward end to the driving bevel pinion meshing with the crown wheel, and driving the road wheels through a bevel form of differential gear. The live axles perform the sole duty of rotating the road wheels, the road wheel hubs being carried on large central single ball bearings set upon the axle sleeves.

The rear brakes are of the internally expanding order operated by the side brake lever and wire connections which provide the necessary compensation. The pedal-applied brake is an internal type, the brake drum being part of the universal joint.

The frame is of channel section steel throughout, cambered centrally, inswept at the dashboard and up-swept over the back axle. The front of the frame is carried on long semi-elliptical springs, the rear having

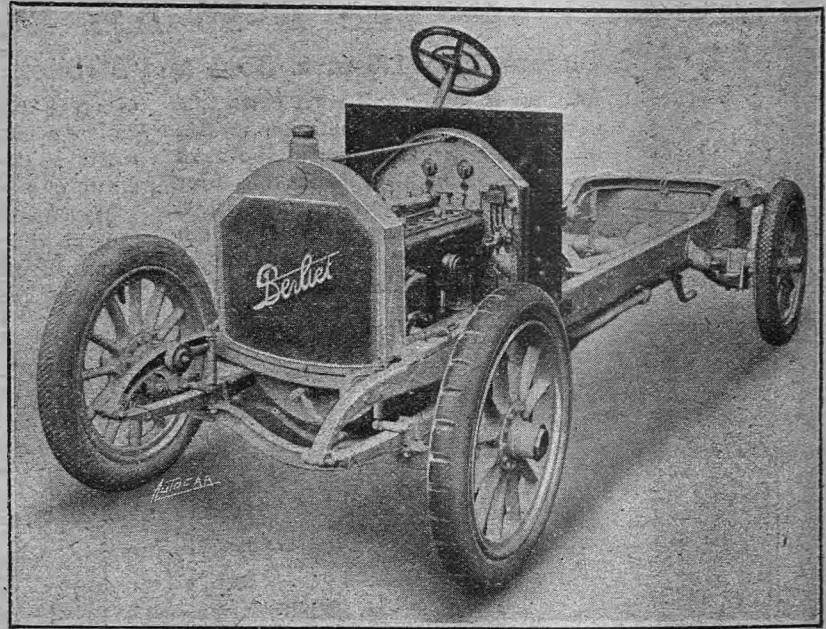


Fig. 5.—Three-quarter front view of the 20-25 h.p. Berliet chassis showing the underhung rear springing.

three-quarter elliptics which are underhung by rocking slings provided with lubricators. The control of the engine is by throttle pedal, and by ignition and throttle setting levers on the steering wheel, the throttle pedal being set in the proper position on the right of the brake pedal.

The wheelbase of this car is 10ft. 6in., the wheel gauge 4ft. 9in.; and the wheels and tyres 880 x 120 mm.

### The Continental Guide Books.

With the rapid increase of motor touring, there has been a corresponding multiplication of guide books of various kinds, but none is more comprehensive than those issued by the Continental Tyre and Rubber Co., Ltd. The set comprises atlases of the British Isles, France, and Germany, and handbooks of the latter two countries, while atlases and handbooks for Holland,

Belgium, and Switzerland are in course of preparation. Throughout these works, great attention has been paid to detail, such as would be of use and interest to motorists on tour.

The atlas of the British Isles is made up of forty-eight sections, bound into one volume, of a handy size; the maps when opened are 8in. x 7in., and the scale is twelve miles to the inch, but special maps on a larger scale are provided for a number of the important towns. A similar scheme is followed with the French and German atlases, and the price of each post free is 2s. 6d.; the handbooks of France and Germany are 2s. per copy.

The Continental Co. also manufacture for the benefit of those using their atlases a waterproof celluloid cover, which can be hung on the dashboard, and thus the book can be used when driving in all weathers. The price of this cover is 2s.

### German Exports of Motor Cars.

During the year 1912 no less than 7,948 touring motor cars and chassis were exported from Germany, of the value of £3,250,500, as compared with only 5,154 and £2,121,600 respectively in 1911. This increase of £1,128,900 was spread over all the purchasing countries, the first place in the list of which is taken by Russia, Austria being second, followed by Brazil, Great Britain, Argentina, Holland, Belgium, Roumania, France, Denmark, Italy, Sweden, Dutch East Indies, Finland, Switzerland, and Spain.

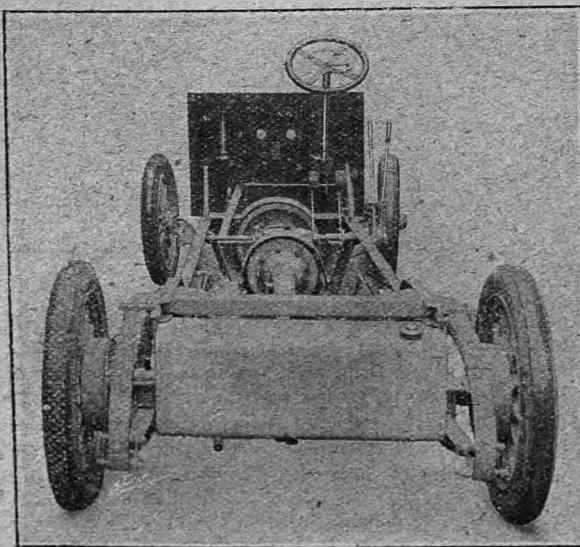


Fig. 6.—Rear view of the 20-25 h.p. Berliet chassis.



## A.A. and M.U. Notes.

Communicated by the Secretary, The Automobile Association and Motor Union.  
Whitcomb Street, Coventry Street, W.

### Badges.

Considerable numbers of motor cars and motor cycles change hands at this time of the year, and the secretary of the Association would remind all members disposing of cars and cycles of the importance of removing their badges before the vehicles pass out of their possession. The badges are not transferable, even to members of the Association, and are returnable when membership ceases.

### Property Dropped from Cars.

Members who have only recently joined the Association should note that in the event of their losing articles while motoring, it is possible that recovery may be effected through the Lost Property Department of the Association. On some days half a dozen items, such as hub caps, lamps, portions of syrens, speedometers, and other mechanism, sometimes expensive to replace, are sent in by the A.A. and M.U. road patrols, who have either picked them up whilst patrolling their beats, or received them from others. A very large proportion of the articles found has been claimed, but a number is still in the possession of the Association awaiting identification by owners.

### Water Gauges for Flooded Roads.

To protect motorists as much as possible from the inconveniences and dangers encountered when travelling in districts where—in rainy seasons—the roads are always liable to be flooded, the Association is erecting "water gauges" (taking the form of posts marked off in feet) in low-lying portions of main and other roads. The actual depth of the water is indicated, enabling motorists to decide whether their cars can successfully run through, or whether it is best to take another route. The first of these water gauges has just been erected at Ruxley Splash, near Epsom, where seven or eight motorists were recently held up in one week.

### Touring in Scotland.

Members contemplating tours in Scotland are reminded that the Association has published a handbook entitled "Scotland for the Motorist," which is a most complete guide to the touring grounds north of the Tweed. This book may be obtained by members upon application to the head offices, or any of the branch offices. The Association has two branch offices in Scotland, viz., Gordon Chambers, Mitchell Street, Glasgow, and 2, Castle Street, Princes Street, Edinburgh, where all the usual facilities for touring, legal defence, insurance, etc., may be obtained.

### Latest Road Information.

**DURHAM.**—Durham-Stockton Road: Railway bridge is to be reconstructed under the road about two miles north of Sedgfield, near Holdforth Bridge, and, during the reconstruction, half width of road only can be used lights at night; also the Stella Gill and Chester Burn Bridges, situate on the district road between Chester-le-Street and Pelton, are undergoing reconstruction.

**GREAT NORTH ROAD.**—In bad condition between Scotch Corner and Darlington.

**LANCASHIRE.**—Preston-Lytham Road: In bad condition between Freckleton and Lytham owing to rough surface and frequent patches of loose metal. Kirkham Lytham Road: Under repair in Wrea Green village, half width foundations also being laid half width half mile west of Wrea Green, lights at night. Blackpool-Poulton Road: Members are warned to drive with care through Poulton-le-Fylde and district. Preston-Garstang Road: Members are warned to drive with special care between Withy Trees, Fulwood, and

Broughton village; also through Garstang Preston-Blackburn Road: Full width in bad condition on Brockholes Hill two miles east of Preston Preston-Wigan Road: In very rough condition between Bamber Bridge and Standish. Control likely to be working in Burton 10½ miles north of Lancaster. Southport-Ormskirk Road: Canal bridge under repair, widening in hand, will occupy about two months.

**YORKSHIRE.**—York-Malton Road: Under repair full width, roller working, no light at night. Leeds-Harrogate Road: Remetalling and rolling full width between 10th and 11th milestones from Leeds. Otley-Bradford Road: Main road west of Otley is under repair; special care necessary, lighted at night. Guisborough-Kedcar Road: Under repair half width for half-mile; alternative route *via* Marske. Hut Green-Doncaster: A bridge is under construction 2½ miles north of Doncaster.

**BIRMINGHAM ROAD.**—Remetalling two miles north-west of St. Albans and between 22nd and 23rd milestones, will last about ten days. Tarmac being laid at Compton sixteen miles from Birmingham, lights at night. Framway at Yardley is under repair, and all traffic to Birmingham is diverted.

**LINCOLNSHIRE.**—Holbeach-Peterborough Road: Under repair full width for about half a mile; alternative route, *via* Spalding.

**LONDON YARMOUTH ROAD.**—Under repair at Brentwood town, 18th milestone, roller at work. Under repair between Kelvedon and Colchester. Remetalling at Gunton, half width. Roller working in High Street, Melton, full width under repair.

**NORWICH BUNGAY ROAD.**—Road blocked nine miles from Norwich. A bridge under repair at Fox Burrows, in the parish of Woodton, lights at night.

**NORWICH IPSWICH ROAD.**—Broken bridge at Newton Flotman, which cannot be seen more than twenty-five yards away, lights at night.

**SHREWSBURY DISTRICT.**—Wenlock-Bridgnorth Road: Remetalling full width three and a half miles from Shrewsbury. Welshpool Road: Remetalling full width between Westbury and Cross Gate.

**NEWTON TORQUAY ROAD.**—Under repair half mile from Kingskerswell (Newton side), full width, roller working.

**DORSET.**—Dorchester-Bridport Road: Foundations are being laid at two and a half miles west of Dorchester, whole width, clear at night; alternative route, *via* Martinstown.

**BATH ROAD.**—Maidenhead High Street under repair half width, tarmac being laid, roller at work—members are advised to drive slowly. Repairs are in hand one and a half miles west of Twyford for a quarter of a mile to Sonning cross roads, roller at work. Under repair between Calcot and Thatgham.

**BRIGHTON ROAD.**—Roller working between Kingswood-Reigate, Reigate-Redhill, and Woodhatch-Povey Cross-Crawley. Under repair between Merstham and Redhill, Redhill-Horley, and Hazeldene and top of Bolney Hill.

**HERTS.**—Remetalling at Northchurch, full width of road.

**KENT.**—Sidcup: Pitchbending in progress near Sidcup, half width. Controls likely to be working at the following: Between Eltham and Lee, Foots Cray, and near the Bull at Birchwood on the London side.

**LONDON DISTRICT.**—Controls are likely to be working at London Road, Figgs Marsh, Streatham, Mitcham, Morden, Sutton, Shooters Hill, Charlton, Finchley, Kingston-Hampton Court, Putney High Street, Barnes Railway Bridge, Sunbury-Staines, and Bedfont-Staines.

**SOUTHAMPTON ROAD AND HANTS.**—Under repair and roller at work a quarter of a mile south of Holmsley Station, full width; special care is essential, as roller is on steep hill and at a nasty bend. Roller at work at Iford Bridge, full width; also at Otterbourne village, full width. Basingstoke-Newbury Road is in bad condition for about two miles. Salisbury Road: Remetalling in hand at Whitchurch, full width.

**LITTLEHAMPTON ROAD TO FELPHAM.**—Control likely to be working from Felpham Bridge along a straight piece of road from Littlehampton.

**SUSSEX.**—Control is likely to be working in the ten-mile limit at Uckfield. It is intended to repair the main roads between Ringmer-Horsebridge, Newhaven-Rottingdean, Choksbribe-Lewes, Falmer-Lewes, Hailsham-Polegate, Bridge-Tunbridge Wells, Burwash Common and Shovers Green, Kingstanding-Groombridge, Guestling Winchelsea, Seacox Heath and Flimwell, and Flimwell-Hurst Green.

## The 18-24 h.p. F.N.

### The Impressions of a Trial Run and a Description of the Universally Jointed Clutch

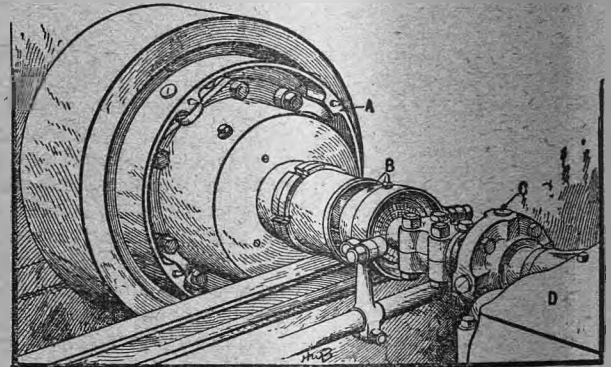
**N**OT many weeks ago there appeared in these pages an account of the very satisfactory and economical record of an 8-12 h.p. F.N. delivered early in 1910. Consequently a long week-end on a 1913 18-24 h.p. car of this make was an especially interesting experience.

On the day on which the car was placed at our disposal it was driven about forty miles in Surrey, and on the next day about 150 miles on the fast, flat roads which lead to the East Coast. The roads were very heavy and the surface, especially for a few miles south of Newmarket, was of the most pot-hole description, and on this portion the good springing was apparent. The way the very long springs absorbed the road shocks was excellent, and left us an impression which will always serve as a standard by which to compare other cars as regards their suspension.

The whole car is a sound job, while its running was of the sweetest. The engine, 85 x 120 mm. four cylinders, ran silently and yet possessed plenty of vim, the brakes acted smoothly and were of sufficient power, while the multi-disc clutch, which has its outer member universally jointed, is delightfully smooth in action. The method of mounting the clutch is shown in the accompanying sketch. The gear box contains four speeds, and we found the gears remarkably easy to change.

The whole car impressed us most favourably as regards the way it held the road. On our two journeys no hills worthy of the name existed, so that to test the car's climbing powers it was taken to the foot of Netherhall Gardens and put up that well-known North London test hill on second speed from practically a standing start. The whole of the 1 in 7.2 gradient

was taken on this speed without a falter, which was an excellent performance when it is taken into consideration that the 18-24 h.p. F.N. chassis is a heavy one, built with one end in view—to last, and the F.N. does last. The 8-12 h.p. referred to in our issue of Jan. 18th (p. 103), with now nearly 20,000 miles to its credit, had the engine taken down the other day, and not a trace of wear in any one of the bearings was discernible. Few cars can boast of such a record.



*The F.N. articulated or universally jointed clutch. This device takes the place of one of the usual universal joints between clutch and gear box. Of the four swivelling joints on the universal ring A, two which are opposite one another connect the ring to the clutch, and the other two which are also opposed connect the ring to the flywheel. The sketch also shows the phosphor bronze cone clutch brake, and the universal pin joint connecting the clutch-shaft to the intermediate gearshaft of the gear box.*

A, universally jointed ring. B, phosphor bronze to steel cone clutch brake. C, pin type universal joint. D, front of gear box.

## Concealed Screw Heads.

### A Special Process of Concealing Screw Heads in the Moulding of Body Panels.

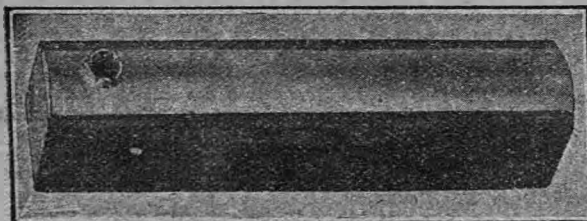
**H**AVING noticed a "Hint and Tip" which appeared in our issue of March 15th regarding a method of concealing screw heads in car body mouldings, Messrs. Kroll and Co., sheet metal workers, Bayham Place, Camden Town, London, N.W., have drawn our attention to their patent process of burring aluminium to make a natural cover for such screws. The illustration given herewith shows a sample piece of moulding fixed to a piece of wood by two screws. Neither of these screws is, however, visible in the photograph, but actually one is within the burred hole and the other is concealed by a

similar burr, which has been flattened down upon the screw head and filed off flush. It is impossible either in the photograph or in the original moulding to see actually where the screw is buried.

The forming of the burr is done by a special machine manufactured by the firm mentioned, and we are told that this system is being extensively used by many coachbuilders. This method of concealing screws is obviously considerably better than the usual method adopted, *i.e.*, filling up the holes with stopping, which is really a glorified putty. It appears preferable also to the method suggested in the "Hint and Tip" referred to, the author of which had filled such holes with solder, filing off flush any superfluous metal.

Many may at once point out that it is impossible to remove the screws covered by Messrs. Kroll's process. This is doubtless correct, but, except in the case of a new body panel requiring to be fitted, there is no necessity for the screws or moulding ever to be removed; certainly the screws can never work loose in use, for the burr forms an effective lock.

In addition to supplying the special machines for forming these peculiar burred holes in moulding, Messrs. Kroll can supply mouldings, drilled and prepared for fitting, to those who do not care to purchase a machine.



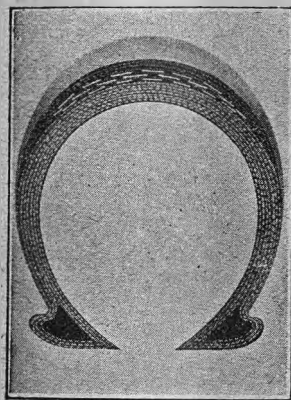
*A section of aluminium moulding secured to a block of wood by concealed screws. The screw at the right-hand end is covered by a similar burr to that shown on the left being flattened down and filed off flush.*



## The Atlas Puncture-proof Tyre.

**Overlapping Steel Discs Embedded in Rubber between the Tread and the Inner Fabric.**

THE puncture-resisting qualities of the Atlas inner case, which has been supplied for some time past by the Atlas Non-puncture Inner Case Syndicate, 124, High Street, Kensington, London,



Section of the Atlas puncture-proof tyre.

W., are well known, and in the hands of a large number of private users these qualities have been demonstrated over and over again. As a result of the satisfactory nature of the design the firm mentioned are now supplying a complete tyre embodying this system.

A section of this tyre is shown in the accompanying illustration, in which it will be seen that the specially coated steel discs, which form the medium for resisting punctures, are fitted between the inner fabric of the carcass and the tread.

The steel discs are each about half an inch in diameter, and in the centre of the tread are arranged in three rows in such a manner that it is quite impossible for any flint, nail, or other puncture-causing instrument to penetrate between them. The overlapping not only occurs in the lateral section, as shown in the illustration, but in the longitudinal section as well.

The discs are embedded in a cushion of Para rubber, and although they overlap, as previously stated, they are not in contact with each other, so that there is no friction and consequent heat set up by contact and movement between them. Further than this, it is claimed that, owing to the peculiar construction, the tyre as a whole is as resilient as any ordinary type of tyre.

It may be remembered that in our issue of March 15th we published particulars of an R.A.C. certificate which had been issued in connection with these tyres after a set had been subjected to a strenuous test of their puncture-resisting qualities. The tyres tested were several times run over planks through which had been driven a large number of nails. The boards were placed on the ground with the sharp ends of the nails uppermost, and the only effect of the tyres running over them was to flatten the nails without in any way damaging the carcass of the tyre or puncturing the tube.

As showing the life of these tyres as such, entirely apart from their puncture-resisting qualities, we have been shown an account of the mileages obtained from a number of mail vans running in Philadelphia, U.S.A. fitted with these tyres. In connection with fifty-four tyres fitted to 30 cwt. vans, it would appear that the average mileage before retreading amounted to 6,056.

As examples of the prices of these tyres, we may mention that the 810 x 90 mm. size with plain tread cover costs £5 18s. 5d., while with a non-skid rubber tread the price is £6 16s. 10d.

## A New Steel Piston.

THE type of piston illustrated herewith enables, it is claimed, about half the weight of cast iron pistons to be saved, with the consequence that very much higher engine speeds and increased power should be obtainable.

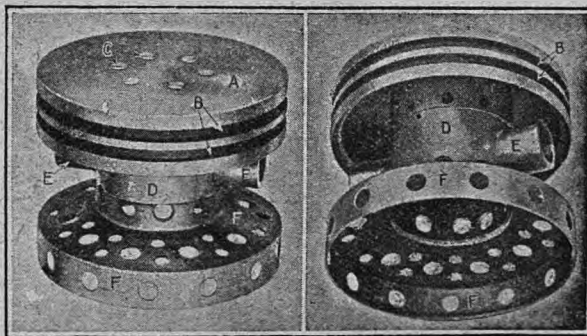
It will be noticed that the piston is of very different shape from that of the ordinary type, inasmuch as it comprises a cap portion A, with two grooves for piston rings at B, this cap being secured by rivets C to a skirt portion. The upper part D of this is tubular, and is formed with two lugs E for the gudgeon pin, and below this the skirt is enlarged as at F so as to take a bearing against the cylinder walls.

The chief advantages claimed, apart from lightness, are that the explosion pressure is not transmitted through the wall of the piston but passes straight down the tube D to the gudgeon pin. Furthermore, neither the gudgeon pin nor the lugs E which carry it touch the cylinder wall, so that the lubricant and gudgeon pin bearings are not raised to such a high temperature as is usual, and there is less fear of seizing. The gudgeon pin is secured by a single split ended taper pin inserted through a hole in the gudgeon pin and one of its supporting lugs.

It is not generally realised that one defect of the ordinary straight-sided piston is that the oil is drawn up between the piston and the cylinder walls by capillary action. It is claimed that with this piston the large gap between the two parts which come in contact with the cylinder wall prevents this capillary

action. In the case of pistons of 4in. bore, roughly about 1 lb. 8 oz. per piston is saved with ordinary steel, but if B.N.D. or other special steels are used the saving is much greater. Being made from steel bar the distortion is said to be less than with pistons manufactured in dies.

The makers are Messrs. James, Talbot and Davison, Ltd., Lowestoft, and it may be of interest to state



Two views of the James, Talbot and Davison steel piston which is built up of two portions rivetted together.

that the pistons have been used with success on Brooke racing motor boat engines and on certain aeroplanes. In fact, the photographs illustrating this description are of a piston for an Anzani aeroplane engine.

# 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.

Enquiries 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 STOCK CAR RACE.

[19411].—I was much interested in the letter of Mr. Oscar Copper [19362] in your issue of the 22nd ult., dealing with the Stock Car Race, and have been expecting to see further correspondence on the subject. I think this gentleman brings out some very important and interesting points, and as I have seen this same letter disadvantageously criticised in the motoring section of a daily paper, I venture to add my views on the subject.

I have heard that if the Stock Car Race does not take place, owing to insufficient entries, the R.A.C. does not propose to inaugurate any further races, owing to insufficient support being given to its schemes, by the trade.

I venture to say that this is an entirely wrong view of the matter, and that a race on these lines would be keenly supported by the trade, if they had more faith in the conditions and rules, and if these rules were sufficiently expressive and rigid to ensure every competing car being a *bona-fide* "standard chassis."

The preliminary rules, as set out by the R.A.C., most certainly do not fulfil these conditions, as must be obvious to anyone in a position to judge. Even the regulations framed and the examinations made at the Brooklands Standard Car Race gave ample margin for the less obvious forms of "faking."

As a prospective entrant, I believe I am voicing the opinions of other competitors when I say that plenty of entries will be forthcoming if really stringent regulations are drawn up.

I realise that to carry out such regulations would entail considerably greater expense and trouble to the R.A.C. officials, but the results thus given to the public would fully justify any extra cost, and would be of real value.

As the rules are framed at present I defy anyone to "spot" the small "refinements," which are simple to carry out on a stock chassis, but which make all the difference.

Without a previous examination at the works of the entrant, how will it be possible for the R.A.C. officials to determine exactly if any of the following points are absolutely standard, even though they be shut up for a month with the three first cars, and with the printed catalogues in their hands?

1. Piston clearances.
2. Clearance volume.
3. Gauge and strength of valve springs.
4. Exact cam profile.
5. Gear ratios on indirect speeds.

Dozen other examples could be cited, which are equally simple to alter, and which, from my previous experience of examinations, I venture to say the officials have not the necessary information or tools properly to examine.

It is not the drastic departures from standard which are difficult to detect, but without any obvious alteration, or making the chassis in any way abnormal, it is possible to make a "wooley" standard car into a very useful machine.

In order to make the Stock Car Race really worth something, I suggest that a thoroughly competent committee draw up a list of parts about which it is necessary to know the exact dimensions before the race. This list would comprise 75-100 items.

Also that an intending entrant shall have his competing car or cars chosen at random out of stock by an R.A.C. official. That in the presence of this official the chassis thus chosen shall be dismantled, and the important parts as set out in the list measured and stamped. This would entail about a day's work for each car for an R.A.C. official, and a viewer and fitter from the entrant's works.

The result would be that after the race, when examining the first three cars, the R.A.C. officials would have some real data to work on, and both the public and the trade would be satisfied that everything was "above board."

FAIR PLAY.

[19412].—We cannot help but feel bitterly disappointed at being debarred from entering our standard 10-24 h.p. car, 80×160 mm. bore and stroke, as the regulations provide that a standard car, having a maximum bore and stroke of 90×140 mm., only should be allowed to run. As is easily seen, though about the same cubic capacity, the 90 mm bore has certainly an advantage, and if we are prepared to take the risk of this and run our car in a sportsmanlike manner, it seems difficult to understand the attitude the Royal Automobile Club takes up in refusing the entrance of any cars save those of manufacturers who are fortunate enough to have on their list a standard car with motor of 80×140 mm.

We should have thought the R.A.C. would have felt the pulse of the public better in admitting cars within the stated limits, or even slightly below, to have thus demonstrated the actual combinations which give off the best results. We hesitate very much to write the following, but, in the interests of all, do so. Does it not indeed look as if the Club has formulated this rule to eliminate as much as possible the competition of foreign cars, the makers of which have been well known to make a successful study of motors with the longer stroke?

We quite concur with those manufacturers who have openly stated their views on the subject, and, no doubt, there are many who agree with us and regret the fact of their having to await another opportunity of proving their mettle against cars having motors of larger dimensions through the hastily drawn up rules which govern the present Tourist Trophy competition.

Has the R.A.C. ever thought of a race open to all 15.9 cars strictly standard? We are sure it would be very popular.

BRITISH GREGOIRE AGENCY, LTD.

[19413].—We are gratified to note that your correspondent "T.C.L." [letter 19405] has exactly caught the purport of our remarks in reference to the regulations which the R.A.C. drew up for the Stock Car Race, now unhappily banned by the S.M.M.T.

We should be, and indeed are, perfectly willing, in the event of our entering any car for a race on the lines of that in question, to have our cars selected from stock in such a manner that any special treatment of them would be quite impossible. The only difficulty is the question of "stock." When one is experiencing as big a demand for a car as one can possibly contend with, it is quite out of the question to maintain a "stock," either at one's showrooms or at various agents. This at all events is the state of affairs in our case. To meet the difficulty, we should be perfectly prepared to have a chassis chosen by a representative of the R.A.C. from the number which are undergoing completion at the works. As soon as the usual road tests have been completed on this chassis, all the important parts could be sealed, and either we ourselves, or some person appointed by the R.A.C., could hold the car until it was ready to start in the race.

We agree entirely with your correspondent that it is only by adopting some stringent means, such as we have outlined above, that a real stock car event can be held.

We may say that we should enter a competition upon these lines without hesitation, because we have a perfect confidence in the standard quality of Métallurgique cars. If the R.A.C. should decide to organise an event of this character, we can assure them that they may count upon our support.

MÉTALLURGIQUE, LTD.

## THE FUEL QUESTION.

[19414].—I find, after due experience, the best way to use paraffin in conjunction with petrol is as follows: Have a separate tank for each and do not mix in one tank. When these fuels are mixed there is difficulty in starting and running slowly, and one never gets into good running until the car has gone some miles on its journey and the

## Correspondence.

engine consequently is thoroughly lost. There should be a branched induction pipe to the engine with a throttle at each branch, one for the petrol and one for the paraffin. There should be a pilot jet to the petrol carburetter connected to the induction pipe between the two throttles, always on and so set that the engine just ticks round on petrol when both throttles are shut. The engine can then be accelerated on either paraffin or petrol or both together. Each throttle should be made to shut gastight. There should be an effective hot air muff around a good length of the hottest part of the exhaust pipe. The petrol carburetter should be connected to this in the usual way. There should also be provided a copper induction pipe for the paraffin to lead direct from the hot air muff to the paraffin throttle. Some part of this paraffin induction pipe should lie in a horizontal direction, and in the bottom side of this horizontal part the paraffin vaporising pipe should be brazed flush with the inside, so that any paraffin not vaporised may run back into the vaporising pipe. The vaporising pipe is a thin gauge steel tube of small diameter made to pass completely along the centre of the hottest part of the exhaust induction pipe, which comes exactly over the exhaust ports of the engine. At the radiator end should be fitted a float feed and screw down valve to regulate the flow of paraffin to the requirements. A choke tube should be placed in the paraffin induction pipe just behind the entrance of the vaporising pipe to assist the suction on the mouth of the latter. The engine is started on the petrol, the vaporising pipe within the exhaust branch quickly becoming red hot. As soon as the paraffin throttle is opened, the suction on the vaporising pipe draws the vaporised paraffin into the paraffin induction pipe and the mixture with the hot air then passes into the engine. When the paraffin throttle is closed, any vapour left behind is drawn back through the muff and on through the petrol carburetter. There is therefore no smell on the car, as all the vapour from the paraffin is confined to the induction pipes and muff. It is necessary in using paraffin to note that all paraffin drawn into the engine should be absolutely vaporised. If this be not done, a stinking exhaust, pre-ignition, and corrosion of valves and cylinder heads result. The insertion of watery vapour may prevent pre-ignition, but, in my case, made it necessary to reprim the valves into the seatings every few days. With the above arrangement, petrol costing 1s. 9d. per gallon and paraffin at 7d., it is an easy matter to bring the cost down to less than 1s. without being a nuisance to anybody, and increasing the mileage by 10 to 15% per gallon. I have no self interest in remarking that the latest three-jet Brown and Barlow petrol carburetter lends itself well to this arrangement.

W. R. REFFELL.

## AMERICAN AND ENGLISH PETROL PRICES.

[19415.]—I notice several letters in your correspondence columns on the comparative prices of motor spirit in this country and the United States, but no one, so far as I have seen, has stated the comparative quantities contained in the American and the Imperial gallon. The American gallon contains only 128 fluid ounces, while the Imperial is, of course, 160 ounces. American prices should therefore be multiplied by  $\frac{4}{5}$  before drawing any comparison.

PERCY C. E. ISHERWOOD.

## A ROAD TO THE NORTH.

[19416.]—It is often a matter of difficulty to a motorist bound for the North to determine by which route he shall travel from North Cheshire, South-west Lancashire, or North Wales.

If he should choose to proceed *via* Liverpool he has two routes available without touching Warrington, and without being obliged to make Preston through thickly-populated districts. The straight, and perhaps the best, route is first direct through Liverpool to Aintree, past the celebrated racecourse, and so on into Ormskirk. The road from this town on is good, though with many turnings, to Preston. An alternative route is available through the villages of Knotty Ash and Knowsley, thence by Rainford into Ormskirk.

Now half a mile north of the village of Knowsley has lately appeared a blue metal sign fixed to a telegraph pole directing motorists to turn to the left. This legend reads, "The best road to the North: Preston, 27½ miles." I happen to know every yard of this particular road, and would warn motorists against taking it. The road is certainly shorter than that by Rainford, but it is not the best. Perplexing in its turnings, I should class this road as a dangerous one for motors for the following reasons: It is intersected by several extremely dangerous cross roads with blind corners; at several points small farm buildings

and cottages abut upon the highway; at one point there is a particularly awkward bridge at a narrow bend over a culvert with a sharp rise at the other side, and at intervals the highway is paved on alternate sides with the old stone paving so familiar to the users of Lancashire by-roads and so detrimental to springs and universal joints. Apart from this fact, the inducement is offered to motorists to avoid the stone setts by driving on the wrong side of the road.

I do not know who may be responsible for the erection of the sign referred to, but I am inclined to doubt the wisdom of it. I would strongly recommend motorists to stick to the straighter, if longer, route through Rainford.

I consider the use of this "best road to the North" is likely to be attended by accidents to drivers unfamiliar with it and with the habits of the local teamsmen, who are invariably on their wrong side—a matter of importance in a country lane.

Although sections of this road are perfectly good and safe, for the reasons stated motorists would be well advised to avoid it—especially for night travelling. C. COPE.

## A RECORD SKID!

[19417.]—Those interested in the achievements of motor cars should attend the Farnham Bench when motor cases are being tried and they will hear of some wonderful records. On Thursday last week sworn police evidence showed that a light cycle car had skidded sixty-two measured yards on a dry road. (Strange to say the tyres were absolutely uninjured.) No wonder the villainous driver, having escaped with his life, was convicted of "driving to the common danger," fined, and had his licence endorsed. But what a blessing it is that we have such clever police to protect us!

BRYAN HOOK.

## THE RUNCORN TRANSPORTER BRIDGE.

[19418.]—I see your correspondent "Theo" [19384] calls attention to the unsafe condition of the gates of the Runcorn transporter bridge and says they are frightfully weak, and I quite agree with his remarks. On the 10th June last I wrote to the Board of Trade calling their attention to this very same matter. The Board of Trade seem to have satisfied themselves by referring my letter to the Widnes Town Council. I thought we had some well-paid Board of Trade officials whose business it is to look into matters of this sort. The original reply to my complaint is found in the letter (enclosed) of August 22nd, 1912, addressed to the Town Clerk of Widnes, signed by John Henderson as General Manager of the Bridge Company, and transmitted to me on September 21st, 1912, by the Board of Trade, with an enquiry as to whether I desired to offer any further observations in the light of the report furnished. This answer is most unsatisfactory, and, in spite of it, I maintain that the barriers on the carrier bridge are quite unsafe, badly designed for the purpose, and would certainly let a motor car go through if by a mischance a driver happened to start his car while in gear or failed to pull up correctly when going on to the bridge. A breach of the byelaws does not enter into the question. It is protection against an easily made mistake or error of judgment that is wanted. Perhaps a little publicity given to this question in your valuable paper will stimulate the Board of Trade.

J. COPE.

[COPY.]

August 22nd, 1912.

Sir.—(a) The gates at each end of the transporter car are of good design and have been in position for the past six years, during which time no such occurrence as suggested has ever taken place. It is, of course, possible for an incompetent and careless driver to recklessly drive a car on to the car-deck, and only on such an occasion could any definite conclusion be arrived at as to the strength of the present gates. To do so, however, would be a direct breach of the byelaws and the necessity of legal prosecution.

(b) The mention of a chain, I presume, refers to the original installation of such, and these were removed from the car-deck in 1905, when the gates mentioned in paragraph (a) were installed, and those on the approach road were removed in 1909, when a driver of the class already referred to did drive through the chain on the Runcorn approach and caused a serious accident.

(c) The gates erected on the approach road at either end of the bridge met with the approval and sanction of the insurance company's officials and have served the purpose quite effectually up to the present date.

Owing to the varied nature of the traffic which daily is carried by the car, it is necessary that the said gates be of such a construction as to admit of being easily and quickly



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removed from their position and as easily and quickly replaced.

(d) Motor cars are not the only vehicles carried by the bridge, and traction engine owners, carting contractors, farmers, horse breeders and the public generally have expressed themselves satisfied with the general arrangements and the attention bestowed upon them when using the bridge.

(Signed) John Henderson, General Manager.

H. S. Oppenheim, Esq.,  
Town Clerk, Widnes.

**ROAD CONSTRUCTION.**

[19419.]—I see in the last issue of *The Autocar* a letter in reply to my letter on "Road Construction" with two queries, and in answer thereto, first, I certainly have calculated the cost as far as it is possible, but it must be borne in mind that one can only base this on the usual builder's rates, and I am sure that after a time, if concreting became general, it would be very greatly reduced for road purposes; it is also a matter of experiment how rich in cement it would need to be, but in any case I am convinced something will have to be done in the future, and it will pay in the long run, as you would have both practically an everlasting and immovable foundation. As to extra taxation, it appears to me that the heavy motor ought to pay a much greater share, as also ought every other mode of locomotion on the road. Your correspondent's idea of limiting heavy motors I do not think practical, for the reason that if these were restricted to run the ordinary size used for agricultural purposes (and I suppose he does not propose to reduce these), owing to the iron tyres, etc., it would not alter the case much.

G. HIGGINBOTHAM.

**THE MOTORING ORGANISATIONS.**

[19420.]—Nothing have I in common with certain ill-conditioned gods, so far as wishing for "Owen John's" destruction is concerned, but certainly I do seem to have made him considerably mad!

My personality is of as little moment to your readers as that of your disgruntled contributor, but I hope to be forgiven for emphasizing on this phase the following: Item—he does Scotland a gross injustice in suggesting that I am other than purely English by birth and education. Item—I am the poorer by neither jot nor tittle (not to mention lawbees) by reason of his existence. Item—if I am not better acquainted with the conditions of the automobile industry and its collaterals than is he, then without comparison of our respective intellectual capacities, I must needs confess to a most lamentable misuse of the past seventeen years. Again—in the words beginning "as a barrister" we have an illuminating confession that seems unnecessary, having regard to his habitual use of the procedure described. Finally—I have to explain to "Owen John" (I am sure the explanation is quite unnecessary to any reader of *The Autocar*) that my humorous reference to the "Zedel" car was intended to convey to him that some of us resent the gratuitous advertising of a journalistic scribe's personal proclivities.

I am glad to welcome his chastened and apologetic tone—long may it continue! His apology does not, however, cover the whole of his misstatements. For the rest "Owen John" stands self-condemned as a person who writes reckless, misleading diatribes, and who, when tackled on them, takes refuge weakly in idle and personal banalities.

"Owen John's" remarks have received at the hands of his critics more attention than their intrinsic merits deserve; but unluckily the casual reader does not know that he speaks without authority, and in some cases obviously without any real knowledge of the conditions obtaining. This must be my excuse for having intervened at all, for there is no pleasure in meeting an adversary who is not only false to his admitted legal training, but is constitutionally incapable of fair argument.

C. McROBIE TURRELL.

**NON-SKID TYRES.**

[19421.]—We have read in last week's issue of *The Autocar* the Victor Tyre Co.'s letter, which contains a lot of irrelevant matter. We challenged the Victor Company to submit their steel-studded non-skid tyres to the Royal Automobile Club that they might be tested as to their non-skid properties, and we are glad to see that Mr. W. Yarworth Jones, in another letter, says that he "entirely agrees that the Royal Automobile Club is the one authority which should conduct such trials and tests."

Our letter was simply written in the interests of the general public, that where a claim is made for any peculiar

qualities in any automobile goods—whether it be tyres or other accessories—it should receive the imprint of this impartial tribunal.

The Kempshall Tyre Company, at their own expense, submitted their well-known non-skid tyres for a trial by the Royal Automobile Club as far back as February 18th, 1909, and we suggest that the Victor Tyre Company should submit their steel-studded non-skid tyres to an equally severe test—also at their own expense.

THE KEMPSTALL TYRE COMPANY OF EUROPE, LTD.

**ADVERTISING.**

[19422.]—Your several contributors to this exceedingly interesting and, I hope, valuable correspondence, have elaborated several of my original points and emphasised several other particular phases of importance. I do not desire this note to be in any way a criticism of their views, but merely a short summing up.

Generally, in matters of advertising, it may cheerfully be admitted that great advances have been made, but there is still ample room for greater improvement. Every step up in general effectiveness calls for the better idea, or the more skilful presentation of it, or both, if one advertisement is to stand out from the rest.

It is the more surprising, therefore, that, in some industries particularly, the advertiser is still content to waste the money spent upon buying space because he will not spend the little more that is necessary to buy brains to fill that space effectively. A huddle of dull words with a few large capitals is still very often the best he is equal to, when an extra 10% or so of his expenditure would give him the services of a man who can make the advertisement pay a hundredfold.

The man who is still unable to see the necessity for such a little additional outlay may not be able to distinguish between the good and bad "expert." There are any number of advertising "experts" whose work is no better than the work of the uneducated advertiser. Indeed, in my own knowledge, men have gone into this highly skilled business of advertising experts without a single qualification for the work, and have made a very fair living solely by trading as "experts" upon the ignorance of the advertiser—and his cupidity.

The first essential, therefore, seems to me to educate advertisers into an appreciation of the fact that parsimony in advertising is the most fatal of all business practices. They would argue that buying a valuable site and dumping rubbish on it was foolish, yet that is what they often do. Having bought valuable advertising space, make the most of it. Improve it by buying the best talent available. An extra £10 in every £100 may, and very often does, return many hundreds per cent. More money is wasted in the advertising department of business than in any other.

A firm that does not advertise in some form or another will die. That is axiomatic. The firm that wastes its money in advertising will also die a little sooner. The firm that recognises the enormous importance of its advertising department, the need for the closest attention being given to it, the necessity for the best brains being put into it, that is the firm which, other things being equal, will live and progress.

W. YARWORTH JONES.

**THE SUPPLY OF SPARES**

[19423.]—As one so often sees in *The Autocar* the growls of the annoyed and irate motorist on the suppliant and dilatory methods of motor manufacturers, I think it is only fair to have a little of the other side when it occurs. On the evening of Sunday, March 30th, I stripped one of my fibre half-time wheels, my car having run for over three years in all weathers without once having been opened out. I took the car into a friend's coachhouse at great inconvenience to him. On Monday, March 31st, at 9.30 a.m., I wired to the Sunbeam Co., at Wolverhampton, to send me a new wheel. At 3.50 p.m. of the same day I had the wheel in my hands here at Carlisle. This points to excellent organisation and method, and also prompt attention to a telegram.

C. N. ALLEN HODGSON.

**GUARANTEES.**

[19424.]—While I quite agree with "Disgusted's" letter [No. 19403], I would go further and point out the truly uselessness of the makers' so-called guarantee. Filtered down, it comes to this, that the guarantee is useless to a purchaser of a car for the simple reason that the majority of makers' guarantees are too vague. Defective material is, I own, replaced free of charge under certain conditions, but the whole crux of the matter lies in the fact that generally the

makers charge the unhappy motorist "labour and men's time." This, of course, is out of all proportion to a slight breakage, but in any case the whole labour and material should be done free of charge to the owner. Surely this ought to be the proper way of doing business.

ANOTHER DISGUSTED ONE.

#### ELECTRIC LAMP LIGHTING TESTS.

[19425.]—We are pleased to see how readily Mr. S. F. Edge picked out the weak points in the published rules of the proposed *Country Life* Cup contest for lighting sets, and every one of the suggestions so concisely stated in his letter [19392] should receive the attention it deserves in order to make the results of the competition tests of real value to motorists who drive by night, and who wish to purchase lighting sets which really have been proved to fulfil the claims made for them by the vendors.

Although we are debarred from competing by Rule 4, which says "not less than two head lights," etc., we trust that owing to our system being so well established we may be allowed to compete in spite of our obvious advantage of using only a single electric bulb as against every one else's two bulbs.

Also it is obvious that very shortly the long delayed "No Glare Bill" will have to come through, and, therefore, it would be an advantage if that were also taken into consideration at the same time, otherwise a further series of trials would be necessary under the restricted conditions imposed by the Bill.

THE DIVA HEADLIGHT CO.

#### THE BROMLEY SPEED LIMIT.

[19426.]—I am desired by the Town Council of Bromley, Kent, to ask your co-operation, by the publication of this letter in your columns, in calling the attention of owners and drivers of motor vehicles to the marked disregard of the ten miles per hour speed limit in Bromley, and also to the great lack of caution which is shown by many drivers in turning dangerous corners and passing through narrow parts of the town.

The speed limit has been in force since 1908, and hitherto the authorities have, as I feel sure all reasonable motorists will admit, exercised their powers as regards police controls with very great leniency, trusting to the good sense of motorists to drive at such a speed and with such caution as was proper under the circumstances.

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, the most stringent steps will be taken to enforce the observance of the speed limit, and as to the carrying out of the provisions of the Act relating to driving to the common danger.

W. JERMYN HARRISON, Corporation Solicitor.  
Bromley, Kent.

#### CYLINDER CLEANING.

[19427.]—I should like to tell "Red Rock" [letter 19397] my experience. He says he understands that cylinders should be cleaned every 5,000 miles. I suppose the makers of his particular engine told him this. There is no rule regulating cylinder requirements. I had a 15 h.p. Mass and drove it 36,000 miles without cleaning the cylinders, because they did not require cleaning. The pistons and rings must have been a good fit and the Filtrate oil must have been good. I sold the car six months ago and the present owner has not cleaned the cylinders yet, so he finds no fault. Then I had a 10 h.p. Mass special racing engine, and I had to clean the pistons and cylinders every 1,000 miles, sometimes I could not run 1,000 miles. I fitted new rings and could run about 2,000 miles. A Mass owner friend of mine does about 10,000 miles with the same type of engine, so I think "Red Rock's" remarks regarding 5,000 cannot be accepted as a rule. My present car has run nearly 3,000 miles and the pistons are quite clean. The 1911 type of Mass engine was a very dirty engine, but I never owned one of these.

J. M. BELLAIRS.

[19428.]—I presume your correspondent, "Red Rock" [19397] refers to letter 19251, in which I stated that my present car had run 26,000 miles without having had the cylinders cleaned or the engine touched in any way. A few years ago I should have agreed with his suggestion that engines should be scraped at least every 5,000 miles, though probably I should have avoided his curious analogy. As my statement has brought me several letters and an interesting

point has been raised, I should like to mention that the car to which I referred is a three-year-old 15 h.p. S.K. Daimler. As stated, at 15,000 miles I took off the head of the rear cylinder, not because there were any signs of sluggishness or preignition, but merely because I had driven poppet valve engines for so many years that I had acquired the habit of scraping my cylinders frequently in order to retain that quality in running which is so desirable to the discriminating driver. When the cylinder head came off the combustion chamber was found to be quite clean. There was just the slightest trace of soot and a spot of carbonised oil about the size of a shilling in the concave top of the piston. Certainly there was nothing worth scraping, and I replaced the cylinder head without attempting to touch it. Incidentally the whole job took less than an hour, there being nothing to dismantle before lifting the head, a most practical feature about this engine. Since my previous letter I have completed a further 2,000 miles, and as the engine still runs sweetly, and there is not the slightest sign of preignition, I conclude there is no serious deposit even after 28,000 miles. Other owners to whom I have spoken have also testified to this curious quality of cleanliness in the sleeve valve engine, one man telling me that he had run 22,000 miles before scraping out his cylinders. Perhaps the explanation lies in the spherical form of the combustion chamber and in some property of the sleeve port, whereby the oil passes out with the exhaust instead of adhering to the head, for like most of the early Knight engines this one smokes badly. Whatever the explanation, the fact of this engine having completed this mileage without attention other than filling up with oil should cause "Red Rock" to reconsider his suggestion as to the "proper" treatment of engines. Surely the proper interval between cleanings should depend upon the amount of deposit accumulated by the engine?

I do not for a moment wish to suggest that this 15 h.p. Daimler is a perfect car. All cars are compromises, and this particular compromise has plenty of weak points. On the road the steering soon becomes stiff owing to the steering heads not being fitted with ball thrust rings. The gear lever requires exceedingly adroit manipulation. The dual ignition is flimsy and unsatisfactory, for the coil is practically useless, but as the magneto always functions with efficiency and despatch, and the contact points remain absolutely unworn, I cannot be very severe with it. But as far as the engine is concerned, it comes within measurable distance of perfection, and I hope to run it many thousands of miles yet before curiosity overcomes a natural inclination to let excellent alone.

DONALD STRAKER.

#### THE TRAINING OF AUTOMOBILE ENGINEERS

[19429.]—Engineering is such a fascinating profession, and entails so much experience, that a boy ought to consider whether he will be content to live on a mechanic's wage after his apprenticeship is finished before he obtains an important position.

There is naturally a limited number of responsible positions, and an apprentice cannot expect to become a works manager all at once. It is an up-hill fight, and hardly seems worth the outlay that a premium apprentice's father has to make.

The ordinary workman has a dislike for pupils, because he knows the learner will suck his brains and learn all he can, whilst he (the workman) gets nothing for his pains in acting as tutor. The premium is paid to the firm, and how many firms pay a little bonus to the workman for teaching? Not many, I am afraid.

My own experience may perhaps be interesting.

I became a pupil, or premium apprentice, and when I started I had to meet much opposition from the men. Foremen and men alike would not teach me, and I had to show them that I was really willing to be of use, and to work hard before they would interest themselves in me. Hard work and much "footing money" were needed.

When I was placed under a charge hand with a gang of men I had all the dirty jobs and the worst ones to do. The men seemed to delight in seeing me dirty. However, when the foreman became interested I had several decent jobs, but this was a long time after the start, and, in the meantime, I had practically become discouraged. I had to get up at five o'clock in the morning, and did not reach home until nine o'clock in the evening. This did not allow any time for study.

However, I kept a record of all the jobs given me to do, the time I did them in, and the time allowed a full pay man to do for the same work. We worked a bonus system, and my wages were 2s. 6d. per week, plus the bonus, but no pay for overtime.

## Correspondence.

After two years I was given charge of a Gisholt turret lathe. The workmen were very sarcastic. They put labels on my machine to inform me there were forty-nine oil holes to be oiled every day before starting work. I believe they would have been pleased to have seen the machine seize, but I was careful not to let this happen, and I was soon getting good work.

Series of 500 pieces were common, but I never grumbled about too much repetition and not being able to learn; in fact, I made it a practice to try and beat all other times on the job. I was looked upon as fairly efficient, and was given charge of several automatic machines. The workmen told me I ought not to have accepted this, as I was robbing a good man of a job. This did not trouble me, as I was determined to get on and learn all I could. I had shown the foreman that I could be trusted to do a job without supervision, and he gave me much valuable advice, but the workmen still continued their opposition, and this lasted throughout my training of six years.

Then came the day when I was a real workman, able to do any job, and I looked round for a good berth. On seeing nothing immediately promising I went for a three years' study of engineering in France. I should advise all young fellows to have a short period in France or Germany, both if possible, before fixing in a responsible berth.

Now came a period of anxiety. Was I to become a skilled mechanic earning £2 per week, or should I try for something higher? I applied for several good positions, but was told I had not had sufficient experience, or was too young. I thought otherwise, and kept on the look out, in the meantime working as a fully paid skilled man. I had good luck, and was appointed automatic machine expert to a firm of machine tool makers.

Maybe I was lucky. I wonder what becomes of the hundreds of young fellows who have been pupils. They all cannot become head men in a year or so after finishing their training. I think before boys start in engineering they ought seriously to consider whether they will be content to work either as a skilled mechanic or draughtsman until their chance comes along.

Most premium pupils come from good families, and have had a good education, and I think ought to be given facilities for keeping up their studies. Not many works allow their pupils to attend classes, but look upon them as a profit-earning part of their staff.

Although many pupils simply idle their time away, those who mean business can easily be picked out, and ought to be encouraged.

The system of training engineers in France is really better than that which obtains in England. In Paris there is a large school equipped in a most up-to-date manner, called "Les Arts et Métiers."

All young men who wish to become engineers attend this school, and have to work exactly as if they were in a large works. They start at 5 a.m., and work in the shops until 9 a.m. Then rest until 12 a.m., 12-1 lunch, and then a period until 4 p.m. for classes—civil, mechanical, and automobile—and now, I believe, aviation; from 4-9 they work again in the shops, and lights are out at 10.

This period of training lasts for five years, and the men who come out in the examinations amongst the first 100 are generally given good salaries in engineering or manufacturing concerns.

It may be interesting to note that nearly all the best French engineers come from this school. M. Eiffel, who built the famous Tower, was a student. M. Coatalen, the Sunbeam designer, and M. Sabatier, the Bayard dirigible designer, both came out of this school. In fact, French engineers may all be said to have had their training in this school, which is looked upon as *the* school.

There is no system of premium apprentices at all in France. Really, I think the system of premium apprentices in England is very often regarded as a way of intruding capital into a concern without having to pay dividends upon it.

There are not many pupils who, after having paid £200 to learn, after five years have had their money's worth. I may be criticised by people who will say, "It depends on the boy to learn." It does to a large extent, but so many things happen to discourage the budding engineer that it is not all his fault if he wonders at times whether engineering is worth sticking to. The life is hard, very hard, for a youngster who has just left school.

My advice to a young fellow is to try and become one of the men, to show them that he is capable of hard work, not to grumble, but to appreciate the little things that the other workmen do for him.

HARRY WOOLLEN.

## FACILITIES FOR JACKING UP A CAR.

[19430].—With all the improvement in details that has taken place during the last few years in connection with motors and motoring, there is one simple thing in my opinion that manufacturers seem to have completely overlooked, and it might be worth the consideration of some of them in the future. I refer to the difficulty of "jacking up." I have a well known make of car with everything, so far as I can see, well thought out, but what should be quite a simple affair is a bit of a nightmare. There is not a single place where one can find a lodgment for the head of the jack to raise the back wheels. Stay rods are drawn right across from one side to the other, passing under the differential, and with brake connections, etc., in the way, it is impossible to hit on a suitable spot to put the head of the jack on. I look upon this as a somewhat serious matter, because, nowadays, a very large percentage of cars have detachable wheels, and it is particularly risky to take off a back wheel, leaving the car supported perhaps on about a quarter of an inch of metal. I fancy the manufacturer who placed a couple of suitable projections (they need not be large) in such positions that the jack head would safely rest under them would gain the thanks of the motorist, not only through a feeling of safety for his car when a wheel is detached, but also for saving him the trouble of having to crawl under the car in an endeavour to find some suitable place of support. G 789.

## MANNERS.

[19431].—I was drawn up outside a drapers' shop on the steep slope of Guildford High Street. Suddenly there were shouts and yells, and my car was jerked downhill two or three feet by a severe blow at the rear. Apparently what had happened was that a big car higher up the hill had been deserted by its chauffeur; the brakes slipped, and the car started backwards downhill and collided with mine. I alighted, and found considerable damage at the back of my car—one mudguard crumpled up; lamp bracket bent, and spare wheel carrier bent. (A sprag on the other car would have prevented its running backwards.) I asked the chauffeur where his master was. He said, "In the shop." I waited till he came out, and then in perfect good faith and under the impression that he was the owner of the car, I told him what had occurred, and asked him to see the damage done to my car. He replied that "He didn't care a ——— what had happened to my car, that the car wasn't his, and that if I wanted the name of the owners I could find it out for myself"! I learned from a bystander that he was a traveller employed by a commercial firm to travel round with their material. Apparently travelling in a hired car had caused him to suffer from swelled head. He refused even to examine my car, but turned his back on me, and left his unfortunate driver to give me what details he could.

H. W. MERRAT.

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## Flashes.

A competition of lamps and head lights for motor cars is shortly to be held by the Association Automobile de Belgique.

\* \* \*

A proposal to organise a competition for the best means of utilising paraffin in the engines of motor vehicles without requiring the assistance of petrol for starting purposes has been submitted to the French Automobile Club by the Chambre Syndicale de l'Industrie du Pétrole, which latter body will offer two prizes of £200 and £10 respectively in connection with the event.

\* \* \*

The new American Tariff Bill, which was introduced on Monday last to the House of Representatives, provides, amongst other things, for a reduction of the present duty upon motor cars and motor cycles imported into the United States from 45% to 40%.

\* \* \*

According to a booklet recently issued by Messrs. Knight and Kilbourne, of Chicago, there are now twenty-six motor firms using the Knight slide valve engine—three British, four American, one Canadian, two Austrian, two Belgian, nine French, four German, and one Swiss.

\* \* \*

It is very pleasant in these days of strenuous competition to learn that an interchange of courtesies has taken place between two leading motor manufacturers of England and France, *i.e.*, Messrs. Rolls-Royce and Messrs. Delaunay-Belleville of Paris. It

was mutually arranged between the two firms that representatives of the Delaunay-Belleville Co. should visit the Rolls-Royce works, and that the representatives of the Rolls-Royce Co. were to be made equally welcome to inspect the works and the construction of the Delaunay-Belleville chassis. This exchange of visits duly took place during the latter part of March.



Villagers drawing the car of Mr. John Cullinan, M.P., and his bride, on the occasion of their recent wedding.

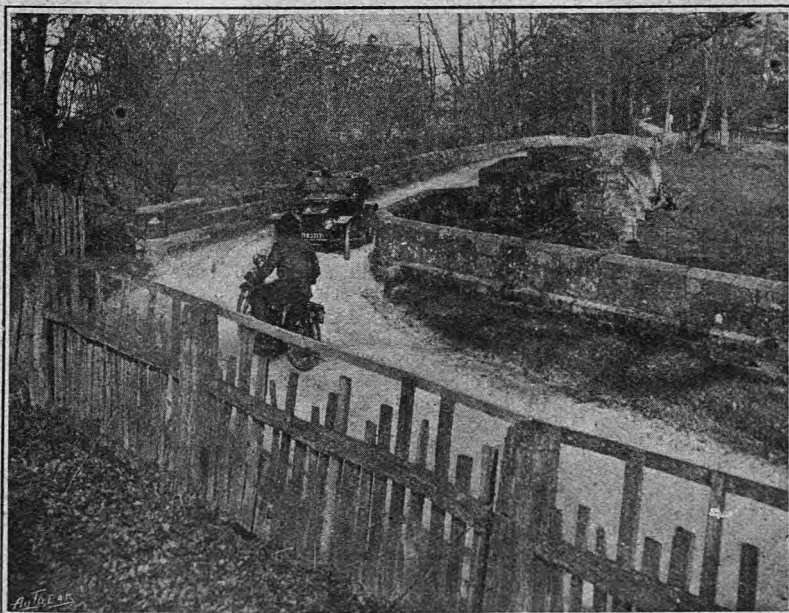
Such an interchange of visits can only prove of material benefit, and it is an exceptionally broad policy to adopt—the one country to ascertain what is to be learned from the other; the result should certainly be of benefit to the future purchasers of either make.

\* \* \*

Two hundred yards of the London Road at Bromley, Kent, was re-metalled, rolled in, and the work completed in three hours one afternoon last week. To accomplish this smart piece of work a steam tipping waggon with the new metal, and three steam rollers were engaged, besides the necessary manual labour. It is claimed to be a record for a Kent road repair.

\* \* \*

Recently one of the daily papers calculated that a man smoked on an average ten cigarettes per day, during working hours in France. Reckoning five minutes to prepare the paper, the tobacco, and roll the cigarette, this meant fifty minutes lost to the man and to the master. In works employing 1,000 men, 50% of whom smoke (which is greatly below the average) it is easy to realise the loss of time from this cause alone. It has been said that the effort to introduce the Taylor Timing System into French works, and which resulted in a strike at the Renault works from February 10th to March 22nd, was made with a view of stopping smoking during working hours, which habit is tolerated in practically all the workshops and offices throughout the country.



A dangerous corner on the Leamington-Stoneleigh Road, the approach to which badly needs the attention of the Road Board. There is barely room for two cars to pass, whilst it is impossible to pass on the bridge itself, but this would not matter if the approach were straightened out. The Premier miniature car seen on the bridge and the motor bicycle, occupy practically the whole of the road.

## 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. 2616.—Carburettor for 14-16 Belsize.

My 14-16 h.p. Belsize is a late 1911 pattern. By carefully tuning the original carburettor I used to get 17 m.p.g.—very occasionally 18. I recently fitted a Smith carburettor, four jets, and the results astonished me. On one occasion I got 33 m.p.g. on a sixty-mile run, after very careful tuning and driving. My general average now in all weathers is 27 to 28 m.p.g., including stops and town traffic.—J. BRUCE PAYNE.

#### No. 2610.—20 h.p. Ford.

I can mention several Fords that have done two years' good work without replacements, and saw one that had done 85,000 miles hire work with no general replacements. The lack of intermediate gear is practically never felt. It is a very easy car to drive in traffic. I have just done 330 miles in Devon, Somerset, and Dorset, averaging 25 m.p.g.; 1913 two-seater, two people and luggage, and only three times used the low gear. Keep to 25 m.p.h. or less on the flat and you will have no trouble. Always turn off the petrol in the garage, as there is much loss from evaporation if this be not done.—FORD USER.

#### No. 2620.—Hollings's Easy Starter.

My experience after fitting Hollings's easy starter was that the engine ran better with the air tap open, and the petrol consumption was between 5 and 10 m.p.g. further. No trouble in re-starting if the air tap is closed for a few seconds. The maker is T. E. Hollings, Motor Garage, Heysham Road, Morecambe.—F. C. CARPENTER.

I have had this fitment on my last two cars and would not care to be without it. Does the writer of Query No. 2620 inject petrol from it to cylinders when engine is hot when he wishes to start? If so, the mixture is probably too strong. Let him shut off air tap just before stopping his engine, then, without running petrol into the cylinders, try to start the engine in the ordinary way with the air tap shut, and he will have no difficulty.—CAPTAIN.

#### No. 2533.—11.9 h.p. Arrol-Johnston.

As a medical user of an 11.9 h.p. Arrol-Johnston, 1912 model, I can speak in the highest terms of this car. I have had a two-seater car for a year, and during this time I have not had the slightest trouble. The car has always been ready whenever I have gone for it, day or night, and it has unfailingly taken me there and back wherever I wanted to go without the slightest hitch. It has done now between 4,000 and 5,000 miles in one of the hilliest parts of a Yorkshire country district, and is a splendid hill-climber, as of the four gears the lowest is very rarely touched except for starting. Except for doing the usual things to keep a car in good running order (washing out clutch,

cleaning plugs, and letting out dirty oil), nothing in the car has been touched, and I consider it to be a first-class article made of good stuff, and a handsome and substantial-looking car with artistic lines. The petrol consumption averages 25 m.p.g., and I am still using the original tyres, which have a few thousand miles wear in them yet. Except for washing, I look after the car entirely myself, and everything is most accessible. The Arrol-Johnston firm is a delightful one to deal with, and periodically sends a man to look over my car, free of charge.—SCALPEL.

#### No. 2611.—New 10 h.p. Swift.

I purchased a 10 h.p. Swift car at the beginning of the year, and am thoroughly satisfied with it. The Longemare carburettor is most excellent, giving 36 m.p.g., and the oiling arrangement to the engine is no trouble whatever. The running of the car is quiet, speedy, and comfortable; 40 m.p.h. easily obtainable. I was highly delighted with the manner Messrs. Lookers' representative attended to the car, no pains being spared to make everything to my entire satisfaction, and now I could wish to have nothing better. I have used petrol, benzole, and mixtures of both without touching the carburettor, and find the running quite all right. The usual disclaimer.—JOHN BERRY.

#### No. 2617.—Brake Lining.

I removed the metal brake linings from the rear wheels of my 15 h.p. 1911 Crossley a few weeks since and lined the brake drums with  $\frac{1}{8}$  in. Raybestos. The brakes now are much less harsh when applied, but I cannot stop the car as promptly as before with the metal-to-metal, and if the car is stopped on a steep incline the brakes cannot be relied on to hold it stationary, if left unattended. As far as I can judge up to now, Raybestos wears very well. I lined the drums and not the shoes, as I found there was not sufficient room to allow for the Raybestos without either taking metal off the shoes or removing the old metal linings and braking direct on the brake drums.—ANOTHER CROSSLEY OWNER.

#### No. 2615.—18-20 h.p. R.M.C. Car.

In reply to "H.W.," I have had an 18-20 h.p. R.M.C. two-seater since July, 1911, and have covered over 20,000 miles. In town I find the petrol consumption to be 18 to 20 m.p.g., but on long runs 25 m.p.g. I use Vacuum A oil, the consumption being about 500 to 600 m.p.g. The average mileage for eight covers, including two non-skids (all Michelin), is 6,930 miles per cover, used partly on front and partly on back wheels. The car does not skid; in fact I have run all this winter without a steel-studded cover on at all. Messrs. Sea-brook are good people to deal with; I have had no waiting for spares. The carburettor is easily adjusted, even while the engine is running. The cars are excellent hill-climbers (Netherhall

Gardens on second). I am so thoroughly satisfied with the standard carburettor that I would not change it for any other on the market. I have my cylinders cleaned by the oxygen process every 4,000 or 5,000 miles. The car was overhauled after 18,000 miles, the necessary replacements costing about £3. It now runs as well and quietly as ever. The car has been twice driven to Scotland, and, last August, from London to Carlisle via the North Road and Scotch Corner in less than fourteen hours, including all stops for meals, with two up and luggage. While in the North, it climbed Cairn-o'-Mount with four up quite easily. The usual disclaimer.—LA 8201.

### QUERIES.

#### No. 2635.—11.9 h.p. Phoenix.

WILL any reader give me his experience of this car, with special reference to its hill-climbing ability and reliability?—YORK.

#### No. 2636.—Ever Ready Tyre Jack.

WILL any user of the Ever Ready tyre jack kindly say if it does all the makers claim?—C. JAGO.

#### No. 2637.—Shock Absorbers on Ford Car.

CAN any of your readers give me any information re shock absorbers on a Ford car; if they are practicable; also any particular make?—G.C.

#### No. 2638.—Zenith Carburettor for Overland Car.

I WOULD be glad if any of your readers who have fitted a Zenith carburettor to an Overland car would give me their experiences, particularly as regards petrol consumption.—R.C.H.

#### No. 2639.—Dry Cell for Starting a Ford.

COULD any of your readers who have tried it tell me if a dry cell is of any help for starting up a Ford car? What size make recommended? Mine is the 1913 car.—X.F.

#### No. 2640.—Benzole in Daimler Seven Jet Carburettor.

I SHOULD be glad if any reader who has used benzole in the new Daimler seven jet carburettor, 1913, will give me his experience of its efficiency, and where he obtained it from.—D. F. HOGAN.

#### No. 2641.—New Pick Car.

CAN any reader say if the New Pick is a suitable car for use as a conveyance for a commercial traveller, who would require to carry a quantity of light samples? Would chassis be suitable to carry light delivery van? Any information as to tyre life and petrol consumption will be appreciated.—C.

#### No. 2642.—Spyker Cars.

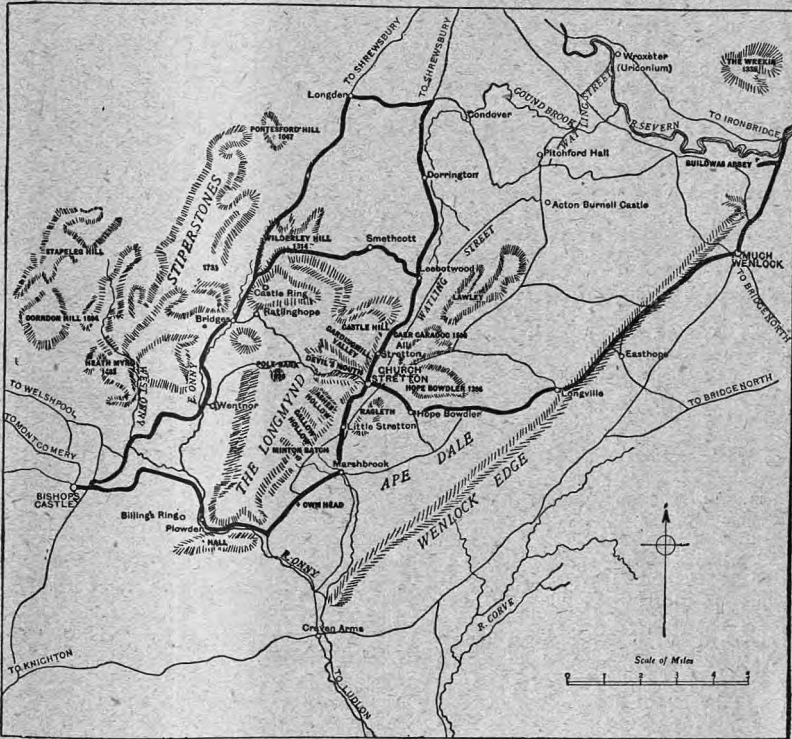
DURING a pull-up at the Hut at Wisley the other day for lunch, I noticed a Spyker car standing with the engine running. As the engine was almost inaudible an argument arose as to whether it was of the valveless type or not, and I was assured by a friend that the silence of the car is due to a patented valve gear, which appears to be driven by worm. As I was much struck by the car, I should be glad if any of your readers, who have had practical experience with this type of Spyker car, could give me any information as to its efficiency and reliability, and whether it maintains its silence and pulling properties.—CURIOUS.

# Week-end and Touring Notes.

The Longmynd and Wenlock Edge. By John Lloyd Warden Page.

"Are there any banks at Church Stretton?" I asked of a man as I passed up the valley from Ludlow. "Ay," he replied, looking surprised, "there are several." I looked surprised, too, for Church Stretton is but a small place. "I want to change a five-pound note," I said. He grinned broadly.

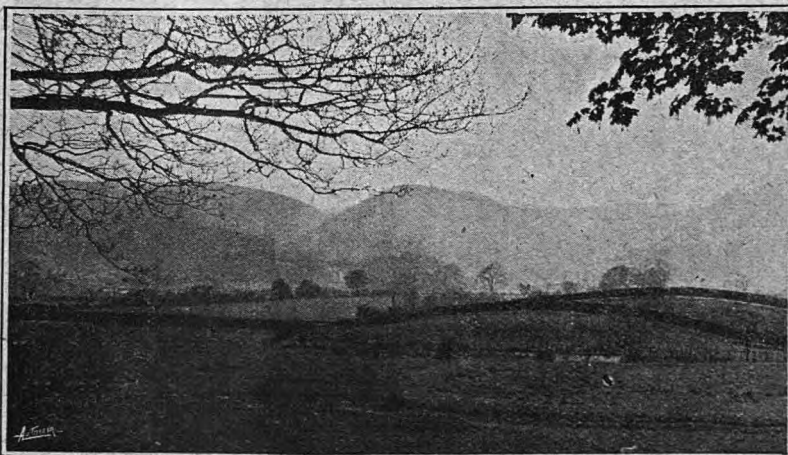
I changed my five-pound note at a bank financial, and, with a doubtful eye at the other bank overhead, started northward. For a few miles the road was all that could be desired. It is the excellent Shrewsbury Road—wide, gently undulating, with a grand surface, altogether excellent. I came



"Ay," said he, "but I thought ye meant hills—there are lots." And there were.

For Church Stretton lies at the foot of the Longmynd—the Long Mountain—and "banks" are indeed numerous. You cannot get round it without encountering many; you cannot get over it without —. But of the crossing of the Longmynd in due course. The "banks" are "banks" with a vengeance.

first to All Stretton, a pretty village embowered in trees at the very foot of the hills, one of which is crowned by an earthwork supposed to be of the Saxon period, or even earlier. There are many of these "camps" on the Longmynd (which is a range rather than a single mountain), and their presence is explained by its position so near the Welsh border. This Castle Hill looks down upon the Batch, one of the numerous valleys or "hollows"



The Longmynd. Church Stretton is at the foot of the range.

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- 18-28 h.p. British Clement Torpedo Touring Car,** painted dark red, fitted with Cape hood, windscreen, Sankey detachable steel wheels with two spares and tyres, full equipment of acetylene head lamps, etc. .... **£325**

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## Week-end and Touring Notes (Continued).

that everywhere cut into the Longmynd, deep glens of great wildness and beauty, here wooded, there bare.

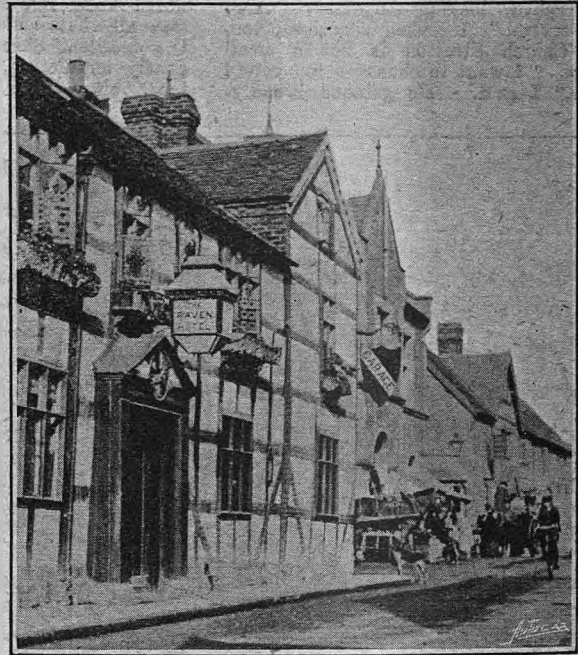
Across the valley rose the great rocky hill of Caer Caradoc, which some suppose to have been the scene of the British King Caradoc against the forces of the Roman general Ostorius Scapula. It is a moot point, however, whether the battle did not take place near the Breidden Hills far away to the North. Some even favour the great earthwork on the Herefordshire Beacon—one of the Malverns. Anyhow, Caer Caradoc, as its name implies, is crowned by a Celtic caer or camp, an enclosure surrounded by a double bank and ditches. And there is a cave in which the country folk say Caradoc hid, though a ruthless archæologist opines that it has "an aspect comparatively modern." This Caradoc is, of course, Caractacus of our school days—the king who, when taken captive to Rome, so wrought upon the feelings of the Emperor that he was set at liberty.

Beneath it is the Roman road known as Watling Street, parallel to which runs our road at a distance of less than half a mile. In fact, part of this ancient highway runs through Church Stretton itself, and, till quite recently, was a picturesque lane. But, alas! modern improvements have almost improved it out of existence, and I found it fringed by villas and lodging houses, while the road itself was in process of kerbing and channelling—a very chaos, and quite impassable to motor cars.

To this modernised Watling Street the village of All Stretton is a delightful contrast, with its steep hillside dropping almost on to the roofs of the cottages, and its quaint half-timbered Travellers' Lodging House.

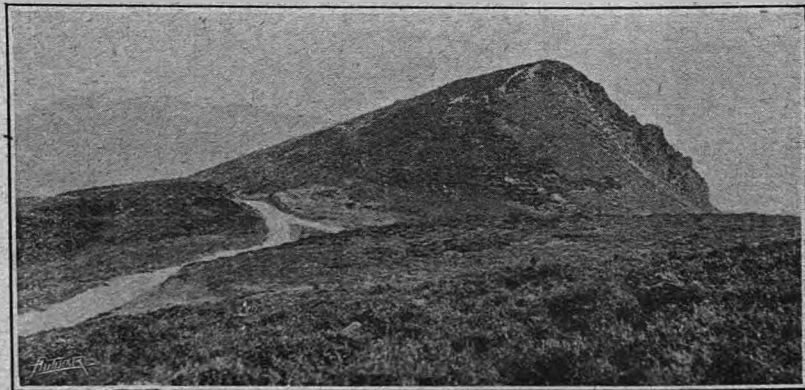
Three miles further comes Leebotwood, with an ancient inn by the roadside, and at this inn you must make

up your mind whether or not to take the short cut over the northern end of the hills by way of Smethcott. The board at the turning is not encouraging, for it announces that the road is unfit for motor cars. However, I, who



A picturesque inn, Church Stretton.

have been over it (though not in a car), scarcely agree with this. Narrow it certainly is, but as far as Picklescote, half the distance, the surface is quite good; indeed, only the ascent of Wilderley Hill is rough. From Wilderley Hill, where there is another earthwork, it drops abruptly into the Shrewsbury-Knighton highway, the fine road skirting the base of the hills, and there is a gate just round a bend near the bottom which is invisible fifty yards away. On the whole, perhaps motor cars had better stick to the excellent Ludlow-Shrewsbury Road to a little beyond Dorrington village, whence a better road runs across to the western side. Do not, however, omit a visit to Condover Hall, an Elizabethan mansion a couple of miles beyond, while a *détour* of another mile or two might well be made to the fine half-timbered hall of Pitchford and the ruined thirteenth



The Devil's Mouth, Longmynd.

**Week-end and Touring Notes** (Continued).

century manor house of Acton Burnell on the Watling Street. From Condover Station a road will take you in a very few minutes into the western highway at Longden, whence your way lies plain before your face.

it was when Caractacus strove with Ostorius—if he ever did—in the valley yonder.

At a point where a finger-post appears the Port Way comes in. The Port Way is a British trackway run-



The road up Wenlock Edge (Caer Caradoc in the distance).

The western road, which is very good, threads a pleasant pastoral valley. Over it on the one hand towers the Longmynd; on the other rises the ridge crowned by the tors called Stiperstones. Presently you strike the East Onny rivulet and come to Bridges—an inn with a farm or two. Here the mountain road to the left starts to climb the Longmynd. And it is not a road to be taken delicately. After passing the minute tree-embowered hamlet of Ratlinghope (which the natives call *Ratchup*) it struggles desperately upwards to the moors. The surface is at first hard and firm, but after reaching unenclosed country it becomes rough and loose. Below lies the deep glen of Bilbatch with its stream and pools; above, nearly 1,700ft. above the sea, the Pole, a post marking the summit of the range, stands out against the sky. The road improves and is fair across the tableland beneath the Pole, while

ning the whole length of the range between Castle Hill, an earthwork above Leebotwood, and Billings Ring, another ancient stronghold near Plowden. It is only just hereabouts that the old road is much more than a cart track, a double furrow winding through whortleberry and heather. It is certainly not for motorists, but the pedestrian who follows its meanderings will have his reward. For, as Miss Adeline Cooke says, "There is something peculiarly fascinating about this solitary British trackway running along and aloof over the summit of a mighty ridge. It seems to have lost its history with those past ages which have gone down into the great silence. There it lies, and no man can tell its story. But ever it is companied about with the tragedy of life and leath. Pleasant in summer, the Longmynd is full perilous when sudden mists and frequent snowstorms sweep across its shelterless expanse. So many have



Cardingmill Valley.

the view eastward leaves little to be desired. Lawley Hill, Caradoc, and Hope Bowdler rise boldly; beyond, a glimpse is caught of the long ridge of Wenlock Edge. At one's very feet yawn deep *cwm*s; not a tree is to be seen. All is wild moor, very much as

perished returning homewards across the ridge that the last fair held at Church Stretton on November 29th is locally called 'Dead Man's Fair.' It is not so much that the farmers lose their way and fall down the precipitous passes, but that the violence

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**CHAS. CLARK & SON, Ltd.,  
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have the following really good Second-hand Cars for disposal, most of them will be fully guaranteed for two years:—

- 12-16 h.p. Sunbeam** landaulette, quite equal to new .. £350
- 12-16 h.p. Sunbeam**, flush-sided body. Fully guaranteed ..... £200
- 12-16 h.p. Wolseley** landaulette, Sankey detachable wheels, all latest improvements ..... £325
- 12-16 h.p. Sunbeam**, flush-sided body, hood, screen, and all accessories ..... £275
- 12-16 h.p. Sunbeam**, flush-sided body, hood, screen, and all accessories ..... £225
- 16-20 h.p. Wolseley**, perfect condition, hood, screen, etc. £250
- 8 h.p. De Dion**, four-seated body, hood, screen; splendid running order ..... £50
- 14-20 h.p. Wolseley**, just been thoroughly overhauled, as new ..... £235
- 20-25 h.p. Overland**, 1913, only run 500 miles, cost £235 in December ..... £180
- 15-9 h.p. Rover**, dual ignition, guarantee as new ..... £225
- 10-12 h.p. Alldays**, with two-seated body, high doors, leather hood, only run 1,000 miles ..... £150
- 10-12 h.p. 4-cyl. Renault** new, with two-seater body, very low price.
- 8 h.p. Rover**, hood and screen £50
- 8 h.p. Rover**, four-seated body, hood and screen ..... £50
- 8 h.p. Rover**, two-seater, hood and screen ..... £69
- 12-16 h.p. Clement-Talbot**, in good running order, five-seated body ..... £90

**Week-end and Touring Notes** (Continued).

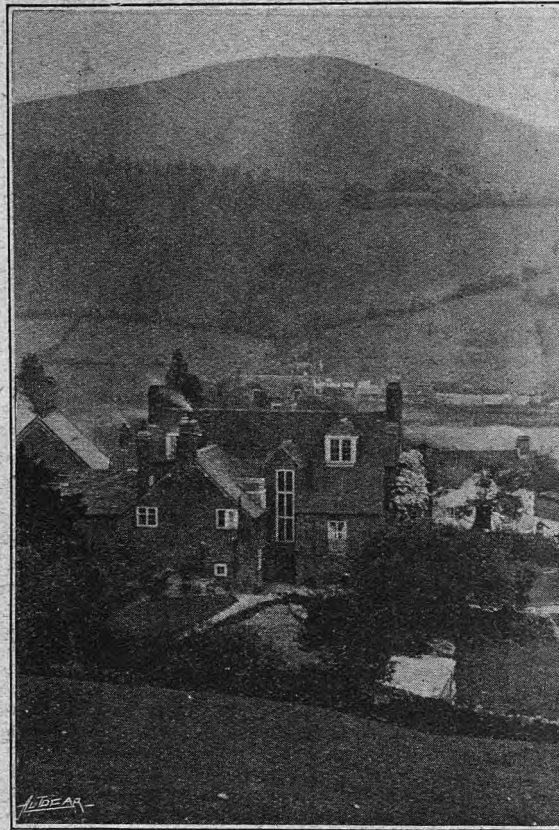
of the tempest is such that they are unable to proceed, and die from sheer fatigue. Oddly enough, the signpost seems to be where they go astray, and here the full force of the wind is

rocky peak. On either hand are deep glens—Town Brook Hollow on the right, Cardingmill on the left. Between these is the steep descent of the Burway, a rather fearsome thing with a gradient of about one in seven. This road, it is perhaps needless to say, is not much in favour with motorists; but the local medicine man makes nought of it. I have been twice over it on a bicycle, and I have been many times up and down the hills of Porlock and Countisbury, where you will see motorists by the score, and I can only say that the Burway has a much better surface than the former, and that the ascent from Ratlinghope is neither as long nor as steep as the latter. As for the other road across the Longmynd—that coming up from Wentnor and passing the other side of the Pole—I am told that it is worse.

To return to the western road. Eight miles or so from Bridges the road, swinging to the right, enters the little town of Bishop's Castle. Here is a rather quaint sandstone town hall and market house and one or two half-timbered houses.

The road back to Church Stretton follows the Onny, which flows down a delightful wooded vale to Plowden, half a dozen scattered cottages at the very foot of the hills. Up above the trees, climbing the green slopes the Port Way may be traced very plainly, its course marked by tall posts. In a dip under the woods lies Plowden Hall, an interesting half-timbered mansion, home of a kinsman of the humorous police magistrate.

From Plowden I ran over the feet of the hills and, turning their flank, mounted a long easy ascent with woods on one side and a semi-moorland valley on the other, to the lonely church of Cwm Head. There followed a swift descent to Marshbrook village, about which the glens again opened out from the very heart of the Longmynd; Minton Batch, Callow Hollow, and Ashes

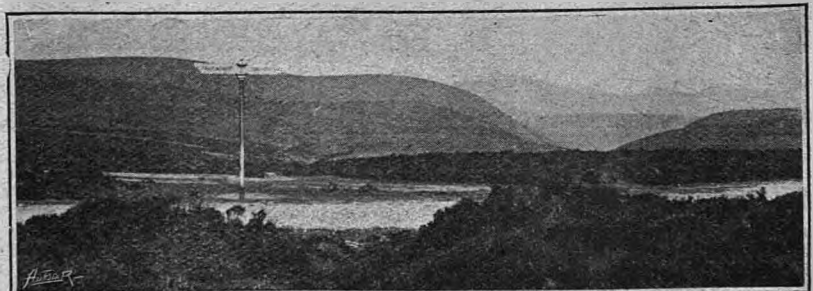


Little Stretton and Ragleth Hill.

met. Many a gruesome tale the cottagers will relate and you listen, and terrible indeed looms the Longmynd before the recital is half finished."

One who nearly fell a victim was the parson of Woolstaston. Overtaken by a blizzard as he was returning from Ratlinghope, he wandered about the Longmynd the whole night, till his sodden shoes fell from his feet. Death seemed very near when he struck the Cardingmill Valley, an apparition so wan that the children fled at his approach. One, however, recognised him, and he was rescued from a state of exhaustion that would have soon proved fatal.

From an elevation which must be at least 1,500ft. above the sea, the road descends to the Devil's Mouth, a cutting beneath the shadow of a



The stony road over the Longmynd.



**Week-end and Touring Notes** (Continued).

Hollow following in quick succession. The latter, with its waterfall, is, perhaps, the finest and most like a gorge. The approach is through Little Stretton, a picturesque village at its very mouth, and a car may be driven to the foot-bridge in the shadow of the hills. Hence a stile gives access to a foot-path winding along the banks of a stream half hidden by wooded banks.

(To be concluded.)

At the end of the path comes the gorge closed at its upper end by the seventeen hundred steep of the Longmynd summit.

Over Little Stretton rises Ragleth Hill, a lofty green cone. Further up the valley Caradoc and Lawley appear once more, and with their ever increasing bulk filling the eye the road enters Church Stretton and the tour round the Longmynd is complete.

**Flashes** (Continued).

On Friday last week the sixth annual dinner of the staff of the Dunlop Co. was held at the Midland Hotel, Birmingham. In the absence of Mr. Arthur du Cros, M.P., the chair was occupied by Mr. M. Egan, the Birmingham manager.

The County Chemical Co., Ltd., Chemico Works, Bradford Street, Birmingham, who have now had Chemico car polish upon the market for some time past, and never ceased laboratory experiments to improve it, consider that they have now attained the perfect polish, which they claim will remove all dirt, grease, smears, and dulness from bodywork. The original mirror-like surface will, it is claimed, be restored to a condition equal to new, with the additional advantage that the treated surface will be found to be harder and less susceptible to soiling than before. The County Chemical Co., Ltd., are so confident of the success of the new polish that they will be pleased to send a sample to any of our readers on receipt of a request.

The 25 h.p. Talbot car supplied to Mr. F. C. Garrick, of Roughwood Croft, Chalfont St. Giles, Bucks, which was illustrated in *The Autocar* recently, was supplied by Messrs. H. Wilkinson and Son, of High Street, Uxbridge, who were also responsible for the building of the limousine bodywork.

Two Calthorpe cars have been selected by the New Zealand Government from out of a large number of makes which were also considered for the conveyance of Government officials to and from Christchurch and Lake Coleridge. The cars are fitted with 40in Rudge-Whitworth detachable wire wheels.

We are informed that arrangements have been made by which the R.C.H. cars, for which Messrs. Byrom and Co., of 85, Great Portland Street, London, W., are sole concessionaires in this country, can now be supplied equipped with the "En Route" dynamo, marketed by the Motor Accessories Co., of 55, Great Marlborough Street, London, W.

**Catalogues and Booklets Received.**

We have received a copy of an interesting catalogue descriptive of the Oakland cars for 1913. The car is of American origin, coming from Pontiac, Michigan, but it is handled in this country by the Oakland Motor Car Co., 159, Shaftesbury Avenue, London, W.C.

The Argyll album (properly so named), the current catalogue of Argylls, Ltd., is now to hand, and any of our readers who contemplate the purchase of a new car should not fail to obtain this work in order that they may realise the many advantages offered them when purchasing an Argyll car.

Messrs. Dresser and Garle, automobile suppliers and shippers, Regent House, Regent Street, London, W., send us a copy of their "Indian Buyer's Guide," which is published at one rupee. This book is produced on the "Inclusive System" as applied to exports, and is a most complete work on the subject. All the figures have been doubly checked, and Messrs. Dresser and Garle claim that they are absolutely reliable. The quotations include: Packing, collection, delivery at docks, insurance, harbour dues, clearing, shipping, delivery at port of consignment, lighterage, dock dues, stamps, customs, and all charges.

We are in receipt of Messrs André Godin's catalogue of automobile accessories for 1913, one of the most prolific issues of its kind which has yet come to hand. This voluminous work is profusely illustrated, and the accessories are interestingly described.

The 1913 Swift catalogue just to hand is interesting and well produced. The illustrations are excellent, complete cars, chassis and parts being well dealt with in this respect. This year the Swift Co. are specialising on three-four-cylinder models, i.e., 10 h.p., 12 h.p., and 16-20 h.p., a two-cylinder 8 h.p. two-seater, and a cycle car. The latter has a two-cylinder 75x110 engine, three-speeds, and shaft drive—in fact it is a car in miniature.

The Continental Tyre and Rubber Co. (Great Britain), Ltd., of Thurloe Place, London, S.W., send us a catalogue of their 1913 models, in which are illustrated and described the Continental three-ribbed tyre, the well-known and well-tried Continental red-black steel-studded non-skid, the Continental flat tread, and the Continental leather non-skid. The Continental detachable twin wheel is also clearly described and illustrated, together with the Continental detachable rim. Ordinary wheels can be altered in two or three days to take this detachable rim.

**Taylor's Patent Number Plate.**



High-class make, polished aluminium letters fixed on black enamelled copper wire panel.

Specially suitable for fixing across radiator of car as it does not interfere with passage of air.



Easily fixed in three minutes, readily cleaned.

Its pleasing appearance improves your car.

Send number of your car and width across cooling surface of radiator.

Price, carriage paid, complete with screws for fixing, 7/6 each, supplied same day.

Also makers of solid aluminium number plates for rear of car, 7/6 each, carriage paid.

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\*Phones: Victoria 6094, Chiswick 1185.

**OPEN CARS.**

- 12 h.p. DARRACQ, 1911-12 model, Semi-torpedo.. £100
- 14-20 h.p. SIDDELEY-DEASY 1911 model, Torpedo.. £300
- 20 h.p. JUNIOR ..... Torpedo.. £125
- 12 h.p. DARRACQ Torpedo, as new... £175
- 20 h.p. STANDARD, six-cylinder 5-seater, brand new.. £250
- 12 h.p. ROVER 1912 Torpedo ..... £290
- 15-9 h.p. STAR Torpedo ..... £160
- 12 h.p. DARRACQ, 4-seater, 1912, Torpedo, new.. £285
- 14-16 h.p. DARRACQ, Semi-torpedo ... £155
- 12-16 h.p. SUNBEAM, late 1911, Torpedo £295

**TWO-SEATERS.**

- 12-14 h.p. DE DION Torpedo..... £195
- 9 h.p. DARRACQ ..... £65
- 12-20 h.p. RENAULT Torpedo ..... £190
- 10-12 h.p. BELSIZE, 1912, as new..... £195
- 10 h.p. DARRACQ, Sports type, soiled.. £180
- 12-14 h.p. METALLURGIQUE, 1910 model, Torpedo.. £210

**LANDAULETTES.**

- 14-20 h.p. RENAULT, Limousine, bargain £200
- 22 h.p. DARRACQ, Limousine, 1911, as new..... £275
- 10-12 h.p. DARRACQ, seats 4 inside ..... £100
- 20-30 h.p. NEW ORLEANS..... £150

**DARRACQ VALVELESS.**

Immediate delivery of 12 h.p. 1913 models.  
Any good cars taken in part payment.  
Above actually in stock.

## "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.		This Year.		Last Div.	Div. Payable
				Highest	Lowest.	Highest	Lowest.		
£ 2,520	1/	Abingdon-Ecco, Ltd. ....	2/9 3/3	3/-	2/3	3/3	3/-	Nil	Nov.
45,000	1/5	Alldays & Onions (£3 paid)	3 3/4	4 1/2	3 3/4	3 3/4	3 3/4	1/6	Ap/Dc
50,000	1/5	6% Cum. Pref.	5 1/2	5 3/4	5 1/2	5 1/2	5 1/2	2/6	Ap/Dc
209,802	10/-	Argylls, Ltd. ....	3/9 6/3	6/-	4/-	6/-	4/9	Nil	Dec.
150,000	1/1	Belsize Motors, Ltd. ....	25/9 26/9	28 1/2	25/-	27/6	26/-	12	My/Nv
100,000	1/1	Cum. Pref.	19/9 20/3	20/9	20/-	20/3	20/-	6	Fb/Au
44,771	1/1	Bowden Brake, Ltd. ....	2/6 3/6	7/-	3 1/2	5/-	3/-	1/-	Dec.
766,982	1/1	Birm'gham Sm'l Arms, Ltd.	47/9 48/-xd.	53/3	46/3	50/-	47/9	20	Mr/Sp
203,150	1/5	Cum. Pref.	5 1/2	5 3/4	5 1/2	5 1/2	5 1/2	5	Mr/Sp
75,000	1/5	Braunton Bros. Cum. Pref.	4 sellers	4 1/2	3 1/2	4	3 1/2	6	Oct.
100,000	1/1	Brooks, J. B., & Co. Ltd.	35/3 36/-	37/6	31/-	36/6	35/-	15	My/Nv
100,000	1/5	Cum. Pref.	5 1/2	5 3/4	5 1/2	5 1/2	5 1/2	5	My/Nv
100,000	1/5	Brown Bros. Curr. Pref.	4 1/2 bid	5	4 1/2	4 1/2	4 1/2	6	Ap/Oc
380,000	1/1	Charron Par. Pref. Ord. ...	8/9 9/3	11/6	8/-	9/6	7/9	7	Ju/Dc
200,000	1/1	Clement-Gladiator ....	3/6 4/6	3/-	1/6	6/-	2 1/2	Nil	Dec.
100,000	1/1	6% Cum. Pref.	14/- 16/-	14/9	10 1/4	15/-	12/6	6	Ju/Dc
55,000	1/1	Components, Ltd. ....	6/9 7/3	6/9	4/-	7/9	6 1/2	Nil	Dec.
25,347	1/1	7% Cum. Pref.	12/9 13/3	15/-	11 1/4	13/-	12/-	7	Dec.
275,000	1/1	Dartacq, A., & Co., Ltd. ....	12/3 13/-	18 1/4	8/9	15/-	9/9	Nil	Ju/Dc
375,000	1/1	7% Cum. Pref. Ord. ....	14/3 14/9	19 1/2	11 10/16	16/-	13/-	7	Ap/Oc
154,229	1/1	De Dion-Bouton, 7% Ord. ....	8/- 8/6	11/3	8/9	8/9	7/6	6	Dec.
1,000,000	1/1	Dunlop Rubber ....	36/9 sellers	56/9	27/6	39/6	35/6	12 1/2	Ap/Oc
200,000	1/1	Cum. Pref.	19/3 sellers	21/-	17/-	20/-	18/6	6	MJSD
312,785	1/1	Income Stock	17/6 18/-	19/-	15/6	19/-	17/6	5	Ju/Dc
624,995	1/1	Dunlop Parent Co. 8% Ord. ....	15/3 15/6	18 7/8	10/-	18/-	13/9	10	Ju/Dc
994,990	1/1	5% Cum. Pref.	13/- 18/6	16/9	10/6	15 1/2	12 7/8	5	Ju/Dc
499,962	1/1	Deferred ....	9/9 10/3	15/-	6/3	10 1/2	8/-	Nil	Ju/Dc
99,977	1/1	Enfield Cycle ....	21/- 21/3	19/9	12/9	21/9	18/-	5	Oct.
24,985	1/1	Cum. Pref.	21/6 bid	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	1/1	Humber, Ltd. (New) ....	11/- 11/9	7/6	3 7/8	14/-	6/9	Nil	Nov.
331,495	1/1	6% Cum. Pref.	16/3 16/6	11/-	6/9	17/9	10 1/2	Nil	Nov.
50,000	1/1	James Cycle ....	12/6 14/6	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	1/5	Lucas, Joseph, Ltd. ....	9 1/2	9 3/4	9	9 1/2	9 1/2	15	Ap/Nv
100,000	1/5	Cum. Pref.	5 1/2	5 3/4	5 1/2	5 1/2	5 1/2	5	Mr/Sp
73,385	1/1	New Hudson Cycle Co. ....	25/6 26/-	24/6	14/6	28/-	24/6	10	Nov.
18,033	1/1	Cum. Pref.	19/6 20/-	19/6	19/6	19/6	6	Mr/Nv	
50,000	1/1	Premier Cycle ....	5/3 5 1/4	5/-	3/-	5/6	4 1/2	15	Sept.
125,000	10/-	Cum. Pref.	8 1/2 8/3	8/9	6/9	8/3	7/3	7 1/2	Sept.
31,000	1/1	Riley (Coventry), Ltd. ....	6/9 7/-	8/9	5/3	7 1/4	5/3	Nil	Feb.
200,000	1/1	Rolls-Royce ....	41/0 sellers	47/3	36/3	48/6	44/6	30	Ju/Ju
138,662	1/1	Rover ....	39/- 39/6	31/3	12/6	40/-	39/9	10	Nov.
100,000	1/1	Rudge-Whitworth, Ltd. ....	24/- 24/6	24/-	15/-	25/3	22/6	5	Oct.
100,000	1/5	6% Cum. Pref.	3 1/2 4	5 1/2	3 3/4	4	3 3/4	*12	Oct.
41,621	6/-	Siddeley-Deasy ....	10/6 11/-	10/6	6/-	10/9	8 10/16	8 1/2	Dec.
50,007	1/1	Singer & Co., Ltd. ....	16/- 17/-	19/6	6/6	19 1/2	16/-	Nil	Oct.
70,000	1/1	Star Engineering, Ltd. ....	13/- 13/6	18/6	10/6	17/6	13/6	5	Mar.
69,157	1/1	Cum. Pref.	17/- 18/-	18/-	15 1/4	17/6	17/-	7	Mar.
87,550	1/1	Stepney Wheel ....	32/6 33/6	35/-	30/-	32/6	31/-	20	Mr/Oc
120,000	1/1	Sunbeam Motor Car ....	35/9 sellers	59/-	37/6	56/6	52/-	25	Nov.
30,000	1/1	6% Cum. Pref.	22/- 23/-	23/3	20 1/4	22/6	22/6	6	Ap/Nv
80,000	1/1	Swift Cycle ....	21/- 21/3	21/9	13/-	24/-	20/9	6	Dec.
100,000	1/1	6 1/2% Cum. Pref.	17/6 sellers	17/3	14 10/16	17/-	16/3	6 1/2	Ju/Dc
80,000	1/1	Triumph Cycle ....	74/- 76/-	71/6	43/9	75/-	68/-	30	Nov.
60,000	1/1	5% Cum. Par. Pref.	22/6 bid	23/6	20 7/8	23/3	21/6	6 1/2	Nov.

\* Including all arrears.

Business has been quieter during the past week. Clement-Gladiators had a quick spurt to 6s., but came back just as quickly again to 4s. Humber Ordinary have considerably weakened in price, but are now a little above the worst; Swits are easier, and Premiers, Sunbeams and Triumphs firmer.

## "The Autocar" Diary.

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| <p><b>April.</b><br/>12.—Lancashire A.C. Opening Run an Speed-judging Competition.<br/>12.—Manchester A.C. Opening Run.<br/>16, 23 and 30.—Examinations for R.A.C. Driving Certificates, Pall Mall, 9 a.m.<br/>19.—Coventry and Warwickshire M.C. Cycle Car Trial.<br/>22.—Leicestershire A.C. General Meeting.<br/>26.—Manchester A.C. Run to Nantwich.</p> <p><b>May.</b><br/>3.—Hampshire A.C. Meet at Christchurch.<br/>3.—Lancashire A.C. Hill-climb.<br/>8, 11 and 12.—A.C. de la Sarthe et de l'Ouest. Le Mans Meeting.<br/>11 and 12.—Targa Florio Race.<br/>13.—Opening of the Russian Automobile Exhibition.<br/>24.—Cardiff M.C. Annual Hill-climb.</p> | <p><b>June.</b><br/>4 and 6.—Tourist Trophy Races; Isle of Man (see <i>The Motor Cycle</i>).<br/>7.—Shelsley Walsh Hill-climb.<br/>10-17.—Austrian Alpine Tour.<br/>19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly.<br/>21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Portlancawl.</p> <p><b>July.</b><br/>12.—Grand Prix Race. Picardie Circuit.<br/>19 and 20.—R.A.C. of Belgium Grand Prix Race.<br/>28.—Grand Prix de France and Coupe de la Sarthe. Le Mans.</p> <p><b>August.</b><br/>10.—Mont Ventoux Hill Climb.</p> <p><b>September.</b><br/>21.—Coupe de l'Auto, Boulogne Circuit.<br/>25.—International Stock Car Race, Isle of Man.</p> |
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## "THE AUTOCAR" COLONIAL AND FOREIGN EDITION.

IN ADDITION TO THE USUAL EDITIONS OF "THE AUTOCAR," A THIN 3D. EDITION IS PUBLISHED EACH WEEK FOR CIRCULATION ABROAD. THE ENGLISH AND FOREIGN RATES WILL BE FOUND BELOW. ORDERS WITH REMITTANCE SHOULD BE ADDRESSED "THE AUTOCAR," HERTFORD STREET, COVENTRY. THE FOREIGN EDITION OF "THE AUTOCAR" IS SOLD TO THE TRADE AT A PRICE WHICH ENABLES IT TO BE RETAILED IN ANY PART OF THE WORLD AT 3D.

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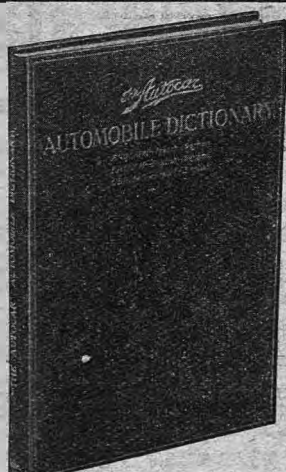
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