

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 915.

SATURDAY, MAY 3RD, 1913.

VOL. XXX.

The Autocar.

(Largest Circulation.)

Registered as a newspaper for transmission in the United Kingdom.
Entered as second-class matter in the New York (N.Y.) Post Office.

Three Editions weekly (every Friday).

The THREEPENNY EDITION, printed on Art Paper.
The PENNY EDITION printed on thinner paper.
The FOREIGN EDITION, price 3d., on thinner paper for transmission abroad.

Publishing Offices :

20, TUDOR STREET, LONDON, E.C.
Telegrams: Autocars, Fleet, London.
Telephone: No. 6720 Holborn (5 lines).

Editorial Office :

HERTFORD STREET, COVENTRY.
Telegrams: Autocar, Coventry.
Telephone: No. 10 Coventry (5 lines).

CONTENTS.

	PAGE
NOTES	769
THE ROYAL INDUSTRIAL TOUR	770
USEFUL HINTS AND TIPS (ILLUSTRATED)	771
IN THE SALZKAMMERGUT (ILLUSTRATED)	772-775
THE STORAGE OF BENZOLE	776
THE EIGHT-CYLINDER V ENGINE (ILLUSTRATED)	777-779
ON THE ROAD. BY OWEN JOHN	780-782
THE 12 H.P. LION PEUGEOT (ILLUSTRATED)	783-784
FAMOUS CARS IN RETIREMENT (ILLUSTRATED)	785-787
ON THE TRACK	788
THE 14 H.P. DE DION (ILLUSTRATED)	793-794
NOTES FOR THE BEGINNER	795-796
THE 12-14 H.P. F.N. (ILLUSTRATED)	797-800
PATENT LITIGATION	800
APPLICATIONS FOR DRIVING LICENCES	801
A NEW H.F. FITTING (ILLUSTRATED)	802
THE 12 H.P. BAYARD (ILLUSTRATED)	804-806
THE IMPERIAL MOTOR TRANSPORT CONFERENCE	807
THE CONVAC CARBURETTOR (ILLUSTRATED)	808
THE GLENTWORTH TYRE LEVER (ILLUSTRATED)	810
LEAVES FROM A SPORTSMAN'S NOTE BOOK	811
CORRESPONDENCE (ILLUSTRATED)	812-816
SOME RECENT PATENTS (ILLUSTRATED)	817
REVIEWS	818
FLASHES	819-820
SOME QUERIES AND REPLIES	821-822
WEEK END AND TOURING NOTES	823-825
"THE AUTOCAR" SHARE LIST—"THE AUTOCAR" DIARY	826

Subscription Rates.

British Isles—Home Edition, 16s.; penny (thin paper) edition, 6s. 6d.
Abroad (thin paper edition), 24s. per annum.

An Index to Advertisements appears on page 5a.

Notes.

The Tourist Trophy Race.

Last week we were able to announce in our later editions that the Royal Automobile Club had altered one of the main regulations of the international race for the Tourist Trophy open to stock cars. This race was originally announced as for cars having four-cylinder engines not exceeding 90 mm. bore and 140 mm. stroke. As soon as the conditions were known we pointed out that this very much limited the possibility of entries, because there were only fifteen makes in the world with 90 x 140 mm. engines, and only two of them were British. On the other hand, as we mentioned at the time, if the race were confined to

engines which must not exceed the same cubic capacity as that of an engine of 90 mm. bore x 140 mm. stroke, a large number of cars which were barred from competing would then become eligible. More than one possible competitor in the race also brought this question forward, and the result has been that the Club has now altered the conditions as suggested, and cars of a longer stroke than 140 mm., but a bore sufficiently small to bring them within the maximum capacity, 3,563 c.c., can now take part. Also, cars with a larger bore but a shorter stroke than 140 mm. can participate so long as the capacity is no greater than that of the 90 x 140 mm. engine.

This not only very much widens the number of possible competitors, but also tends, at least as greatly, to increase the interest and instructive value of the race, as it enables engines of widely different bore-stroke ratio to compete. For instance, the 80 x 160 mm. engine is now available, so, obviously, is the 80 x 150 mm., likewise the 95 x 120 mm., and so on.

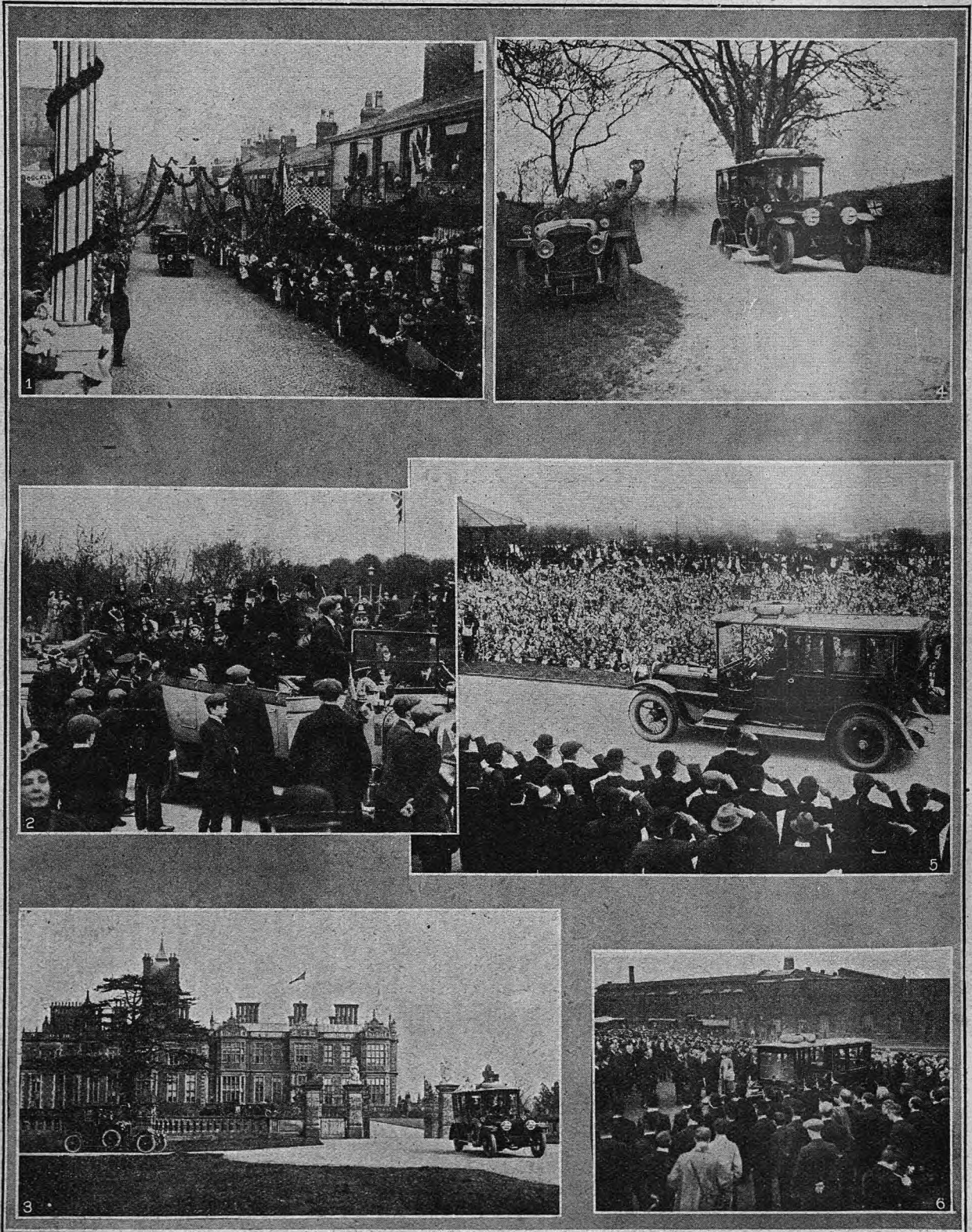
Nevertheless, this desirable alteration in the conditions does not, we imagine, in any way affect the embargo of the Society of Motor Manufacturers and Traders, who state that they do not believe that the race this year will be beneficial, and who have, therefore, advised their members that they are not to take part in it, and if they do they will be subjected to the penalties meted out to those who break the bond. This embargo was issued in connection with the race as originally proposed, and so far has not been removed. Under these circumstances it remains to be seen whether the Club will receive sufficient entries to make a race, as the conditions state that unless twenty entries are received by May 31st, the race will be cancelled.

A Misunderstanding.

The misunderstanding between the Club and the Society over the Isle of Man Race is somewhat hard to account for. The general impression was that while the Society did not care about the proposed race when it was originally suggested by the Club late last year on a basis in which the price of the car was the chief factor, it was in favour of the 90 x 140 mm. stock car event, for it must be remembered that the latest alteration to a race on an engine capacity basis is really the second alteration that the Club has made in the main conditions. Indeed, it was generally believed that the 90 x 140 mm. race had been instituted in place of the impracticable one with a price limit to meet the objections of the Society of Motor Manufacturers. As a matter of fact, it now appears that the Society has been opposed to any sort of race during the present year, and that it has never disguised the fact. If this be the case, it follows that in banning the race it has not sprung a surprise on the R.A.C., but has merely done what it plainly told the Club it would do. The general idea has been that in banning the race the Society has taken a sudden and rather mean action for which the Club was wholly unprepared, but from the above it will be seen that this is apparently not the case.

The Royal Industrial Tour.

Some Pictorial Records of the part played by the Automobile in a Royal Progress.



1. Their Majesties leaving Crewe after visiting the L. and N.-W. Railway works. 2. Owing to the rapid movements of the Royal party the police were conveyed from point to point in motor chars-a-bancs. 3. The Royal car leaving Crewe Hall, where their Majesties were the guests of Lord and Lady Crewe. 4. On the road in Cheshire; the Royal car. 5. In Hanley Park, the Royal procession passing between saluting veterans and cheering children. 6. Their Majesties taking leave of the Crewe officials.

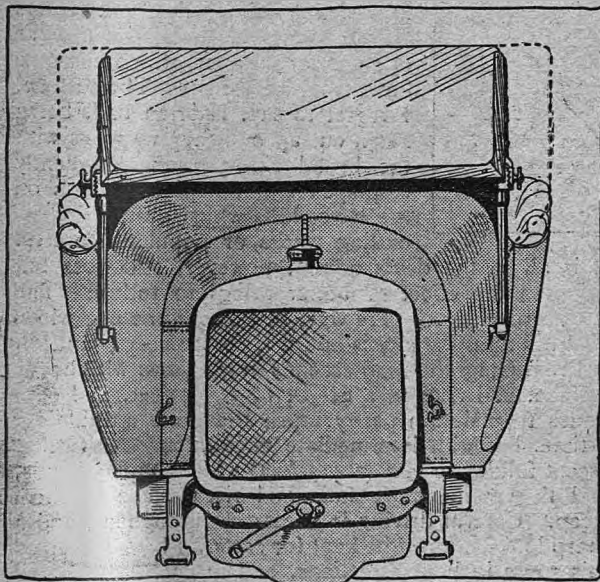
Useful Hints and Tips.

Rubber Tubing Hints.

THE rubber tubing of acetylene lamps—that is, the tubing which connects with the generator—will often be found to crack somewhat after twelve months' use or so. To make a temporary repair of a crack I have several times found it effective to light a match and hold it under the tubing where the crack happens to be. If the match be held thus for a few seconds, it will generally seal up the crack and make quite a good temporary repair. It is almost needless to say there should be no gas passing through the tube at the time. When fitting a new piece of rubber and fabric connecting tube to a pump I have found that if the connection of the pump nipple be held over a gas jet for a few seconds—in other words, if it be warmed—the pipe will firmly adhere to the nipple and make a very secure job.—X.

Screen Width.

In ordering a wind screen for a car the motorist often appears to err on the side of narrowness. It may, therefore, be well to point out that the width of a screen should not be less than the width of the body at the widest part of the front seats.



Sketch showing front view of a car with a narrow screen, a screen of the full width of the front seat being shown by dotted lines.

We have found that a good many cars are fitted with screens which are from two to four inches narrower than this width. The objection to the narrowness is that when driving in rain the wet comes back and collects upon the side of the body. None necessarily falls upon the occupants of the front seats, but it drifts straight back and collects on the upholstery on each side of the front seat and on the back and runs down so that the outside arm of each occupant gets wet, and before very long in really bad weather one finds out that the screen, simply because it is an inch or so too narrow on each side, is not half as good a protection as it otherwise would be.

To make our meaning perfectly clear we reproduce a sketch showing a front view of a car with a narrow screen, and also, in dotted lines, a screen of full width. It will be seen how the former leaves the sides of the body unprotected. It is astonishing what an

appreciable advantage a very little addition to the width makes in the comfort of the occupants of the front seat. Actually from a driving-point of view, the slightly wider screen is better, inasmuch as the opaque side frame of the screen is more out of the driver's line of vision.

The one objection to the wider screen is that on some cars it looks rather clumsy, simply because it is wide and projects a good deal on each side of the dashboard. On the other hand, a car which has a fairly wide dashboard, and which is rightly designed in this respect, is not in the least disfigured by the extra inch or two on each side.

It is, perhaps, well to add that when the screen is wider than the dashboard the space should be filled in to the height of the body, otherwise with the curved dashboard and the straight screen there is a three-sided hole each side between the screen and the dashboard through which wet drifts copiously, and even in dry weather a very cutting and concentrated draught will come through these spaces between the screen and the dashboard; this will often necessitate the use of a rug on days when otherwise it would be quite superfluous.

Draining the Oil from Crank Chambers, Gear Boxes, and Back Axles.

When draining the oil from a crank case before cleaning it out with paraffin and refilling with fresh oil it is well to bear in mind that the draining part of the performance is rendered much quicker and more nearly complete by carrying it out when the engine is warm, as then the oil is thin.

We have found that quite the best plan so far as the engine is concerned is to run the oil off immediately after coming in from a drive. When this is done the drain plugs or drain cocks, as the case may be, should be left open for some time after the bulk of the oil has run out, as immediately at the end of a run a good deal of the oil is more or less spread over the whole engine interior and gradually drains off into the base; if, therefore, the hot oil be run out and the drain cocks closed there is some further accumulation; as the oil drips into the base from the various parts of the engine above. It also slowly runs down the inner walls of the case.

Incidentally, the thorough draining can be helped by covering up the radiator and bonnet with a rug and leaving them covered up so that the engine cools very gradually.

There is no doubt that by draining in this way any dirt is much more likely to be got out of the engine easily. If the oil be run off when the engine is cold, some of it, especially round about the filter and lowest parts of the base chamber, is very thick and very sluggish, this thickness being mainly due to fine particles of grit or metal, which accumulate and give body to the mixture, and which settle in the lowest levels of the lubrication system if the draining be postponed till the engine has cooled down.

In the main the same remarks apply to the gear box and back axle. When these are drained off preparatory to washing out and refilling it is best to drain them off when they are warm immediately after a good long trip, of course leaving the drain plugs out all night. As gear oil is thicker than engine oil, the advantage of having it thinned by the heat of the working of the parts that it has been lubricating, so far as completeness of drainage is concerned, is even greater than in the case of the engine and back axle.

In the Salzkammergut.*

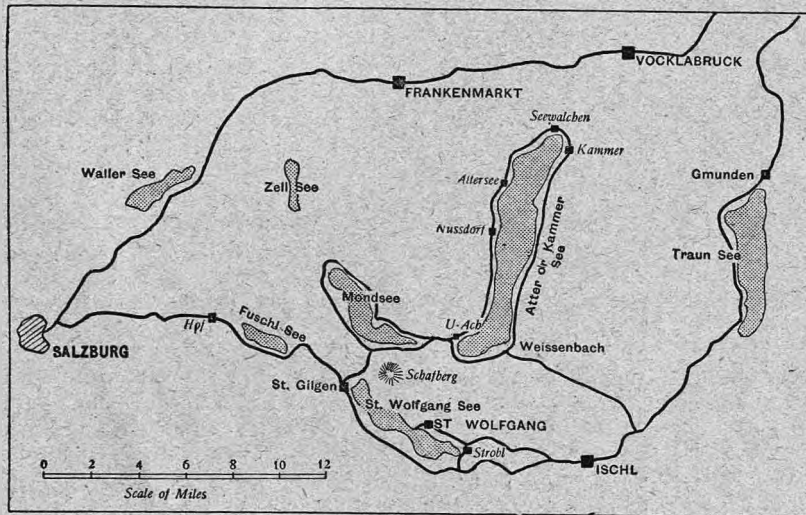
A Galaxy of Mountain Lakes.

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

WHAT is the Salzkammergut? The question is inevitable because of a general haziness of impression on the subject among English tourists. Many of them believe it to be part and parcel of Tyrol; but, as we have already seen in previous articles, the boundary of Tyrol is well to the east of Bavarian soil, and south of the province of Salzburg. The last named, on the other hand, does not include,

Good roads, for the most part, lead to nearly all these lakes, and they may be made the subject of a definite study in themselves by anyone who can afford the time to rove about from one lake to another, or to make Bad Ischl the centre for a stay of several days. In that case, of course, the height of summer is to be preferred to early June, on account of the rain which is always too likely to interfere with one's enjoyment ere the weather becomes settled.

To the tourist bound for Vienna, however, it may not be feasible to explore the Salzkammergut as a whole, and I must describe in the first place the road which he will follow when making a through journey from Salzburg to the east. When leaving the town one must avoid crossing the river to the south, and enquire instead for the road to Gnigl. After leaving the broad plain in which Salzburg lies, one enters upon a series of undulations, some of a steep character, which continue for several kilometres. The surface, I regret to say, is often bad, being much cut up by heavy waggons with the brutal skid-pans so frequently employed in all Alpine districts on the lower hills which adjoin timber-cutting works or populous centres.

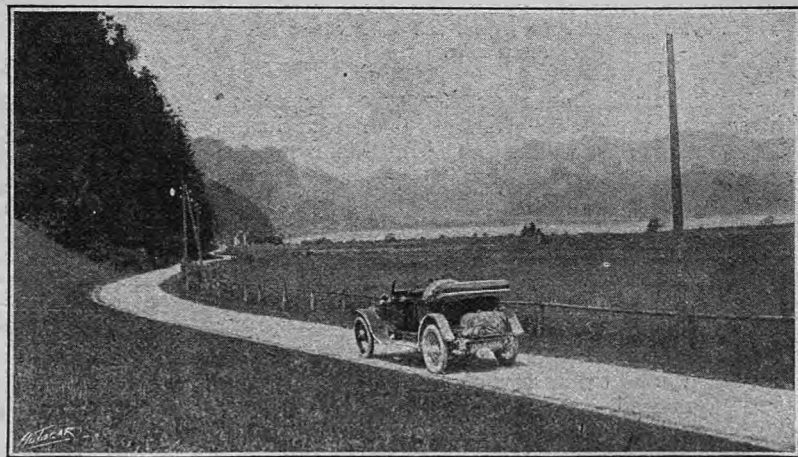


but adjoins, the Salzkammergut; and, to make the position quite clear, I may explain that the province of Salzburg ends just beyond the Lake of St. Wolfgang, while the majority of the lakes in this delightful district belong to the Salzkammergut, a territory so named because it is the seat of an ancient salt industry. At the same time, it is little wide of the mark to regard the word Salzkammergut as inclusive of the whole of the lake district, which covers an area of 650 square kilometres, within which there is a population of some 60,000 inhabitants.

The perennial charm which attaches to all lake country is nowhere seen to greater effect than in this wondrous galaxy of the Fuschl See, the Aber or St. Wolfgang See, the Mond See, the Atter or Kammer See, the Traun See, the Hallstätter See, the Altausseer See, the Grundl See, the Gosau See, and others. Individually they are less grandiose than, say, the Lake of Lucerne, but as a cluster they are unique. In a sense, too, they are unspoiled. They may be reached by rail, it is true, and they are popular enough to have hotels, but these do not swarm along their banks to any desecrating degree, nor is the tide of traffic offensively great. In this district, in fact, as with so many others in Austria, one may enjoy the amenities of civilisation without the drawbacks of vulgarity

It is all in the day's march, however, and does not heighten the effect of better things to follow. The backward views, by the way, of Salzburg as one winds up a hill until the city is out of sight are very beautiful.

From Gnigl the road ascends over a pass, with heavy surface, and rises to a height of 2,335 feet, and continues to maintain pretty much the same altitude for a time, but with intermediate undulations. A further ascent follows to Hof (2,415 feet) with sweeping bends, and then come more falls and rises, some of them steep. Careful driving is necessary throughout, and a sharp look-out must be kept for carts. I have traversed this route in both directions, and in each case I find



On the road between St. Wolfgang and St. Gilgen.

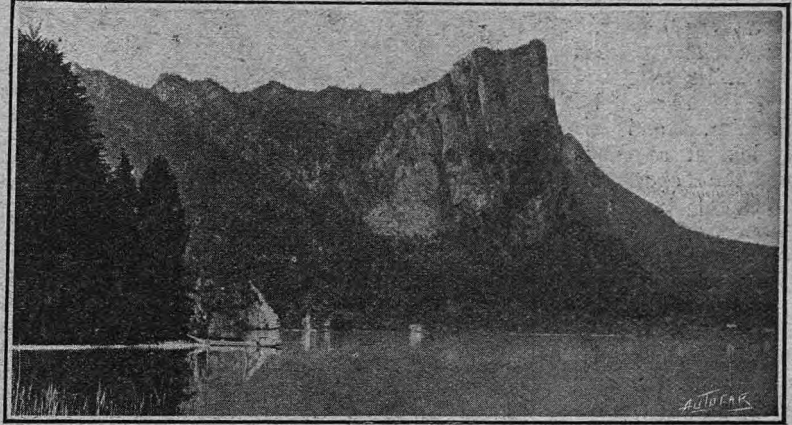
*All rights reserved

in my note-books references to this same fact. The explanation of this prevalence of cart traffic is simple; the line of railway from Salzburg, though ultimately attaining St. Gilgen, on our own route, avoids high ground, and goes round by way of Mond See, and, as in kindred cases elsewhere, the haulage between the villages has to be performed by waggons.

A narrow, difficult road leads down to the Fuschl See (2½ miles in length), of which one skirts the eastern end only, the greater portion of the lake having been invisible from the road on the descent. In rainy weather the water of the lake may be covered with "white horses," and resemble a miniature sea. From the village of Fuschl (2,195 feet) the road oftener than not is akin to an English winding lane, and, provided one does not force the pace, offers very pleasant running. At the same time I may strongly impress upon the ruling authorities of the province of Salzburg the very definite desirability of improving the whole road between Salzburg and St. Gilgen, inasmuch as topographically it is practically a main route, although in construction and upkeep it is purely local. It is true that the main road proper from Salzburg to Vienna goes in a north-westerly direction to Frankenmarkt, Vocklabruck, and Lambach, but this entirely avoids the lakes, and is therefore out of the question for the tourist whose object is to explore charming scenery. Signposts, moreover, are far too scanty in number, and there is every evidence that the government of this charming province has not fully realised as yet the importance of road locomotion as compared with that of the railway. I may also mention the fact that not

only has great care to be exercised in passing carts actually on the narrow road, but even greater care is necessary in the way of keeping a look out for a peculiar species of danger—namely, the unexpected passing out of empty waggons on to the highway from

In the Salzkammergut.



The Drachenwand, on the Mondsee.

a side opening. When I was covering this route in the reverse direction to that now being described, I met with one of the narrowest escapes in all my motor-ing experiences. A boy suddenly ran a waggon down a small declivity on to the road just as the car approached the spot, and he was powerless, of course, to stop in time, with the result that the car had to be pulled up under the fullest possible brake power, and only missed a violent collision with the cart, broadside on, by a couple of inches. If we had been going at all fast there would have been a smash-up of a very serious kind.

None the less, this route is worth the taking, if only for the sake of the grand view which unfolds itself as



The village and lake of St. Wolfgang.

In the Salzkammergut.

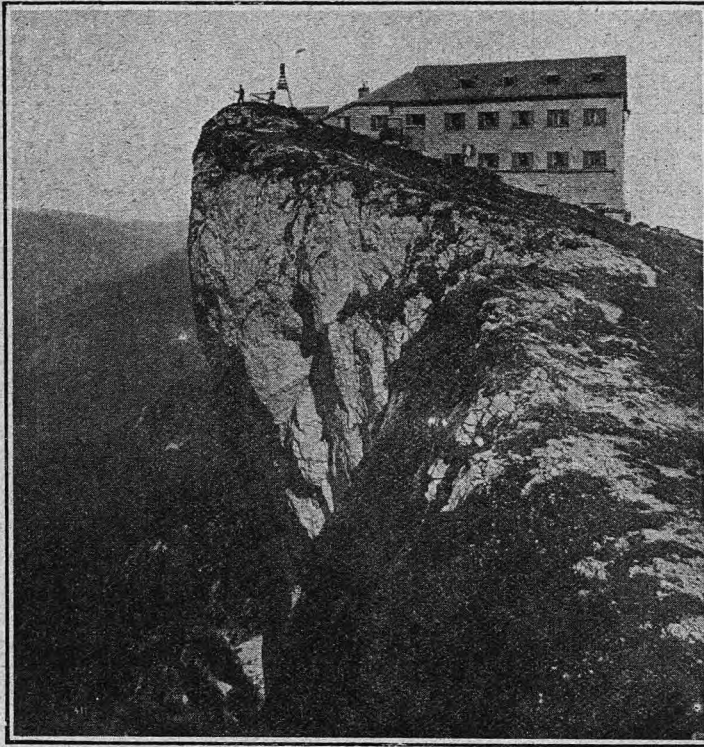
one reaches the top of the hill leading down to St. Gilgen. The little town nestles most picturesquely at the foot, on the western limit of the Aber or St. Wolfgang See, the greenish-blue water of which stretches away in the distance, flanked on the left by wooded foot-hills and rugged mountains, dominated over all by the Schafberg (5,840 feet). The lake is $7\frac{1}{2}$ miles long and $1\frac{1}{4}$ miles in breadth, and is typical at a glance of the characteristics of the lake scenery of the district, so far as concerns the larger sheets of water. It is not highly populated, however, for almost the only village on its shores, other than St. Gilgen, is that of St. Wolfgang, which lies midway on the northern bank. The railway, which has come down from Mond See, now runs along our route, in spite of which the country generally has an aspect of delightful remoteness, from the world.

The road itself is vastly better than that across the hills from Salzburg to St. Gilgen, and save for a level-crossing outside the latter place, and one stretch which is narrow and bounded by hedges, it is of good quality throughout. As is generally the case in lake country, however, the road does not necessarily adjoin the water all the time, but retires slightly inland; nevertheless, for the most part it offers pleasing views. In thirteen kilometres from St. Gilgen a fork is reached

at which the road to the left goes northwards to Strobl, and then turns westwards to St. Wolfgang, but for the present we keep straight on. The road continues good for the remaining twelve kilometres to Ischl, fifty-eight kilometres from Salzburg.

Bad Ischl is the spot above all others in the Salzkammergut at which an indefinite stay may be made with advantage. It is a fine market town, standing at a height of 1,535 feet amid a glorious environment of well-wooded hills. Apart from its surroundings, however, it is highly popular as a summer resort by reason of its salt baths and numerous springs, with every variety of "cure" in the shape of sulphur, pine-cone, mud, vapour, and other baths, as well as the whey cure. Hither flock in the summer, particularly in July and August, all the fashionable folk of Vienna, and here, too, the Emperor of Austria has a permanent summer residence. Innumerable villas

are to be seen in the beautiful valley, and there is a large array of hotels. It is because Ischl itself is in every way so pleasant that it is better to make it a centre for out and home excursions than to attempt to take in some of them on the way thither. The Mond See, for example, could be visited from St. Gilgen, and for that matter the Atter See also; but if one took the direct road from the latter to Bad Ischl the road alongside the St. Wolfgang See would be missed. On the



The striking summit of the Schafberg, with hotel.



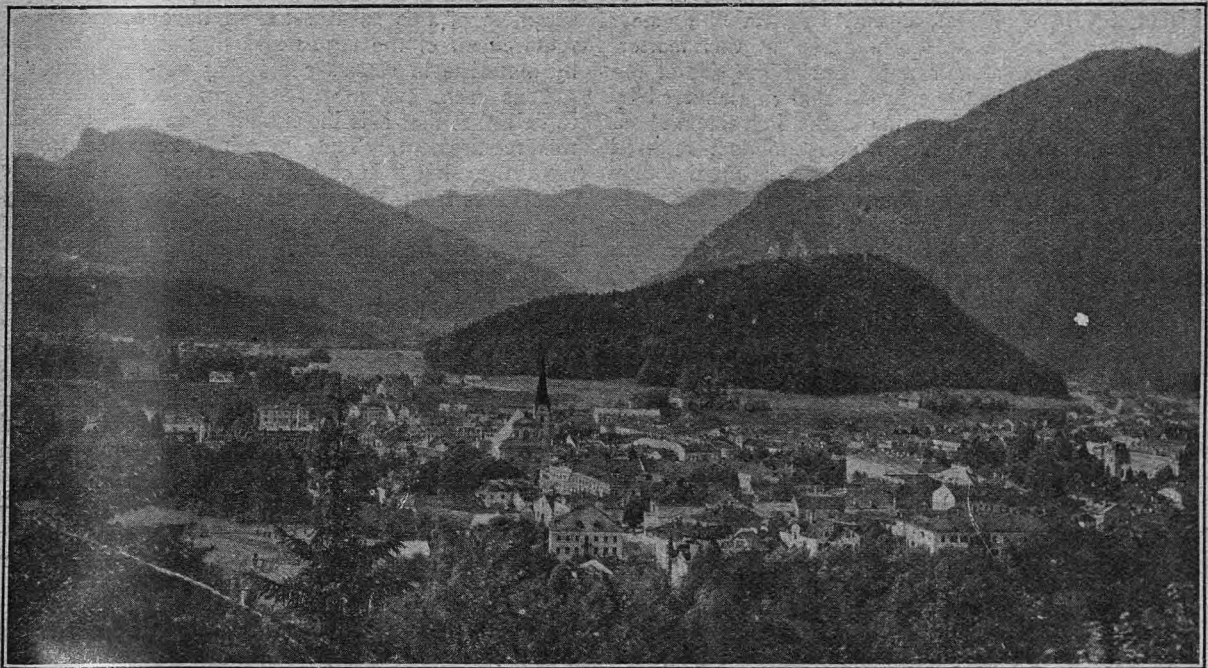
The charmingly situated village of Mondsee.

other hand, a return to St. Gilgen would involve nearly as much doubling of one's tracks as if the Mond See and Atter See were visited from Ischl. If every moment be precious, however, a little time may be saved by breaking off at the fork previously mentioned and proceeding through Strobl to St. Wolfgang village instead of going into Ischl forthwith.

Whether the start be made from the fork or from Ischl itself, however, a visit should certainly be made to St. Wolfgang, with the primary object of ascending to the finest view-point in Upper Austria. This is the summit of the Schafberg, which towers above the village in splendid isolation, and may be ascended by a rack and pinion railway in about an hour, the distance being four miles. Not only does it offer splendid views on the way up, but at the summit it commands a panoramic prospect which has even been compared with that from the famous Rigi itself, above the Lake of Lucerne.

In the Salzkammergut.
there is no road from St. Wolfgang in the direction of the Mond See, it is necessary to hark back to Ischl ere making further excursions. The journey, however, is merely one of thirteen kilometres.

As the Mond See and the Atter, or Kammer, See are each completely encircled by a road, and each lake alike is picturesque, there is every reason for the making of a round trip from Ischl—a matter of 122 kilometres, and therefore quite easily to be covered in the day, unless, of course, one yields to the desire to stay for a time at some pleasant spot *en route*. The way out of Ischl must first be enquired after, as several of its thoroughfares are closed to motor cars; but advice may readily be obtained at a local garage, and, as a matter of fact, there is no prohibited street on our line of route if one has approached from St. Wolfgang or St. Gilgen, though the case might be different if one had stayed the night at an hotel within the town. In the first instance the main road to



A favourite Austrian health resort, Bad Ischl, from the south.

As with the Swiss, so with the Austrian outlook; one is dependent upon the weather for the reward or otherwise of the ascent. On a clear day, nevertheless, the tourist who stands upon the Schafberg summit may enjoy a truly gorgeous view, embracing as it does a series of lakes below—more numerous, of course, than those visible from the Rigi—and the vast plains which lie between Munich on the west and the Bohemian mountains on the east. While, as an inveterate pass-stormer, I pity the railway traveller who is content to bury himself in tunnels when the road climbs magnificently overhead, as on the St. Gotthard, Arlberg, and other routes, that fact does not prevent my pointing out that where no road exists, and a mountain railway conveys one to an all-embracing summit, the opportunity should never be let slip of making the ascent by such means as are available.

On the rugged precipice of the Schafberg, which of itself constitutes a picture, an hotel is perched at a dizzy altitude, and hence one may linger here at will until it is decided to make the return descent. As

Gmunden must be followed for five kilometres, and from the fork our way leads through the secluded Weissenbach-Thal to Mitter-Weissenbach and on to Weissenbach at the foot of the Atter See.

It is immaterial which lake be taken first, but we may prefer to steer for the Mond See by way of Unterach. Here the Atter See is left behind, and in a short distance the rival lake is reached. It measures seven miles in length and $1\frac{1}{4}$ miles in breadth, and strikes a picturesque ride at once, as the opposite side of the Schafberg from that which is ascended from St. Wolfgang is seen to rise precipitously from the lake. Following the road on the south bank we come to Scharfing, where the road veers to the north-west, and, by way of Plomberg and St. Lorenz, brings us to the busy little town of Mondsee, where there is a chateau belonging to Prince Wrede, with a fine church and several hotels. The scenery is even more beautiful, perhaps, than that of the St. Wolfgang See, for in addition to the Schafberg we have another impressive eminence in the rocky Drachenwand, as well as

In the Salzkammergut.

vistas of higher and more distant mountains. In sunny weather one might do worse than make a stay at this charming spot, enjoying the lovely walks along the banks or the little steamer trips.

A run of fifteen kilometres will bring us to Unterach by the north bank, and thence through Parschall, Nussdorf and Attersee, at the head of the Atter See, is a journey of twenty-five kilometres. The lake enjoys the distinction of being the largest in Austria, its length being $12\frac{1}{2}$ miles, with a maximum breadth of two miles. A short distance from Seewalchen is the village of Kammer, which gives the

lake its alternative name; here there is another chateau used as a *pension*, with several hotels. As one drives southwards on the return journey the boldly isolated Schafberg comes into view. Several picturesquely situated villages are passed in turn, and ere Weissenbach is reached, in nineteen kilometres from Seewalchen, the lake is seen to be bounded by precipitous rocks. As with the two lakes already dealt with, the beauties of the Atter See may be enjoyed at option by steamer as well as viewed from the road.

Of the remaining lakes in the richly endowed Salzkammergut I must defer consideration until next week.

The Storage of Benzole.

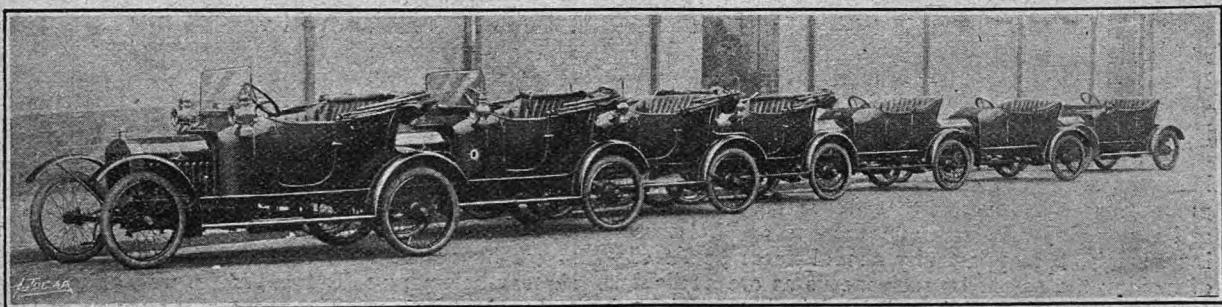
Must be Kept in Vessels containing not more than Two Gallons.

REFERRING to the point raised by a correspondent in *The Autocar* of April 19th (p. 706) as to the sale and delivery of benzole in five-gallon tins being illegal, it may be as well to state clearly the position of the motorist in this matter. There is, of course, no law to restrict the size of the vessels in which benzole may be sold or delivered by firms licensed to deal in it under the Petroleum Acts. The restriction to which our correspondent referred as to keeping benzole in two-gallon tins applies only to spirit "kept, used, or conveyed" by motorists in connection with their cars. The position may be briefly stated thus: Until the advent of motor cars and the passing of the Locomotives on Highways Act, 1896, by which motor cars were allowed to run upon the highways of this country, the law would not permit a person to keep petroleum, the legal definition of which, by the way, includes benzole as well as what is commonly known as petroleum spirit, either for private use or for sale, except under the most stringent conditions imposed by an Act of Parliament which was passed as a piece of panic legislation in 1871. The conditions were that it should be kept in separate glass, earthenware, or metal vessels, securely stopped, each containing not more than a pint, and the aggregate quantity allowed to be so kept could not exceed three gallons. Under such prohibitive conditions, motoring as now practised would, of course, have been impossible. It was to relieve this situation that the Secretary of State was empowered by the Locomotives on Highways Act of 1896 to make regulations to release petroleum spirit used for motor cars from the restrictions which hampered its use. These regulations were issued, but were replaced seven years later by those now in force, and the current set is dated 18th March, 1903. Under their provisions motor spirit is put up in two-gallon tins, and the aggregate quantity that may

be stored without a licence for motor car use is increased to sixty gallons. Now that benzole is being used instead of or in addition to petrol, some of the suppliers of this spirit seem to have overlooked the requirement of the regulations that it must be stored by motorists in vessels containing not more than two gallons each, and motorists themselves do not seem to be aware that it is incumbent upon them to observe this requirement. They naturally keep the spirit in the drums that it is supplied to them in. To protect themselves from legal consequences they should empty the contents of the larger vessels into smaller ones that comply with the law.

We cannot conceive that it is contended seriously by the L.C.C. officials that the risk of danger is any greater with five-gallon steel drums than with two-gallon tins. It may, indeed, be safer, and probably is much safer to store benzole in strong substantial steel drums than in more or less flimsy tins, but the all-absorbing point for the L.C.C. appears to be that the five-gallon drums are not in accordance with the strict letter of the law, and they see here one more opportunity, to add to the many they have already discovered, by which they may harass motorists, and demonstrate their own officials' legal sagacity and smartness.

Motorists who may have their benzole delivered to them in five-gallon drums will be under the necessity, in order to conform to the strict letter of the law, to transfer the benzole from the larger to smaller vessels. The decanting operation may be attended with needless extra risk, but it will at all events be legal. The possible consequences of the unnecessary pouring out and handling of the highly inflammable liquid may be absurd to contemplate, but literal L.C.C. legality must be met though the risk of possible fire be increased in the endeavour to meet it.



A fleet of Enfield Autolettes awaiting the arrival of customers to take delivery. One reason why so many of these little vehicles are taken home by road is that the railway companies charge as much for the conveyance of one of these as for a full-sized car.

The Eight-cylinder V Engine.

The Why and Wherefore of its Advantages over Other Types. By W. G. Aston.

EVERYONE will remember what a tremendous volume of ink was spread over the subject when the six-cylinder engine first came amongst us, and definitely marked an epoch, or perhaps in the interests of strict accuracy it would be better to say not when it first came amongst us, but when its coming was first noised abroad. Now there are good grounds for supposing that another such epoch will be marked in the comparatively near future by the eight-cylinder engine, which is even more superior to the six-cylinder than the six-cylinder is to the four-cylinder. So far as motor cars are concerned, it is only employed by one firm, *i.e.*, Messrs. De Dion Bouton, but it requires no prophet to see that this principle is speedily gaining adherents, and to foresee that it will continue to do so.

It is quite evident that in practice the eight-cylinder engine commands the approval of the public, and it likewise makes a strong appeal to those motor manufacturers who have taken the trouble to look carefully into this very interesting subject. For some extraordinary reason, however, it is quite apparent that a great deal of misconception exists as to the why and wherefore of the eight-cylinder engine.

When the four-cylinder was standard and the six-cylinder engine came along, the latter represented a

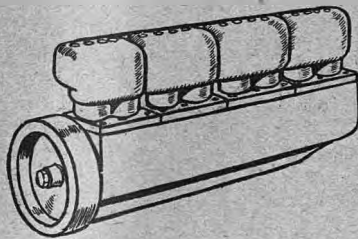


Fig. 1.—An eight-cylinder all-in-line engine.

very simple proposition. There were two more cylinders, and consequently it was quite easy to see that somewhere or other in the cycle of operations the crankshaft received two more impulses. With the De Dion eight-cylinder engine the case is rather different, because here the cylinders are set at an angle with one another, and not all in a row along the crank chamber. The engine thus presents the appearance of two separate four-cylinder engines, and very widely the conclusion has been jumped to that these two four-cylinder engines working together are practically just twice as powerful as one four-cylinder engine, and that beyond that there is nothing more that remains to be said.

Of course, the eight-cylinder engine is nothing particularly new; in the aeronautical world, it is quite an "old stager," as some of the earliest aeroplane motors were of this type, such as the Antoinette, the E.N.V., the Wolseley, the J.A.P., etc. The general public has, however, never taken much interest in these engines, and consequently never bothered its head about them. If it had done so it would ere now have expressed a strong desire to possess this type.

The object of the present article is to point out the great advantages of the eight-cylinder system. Although Messrs. De Dion Bouton are undoubtedly the first to produce a modern eight-cylinder chassis as a commercial proposition intended for public consumption, they were not the first to employ an eight-cylinder in an automobile by any means; as long ago as 1902 Charron, Girardot and Voigt produced an experimental car with eight cylinders all-in-line, and

a similar engine was used by the Weigel Co. in the Grand Prix Race of 1907. There was also the famous Rolls-Royce "Legalimit" eight-cylinder V engine car of 1905.

The V type of engine and the all-in-line type are diagrammatically illustrated in figs. 1 and 2. In some respects they are similar, in others they are totally different. As a case in point, the all-in-line engine has not a ghost of a chance of coming into favour, whereas the V type may be regarded as a fair certainty for the future. Why this should be so is clear enough. The former is of enormous length, and since the wheelbase of

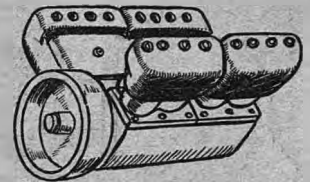


Fig. 2.—An eight-cylinder V-type engine.

a car intended for ordinary use is limited to a certain definite length, the body space of the vehicle would have to be very restricted for the chassis to accommodate an all-in-line type eight-cylinder engine. Then, again, it is very much heavier than the V type, because it has twice as large a crank chamber and twice as long a crankshaft. The last-named must therefore be made exceedingly strong, so that weight in this part goes up disproportionately. As far as balance and torque are concerned, both engines are identical, in each case the balance is perfect, for there are no unbalanced forces whatever; whilst in each case the crankshaft receives four impulses per revolution.

Fig. 3 shows diagrammatically an all-in-line eight-cylinder crankshaft, with a bearing between each throw. It will be perceived that it consists simply of two four-cylinder crankshafts placed in tandem, the one having its webs at an angle of 90° to the other. In the V engine, instead of using, as it were, a second crankshaft, the second four cylinders are applied to the first crankshaft, but are themselves arranged at 90° to the first set of cylinders.

The advantages of this system will be discussed in detail later on. For the moment we will content ourselves with making clear the value of the eight cylinders from the *torque* point of view. In order to do this, let us imagine that the V engine is tipped

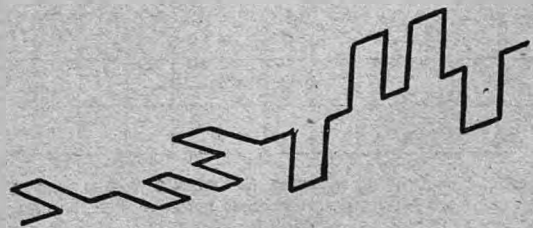


Fig. 3.—Diagram of the crankshaft of an eight-cylinder all-in-line engine.

over on to its side, as shown in the diagram fig. 4. Now let us first consider the behaviour of the four vertical cylinders, which are, in point of fact, just an ordinary motor car engine. The crankshaft having its throws at 180° , the impulses are received at equal intervals, which intervals may be easily remembered by considering the crankshaft as the hour hand of a clock, and the first revolution of the flywheel as a.m.

The Eight-cylinder V Engine.

and the second as p.m. The crankshaft receives its impulses, in these circumstances, from the four vertical cylinders at 12 a.m., 6 p.m., 12 p.m., and 6 a.m.; in other words, the intervals between the impulses are half a revolution of the crankshaft. Now let us consider the horizontal group of cylinders, the crank chamber still being imagined to be marked in the

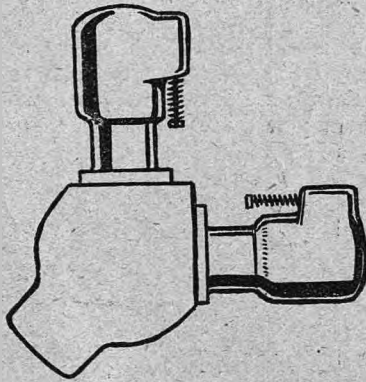


Fig. 4.—Front view of the eight-cylinder V engine with one set of cylinders vertical.

same way as the clock face. These cylinders give their explosive impulses at 3 p.m., 9 p.m., 3 a.m., and 9 a.m., the intervals again being half revolutions of the crank chamber. It will thus be seen that no two explosions actually occur at the same time, but that they all follow one another at equal intervals of a quarter of a revolution.

The turning effect, or torque, of the eight-cylinder engine is, therefore, twice as good as that of the four-cylinder engine. By applying the same method to the six-cylinder engine, it will be perceived that the three impulses which are received by the crankshaft per revolution occur at twelve o'clock, four o'clock, and eight o'clock, so that the eight-cylinder is superior to the six-cylinder in torque by a matter of 33%.

Since in the four-cylinder engine one pair of pistons is at the top and one at the bottom of the stroke, there can be no overlapping of impulses, because the explosion pressure cannot last longer than from twelve o'clock to six (sic), though, as a matter of fact, it never does so actually, as the exhaust valve is always allowed to open slightly before the end of the power stroke. For the purpose of the present argument, let it be assumed (and there is no particular inaccuracy in this) that the explosion pressure lasts, as it were

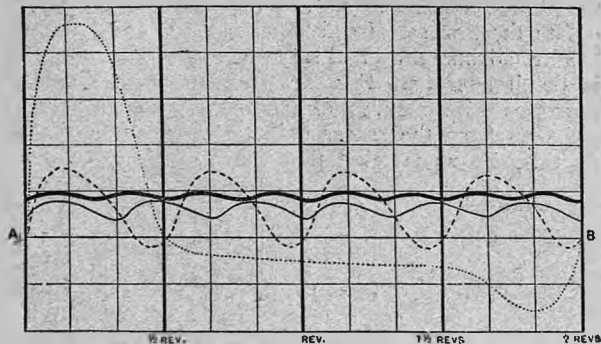


Fig. 5.—Diagram showing the relative torque curves, during two revolutions, of engines with one, four, six, and eight cylinders. The dotted line shows the single cylinder, the broken line a four-cylinder, the thin continuous line represents a six-cylinder, and the heavy line an eight-cylinder.

from twelve o'clock till five o'clock. In the six-cylinder engine it will then be seen that the explosions overlap by one hour, that is to say, that when the second cylinder fires its charge at four o'clock, the first cylinder has still got one hour to go. It is this fact which, more than anything else, has brought the six-cylinder to the prominence it now enjoys. In the

eight-cylinder matters are better still, because when any explosion occurs the previous one has still *two* hours to go, and this means that the tangential pressure on the crankshaft, which causes it to revolve against the load, is always strongly positive; that is to say, at every point in its revolution the crankshaft is receiving an impulse. In the four-cylinder engine periods occur at which the flywheel has to do negative work; that is to say, there is no appreciable positive pressure at any of the pistons.

Fig. 5 shows all this graphically, although it does not pretend to absolute accuracy. Four curves or torque diagrams are given. The first, which is shown by the dotted line, represents the torque of a single-cylinder engine. The base line A B is divided into four equal distances, which each represent half a revolution of the engine. When the curve is above this line it shows that the crankshaft is receiving a power impulse. When the curve is below the line it shows that at this point a certain amount of work has to be given back by the flywheel. The second curve, which is shown in broken lines, is the torque diagram of a four-cylinder engine, in which it will be seen there are short periods of negative work occurring. That of a six-cylinder engine is shown in the thin unbroken line, which, it will be observed, lies wholly above the base line A B, indicating that there is always a power impulse upon the crankshaft. The thick black line is the curve of the eight-cylinder engine, which is higher still above the base line, because the minimum positive pressure existing at any time in the engine is always higher than in the six-cylinder.

The ideal engine would give a torque diagram which would represent a perfectly straight line. Generally speaking, the torque curve of the eight-cylinder does not fall very far short of this, as the amplitude of its waves is short, and the difference between the maximum and minimum tangential pressures is also very small.

It may now be asked why not continue to multiply cylinders and gain an even better result? The answer to this is very simple. Eight cylinders are only two more than six, and the improvements which they produce are very marked. Now the next size of engine would be twelve-cylinder, or half again as many cylinders, which would not possibly give 50% better result, and so on. A glance at the torque curves of fig. 5 will show that as the cylinders are increased the difference in the characteristics of the curves tends to become less marked. Drawn to the same scale, the curves of a sixteen-cylinder engine would hardly be distinguishable from the twelve, and twelve scarcely distinguishable from those of the eight. For ordinary purposes, therefore, the eight may be considered to be the ideal as well as the practical maximum, for motor car work at all events.

Just as in the old days, and even at the present time, one always described the excellence of the six-cylinder

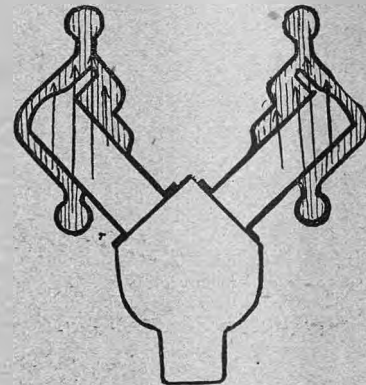


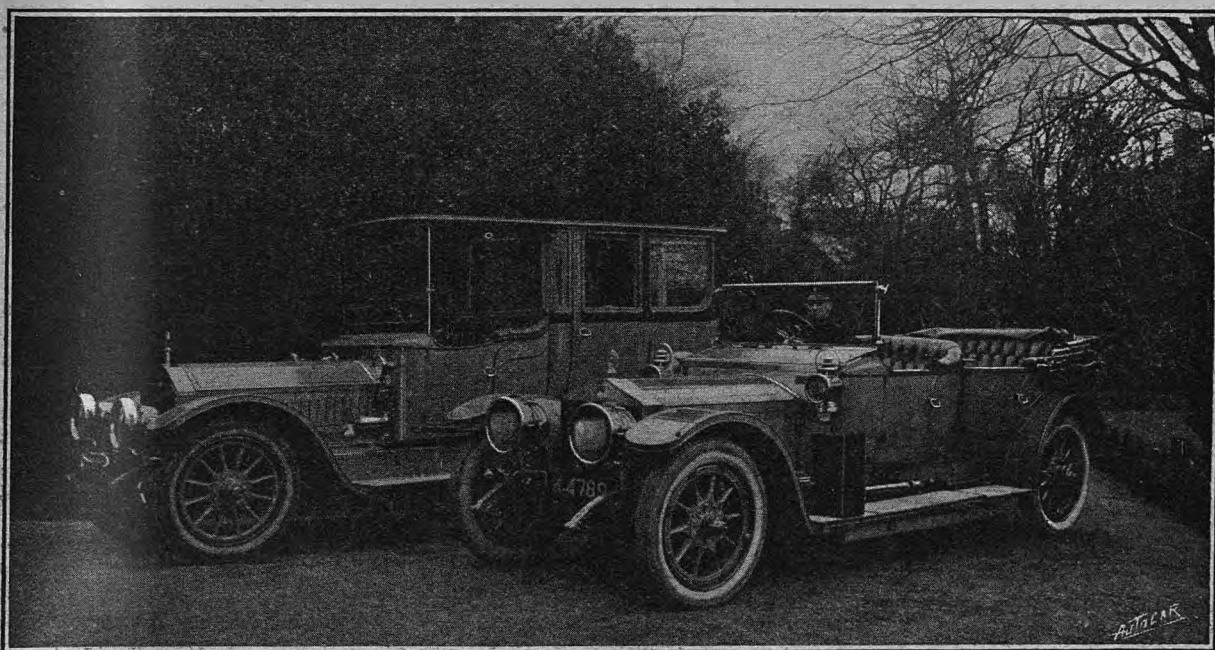
Fig. 6.—Diagram showing the natural water circulation tendency in a V type engine.

engine by comparing it with the four-cylinder, so we will now discuss the eight in terms of the six; over which it has several very pronounced advantages.

1. **SIZE.**—In length, which is the only dimension that matters, within reasonable limits, on a motor car, the eight-cylinder is preferable to the six, by a matter of 30%. The space available for bodywork upon the chassis is, therefore, much greater, and this in itself is a point of enormous importance. But of even more value still are the advantages which follow on the use of a short engine. The crankshaft has all its throws in one plane, and is therefore cheaper to manufacture than the crankshaft of a six-cylinder engine, the throws of which lie in three planes, as each pair is at an angle of 120° to the others. Again, the crankshaft being shorter possesses less torsional elasticity; therefore periodic vibration, which is so bad a

The Eight-cylinder V Engine.
former it can only be prevented by special balancing devices, or by the use of a crankshaft of great strength and stiffness.

5. **COOLING.**—The eight-cylinder is preferable to the six, as each row of cylinders can be treated as a separate unit, and if the valve chambers face one another (as in the diagram fig. 6) it will be seen that the water circulation has no tendency to form "pockets" round the valves. Each engine unit being smaller, a thermo-syphon system of circulation can be used without requiring the radiator to be placed very high above the engine. In other words, if the inclination of the water outlet from the head of the cylinders is to be the same in each case, the six-cylinder engine requires the radiator more than half as high again above it as the eight, for in the V type the water jackets also occupy a lower position.



TWO HANDSOME CARS. The nearer one is a 40-50 h.p. Rolls-Royce, and the other a 45 h.p. Napier Limousine. Both are the property of Mrs. C. Chapple-Gill, Woolton, Liverpool. The bodywork on both cars was executed by Messrs. Barkers, South Audley Street, London, W.

characteristic of six-cylinder engines, unless special preventive measures are taken, is greatly reduced. In like manner the camshaft is shorter, and periodic vibrations arising from this source are also reduced. No great length of inlet piping is required, as is the case with the six, as the four V-form cylinders lend themselves very readily to a piping arrangement which gives each cylinder practically an equal chance of getting a full charge of gas—that is to say, no cylinders are likely to be starved.

2. **WEIGHT.**—Power for power, and allowing equal strength of material, the eight-cylinder engine is lighter than the six, owing to the shorter crank case, lighter crankshaft, lighter flywheel, shorter camshaft, and lighter reciprocating parts (the cylinders being smaller), and this again is a great advantage.

3. **TORQUE.**—The eight-cylinder has a $33\frac{1}{3}\%$ better torque than the six, as previously described.

4. **BALANCE.**—Theoretically, both engines are equal in this respect—that is to say, both are perfect. But periodic crankshaft vibration is far more likely to occur in the six than in the eight-cylinder. In the

6. **LUBRICATION.**—Shorter oil passages and a smaller length of crankshaft are advantages in this respect, but the V type eight-cylinder has the disadvantage that if the pistons be lubricated by splash, one set of the cylinders is apt to get more oil than the other set. Thus, if the crankshaft revolve clockwise, the left-hand block of cylinders tends to get over-lubricated and the right-hand block under-lubricated. This difficulty can, of course, be met without introducing much complication.

7. **IGNITION.**—There is nothing to choose between the two types, as both require one magneto which differs only in the gear ratio between it and the camshaft, and, of course, in the number of contacts on the high tension distributor.

8. **ACCESSIBILITY.**—Under this head the six-cylinder scores so far as the valves are concerned.

In brief, the great advantages of the eight-cylinder engine are its small size, light weight, excellent torque, perfect balance, and good carburation, in all of which points it is equalled by no other type of engine at present applied to motor car propulsion.

On the Road.

A Run from Huddersfield to the South, including Coleshill to Stonebridge, the most Pot-hole Road in Existence.

MESSRS. DAVID BROWN AND SONS, of Huddersfield, one of the participants in the worm gear cutting duel now on with the Daimler Co., invited me to inspect their works at Lockwood on the occasion of trying their new 19.9 h.p. Valveless car. Of late I have visited the motor works of many firms, but here motors were not the chief attraction, and I was amazed at the enormous wheels that were being played with by their many machines. Also the machines themselves, inventions that seem to have brains somewhere inside them, and it came as a surprise to me to see what tiny things automobile engines are compared to the mighty parts of mill machinery and maritime accessories. Some of the wheels themselves weighed over five tons and, I was told, their cost ran into three figures each. Yet the grooves in them were being marked and cut automatically as easily as if they were little bits for back axles or gear boxes, and the machines for making machines in their intricacies and their ramifications had me out of my depth in less than no time. So easy, so simple, and so rapid are the movements that at first one is inclined to wonder why motor machinery is as expensive as it is. Then come second thoughts, and when one considers how costly the stuff itself is, how skilled are the mechanics, and how much experiment and failure each machine represents, one almost wonders why these bright and shining things can be produced at their price at all.

To this firm the manufacture of automobiles is only a bit of their job. Big things, and the machinery for making them, are their speciality, and motors come in, as it were, to fill up odd times. Because this is so is the reason that the cars turned out here are entirely unlike all ordinary ones, and, some day soon, when their present experiments fructify, as it is confidently expected they will, the Valveless engine will be a very wonderful thing. But at present the twin-cylinder Valveless is their business production in the motor line, and in the two thousand miles or so I have driven different types I must confess I have never had

a road stop except for causes which had nothing to do with the cars, in the shape of dirty petrol and obstructions in the fuel pipes. But these can make one savage enough, even though they have as little connection with the car as a burst tyre or a leaky tube.

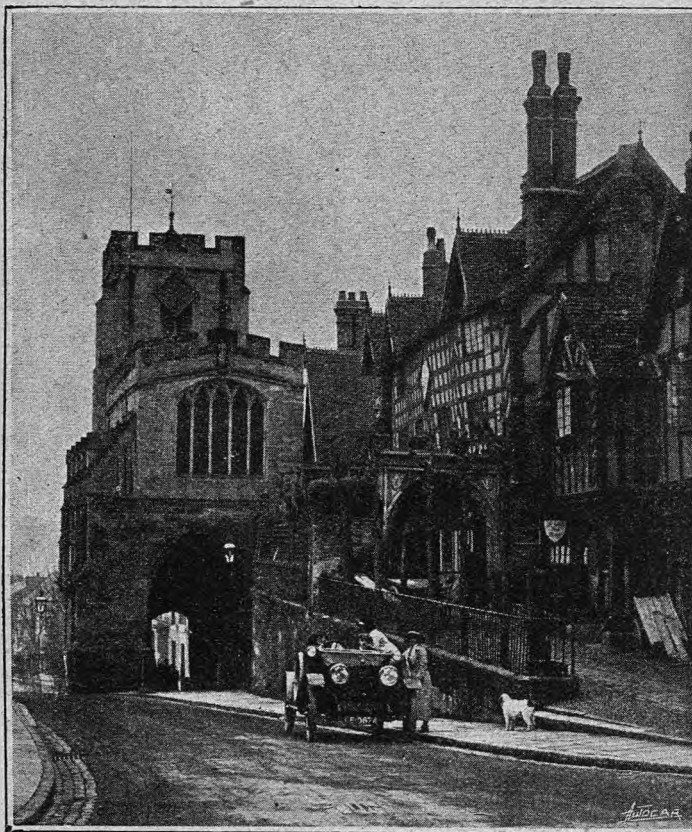
I do not pretend that the present Valveless is as noiseless as a good four-cylinder ordinary engine. It is not natural that it should be, for though there are an equal number of cylinder explosions they come in the order of "two, blank, two, blank," instead of the "one, one, one, one," we are accustomed to. Some

day I believe it is to be "two, two, two, two," and then we shall see what we shall see. Yet the two flywheels that go round in opposite directions keep it moving, and the present car is one that it is impossible to stop by mistake even though the mixture be completely shut off. One can always "let the cat die" and revive it again in its latest breath.

As has been pointed out, in this engine there are but six main moving parts, and all of them are solid ones. Nor does there seem to be much about it that the village blacksmith could not repair if necessary, which would be an advantage on distant shores or at the Back of Beyond that other cars have not. I do not pretend that other cars do go wrong; if one leave well alone I have found that most of them go for

ever, but the fact remains that such things as valves, springs, cotter pins, and the like can be troublesome, and, for the wilds, the fewer of them there are the better.

The chassis I took over was a new one, so new that somebody had forgotten to remove all the cotton waste from the fuel pipe, and on a works body with a hood that did not quite meet the screen I set off over the hills to Penistone and the South-west in a wintry landscape, amid showers that could not determine whether they were snow or rain; therefore they compromised at hail. But it is a fine road, especially for car-testing, and all the way beyond Woodhead I had plenty of opportunity to try the springs and exercise my liver. How very bad that road is in places,



An R.C.H. car outside Leicester's Hospital at Warwick. The building in the background is the old West Gate, surmounted by a chapel. Leicester's Hospital is well worth a visit by motorists when in the neighbourhood of Warwick, as it is one of the few remaining buildings which contains a banqueting hall with the original groined roof and earthen floor.

and the stone it was being repaired with just above the big Manchester Corporation reservoirs did not appear to be likely to improve the surface for very long. But it was good to be two thousand feet up among the dead heather, with grouse all around one taking little or no notice of motors or even steam-rollers, and the view was glorious under a most patchy April sky.

I had not been by this route before, and for those going North who are weary of the Great North Road by Doncaster and Boroughbridge, or the dull highway by Warrington and Lancaster, I think it would be an interesting though a longer alternative. One might run from Derby to Buxton, and thence by the Peak Forest canal to New Mills and Glossop, and afterwards by Penistone, Huddersfield, Halifax, and Skipton to Kendal through Settle. But see that your ride be not in the winter, and also learn to appreciate the busy parts of the West Riding of Yorkshire. I suggest it as a change, not as a more immediate route.

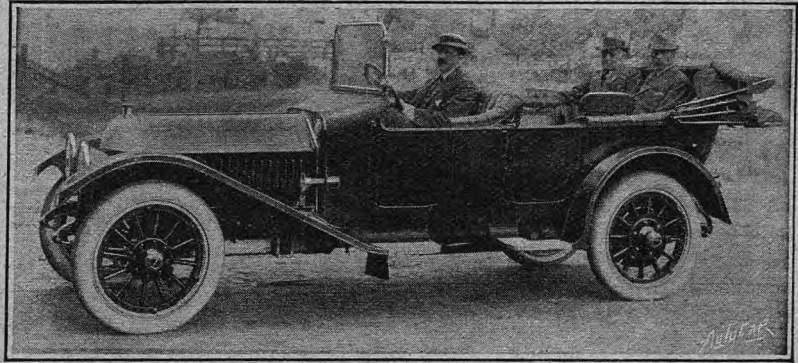
From New Mills—which is a very busy place and once was a very beautiful one—I made for Macclesfield, and whether it was I took a short cut or made an error, I found myself on the hilliest of up-and-down roads with gates to open and a petrol pipe that refused to deliver petrol except when it liked. But we arrived, and at Congleton I got Mr. Banks's most intelligent men to free the offending part while I visited the town and inspected, in the rain, the decorations that were being put up to honour the King and Queen at their visit about five days later. I hope the decorations survived, but they must have suffered some, as the American guide books phrase it.

Then on down the well-known road past Moreton Old Hall, through Newcastle-under-Lyme, just missing the horrible Potteries, to Stone and Lichfield, where, just as darkness was falling, more cotton waste tied me up, and I was lazy enough to wait till Mr.

Jones's breakdown gang came up and found the offending stuff blocking up and firmly attached to the filter tap itself that exists for the purpose of getting rid of obstructions. So to dinner and bed in the town which is apparently so proud of Dr. Johnson that it refuses to relinquish his habits.

For many years I have always gone from Lichfield to Coventry by way of Basset's Pole. But now I have done with that route and next time I go through Tamworth. If anyone wants to know why, all he need

On the Road



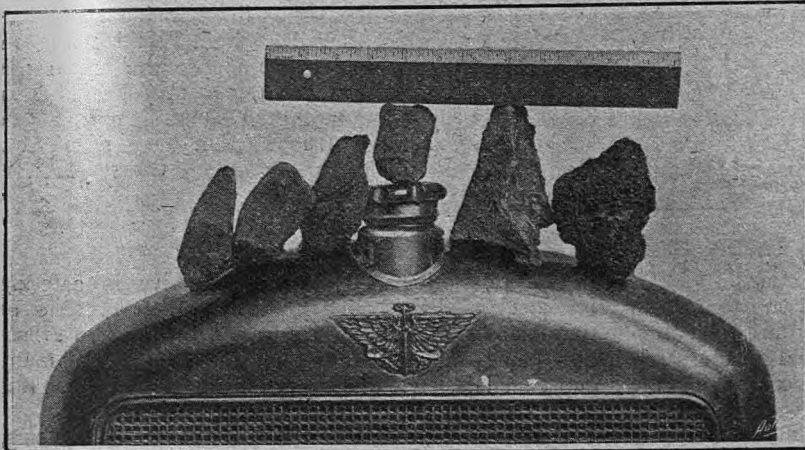
A 40 h.p. six-cylinder Oakland car fitted with the Delco electric self-starting, lighting and ignition system. At the steering wheel is Mr. G. E. Daniels, Vice-president and General Manager of the Oakland Motor Car Co.

do is to go from Coleshill to Stonebridge, and he will be upon the worst and pot-holiest road that can exist. It was bad two years ago, to-day it is infinitely worse, and whoever is responsible for its condition must be sadly wanting in pride in himself. In the middle of it I met a young couple walking with bowed heads near an empty cycle car. They had lost something; it might have been a cylinder, it might have been a baby. The holes in the road were almost big enough to lose the carlet itself.

When I came to Coventry I found it much disturbed over a sidecar climb about to take place on Edge Hill, and it seems a point of honour amongst Coventry motorists to furbish up their cars to the last gaiter button before appearing at any of these entertainments. Which is quite right except that it always makes me feel guilty. Therefore I came along home without incident except that a westerly gale blew off my best hat and I spent a long time chasing it across the plough. Once free of petrol dirt, the Valveless had gone speedily, and I have no intention of declaring how fast it can go when it likes.

The worst of testing a car nowadays is that nobody can give an opinion of any value on one until it has been running at least ten thousand miles. One may remark that it is noiseless, smooth-running, of good acceleration, comfortable, well sprung, and so on, but whether or not it will last can only be solved by the motor equivalent of "ambulance," and one has no time or opportunity to prove this.

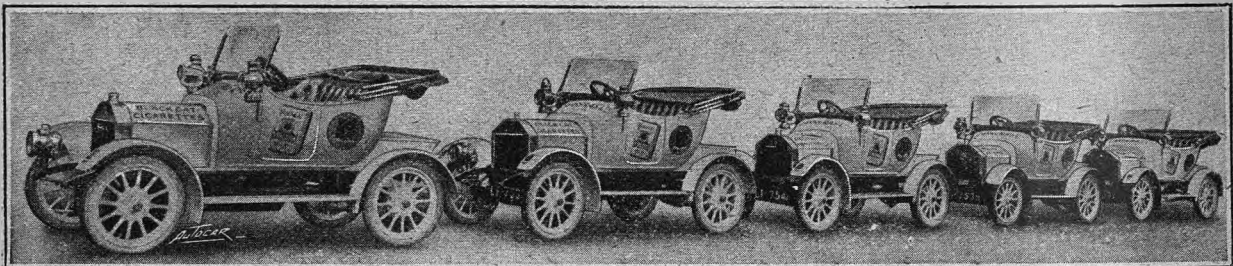
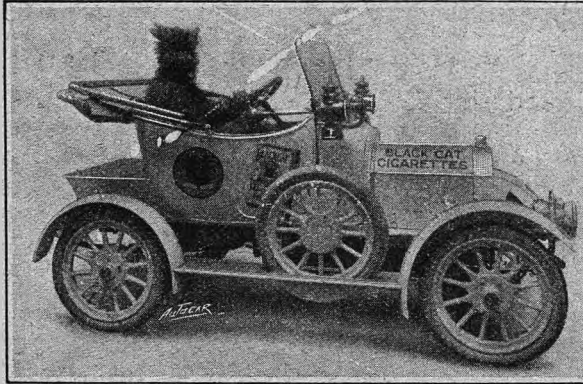
Machinery manufacturers of long repute have the pull over firms just beginning, in that their stuff is beyond question good, and good



ROAD MATERIALS IN NEW ZEALAND. Six specimens of a peculiar volcanic stone which Mr. Herbert Austin, managing director of the Austin Motor Co., Ltd., has received from one of his correspondents, Mr. A. Sturges, of Otahuhu, Auckland, New Zealand, who picked them up from the road outside his house, and states that they afford a fair idea of the materials used in the construction of some New Zealand roads. The road from which these stones were picked is in daily use by motorists.

On the Road.

stuff has more to do with good cars than is evident in catalogues and on the surface. Messrs. Napiers found their many years' experience as makers of mining machinery invaluable, and similarly Messrs. Brown and Sons are enabled to experiment with new ideas in motor engines when a new firm might be chary of so doing. Another point in favour of this engine is in its short length, which enables it to carry a very long body so that the proud proprietor can utilise more of his car for his comfort and not give up three-fourths of it to the bonnet and driving seat. This, in my opinion as a mere critic, is an advantage which is going, as the years roll on, to become more and more prominent. If I may prophesy, my expectation is that in less than five years' time all the best engines will be placed where the Lanchester engine is placed



A fleet of 8 h.p. Swift cars which has just been supplied to Carreras, Ltd., for their travelling representatives. The upper picture shows one of the drivers disguised as a "Black Cat," in accordance with the name of the cigarettes which are a speciality of this firm.

to-day, and so, while more space is available for the back seaters, bodies themselves will be the better for being put between the wheels and not hanging over behind as so often is the case now. Everyone acknowledges that an overhanging body is a badly-designed one, and very soon an abnormally long bonnet will be looked on by all practical motorists as an offence to the eye and a tacit acknowledgment that the machinery requires a great deal of looking after away from its garage and on the road.

In the beginning of cars engines were behind because that was the most accessible part and transmission was at its weakest. Then came the bonnet in front for the same reason, and now merely the notion that a car

does not look pretty unless it has a tin tank ahead of the driver must be responsible for the waste of room, for no manufacturer of any decent car will allow for one instant that his engines ever require looking at after they have left the motor house and are being employed on their ordinary uses. In spite of all exhibitions and catalogues, motor designers are a curiously conservative race. They do so many things "because they have always been done," which was the reason that the horseless carriages of early automobile days were so ungainly and gave the invariable impression that the animals belonging to them had kicked themselves loose.

This habit of clinging to the past—as does our anatomy, by the way—reminds me of a little chat I had with an English shopkeeper on the Riviera who prides himself

—and succeeds—in looking like the worst of Frenchmen and then talking pure Board School English. I asked him if he sold writing pads, because I wanted one. He replied he did not, and when I asked him if any other emporiums stocked them, he said, "We don't know what other people keep." "No," I answered, "and it is a pity you don't! Because men like you are content to bide in your ignorance the world leaves you out, and if we want anything modern we go to stores and up-to-date shops, who sell us the things we want and not the things they keep. You bookshop people are quite the worst. Because you keep stationery you think you can keep stationary. *Bon jour.*"

OWEN JOHN.

Open Hill-climb and Speed Trials in Wales.

The South Wales A.C. and the Cardiff M.C. announce that they are again co-operating to run an open hill-climb at Caerphilly, near Cardiff, on Thursday, June 19th, and an open speed trial on the sands at Porthcawl on June 21st. The course on the sands is one mile in length by about 150 yards wide, and the sands have proved to be particularly hard and adaptable for a trial of this sort. The hill at Caerphilly is 1,194 yards in length, with a rise of 387.03 feet and an average gradient of 1 in 9.2; the steepest portion is 1 in 6.2, and is admirably suited for an event of this kind, as the accommodation for spectators is spacious, there being grass downs bordering the roadway and an entire absence of hedges.

The promoting clubs are very active in catering for local motorists. They have held from time to time many successful meetings, and for the two events now being organised they have the promises of many cups, medals, etc., and everything points, even at this early date, to very successful meetings.

Cardiff is an admirable centre for events of this sort, as not only is it the recognised metropolis of Wales, but the centre of a population of 1,500,000. The committee are now preparing their schedule giving full details of the events, and intending competitors and others interested may obtain copies on application to the hon. sec., Mr. J. Thompson Willows, 2, Dumfries Place, Cardiff.

The 12 h.p. Lion Peugeot.

Four-cylinders Arranged as a Square Block, Pairs Opposed at 20 Degrees.

THE 1913 model 12 h.p. Lion Peugeot presents many features of interest, and not the least of these is the engine itself, for the head of the cylinder casting looks practically square, with valve chamber caps arranged along each end, the four cylinders of the engine being arranged opposite each other in pairs working on the same crank throws, and inclined to one another at 20°. The valves are arranged side by side, but in front of the front pair of cylinders and behind the back pair, the exhaust valves being outside at the four corners, as it were, and operated direct from the cams, the inlets being operated through lifting levers. The bore and stroke are 65 mm. and 130 mm. respectively.

Water circulation is maintained by a pump driven off the front end of the offside camshaft. Ignition is by Bosch magneto with fixed firing point, and a Claudel carburetter is fitted which, placed on the off side, is jacketed and connected with the circulation system for better vaporisation of the petrol.

Lubricating oil is distributed under pressure to the bearings by a pump conveniently secured to the crank case at the near side and driven off the end of the back camshaft on that side. This pump draws oil from the base chamber sump, and circulates it past a sight feed on the dash; but, besides this, a second string is provided in the lubrication system, for the balance discs of the crankshaft, which in themselves constitute flywheels, carry the oil round on to a baffle plate just clearing the periphery of the crank disc, and thence the oil is deflected to the parts requiring it.

In addition to the flywheel crank discs, a flywheel of large diameter is bolted to a flange on the tail end of the crankshaft, and, as usual, this constitutes the driving element of the

clutch. The leather cone clutch is unusual in that it is split—made in halves—rendering removal exceptionally easy; and another point is that rubber pads are substituted for the ordinary first intention springs

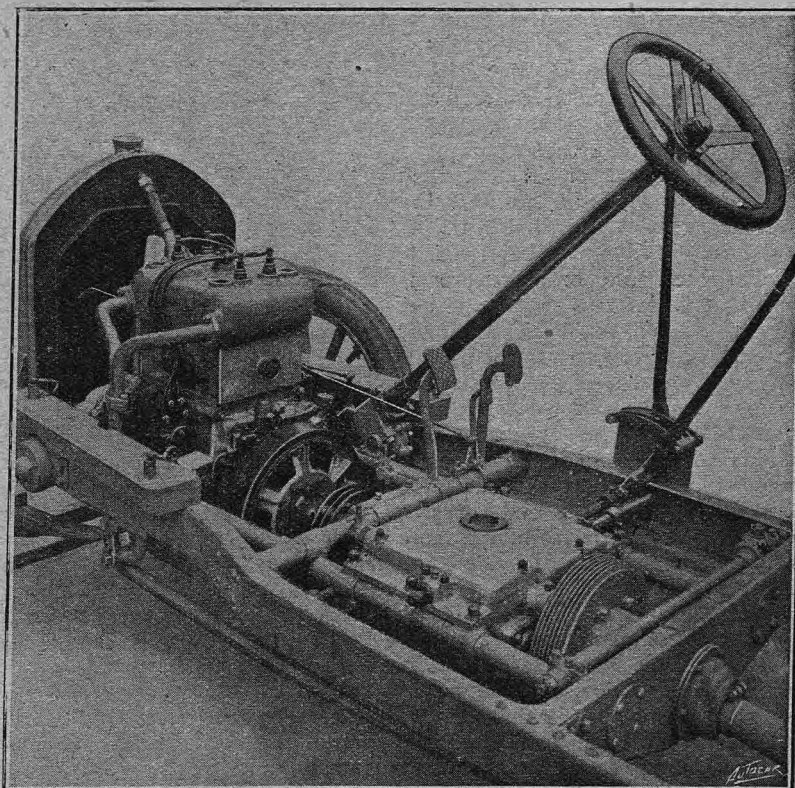


Fig. 1.—A view of the front portion of the 12 h.p. Lion Peugeot chassis showing the form of the cylinder casting, with the two transverse pairs of cylinders. In front of the central cross member, on the off side, can be seen the bevel balancing gear of the rear wheel brakes.

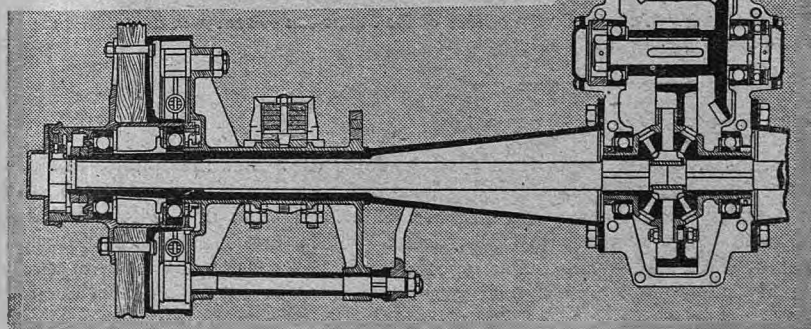


Fig. 2.—Part section of the 12 h.p. Lion Peugeot back axle showing the bevel reduction gear which drives a counter-shaft carrying a straight tooth pinion meshing with a crown pinion on the differential gear box.

underneath the clutch leather.

Between the clutch and gear box there is a very distinctive piece of design in the universal joint. The driving plate member has standing off from it three thin flat rings of flexible metal plate held by bolts. These bolts are continued through holes in the driven member, but as the holes in the driven member are large enough to allow a certain amount of play, and as the bolts seat on spring held spherical seatings, considerable latitude of movement is allowed between driving and driven member. This is the arrangement at two points around the flexible metal rings. At the two other points, at right angles to these positions, the flexible rings are secured rigidly to the driven member, so as to allow play on the ball and socket principle on the driving member—in fact, the previously described arrangement reversed.

The 12 h.p. Lion Peugeot.

The gear box provides four speeds and a reverse. When the fourth direct speed is engaged the gears through which the layshaft is driven are brought out of mesh, and thus on the direct drive there is no work wasted in useless rotation of the layshaft.

With regard to the back axle, this is so designed that the shafts are subjected only to torsional stress, the bending stress due to the weight of the car being taken entirely on the axle casing. The gearing-down mechanism between the propeller-shaft bevel pinion and the differential is a special feature. In this arrangement the driving bevel pinion meshes with a bevel much smaller than the ordinary crown wheel. The latter is secured on an intermediate shaft to which a reducing spur gear is also attached, and this spur wheel is of such a size as to give the necessary total reduction between the propeller-shaft driving bevel pinion and the spur wheel on the differential casing, with which the reducing gear meshes. Such a construction removes the end thrust on the differential casing, and on account of the more nearly equal size of the bevels the transmission noise from this source is reduced to a minimum.

The foot-operated brakes on the rear wheel are compensated by a balance gear on the same principle as an ordinary differential. This is just in front of the deep cross member behind the gear box, together with the compensating shaft, from each end of which connection is made

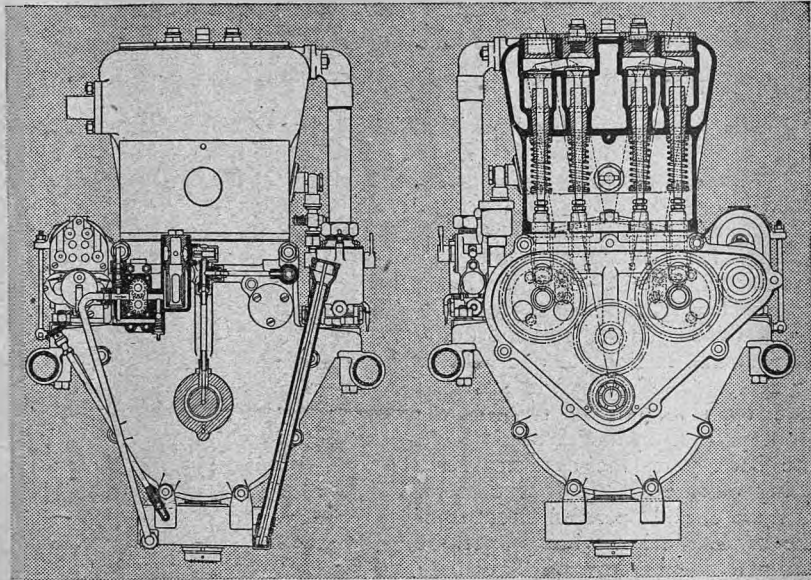


Fig. 3.—Two part sectional views of the 12 h.p. Lion Peugeot engine. One showing the valve and valve motion gear, and the other the lubrication system.

to the brake levers on the rear axle. This connection is a compromise between the rod and wire forms of connection, for it is made of strip steel. Truffault shock absorbers are fitted to both back and front axles.

It is not too much to say in conclusion that, as in all Peugeot models, the reputation of a great name is worthily sustained not only in design, but in finish and general excellence.

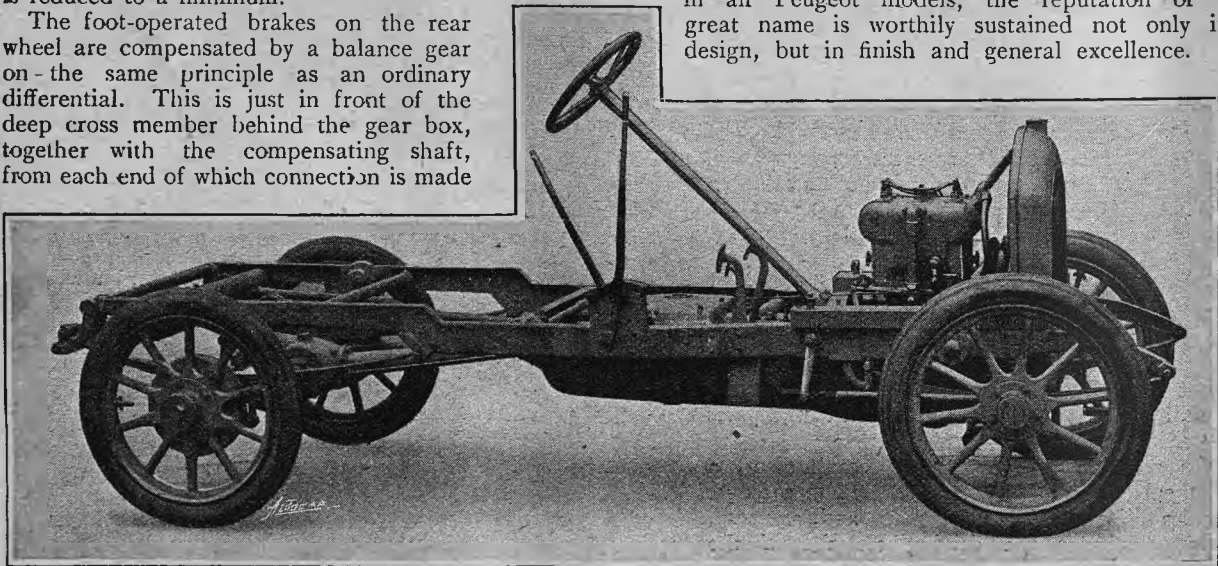


Fig. 4.—Offside view of the 12 h.p. Lion Peugeot chassis. In this view the offside of the engine can be seen with its induction pipe leading to passages in the cylinder casting.

Hood Renovation.

Motorists owning cars with worn, stained, and leaky hoods will find that they can render them light and smart by painting them with Accordion flexible paint, which can be obtained from Messrs. Brown Bros., Ltd., Great Eastern Street, London, E.C. It is supplied in black, buff, brown, and grey. A quarter of a gallon suffices for the hood of a two-seated car, half a gallon for a four-seater, and a gallon for a full-sized hood and side curtains. It is only right for us to say that we have as yet had no personal

experience of the Accordion flexible paint, but are recommending it to the attention of our readers on the experience of Mr. Charles Braun, of the Royal Automobile Club, and a well-known Hampshire motorist. Mr. Braun speaks most enthusiastically of the paint, and says it has again brought into good service and made most presentable a thin and leaky hood which he was just about to scrap. The paint is sold at 5s. 6d. the quarter, 10s. 6d. the half, and £1 1s. the full gallon.

Famous Cars in Retirement.

X. The Four-inch Darracq, No. 17 in the Race of 1908. By G. R. N. Minchin.

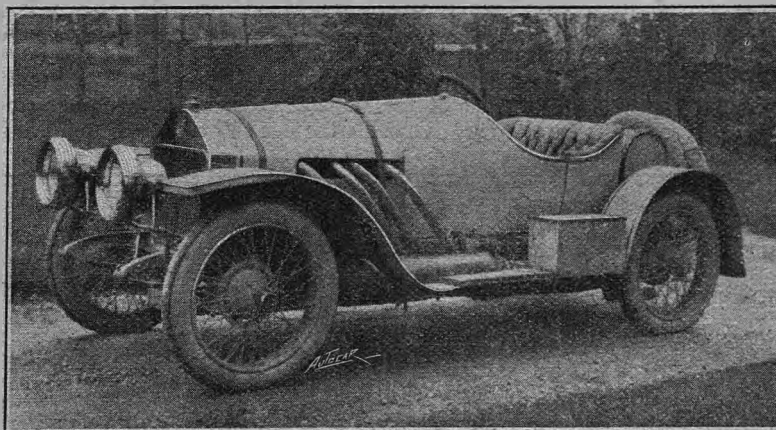
When meeting an ex-racing car on the road in mufti it occurred to us that brief illustrated biographies of one-time prominent cars would be of interest. We shall be glad, therefore, if those of our readers who are acquainted with the whereabouts of cars of historical interest, racing or otherwise, will communicate with us, giving particulars and photographs of the cars. Every care will be taken of the photographs, which will be returned after reproduction.

AS there is to be a revival of car racing in the Isle of Man this year, possibly a short history of one of the most successful cars in the last race held there might be of interest to readers of *The Autocar*.

The great race was, of course, the "Four-inch" held in September, 1908, and the car the Darracq (No. 17), driven by George. The Darracq Co. were one of the earliest to start building their cars for this race, and in fact the engines for the racing cars were completed at the Suresnes Works in time to be mounted into light chassis and used in the Trouville hill-climb that summer. In that event the three cars finished first, second, and third. The engines were then taken back to the bench, where a few final adjustments were made, after which they developed 84 b.h.p. The Darracq firm had for some time favoured long-stroke engines for their racing cars, so the long stroke of 160 mm. was no new departure for them, as was the case with several of the other manufacturers whose cars ran in the Isle of Man race.

The engines were then mounted into what was practically a standard, though strengthened, chassis with suitable gear ratios.

However, we must confine our attention to No. 17. Everyone who remembers the event will know that No. 17 finished third, five minutes behind the winning Hutton and three minutes behind the second Darracq, driven by Mr. A. Lee Guinness. There is always a large element of luck in every motor race. In this

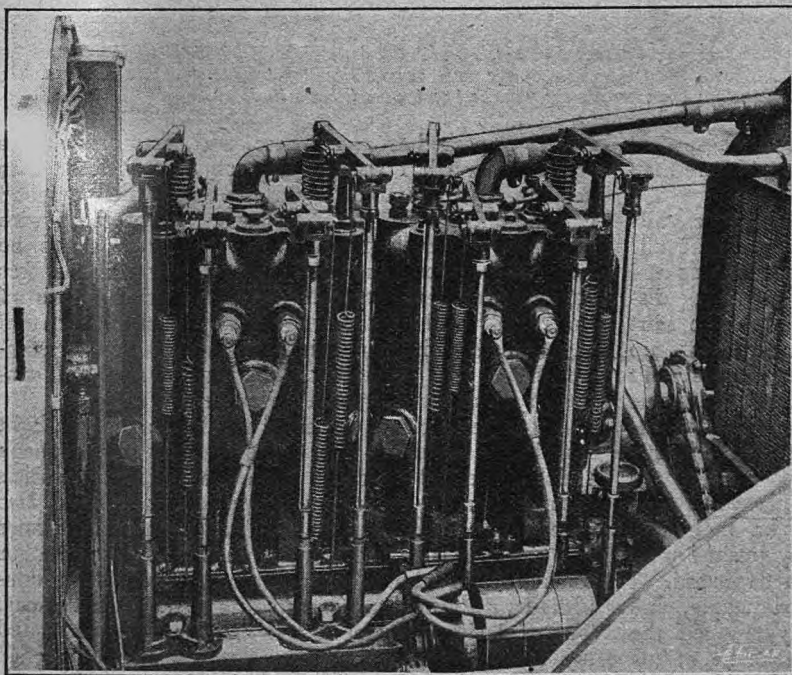


The "four-inch" Darracq in its present form with a body by Messrs. Mann, Egerton, and Co.

case the carburetter of No. 17 caught fire in the last round and wasted six minutes. No. 17 never did a bad circuit, and accomplished the fastest lap that has ever been done over the "four-inch" course at the extraordinary speed of 52.6 m.p.h. The race may be said to have been a veritable triumph for the Darracq cars, the only complete team to finish.

After the race the car was bought and used by a doctor in the North of England; hardly a suitable run-about for a doctor! No. 17 was next heard of in Wales, where its owner used it to go daily to and from a coal mine in the course of business. Poor old car! It fell into a very bad state, and eventually gravitated to London, where Messrs. Darracq took it to pieces and renovated it throughout. Its prestige, so to speak, revived, and on one occasion it was raced on Brooklands track by Mr. Malcolm Campbell, who had been so successful with the 59.6 Grand Prix Darracq car, but as there had been no time in which to tune up the "four-inch," it did not do justice to itself, and had to be content with a third place.

When the car first came into my hands about a year ago it was as good as new, and various adjustments rendered it suitable for touring



The engine of the "four-inch" Darracq showing the arrangement of the overhead valves. Just behind the radiator can be seen the front end of the car lighting dynamo and its driving belt.

Famous Cars in Retirement.

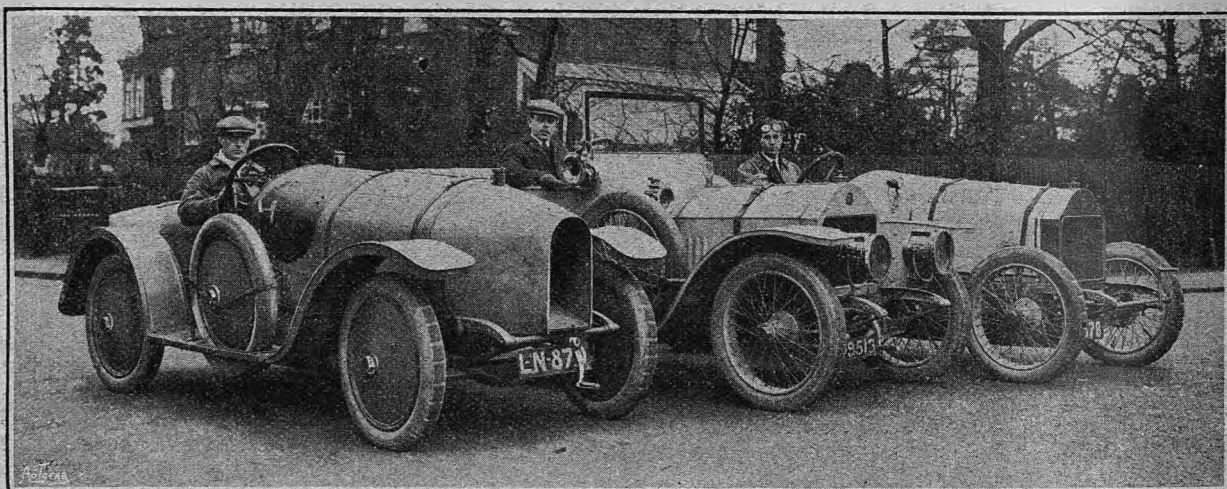
work. A finer touring car it would be impossible to imagine. It has been the very essence of reliability and is really economical to run. An S.U. carburetter having replaced the original one gives a consumption of 18-19 m.p.g., besides allowing the engine to run at an extraordinarily slow speed when the car is standing. The consumption of lubricating oil is somewhat heavy, though this is due more to a mere whim on my part than to necessity. Although the phenomenal acceleration of the car is frequently taken advantage of, tyres (820 x 120 mm., mounted on R.-W. detachable wheels) last well. The four-speed gate change is as sweet a gear box as on any 1913 car. It is believed that no mechanical breakage has ever taken place on any of the three "four-inch" cars, which is quite likely considering the practical nature of the design and the quality of the materials used.

The best speed attained by one of these cars is in the neighbourhood of 80 m.p.h., although at the present time we have engines of the same size covering over 100 miles in an hour. On hills the car shows

It needed some diplomacy and a good deal of courage to announce the fact that the performance had to be gone through again. However, be it said to their credit, they rose to the occasion and gallantly helped me to start the car once more. This time I thanked them in advance, so that there was no necessity to back the car!

I left Poole one winter evening to drive up to London. As the control to the carburetter from the steering wheel was broken, taking one's foot off the accelerator pedal meant stopping the engine, which was distinctly inconvenient. The first stoppage was in the depths of the country, though fortunately I saw ahead that an infants' school was just breaking up. After some talk I managed to strike a bargain that if the kiddies started the car they should have money for sweets. I doubted their ability to do so, as the eldest could not have been more than five; however, a bevy of some twenty little girls started the car in fine style.

Another stop occurred in the evening, when it was dark and assistance seemed unlikely. A drunken



The three 4in. Darracqs in company for the first time since the race of 1908. On the left is Mr. M. Campbell, in the centre Mr. Lee-Guinness, and on the right Mr. G. R. N. Minchin. Neither of the three owners has had trouble with his car, and each, according to Mr. Minchin, considers his car "the best on the road, bar none."

up remarkably well, and it is curious that these cars have not been entered more for hill-climbs, where they would surely do well.

The sole drawback to the car is the lack of a half-compression device; starting also is somewhat difficult. The car is reputed to have broken two men's arms and knocked out the teeth of another, and regarding discretion as the better part of valour, I prefer to start by pushing. By this method the car will start up within half its own length. It would be simple to fit dual ignition. It has been in starting I have had some of the most humorous episodes in connection with the car. One very wet Sunday in Cambridge, there being no one else in sight, I was compelled to ask the assistance of an aged professor and his wife, who were dressed in their Sunday clothes on their way to King's College Chapel. United they pushed until finally the engine started and the car shot forward. I immediately backed to thank these kind people, and in the act of drawing up, accidentally stopped the engine. The lady remarked on the silence of my car when standing still, though she said that it made a nasty noise when moving. The professor told me he was glad it had started when it did, as he could not have pushed one inch further under any circumstances.

soldier appeared from nowhere, and, extraordinary to relate, although I was on an incline of at least 1 in 20, this man was able to start the car, which weighed considerably over a ton. He gave a great groan with the final successful push, in the course of which he lost his balance, and when last I saw him he was rolling over and over in the grass at the side of the road. Still another engine stop occurred on that journey, this time in Kingston. This time I commandeered the services of the driver and the conductor of a tramcar, which was nearly empty.

One other incident occurred not long ago. A slight leak in the induction pipe caused a mechanical squeak which appeared to come from the engine (motorists with mysterious engine noises, please note) and also severe popping in the silencer. I had been out to dinner and had persuaded a friend of mine, a famous amateur cricketer who abhors motor cars and everything connected with them, to accompany me home in the car. The explosions became louder and more frequent, and my friend was alarmed; however, when we reached my garage in safety the explosions were as frequent in the exhaust pipe as in the cylinders themselves, and long tongues of flame shot out. Scarcely had I put the car to bed when someone attired in a most horsey

get-up rushed up to my friend, having apparently run at full speed from King's Cross (a distance of over a mile), breathlessly remarking that he thought his premises were being blown up. It appeared that some cans of petrol had been left in his stables adjoining my garage, and he thought they were exploding one by one! He violently abused my friend, who was vainly endeavouring to explain the noises. His unique explanations and his vain attempts to appease the

other's anger provided me with more amusement than I had enjoyed for a long time.

In conclusion, I would advise anyone who wants a really good sporting car to get a 4in. Darracq; but as there are only three in existence I fear many possible purchasers must be doomed to disappointment. The other two, I have recently found out, are in the possession of Mr. M. Campbell and Mr. Lee-Guiness respectively.

Famous Cars in Retirement.

An Extraordinary Escape.

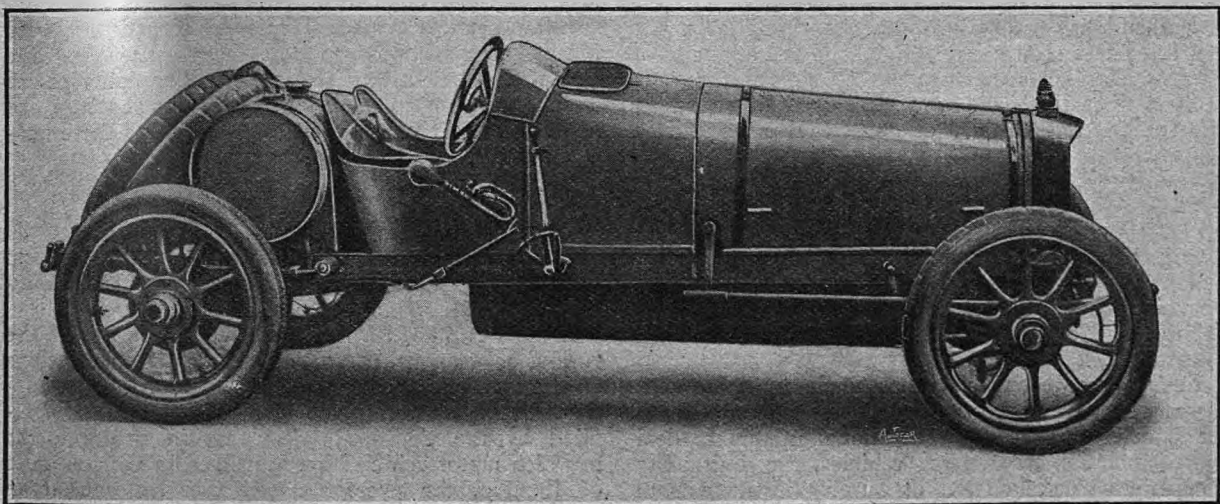
Almost Unhurt After Colliding with a Telegraph Pole on Brooklands Track at 80 m.p.h.

ON Thursday of last week a very remarkable accident took place at Brooklands, when Mr. W. G. Scott was driving a 15 h.p. Argyll car fitted with one of the famous slide valve engines. Apparently the machine was being run on an endurance test, and we had been watching it steadily lapping the track at about eighty miles an hour.

On emerging from the club house we were shocked to hear that it had met with an accident, and run into a telegraph pole. We jumped on a car as quickly as possible, and ran round the track to the scene, which was at the beginning of the straight alongside the railway. The car had apparently run right off the track at the inner edge, swept away a yard or two of the stone kerb, and, in trying to enter the telephone hut, had utterly demolished that building, while a massive telegraph pole, which the car had also hit, had a bad list to one side, with broken telegraph wires hanging from it in festoons. To our surprise, the driver, Mr. W. G. Scott, was walking about the track smoking a cigarette, and forcibly complaining of his inability to find the screw cap that had apparently worked loose from the end of the rod connecting the two steering arms, and so caused the accident. As one comes off the banking at the east end there are one or two bumps, and it was apparently one of these that had finally shaken off the cap that had caused the trouble. Coming down off the banking like this, Mr. Scott's speed could scarcely have been less than eighty miles an hour, judging by the pace at which we had seen him travelling, yet, in spite of the damaged kerb, the demolished hut, and the

broken telegraph pole, the only apparent damage sustained by the driver was a rather nasty cut under his left eye. Though Mr. Scott seemed considerably annoyed at having his endurance test so hastily cut short, he may certainly congratulate himself on a miraculous escape, and perhaps he will allow us to join in the congratulations. It was marvellous how little the car itself was damaged by the impact. The dumb irons were bent up pretty badly, the starting handle-shaft was bent right back in a graceful semi-circular curve, the wedge-shaped metal casing in front of the radiator was crumpled like paper, and one of the front tyres was nearly cut in two, across the bias of the fabric, but beyond this there was little damage visible. The construction of the car must certainly have been extraordinarily strong.

Incidents of this kind show the extreme wisdom of makers, whether they go in for competitions or not, in running their cars for long distances on Brooklands at sustained high speeds, as they are put to a test as to magnitude of stresses and as to duration of these excessive stresses which can never occur in ordinary use on the road. Although this accident occurred through some carelessness and not on account of a constructional defect, the advantages of the sustained high-speed tests are none the less real, because it is pretty safe to say that such a thing is most unlikely to occur again with this particular make, and, of course, the maker learns as much by the absence of failure as by failure; for instance, if his car will stand continuous forcing on Brooklands, he may rest assured it will not give trouble in the ordinary way.



THE SUNBEAM GRAND PRIX CAR. One of the Sunbeams entered for the race. We understand that it has six cylinders with a bore and stroke of 80 x 150 mm. giving a cubic capacity of 4,518 c.c. It may be remembered that the Grand Prix, which takes place on July 12th, will be run on a fuel limit, approximately fourteen miles to the gallon.

On the Track.

Prospects for the Whitsun Meeting. Many New-comers.

THINGS are moving at the Track. Cars, both private and trade, have been there in plenty of late, and there is talk of another splendid programme for the Whitsuntide Meeting. It is said that, though car entries were not officially "closed" until the 30th ult., several well known competitors have had to be ousted with being on the list of reserve entries. It seems that the Benzole Handicap and the 100 m.p.h. Long Handicap were filled days ago, and that among the competitors entered is Mr. Eric Loder with the big Benz so often driven by Mr. Hornsted. Mr. Loder is one of the most popular amateurs, and his handling of the Grand Prix Italia he used to race is well remembered. A good match for the Benz is one of the 90 h.p. F.I.A.T.'s, which, we hear, has been entered by Mr. Engley. With the exception of the ponderous Darracq once run by Mr. Lee Guinness, it has as big an engine as any ever seen at Brooklands, and is, we believe, of the same dimensions as the F.I.A.T. driven by Nazzaro himself.

We always look for new cars at the Whitsun Meeting, and this year Mr. Coatalen will introduce a new Sunbeam of 16 rating, probably 80 x 120 mm. In view of the recent trend of engine design, this is a very moderate length of stroke, and its performance will be eagerly watched. Then Mr. Coatalen's great rivals at Luton, the Vauxhall Co., are said to have entered a car, but so far we have not learnt its dimensions or even whether it is in the same class as the Sunbeam referred to above. It may be a ninety bore proposition. In any case we shall probably see another great battle in the fight between these great English firms on Whit-Monday.

There are no less than a round half dozen new private competitors who will run for the first time on Whit-Monday. One of them, Mr. R. H. Townshend has a 48.6 h.p. Sheffield-Simplex, a car that has never been raced before, and the others have all good cars—cars that can put up a good race. It is likely that there will be a full field of seventeen cars for this race, instead of about twelve, as usually happens.

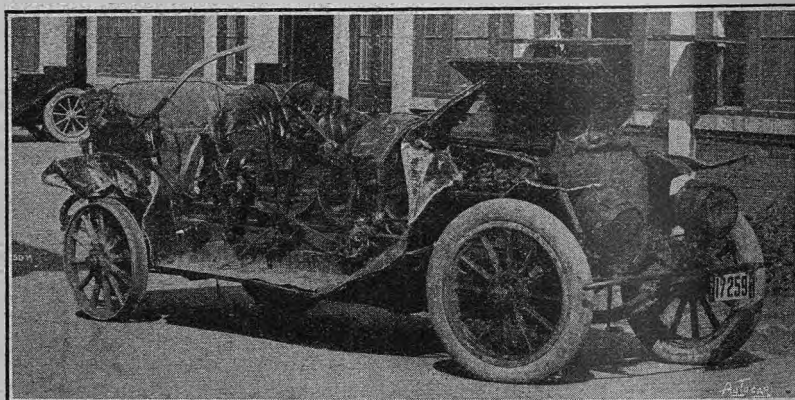
Select Committee on Motor Traffic.

On behalf of the Automobile Association and Motor Union Mr. C. H. Dodd (Vice chairman) and Mr. Francis Wilde (Assistant Secretary) gave evidence before the Select Committee on Motor Traffic on Thursday last week.

Among the recommendations made by these witnesses were: The necessity for a special Traffic Board for London, the need for additional powers to deal with obstruction by standing vehicles, the desirability of restricting certain types of warning instruments to particular classes of vehicles, the provision of mirrors on covered vans to show drivers what traffic is behind them, the necessity for encouraging the use of sub-

Mr. Herrington, of Ariel fame, was well known as a competitor in the early days, and he will be welcomed back on a 15.9 h.p. Ariel, a make of car not seen at Weybridge since 1908. One cannot help thinking that the strenuous rivalry of the newer firms is causing a great revival of the racing spirit. What a time there would be if a new racing policy took hold of the great houses of Daimler, Napier, and others.

The only race that seems unlikely to fill is the Cycle Car Race. We believe it to be a fact that many



A Pierce-Arrow car as it was returned to the makers, with nearly a dozen others, for repair from the flood district in Dayton, Ohio, last month. The car was in a wooden garage which was swept away bodily by the great flood, but after proceeding some distance the garage was knocked to pieces. The car was then rolled over and over in a torrent some fifteen feet deep and carried for a mile and a half, which accounts for the dilapidated condition of the body and chassis. The hood has almost completely gone and one "demountable" rim is missing, but the other three tyres are intact.

of the cycle cars on the market are as little capable of withstanding the peculiar stresses of racing as were some of the cars which attempted it in 1907. There is this difference: the cycle cars do not attempt it!

Members of the B.A.R.C. will miss the genial face of the late Sir Charles Rose, who was on the committee from the commencement, and has often acted in the capacity of steward. It would be a fine thing for the Club if Prince Henry of Prussia were to accept an invitation to fill the vacancy on the B.A.R.C. Committee. He is a familiar figure at the Track, and often when visiting this country he unostentatiously pays a visit to it. He was there only a week or so ago testing a carburetter.

ways by pedestrians, the need for some uniform system of road signals, the re-arrangement of tram-car and motor omnibus stopping places, etc.

A mass of statistics was produced in support of the various suggestions, compiled from actual observations on the road carried out at the instance of the Association. Analyses were given of accident statistics compiled by the police, showing that in the accidents in which motor vehicles were involved in various parts of London, the average speed was between seven and eight miles per hour, proving conclusively that the suggestion frequently made that motor accidents are due to high speed is entirely fallacious.

The Aris Floatless Carburetter.

A Combined Air and Petrol Valve Opened by Suction as Permitted by the Throttle.

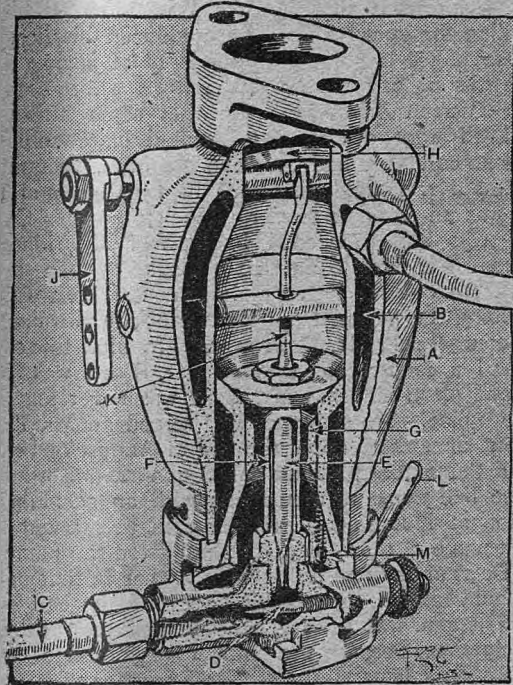
BY the absence of any float chamber it will be seen that the Aris carburetter becomes a remarkably compact apparatus. Reference to the accompanying sectional drawing will show that A is the exhaust jacketed body of the carburetter, into

the lower part of which is pressed the aluminium casting forming the choke tube G and carrying the feed needle valve D and the jet-column F.

The petrol arrives by the union C, the delivery to the jet being adjusted by the needle valve D. Screwed into the orifice above the needle valve is the jet column F, in which the disc-headed needle valve E (which is also the jet) is free to reciprocate. The valve spindle E is drilled down the centre, and has four inlets from the jet column just above the taper. H is a butterfly throttle operated by the lever J in the usual way. To the upper end of the throttle is pivoted a bent chisel-headed rod K which serves two purposes. As the throttle is opened, and the upper end lifts, the chisel-headed stem lifts with it and permits the disc-headed needle valve E to rise from its seating in obedience to the suction of the engine. As the valve E rises the air passage is increased in area, as is the petrol feed by the simultaneous lifting of the needle valve E. The sharp tapered end of the chisel-headed stem has a second function in splitting and spraying the stream of petrol issuing from the top of the jet E.

The lever L and the spring and spindle M are the means provided for flooding the carburetter when starting the engine. The depression of the lever L raises the spring encircled spindle and thereby lifts the disc-headed petrol valve E, so allowing the petrol to flow into the mixing chamber of the carburetter and provide a rich mixture.

The flow of petrol is entirely arrested through the main jet when the throttle is quite closed. An adjustable feed of gas for slow running is provided above the throttle valve. This neat and ingeniously designed carburetter is marketed by Mr. A. A. Godin, 1, Red Lion Square, Holborn, London, E.C. Mr. Godin informs us that his experiments with it show it to be much more economical than many standard carburetters.



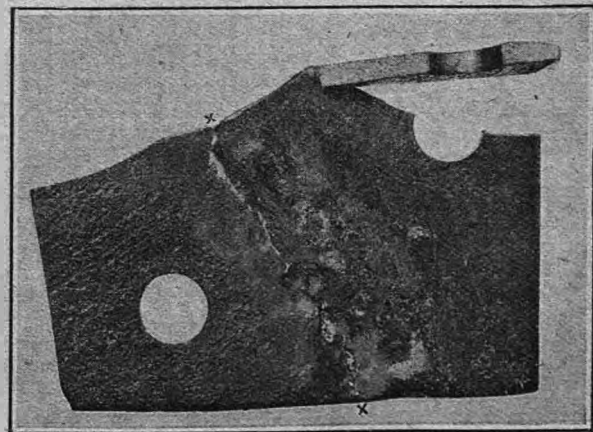
The Aris floatless carburetter.

- | | |
|-----------------------------------|--|
| A, body of carburetter | H, butterfly throttle valve |
| B, exhaust jacket | J, throttle lever |
| C, petrol feed from tank | K, coupling between throttle and disc-headed valve |
| D, adjustable petrol supply valve | L, flooding lever |
| E, disc-headed needle valve jet | M, spindle and spring operated by lever J |
| F, jet column | |
| G, venturi or choke tube | |

A New Welding Process.

IN our issue of November 23rd, last year, mention was made of a new process of welding, more especially applicable to castings, by the County Welding Works, South Street, Romford. Since then, to demonstrate the capabilities of the process, a rough test was carried out, the results of which, as indicated in our illustration, show a piece of cast iron stove plate joined in the middle by the County process and tested by Mr. W. Badger on a machine by Feltons, of Cradley. As the machine employed was a chain tester, two 1/2 in. holes were drilled, about 1 in. from the weld, and it was found that the plate broke at a stress of three-quarters of a ton—but not at the weld. As a matter of fact the metal broke across the small section between one of the holes and the edge of the plate, and, on the area, the stress works out to about four tons to the square inch. A great point about this welding method is that in the actual process no flux is used, and it is claimed that, by an after process, the metal is returned as far as possible to its original molecular structure, and no local hardening takes place, the weld also remaining as machinable as any other part of the casting. Further, it is claimed that with this process the cracks that have been treated do not at any after time show a tendency

to extend. Great care, too, is taken in repairing castings to maintain the accuracy of the relative position of the various parts to be welded together.



A piece of welded cast iron after being subjected to a test. It will be seen that the test piece did not break at the weld, which is clearly visible between the points X.

Perjury Charge against Police Withdrawn.

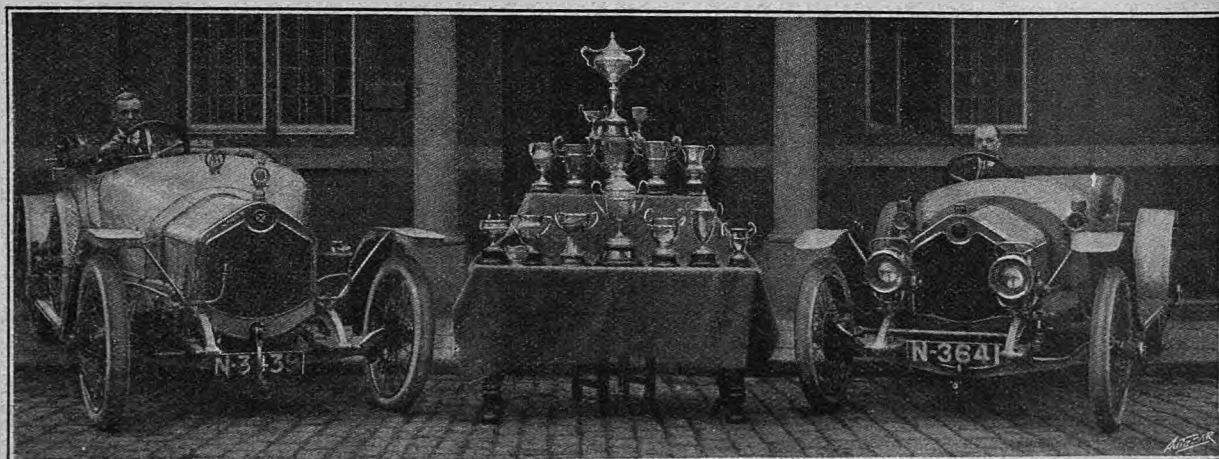
Prosecutor Blamed for not Assisting the Police who had Summoned him in Mistake for his Friend.

A METROPOLITAN policeman, fully uniformed, was placed in the dock at the Old Bailey on Monday last, before the Recorder, to answer to an indictment charging him with committing "unlawful and wilful" perjury in evidence given by him in a case which was heard at the Brentford Police Court on the 26th September, 1912.

Prisoner pleaded not guilty, and was defended by Mr. Marshall Hall, K.C., assisted by Mr. A. H. Bodkin and Mr. Boyd.

Mr. E. Wild, K.C., who, along with Mr. R. Harker, conducted the case for the prosecution, said in his opening statement that the prisoner was a sergeant in the police. The charge was one of perjury, committed before the Brentford justices on the 26th of September last, and the proceedings then being considered were events that happened on the 27th of July previous. The prosecutor was Mr. W. Thorburn Lord, who had been engaged in the motor trade for some ten years or so. In the year 1911 he was carrying on his business at Prince's Garage, Holland Park. He had a number of cars in his garage. It was customary to have what were known as trade numbers. In the case of the Holland Park garage the numbers assigned to Mr. Lord were AWT 1, 2, and 3, and the AWT 1 number was generally affixed to a grey four-seated 16 h.p. Clement. In March of that year Mr. Lord left the garage in Holland Park and went to a garage in Clarges Street, Piccadilly, where he was at present. When he removed from Holland Park he no longer had the AWT numbers. His garage at Holland Park was taken over by a Mr. Marshall, where the Clement car with the AWT mark upon it was left. The registration of the AWT numbers expired in March, 1912. In April, 1912, there came upon the scene a gentleman who was sometimes called Higgins and sometimes Dawson. Mr. Dawson (as counsel called him) purchased the Clement car with the AWT mark upon it in April, 1912, and in the following month Dawson, armed with an authority from Mr. Lord, took the car from the Holland Park garage to his own garage at 101, Fulham Road. On the 27th July Mr. Dawson, accompanied by a lady and gentleman named Stanton, went for a motor

drive in a grey four-seated Martini car to which the plate AWT 1 had been affixed. About 4.50 in the afternoon Mr. Dawson was driving upon the Bath Road, apparently exceeding the speed limit, when he was stopped by the police, including the prisoner. He was informed that he would be summoned for exceeding the speed limit. He produced his licence, and the police had every opportunity of seeing him. There was no boy in the car. After a short conversation Dawson drove off. On that same afternoon Mr. Lord went out in a two-seated claret-coloured American car. He had with him two other occupants. One was Mr. Esdale, an actor in London, and the other was an Airedale terrier. He left Baron's Court about 4.30 and proceeded by way of Uxbridge to Burnham Beeches. He came back by the main Oxford Road. He never went near the Bath Road. Describing the personal appearance of the two gentlemen, counsel said Mr. Dawson was 5ft. 8in., thick-set, and had a moustache, whereas Mr. Lord was 6ft., thin, and clean-shaven. Mr. Lord was never stopped by the police. No summons was served on Mr. Dawson, but somewhere about the end of August or beginning of September prisoner called upon Mr. Lord and said he had come in connection with an accident or collision at Hounslow. Prisoner said he wanted the correct name of the driver, who had given the name of John Dawson and had produced a licence in that name that could not be traced. The plate on the car, said the policeman, was AWT 1. Lord replied that he could not help them because the number was obsolete. Two or three days later, Lord received another visit from the police, who went away and returned soon afterwards with Sergeant Thrower. It was now suggested that there had been an accident at Hammersmith. It was not suggested at that interview that Mr. Lord had done anything wrong, nor was mention made that a summons would be served upon him. On the 20th September, nearly two months after the police had stopped Dawson, Mr. Lord was served with four summonses for alleged offences against the Motor Car Act, 1903. There was a summons for exceeding the speed limit on the Bath Road on the 27th July; a second for fraudulently using a certain identification



TWO SUCCESSFUL CARS. The consistent success of the Crossley cars in hill-climbing competitions last year has been previously remarked upon, for the 15 h.p. model driven by Mr. C. Bianchi up till the end of 1912 had won fifteen times on formula, while the 20 h.p. car driven by Mr. G. Hubert Woods had made fastest time on thirty-four occasions.

mark; a third for fraudulently using a licence issued to Dawson; and a fourth for using an unregistered car. All relating to the events of the 27th July. These summonses were returnable before the Brentford justices on the 26th September. It was at the hearing of the cases that the alleged perjury was committed. Mr. Lord was represented by Mr. Easton. Mr. Lord had been naturally wondering how he could possibly be summoned for offences that he obviously did not commit. He saw Mr. Dawson on the 22nd September, and that gentleman made no secret of the fact that it was he whom the police had stopped on the Bath Road. Mr. Dawson was brought up for the defence, as were also Mr. Easton and Mr. and Mrs. Esdale. Counsel explained that Dawson was kept outside the court until he was called to give evidence. Prisoner gave evidence for the police. He swore that Lord was driving a four-seated car with the plate AWT 1 upon it on the Bath Road on the afternoon of 27th July about 4.50, and that he had a lady and a boy in the car. He was cross-examined and asked whether he was sure of the identity of Mr. Lord. He swore he was sure of it, and added that the lady was in the car with Mr. Lord. Turning round in the court, explained Mr. Wild, prisoner said, "And there she sits." The lady in court was Mrs. Esdale, an actress whose stage name is "Frances Davie." Mrs. Esdale on the afternoon in question was performing in the matinée of "Buntly Pulls the Strings" at the Haymarket Theatre. The prisoner had the opportunity of seeing Mr. Dawson and Mr. Lord, and counsel submitted that nobody could mistake the one for the other. They would not be surprised to know that the Brentford magistrates dismissed the summons. Mr. Lord consulted the Automobile Association and Motor Union, and with their assistance the present proceedings were instituted, the Brentford justices having refused process. Prosecutor then went before one of the judges of the High Court, and leave was given to prefer the indictment. Prisoner had undoubtedly sworn a false oath, concluded counsel, and by that false oath, which carried with it all the weight of his uniform and his position, he had seriously jeopardised the position of the prosecutor.

Mr. Lord gave evidence bearing out counsel's statement. He was subjected to a searching cross-examination by Mr. Marshall Hall, K.C.

After complaining of the "hole and corner" way in which the prosecution had been launched, counsel asked witness why he did not tell the police he had found the man they were looking for following his conversation with Dawson on the 22nd September, several days before the summonses were returnable?

Witness retorted that he did not think it was his duty. "I would not give my friend away," he added.

Mr. Lord admitted a list of five convictions for exceeding the speed limit, and remarked that, although he had known Dawson "in a casual way" for about three years, he did not know him by that name. He had known him as Higgins.

Counsel: Can you suggest any motive of any sort why Thrower should make this false charge against you? Witness was understood to say, "I think he had probably reported the thing at the police station, and someone had to be convicted, and as he didn't find the man he wanted he —"

The Recorder (interrupting with some asperity): It was your fault that he could not find the man.

The proceedings were then adjourned until the following day

When the hearing was resumed on Tuesday morning the Recorder, addressing Mr. Wild, said: "I have been considering this case and feel very strongly with regard to it. If you desire it I shall be prepared to see you both in my room as there are extremely important public questions arising out of it."

Mr. Wild and Mr. Marshall Hall accordingly left the court with the Recorder. On returning after a ten minutes' absence, Mr. Wild said that, having had the advantage of his lordship's assistance, and subject to the gentlemen who instructed him, he thought it would be proper not to proceed further with the prosecution.

The Recorder: I think that is quite the proper course to pursue.

The Recorder said that the case was a most unsatisfactory one for any jury to be asked to consider. He pointed out that perjury in order to be effective must be wilful and corrupt. The jury had not been directed by him, as he knew nothing about the case. (The previous day his Lordship remarked that had he had notice of the case he would have sent it to the Grand Jury. Mr. R. Harker replied that notice had been given.) Under the circumstances they would kindly say that the accused was not guilty.

The jury returned a verdict of "not guilty," after which George Billing, who was with Thrower in charge of the police trap, entered the dock.

The Clerk (to Billing): You are indicted for committing wilful and corrupt perjury at Brentford Police Court. Do you plead guilty or not guilty?

Billing pleaded not guilty. No evidence was offered, and the jury upon the direction of the Recorder found the accused not guilty.

Mr. Marshall Hall said that the Commissioner of Police took a very strong view in regard to that prosecution. When he described it as a "hole and corner" prosecution he did not mean to make any attack upon the Automobile Association for instituting the proceedings. Thrower was a man who was now station sergeant. He had been fifteen years in the police and bore an exemplary character. Billing had been eight years in the police. Counsel's point was that there was no suggestion of any motive upon which either of those two men could have acted. They knew nothing of Lord; he was a person unknown to them. The absence of motive was an enormously important question. Both the accused had authorised him to state that they were ready to acknowledge that they had made a mistake.

Mr. Wild said he was glad to hear the admission that the police had been mistaken. He thought it was a very great pity that, instead of saying they believed Mr. Lord was the man they had stopped, the defendants had said that it was Mr. Lord. He was very glad that his friend had withdrawn the expression "hole and corner prosecution." The whole matter was put before a Judge in Chambers, who granted process and said it was a case for investigation.

Both the accused were then discharged.

At a Local Government Board inquiry the other day into an application for a 10 m.p.h. speed limit on motor cars at Clapham Common, Balham, and Tooting, it was stated that the Chief Commissioner of Police was of opinion that no useful purpose would be served by a limit, but that if speed were reduced it would inevitably lead to congestion, which, as statistics showed, was the greatest contributory cause of accidents.

The 16-20 h.p. Chenard Walcker.

The Impressions of a Trial Run.

WE have lately been making a trial of several different cars, all of which are driven by the much discussed 80 x 150 mm. engine. One of these was the 16-20 h.p. 1913 Chenard Walcker. A special feature lies in the transmission, the power being conveyed to the road wheels through pinions attached to the ends of the live axles meshing with internally toothed rings on the rear wheels. The whole weight of the rear portion of the car is carried on a solid unbroken axle. One would imagine that such a system would create undue noise, but actually this is not so. In fact, it may be said that the transmission noise is only slightly in excess of a very quiet bevel, and a great deal quieter than a good many ordinary bevel drives.

The particular car placed at our disposal was altogether ideal for a trial run. The body was of the torpedo type, and fitted up with C.A.V. electric lighting, Bosch two-spark magneto, hood, speedometer, and every other necessity and convenience the most exacting motorist could require. Too often trial cars are turned out in such a condition that the reviewer has to sink all sense of personal comfort in his mechanical keenness for the running of the engine. Now as regards the control, the change-speed gate is a departure from standard practice, but the unconventional gate when known, and its disposition of speeds did not take long to acquire, was found to have nothing whatever against it. In any case the car changes speed remarkably well, and a noisy change is the exception. The clutch is silky in action and the foot brake perfectly delightful, affording that combination of smoothness and power so greatly desirable and so comparatively seldom obtained.

The trial run consisted of a trip into Surrey. The comfortable body was heavy in itself and carried a load of five people, while the muddy roads combined with a sou'-westerly gale, the full blast of which was

encountered on the outward journey, gave the engine plenty of work to do. The third speed was required for the Robin Hood Hill approaching Kingston, but this was the sole change down as far as the Hut at Wisley, on the Portsmouth Road, all other gradients being comfortably taken on top. Through London traffic the top speed was in engagement nearly the whole time, and it was noticed that the acceleration was quite good. The engine was kept running on one set of plugs only until a burst of speed was required, when on switching on to the double set a notable increase of power was obtained, though the running of the engine became slightly coarser.

On the whole the engine ran very smoothly, and there was a total absence of objectionable periods. Though the roads were extremely heavy, and in places very bumpy, the car ran steadily, and the springing was all that could be desired. This important feature was doubtless aided by the Telesco shock absorbers which are fitted as standard. The steering was excellent, being light and yet not too light, while the large wheel fitted greatly added to the comfort in driving. During the run the steep hill leading from Clandon to Newlands Corner was comfortably ascended on second against the wind and from a standing start.

If there was anything to criticise in the running of this excellent car it was the fact that hills were taken at a speed which was rather under that obtained by other cars the writer has tried fitted with engines of the same dimensions, but this may well have been due to the heavy body, the muddy roads, and the strong wind.

Still, the engine ran sweetly, and there was a total absence of knocking to which long stroke engines are still believed by some to be prone. In conclusion, it must be acknowledged that the 16-20 h.p. Chenard Walcker left a most favourable impression.

Patents in France.

We have received a communication from Messrs. Leechman and Co., chartered patent agents, Hertford Street, Coventry, to the effect that in the *Illustrated Official Patents Journal* of 9th April, there is an announcement of considerable importance to those members of the motor industry who hold patents in France. Most inventors are aware that when a patent is obtained in a foreign country actual manufacture must be effected in that country within a certain period, but, generally speaking, if actual manufacture be not possible, technical "working" is effected by way of advertisements, circular letters, etc. A statement has been made that a change in the procedure has taken place, but the official announcement quoted below states that this is incorrect, and that the procedure remains the same as it was before.

EXTRACT FROM "THE ILLUSTRATED OFFICIAL JOURNAL (PATENTS)" OF 9TH APRIL.

Working of Patented Inventions in France.

"Notice has been received from the director of the French 'Office National de la Propriété Industrielle' to the effect that he is advised that a circular has been addressed to inventors residing abroad, stating that the working of patented inventions in France may be proved, with the concurrence of the French Govern-

ment agents, by means of official certificates which may be deposited at the Ministry of Commerce. The statement made in this circular is absolutely incorrect. According to the terms of Article 34 and paragraph 2 of Article 32 of the French Patent Law of 5th July, 1844, the courts are alone competent to deal with the question as to whether or not an invention has been worked in accordance with the law. The Office National has no power to receive, judge, or preserve any documents relative to the working of inventions; any communications addressed to the 'Office National de la Propriété Industrielle' with the object of giving proof of working will be returned to the sender."



A new brush now being sold by Messrs. G. T. Riches and Co., Ltd., specially for cleaning the inside of channel steel frame members. Obviously it could also be used with advantage for other purposes. It is sold at 1s. The overall length is 27 inches.

The 14 h.p. De Dion.

Four Cylinders. 75 × 130 mm. Bore and Stroke. Four Speeds. Bevel Drive.

THE 14 h.p. four-cylinder De Dion is a new model introduced for 1913, and in chassis length and engine power makes up well with an open or a light enclosed body. The frame is very stiffly built, inswept, and generously flared at the dashboard, and well upswept over the back axle. The rear three-quarter springs are underhung by brass bushed slings, and provided with lubricators. Semi-elliptics occur in front.

The engine (75 × 130 mm.) is somewhat novel so far as De Dion practice is concerned, for the four cylinders are cast *en bloc* with the valves all on the left and the exhaust chest screwed to the left face of the casting. The valves are enclosed by two separate and easily detachable covers, and when these are withdrawn the valve stems and tappets are eminently accessible. Thermo-syphon cooling is adopted, a big volume of water being kept over the cylinder heads and a large overhang tank provided on the radiator.

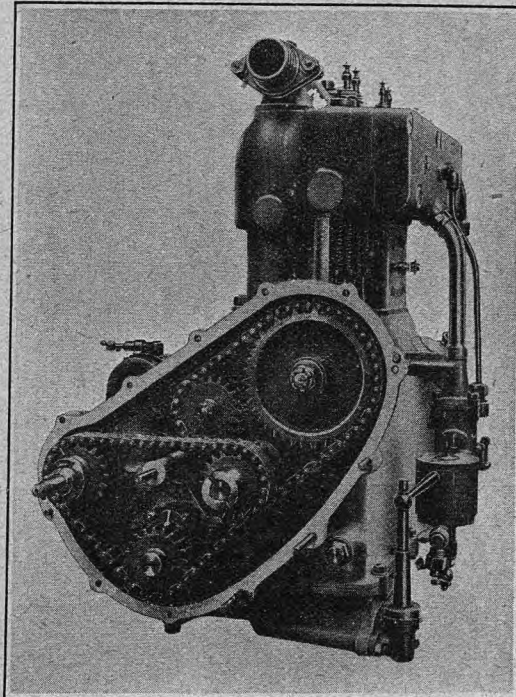
The camshaft, the magneto driving shaft, and the oil pump are driven from the crankshaft by two silent chains. The chains and chain wheels are enclosed in a case formed on but separated from the crank chamber. The pistons are of cast iron, and have their gudgeon pins kept much nearer the mouth of the piston than is usual in ordinary practice, greater steadiness of the piston

within the cylinder being claimed for this slight departure from convention. Three piston rings are fitted. The crankshaft is carried in two bearings, and is provided with an oil return thrower to the rear bearing.

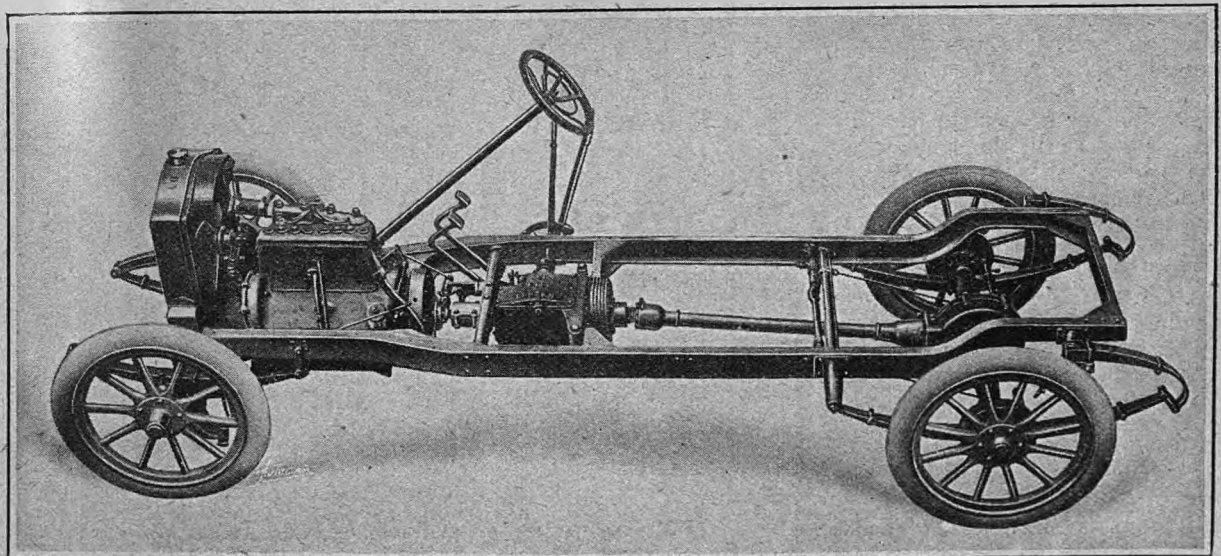
The most thorough De Dion system of lubrication is applied to this engine. The toothed wheel oil pump is not immersed in the sump, but is carried on the forward face of the crank chamber. It draws oil from the sump, which is protected by a sheet gauze filter, and forces the lubricant under considerable pressure and through suitable leads to the crankshaft, big ends, and camshaft bearings. A special delivery is made to the distribution chain gear, and the oil filler to the crank chamber is very accessibly placed. A lead from the oil circulating system connects with a pressure gauge on the dashboard.

The magneto is most accessibly placed on a bracket table bolted to the right hand side of the crank chamber, and can be adjusted or removed with the greatest ease. The radiator fan spindle is mounted on an automatic spring belt tensioning arrangement.

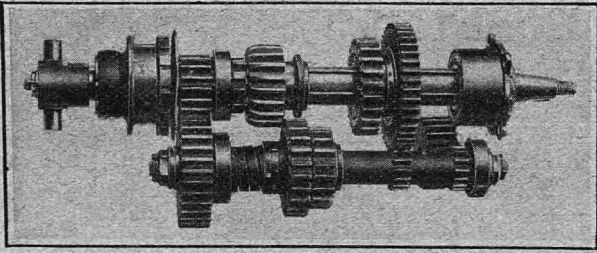
The De Dion clutch consists of a combined clutch case and flywheel bolted to a flange on the end of the crankshaft. The clutch consists of two bronze plates or discs which are fast but can slide on the spigot end of the crankshaft. By means of a number of enclosed



Front view of the 14 h.p. De Dion engine with the distribution chain casing removed. On the right is seen the De Dion, Zenith type, carburettor.

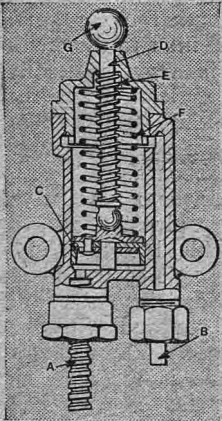


Semi-plan view of the 14 h.p. De Dion chassis.



The gears of the 14 h.p. De Dion gear box. The substantial design of the direct drive and third speed driven pinion is a feature. The actual working faces of the teeth are not undercut for the direct drive dog clutch, but are extended forward as shown.

helical springs these discs are made to grip a central steel disc which is fast on the clutchshaft. When pressure is applied by the clutch pedal to the thrust bearing the latter is displaced longitudinally, the springs are compressed, and the bronze plates liberated from their driving contact with the driven steel disc. This clutch is run without oil, notwithstanding which it is one of the sweetest and most easily manipulated clutches of which we have ever had experience. The



Vertical section of the lubrication pressure indicator of the 14 h.p. De Dion.

- A, oil inlet
- B, oil outlet
- C, pressure piston
- D, piston plunger
- E, restraint spring
- F, piston return spring
- G, tell-tale knob on plunger

clutchshaft is connected to the gearshaft by a split coupling with cardan square joints giving flexibility in every direction.

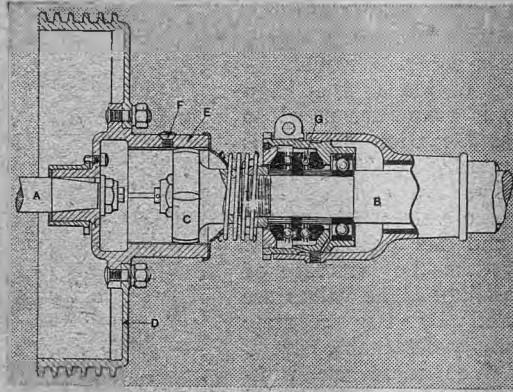
The gear box is three-point suspended by spring-supported ball joint connections. It is cast in one piece and contains a set of gearing which gives four forward speeds and a reverse. The primary and secondary shafts are set in the vertical plane, the former being castellated to permit the sliding of the change-speed wheels. Both shafts rotate in ball bearings of large diameter. A gate change is employed, but the gate is placed within the gear box instead of forming part of the lever quadrant. The spindle of the change gear forks connects with the gear lever spindle by means of a flexible joint which preserves the former from all effects of frame torsion.

A flanged brake drum is set upon the tapered end of the primary gearshaft, where it issues from the gear box, its boss forming the casing of a chamfered square head on the end of the propeller-shaft.

The propeller-shaft passes through a thrust and running ball bearing in the head of the propeller-shaft casing, and continues through two more bearings at its rear end to carry the driving bevel pinion. A bevel form of differential

gear is used, the sockets of the box being carried in ball bearings. Here is a departure from the old De Dion practice, for the sun wheels of the differential gear are mounted directly on the inner ends of the road wheel driving shafts, which at their other extremities are tapered and keyed to take the hub of the road wheel. The driving shafts are formed with a shoulder just inside the wheel hub, and run in double staggered ball bearings.

The rear wheel brake drums are integral with the hubs. Internally expanding brakes are fitted throughout. The pedal applies the gear box brake and the side

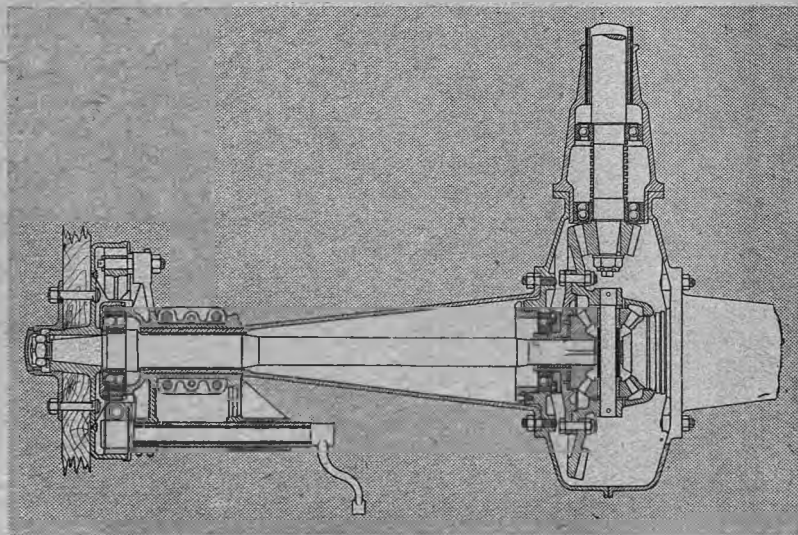


Vertical section of the propeller-shaft coupling of the 14 h.p. De Dion.

- A, primary shaft of gear box
- B, propeller-shaft
- C, hexagonal head of propeller-shaft
- D, flanged brake drum
- E, hexagonal casing of head of propeller-shaft
- F, screw in lubricating hole
- G, thrust bearing

lever the internally expanding brakes on the rear wheels. The front wheels run in double staggered ball bearings on the stub axles, which are very stiff. The steering gear is of the worm and sector order, the steering pillar-shaft turning in a four-ring-collar bearing above the worm. The petrol tank can be fitted on either the rear of the dashboard or beneath the driving seat. The wheels are 815 x 105 mm.

In the matter of the control, the throttle is connected to the brake pedal in such a way that during the first portion of its depression it acts as a decelerator pedal; a throttle lever on the steering wheel is also provided.



Part section of the 14 h.p. De Dion back axle.

Notes for the Beginner.

By Eric W. Walford.

A series of articles (commenced on May 25th, 1912) the object of which is to aid those having little or no experience in the purchase, care, and upkeep of motor cars. Beginners in doubt or difficulty on any matter are invited to seek assistance from the writer. Queries should be addressed to the Editor; replies will be posted direct if desired or published under the above heading as space permits.

Descending Hills.

ONE often receives queries from beginners asking which is the proper method of descending hills of varying steepness. The most obvious course is to close the throttle and check the speed the desired amount by applying the brakes, but the beginner will think there is probably a better course than this, which is quite right if the hill be a very steep one. For mere ordinary gradients the above practice is the most usual, but it is open to a slight objection in that if the engine be run in this way with the throttle closed or nearly closed, oil is drawn up into the engine cylinders, and when the throttle is next opened this oil will be burnt, causing temporarily much smoke and resulting in the cylinders being coated internally with soot. This soot in time forms a hard deposit of carbon which is very troublesome to remove. Some cars are fitted with air valves, or the throttle is so arranged that it can be moved beyond the normally closed position so as to admit air alone to the engine when descending hills by the method described, so that oil will not be drawn up into the cylinders, and the objection mentioned will not hold. Air valves for this purpose can be obtained from accessory houses, and can be fitted to almost any existing car.

The alternative, and the practice which used to be common years ago, is to declutch and either allow the engine to run slowly or to stop it altogether. In such cases the car will descend the hill under gravity or will "coast" as it is usually termed. Directly the beginner declutches in this way he will probably find that the car will commence to travel very fast. At the same time it travels very quietly, and coasting in this way is very pleasant, but one does not have quite the same control over the car as when the clutch is left in, and further, the whole retarding effect required must be obtained from the brakes alone, causing additional wear. Hence this practice is possibly not to be recommended so much as that of leaving the clutch engaged and closing the throttle.

Letting in the Clutch after Coasting.

Assuming, however, that the beginner wishes to coast we will first explain what must be done, assuming that the engine be kept running slowly. The speed must, as mentioned, be checked by the brakes alone, and the reader is warned that the speed should be kept well in hand, as control is not so easy as would be imagined. Having reached the bottom of the hill, if the clutch be let in with the engine running slowly, in all probability the engine will act as a sudden check. To prevent this check it should be rotating fairly fast. For this reason the throttle must be opened slightly to accelerate the engine before the clutch is let in. The amount of speeding up the engine requires can soon be gauged, and the clutch can then be let in without the slightest jerk. Where the engine is actually stopped during coasting the procedure is somewhat more difficult, and the clutch must not be let in until the car is running very slowly, otherwise the jerk will be severe unless the clutch is let in very slowly indeed. Even then the practice is not to be recommended.

One should, therefore, wait until the car slows down to about ten or twelve miles an hour. The throttle should be moved about a quarter open, the ignition retarded about half-way, and the clutch let in gently. Directly the clutch is home the ignition can be advanced and the throttle opened to any desired amount. The beginner, if he wishes to try this procedure, is strongly recommended to do so on a straight and easy hill. If the engine be stopped by switching off, the switch must, of course, be moved into the "on" position again before the clutch is engaged.

The Procedure on very Steep Gradients.

In descending moderate hills, therefore, that is to say those which can be climbed on the top and second speeds, one can either leave the clutch in and keep the throttle closed, or can declutch and keep the engine running slowly, checking the car with the brakes. On steeper hills than this different treatment is required. Assume that a car is descending a very steep and dangerous hill, where it is hardly safe to travel at a higher rate than eight or ten miles an hour. Again, one can leave the engine in gear and descend with the brakes applied; but it is better to stop at the top of the hill and engage either the first or second speed, the former if the hill be extremely steep and very dangerous, and then descend with the clutch in and the throttle closed. The engine will then act as a fairly powerful brake and should prevent the car travelling at anything above ten or twelve miles an hour. The brakes will have to be applied slightly, and it is best to use first one and then the other. When the steepest part of the hill has been passed the clutch can be taken out, allowing the car to coast, but this should only be done if one is sure that the dangerous parts have been passed.

By using the engine as a brake on the lower gears in this way one can safely descend very steep hills without applying the brakes very hard. It does no damage to the engine, but it causes the small trouble mentioned with regard to the suction of oil into the engine cylinders.

It was stated previously that at the top of a steep hill the car should be stopped to engage one of the lower gears, and the reason for this is that changing down into the lower gears is not always easy on the level, and at the commencement of a dangerous hill one cannot afford to run any risks of failing to engage the gear and having to rely on one's brakes alone. Further, if the car be stopped, one is pretty certain that the speed will not be very high when the crest of the hill is passed, and if the car has been previously travelling fast one's ideas of speed are apt to be temporarily distorted, unless one relies on a speedometer.

It must be remembered that the braking effect on steep hills is not always the best that can be desired, and that sometimes on exceedingly steep hills the wheels will lock and the car slide bodily down, owing partly to the fact that the weight on the back wheels is reduced, and partly because the surface of such steep hills is often very stony and rough. For this

Notes for the Beginner.

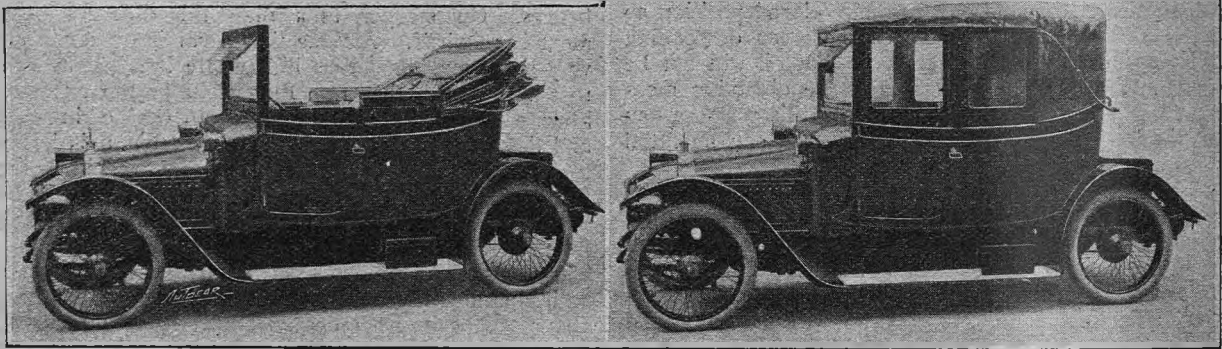
additional reason steep, dangerous hills should be treated with great respect.

The reader is strongly advised never to attempt (it cannot be done actually) to engage the reverse gear when running forward down a hill, nor if he feels the car running away to try to change speed and get into a lower gear. It is far better to give all one's attention to the steering and brakes, in the remote possibility of this happening.

The Law of the Road, etc.

In consequence of a query raised by a correspondent, I would like to say that my note in the issue of February 8th, regarding overtaking when in the proximity of approaching traffic, was not intended to refer to cases where direct obstruction occurred, so much as to those frequently recurring incidents in which one clearly sees that, by accelerating slightly, one can apparently overtake with plenty of time to spare. Here considerable judgment is often necessary, and I know motorists of many years' standing who are quite unable to estimate correctly the respective distances and speeds under such circumstances, with a result that all three parties are apt to be crowded together and one or more seriously inconvenienced. It is for this reason that I advise respect-

ing the convention of delaying overtaking until the approaching vehicle is passed. As a matter of fact the law on the subject (Section 78 of the Highways Act, 1835) does not specifically deal with this point, although it imposes the obligation of always keeping to the left-hand side so as not to obstruct. It is important that the new motorist should know that, under the Motor Car Act of 1903, he should immediately stop and give all information, including, if necessary, his name and address, in the event of any accident occurring in which his motor car is even indirectly concerned. For instance, in passing a horse and cart, the horse may shy and do some damage. The most innocent of motorists might be unaware of the obligation and drive on, oblivious that he is liable to certain penalties, and to have those penalties endorsed on his licence, if he should neglect to stop and give information on the points specified. Similarly, if a vehicle should run into his car, through no fault of his own, he must be prepared to give all information, in spite of the fact that the driver of the other vehicle, if a horse-drawn one, is not liable to a penalty if he should drive on his way and refuse to give his name and address.



A smartly-designed coupé cabriolet body by Messrs. William Cole & Sons, Ltd. Although the car appears to be a two-seater it actually carries four persons quite comfortably. Two are accommodated at the back, and two on front bucket seats. The hood is made on Cole's "One-man" principle, and can be easily raised or lowered. The car is finished in dark mauve, and upholstered in silver grey cloth. It carries a Peto & Radford electric light installation.

Successful Action for Libel.

An Echo of the Unofficial Tyre Test.

In the King's Bench Division on Wednesday, last week, Mr. Justice Darling and a special jury had before them an action brought by the Challenge Reinforced Tube Co., Ltd., of Eagle Wharf Road, City Road, against Mr. Theodore A. Cook, editor, and Mr. Horace Cox, proprietor, printer and publisher of *The Field*. Damages were claimed for an alleged libel that appeared in that journal on February 27th of last year. In defence it was pleaded that the statements complained of did not exceed the limits of fair comment on a matter of public interest, and that there was no malice.

Mr. F. E. Smith, for the plaintiff company, explained that the editor of *The Field*, amongst others, was invited to act on the committee to see that the Victor tyre test was fairly held, but he declined. A copy of the rules was sent to the Press, and *The Field*, said counsel, made an attack on the plaintiffs, and people reading the article would be led to believe that the test was not an honest one, and that the plaintiffs, while largely advertising it as a *bona-fide* test in which all the tyres would be tested on the same basis, had, in fact, reserved to themselves the opportunity of supplying, for the test, a Victor tyre of their own specially prepared for the purpose, as against the ordinary samples of the tyres of other makers. The readers of the paper would also think the Royal Automobile Club had declined to be a party to the test on these grounds.

Evidence in support of counsel's statement was given by the manager of the company (Mr. W. G. Yarworth Jones).

Addressing the jury for the defence, Mr. Shearman said he could call evidence why the Royal Automobile Club declined to associate itself with the test, and he submitted the matter was obviously a fair ground for criticism.

Colonel Henry C. L. Holden, a member of the Royal Automobile Club and a member of the Club Committee, was called for the defence, and said he was present at a meeting of a joint committee of the Club and the Society of Motor Manufacturers and Traders on June 14th last. A member of the committee called attention to an advertisement respecting a tyre trial. The advertisement stated that the trial was about to be carried out by the Royal Automobile Club, and, after a discussion, the committee considered it inadvisable to conduct any test of the character.

Mr. F. E. Smith (cross-examining): Are the Motor Manufacturers and Traders a ring, one of whose principal objects is to keep up the price of tyres?

Colonel Holden said he had heard nothing to that effect.

Mr. Edwin Campbell, motor editor of *The Field*, who wrote the article complained of, also gave evidence.

The jury eventually returned a verdict in favour of the plaintiff company, assessing the damages at £75, and his Lordship entered judgment accordingly, with costs.

The 12-14 h.p. F.N.

Four Cylinders, 69 × 130 mm. Four Speeds. Bevel Drive. Ingenious Lubrication System with Reserve Supplies of Oil.

THE 12-14 h.p. F.N. is the latest production of that famous Belgian firm, the Fabrique Nationale d'Armes de Guerre. The four cylinders are cast *en bloc*, with enclosed valves disposed on each side. The exhaust trunk on the near side forms part of the cylinder casting, and is very neatly

in turn driven from one of the camshafts by skew gearing. The water pump has an ingenious spring drive, the spindle thereof being connected to the hollow driving shaft by means of a flat spring, one end of which is connected to the cross-shaft by engaging with a slot cut therein, while the other end is intuned and engages with a slot cut in the pump spindle. The radiator is of the multi-tubular type, while cooling is assisted by a four-bladed fan, eccentrically mounted on a shaft bearing in a bracket and secured in any desired position by means of a spring locking bolt on the front of the cylinder casting.

The lubrication is well arranged, and though the system is the well-nigh perfect type of forced feed through a hollow crankshaft, it departs sufficiently

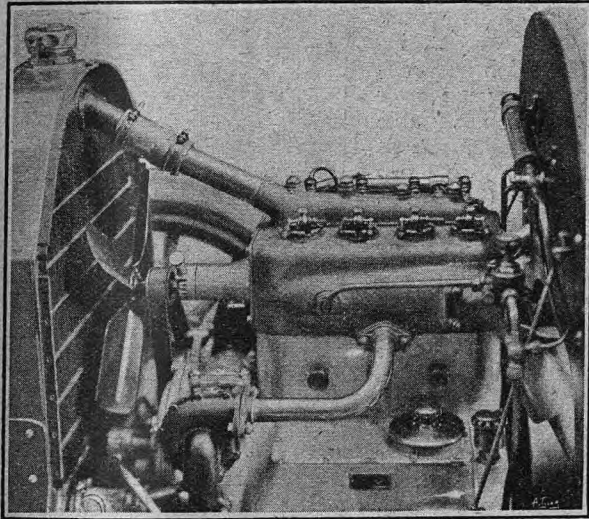


Fig. 1.—Near side view of the 12-14 h.p. F.N. engine showing the water pump driven from the cross-shaft. The exhaust pressure valve for the petrol supply is also seen with its connecting pipe and the union screwed into the exhaust trunk, the latter being formed with the cylinder casting.

arranged. A union is screwed into the exhaust trunk, and a pipe is connected therewith conveying the exhaust pressure through a non-return valve to the petrol tank, the valve being accessibly placed inside the 'bonnet. Important details are well disposed, the water pump being on the near side and the magneto on the off side, both driven off a cross-shaft which is

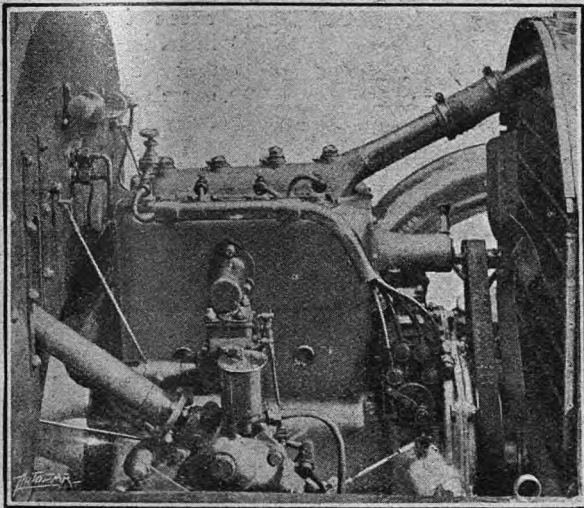


Fig. 2.—Off side view of the 12-14 h.p. F.N. engine showing the accessible position of the magneto and carburetter.

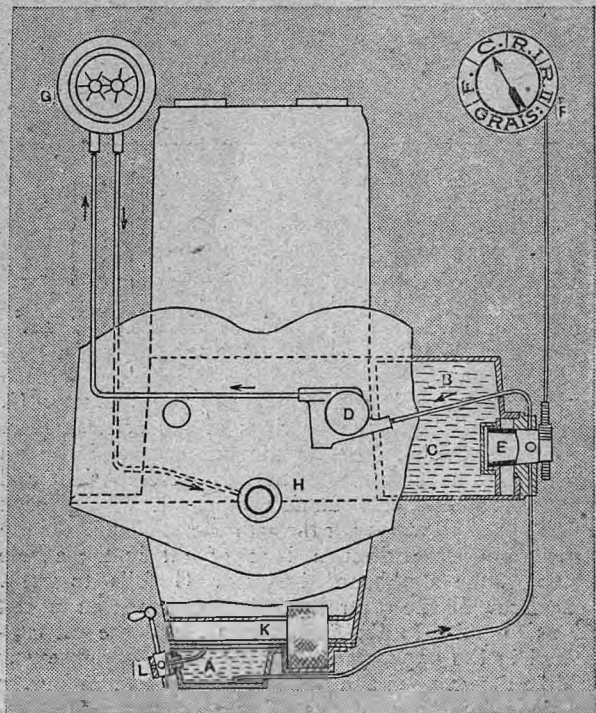


Fig. 3.—Diagram of the lubrication system of the 12-14 h.p. F.N.

- | | |
|--|---|
| A, oil sump at the bottom of crank chamber | E, control valve |
| B, upper part of reserve oil reservoir | F, dashboard control of valve E |
| C, lower part of reserve oil reservoir | G, oil circulation indicator on dashboard |
| D, oil pump | H, crankshaft |
| | K, oil filters |
| | L, oil level cock |

from standard practice to merit a detailed description. The oil pump is accessibly placed in front of the timing gear case, and driven off the front end of the exhaust camshaft. The crank case casting provides a large oil reservoir, as well as the usual sump. This allows a large quantity of lubricant to be carried, and the reservoir provides a reserve of oil which does away with the necessity of carrying a loose spare can.

The lubrication system, shown in the diagram above, consists of the oil sump A, situated in the lower part of the crank case as usual; a secondary reservoir B and C of double the capacity of the sump is divided into two parts, which, as explained hereafter, may be drawn from if needed. The pump is shown at D,

The 12-14 h.p. F.N.

and a control tap at E regulated by a handle F fixed to the dashboard. An oil-circulation indicator G is also fixed to the dashboard. When the arrow on F is in the position shown (*i.e.*, pointing to the letter C which represents *carter*, crank case), the oil contained in the sump A is drawn through the centre of the

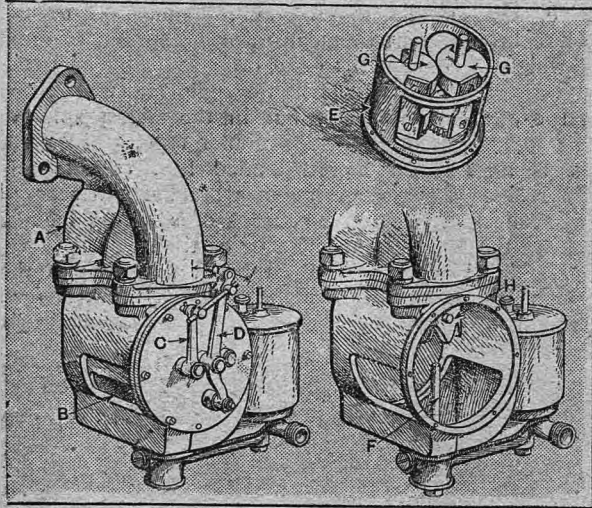


Fig. 4.—The F.N. carburetter; on the right the mixing chamber is seen with the throttle and variable jet arrangement dismantled.

- | | |
|--|--|
| A, hot air entry | E, throttle sleeve |
| B, cold air entry | F, jet |
| C, lever actuating variable choke tube formed by grooves in the roller G | G, rollers with grooves forming variable choke tube |
| D, lever actuating throttle sleeve and cold air entry port | H, serrated tube connected to back of throttle casing by a transverse bolt |

regulating tap E and forced to the indicator G, thence it passes to the bearings of the crankshaft H by way of the oil ducts in the crank case. The oil then passes under pressure through the crankshaft and connecting rods, the unused lubricant falling back into the sump A, passing through the filters K. If the circulation cease through lack of oil in the engine sump A, the dashboard indicator G fails to work. The arrow on the control tap E should then be moved so as to point to R₁ (reservoir 1), and the oil contained in the upper part B of the secondary reservoir will be drawn upon and put into circulation. Warning is given by the stoppage of the indicator G when the oil contained in B has all run out. Then, on putting the arrow back to *carter* the oil will circulate as originally.

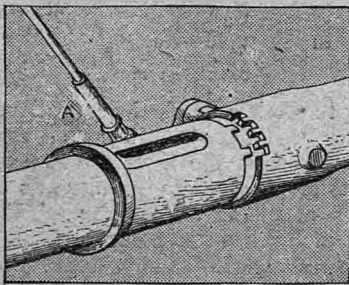


Fig. 5.—The cold air inlet on the hot air pipe and the air throttle for engine starting. The rod A is operated from the dashboard and is coupled to a butterfly valve in the hot air pipe. By means of this the air to the carburetter can be shut off for engine starting if necessary.

If circulation stop a second time through lack of oil in the sump A, the handle F is turned until the arrow points to R₂, when the oil circulation will be re-established as previously. If the engine have a tendency to smoke the arrow must be pointed to F (*fermé*, closed). The level tap L is provided on the sump to indicate when the latter is sufficiently

charged with oil when being refilled. When oil overflows from the tap the arrow must then be turned back to *carter*, and only the normal supply in the sump is then drawn upon.

Fig. 4 shows the F.N. carburetter complete and in detail. It is of the single jet type. Hot air enters at A and passes down at the back of the casting, enters at the bottom thereof, inside and below the throttle sleeve E. The cold air enters at the side at B. Both air and petrol vapour are regulated by the same sleeve E, inside which and controlled by the lever C is the variable choke tube. This consists of two rollers G geared together and cut away in a peculiar manner to form a groove through which the jet F projects. The sleeve

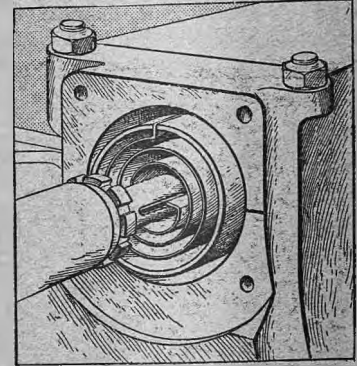


Fig. 6.—The spring drive of the water pump of the 12-14 h.p. F.N.

E has a rectangular orifice at its base, and a heart-shaped opening at the top, the former admitting cold air and the latter controlling the mixture supply and forming the throttle. This sleeve is operated by the lever D, which, it will be noticed, is connected by means of a short link to the lever C, the latter being fixed on the spindle of one of the rollers. Now as the throttle is opened more cold air is admitted through the port B, and, at the same time, the groove between the rollers becomes wider, so enlarging the choke passage. The serrations in the tube H above the jet make as near a fit as is possible with the contour of the grooved rollers; this is so arranged to give the mixture an unobstructed flow. This tube is secured to the throttle casing by a screw passing in at the back, and is so held that a space occurs between it and the induction pipe, so that the throttle barrel can pass between the two.

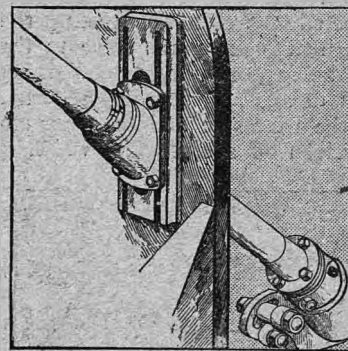


Fig. 7.—The adjustable rake steering. The column is secured by the dashboard bracket and four bolts, while the steering gear box is locked by means of the serrated quadrant.

In fig. 5 is shown the control of the hot air supply. The rod A is operated from the dashboard, and controls a throttle in the hot air pipe, so that a large proportion of the air may be cut off to allow of an easy start from cold. Adjacent to this is a sleeve which covers holes in the air pipe. It has projections at one of its ends which engage with indentations in the main pipe and serve to lock it in position. The object of this sleeve is to admit more cold air in very hot weather or *vice versa* in cold weather.

The clutch is of the multi-disc type, with a universal joint at the end of the short shaft between clutch and gear box. The latter contains four speeds forward and reverse. The change speed lever is of the type rocking through a gate, and is shorter than the brake

lever. The propeller-shaft brake is of good size, the drum being $11\frac{1}{2}$ in. in diameter. It is of the metal to metal contracting type, the shoes of which are ribbed. The sliding joint behind the gear box is of an unusual type. The interior of its housing is grooved, and into these grooves slides a castellated sleeve in which the joint is mounted. Four castellations on this sleeve engage with four grooves in the housing. After long use, when the grooves have become worn, the sleeve may be withdrawn and the remaining four unworn castellations engaged with four unworn grooves.

The propeller-shaft has a pin type universal joint at each end, and the final drive is by bevel.

The chassis is of channel steel, narrowed in front and upswept at the rear. The engine and gear box are carried in an underframe. The

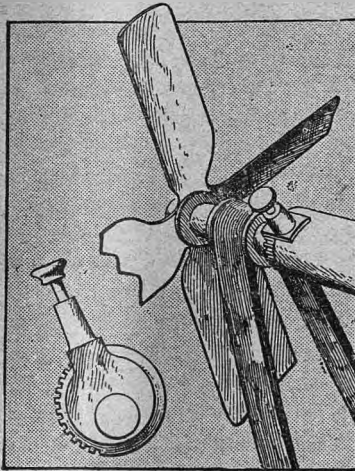
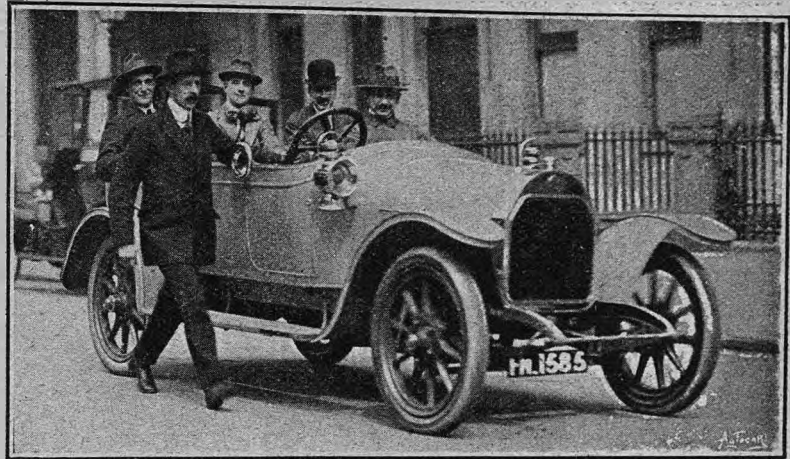


Fig. 8.—The eccentric fan adjustment of the 12-14 h.p. F.N. The inset shows the arrangement of the hand-locking bolt.

Fig. 7 shows the method of varying the angle of the steering wheel to suit the requirements of the driver. To effect this adjustment it is necessary



A slow-running demonstration of the 12-14 h.p. F.N. The car is on top gear, whilst the driver is walking beside it.

to loosen the four bolts holding the steering column bracket plate to the dash, and to unscrew the bolts of the serrated quadrant on the steering gear box. Sufficient length of worm segment is provided to allow for any alteration in lock on one side which the tilting of the column may effect, while the stops controlling the degree of lock are also adjustable. The whole chassis is a sound job from stem to stern, and every detail has obviously been given the most careful consideration.

A Test of Top Gear Flexibility.

We were recently present at a very interesting demonstration of the flexibility of the new 12-14 h.p. F.N. The demonstration took the form of a perambulation on top gear throughout in the streets of London. The car was even started on top gear, and this with a load of five grown men. It is never easy to judge speed in a car; so to give some idea, when the vehicle was slowed down to its minimum, the driver left his seat and walked quietly by the side of the car; nor did the driver have to walk unduly fast. To get a still better idea of the actual speed, we ourselves also got out and walked by the side. Apparently, the car was moving at about 3 to $3\frac{1}{4}$ miles an hour. It was perfectly easy quiet walking to keep up with it, but though this was the most showy part of the demonstration, we were still more impressed by the way in which the car maintained this very slow speed, while being manoeuvred so as to turn round in the road as sharply

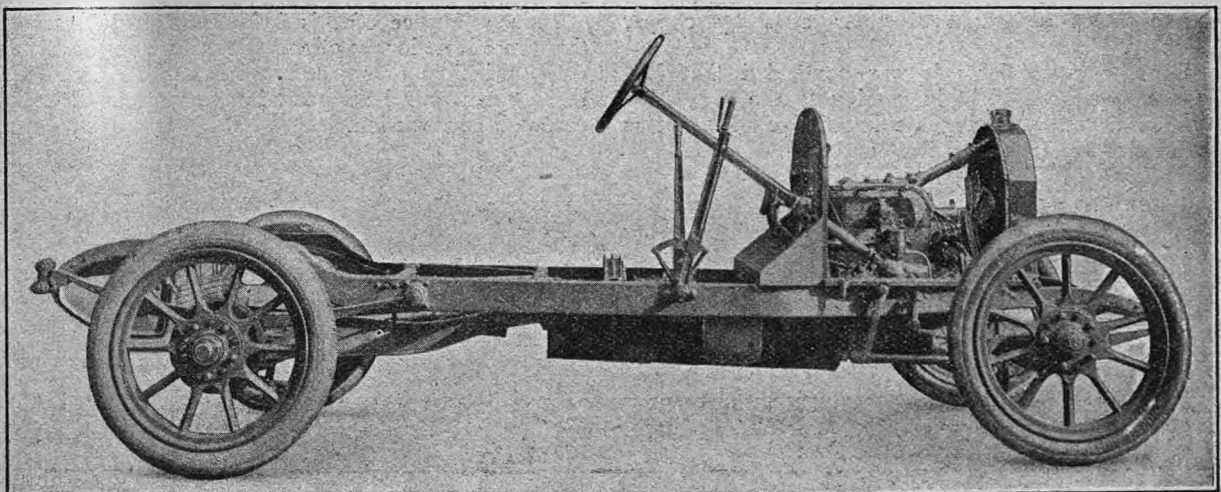


Fig. 9.—Off side view of the 12-14 h.p. F.N. chassis.

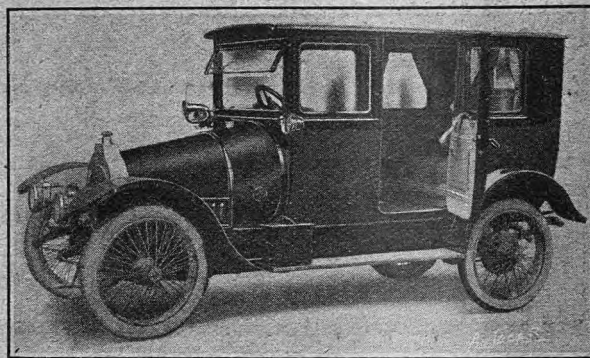
The 12-14 h.p. F.N.

as possible—and the lock enabled the machine to be exceptionally handy in this respect and turn in an exceedingly small radius. Throughout the trial the engine did not give any sign of the very trying conditions under which it was called upon to work.

So much for its low speed capabilities. To form some idea of the other end of the scale, we were taken down to Brooklands—also a top gear run the whole way, except at starting, for which the other gears were used merely to save the clutch, for the car had already shown itself capable of starting on top gear. We had been promised well over 40 m.p.h.; but with three up and an ordinary touring body we were soon bowling along at 45, then 47, then 47½ m.p.h., while round the curve at the east end of the track the speedometer needle went up to 50 without any help from the banking of the track—an excellent performance for a little four-cylinder engine of only 69 mm. bore and 130 mm. stroke!

Apart from the great flexibility of the engine, what struck one most about the whole performance was its balance and silky running. At no speed ranging from three to fifty miles an hour was there any sign of vibra-

tion, yet apparently the engine had not suffered in other respects, for there was obviously no question about its power and acceleration.



A 12-15 h.p. Callthorpe limousine, the property of Mr. A. E. Calt, Northampton, who holds the long distance motor cycle road record, having covered 2,577 miles in six days. The complete weight of the car is said to be only one ton.

Patent Litigation.

The Maybach "Honeycomb" Radiator Patent Declared Invalid.

The appeal entered by the F.I.A.T. Motor Cab Co., Ltd., against the judgment of Mr. Justice Joyce, who found in favour of the Mercedes-Daimler Motor Co., Ltd., in the action they brought for infringement of Maybach's radiator patent No. 3,235 of 1901, was on for hearing for several days recently.

It may be remembered that Maybach describes and claims a radiator consisting of a number of flat-sided tubes arranged equi-distantly from each other within a chamber, which is thereby divided into intersecting passages, whereby fluid passing through the chamber is divided into layers of equal or evenly increasing thickness.

The principal ground of appeal was that there was no subject matter for a valid patent in view of what had been previously disclosed by Daimler and Nezeroux, the former in his patent No. 19,257 of 1898, which describes a radiator built on the lines of a fire tube boiler, and the latter by a memorandum of a French patent, deposited in the British Patent Office library, describing a steam generator built up of square tubes separated at their ends by copper caulking.

For the respondents it was contended that Mr. Justice Joyce was right in coming to the conclusion that an inventor, having the knowledge of radiators

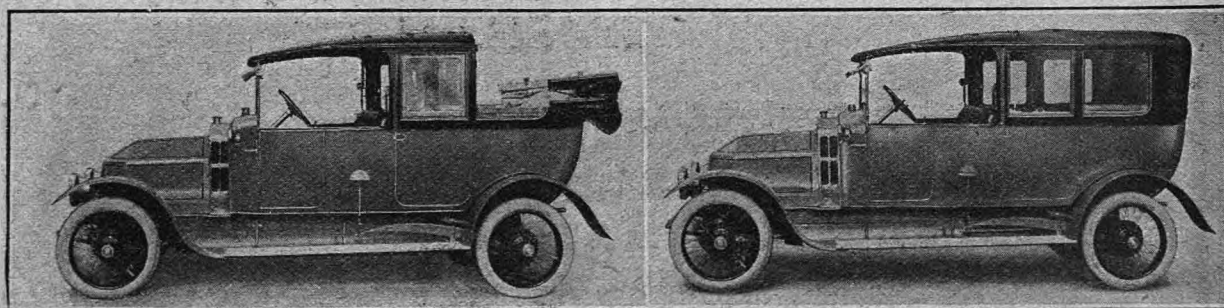
common at the date when Maybach filed his application, and coming across the Nezeroux document, would still require to exercise his inventive faculty in order to produce the Maybach radiator.

The appellants did not deny that they had infringed if the patent was valid.

The Court of Appeal gave their judgment last week and were unanimous in reversing the judgment of the court below, and allowed the appeal; that is to say, they found entirely in favour of the F.I.A.T. Motor Cab Co.

The Master of the Rolls and Lord Justice Buckley gave very lengthy judgments, and Lord Justice Kennedy fully endorsed the conclusions at which they had arrived, the whole being summed up in the statement that the Maybach patent is invalid upon the ground that the claims in the specification are too wide. As infringement was not denied, and the F.I.A.T. Cab Co. stood or fell on the question of validity, that subject alone occupied the attention of the court.

In consequence of this judgment it would appear that there is no longer any master patent on the honeycomb principle of radiator, and that claims in this respect can only hold good in the matters of design or detail construction.



An 18-21 h.p. Siddeley-Deasy mounted with a threequarter limousine landaulet built by the Brighton Motor Coach Works, 50, St. James's Street, Brighton. The interior cabinet work is in hane wood to match the colour of the upholstery.

Applications for Driving Licences.

Illegal Requirements by a Borough Council.

WE see in the newspapers from time to time complaints as to the ease with which motor car driving licences can be obtained; often restrictions are suggested other than those already in force. At present it is possible for anyone over seventeen years of age, who is not disqualified by order of a court of justice by reason of his having committed some offence against the Motor Car Acts, to obtain a motor car driving licence. The competency of the person obtaining such a licence does not enter into the matter, or at most it would appear to be assumed, and his liabilities in case of accident are covered by other provisions of the Motor Car Acts and by the general laws of the land. He is liable to conviction in a criminal court for any one or more of quite a number of driving offences and to damages in a civil court for the consequences of negligence or incompetency. The desirability of some form of examination before the issue of a licence does not now enter into the matter, but there are, we may admit, points for and against such a test of competency.

The County Borough of Walsall, however, appear to believe that further restrictions are necessary, and accordingly have imposed some of their own, regardless of the fact that they ought at least to have obtained or waited for the passage of an Act of Parliament to authorise them to do so. They become a law unto themselves. Their Watch Committee has made a "regulation" that no motor driver's licence shall be issued without the approval of the Chief Constable. Applicants for drivers' licences at Walsall must satisfy the Chief Constable upon certain points other than those laid down by the Act: one of the points upon which the Chief Constable insists is that if the applicant is being taught to drive, he shall not be allowed to drive alone until he is competent. Further, we are informed that an applicant at Walsall is required to secure two signatures to say that he is qualified as a driver. These points are brought out in some correspondence which has passed respecting the application of a young man named Harry Collins, who resides within the borough of Walsall, who is over seventeen years of age, and who has never previously held a driving licence. He applied to the office of the Town Clerk of the borough for a licence on April 3rd, his application was in strict conformity with the law, and he had not previously been disqualified from taking out a licence, but his application was refused.

It appears that he was intending to enter as a pupil at the Priestley Motor School, 148, Coventry Road, Birmingham, but that owing to this refusal he was unable to do so at the time he wished. Upon this Mr. Priestley, the proprietor of the motor school, wrote to the Town Clerk of Walsall on April 4th as follows:

April 4th, 1913.

Dear Sir,—I am to-day informed that Harry Collins, of 15, Reeves Street, Bloxwich, Walsall, filled up an application form for a driver's licence and presented it, together with the fee of 5s., to enable him to drive a motor car.

He is a pupil of this school, and informed your clerk to this effect, but was given to understand that before you would grant a driver's licence he must secure two signatures to say that he is qualified as a driver, or, failing this, that I must sign for him to that effect.

He has not held a licence previously, and his age is over 19, and so far as I can see he has complied with the law in the filling in of his application

He has been put to the inconvenience of making a waste journey here to-day, for we make it a strong rule not to take any pupil out until he has obtained his licence.

Will you be good enough to let me know on whose authority your clerk refused him a licence?

Thanking you for an early reply.

Yours faithfully,

PRIESTLEY MOTOR SCHOOL,
W. C. Priestley.

To this the Town Clerk sent the following reply:

5th April, 1913.

Dear Sir,—In reply to your letter of the 4th inst., the Watch Committee for this borough have made a regulation that no motor driver's licence shall be issued without the approval of the Chief Constable. If Mr. Collins satisfies the Chief Constable that he is being taught to drive at your school and will not be allowed to drive alone until competent, the licence can be issued on payment of the fee of 5s.

Yours truly,

HERBERT LEE, Town Clerk.

Mr. Will C. Priestley, Priestley Motor School.

148, Coventry Road, Birmingham.

Not being able to make any headway against the attitude taken up by the Walsall authorities, and as a driving licence cannot be taken out in any other county or borough than that in which the applicant resides, Mr. Priestley laid the matter before us.

We submitted the correspondence to our legal adviser, who gave his opinion as follows:

"The attitude of the Walsall Town Clerk is quite irregular, and the Watch Committee have no business to make any such regulations. The Motor Car Act, 1903, Section 3, provides that the council of any county or county borough shall grant a licence to drive a motor car to any person applying for it if he resides in that county or county borough on payment of a fee of 5s., unless the applicant is disqualified under the provisions of the Act. There are only two disqualifications, viz., (1) the applicant must not be under seventeen years of age, or in the case of a licence for driving motor cycles only fourteen years of age, and (2) the applicant must not have been disqualified by order of the court on being convicted of an offence under the Act or in connection with driving."

We wrote on April 18th to the Town Clerk of Walsall, asking him if the facts were as stated above; if so, what were the exact terms upon which driving licences were issued by his council, and what was the nature of the examination necessary to secure the Chief Constable's approval, but we have not yet received any reply. On the other hand, we learn from Mr. Priestley that the licence has now been issued to his pupil without further demur on application being made through a solicitor.

It seems most unfair that this young fellow should have been put to this expense and over a fortnight's delay in obtaining his driving licence, and the Walsall Watch Committee should certainly compensate him for the loss and inconvenience he has sustained in consequence of their illegal action.

New Speed Limits.

A five miles an hour speed limit for heavy motor cars has been imposed on Richmond Bridge for a distance of eighty-three yards in each direction from the centre of the bridge. A heavy motor car, according to the Heavy Motor Car Order of 1904, is defined as a motor car exceeding 2 tons in weight unladen.

A ten miles an hour speed limit is now in force in West Street, Harrow, from the junction of that street with High Street to its junction with Bessborough and Lower Roads.

A New H.F. Fitting.

Mandrel and Bench Bracket Simplifying Repairs with the H.F. Baby and Car Vulcanisers.

THERE is no tool or accessory used in the automobile industry which has gained more favour than the portable and fixed vulcanisers made by Messrs. Harvey Frost and Co., 39, Great Eastern Street, E.C., and 27, Charing Cross Road, London, W.C. The portable vulcanisers are the Baby and the Car types, and the repairs made with them have been proved by time to be far superior to those of the old-time methods.

wheel over which the chain B, fig. 2 (securing the vulcaniser in place), passes, so that the correct contact pressure is secured between the cover and the vulcaniser. As shown in the illustrations the mandrel A is carried by a strong adjustable bracket C, intended to be screwed to the edge of a bench in any suitable position. By a turn of the wing nut D, the mandrel can be set in a horizontal position (as in fig. 1), suitable for the preparation of the work, and sub-

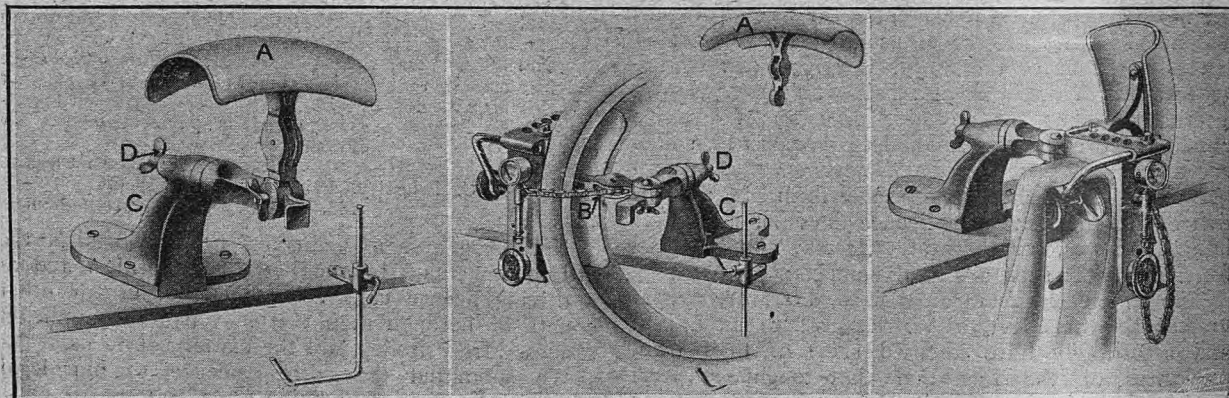


Fig. 1.—The H.F. tyre mandrel and bench bracket. The small bracket and hook aid in supporting the tyre as shown in fig. 2.

Fig. 2.—The bracket and mandrel with a tyre in position. An H.F. Baby vulcaniser is shown in use, the chain B supporting it.

Fig. 3.—The bench bracket in use carrying a Baby vulcaniser while a tube repair is being effected.

The possession of an H.F. vulcaniser by the owner of one or more cars makes for considerable economy in the cost of repairs, and thereby in tyre costs generally, for the apparatus in either of its types is, by the light of the lucid instruction book issued, quite easy to manipulate.

A late addition to the H.F. vulcanising plant is a shell mandrel and adjustable bench support, a very valuable adjunct when it is desired to effect a repair to an unmounted tyre. It increases very materially the scope of work which can be undertaken with any H.F. vulcaniser, and, by adding to the ease and certainty with which covers and tubes can be repaired, transforms a portable vulcaniser into an efficient garage equipment.

It is of course well known that cuts in covers should be vulcanised immediately they are discovered, and if possible without removing the tyres from their rims, but there are times when it is more convenient to deal with the covers separately, and then the new mandrel comes in very handily.

Shortly, the plant consists of a metal shell mandrel A to place inside the cover, fitted with a pulley

sequently turned down to a vertical position (fig. 2), for holding the cover and the vulcaniser while the tyre under repair is undergoing the process of vulcanisation.

The mandrel also serves for inner tube repairs, and is sent out with a bracket to support the vulcaniser in the best position for dealing with a tube repair, as shown in fig. 3.

The price of the complete appliance is 15s., while that of the bench bracket, without the mandrel, is 10s. 6d. The mandrel alone costs 5s. 6d.

Instruction in Repairs.

Although there is no practical difficulty in using the H.F. vulcanisers, and even novices can readily understand the simple process by means of the instruction book issued with the apparatus, Messrs. Harvey Frost and Co., Ltd., give instructions in their process of repair to chauffeurs and private motorists, and ultimately issue the H.F. certificate of proficiency in vulcanising. Messrs. Harvey Frost and Co. tell us that chauffeurs seeking employment sometimes find the possession of the H.F. certificate a considerable asset.

Motorists and Income Tax.

Motorists, professional and private, have probably ere this found themselves in receipt of the usual (buff) form of Return for Assessment to Income Tax for 1913-14. Now, as those motorists who use their motor cars wholly or partly for professional purposes are entitled to, and can claim, rebate on account of expense so incurred, it is desirable that they should give these forms very careful consideration. Although it is officially intimated that the Surveyors of Taxes are the friends of men in these cases, such intimations

should be taken with a pinch of salt, and the man who tries to fight his own income tax claims is very nearly akin to the man who is his own lawyer, for, in the matter of income tax rebate claims, expert aid is a pearl of price. So in such matters we can, from actual personal experience and benefit, advise recourse to the Income Tax Adjustment Agency, Ltd., 9 to 11, Poultry, London, E.C., whose knowledge of the bewildering ramifications of the income tax imposition is extensive and peculiar.

The Road Board.

Total Grants Made to Different Counties.

FROM the several lists of Road Board grants which have been published from time to time, the tenth of which appeared in *The Autocar* of April 12th, we compile the following table, showing the amounts which appear to have been paid to the various highway authorities in the counties of England, Wales, Scotland, and Ireland out of the Road Improvement Fund.

Some portions of the grants to Scotland, although placed against the names of counties in our list, are made to boroughs situate within those counties.

Scottish Grants from the Development Fund.

The following return of grants from the Development Fund made or indicated to highway authorities in Scotland has been presented to Parliament by the Secretary to the Treasury in response to an enquiry from Mr. Eugene Wason:

ENGLAND.		£	
Bedfordshire ...	7,705	London, area of the Metropolitan Police District ...	55,334
Berkshire ...	43,401	Middlesex ...	10,900
Buckinghamshire ...	10,991	Monmouthshire ...	10,000
Cambridgeshire ...	816	Norfolk ...	30,870
Cheshire ...	40,163	Northamptonshire ...	12,400
Cornwall ...	13,543	Northumberland ...	19,246
Cumberland ...	6,710	Nottinghamshire ...	35,201
Derbyshire ...	20,023	Oxfordshire ...	17,542
Devonshire ...	13,021	Plymouth, county borough ...	2,000
Dorsetshire ...	8,745	Rutlandshire ...	950
Essex ...	23,462	Shropshire ...	11,103
Gloucestershire ...	14,810	Somersetshire ...	15,240
Hastings, county borough ...	1,382	Southamp'on (Hants) ...	19,305
Herefordshire ...	1,786	Staffordshire ...	14,215
Hertfordshire ...	12,877	Suffolk (East) ...	29,660
Huntingdonshire ...	3,200	Suffolk (West) ...	5,268
Isle of Ely ...	2,850	Surrey ...	28,978
Isle of Wight ...	1,231	Sussex (East) ...	33,727
Kent ...	45,260	Sussex (West) ...	11,700
Lancashire ...	65,359	Sussex (West) (loan) ...	4,500
Leeds, county borough ...	9,311	Warwickshire ...	14,010
Leicestershire ...	9,057	Westmorland ...	5,917
Lincolnshire (Holland) ...	1,800	Wiltshire ...	40,700
Lincolnshire (Kesteven) ...	4,949	Worcestershire ...	16,300
Lincolnshire (Kesteven loan) ...	2,500	Yorkshire (East Riding) ...	4,000
Lincolnshire (Lindsey) ...	10,150	Yorkshire (North Riding) ...	16,708
		Yorkshire (West Riding) ...	12,254
SCOTLAND.			
Aberdeenshire ...	8,780	Kirkcudbrightshire ...	2,879
Argyllshire ...	9,907	Lanarkshire ...	16,973
Ayrshire ...	10,741	Linlithgow ...	1,750
Banffshire ...	3,106	Midlothian (Edinburgh) ...	10,747
Berwickshire ...	3,700	Nairn ...	22
Caithness ...	2,120	Peeblesshire ...	2,259
Dumbartonshire ...	4,658	Perthshire ...	14,655
Dumfriesshire ...	10,902	Renfrewshire ...	4,650
Fife ...	5,988	Ross and Cromarty ...	3,691
Forfarshire ...	3,834	Selkirk ...	400
Haddingtonshire ...	2,844	Stirling ...	7,214
Invernessshire ...	12,263	Sutherland ...	7,400
Kincardineshire ...	200	Wigtown ...	1,302
Kinross (Burgh) ...	121		
WALES.			
Anglesey ...	559	Glamorganshire ...	8,927
Breconshire ...	2,877	Merionethshire ...	2,620
Carmarthenshire ...	7,000	Montgomeryshire ...	1,975
Carnarvonshire ...	4,784	Pembrokeshire ...	6,407
Denbighshire ...	6,361	Radnorshire ...	518
Flintshire ...	4,202		
IRELAND.			
Antrim Co. ...	7,187	King's Co. ...	1,170
Armagh Co. ...	3,787	Leitrim Co. ...	1,700
Carlow Co. ...	750	Longford Co. ...	1,250
Cavan Co. ...	2,365	Meath Co. ...	2,250
Clare Co. ...	2,600	Monaghan Co. ...	1,550
Cork Co. ...	9,750	Queen's Co. ...	1,050
Down Co. ...	8,768	Roscommon Co. ...	4,040
Dublin Co. ...	3,200	Sligo Co. ...	3,020
Fermanagh Co. ...	1,370	Tipperary Co. (North) ...	1,350
Galway Co. ...	4,700	Tipperary Co. (South) ...	2,277
Kerry Co. ...	7,197	Tyrone Co. ...	3,145
Kildare Co. ...	1,324	Waterford Co. ...	1,878
Kilkenny Co. ...	3,210	Westmeath Co. ...	3,556

Authorities in the Under-mentioned Counties.	Total Grants made and indicated.	Grants formally made.	Balance as to which Particulars are wanting or are under consideration.	Loans indicated.	Loans formally accepted.
	£	£	£	£	£
Aberdeen ...	13,414	8,780	4,643	750	—
Argyll ...	12,765	9,907	2,858	4,800	1,400
Ayr ...	11,250	10,741	509	—	—
Banff ...	3,106	3,106	—	300	—
Berwick ...	3,300	3,300	—	—	—
Bute ...	500	—	500	500	—
Caithness ...	3,800	2,120	1,680	2,000	—
Clackmannan ...	2,250	—	2,250	—	—
Dumbar ton ...	5,000	4,658	342	1,100	1,100
Dumfries ...	11,211	10,902	309	—	—
Edinburgh ...	15,747	10,747	5,000	—	—
Fife ...	11,003	5,988	5,015	120	—
Forfar ...	3,834	3,834	—	—	—
Haddington ...	3,800	2,844	956	1,700	—
Inverness ...	16,703	12,263	4,440	6,370	4,690
Kincardine ...	2,020	200	1,820	—	—
Kinross ...	121	121	—	—	—
Kirkcudbright ...	2,927	2,879	48	—	—
Lanark ...	16,973	16,973	—	—	—
Linlithgow ...	3,600	1,750	1,850	583	583
Nairn ...	1,320	22	1,298	—	—
Orkney ...	400	—	400	—	—
Peebles ...	2,259	2,259	—	600	—
Perth ...	17,900	14,655	3,245	—	—
Renfrew ...	6,227	4,650	1,577	—	—
Ross and Cromarty ...	4,950	3,681	1,269	1,700	—
Roxburgh ...	3,000	—	3,000	—	—
Selkirk ...	750	400	350	—	—
Stirling ...	11,614	7,214	4,400	—	—
Sutherland ...	7,400	4,000	3,400	1,300	700
Wigtown ...	1,302	702	600	—	—
TOTALS ...	200,446	148,696	51,750	21,823	8,473

Petrol and Benzole Compared.

Some experiments which Mr. Harry Ferguson, of Belfast, has been making, with benzole in a series of tests wherein it was directly compared with petrol under identical conditions will be of interest. The principal results of the experiments may be summed up as follows: Petrol, 24⁴/₅ m.p.g.; 57 m.p.h. maximum speed. Benzole, 30⁴/₅ m.p.g.; 57 m.p.h. maximum speed. It will be seen that while, in regard to speed, identical results were obtained, benzole yielded a much larger mileage per gallon at a cost of 1s. 5d. per gallon as compared with 1s. 9d. for petrol. Excellent results were obtained in respect of slow running on top gear, a speed as low as 5 m.p.h. being registered. As prompt a start could be made with benzole as with petrol, even with a cold engine. The tests were carried out on a 25 h.p. Vauxhall car, which was fitted with an extra air inlet that Mr. Ferguson has patented recently, but it should be pointed out that this fitting was designed for use with petrol and not benzole.

The 12 h.p. Bayard.

Four Cylinders, 75 × 130 mm. Bore and Stroke. Four Speeds. Bevel Drive.

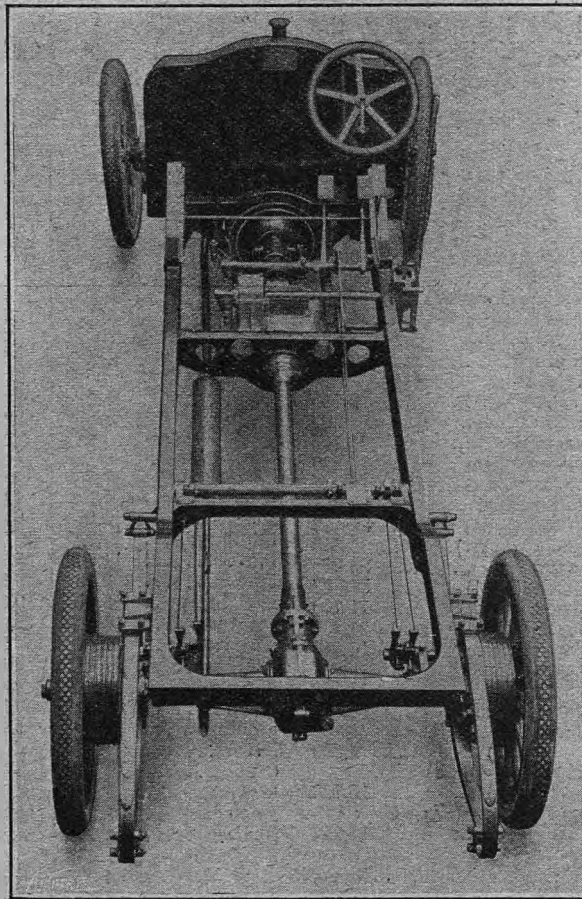
AN examination of the 12 h.p. Bayard chassis shows both the design and the execution to be above reproach, and it is impossible to name another car of the type and price in which more careful consideration coupled with the best practice is observable. The frame is as the frame of a big car, the longitudinals being deeply cambered, and well flared as to the upper flanges at the insweep at the dashboard. The rear parts are also upswept over the back axle. The rear springs are underhung, the threequarter elliptics being of unusual length and flexibility. The lower portions are slung from the axle casings by brass bushed journals, each provided with a large and accessible screw-down lubricator.

The engine and gear box are carried on a channel section underframe, kept particularly narrow to reduce the length of the crank chamber and gear box brackets as much as possible. The underframe is supported from the front cross member and from a lanterned pressed steel cross member in the centre of the frame. The members of the underframe are swept round the flywheel and clutch, and are here stiffened and

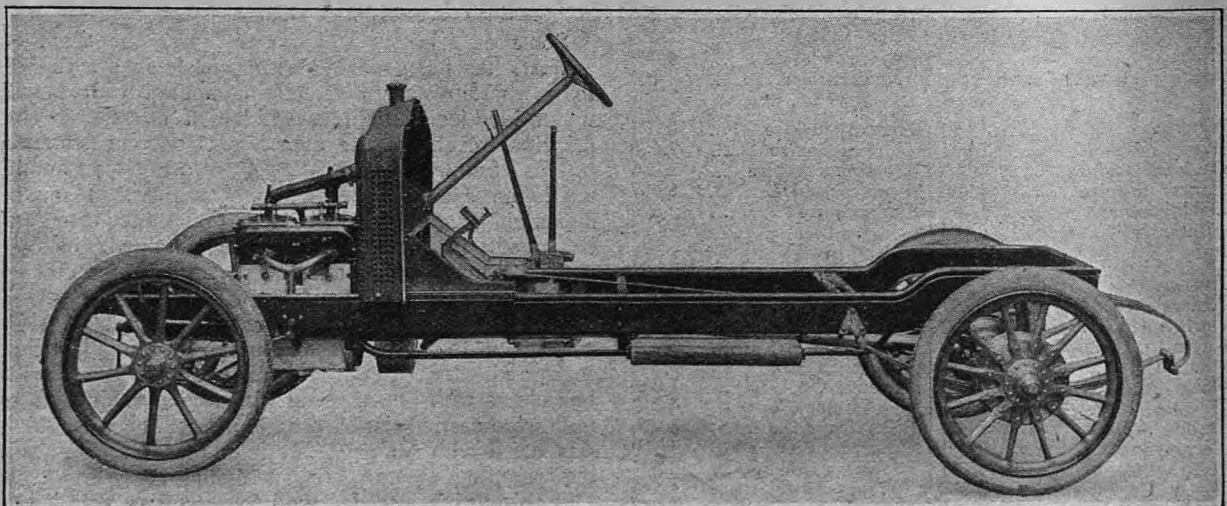
supported by brackets from the main side members. The cylinders, 75 mm. × 130 mm. (2,297 c.c.),

are very neatly cast in pairs and have all the valves on the left-hand side. The valve stems and tappets are enclosed by light aluminium covers secured by one finger disc nut. The Solex carburetter is kept well down on the near side, and the magneto is most accessibly placed on the off side of the engine. Both the camshaft and magneto-shaft are driven by a silent chain of good width. The chain is enclosed in a special aluminium casing, the cover of which is produced forward to form a long tapered casing for the production of the crankshaft and a bearing for the starting handle. The magneto driving-shaft and driving wheel are carried in a bearing mounted in a cylindrical block set eccentrically, which block can be rotated by an external disc nut formed upon it to adjust the tension of the chain when necessary. The crankshaft is carried in three long bearings. Thermo-syphon cooling is adopted, with the vertical tube radiator in front of the dashboard.

The engine is lubricated by means of a direct-acting plunger pump driven by a cam on the camshaft,

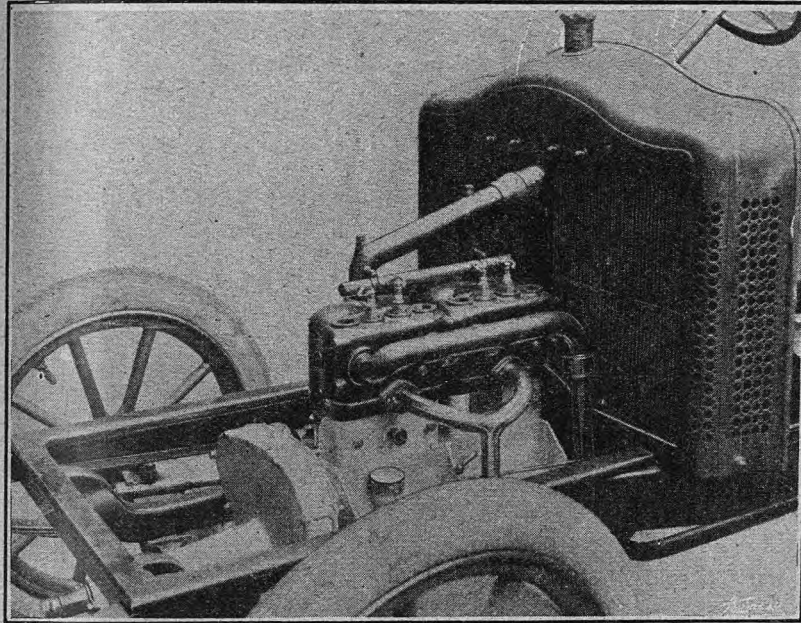


Semi-plan view of the 12 h.p. Bayard chassis behind the dashboard.



Near-side view of the 12 h.p. Bayard chassis, showing the threequarter elliptical underhung rear springs.

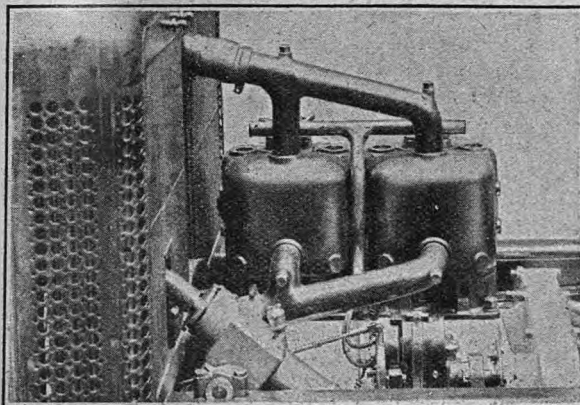
which pump raises oil from the sump in the under casing of the crank chamber and delivers it to troughs formed in the paths of the big ends. The latter are drilled and formed with dippers, which throw oil from the troughs to oil wells formed over all the bearings and also to the cylinder walls and gudgeon pins. A level cock is fitted to the oil sump.



Near-side view of the 12 h.p. Bayard engine with the radiator in front of the dashboard.

The drive is transmitted through a large leather-faced external cone clutch, the clutch cone being formed of steel and cut into tongues which are made slightly proud of the average surface, and which serve to give gradual engagement of the clutch. The clutch striking fork bears against the clutch collar through roller bearings. A double-headed flexible block joint connects the clutch sleeve and the gear-shaft. The joint is easily dismantled when required.

The short rectangular gear box, which is supported as previously indicated, contains gearing giving four speeds forward and the reverse by a neat and easily-operated form of gate change. The gear striking-shaft is carried by itself across the top of the gear box, while the side brake shaft is set below it and runs beneath the gear box.



Off-side view of the 12 h.p. Bayard engine

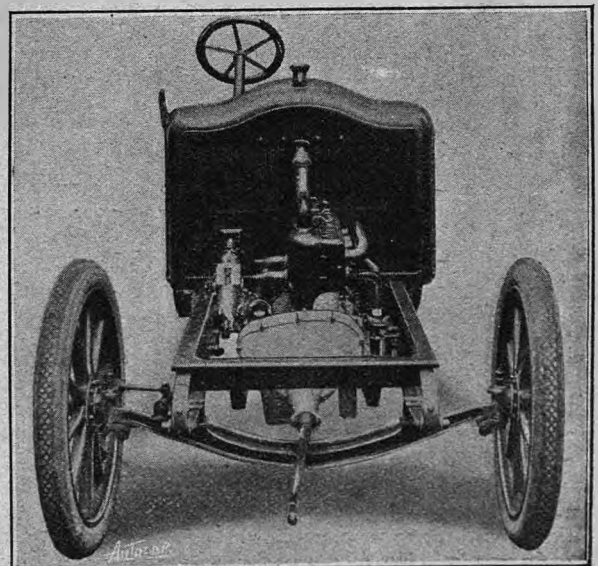
The propeller-shaft connects with a good universal joint which is contained in the spherical head of a tapered torque column, the head of this column being set in a spherical housing secured to the lanterned cross member. Means are provided for the lubrication of the spherical surfaces in contact. The flanged boss of the torque column is bolted to the differential gear casing, which is split vertically and has bolted to it the flanged tapered steel axle casings. Sankey detachable wheels are fitted as standard, and are carried on ball bearings on the axle casings. Both the pedal and lever-applied brakes are internally expanding, and take effect on very wide drums flanged on the outside for cooling. Both the brake application connections are nicely compensated by cross-heads. Worm and sector steering gear is fitted, the steering rod being kept above and the steering distance tube behind the front axle. The steering wheels run on ball bearings.

The ignition timing is fixed, but a peculiar feature is that the entire closing of the throttle lever on the steering wheel switches off the ignition. The petrol tank is set on the rear face of the dashboard, so that there is always a good head of spirit over the carburetter even on the steepest grades.

The wheelbase is 9ft. 9in., and the wheel gauge 4ft. 3in. The complete car, with smart four-seated torpedo body, detachable wheels and spare wheel, five tyres (one non-skid), hood, screen, and five lamps, is sold for £350. The chassis price, with five wheels and tyres, is £285.

An Appreciation.

Since writing the above description, we have been afforded an opportunity of giving a 12 h.p. Bayard

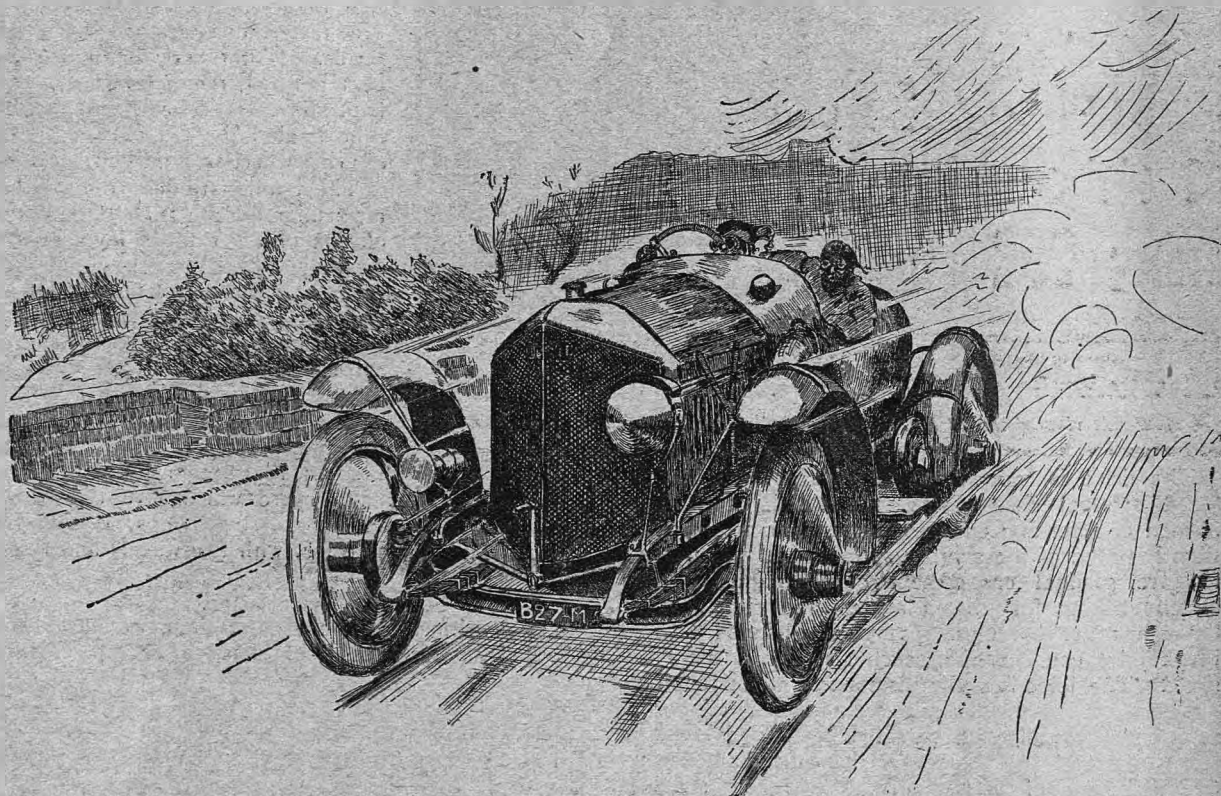


Front view of the 12 h.p. Bayard engine, showing the extension of the cover of the distribution gear case forming the bracket for the starting handle.

The 12 h.p. Bayard.

four-seater a trial trip. We took the little car over a fairly trying route of some 100 miles, and are fain to admit that the speed and handiness of the car pleased us exceptionally. The response of the 75 × 130 mm. engine was quite remarkable, and the car scorned all average slopes on anything but its top speed. There is a bite and a willingness about the engine which makes the handling of the car a distinct pleasure to those who like to feel a real lively response to the throttle. Those who know the Haywards Heath, Balcombe, Worth, and Horley Road will realise the climbing capacities of the car when we say that we only changed down to the third speed twice on this stretch, and that the little car held its fourth

(ratio 4 to 1) in fine style until 100 yards or more up the stone tramway of Reigate Hill. Notwithstanding the fact that the car is on the light side, it holds the road up to quite high speeds in a most satisfactory manner, while the slow running on top in traffic is very good. The solidity on the road is, of course, due to good springing, for the car is certainly not over-tyred. The steering is almost finger light and the lock ample. We know of no better car on the market of this type, power, and price. We owned one of the first small four-cylinder cars made by M. Clement in 1904, and it is not too much to say that the 12 h.p. of to-day is as good as its famous predecessor of nine years ago.



An impression of the 100 h.p. Isotta-Fraschini at speed on the road. This sketch was composed from the photograph of the car which appeared in "The Autocar" for March 8th (page 420). The engine has four cylinders, 130 × 200 mm. bore and stroke.

Road Board Grants to Ireland.

Replying to Mr. Lardner in the House of Commons on Wednesday last week, Mr. Masterman said: Grants to the aggregate of £144,236 have been indicated by the Road Board to highway authorities in Ireland, and of this amount grants aggregating £86,203 have been formally made to date. The Board have also indicated loans, all free of interest, to the amount of £25,030, of which £9,376 has been accepted by the authorities concerned. There are only approximately 6,800 miles of main roads out of a total mileage of 55,690 miles of road in Ireland, and the Board have not confined their grants to these main roads. No advances by way of grant or loan have been made to highway authorities in Ireland for the purchase of road-making machinery. The Road Board do not propose to establish an office in Ireland but to conduct the whole of their administrative work from their office in London. The Board have at the

present time two engineering inspectors engaged on work in Ireland, and the number will be increased as and when additional inspectors may be required.

In reply to Sir John Lonsdale, Mr. Masterman stated that the Road Board are now engaged in selecting and obtaining particulars of other works of improvement in connection with roads in Ireland besides those that are already in hand or finished, towards which they are prepared to contribute a further sum of about £100,000. The amount actually paid up to 31st March, 1913, in respect of work carried out under grants was £43,113. The operations of the Road Board in Ireland are hampered by the division of responsibility for the maintenance of main roads between the county and the rural district councils, and steps are under consideration to make the county councils the sole authority over the main roads of that country.

The Imperial Motor Transport Conference.

IN July the above conference will take place at the Royal Automobile Club. Among the subjects to be discussed are the following:

1. The question of fuel supply—present needs and future prospects—the possibility of creating adequate supplies within the Empire.

2. The consideration of the problems of Imperial military motor transport, with special reference to the production of types of vehicles useful both for military work and for industrial work in the Dominions and Colonies.

3. The organisation of motor transport systems for the carriage of goods, and their value to the mercantile life of the community. The adaptation of existing methods of delivery required to enable traders to take full advantage of the capabilities of mechanically-propelled vehicles.

4. The relations between British manufacturers and buyers overseas. Desirable arrangements for satisfactory supply, agencies, etc.

5. Road transport in cities. The carriage of passengers and the municipal users of motor vehicles. Fire fighting and ambulance services. Postal services.

6. Rural transport and the uses of the motor to the agriculturist.

Delegates for the whole of the Empire are expected, and in the majority of cases have been already nominated.

The president of the conference is H.R.H. Prince Arthur of Connaught, and the vice-presidents include The Rt. Hon. Lewis Harcourt, M.P., Secretary of State for the Colonies.

Col. the Rt. Hon. J. B. Seely, M.P., Secretary of State for War.

The Rt. Hon. the Lord Strathcona, C.C.M.G., C.C.V.O., etc., High Commissioner for the Dominion of Canada.

The Rt. Hon. Sir George Reid, G.C.M.G., High Commissioner for the Commonwealth of Australia.

The Hon. Sir Richard Solomon, G.C.M.G., High Commissioner for the Union of South Africa.

The Hon. Thomas Mackenzie, High Commissioner for the Dominion of New Zealand.

The executive committee, too, is extraordinarily strong and representative, the chairman being the Hon. Arthur Stanley, M.P., Chairman of the R.A.C., while among those serving on the committee may be mentioned:

W. Worby Beaumont, Consulting Engineer to the Chief Commissioner of Police.

Lt.-Col. W. G. B. Boyce, D.S.O., Chairman Mechanical Transport Technical Committee (nominated by the Army Council).

F. Coates, Consulting Engineer to the Commonwealth of Australia and the Government of Victoria.

Col. R. E. Crompton, C.B., Consulting Engineer to the Road Board and Chairman of the Commercial Motor Users' Association

Capt. A. E. Davidson, R.E., Secretary, Mechanical Transport Technical Committee (nominated by the Army Council).

Duncan Elliot, Consulting Engineer to the Dominion of New Zealand.

Richard M. Greaves, Chairman of the Implement Committee of the Royal Agricultural Society of England.

W. L. Griffiths, Permanent Secretary to the High Commissioner for Canada.

Wm. Harvey, Engineer to the Tasmanian Government.

Ashton M. Heath, Chief Inspecting Engineer to the Crown Agents for the Colonies

W. Joynson Hicks, M.P., Chairman of the Automobile Association and Motor Union.

John Howard, Agent General for Nova Scotia.

H. G. Humby, Consulting Engineer to the Union of South Africa.

General F. W. B. Landon, C.B., Director of Transport (nominated by the Army Council).

The Rt. Hon. Sir John H. A. Macdonald, K.C.B., President of the Scottish Automobile Club.

W. H. Mercer, C.M.G., Crown Agent for the Colonies (nominated by the Secretary of State for the Colonies).

Sir Charles Metcalfe, Bart., Consulting Engineer to Rhodesia.

Col. the Rt. Hon. Sir N. J. Moore, K.C.M.G., Agent General for Western Australia.

Sir Thomas D. Pile, Bart., Director of the London General Omnibus Co.

James Tearoe, Executive Engineer to the Queensland Government.

The Hon. J. H. Turner, Agent General for British Columbia. *Representatives of the Society of Motor Manufacturers and Traders.*

E. Manville, President of the Society of Motor Manufacturers and Traders.

Sidney Straker, Chairman of the Commercial Vehicles Committee; Managing Director of Messrs. Sidney Straker and Squire, Ltd.

Raymond Dennis, Managing Director of Messrs. Dennis Bros., Ltd.

F. Churchill, Manager of Automobile Dept., Messrs. J. and E. Hall, Ltd.

T. Barry Cole, Sales Manager, Messrs. Commercial Cars, Ltd.

The honorary secretary of the conference is, we note, the senior editor of *Motor Traction*, Mr. Horace Wyatt, and all communications relating to the conference should be addressed to the honorary secretary, the Imperial Motor Transport Conference, the Royal Automobile Club, Pall Mall, S.W.

Tyre Repairs by the Dunlop Rubber Co. in London.

Tyre repairs should have a good deal of interest for the motorist, seeing that tyre expenditure, as a rule, is the greatest item in his yearly running bill. If he had the opportunity of witnessing and watching the processes of tyre repair as we did on Thursday of last week at the Dunlop Rubber Co.'s new repair works at Belsize Road, Kilburn, N.W., he would be careful in future to confide his work only to established firms and skilled operators. It is worthy of note that this building, which was in time past one of the chief pitches of the London General Omnibus Co., is now the headquarters of the Dunlop Rubber Co.'s solid rubber tyre trade in London, and that the Dunlop solids are fitted in thousands to the vehicles that have utterly swept away the old horse-drawn 'bus. But, as we have suggested, pneumatic tyre repairs are done here by means of the most up-to-date methods, so that

every kind of damaged pneumatic can be tackled quickly and returned without delay. Thus the despatch of work of this kind to Birmingham, necessary hitherto, is now avoided. At this tyre hospital one may watch the worn out tread stripped and the new one fitted, kept in position by aluminium blocks, and afterwards completely encased in canvas by a most uncannily human winding machine, which envelops the cover in the fold as a spider winds up a fly in its web. This operation is preparatory to the tyre being sent down to the vulcanising chambers. A tyre issuing from these works is repaired to the best possible advantage, and may be confidently expected to give good service. It is only those who thoroughly understand the physical and chemical properties of rubber, and the proper methods of compounding and dressing it, who can solve the problems connected with tyre repairing.

The Convac Carburetter.

The Negative Pressure above the Jet Communicated to the Float Chamber.

IN the most primitive type of carburetter—a jet in an air passage of fixed dimensions—the mixture was only correct at one engine speed, this being due to the fact that at lower speeds the mixture was weak because the negative pressure over the jet had fallen so that proportionately less petrol issued, while at higher speeds the negative pressure increased, rendering the mixture too rich. To overcome this inherent feature, many and various are the devices which have been introduced from time to time, but with very few exceptions (the most notable being the Gillet Lehmann), attempts have not been directed towards equalising the mixture by making the negative pressure act as its own governor so far as it tends to draw more petrol from the jet than is required.

This, however, is the object of the Convac car-

speed tending to increase the negative pressure in the mixing chamber B is communicated to the float chamber C by way of the passage D, the tube E, and the pipe F. The latter leads to the interior of the float chamber, through the duct G, which is provided with the adjusting screw H. The float chamber, obviously, is rendered practically air tight: not wholly so, for, if it were hermetically sealed the pressure would be so reduced that no petrol would flow out of the jet at all.

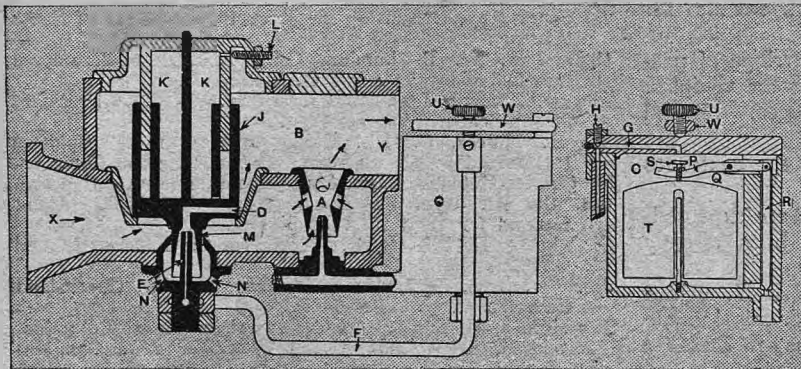
The passage D is formed in an automatic additional air piston J, which is subjected to a pronounced dash-pot effect by the chamber K; this effect, however, is adjustable by the screw L.

When the air piston is raised by the engine suction the negative pressure in the mixing chamber is still communicated to the float chamber, but to a disproportionate extent owing to the shape

of the thimble extension M. That is to say, as the air piston is lifted the suction communicated through the passage D draws a great deal of air through the holes N instead of being almost wholly employed in exhausting the float chamber. This is necessary in order that the additional air entering past the air piston shall not serve only to weaken the mixture, but shall be provided with a rich mixture ready for dilution, the rich mixture entering the mixing chamber at right angles to the ingoing air from the air piston.

It is hardly correct, therefore, to say that the negative pressure over the jet is always the same as that in the float chamber, but a variation is provided for in proportion to the amount of air which passes to the mixture chamber by way of the additional air piston.

The sectional view of the float chamber shows that this varies somewhat from the usual design of this part, owing to the necessity for the total enclosing of the needle valve and levers. The lever P is pivoted at Q, and carries the needle valve R. An adjusting screw is provided at S to vary the cut-off of the petrol when necessary. The float T is guided by the central pin screwed into the bottom of the chamber. The screw seen at U secures the lid of the float chamber and passes through the swivelling bridge piece partly shown at W. This device is being sold by the Constant Vacuum Carburetter Co., Market Street, Paddington, London, W.



Two part sectional views of the Convac carburetter.

- | | | |
|---|------------------------------------|--|
| A, choke tube | H, vacuum adjusting screw | R, needle valve |
| B, mixing chamber | J, additional air piston | S, adjusting screw |
| C, float chamber | K, dash pot | T, float |
| D, vacuum passage in air piston | L, dash pot adjusting screw | U, holding down screw of float chamber |
| E, vacuum tube | M, thimble extension of air piston | W, bridge piece |
| F, vacuum pipe communicating with float chamber | N, air holes | X, air inlet |
| G, vacuum duct in lid of float chamber | P, float toggle lever | Y, mixture outlet to throttle valve and engine |
| | Q, pivot | |

buretter design, wherein any increase of negative pressure in the mixing chamber and air passages is communicated to the float chamber. The result is that, when the engine suction, i.e., the cause of the negative pressure, tends to draw more petrol from the jet than is required to maintain a correct mixture, the negative pressure caused at the same time to occur in the float chamber puts, as it were, a brake on the petrol and equalises matters.

Referring to the accompanying diagrams, the mixture having been correctly set for slow running by the proportioning of the jet bore and the choke tube A, any movement of the throttle or variation of engine

Stone Throwing at Motor Cars.

At the instance of the R.A.C. and the Yorkshire A.C. a girl living at South Kirby was recently convicted at the Pontefract Police Court for throwing some ashes and gravel at the occupants of a passing motor car, and was bound over in the sum of £5 to come up for judgment if called upon at any time within the succeeding twelve months. The Chairman of the Bench characterised the case as a very proper one to bring to their notice, and stated that to his personal knowledge this practice of stone throwing in the dis-

trict was very prevalent, and constituted a very grave danger. He expressed a hope that the case would be a lesson and warning to others, and added that if any further cases came after this warning they would be dealt with much more severely. The General Committee of the R.A.C. at its last meeting resolved to issue notices referring to this prosecution and containing a warning to children, and steps are now being taken to post these notices about the schools and other places in the district.

A.A. and M.U. Notes.

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

Roadside Telephones.

A large number of sentry boxes fitted with telephones are installed on main roads in the home counties, and from many of these boxes members are able to despatch telegrams and express letters. During the coming summer it is hoped that many additional sentry boxes with telephones will be placed at the disposal of members to enable them to ring up garages for petrol, etc., or hotels for meals and accommodation.

Pea Shooting at Cars.

Quite a number of members have recently reported being hit by peas blown through "pea shooters" by boys. One member, whose driver's face was hit by a pea in the Willesden district, was successful in catching the culprit. He instructed the Association's solicitors to prosecute, and the Bench imposed a fine of 2s. 6d., at the same time pointing out that the practice was a very common one, which might have very serious consequences.

Speed Limit Application Refused.

The Secretary of the Association has been informed by the Local Government Board that the application of the London County Council for a ten-mile speed limit for motor cars using Berkeley Street and part of Berkeley Square will not be complied with. The Association was represented at the inquiry and opposed the application.

Riding Behind Vehicles.

The Association has recently been in communication with a local authority which is promoting a Bill containing a clause to enable the corporation in question to make local byelaws for the prevention of children holding on to or riding behind any moving vehicle. The Association is in entire sympathy with the introducers of this Bill, and will shortly give evidence before the Local Legislation Committee of the House of Commons.

Latest Road Information.

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

CHESHIRE.—Altrincham-Manchester Road: Under repair at Northwich, half width; lights at night. Also at Castle, near Northwich, on the Chester Road. Members are warned to drive with care through Northwich and Chester.

GREAT NORTH ROAD.—Under repair full width at Potters Bar, between the 16th and 17th milestones; clear at night. Remetalling one mile north of Welwyn full width; roller at work; lights at night. In bad condition between Baldock and Biggleswade. Controls likely to be working at Buckden, Alconbury, Water Newton, and on the Old North Road at Little Stukeley, and at Fenstanton, on the Huntingdon-Cambridge Road. In bad condition between Scotch Corner and Darlington. Under repair half width north of Morpeth.

LANCASHIRE.—Preston-Blackpool Road: Half width being laid with tarmac between the 3rd and 4th milestones west of Preston; roller working; lights at night. Remetalling half width between 1st and 2nd milestones east of Kirkham; roller at work; lights at night. Half width under repair in Ribby Road, threequarters of a mile west of Kirkham; roller at work; lights at night. Preston-Lytham Road: Remetalling on Freckleton Marsh; roller at work; clear at night. Rough surface and frequent holes between Freckleton and Lytham. Blackpool-Poulton Road: Special care is necessary through Poulton-le-Fylde and district. Preston-Garstang Road: Members are requested to drive

with special caution between Withy Trees, Fulwood, and Broughton village; also through Garstang. Preston-Blackburn Road: In very rough state on Brockholes Hill, two miles east of Preston. Preston-Wigan Road: Under repair half width between the 6th and 7th milestones south of Preston; roller at work; lights at night.

YORKSHIRE.—York-Malton Road: Under repair full width between the 9th and 10th milestones. Otley-Bradford Road: Care is necessary on entering Otley by the Bradford Road, owing to repairs to main water supply; lights at night. Leeds-Huddersfield Road: Remetalling and rolling full width of roadway between 7th and 8th milestones from Leeds. Leeds-Otley Road: Under repair half width at a time between the 3rd and 4th milestones from Leeds; roller at work.

COVENTRY ROAD.—Road metal being laid at St. Albans between the 19th and 20th milestones, half width. New metal being laid on the Hockliffe Hill for half a mile. New gas main being laid in Dunstable; lights at night.

TEWKESBURY-WORCESTER ROAD.—Road open half width in two places at Kempsey, between the 3rd and 4th milestones from Worcester; sewer pipes being laid. Also under repair at Clifton, Severn Stoke.

ERDINGTON-LICHFIELD ROAD.—Remetalling the centre of the road at Sutton Coldfield and at Jockey Hill; roller working.

LONDON-YARMOUTH ROAD.—Under repair at Mount Nessing to Ingatestone; Chelmsford; between Chelmsford and Witham; tarring between Kelvedon and Marks Tey; Marks Tey to Lewden. Main road is completely blocked in South Lowestoft; alternative route, turn to right along Kensington Road, then left along Marine Parade, which rejoins main road at Harbour Bridge.

NORWICH-IPSWICH ROAD.—Roller working one mile from Norwich, full width; also at two and a half miles from Norwich full width. Broken bridge at Newton Flotman; care is necessary.

SHREWSBURY DISTRICT.—Welshpool Road: Remetalling full width between the fourth and fifth milestones from Shrewsbury. Gloucester-Bristol Road: Under repair half width, roller working, left clear at night; also between the twelfth and thirteenth milestones.

DORSET.—Dorchester-Bridport Road: Foundations are being laid one mile west of Dorchester, whole width; alternative route *via* Martinstown. Also on the Dorchester-Buckland Newton road, one mile north of Dorchester, whole width.

BATH ROAD.—High Street, Maidenhead, is still closed for repairs from the Town Hall to King Street; alternative route, Queen Street *via* King Street. Under repair between Calcot and Tnatcham.

BRIGHTON ROAD.—Tarring between Reigate and Povey Cross, also between Redhill and Horley and between Horley and the Balcombe Road. Tarring on Wray Common, Reigate.

LONDON DISTRICT.—Controls likely to be working at the following points: Between Lancaster Gate and Notting Hill Stations (flashlight); on entering Sutton. Belle Vue Road, Wandsworth, is closed to traffic; alternative route through St. James Road.

SOUTHAMPTON ROAD.—Winchester-Bournemouth Road: Under repair and roller at work at Lyndhurst, near Swan Inn, full width; also at Wilverley Post, New Forest, and at Itford, full width. Basingstoke District: Salisbury Road, remetalling full width between the 4th and 5th milestones; loose metal left at night.

SUSSEX.—Control is likely to be working in the ten-mile limit at Uckfield. It is intended to repair main roads between the following points: Wych Cross-Chailey cross roads; Newhaven-Brighton; Brighton-Lewes; Eastbourne-East Hoathley; Ringmer-Dicker; Plumpton-Ditchling; Flimvell-Silverhill; Peasmarsh Beckley; Five Ashes and Argos Hill, Mayfield; Wych Cross Nutley; Heathfield-Burwash; Heathfield-Cross-in-Hand.

"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. 1rd.

The Glentworth Tyre Lever.

As the result of practical experience, the Glentworth tyre lever has been evolved, and is now being sold by the Motor Accessories Co., 55, Great Marlborough Street, London, W. The device has been designed to pull the cover of a tyre back so as to render the insertion of valve or security bolts



Fig. 1.—The Glentworth tyre lever in use. A second lever is shown on the wing of the car; it will be noticed that the lever extends beyond the hook for the tyre bead to enable it to reach the inner side of the rim which acts as a fulcrum.

an easy matter. To this end the lever is fitted with a hook on its side which takes hold of the beading of the cover, while the end fulcrums on the edge of the rim at the opposite side of the wheel. Its principle is perhaps best explained by reference to the accompanying illustration, fig. 1, and in a demonstration we witnessed it was successful in dealing with a large tyre of exceptional obstinacy. On the wing of the car shown is a second lever on which can be seen the extension beyond the side hook.

In the very complete Moco repair outfit sold by the same firm the method provided for applying the solution calls for remark. The solution is kept in a well finished and plated tubular case, provided with a screw top, and attached to this top is a brush long enough to reach to take up the solution even when the supply becomes partly depleted. The whole arrangement is very clean, and the outfit, while compact, is comprehensive, and includes the roughening brush seen on the left of the illustration fig. 2. The whole outfit is packed in a substantial wooden box for carriage on the car.

E26

Motor Trade Figures.

The most striking feature of the returns relating to the exports of motor cars and chassis from Germany during January last is the big reduction in the shipments to the United Kingdom, this country now only occupying the ninth place in the list. During the month a total of 649 vehicles valued at £394,400 were exported from the Fatherland, these figures contrasting with 517 and £300,100 respectively in January, 1912. Russia is at present by far the best customer for German automobile productions, followed by Brazil, Belgium, the Argentine Republic, and Denmark.

That a very active state of affairs is prevailing in the motor industry in France may be judged from the fact that the exports of cars and chassis from that country during the first two months of the current year attained a value of no less than £1,448,568, as contrasted with only £873,532 in the two months ending with February, 1912. The United Kingdom still occupies the position of being France's best customer, but the total is not equal to that of last year.

An increasing number of foreign motor cars and chassis are this year being imported into Belgium, the arrivals during the three months ending with March last having attained a value of £99,420, as against only £88,040 in the corresponding quarter of 1912. France supplies the largest number of the imported cars, Germany coming next on the list, while Great Britain is third.

The value of the imports of motor cars and chassis into New South Wales last year amounted to £548,225, as compared with only £504,580 in 1911. There was a drop of £3,000 in the value of the imports from Great Britain; on the other hand, those from Italy increased by £8,000, from Germany £6,000, and from Canada £2,000.

We are asked by Barimar, Ltd., 10, Poland Street, W., to state that they can supply their cast aluminium number plates within six hours of the receipt of an order, or sooner if really necessary, and not twenty-four hours, which was suggested in a paragraph in our last issue as being the usual time necessary to prepare this type of plate. It may be remembered that the Barimar plates have the identification letter and numerals cast solid with the base plate.

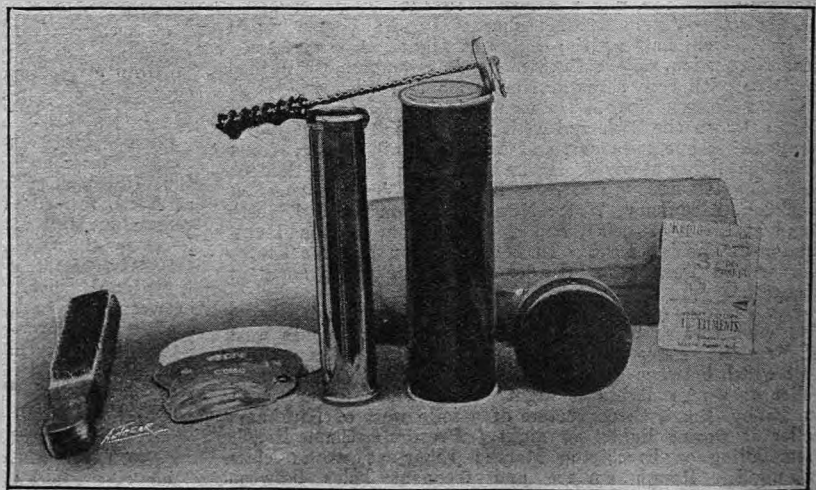


Fig. 2.—The Moco repair outfit with the brush fixed to the cap of the solution tin. A roughening brush is seen on the left.

Leaves from a Sportsman's Notebook.

By J. Fairfax Blakeborough.

Chauffeur groom or Groom-chauffeur.

THE automobile is undoubtedly begetting a human hybrid! There is not the least doubt about it, for one sees renewed signs of the fact daily. That hybrid is the groom-chauffeur, or, if you prefer it, chauffeur-groom. I see him daily, and note that he is sometimes groom from the knees downward and mechanic above, in other cases he has the peculiar horsey face, the neat and clean appearance about the neck, but he is a mechanic below. In neither case do the twain blend—indeed, they seem in open antagonism. You might put a suffragette into male habiliments or dress a jockey as a policeman with less incongruity than to transform a groom into a mechanic or ask a mechanic to appear "horsey" and look and act his part. Yet the hybrid is everywhere in evidence. Grooms are discovering that they are likely to obtain the best billets if they can drive a car, and are sinking all prejudice and are making themselves proficient in this direction.

I think it is to be regretted that those spruce little dapper men, with faces full of character (often not unlike horses), should pass from amongst us. They are a type unto themselves, possessed of much individuality, and inseparable from the old country house staff of servants. The old type of groom grew to be almost one of the family he served. He watched the children of the household grow up; their joys and sorrows and successes were shared by him, and he came to be more than a mere servant. I question whether this is so with the average chauffeur, or whether time will ever make it so. I have confessed the hybrid likes me not, yet I suppose the economics of many households demand it—one car and one horse cannot occupy a groom and a chauffeur, so the hybrid is more or less essential. If one has to go it will probably be the horse, which is used for the tennis-lawn roller, leading coals and luggage, and saving the car when the roads are "up to the neck" in filth. I am not so pessimistic as some (who lack circumspection), and I cannot see that the automobile will drive the horse off the road, but the hybrid will probably become more and more numerous. The old type of groom will always be found at country hall and manor house stables, even though he alter somewhat owing to the influence of the groom-chauffeur, and those stables will always have their occupants, come what may:

Though the automobile whizzes over the scene
That once was so peaceful and still,
Leaving dust in its wake and the scent of benzene
As it disappears over the hill;
Though its zips and its jolts give alarm to the colts,
Let us not for the moment forget
That, in spite of man's need for excitement and speed,
There is room for the old horse yet.

Motor Hound-vans.

The facts that Earl Harrington's Hunt motor hound-van caught fire early in the season, and that an axle of the Worcestershire Hunt van snapped recently, cannot, with the wildest extravagance, be said to be evidence against the utility of this means of conveying packs to distant fixtures. The scheme has been found to work well and to answer its purpose to the full in the economics of the kennel. One hears of more Hunt Committees which intend purchasing motor hound-vans next season. They have been cautiously waiting to see the results of other folk's experiments,

and, these being altogether satisfactory, the innovation will spread. Probably Hunt Committees rather than Masters of Hounds will have to take the initiative in this matter. Nowadays the M.F.H. is often a "carpet-bag" gentleman—here for a season and somewhere else the next—who does not care to lay out the considerable sum necessary for purchasing a motor van, though he would probably be quite willing to admit that it would be a considerable acquisition and assistance to him in his endeavours to show sport. A hound van, however, is a bulky piece of furniture for a man to have thrown on his hands. Supposing a Master of Hounds has one built in the hope that his successor will take it from him, he has no guarantee that that successor may not be a M.F.H. changing countries and bringing a van, built to his own plans, with him, or that the new Master will not feel disposed to take his vehicle. Naturally, under these circumstances, many sportsmen who would otherwise have had this improvement ere now have shirked the responsibility. In the future, therefore, it will probably be found that Hunt Committees, who so frequently own the hounds and kennels, will also buy the hound van and loan it to succeeding Masters.

To revert to the Worcestershire Hunt incident, or accident, neither hounds nor driver were any the worse, and the lesson to be derived from the occurrence is one which has been evident with most of these constructions—that they should be built lighter. *Experientia docet* may be applied to all forms of vehicular traffic. Look at the old railway engine and tender in Darlington Station, and compare them with the engines of to-day. It is precisely the same with the earliest motor cars. Motor hound-vans are yet in their infancy, and the same may be said of motor horse boxes. Of course, the chassis are not specially built, but the bodies seem too heavy for the load to be carried.

Another Incident.

Speaking of "incidents" in connection with motors and hunting reminds me that there was a somewhat exciting scene at a recent fixture of the Essex Farmers' Stag-hounds. The horse attached to the deer cart bolted amongst the motor cars, and in his attempts to stop the runaway the driver was knocked down and run over. The cart then collided with a car, and was overturned, though much heavier than the motor. Peculiarly enough, the two deer inside were none the worse for their severe shaking, though the driver was much bruised.

I cannot say I am a great admirer of carted stag hunting, though by no means am I one of those who would have it stopped. To me it always seems that sport is best when nearest to nature, and consequently untrammelled by things artificial. Now the hunting of the carted stag can hardly be said to be natural, exhilarating and exciting though the sport may be. It is frequently a travesty on the real thing with the wild stag on Exmoor.

In olden days Londoners used to have a great outing in Epping Forest with the carted stag, and a ball afterwards, every Easter Monday; but all this is now, I fancy, dead. In the early part of the nineteenth century from two to three thousand sportsmen attended the fixture, with seven or eight hundred vehicles through which the deer had to make its way.

Correspondence.

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

Letters of a personal nature will be withheld.

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

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

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

WORM GEAR CHALLENGE.

[19485.]—We have noted the Daimler Co.'s reply [19432] to our letter [19386] and are sorry to read their suggestion that we wish to place difficulties in the way of these tests. This is not so, for we are only too willing to provide gears of Lanchester ratio and to work at Lanchester centres (they to do likewise), but we only insist that the tests shall be sufficiently thorough to provide really valuable data. We could not entertain any test unless it be under true working conditions, and as the Daimler Co. state in their last letter, "the worm gear box was maintained approximately at a given temperature artificially," it follows that the results will likewise be artificial and misleading. This is another reason why we consider new and independent tests essential, otherwise the results of our tests and those of the Daimler Co.'s previous tests will not be comparative, because we do not intend to conduct any of our tests under artificial conditions.

The Daimler Co. remark that we make statements regarding efficiency with no means at our disposal for ascertaining whether they are correct or not, but we would gently remind them that we have made and tested worm gears before the Lanchester worm-driven rear axle ever existed, and that their insinuation is quite unfounded. Further, our intimate study of this subject enables us to point out to the Daimler Co. that any worm test carried out at an artificial temperature will only give a result which is misleading to the general public.

The Daimler Co.'s letter raises a point which we had wished to avoid in this controversy, namely, their statement, "Mr. Lanchester has also given wider and more detailed publicity in his paper read recently before the Institution of Automobile Engineers." We were invited to attend and hear Mr. Lanchester's paper read and take part in the discussion which followed, consequently we instructed one of our staff, who is a member of the Institution of Automobile Engineers, to be present. Our representative attended, not only when the paper was read, but also at the subsequent meeting when the discussion took place. He took with him a number of specially prepared lantern slides, notified the secretary in the usual manner, who kindly prepared a lantern, and yet when it came to his turn he was prevented from taking part in the discussion. After travelling in all a distance of 800 miles he was not given the opportunity of speaking even one sentence! Our representative, therefore, sent his reply in writing, but although this was two months ago, it has not yet been published, the excuse being given that Mr. Lanchester "has had to put the matter on one side for a little while."

Bearing this in mind, we do not intend to enter into any partial or artificial trial, but will only consider a most thorough and searching test, similar to what we have already suggested. We desire to avoid unnecessary quibbles, so will conclude by remarking that if the 100 ft. lbs. test mentioned in their letter [19342] was a printer's error it is somewhat remarkable that it took just four weeks to correct it!

DAVID BROWN AND SONS (HUDDERSFIELD), LTD.

UNOFFICIAL TRIALS.

[19486.]—I find the *R.A.C. Journal* of April 11th quite interesting. Therein I see that the Chairman of the Club, in his opening speech, states: "I should like to say I am perfectly convinced now, as I was at the time, that the Club did quite right" (referring, of course, to the "unofficial" Victor tyre test); also, he said "That it would be the height of folly on the part of the committee of a club like this if it were in any way annoyed by being criticised."

It is very interesting to know that they have been very much annoyed by the criticisms, and also that he is perfectly convinced now that the Club did quite right. Regarding this latter, it much amazes me that it can be the case, since at the time the Club published a statement which has since been shown to be an incorrect one; here the Chairman seems

to be condoning a very peculiar line of conduct in stating that "he is convinced that the Club did quite right."

What astonishes me more than all this is that Mr. Yarworth Jones, after battling with the Club (and the opinion of every motorist I have spoken to upon this subject is the same), and winning the battle so brilliantly, is to be found begging for an R.A.C. trial.

Does Mr. Yarworth Jones think, then, that the "unofficial" trial was of no value, and that it necessitates a so-called "official" trial afterwards? If so, why should he have given the large committee he called together to supervise his "unofficial" trial all that trouble and time which was expended, which he thinks now, or seems to think, is of no account and is practically worthless? I certainly think Mr. Yarworth Jones owes considerable explanation to the large body of motorists who have given so freely of their time and trouble, and who have so admirably supported him throughout the trial.

A. J. WHITEHOUSE-COLE.

CAMPHOR IN PETROL.

[19487.]—In answer to your correspondent's letter [No. 19468], the amount of camphor I use is one ounce to five gallons. I cut a one ounce block into five equal pieces and put in one for each gallon. If broken up and put in the funnel, it will melt whilst pouring in two gallons. Since using camphor I have done about 500 miles. There is very little sign of carbon, although I drove 2,500 miles before introducing the camphor. A Bowden extra air inlet fixed to the induction pipe will increase the speed of the car without affecting acceleration, which naturally means a saving of petrol. The driver also economises in the use of fuel by endeavouring to keep the tank as full as possible. For instance, if your correspondent, whose 10-12 h.p. Belsize tank holds five gallons, will, after running, say, fifty miles, put in two gallons so as always to have the tank more than half full, he should get quite 5 m.p.g. extra. This I have proved, but the reason has never been satisfactorily explained to me.

ERNEST SMITH.

THE DEL MONTE PROCESS.

[19488.]—Mr. A. E. Tucker's condemnation of this process should be read by all who have applied for shares in the new company handling this process, and I, for one, will expect to see some reply to Mr. Tucker's remarks. It is unfortunate that this criticism did not appear earlier.

On discussing this process with practical men in the gas and coal trade, I have heard nothing but condemnation of it. On top of this comes Mr. Tucker's serious criticisms, and unless some satisfactory reply is made on behalf of the company, I think it is time the shareholders took the matter up.

W.

UNDER-TYRED CARS.

[19489.]—Your leading article of April 26th on "under-tyred cars" only served to whet the appetite, which it wholly failed to satisfy. Surely it would be of the greatest interest and value to intending purchasers if *The Autocar* published a table of advice to genuine users and not abusers of the road, giving in column 1 the dimensions of the smallest size of tyre permissible, and in column 2 the dimensions of the size of tyre recommended in respect of automobiles weighing, ready for the road, from, say, 15 to 40 cwt.

The publication of such a table will compel the makers of tyres and the chassis builders either to come out into the open and adjust their differences in full view of their patrons or to accept your table as unassailable.

SEEKER.

STEAM CAR DESIGN.

[19490.]—I can assure "M.S.T." [letter 19482] that I have made no mistake in giving 40 m.p.g. as the water consumption of the White steam car. On March 22nd the car

ran from Bolton to Halton beyond Lancaster on dry roads with driver and two passengers. The return journey was made over muddy roads in a hurricane of wind and rain with hood and side curtains up. The water and paraffin used were carefully measured, and worked out at 40 m.p.g. of water and 13 m.p.g. paraffin. On shorter runs over hilly roads the water consumption falls to 20 m.p.g., the worst I have ever reached being about 11 m.p.g. of water on excessively muddy, rough, and hilly roads.

I have a very high opinion of the Pearson-Cox car, but the White generator works so well that one feels disinclined to change for anything else. The White engine might be improved upon, but the chassis, wheels, brakes, etc., are truly incomparable.

ENGINEER.

THE WHEEL AND THE ROAD.

[19491.]—In your very kindly articles and other notices on my recent paper on "The Wheel and the Road," one important error occurs. You attach my name to the road machine that has been installed at the National Physical Laboratory. This is not fair either to the Advisory Committee of the Road Board who are responsible for advising the Board to spend the money, nor to Dr. Stanton of the National Physical Laboratory on whose shoulders has fallen the most difficult part of the design work. If any name should be given to the road machine it should be called Dr. Stanton's road machine.

R. E. CROMPTON.

TOUR BY A LADY.

[19492.]—Having read with interest so many lady drivers' experiences which have appeared in *The Autocar* at various times, I thought an account of one of my runs in Lakeland might prove of interest.

I started with an American K.R.I.T., and a very sound, reliable car I found it. Since then I have driven a 15.9 B.S.A., with Silent Knight engine, and in the course of four months' running had driven it about 3,000 miles without a hitch of any kind, and I consider it one of the easiest and most reliable cars a lady can drive. It has a four-seated torpedo body, finished dark green, three speeds and reverse, the lowest of which I seldom have to use. It is a splendid hill-climber, and as it has Rudge-Whitworth detachable wheels punctures present no difficulties.

The most pleasant roads are in the vicinity of Windermere, Rydal, Grasmere, and Thirlmere, and once Kirkstone Pass is safely negotiated Ullswater provides very fine roads, but I would advise motorists to avoid the Duddon Valley, Coniston, and Buttermere, as the roads are very stony and rough, and the corners are very sharp.

I think the most interesting drive I have taken is by Bowness through Troutbeck and over Kirkstone Pass. Then passing Brothers Water on the left, you reach Patterdale, then along the edge of the lake to Ullswater and Pooley Bridge. Before reaching Penrith it is worth while to pay a visit to Gowbarrow Park and Airey Force, which has been bought by the Trust for preserving England's beauty spots. The return may be made by Shap Fell, Kendal, and Grange, or in the opposite direction across to Keswick, then down Thirlmere and Dunmail Raise into Grasmere and Ambleside, and back to Barrow by Bowness and Newby Bridge.

I enclose a photograph showing the car referred to.

EDITH I. WALKER.

THE HOLYHEAD ROAD.

[19493.]—The main roads of Merioneth are repaired by contract, and the contractors are Messrs. Davies Brothers, butchers, carters, and garagers, of Barmouth, and, I suppose, their work is subject to the approval of the County Council surveyor, Mr. Vaughton, of Barmouth Junction. It must, in justice to the contractors, be said that the price is very low, although there is plenty of stone always at hand, which, in many cases, costs nothing. The price is about £22 per mile, and, of course, in this case, the extras.

It is a much larger loss to the coast towns than they are aware of, but you would think that the County Council, who must be aware of the fall, not only in values of property in the coast towns, but in population, would know by this that

good roads mean money, increased rateable value, more visitors, etc., but it is hard to convince a conservative people like the Welsh. You can go on to farms in Merioneth and see the same methods of farming, the same tools, etc., that were in use in 1800. "What was good enough for grandfather is good enough for me" is the motto, and many of these farmers go to form the Merioneth County Council.

NORTH WALES.

Correspondence.

LLANGOLLEN TO CERRIG-Y-DRUIDION AND BETTWS-Y-COED.

[19494.]—Regarding a route to avoid the bad piece of road between Corwen and Pentre Voelas, I may say that I found the best route from Llangollen to Bettws-y-Coed is to proceed from Llangollen to Ruthin over the mountain road called Bwlch, and from Ruthin take the mountain road to Pentre Voelas, thus avoiding the long *détour* by Denbigh. This route passes through delightful scenery, and the surface is in very fair condition.

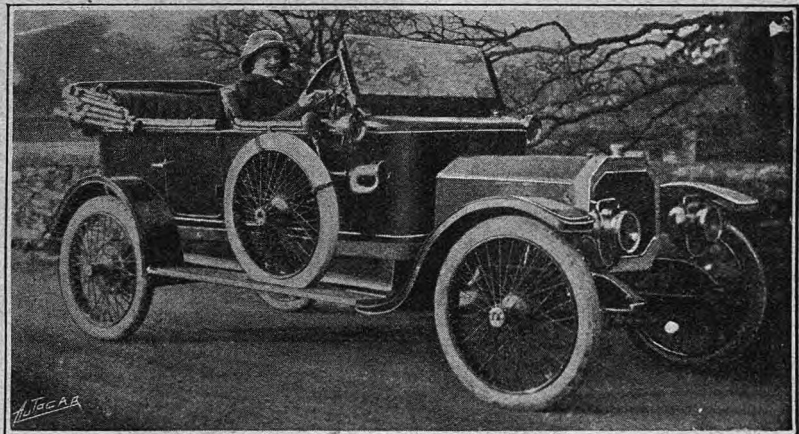
BERNARD HOPPS.

CLIMBING PENYBALL HILL, HOLYWELL.

[19495.]—On April 21st our Mr. S. K. Broadfoot, driving a 15.9 standard S.C.A.R. car fitted with four-seated body, with Mr. Roberts, of the Garage, Holywell, as passenger, climbed Penyball Hill, Holywell, the minimum speed on the steepest pitch being above 10 m.p.h. as shown by the speedometer.

From enquiries made we believe that this is the first time that a car has been driven up this celebrated motor cycle test hill, and we would be glad to hear if any of your readers can inform us if this is correct, and, if not, what make of car and what driver have previously accomplished this feat.

NORTHERN DEPOT, LTD.



Miss Edith I. Walker on her B.S.A. car referred to in the accompanying letter.

THE TRAINING OF AUTOMOBILE ENGINEERS.

[19496.]—In reply to letter 19456, I am unable to give particulars of "Les Arts des Métiers," but no doubt if Mr. Bedford wrote to the Secretary, Paris, he would be forwarded the required information. May I say that whilst employed by a large automobile firm in Paris I was received with nothing but kindness, and everything was put in my way to learn French methods, and the language. The cost of living is on a par with England. I prefer the French method of *pension de famille* to the English system, as it affords one facilities of conversational French.

HARRY WOOLLEN, A.M.I.A.E., G.I.Mech.E.

TRADE TRUSTS AND THE CONSUMER.

[19497.]—With reference to letter 19379 in your issue of March 29th, it may interest Mr. Rive to know that the price of petrol in the States at present is from 23 to 25 cents (11½d. to 1s. 1½d.) per gallon at garages, and 19 to 20 cents (9½d. to 10d.) per gallon in not less than five gallon lots if bought of the refining companies.

Wilkes-Barre, Pa.

FELIX DU PAS.

TRAPS IN ESSEX.

[19498.]—A fortnight ago I had occasion to write you with reference to trapping motorists at Witham, in Essex [letter 19449]. As you will see by the enclosed cutting from the *East Anglian Daily Times*, the disease has spread

Correspondence.

to other places in the county. I hope you will find space in your next issue to warn your readers, as no doubt several traps will be busy during the Whitsun holidays.

E. A. SERRE.

[The newspaper report enclosed shows that a number of motorists were fined for exceeding the speed limit over a measured distance of $4\frac{1}{2}$ miles from the police station at Ingatstone, through Margaretting, to the Widford railway bridge.—Ed.]

REPAIRS.

[19499].—With reference to Mr. Stuart's letter [19447], it would greatly interest me, and, I am sure, a good many more readers of *The Autocar*, to have published an account of the time taken, number of men employed, and the expense incurred by the garage people who dismantled and assembled his back axle and rendered sundry other services for the sum of £1 5s. How any person can give this letter a second thought and then say there was a profit made at the price is past my comprehension.

I am a motor mechanic employed by a large engineering company with no connection with the motor trade. I was ordered to dismantle the back axle of a Buick car—this operation must have been similar to Mr. Stuart's—and it cost in labour, one fitter, thirty hours, at 8 $\frac{1}{2}$ d. per hour, £1 1s. 3d.; one labourer, thirty hours, at 5 $\frac{1}{2}$ d. per hour, 13s. 9d.—total, £1 15s. The work was carried out under the most favourable circumstances, in a well equipped shop, the men worked well, and the time taken was thirty hours from driving in to driving out, including as it did cleaning and tuning up for about four hours.

I feel sure if Mr. Stuart's job is gone thoroughly into it will be found there was a loss and not a profit.

W. H. GRAVES.

COST OF A NEW STREET LAMP.

[19500].—Recently I had the misfortune to knock down a lamp-post through a derangement of the steering gear of my car, and the following is a detailed account which I received from the Town Council and may be of interest:

To replacing broken gas lamp column and lantern—		s.	d.	£	s.	d.
10ft. $\frac{1}{2}$ in. gal. pipe	3	4		
One $\frac{3}{4}$ in. connection	6			
One $\frac{3}{4}$ in. bend	7			
One $\frac{1}{2}$ in. to $\frac{3}{4}$ in. lamp tap	2	6		
One No. 4 Kern burner complete	6	0		
Three bolts and nuts	3			
Fitters, 2 hours at 1s.	2	0		
10 hours at 8d.	6	8		
Labourer, 10 hours at 6d.	5	0		
					1	6
						10
To fixing new column—						
$\frac{1}{2}$ square yard York flagging	3	0		
Mortar	1	0		
Labour, 3 hours at 8 $\frac{1}{2}$ d. and 5 hours at 5 $\frac{1}{2}$ d.	4	3		
$\frac{1}{2}$ day hauling	2	0		
						10
						3
Charge for old column	10	0		
Charge for lantern	15	0		
					1	5
						0
Total	£3	2	1	

These charges do not, it is hardly necessary to point out, contain any item connected with the repair of the car; which, unfortunately, was not insured.

R.R.E.

LONDON TRAFFIC CONGESTION.

[19501].—I regret that your correspondent [No. 19484] in your issue of the 26th ult., writing on London traffic congestion, knows so little of the subject of which he speaks. Evidently he is one of a class who considers that the road should be left only to those motorists who are out on pleasure bent. He speaks of the multiplication of motor 'buses. Certainly they have been multiplied, but he has not considered the extension of the services upon which they run. I should like to point out that, although the L.G.O. Co. have more 'buses on the road (and they have been increased by over a thousand), there are no more 'buses in the heart of London than there were two years ago, owing to the extension of services. I will endeavour to explain in the following way. If the company have a service running, we will say, in a five-minute time on a stretch of three miles, and they find it necessary to extend the service another three miles, they must place double the number of 'buses on that

service, or, if that be not done, they must extend the running time to ten minutes. You would then find that intending passengers would be crowding on the pavements, causing foot passengers to walk out into the roadway. Hence more danger. So you must see the point of my argument that, although there are more 'buses at work, there are no more 'buses in the City or in any place previously served by 'buses at the same time. Also he has not considered that there are a large number out of the total number of 'buses which never touch London or rather the congested parts, which are probably suggested by him. One of these services is mentioned by him, viz., the Windsor and Hounslow service; the 'buses on this road come in the company's total, but never touch congested areas.

I wish gentlemen like "Wanderer" would think before they argue. He has never driven a motor 'bus, neither does he understand the working of one. He has not thought that the motor 'bus is the poor man's motor car. A poor man now has the opportunity to have a country run for the easy fee of 6d. which he could not have in any other way, so why grumble about the poor man's ride? By way of a suggestion I would say that "Wanderer" should obtain a licence from the police and just try the handling of a motor 'bus in the City, so that he can find the difference between that and a private car. I have driven both, so I know. To come back to the accident question, the Government can reduce the speed limit to 4 m.p.h. and it will not stop or reduce the number of accidents; the restrictions must revert to the public and not to vehicular traffic.

To stop congestion, I suggest that police on traffic points should be appointed permanently instead of temporarily, which would give the police the opportunity of getting quite used to the one spot. I must say that at present some of the Metropolitan police are more like pantomime policemen than anything else in regulating traffic.

When "Wanderer" is thinking of motor 'buses, let him also think of taxicabs and the congestion they cause. How often do we see these cabs plying for hire along the near-side and then shoot out round some obstacle regardless of what may be passing at the time; this alone is one great source of danger. The authorities have been good enough to take a census of motor 'buses, now let them take a census of taxicabs which are standing idle on the ranks, or crawling along the road plying for hire. Taxicabs are now overdone. I would like to ask this question, "Why does everybody fly at motor 'buses as the cause of fatal accidents?" I should like to reter anyone who would try to answer this question to the very small percentage of 'bus drivers who are tried for manslaughter. It is nearly always the same verdict: accidental death, driver exonerated from blame.

In conclusion, I would like to say that had the L.C.C. trams been the cause of losing so many lives, there would never have been a traffic inquiry, as the tram's supporters in Parliament found this a good reason for placing more restriction upon motor 'buses, so that the trams could have the monopoly of the road. I say now, and always will say, that the traffic inquiry is a farce got up for party purposes.

THOMAS A. DANCE.

LONG V. SHORT STROKE.

[19502].—My last car had a 70×130 mm. engine; my present one has a 65×130 mm. The former, with a five-seated body, certainly pulled better at slow speeds than the latter with a two-seated one. A 65×98 mm. engine romped up a hill on top speed, over which a bigger engine, with a moderately long stroke, made a good deal of fuss on its second. Such is my small experience. Will not those who have had personal knowledge of both long and short tell us what they have found? There are firms which make engines of the same bore and different strokes—Adler, Crespelle, Delage, Grégoire, Hansa, Hispano-Suiza, Hupmobile, Itala, Licorne, Mass, Motobloc, N.A.G., Opel, Palladium, Peugeot, Piccard-Pictet, Pipe, Star, Vulcan. Is it too much to ask members of these firms to tell us in what these engines differ, besides power? It would be a boon to many if the R.A.C. would undertake a trial and publish the power-curves. To me, the solution of the difficulty is still far away. I ask myself, why do such firms as Rolls-Royce and Lanchester make short stroke engines and Renault and De Dion long ones? Why did Straker-Squire change from square to medium stroke? Why have all Napier's the same stroke? Why are most American engines on the short side? How do the long and short stroke engines of the same firm compare, such as the 70×135 and 75×115 mm. Opel, the cubic capacity being about the same? Do *désaxé* cylinders make a difference?

Correspondence.

I seem to have reached these conclusions at present: That maximum power does not depend on stroke, but on cubic capacity. That the bigger the bore the shorter the stroke may be, in proportion. If this be true it seems to show that the short stroke is best for slow work, for the larger engines are more often used at less than their maximum speed than the smaller. That the ratio of bore to stroke matters less than carburation, balance, and many other details, so that an engine that is well designed and made will be both powerful and sweet-running, whether it has a long or short stroke. Yet there must be some differences, and they may be important.

I want a more powerful car as soon as I can afford it. Will not more of those who know help to correct, inform, and set at ease the enquiring mind of A SMALL MAN.

CAR IN A BASEMENT.

[19503.]—I enclose two photographs of my old 45 h.p. Napier car which found a temporary resting place in the basement of a house near Northampton. The driver failing to stop, owing to oil on the brakes, the car ran gently through a small fence, down a grass slope; and into a window in the basement, the dumb-irons resting on the window sill while a head lamp supported the car against the wall. In a little over two hours, the car was jacked up and pulled on to the level with the aid of horses and then driven away, the total damage being near head lamp telescoped, bracket slightly bent, and window smashed. The R.W. wheels were apparently none the worse. W.G.S.

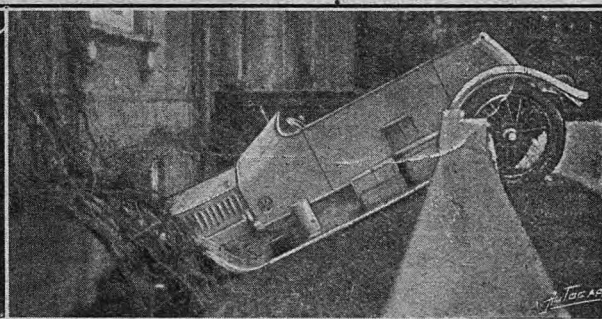
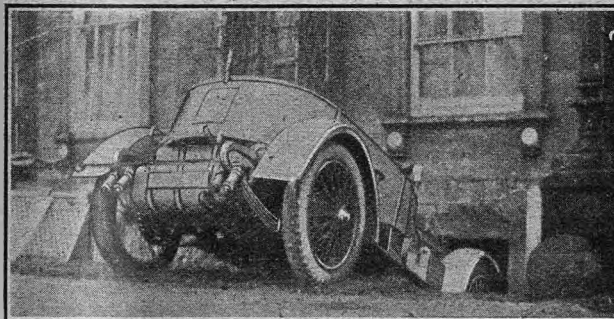
three years ago German manufacturers sent their cars into the country, some of these being sold at £500, and cheaper American cars entered the market at £250.

Motor car business then grew steadily, one German firm—N.A.G.—devising a new model in order to attend solely to Brazilian orders. Garages for hiring motors were founded, and a fair business resulted. It was found that cheap cars were not always worth even the low prices paid for them. In a few months, often weeks, a car was quite useless—bevel gears, gear change, crankshafts, and cylinders all gone, not only on account of bad material or workmanship, but also for want of good repairers, which we are still wanting.

To-day high-grade cars are preferred, and cheap cars do not find any favour. It is astounding that British manufacturers do not take advantage of the well-known "Made in England" mark. Brazilians are very fond of it.

I will attempt some criticisms of British cars. (1.) They have a lack of special design, water boils quickly in the radiator (that is not true of all makes), and are not easy to start. Worm gear is not liked by Brazilians. Track is not wide enough. The only track suitable for Brazilian roads is 1m. 44 wide. The bevel gear is not strong enough on most cars, and does not compare favourably with French makes. High-tension magneto with automatic advance is only now being fitted to them; ball bearings should be provided on most parts; top gear on hills is not easy. High-powered fast cars are wanted, as hill-climbing performances are the daily requirements; road clearance is somewhat low.

(2.) Bodies. The average British four-seated body is not good taste in Brazil. Open bodies should provide places in



CAR IN A BASEMENT. "The driver failing to stop, owing to oil on the brakes, the car ran gently through a small fence, down a grass slope, and into a window in the basement."

AN APPEAL FROM INDIA.

[19504.]—I have, on more than one occasion, seen a plea from Indian and colonial readers for the inclusion in traders' announcements of the names of the Indian and colonial agents of the various cars and accessories. This is sometimes done in the case of colonial agents, but rarely of Indian.

Now India is a large country, and the most important dealers are located in Bombay, Calcutta, or Madras, while motorists are all over the country, frequently thousands of miles from these places.

I sometimes require to know where I can purchase certain tyres and accessories, but except for three very well-known tyres, there are few particulars to be found in the papers. It is therefore necessary to write round to the different agents and enquire; personally I prefer to go without the article or to buy some substitute I know of. I own an English car and use British tyres. I support home industries as far as possible.

British firms I deal with rarely send a price list unless asked to do so, but two foreign tyre firms with whom I have never dealt frequently send me price lists; presumably they get my address from the directory, which is equally open to British firms. I belong to an American scientific body, and also to a British one, but I get far more advertisements from America than England. VERB. SAP.

MOTOR CARS IN BRAZIL.

[19505.]—Some time ago the German Consul in this country (Brazil) called attention to the good markets that there are here for motor cars.

Motoring practically was introduced in Brazil at the time of the great improvements undertaken in Rio de Janeiro by President Rodrigues Alves. French cars were then the sole cars on the market, namely, Berliet, Darracq, Renault, and De Dion, prices averaging £1,400. Prices were maintained, and year after year cars were still as dear as before. But

the front seat for the chauffeur and another person and five more seats at the back—three permanent seats and two collapsable occasional seats. Two-seaters are seldom sold. Doctors' coupés are very scarce (I know only two in Rio de Janeiro—one is mine). Doctors prefer landaulets. Stream-line torpedoes are very much in favour, though cars with high bodies, *imposants*, are also highly favoured.

(3.) Agents ask far too much above the catalogue prices to face the deferred payment system now in almost universal use.

There are many cars on the market—Delahaye, Bayard, Clément, Charon, F.I.A.T., Itala, S.C.A.T., Mercedes, Benz, S.P.A., Loreley, Stoewer, Ford, Flanders, Detroit, Pope, Hartford, Humber, Calthorpe, etc.

Accessories and tyres are very dear, retreaded tyres being sold as new.

British makers would improve their market if they studied the special needs of motorists more, and tried to meet them. The public are favourably disposed to British cars, and British makers would do well to unite in making a display of their cars here.

By general consent here, Napiers are regarded as very good cars—there are only three of this make in Rio de Janeiro. DOCTOR.

Rio de Janeiro.

RUNNING COSTS.

[19506.]—The ordinary method of giving costs by lumping all expenses together and reducing the total to pence per mile is not the most suitable that may be devised, and I should like to put forward a slightly different method which appears to me to have certain advantages. First, to illustrate the failing of the ordinary method, let us consider the cases of two motorists owning similar cars and driving equally carefully, but one of whom (A) drives 15,000 miles per year, while the other (B) only covers 5,000 miles. Suppose that the value of each car is £300. Then in these

Correspondence.

hypothetical cases the expenses may be put down as follows:

Standing charges for A and B.	
Depreciation at 20%	£60
Insurance, licence, etc.	20
	— £80
Running expenses A.	
Petrol (25 miles per gallon)	£45
Tyres	45
Cleaning, repairs, etc.	21
	— £111
Running expenses B.	
Petrol (25 miles per gallon)	£15
Tyres	15
Cleaning, repairs, etc.	7
	— £37

That is, the total expenditure of A for 15,000 miles will be £191, while B will pay £117 for 5,000 miles. Putting this in the generally expressed way of pence per mile, we get that A's expenses are 3d. per mile, while B's work out to 5½d. Now since we have assumed that both cars are driven equally economically, these divergent figures cannot be regarded as other than misleading. To overcome this difficulty I would propose, as a more satisfactory method, that the standing charges should be given in £ per annum and the running expenses in pence per mile, instead of including both items under one head. By this method the expenses of both A and B would come out to

Standing charges	£80 per annum
Running expenses	1.8 pence per mile

Now information of this kind would be of great practical service to those contemplating the purchase of a car who are held back by doubt as to the cost of upkeep, for such a person would then know how much his out-of-pocket expenses would be apart from any use of the car, and, further, how much he would have to pay for every mile he drove. Knowing roughly what mileage he expected to cover, he would be able to ascertain easily what his total expenditure was likely to be per annum. A further advantage of this method would be that the item "Running expenses" is entirely independent of such debatable quantities as "depreciation," and therefore the cost per mile given under this heading would be strictly comparable as between different motorists.

J. S. DINES.

[19507.]—It may interest some of your readers to know the actual cost of running a 15.9 h.p. Arrol-Johnston car during the past year, which in my case was as follows:

Distance run 8,937 miles.	
Tax and insurance	£19 10 11
Tyres and tubes	55 14 1
Oil, etc.	4 6 5
Petrol, 398 gallons	23 8 11
Repairs and adjustments	6 13 9
Sundries	2 13 10
Total	£112 7 11

This works out at almost exactly 3d. per mile with an average of 22½ miles per gallon of petrol. I have deducted 3d. per gallon from petrol and added it to the tax item in above.

Last year my cost was about 2½d per mile, but petrol costs more now, and I see tyres are a larger item. I was unfortunate with one tyre, but the eight I actually discarded during the year averaged 4,810 miles apiece.

The mileage per gallon also might show better if one could be sure of always getting two gallons in a two-gallon tin. I return a good number palpably not full, but I suspect a large number more pass undetected, lacking from half a pint to a quart, all of which mounts up in the end. My best average was 268 miles in two days in June at a rate of 28 miles per gallon.

I cannot help thinking it would be a good plan if the A.A. were to withdraw some of their scouts, who can be of little use down here in Dorset and Devon except as an advertisement, and to utilise the saving by testing the contents of petrol tins and prosecuting where short measure was sold. There is no more reason why traders should be allowed to sell short measure of petrol than of beer.

A. B. GORDON.

[19508.]—I have just concluded five years' running of an 18-24 h.p. Austin car, and as the figures and mileage have been carefully kept they may be of interest to your readers. For six months I was without a driver and this makes the item of wages rather low.

The following are the running costs for five years:

Petrol	£113 0 0
Oil and grease	9 0 0
Tyres and their repairs	225 0 0
Repairs and repainting (exclusive of railway freight to repairers)	111 0 0
Carbide, chalk, patches, solution, and cleaning materials	16 0 0
Wages and clothes	300 0 0
Total	£774 0 0

Mileage, 29,154. Cost per mile exclusive of wages, 3½d. Cost per mile inclusive of wages, 6½d. Cost per mile for licences and insurance comes to ¾d. extra. As the car is finished in works grey, unvarnished, repainting costs little.

It is to the credit of the car that it has never run out of the Scottish Highlands, and some of its work is worth mention. The main road to the South from Inverness rises 850 feet in the first five miles, and that hill was climbed 149 times in the first eighteen months. There are three passes leading to the South from the Moray Firth—one of them rises to 1,300 feet, and the other two to 1,000 feet above sea level. The car has been over them ninety-seven times.

I have had one breakdown on the road, owing to the armature-shaft of magneto becoming loose, and I have only stuck in one snowdrift. The engine bearings have been taken up once. The gears are unchanged.

I have no connection with the Austin Co. It may be a matter for surprise that the brake shoes have only been renewed twice.

A.G.

[19509.]—The following account may be of interest to some of your readers. The car is a 10-12 h.p. two-cylinder Alldays, four-five seater, and open standard body. It was bought new in March, 1910. The account is from date of purchase to December 31st, 1912—practically three years, as I do very little driving during January and February. The car has been driven and looked after by myself only. The car is not insured, and nothing is allowed for depreciation. I am not interested in any way with the makers of the car.

Tyres and tyre repairs	£47 11 1
628 gallons petrol	39 6 9
Oil and grease	3 10 0
Three years' Revenue licences at £3 3s.	9 9 0
Three years' driving licences	15 0
Repairs, renewals, cleaning cylinders, garage and tolls when on tour, dusters, etc.	12 4 4

Total £112 16 2
Total distance run, 12,800 miles (2.115d. per mile); average m.p.g., over 20.
A.F.H.

**:: BOOKS and MAPS ::
:: FOR MOTORISTS ::**

	Price:	
	Nd.	By. post.
"Complete Hints and Tips for Automobilists"	2/5	2/10
"Faults and How to Find Them." J. S. Bickford, B.A., 3rd edition	2/6	2/10
"The Maintenance of Motor Cars." Eric W. Walford	2/6	2/9
"Encyclopedia of Motoring." R. J. Mcreedy	7/6	7/10
"The Autocar" Log Book	1/6	1/8
"Motors and Motoring." Prof. Spooner	2/-	2/4
"The Highways and Byways of England," Their History and Romance. T. W. Wilkinson	4/6	4/9
"The Autocar" Sectional Map of England and Wales. Consisting of 24 loose sections on strong card. Scale 8 miles to the inch		
In stout waterproof envelope	4/6	4/10
In cloth case	6/-	6/4
In solid hide case, celluloid front	12/6	12/10
"The Autocar" Map of England and Wales. Scale 8 miles to the inch		
Dissected and folded, in neat case cloth	8/6	8/10
Also on rollers (a good wall map)	8/6	8/10
"The Autocar" Map of Scotland.		
"The Autocar" Map of Ireland. Scale 7 miles to the inch.		
Same styles and prices as above.		
"The Autocar" Map of London and Environs.		
In stout waterproof envelope	3/6	3/10
In cloth case	4/6	4/10
Solid hide case, celluloid front	12/6	12/10

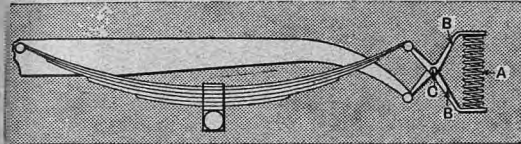
Obtainable by post (remittance with order) from
ILIFFE & SONS Ltd., 20, Tudor St., London, E.C
or of leading Booksellers and Railway Bookstalls.

Some Recent Patents.

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

Supplementary Springs.

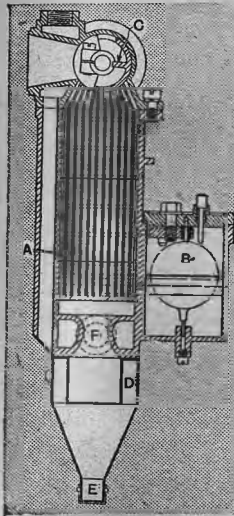
THE supplementary spring A is arranged between the ends of a pair of levers B which are pivoted together at their centres. The spring A is adjustable towards or away from the pivot C to cope with



different loads. An important feature is that the resistance of the supplementary spring increases as the load is augmented.—C. B. Waterlow, No. 2,974, 1912.

A Wick Carburetter.

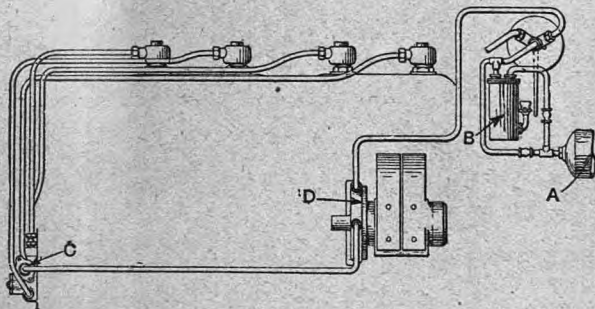
A number of wicks A are vertically arranged in the carburetting chamber, standing in a bath of petrol which is maintained at a suitable height by means of a float feed device B. The wicks are either of fibrous material or fine wire gauze, and as the throttle C is moved the air is caused to flow over an increasing or decreasing number of wicks. The air enters the chamber D through tangential openings so that a whirling motion is imparted to it. This by centrifugal action causes all dust to be thrown outwards, and finally to drop into a trap E. The purified air then rises through a heated passage F and passes therefrom over the surfaces of the wicks. The float feed mechanism is provided with means whereby the level of petrol can easily be varied.—



W. L. Spence, No. 28,096, 1911.

A Self-starter.

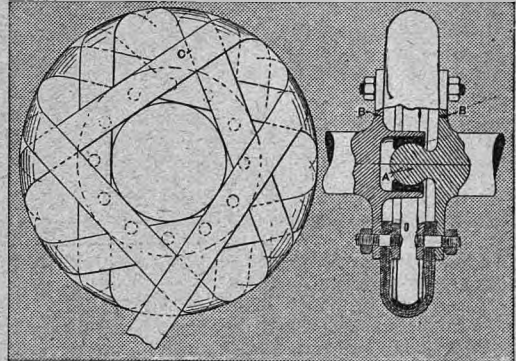
In this device compressed air from a reservoir A is passed through a carburetter B and then transmitted to all four cylinders in turn through a distributing valve C. On its way it passes through a small turbine D mounted upon the magneto-shaft, so that as the starter



is operated the magneto is rapidly rotated to cause ignition. It will be understood that sparks occur in all four cylinders, but owing to the use of a distributing valve inflammable gas obtains in one cylinder only. The magneto is normally driven through an overrunning clutch device, which picks up when the engine starts.—N. A. Christensen, No. 26,619, 1911.

A Flexible Coupling.

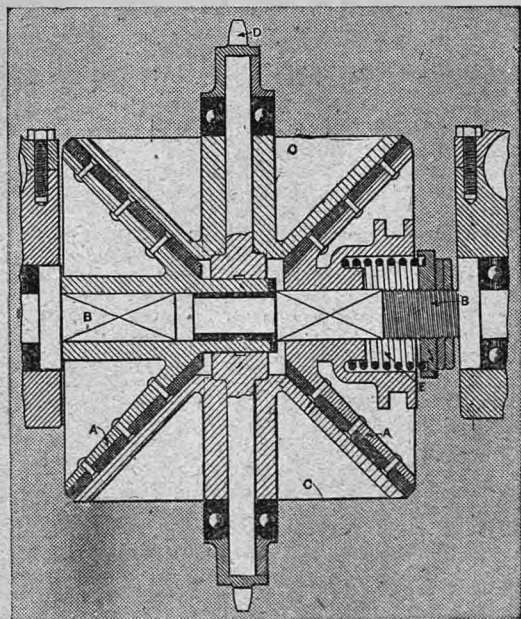
The two shaft members are primarily connected together by a ball and socket joint at A, and on each side of the joint each shaft member is formed with a disc B. These discs are connected together by liga-



ments C, which are arranged tangentially with regard to the disc and form a kind of net coupling the two discs together. The ligaments are glued together and covered by a flexible coating of some material such as rubber.—Société Anonyme des Etablissements Panhard et Levassor, No. 17,174, 1912.

A Combined Friction Clutch and Differential Gear.

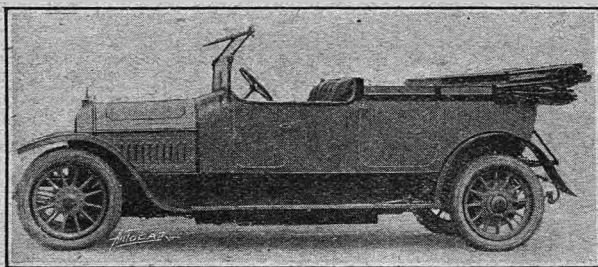
In this differential gear the members are, instead of being toothed, coated with frictional material such as Raybestos, and the two driven cones A are mounted upon their respective shaft lengths B. Each shaft length either drives directly on to the road wheel, or, if the gear be mounted on the counter-shaft, is connected with the road wheel by chain gearing. The



satellites C are carried by a spider which is attached to the chain wheel D. The right hand friction cone A is formed to slide on its shaft B, so as to constitute a friction clutch, being engaged by a spring E which maintains the frictional grip between the various cones except when the clutch is disengaged.—G. Brown, No. 7,956, 1912.

Reviews.

"TOOTHED GEARING." By Geo. T. White, B.Sc. (Lond.) (Scott, Greenwood, and Son, 8, Broadway, Ludgate, E.C.) In this book the author is at considerable pains to make clear the action of the principal forms of teeth used in gear wheels, in addition to many other items of importance to



A 20-30 h.p. Peugeot carrying a cabriolet body by Million-Guët. This car has been sold to Mr. W. J. Menzies, Empshott Grange, Liss, Hants, by Messrs. Peugeot (England), Ltd., and is the fifth Peugeot car that has been bought by that gentleman in the last three years.

designers and cutters of gearing. In view of the great interest and present importance of gearing as applied to automobiles, it is certain that this little book, setting forth the essentials of toothed gearing, will prove of value to all students of automobile engineering. The two most general forms of tooth, viz., the cycloidal and the involute, are considered in detail, although neither is more strongly advocated than the other. Amongst other reasons, the great use of toothed gearing in motor car construction is responsible for the production of this book. It will certainly be found useful and instructive to those who have not had the time and opportunity to study the subject at technical schools or in special works.

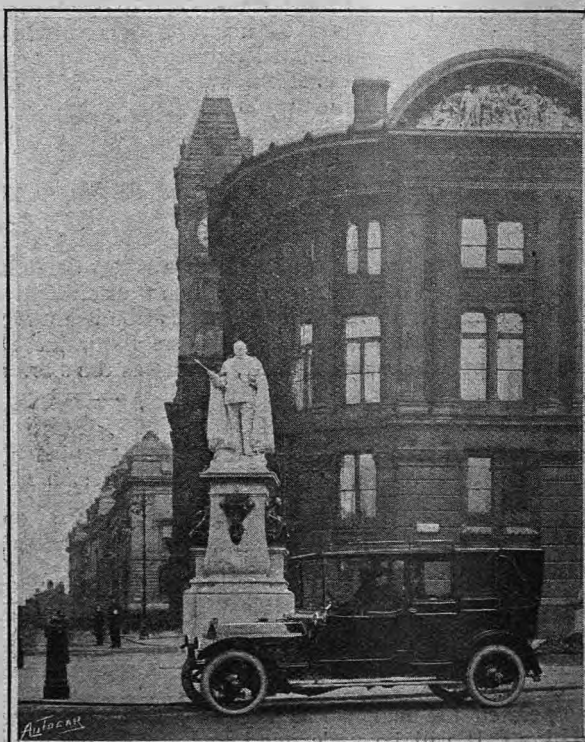
BARTHOLOMEW'S HALF-INCH TO MILE MAP OF ENGLAND AND WALES. Sheet 3 (The Lake District). This the latest addition to this beautiful and interesting survey just to hand. It is the sheet which will specifically serve motorists touring this perhaps the fairest part of all fair England. Within the confines of merry Carlisle to the north and Kendal and Sedburgh with the Solway Firth and the Irish Sea to the south and the west, and Hawes Junction, Brough and Alston Moor to the east, are the lakes of Windermere, Coniston Water, Grasmere, Hawes Water, Ullswater, Thirlmere, Derwentwater, Bassenthwaite, Buttermere, Crummock Water, Loweswater, and Ennerdale. The sheet also gives that part of the Great Western route to Scotland which lies between Kendal, Penrith, and Carlisle, with the ascent and descent of the celebrated Shap separating the two former towns. A portion of the mid route where it runs from Middleton-in-Teesdale through Alston to Brampton also comes upon this sheet. The character of this big country is most realistically shown by the gradual shading and contouring, while the execution of the sheet throughout is entirely up to Bartholomew's superlative standard. The sheet mounted to fold on linen in stiff covers is 2s. net, paper 1s. 6d.

"PETROLEUM: THE MOTIVE POWER OF THE FUTURE." By Walter Sheldon Tower, Ph.D., and John Roberts, F.G.S., M.Inst.C.E. Messrs. Hodder and Stoughton, Warwick Square, E.C. 6s. nett. This book, which will form most interesting reading to any intelligent person, who cares to have something more than a mere superficial knowledge of a fuel which is in such great demand to-day the world over, is a revised edition of "The Story of Oil" by the first-named author, and published some time since in the United States. The history of petroleum since its earliest discovery is told in quite an engrossing manner, and the enormous development of the petroleum industry set out in a readily comprehensive manner. We are told of the home and use of petroleum in ancient times, for there is no doubt that the Egyptians, who appear to have known about everything, knew of and used petroleum. We read of the wonderful pioneer work in the early oilfields, and how petroleum at one time had only the sale of a quack medicine. The stories of its carriage and processes of refining are told in easily comprehensible terms, and its products and their uses

detailed. The figures given in the short history of the industry in the United States are absolutely staggering. The chapter on the Scotch shale industry will be read with interest now that, by the offered prize of the S.M.M.T. and the work of the R.A.C., the public have been moved to the consideration of a home-produced fuel.

"BRITISH MOTOR VEHICLES." 1913 edition compiled by J. S. Critchley, M.I.Mech.E., M.I.A.E. C. D. Clayton, Ltd., 52, Shaftesbury Avenue, W., price 1s. The 1913 edition of the Critchley book on British motor vehicles (pleasure car section) has been enlarged consequent upon the success of previous editions. The book contains a large amount of useful information, mainly in tabular form, and its peculiarity, as its name implies, lies in the fact that it deals solely with British-built cars. There are a few pages containing general information, such as speed tables, local taxation licences, holders of Brooklands records, etc., but except in connection with the latter there is no mention of a foreign car. Two or three pages are devoted to the reliability of the home production, as demonstrated by official tests from the earliest days of the movement, and characteristic features of proved merit that originated in Britain are touched upon. The principal feature of the book is the list of British car manufacturers, and the classification of the cars in order of chassis price, which is followed by tabulated details of the same cars in order of make arranged alphabetically. A short chapter on running costs precedes the tables.

"SPORTING LIFE COMPANION." *The Sporting Life*, 148, Fleet Street, E.C. 2d. To hand is an advance copy of the thirty-ninth annual issue of this work. In it will be found full records of the Turf and of every branch of sport except—motoring. Maybe the powers at 148 do not regard motor racing as sport, and so have omitted all reference to speed and other records attributable to self-propelled vehicles.



The new statue of the late King Edward VII. outside the Birmingham Council House and Art Gallery, which was unveiled last week by Princess Louise, Duchess of Argyll. The car is a 24-30 h.p. Wolseley.

Flashes.

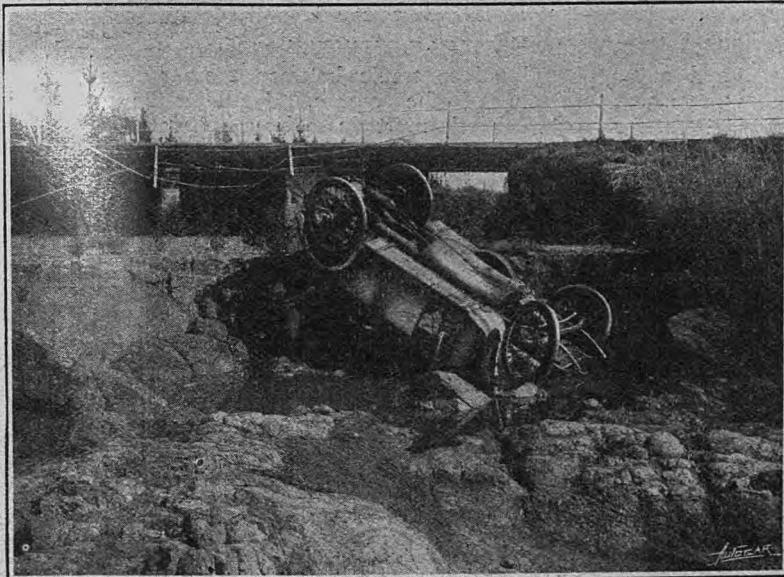
The Duke of Beaufort has been elected president of the Bristol branch of the Roads Improvement Association.

* * *

Speaking at a banquet given in his honour by the Canada Club in London last week, H.R.H. the Duke of Connaught, the Governor-General of Canada, referred, amongst other things, to the pressing question of road construction in the Dominion. "I think," remarked His Royal Highness, "that at the present day, with motor traffic on every hand, you require an alternative means of progression to the railways, and I hope the Government may see its way to do all it can to promote the great highways which will be such an important factor in the future of Canada. Many of us know what magnificent roads are being built in India, and in many portions of the British Empire. Up till now, I am afraid, we are a little behindhand in Canada, but I have every hope that other methods besides the railway will be afforded to farmers to give them an alternative means of moving their produce."

* * *

The scheme formulated by the Roads Improvement Association last year for the improvement of the cross-roads at Berwick (Sussex) has been adopted, and the Eastbourne R.D.C. has now commenced the work. A serious collision which occurred recently between a motor cyclist and a carrier's van emphasises the necessity for this improvement. Preston Road, Brighton, is to be resurfaced with tarmac, and the Road Board has granted £2,000 towards the work.

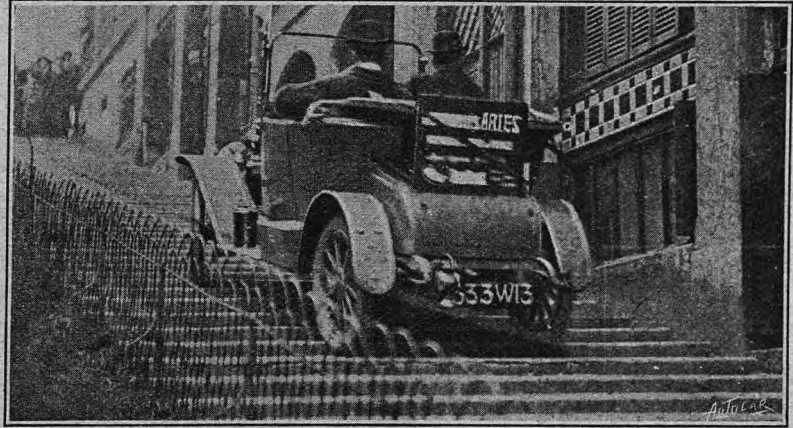


THE SERIOUS CONSEQUENCES OF A SIDE-SLIP. The car shown is the property of Mr. George Nathan, of Johannesburg. Whilst leaving the estate of Sir George Farrar a side-slip occurred on the slippery bridge, with the result shown. Fortunately Mr. Nathan had time to jump clear.

At the recent council meeting of the Society of Motor Manufacturers and Traders, Ltd., Mr. S. F. Edge was unanimously elected president, and Messrs. Albert Brown and E. M. C. Instone were elected vice-presidents for the ensuing year.

* * *

An application has been made by the Town Council of Grangemouth for a ten-mile limit on certain streets



During the motor show at Lyons M. de la Valette on an Aries car, for a wager, accomplished the feat of driving the car up and down the 150 steps of the Coteau de la Croix Rousse. The car was a standard 10-12 h.p. model.

in that town, and the Scottish Automobile Club has directed the Club solicitor to attend the public inquiry, which is fixed to be held on 6th May, and to oppose the application.

* * *

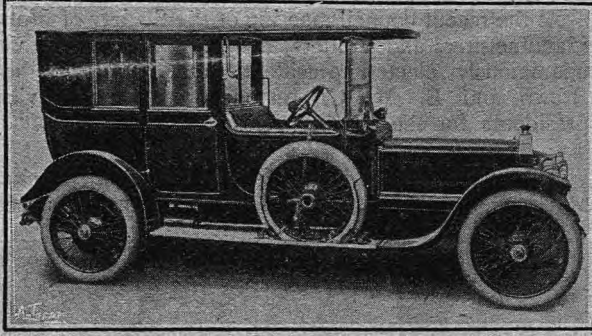
At a meeting of the Executive Committee of the Scottish A.C. on Wednesday last week it was decided to entertain Mr. John Adam to dinner on the occasion of his retirement from the chairmanship of the Club and as a mark of appreciation of his work for the Club and the automobile movement during the years he has occupied the chair. The dinner will take place in the club house, 11, Blythswood Square, Glasgow, on Friday, 9th May, at 7 p.m., the Right Hon. Sir J. H. A. Macdonald, president of the Club, in the chair.

* * *

It is generally considered that sand is the best means of extinguishing petrol fires, but, according to a report of some trials carried out in Boston, U.S.A., sawdust, when it can be promptly applied, is more effective.

* * *

As some confusion appears to have arisen in the minds of the public with regard to the Sizaire et Naudin and Sizaire-Berwick cars, the two firms handling them have mutually arranged that in future the cars manufactured by Sizaire et Naudin, of Paris, and 38, Great Portland Street, W., shall be known as "Sizaire-Naudin" cars, and those manufactured by F. W. Berwick and Co., of 18, Berkeley Street, W., and Balham, S.W., as "Sizaire-Berwick" cars.



A 30 h.p. six-cylinder Daimler car to be shown at the St. Petersburg motor show, which opens on May 18th.

The Borough of Kingston-upon-Thames has adopted a byelaw made by the Surrey County Council requiring the provision of red rear lights on vehicles, including bicycles, but not hand carts. The penalty for a first offence is a fine not exceeding 40s., and for a second or subsequent conviction a fine not exceeding £5.

* * *

A motor club, composed of old public school men, has been formed under the name of "The Public School Motor Club." The area over which it extends is to be in no way restricted, and all past and present members of recognised universities or public schools are eligible for membership. A very limited number of foundation members will be enrolled at a reduced subscription of 10s. 6d. and without entry fee. The idea is to foster the social, as well as the sporting side, of motoring, and at an early date the committee hopes to acquire permanent rooms in Birmingham for the club's headquarters, for the use and convenience of members. All old public school men desirous of joining the club are requested to communicate with the honorary secretary, Public Schools Motor Club, 96, Church Road, Moseley, Birmingham.

* * *

The encouragement of motor traffic in the Cape Peninsula is shown by the extent to which improvements in road construction and new roads are being carried out. For instance, during the ten months ending March, 1911, the expenditure on new roads in the Province was £6,255, while for the current financial year it is no less than £28,300, maintenance cost having gone up from £19,252 to £25,840. Expenditure on new bridges has also advanced from £10,203 to £55,000, or nearly double the amount spent for new roads.

It is reported that Nazzaro will return to the road in the coming Grand Prix over the Picardie course, and that in all probability he will drive an Itala car.

* * *

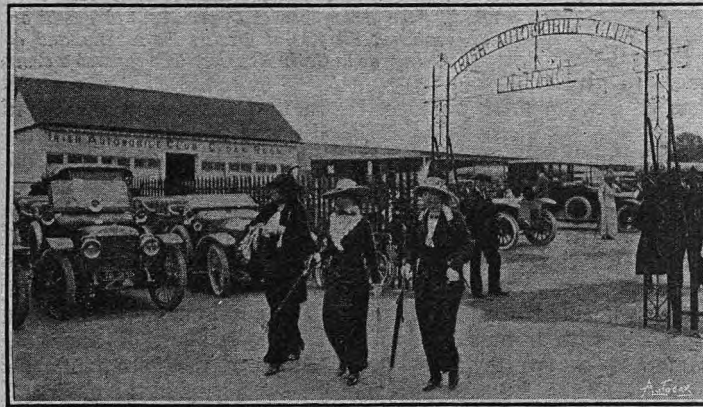
In his annual report the President of the Manx Automobile Club states that, much as the Manx people would like to see the Tourist Trophy Race held this year, it appears somewhat doubtful if it will be held on account of the attitude of the S.M.M.T.

* * *

The trapping of motorists by the police is not unknown in Guernsey, for at a police court on that island the other day a motorist responded to a summons charging him with having driven a motor car at an excessive speed when in the neighbourhood of the Grandes Maisons, St. Sampson's, on April 13th. Defendant admitted the infraction, but pleaded that in his opinion the speed was not dangerous. H.M.'s Comptroller asked for a fine of 10s. or four days' imprisonment in default of payment, and the court concurred. Jurat Kinnersly smilingly observed that were he a motorist he would put aside a certain sum annually to pay fines.

* * *

Loch Long side road, in Dumbartonshire, owing to damage caused by recent storms, is closed for a period extending probably to the end of June, and on the Loch Lomond Road, four miles south of Tarbet, draining, widening, and rock blasting operations are in progress. Motorists should, therefore, observe great caution. The coast road from Cockenzie to near Aberlady, in Haddingtonshire, is now undergoing reconstruction, and will be closed to traffic between these places until the middle of the month. All traffic going east of Cockenzie must do so by the Great Post Road or Mid Road to Longniddry, and then by Ballencrieff Old Toll. Careful driving is necessary on the Carlisle Road between Crawford and Beattock, owing to the large number of sheep in the vicinity and the road being unfenced. Careful driving is also desirable when passing through Bearsden, and on all roads in the vicinity of Edinburgh.



The entrance to the Irish Automobile Club car enclosure at Punchestown Races. A bird's-eye view of one of the enclosures is shown below.



PUNCHESTOWN RACES. A view of part of one of the motor enclosures.

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. 2648.—16-20 h.p. Adams.

The engine is a good one and wears well. The car keeps the road well, and for the size of the chassis (five-seater) plenty of power is developed. With careful driving on standard Claudel, twenty miles per gallon should be obtained on a long run. An improvement in slow running is obtained with a Javal set, which improvement is marked.—J.C., M.D.

No. 2616.—Carburettor for 14-16 h.p. Eelsize.

In your replies column of April 12th was a letter from one who obtained twenty-seven to twenty-eight miles per gallon on above car with a Smith carburettor. Will he kindly state number or size of carburettor and the sizes of the different jets he uses? Is the water heating arrangement satisfactory with a thermo-siphon water-cooling of engine?—CAPTAIN.

No. 2635.—11.9 h.p. Phoenix.

I have had personal experience of the 11.9 h.p. Phoenix car, and especially tested it for hill-climbing on top gear, and was absolutely surprised at its marvellous power on hills, especially on its top gear. The petrol consumption is low, the engine is easily started, and seems to be excellent, and it should prove thoroughly reliable. No 11.9 h.p. Phoenix cars can have been in the hands of private users for a sufficient length of time to make sure of reliability, but there is no reason to suppose otherwise. I have no financial interest in this car whatever.—NIPPONJIN.

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

In reply to "T.W.M." I would suggest that he first ascertains that there is no leakage of petrol anywhere and that the carburettor does not flood. In this connection he will find a permanent cure for all leakage while the car is not in use by fitting a screw-down needle valve in the entrance to the pear shaped casting at the bottom of the petrol tank, the needle valve being long enough to project through a small hole drilled in the top of the tank for it. This type of valve keeps tight naturally, whereas the ordinary taps invariably leak sooner or later and cannot be cured of it. A leakage of one drop of petrol per minute (an almost imperceptible amount) totals nearly seven gallons a year, and twenty or thirty gallons can easily be lost in this way in a year without any obvious dripping of petrol. If there is no loss by leakage, and the engine, ignition, and transmission are as they should be, he is running on an unnecessarily rich mixture. Let him then first make sure that the hot air tube to carburettor really does supply hot air, and then, after the engine is warmed up, gradually cut down the jet by the control on the dash. This is best done when running on the road. The first symptom of being on the fine side is a slight pause between opening the throttle and the expected acceleration. This does not matter in open country. Having got the finest jet opening on

which it will run without popping in the carburettor, mark this setting on the control on the dash with a pencil or paint. It is an easy matter to give a larger jet if required for traffic or a severe hill, and the jet should be opened about one turn to get an easy start. I have a 1913 two-seater Ford which, standard in every respect, regularly gives thirty-five miles to the gallon on dry roads on a straight-away run with three up, and averages from 29 to 30 m.p.g. at runabout work. Average speed 22 to 24 m.p.g. At this jet setting, it easily climbs 1 in 10 at 25 m.p.h. The same car, with jet setting as delivered, gave 24 m.p.g. The adjustable jet can be used in the same way as an extra air opening, but if the utmost power be required then fit an extra air on inlet pipe and use a slightly larger jet opening; this will provide a greater volume of mixture.—F. C. JAMES.

No. 2619.—Two-stroke Engines.

Mr. Pigot may be interested to know that I own the original Dolphin engine—the one built by Mr. Ricardo, the patentee, at Cambridge, and which underwent numerous tests, both privately and by various firms. I bought it in 1907, and installed it in a boat, in which it ran most consistently till last Christmas, when it was removed and put to run a circular saw, not from any failure—it was running as well as ever—but owing to my having a new boat with the last Dolphin engine which was ever built at Shoreham, a 25-30 h.p. hydroplane motor. The cylinders of this motor as originally designed were made too weak over the holding-down bolts, and I had two blow off. Since then I have had thicker ones fitted and steel pistons, with excellent results. My old Dolphin engine started in ten races and took seven prizes, both in handicaps and under M.M.A. rules, and as I live on an island and use my boats as an ordinary mortal uses a car, you will see they have more work than usually falls to the lot of a boat. Usual disclaimer.—H. C. BUTLER.

No. 2615.—18-20 h.p. R.M.C. Car.

I have had an R.M.C. car for seven months, and have done about 6,000 miles, touring in Devonshire and Cornwall, etc., over the worst of roads and hills without a stop (involuntary)—not even a puncture. It is a four-seater model, does about 24 m.p.g. of petrol, and is most economical as regards lubricating oil; very light on tyres, and, owing to the underslung frame, not at all liable to skid. I have had none of the many troubles "H.W." mentions. The London agents are very pleasant to deal with, and most attentive. The carburettor is the most easily adjusted I have ever had to deal with. The engine runs very slow, and picks up very well. The car climbs hills with ease; no need to try other carburettor, as this is so simple and economical. Being curious to see the inside of the engine I had the cylinders off recently, and found very little deposit, and everything wearing well.—R. LORD.

The AUTOMOBILE EXCHANGE, Ltd.

91, Gt. Portland St.,
LONDON, W.

Sole London Agents for **ADAMS** and **S.C.A.R.** Cars.

London Agents for **GERMAIN** Cars.

Quick Delivery of all Models.

Immediate delivery of 15.9 h.p. **S.C.A.R.** Torpedo.

Immediate delivery of 20/25 h.p. **OVERLAND** Touring Car, completely fitted up ready for the road, **£235.**

Immediate delivery of 8 h.p. 2-cylinder **HUMBERETTE**, **£125**

Second-hand Cars for Sale.

1910 20/30 h.p. **RENAULT** three-quarter Landalette **£450**

1909 18/24 h.p. **AUSTIN** three-quarter Landalette, beautifully equipped **£425**

Late 1910 30 h.p. **RAPID** three-quarter Landalette, seating 5 people inside, all facing forward, magnificent touring car **£250**

1910 60 h.p. **AUSTIN** 6-cylinder three-quarter Landalette, beautifully equipped with every possible accessory **£500**

1911 22 h.p. **DARRACQ** Cabriolet, beautifully equipped **£285**

August 1912 24 h.p. **DENNIS**, with "All Weather" body by Salmon, perfect condition..... **£500**

18/20 h.p. **CHENARD WALCKER** 7-seater Limousine, in excellent condition throughout **£150**

1912 12 h.p. **DE DION** Touring Car, in perfect condition **£315**

Late 1912 16/20 h.p. **ADAMS** Touring Car **£300**

1911 15 h.p. Silent Knight **DAIMLER** Coupe to seat 6, dynamo outfit, in beautiful condition **£350**

1911 15 h.p. Silent Knight **DAIMLER** Torpedo **£285**

1912 (delivered 1913) 15 h.p. **RENAULT** Torpedo, completely equipped **£350**

10 h.p. **ADAMS** 4-seater, fully equipped **£50**

Repairs

ANY MAKE OF CAR
REPAIRED AND OVER-
HAULED AT THE

Clement REPAIR WORKS.

All work carried out by skilled
mechanics.

Detailed estimates and definite
date of delivery given.

BODY PAINTING, ETC.

CLEMENT MOTOR CO., Ltd.,
Mercer St., Long Acre, W.C.

Telephones: Gerrard 1917 & 1918.

1913 Studebaker

The best value
in the world.

Your present car taken
in part payment.

A. GAAL & Co.,

RENAULT SPECIALISTS,

17, HANOVER SQUARE,
REGENT STREET, W.

1161 Gerrard.

2761 Mayfair.

Some Queries and Replies (Continued).

No. 2571.—Scout Cars.

I have been driving a 15.9 h.p. Scout car for some time, which is fitted with an automatic carburetter of the Scout Co.'s own make. The air valve is opened by the suction of the engine against a spring, and I must say that I do not know what it is to choke and stop the engine. It is possible when car is travelling at four miles an hour on top gear to open the throttle wide, when the engine will pick up and get away without any tendency to choke. It is when running slowly that the choking business would take place, but there is none. A more delightful car to handle in traffic I have never had, and I have handled a good many. —N.C.T.

QUERIES.

No. 2665.—7 h.p. Swift.

I SHOULD be glad of the experience of any reader who has fitted a carburetter to a 7 h.p. Swift, 1911 model, other than the Swift as fitted to their early 1911 models.—E.A.H.

No. 2666.—Safety Starting Handle.

I SHOULD be obliged for experiences concerning any satisfactory type of safety starting handle—a handle, that is, which precludes the possibility of injury through backfire, and which is suitable for fitting to any ordinary type of engine.—P. YOUNG.

No. 2667.—Wear in Gudgeon Pin Bearings.

WILL anyone who has tried taking up wear in unbushed little ends by filling with white metal kindly say if (1) it has been satisfactory. (2.) Should little end be bored out larger and trimmed before filling, as space caused by wear must be very slight? (3.) How does one avoid the white metal shrinking on to the gudgeon pin, which would hold the pin fast?—H.S.N.

No. 2668.—Carburetter for 10-12 h.p. Single-cylinder Adams.

I HAVE a 10-12 h.p. single-cylinder Adams car with Brown-Barlow carburetter. Can any reader advise me if fitting a Mills or Javal jet is likely to be an improvement? If so, which for choice? I have no fault to find with my carburetter.—G.W.M.

No. 2669.—Touring in Spain.

I AM thinking of driving from San Sebastian to Madrid by Burgos and Valladolid, and back to France by Zaragoza and Pamplona, or Barcelona to Perpignan. Could any reader help with information as to roads, stopping places, and hotels? I am told that the rule of the road differs in various parts of Spain, and I should like to know if this is the case.—T 288.

No. 2670.—14 h.p. Vickers (or Vickstow) Car.

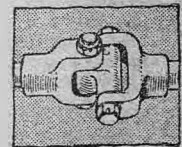
HAS any reader had experience of the 14 h.p. Vickers (or Vickstow—I have seen it advertised as both) car, particularly as regards petrol consumption, speed, silence, hill-climbing, and last, but not least, in regard to reliability; also whether spares and replacements are easily obtainable?—ROBERT AMES.

No. 2671.—The Nieuport Magneto.

I SHOULD be pleased to have the experience of a user of a four-cylinder Nieuport magneto as to its working in practice and general reliability. Is there any drawback in having two sparks per cycle in each cylinder, *i.e.*, one at the beginning of the explosion stroke and one at the beginning of the admission stroke? Does this feature, peculiar I think to this magneto, introduce any difficulties at starting? Is this magneto still made, and who are the agents in this country?—F. L. MATER.

No. 2672.—Noisy Universal Joints.

I SHOULD be greatly obliged to any reader of *The Autocar* who could give me any "tip" for stopping the noise of the universal joints of the driving-shaft. I have an old car, otherwise fairly quiet, fitted with the common type of universal joints (as shown in the sketch), and the rattle of these is almost intolerable. I have had new bolts fitted, etc., and also tried strong springs to give stiffness to the joints, but though an improvement was effected in this way, the noise soon became as bad as ever.—G.H.H.



Road Warnings.

ESSEX.

Witham: High Street (ten-mile limit). Also a $4\frac{1}{2}$ -mile trap between Ingatestone Police Station and Widford railway bridge, through Margaretting.

SURREY.

Byfleet.
Ockford Corner, Godalming (ten-mile limit).
Windlesham.

SUSSEX.

Handcross (ten-mile limit).
Cowfold (ten-mile limit).
Ifield.
Epsom.

METROPOLITAN POLICE AREA.

Surbiton.
High Road, Kilburn.
High Street, Lewisham.
Shooter's Hill Road.
Eltham-Woolwich Road, near Well Hall Station (measured furlong).

Chislehurst: Burlington Parade.

Maidstone Road, St. Mary Cray, and Fooks Cray.

Bromley Road, Catford.

London Road, Bromley.

High Street, Bromley.

Bromley Common.

Richmond Park (twelve-mile limit).
Ewell.

Richmond: Sheen Road, Kew Road, and Richmond Hill (ten-mile limit).

Regent's Park Road, Whetstone.

Whyteleafe village.

Lambeth: Kennington Road and Crystal Palace Parade.

Croydon Road, Anerley, and Anerley Road.

Carshalton.

Blackfriars Road.

EDINBURGH.

London Road: Measured distance extending eastwards from near Abbey-hill Station.

Week-end and Touring Notes.

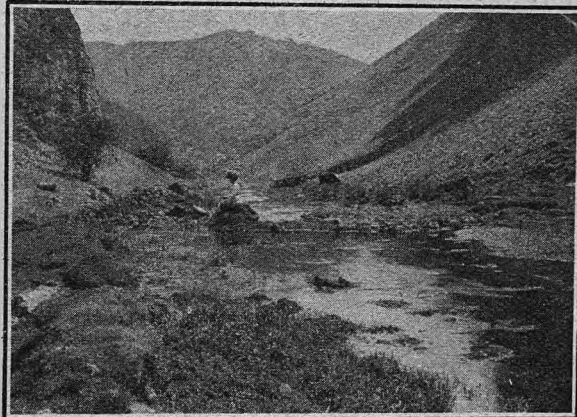
A Pilgrimage to the "Adam Bede" Country.

By Henry Walker.

Motorists who visit Ashbourne in order to see the beautiful vales of the Dove and the Manifold may be interested in knowing that they are within easy reach of the "Adam Bede" country. Ashbourne itself, "that pretty town within sight of the blue hills," as George Eliot described it, is the "Oakbourne" of the novel, and it possesses further literary interest as being the favourite haunt of the venerable Dr. Johnson and his friend Boswell.

In order to reach the "Adam Bede" country, the motorist should leave Ashbourne by way of Church Street, and after crossing the Dove turn left into the village of Mayfield. On the outskirts of this village, and within five minutes' walk of the school, is the little cottage where Tom Moore lived, and where he wrote "Lalla Rookh" and "Those Evening Bells," the latter being the chimes of Ashbourne Church, which sound very sweetly on these uplands when the wind is in the right direction. From Mayfield it is but a short run to Ellastone, the "Hayslope" of "Adam Bede." The country hereabouts is picturesque, and in great contrast with the bareness of Derbyshire a few miles away to the north, and we are reminded of George Eliot's inimitable word picture of this charming district: "That rich undulating district of Loamshire (Staffordshire) to which Hayslope belonged lies close to a grim outskirt of Stonyshire (Derbyshire), overlooked by its barren hills as a pretty blooming sister may some-

times be seen linked in the arm of a rugged, tall, swarthy brother; and in two or three hours' ride the traveller might exchange a bleak treeless region, intersected by lines of cold grey stone, for one where his road wound under the shelter of woods, or up swelling hills, muffled with hedges and long meadow-grass and thick



Dovedale the Eagle Dale of Adam Bede.

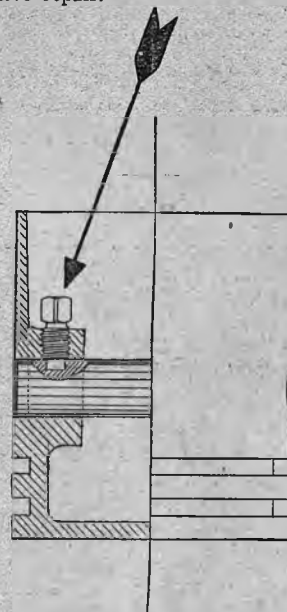
corn; and where at every turn he came upon some fine old country seat nestled in the valley or crowning the slope, some homestead with its long length of barn and its cluster of golden ricks, some grey steeple looking out from a pretty confusion of trees and thatch and dark red tiles."

The village of Ellastone, the "Hayslope" of the novel, has changed but little since the days when "Dinah Morris" preached in front of the "Donnithorne Arms," much to the consternation of "Mr. Casson" and "Joshua Rann." Was ever more graphic scene painted by the pen than that limned by George Eliot of the coming of the "Methody" to "Hayslope"? The "Donnithorne



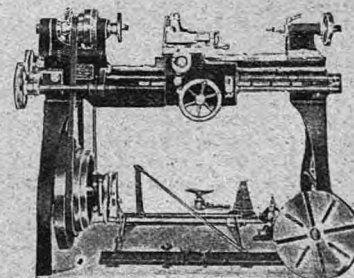
En Panne! And badly so; the motorist knows well what has happened, and is blaming himself roundly for not having prevented the trouble when prevention was not only possible, but easy.

This is what has happened. The set-screw that holds the gudgeon pin in place on one of his pistons (see drawing below) was lost during an overhaul of the engine. Not having another set-screw that would fit, it being a metric pitch, the motorist assembled his engine without it. Result, the gudgeon pin became loose and badly scored the cylinder, putting the car in dock for an expensive repair.



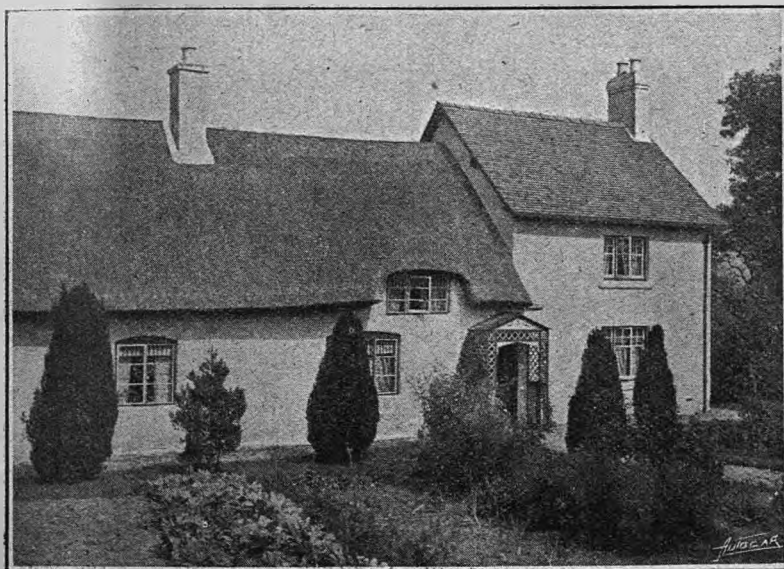
Now, supposing our motorist had had a lathe in his garage during the assembling of his engine, the making of a set-screw would have been an obvious and an easy thing to do. There would have been no need to trust to luck, and the consequences we have pictured could not have resulted.

The installation of a lathe in the garage is a paying proposition. There are hundreds of jobs similar to the above that can be readily done; running repair bills can be halved by such an installation.



Let us send you full particulars of our lathes for garage use. We shall be pleased to, and to give any information as to methods of installation, etc.

DRUMMOND BROS., LTD.,
AUTO TOOL WORKS, GUILDFORD, SURREY.



The Hall Farm, where the redoubtable Mrs. Poyser lived.

CLEARANCE SALE OF SECOND-HAND CARS

taken as part payment of new **SCHNEIDERS.**

- MORS**, 30 h.p., magnificent 7-seated limousine, perfect condition, all accessories, new tyres **£140**
- GOBSON**, 40 h.p., 7-seated landaulette, by Mulliner, late model, all accessories, perfect order **£260**
- MINERVA**, 16 h.p., S.K. English torpedo, h. and s., Warland detachable rims, and spares, every possible accessory, perfect condition **£290**
- JACKSON**, 9-11 h.p., genuine De Dion motor, hood, 2-seater lamps, speedometer, Stepney, recently overhauled and repainted **£90**
- HUMBER**, 15 h.p., 5-seater, h. and s., speedometer, Stepney, all lamps, new tyres, thoroughly overhauled **£75**
- RENAULT**, 35 h.p., open touring car, luxurious body, h. and s., Rudge wheels, all accessories, splendid order **£290**
- SCHNEIDER**, 18 h.p., enclosed drive limousine, used one month, fully guaranteed; cost £750; price, immediate sale **£600**
- SCHNEIDER** Cars, latest models, immediate delivery.

SCHNEIDER MOTORS,
175, Piccadilly, W.

Telephone: Regent 233.

GRAY'S GARAGE, GUILDFORD.

NEW CARS IN STOCK.

- 1913 25 h.p. **STUDEBAKER**, self-starter, and lighting set, 4-6 seater **£295 0**
- 1913 15-20 h.p. **STUDEBAKER-FLANDERS**, 4-seater **£200 0**
- 1913 15-18 h.p. **HUPMOBILE**, 4-seater **£235 0**
- 1913 11.9 h.p. **ARROL-JOHNSTON**, 2-seater **£285 0**
- 1912 10 h.p. 4-cylinder **DARRACQ**, 2-seater, complete **£195 0**

SECOND-HAND CARS IN STOCK.

- 1912 15-20 h.p. **FLANDERS**, 4-seater, completely equipped **£135 0**
- 1912 10-16 h.p. **STOEWER**, 4-seater, completely equipped **£250 0**
- 1911 10-16 h.p. **STOEWER**, 4-seater, completely equipped **£185 0**
- 1912 10 h.p. 4-cylinder **DARRACQ**, 2-seater, completely equipped **£180 0**
- 1911 12-20 h.p. **HUMBER**, as new **£195 0**
- 18 h.p. **WOLSELEY-SIDDELEY** Double Landaulette, perfect condition **£195 0**
- 25-30 h.p. **MARTINI** Double Landaulette **£100 0**
- 10-12 h.p. **RENAULT**, 2-seater **£45 0**
- 10-12 h.p. **PEUGEOT**, 2-seater **£45 0**
- 10-12 h.p. **ADAMS**, 2-seater **£17 10**
- 7-9 h.p. **PANHARD**, 4-seater **£37 10**

These cars can be seen and tried any time at our Works at

**Falcon Road (Off York Road),
GUILDFORD, Surrey.**

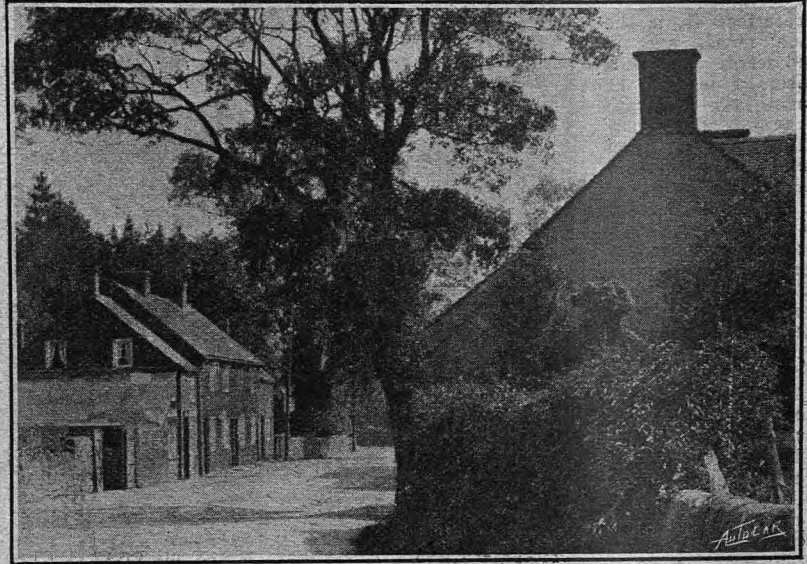
Telephone 335.

Week-end and Touring Notes (Continued).

Arms" (Bromley Arms) still stands at the entrance to the village, but the literary pilgrim will look in vain for the village green (now enclosed) and the thatched cottages which continued in a line to the churchyard gate. Higher up the village street, however, a somewhat modernised house, now occupied by the village doctor, is pointed out as the home of "Adam Bede," and further up the lane a

can be little doubt but that she had the Hall Farm at Ellastone in her mind.

It was the writer's privilege to look inside this old farmstead on a recent occasion, to stand inside "Mrs. Poyser's" dairy, to conjure up the form of "Hetty Sorrel," "with her cheeks like rose petals, with dimples playing about her pouting lips, her dark eyes and curly hair, her buxom

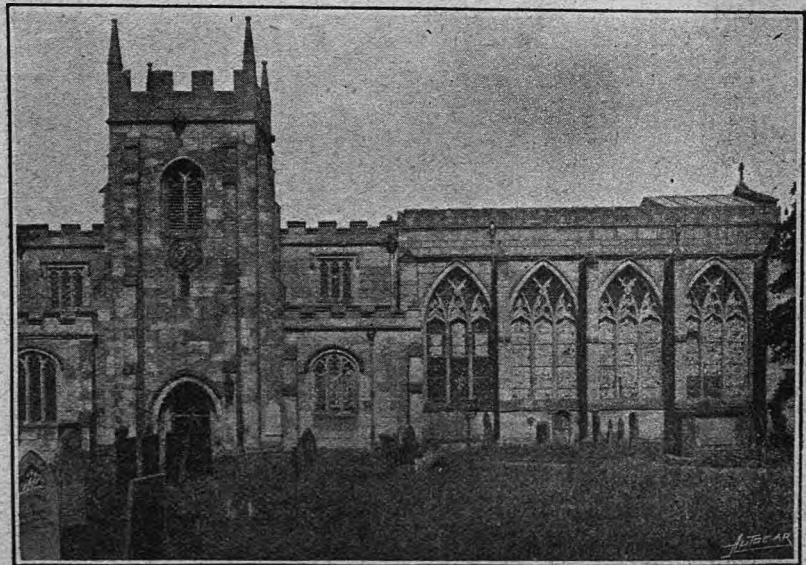


Ellastone, the Hayslope of Adam Bede.

thatched farmstead on the right is said to have been the abode of the redoubtable "Mrs. Poyser." It still bears the name of the Hall Farm, and although its present appearance, so far as the exterior is concerned, has nothing in common with the description given by George Eliot, local tradition is strong in supporting its claim to be the original of the "Hall Farm" of "Adam Bede." The talented authoress probably sketched Griff Farm, near Nuneaton, as the exterior of the "Hall Farm," but in her description of the interior there

form, busily engaged in making butter." The kitchen, the scene of "Mrs. Poyser's" many triumphs, is identical with that described by George Eliot, and motorists who visit Ellastone will be well advised to seek the permission, which is courteously granted, to inspect this interesting old homestead.

Wootton Hall stands amid the woodlands further westward, its towers being visible from the roadway in front of the Hall Farm. It was, in all probability, the "Donnithorne Chase" of the novel, and has also gained some



Norbury Church.

Week-end and Touring Notes (Continued).

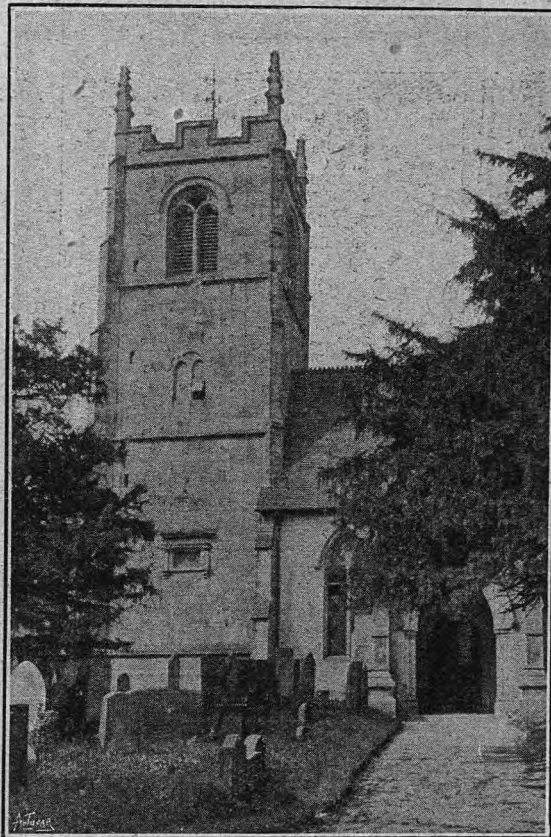
notoriety from the fact that it was the home for some years of Jean Jacques Rousseau, whose "Confessions" were begun there:

"Lo! where these oaks encircling meet,
There Genius formed his rural seat."
Rousseau was greeted with a spell of bad weather at the outset, but he wrote: "In spite of all, I would rather live in a hole of one of the rabbits of this warren than in the finest rooms in London."

Ellastone Church is interesting to the literary pilgrim, from the fact that "Adam Bede" (Robert Evans) was married within its walls, and here we may note that nearly all the characters delineated in the famous novel are more or less sketches of people who actually lived in this district.

After inspecting "Hayslope," with its many interesting literary associations, the motorist should pass through the village in an easterly direction, and after crossing the Dove and the railway take the first turning left for the purpose of inspecting Norbury Church, one of the finest churches in Derbyshire, and of interest to the literary pilgrim from the fact that "Adam Bede" was the carpenter who re-pewed the nave. Its capacious chancel, flooded with light from nine windows, and with the elaborate altar tombs of the Fitzherberts, makes a picture that lingers long in the memory. At the west end of the churchyard is the ancestral home of the Fitzherberts, some ancient portions of which remain. On a clear day the view from the churchyard looking over the Dove valley, is very fine and extensive.

"Sweet Norbury, decked with rural smiles,
Gleams faintly through these sylvan aisles.
'Mid Gothic grandeur soars serene
O'er bold varieties of scene."
—GIBBORNE.



Ellastone Church, the Hayslope Church where Adam Bede was married.

About a mile from Norbury on the outskirts of the hamlet of Keston, a cottage and workshop are pointed out as the home of "Thias Bede," where much of the action in "Adam Bede" took place. It is an unpretentious little dwelling, and as we gaze on the simple structure we are reminded of that grim

tragedy when "Thias Bede" was carried in at its front door by his stalwart sons, as depicted by George Eliot.

In returning to Ashbourne the motorist should keep on the Derbyshire side of the Dove. The roadway commands some exquisite views, especially that of Ashbourne with the "blue hills" in the distance.

We are informed that Goux and Boillot used Oléo plugs when beating records with the Peugeot at Brooklands on the 12th ult.

Flashes (Continued).

Mr. Warwick Wright is on his way to Canada to establish agencies there for the Sheffield-Simplex cars for 1914.

Long sacred to the mystic craft of horse coping, Aldridge's Repository (Upper St. Martin's Lane, London, W.) is now inter-persing with the sale of horses the auction of motor cars.

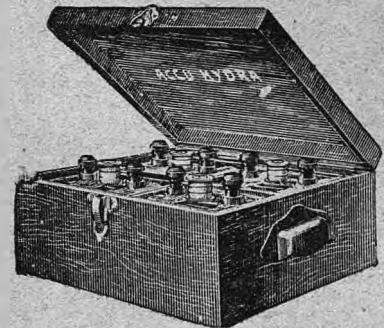
Métallurgique, Ltd., have quitted, or are about to quit, the premises in High Street, Marylebone, having opened a new depot in Regent Street, at a corner of vantage where No. 237, Regent Street, gives by Princes Street for Hanover Square.

Messrs. Stewart and Arden, Ltd., 18, Woodstock, Bond Street, London, W., are the London agents for the Morris-Oxford light car, a description of which appeared in *The Autocar* of the 19th ult., and they will be pleased to send an illustrated booklet to any reader upon application.

H.F. "Plastene," the new vulcanising material introduced by Messrs. Harvey Frost and Co., Ltd., 39-41, Great Eastern Street, E.C., having proved so successful, the firm are willing to send a free sample to anyone applying to the address given, or to 27, Charing Cross Road, London, W.C.

HYDRA

Lighting
Accumulators.



No Separators used.
Actual Capacity Supplied.
Cheapest in the end.

British Representatives:

G. H. SMITH & Co. (London) Ltd.,
143, Great Marlborough Street,
LONDON, W.
and 171, Spon Street, Coventry.

Write for Hydra List.

THE
NUMBER QUESTION.



TAYLOR'S PATENT NUMBER PLATE is of high-class make and finish. Polished Aluminium Letters fixed on backenamelled Copper Wire Panel.

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



Easily fixed in three minutes.
Readily cleaned—rustless.

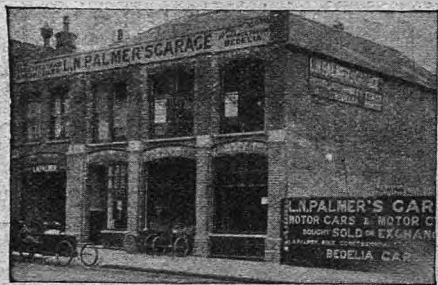
Its pleasing appearance improves your car. When ordering, send width across cooling surface of radiator.

Price, carriage paid, including 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.

TAYLOR'S,
NUMBER PLATE SPECIALISTS, GREEN LANE,
WOLVERHAMPTON.



L. N. Palmer's Garage, Tooting.

The recognised Mart for purchasing, exchanging, or selling Automobiles of every description.

AUCTION SALES every fortnight regularly.

The following selection from a stock of upwards of 100 machines is submitted:

Table with 2 columns: Car Model/Year and Price. Includes sections for 'TWO-SEATERS', 'TOURING CARS', and 'LANDAULETS AND LIMOUSINES'.

Table with 2 columns: Car Model/Year and Price. Includes section for 'CHASSIS only, with tyres'.

Table with 2 columns: Car Model/Year and Price. Includes section for 'CYCLE CARS'.

Clients should make a point of attending our next AUCTION SALE on May 14th, at 2 o'clock. Many of the above cars will be included, together with about 20 other Cars and Motor Cycles, many of which will be sold entirely WITHOUT RESERVE; also about 160 lots of Accessories will be sold. Write for Catalogue, post free.

NOTE ONLY ADDRESS: L. N. Palmer's Garage, Tooting.

20 mins. Victoria; 10 mins. Wimbledon. Phone-208, Streatham.

If you have a Car or Accessories to Sell, you cannot do better than send to L. N. PALMER'S GARAGE, Tooting. Terms: no sale, no charge, but 7 1/2% commission on realisation. Free garage and fire insurance.

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.

Large financial table with columns for Issued Capital, Amt. of Share, NAME OF COMPANY, Present Prices, Last Year (Highest/Lowest), This Year (Highest/Lowest), Last Div., and Div. Payable. Lists various companies like Abingdon-Ecco, Alldays & Onions, Argyls, Ltd., etc.

* Including all arrears.

Darracsq and Sunbeams have been an active market, and the price of both has considerably improved. De Dion, after touching ros., have reacted to gs. Charron and Humber are easier, and Swift and Rudge-Whitworth keep very dull. A good demand has sprung up for Dunlop Rubber and the price has improved.

The Autocar Diary.

- List of events for May and June, including Lancashire A.C. Hill-climb, Hampshire A.C. Meet at Christchurch, Shelsley Walsh Hill-climb, Austrian Alpine Tour, etc.

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.

The Autocar can be obtained from the following:

- UNITED STATES: The International News Company, New York. PARIS: Smith's English Library, 248, Rue Rivoli. AUSTRALIA: Gordon and Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania). NEW ZEALAND: Gordon and Gotch, Ltd., Wellington, Auckland, Christchurch, and Dunedin. CANADA: Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon and Gotch, Ltd., 132, Bay Street Toronto. SOUTH AFRICA: Central News Agency, Ltd.

THE AUTOCAR SUBSCRIPTION RATES.

British Isles—Threepenny edition, 16s.; Penny (thin paper) edition, 6s. 6d. Foreign, 24s. per annum.