SATURDAY, MARCH 29TH, 1913.

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

NO. 910. SATURDAY, MARCH 29TH, 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	533
USEFUL HINTS AND TIPS	534
THE ROAD TO VIENNA (ILLUSTRATED)	535-539
THE ATLAS EMPTY QUICK (ILLUSTRATED)	539
ON THE ROAD	540-542
THERMO-SYPHON WATER CIRCULATION (ILLUSTRATED)	543-545
THE ELECTRIC AUTOCHIME (ILLUSTRATED)	545
THE BROOKWOOD SPEEDOMETER (ILLUSTRATED)	546
BROOKLANDS EASTER MEETING (ILLUSTRATED)	547-550
THE GRAND TOUR	553-556
THREE YEARS WITH AN ELLIOTT SPEEDOMETER (ILLUSTRATED)	556
LEAVES FROM A SPORTSMAN'S NOTE BOOK	557-558
SPEED LIMIT APPLICATIONS	558
A.A. AND M.U. NOTES	559
THE PEARSON-COX STEAM CAR (ILLUSTRATED)	560-565
MOTORING IN AUSTRALIA	565
CORRESPONDENCE	566-570
FLASHES	571-572
SOME QUERIES AND REPLIES	573-574
WEEK END AND TOURING NOTES (ILLUSTRATED)	575-577
"THE AUTOCAR" DIARY AND "THE AUTOCAR" SHARE LIST	578

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.

Road Foundations.

A letter on road construction from one of the pioneer motorists of this country, Mr. G. Higginbotham, appeared in our correspondence columns last week, and, although the subject is no new one, it is well that it should be brought to the front periodically. While the vital question of foundation is so often apparently ignored by many road constructors, and while we see so much good road material being regularly interred in what are practically foundationless roads, we cannot regard reference to the matter as superfluous. Indeed, not a little of the road repairing and road making going on in this country is really but the burial of both capital and labour, as the money spent on metal and the sums paid to the road menders for working it in are practically thrown away, simply because of the elementary fact that in many places the soil upon which the road surface is spread is quite soft and unable to support the crust.

Recent reports of the experience of road surveyors in cities in which heavy and constant traffic is common have shown that foundation is all important. Already the modern axiom that a six-inch Portland cement concrete foundation would carry the road crust whether of wood, asphalt, or granite, has been maintained to be in need of revision, and solid concrete beds of double the thickness are no longer merely matters for discussion. At the same time, it is only right to point out here that there are differences of opinion between road engineers as to mere thickness, as it is maintained by many that such a depth as twelve inches is excessive not only by reason of first cost, but because it is not necessary, and that a thinner foundation of the right materials properly laid is actually better. All this, of course, refers to city streets or to those roads which carry such heavy industrial and other traffic that they may be regarded in the same light.

While no reasonable person would suggest such costly and deep foundations for the average country road, it really begins to be a question of whether, in some cases at least, a really good foundation of what we may call city thickness and strength would not be true economy in the long run.

Not so long ago it was the custom of all who deplored the condition of any particular road to put it down to motor car traffic, that is, to private motor carriages, but nowadays this can no longer be done, as we have to bear in mind that, altogether apart from huge traction engines and road trains, which, of course, do far more harm to any road than any other form of traffic, there is a heavy and constantly growing traffic of motor vehicles carrying from 30 cwts. up to 5 tons, and, what is more, carrying these loads at comparatively high speeds day in and day out throughout the year. With the mail and parcel motor vans, besides certain classes of goods delivery vehicles, this work is not confined to day alone, but goes on night after night as well throughout the year.

This absence of good foundation is regarded as very serious by the War Department, and they have approached more than one county on the matter, making it quite clear that a very short usage of the roads in their area by military transport in wet weather would completely obliterate many of them, and convert them into impassable tracks of mud and ruts.

It should be understood that we are not attempting to belittle the improvement of surfaces, *i.e.*, of road crusts as such, but in too many cases the foundations are not receiving the attention which they deserve, and, consequently, when much of the surface improvement is only of a temporary nature; such roads cannot be maintained in good condition for any length of time without repairs of so extensive a nature that they result in what is practically surface reconstruction.

Useful Hints and Tips.

To Raise Pressure Quickly.

A quick way to raise the pressure in a pressure petrol tank when the pressure is supplied through a valve on the exhaust trunk is to press the sole of the boot against the end of the exhaust pipe for a few moments, and by so doing restrict, not wholly obstruct, the passage for the exhaust gases. A pressure of about 4 lbs. can easily and quickly be raised without the trouble of working the hand pump. Of course, there must be some pressure in the tank to start the engine.

Mysterious Knocks.

A matter which might be of interest to some readers, and about which one or two remarks have appeared recently, is that of mysterious knocks in petrol engines. I have suffered in this way for two or three years, and have had to own that I could not locate the trouble. Recently a suggestion was made to me that the trouble might be due to slack pistons. This seemed a feasible idea, as the knock was only noticeable when the engine had full throttle and under full compression. I therefore arranged to drive the engine independently of the car, that is to say, I drove it by an electric motor and belt *via* the flywheel. The bottom of the crank chamber was taken off and the knock was located in No. 3 cylinder, and when turning the engine over very slowly it was noticed that as the piston went over the dead centre at the top of the stroke it tipped and thus caused a knock. On taking out the piston it was found that this particular one was just a shade on the small side, and on changing it with the piston in No. 2 cylinder, which was slightly larger and the cylinder slightly smaller, it was found that the knock entirely disappeared. It is extremely likely that some of the knocks complained of are due to this cause.—N. W. PRANGNELL.

Piston Ring Troubles.

Most readers are aware that many piston rings are prevented from turning on the piston by the use of pegs which lie in the piston ring slots. These pegs may cause considerable trouble, as was the case in an engine recently dismantled. The piston had four rings, and in replacing the cylinder it was found very difficult to ensure none of the rings being turned. At first no particular care was taken to ensure this, and some little difficulty was experienced in sliding the cylinder into place. However, by dint of a little wriggling the cylinder was fitted, but it was then found that the crankshaft could hardly be turned at all, which indicated serious binding somewhere. It was difficult to understand this, and consequently the cylinder was again removed. Casual inspection of the piston showed everything to be all right and it was replaced, with the same difficulty in getting the cylinder down into position.

It was subsequently found that one or more of the piston rings were apt to turn as the cylinder was put on, so that the peg, instead of lying between the ends of the ring, came underneath the ring, and prevented the latter entering properly into its groove in the piston. To prevent the rings turning while the cylinder was replaced was a somewhat difficult matter, but finally this was effected, and then everything was found to be free and easy. The engine in question was a single cylinder one, so that little damage was likely to ensue, but where an engine has four cylinders it is quite possible to replace a cylinder casting with a piston ring out of position in the manner described, and without the operator knowing anything to be wrong for the engine to be subsequently started up and run, with the consequence that much damage might be done to the cylinder walls.

These pegs are not altogether an unmixed blessing, as they sometimes work loose and score a groove in the cylinder wall. They certainly are liable to render refitting of the cylinder a much more difficult job.—E.W.

Resource in a Difficulty.

One expects resource from a veteran motorist like Mr. S. F. Edge, but one imagines that the following problem would require some solving by even the most deeply initiated. The incident occurred on a car having the petrol tank under the seat, and the supply pipe feeding therefrom broke off close up to, and flush with, the outer face of the tank. No rubber tube was on board, even if it could have been used, which it could not. The petrol tank had become empty when the pipe broke, and only about half a gallon remained in the spare can. The stoppage occurred about five miles from the nearest town. The problem was what to do. The following was the solution: First, the end of the broken petrol pipe was turned up above the level of the footboards and well above the necessary level of the petrol in the carburetter. The car oil-can was then produced, the oil emptied out, and the interior washed out with the Eau de Cologne of a lady passenger (every drop of petrol being worth its weight in gold). The float chamber of the carburetter was filled to its proper level, and also the now odoriferous oilcan. The engine was started up, and as soon as the driver had taken his seat and got the car under way, the supply to the carburetter was maintained from the pressure oilcan, the nozzle of which was inserted in the open and broken end of the now upturned petrol pipe. In this way, and with quite a few refillings of the oilcan, a much-desired haven was reached.

Removing Bolts that Turn.

Few things are more exasperating, when one has strained one's best spanner in an endeavour to loosen a tight nut, than to find the bolt turning as well, when at length a move has been got on the nut. This is especially so when the bolt has not a square or hexagon head which may be held by another spanner. Under these circumstances it is no use trying to wedge the bolt by driving a screwdriver under the head or other means—such procedure is likely to injure something. It is best to sacrifice the least valuable thing—the nut—at once. If it be in a convenient position, a hack-saw cut through the nut, alongside the bolt and quite close to the thread, will ease it at once. If the nut be absolutely rusted in place, one cut at each side of the bolt may be necessary. If the hack-saw be not permissible, then the nut can easily be split with a cold chisel. It is necessary, however, that a heavy piece of metal be held against one face of the nut while the chisel cuts through the opposite side. A sharp chisel in capable hands will split nuts with remarkable facility. Even professionals seem often to forget this tip. I remember how my heart went into my mouth when an engineer in France imperilled the hub of our car some years ago. The wooden spokes had become loose in the hub, and when the repairer tried to remove the nuts, the round-headed bolts turned. Instead of splitting the nuts, he turned the wheel over and brutally cut off the heads of the bolts!—J.L.D.

The Road to Vienna.*

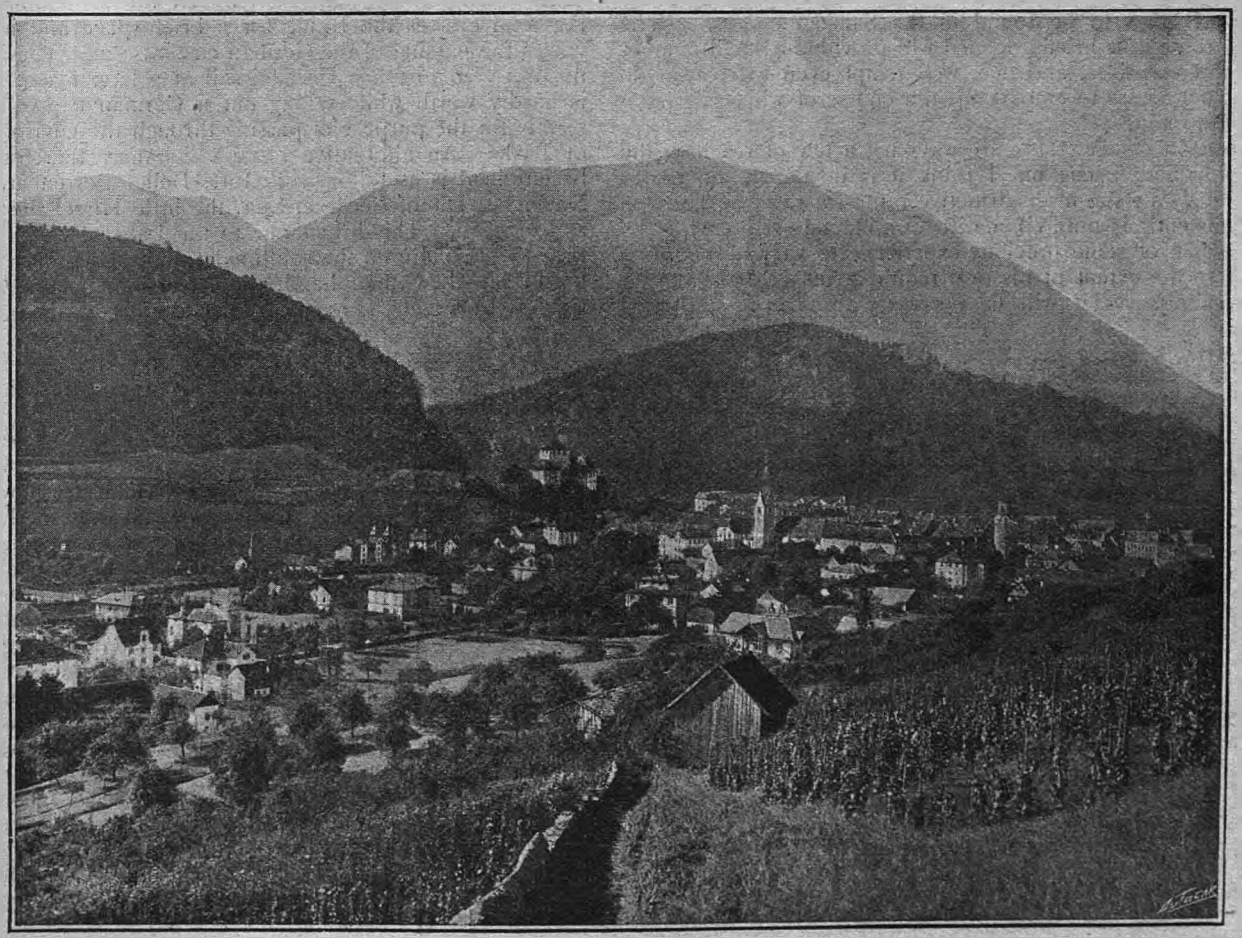
A Diversity of Routes. Over the Arlberg to Innsbruck.

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

MANY and various are the points to which one may converge when bound for Austria by road; and, even when the place of entry has been predetermined, there is an ample choice of routes by which it may be reached. Finality of selection will depend upon, firstly, the extent of the tourist's existing knowledge of any part of Austria or the countries which precede it on the eastward line of march; and secondly, on the nature and comprehensiveness of the itinerary he may propose to follow on arrival. Unless, too, the start is made in June, in order that the whole country may be explored during the height of summer, the outward and return routes alike will have to be considered in relation to the season, so that the tourist may neither find himself confronted by a lofty pass which is covered with snow, nor, on the other hand, sweltering at low altitudes at a time of year when he were better on higher ground.

Save for the case of the man who has spent the winter or spring on the Riviera, and works upwards to the Austrian Alps from the south, the average tourist will enter from the north; and, in considering the various routes, one may assume that England is the starting place and Boulogne the point at which the Continent is struck. The first point to be then decided is whether Vienna be the chief objective or not. The direct routes lie mainly through German territory, and may be made to include the Moselle and the most attractive portion of the Rhine by way of Sedan, Treves, Coblenz, Bingen, Frankfurt, and

*All rights reserved. This series was commenced on March 15th.



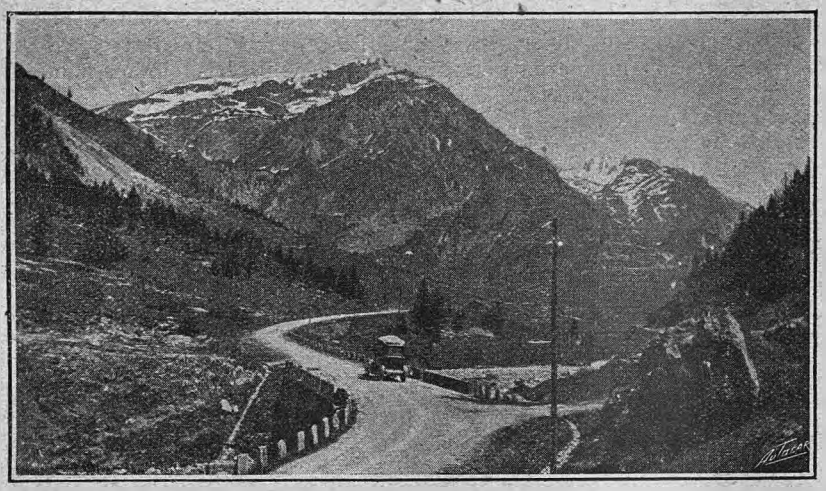
A view of Feldkirch, on the way to the Arlberg Pass.

The Road to Vienna.

Nuremberg to Linz, on the Danube, and thence to Vienna; or, by proceeding, on the other hand, to Reims and Nancy, the straight road across Germany may be followed through Strasburg, Ulm, and Munich, and on to Lambach, with an agreeable variation between the last two towns by way of Salzburg, and, if desired, yet another digression between Nancy and Ulm, through Epinal and Freiburg.

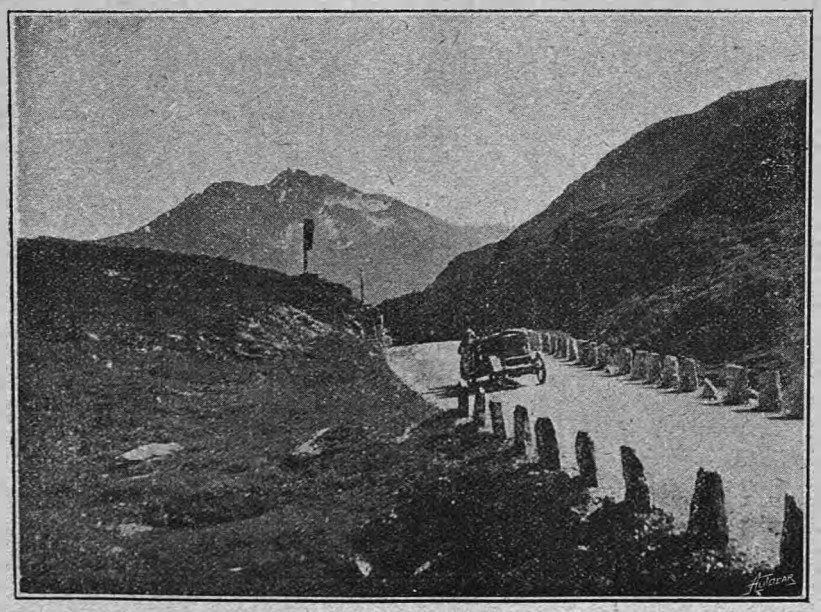
Unless the western part of Austria—*i.e.*, Tyrol—be already familiar ground, it is a mistake to proceed to Vienna by any of the routes already named, as the task of including all that Austria has to offer in the way of attractions after reaching the capital will be found impracticable without much circumnavigation of territory. Better by far will it be to make the journey to Vienna include as much picturesqueness as is possible, so that the course may be clear for travelling to other quarters of the empire; and for this reason I would recommend that Austria be entered by the same gateway as that which is usually chosen by the ordinary railway tourist, namely, the Arlberg, and so to Innsbruck; while from there the direct road to Lambach may be avoided in order to explore the little-known country in the extreme north of Tyrol, the beautiful province of Salzburg, and the wonderful series of lakes to be found in the Salzkammergut. The route thus briefly defined will provide no small number of surprises, and may well tempt even those who do not aspire to embark upon a course of wholesale pass-storming.

Of course, there are ways not a few of reaching the Arlberg itself, but I think it is incumbent on me to indicate the most attractive route for the traveller who is entirely unfamiliar with Continental soil, leaving the man of some previous experience to vary it according to the extent of his own requirements. In the former alternative it will be necessary to take in a limited amount of Swiss territory, through which due regard must be paid to the numerous local speed limits announced at the entrance to the towns and villages *en route*. The line to follow in the first instance across France should be through Reims, Châlons, Vitry, St. Dizier, Langres, and Vesoul to Belfort; or a slightly longer, but more attractive, alternative may be adopted from St. Dizier by striking eastwards to Nancy and then due south to Epinal and Belfort.



The winding road on the Arlberg Pass.

Zurich is the next objective, and the direct route leads through Basle and Baden. At the same time, the road crosses the Rhine for a brief space and involves the passing of the German customs; and, if it is not intended to touch German soil at a later stage, it is hardly worth while taking out a German triptyque merely for the purpose of passing through the environs of Basle. An alternative route which may therefore be enjoined is as follows: Belfort, Delle, Porrentruy, Delémont, Olten, Lucerne, Zug, the little Hirzel Pass, and Horgen. This brings one to the Lake of Zurich, near to Pfäffikon, on the south side, and misses Zurich itself; on the other hand, the diversion includes a sight of Lucerne. Throughout, this alternative is more picturesque than the straight run to Basle and Zurich, but the cross-country tract between Zug and the Lake of Zurich is somewhat difficult to follow, the signposts being very puzzling, while the roads are narrow.

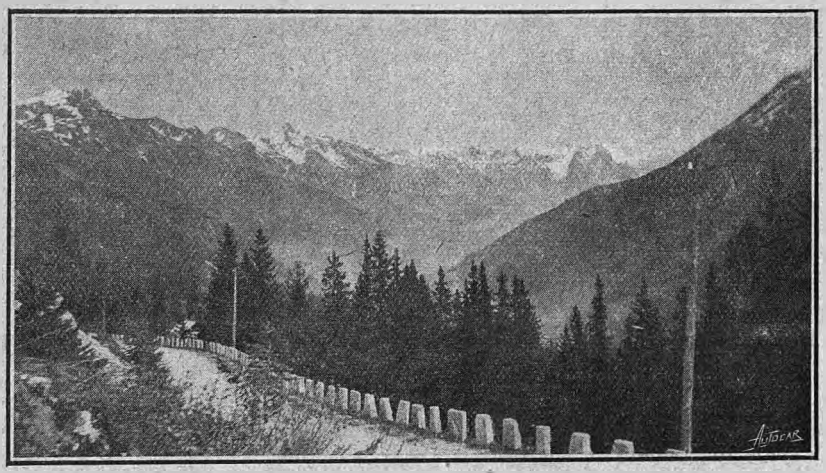


A halt above Langen on the Arlberg Pass.

Whichever route be chosen, however, I should certainly advise the taking out of a German triptyque, for the reason that, as we shall see later, the German frontier overlaps Austrian territory in the immediate neighbourhood of Salzburg, and embraces a particularly delightful region—that of Berchtesgaden and the Königsee, which should on no account be left unvisited by anyone who finds himself within a hundred miles thereof. To ignore these two places would be just as absurd as to confine one's self to Cumberland when touring in the English Lake District, and leave Westmorland severely alone.

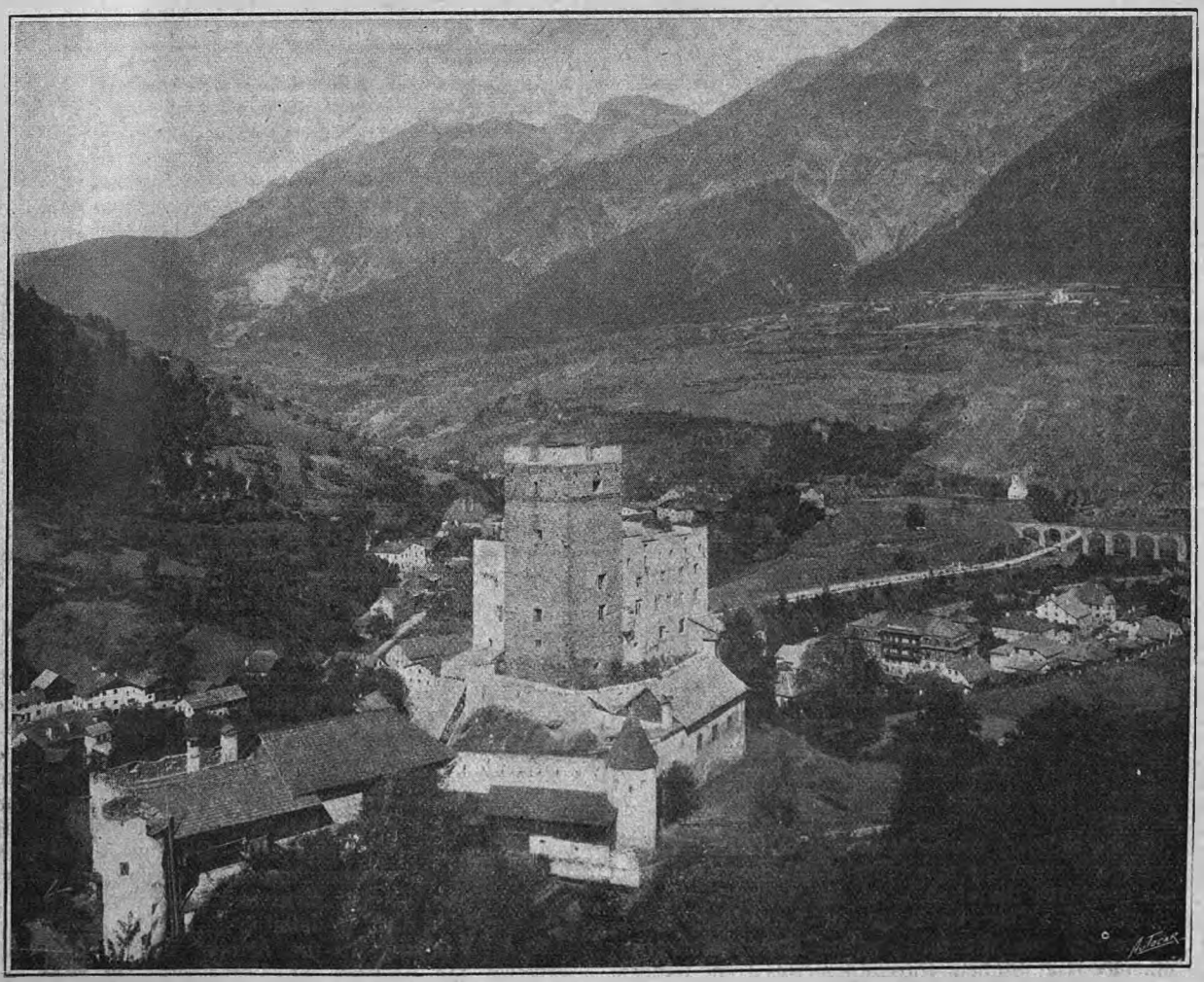
From the point where one emerges near Pfäffikon, or from Zurich itself

on the north bank of the lake, there is charming running all the way to the Austrian frontier; in fact, the roads on this route are the best in Switzerland. The route is mostly flat, but when crossing over to the Walen Lake a ridge has to be crossed which is somewhat steep on the ascent and descent alike. This break occurs at Mollis, and must be looked out for, or the turn will be missed. Between Obstalden and Mühlehorn there is a steep descent with windings. Generally speaking, however, the roads are above the average of quality which prevails in Switzerland. At Sargans one turns to the left for Austria; but, if it so happen that the day is drawing to a close, it will be advantageous to keep to the right and choose Ragaz as the stopping place for the night, and retrace the intervening six kilometres on the morrow. I may add that, personally, I have found the run from the Lake of Zurich to Ragaz the pleasantest, from the driver's point of view, of any that may be enjoyed on Swiss territory; but latterly, I regret to say, the hostile spirit that pervades so large a portion of Switzerland, where motorists are concerned, has extended to this north-western corner, and it is necessary to be on the look-out for local regulations and police traps.



A mountain chain seen from the Arlberg Pass

The road to the frontier runs northwards, along the left bank of the Rhine, to Buchs, 25 kilometres from Ragaz. Here the customs must be passed, a process much less tedious, however, than formerly, when it

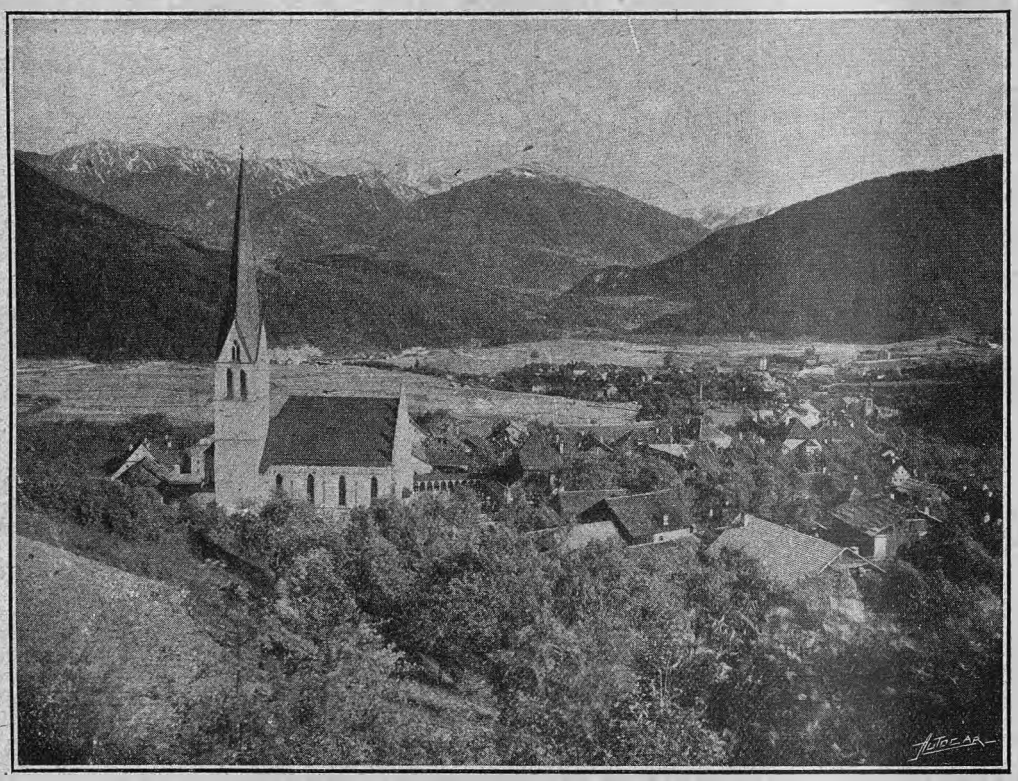


Landeck, near Imst. *The large building in the centre of the foreground is* ***Landeck Castle.***

The Road to Vienna.

was necessary to have special number-plates affixed to the front and back of the car on entering Austria. The "G.B." plaque, however, and the international travelling pass have done away with that unwelcome species of hindrance. The custom-houses are somewhat hard to find, but one must turn to the right in the town, and the Swiss *zollamt* is seen before reaching a bridge over the Rhine, while the Austrian is now on the opposite bank, having been transferred since I last passed that way.

Thenceforward there is level running to Feldkirch, through scenery which, if not exactly grandiose, at least affords a promise of greater glories to come. The town lies amid an environment of mountains, and contains many houses with covered arcades. A turn to the right must be made for Frastanz, and the road crosses the River Ill a few kilometres out and leads to Bludenz, beyond which the Alfenz river is followed to Dalaas. An imperceptible rise has thereby been made of 1,570 feet from Fuchs in fifty-three kilometres, and a more definite, though gradual, ascent must now be made to Langen, where the famous Arlberg Tunnel has its western opening.



The town of Imst on the way to Innsbruck.

It need hardly be said that nothing would be further opposed to the touring motorist, as a rule, than to resort to the railway; but I may as well give a tip in passing concerning the Arlberg. As the road over the Pass is much higher than anything within measurable distance, it often happens that motorists are cruising about at a time of year when the summit itself is buried in snow, and it is a common thing to put the car on the train at one end of the tunnel and receive it at the other. It might possibly happen, too, that this course would prove desirable through stress of weather, and I only mention the fact because, should this necessity arise, the tourist may be assured that the process is unusually simple, as it is so often followed, and the railway officials are familiar with the routine. The charges, moreover, are nothing out of the way.

In the ordinary course of events, of course, the car owner will scout the possibility of taking to the train, and may face the crossing of the Arlberg Pass with equanimity. The rise is one of 1,922 feet in 8½ kilometres, and the only section that presents any difficulty is at Stuben, three kilometres from Langen. There a series of four hairpin corners is somewhat suddenly encountered. They are not by any means acute; at the same time, one must look out for them in advance and be prepared to change down to a lower gear, as the gradient of the Pass is here at its steepest.

Once the zigzags have been surmounted the road runs up a picturesque valley, and is of good quality. The stone slabs at the side are flat, in lieu of the sugar loaves or rectangular pillars which are found elsewhere, and one can always recognise a photograph of the Arlberg Pass from this fact alone. Compared with the Alpine roads the Arlberg is not to be described as wildly beautiful, but curiously enough it often provides some good photographs, and in any case is a very useful introduction to the art of pass-climbing. That art consists in the main of remembering the golden rule that one must never be in too big a hurry to reach the top or to force the pace with a widely open throttle. The throttle must always be the guide, and not the gears or the pace which the car may be making. To keep the engine cool over a long drawn ascent the throttle lever must be kept well back, and the car given whatever gear it will take in the circumstances. Never on any account give the engine a full dose of gas even if the motor is not labouring and the car is taking a gear which one would normally use on a similar but shorter gradient at home. The engine must always be kept lively on an almost closed throttle, which is a very different matter from the liveliness on a full throttle when one is temporarily using full engine power on a very steep hill. Of course, one may momentarily have to accelerate at a corner, but generally speaking the way to ascend a pass is the one I have here described in detail.

From Feldkirch to the Arlberg summit the road traverses the province of Vorarlberg, but when the highest point of the road (5,912 feet) has been passed

one enters the glorious and altogether unrivalled Tyrol. Some years ago I ventured to describe this wonderfully attractive region as the "motorist's paradise"; the phrase was taken up in Austria, and I find it frequently employed in Vienna journals. Renewed experiences of the superlative attractions of Tyrol have but confirmed me in my original view, and certainly I make bold to say that no automobilist's education can be accounted as complete until he has explored the province to its uttermost corner.

All the same, the Arlberg road must not be taken as a criterion of the beauties to follow further east and south. It is a pleasant run enough, however, to St. Auton, where the tunnel ends, and if it be convenient to divide the journey here the tourist will find every civility at the Post Hotel. St. Auton, by the way, is one of the rapidly growing number of Austrian resorts which cater for the wants of the "winter sports" enthusiast, while in summer it forms a desirable centre for mountain excursions.

The fall from the summit has been one of 1,690 feet in eight kilometres, but the remainder of the route presents only slight descents, and the road continues good to Landeck, with the Rosanna river accompanying it throughout to Strengen. There the scenery opens out, and a picturesque run brings us to Landeck, with its castle as a familiar landmark. If bound for the Stelvio Pass, one must turn south here and cross the Reschen-Scheideck Pass, often known as the Finstermünz, but for the present we continue eastwards and head for Innsbruck.

The Road to Vienna.

As a whole, the forthcoming run along the valley of the Inn is less noteworthy than any other in Tyrol, and must be regarded as a means to an end. At Imst, 18 kilometres out, particular care must be taken to make a sharp turn to the right; otherwise one will find oneself on an alternative route which, though not much longer, rises to a fair height and is slower than the valley road. One only goes straight on at Imst if bound for the Fern Pass (3,969 feet), a very charming road which leads eventually to Ober-Ammergau, but to visit that place is not part and parcel of our immediate purpose.

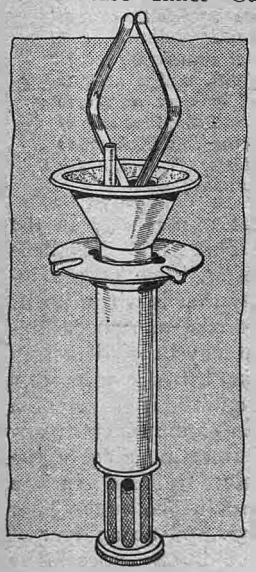
From Imst the road runs along the north bank of the river at first, crosses to the south, and rejoins the north bank at Telfs, whence Innsbruck, the capital of Tyrol, is soon reached. Truly a fine town is this, and full of attraction to the summer and winter visitor alike. Its leading hotel, the Tirolerhof, is crammed with visitors almost throughout the year; but to those who may prefer something on a less pretentious scale I may recommend the Hotel Kreid. Here, by the way, I once experienced the satisfaction of finding that the Englishman is still trusted in various parts of the Continent, even if not so universally as in the days when his word was held to be as good as his bond. Wishing to change some money overnight, I presented a circular note, and, though the proprietor himself had never seen one before, he gave me its face value of £10 without demur. These notes, of course, are only supposed to pass current at a particular banker's mentioned on one's list.

(To be continued.)

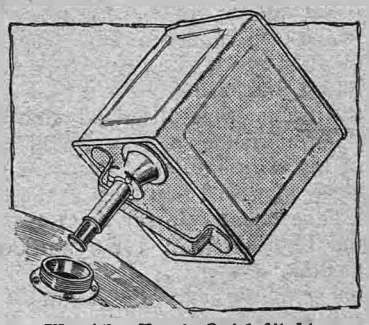
The Atlas Empty Quick.

A Device to Facilitate the Filling of Petrol Tanks from Two Gallon Tins.

THE device illustrated in the accompanying sketches is being sold by the Atlas Non-puncture Inner Case Syndicate, Ltd, 124, High Street, Kensington, London, W., and is intended to obviate the necessity for a petrol funnel when discharging the contents of the usual two-gallon can into the car tank. One special feature of the Empty Quick, as it is termed, is that it can be fitted to the petrol can instantaneously, it is not secured by a thread to suit the petrol can, but by a double flat spring as shown, and a rubber neck piece. The former passes inside the nozzle of the can, while the rubber falls over the thread and makes a petrol tight joint. The extension tube is formed with slots protected by gauze which strains the petrol as it passes out. Inside the extension tube is an air pipe which ensures a steady and rapid flow of spirit without wasting any of the precious fluid; the can may be turned completely upside down and the tube inserted into the petrol tank. An external sleeve is also provided, and in both sketches this is shown drawn up against an internal spring and held by a type of bayonet joint when the device is in use. When the sleeve is released it presses down tightly on a rubber washer against the shoulder on the end of the slotted tube. This arrangement can be utilised where the filler orifice of the tank is awkwardly placed, for the sleeve need not be lifted until the tube is in position. But the most important feature is the rapidity with which a can may be emptied, this being largely due to the ample size of the air tube which leads air in to the can as the petrol rushes out. We have not timed the emptying of a two-gallon can, but it is claimed it can be done in thirty seconds.



The Atlas Empty Quick, showing the flat springs which hold the device to a petrol can, and the rubber neck piece which makes a petrol tight joint.



The Atlas Empty Quick fitted to to a petrol can and in use.

Messrs. Benz and Co., of Mannheim, Germany, the makers of the Benz cars, have presented £2,500 to the authorities of the Technical High School at Karlsruhe, Germany, for the purpose of establishing a laboratory in which to carry on experiments in connection with internal combustion engines and motor vehicles generally.

On the Road.

Reporters' English. Interesting Advertisements. Uniform Warning Notices.

I HAD sworn that while I was on my little holiday the only writing that I would do should be on postcards. Cheques do not count, I am afraid. But since I found a copy of *The Autocar* in a shop at Cannes, and had to spend fifty centimes to purchase it, it is incumbent on me to resume the topic of Motors and Morals once more and to take up the pen in defence of the anonymous reporter who Mr. Filson Young has been so hard upon. It seems cruel on reporters that they always get the blame. It is hard enough to have to give the sense, it is even harder still to be chidden because the "atmosphere" is not reproduced too. Why, if a mere reporter were capable always of doing that he would be a journalist of high degree, a creator, perhaps, even one to be described as "our valuable contributor." This is where the French excel. I am but little of a French scholar, yet I can mark the apostrophes, the notes of exclamation and interrogation, the short, quick, panting sentences, and enter into their tense meaning and enjoy them. To report, then, a lecture before the Ladies' Automobile Club is useless in cold, bald prose. One requires the *nuances*, the arts of a *diseur*, winks, asides, and mobile hands to make play with. (I am writing this from Cannes, which accounts for my polyglotomy.) I know myself—who should know better?—how dispiriting it is to pipe to those who will not dance and who give afterwards the excuse that they thought I was tuning up. It is dreadful having to explain that one was in jest; magistrates invariably meet such excuses in their most unpleasant manner. Therefore I plead guilty to having placed a wrong construction on threequarters-of-an-hour of humour condensed into a thousand word article, but at the same time I plead that the reporter made a very good job of his work in *The Autocar* as far as his implements went. I wish I had been at the lecture, but how could I have been! So far am I from being a member of the Ladies' A.C., I am not even a member of the Gentleman's A.C. Perhaps Mr. Filson Young did not read through the report of his paper that was reproduced in these columns. I write this because he describes the straw I had for my brick-making as "extremely sketchy and totally inaccurate newspaper reports." Wherein he was wrong, for *The Autocar* paid him a much greater compliment than can be so expressed. I have not it with me—I am travelling on a promoted soap-box—but I can remember that it gave quite a lot for the money. Yet in it there was little indication that it was "light, harmless, and intimate," indeed what he rather unkindly describes as "reporters' English" showed it to be quite an august and well-balanced oration. They tell me that in the House of Commons the "reporters" by their education and intelligence turn out all speeches in forms superior to their originals. Which, knowing some members, I do not doubt. Yet here Mr. Filson Young accuses reporters—or one of them—of having done the opposite and spoilt his effects, altered his meanings, and obscured his brilliancies. Certainly I do not remember any "hear, hears!" "laughters," or "sensation," but I put that down partly to the excessive gentility of the audience, and partly to the usual habit of giving type-written reports of speeches to the press in advance. Therefore I am accused of having no sense of humour because I believed what I read in print.

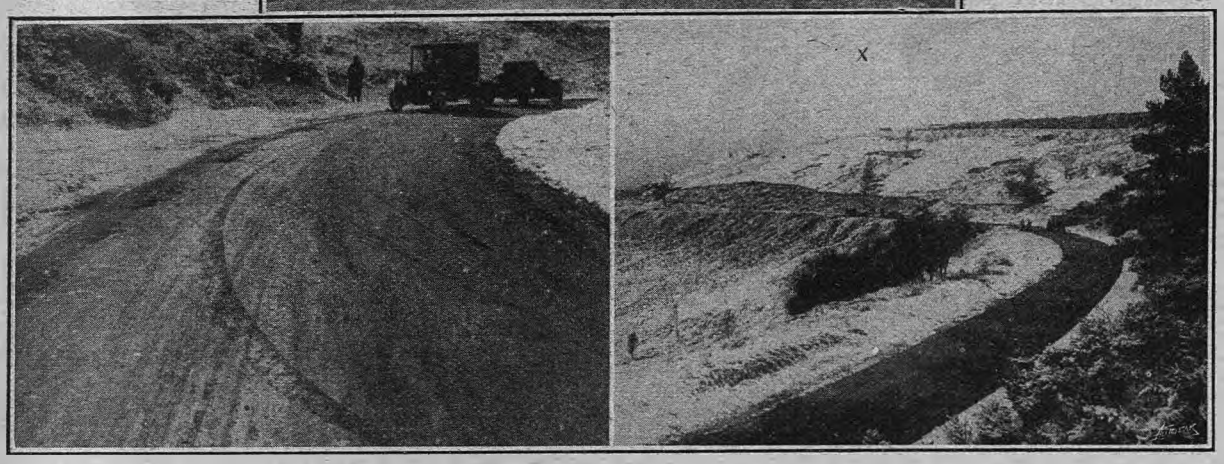
A TEMPORARY WOODEN DRAWBRIDGE. The old bridge which spanned the river Hull near Beverley, Yorkshire, was a notorious danger spot, but a contract has been placed for an iron swing bridge operated by hydraulic power. The old stone structure has been removed and a temporary wooden drawbridge across the river has been installed alongside the site of the new one, and a man is stationed with red and green flags to signal if the road be clear or not to approaching traffic. The new bridge is expected to be finished about the end of July this year, and will be of great benefit to road users going into Holderness from the west, as there is no bridge for ten miles on either side of this spot, which lies about 1½ miles due east of Beverley, on the Hornsea road.

Mr. Filson Young has a great opportunity in the pulpit he daily occupies in the *P.M.G.* His little sermons, "The Things that Matter," are always interesting and models of the brevity that is wit in itself. Yet at times as even a daily cartoonist must occasionally run short of raw material, he may be glad of suggestions from any source, and so I freely offer him the notion that our English language is short of a device to denote things spoken in sarcasm, or at any rate in a sense opposite to the direct meaning of the words as written. For example, to read such a sentence as this, "She complained he had called her a perfect lady" is to be mystified, and no amount of inverted commas will translate it. I have no remedy to suggest, except that the meaning might be conveyed after a little practice by printing the letters upside down. Some American author, I believe, used to add in brackets "This is writ sarkastic," but that only reflected on the intelligence of his hearers, and was bound to make him less widely popular. Sarcasm is

a very awkward thing, and the possession of it is often as the carrying of a double-edged sword or a box of gentles. One has to be so very careful. As an example of its ubiquity one can see it sticking out in letters between the greatest of engineering experts on the subject of "worm gear"—the last place one would imagine it could be found. And how it has flaunted itself in tyre disputes, in the discussions on clubs, on hotels, and, occasionally, on me. People do not mean to be rude, but how easy a thing it can become with a little practice. See advertisement columns. Which reminds me.

"E.W.W.P." (in letter 19330) voices the complaints of many persons concerning the interleaving of advertisements in the reading pages of this journal. Now I am not an authority on advertising, and I shrewdly suspect that those who are responsible for the present state of things know their business. Yet, as a reader, I am in sympathy with "E.W.W.P.," and many of my friends and correspondents tell me that they always begin to study their *Autocar* by getting rid of all the interleaves. This, of course, I take as a compliment, but at the same time I do not think wise, for there is no doubt that of all kinds of advertisements those connected with automobilism are the most interesting and to the fore in value. I have of late even noted an improvement in their nature, and the fatuous and exaggerated kind are now chiefly conspicuous by their absence. Which is as it should be, for as motoring is in the front of all other advances, so also should be its details. *Si monumentum*, etc., take the issue of March 15th as an example, and, beginning at the beginning, note how almost every "ad." is a sensible one and imparts information so that those who run may read. As I am writing this I have been doing so, and insensibly I have gone on from one clever picture or page to another hardly noticing at all in my interest the fact that I have reached the reading matter. Yet, if I want to read some article in particular, such as Dr. Ormandy's late authoritative statement on fuels, I feel inclined to tear out the interloping pages because it is easier to keep one's grasp on the subject if one can go straight on as if one were reading a book.

To many readers the pages "E.W.W.P." would get rid of are the most interesting of all, and, of a certainty, each one of us looks up the advertisement of his own particular brand of car each week to see how out of date his own specimen is getting. Years ago, to return to the style of advertisements, many of them were ineffably silly. I remember the proprietors of a car offering a prize for the smartest poem descriptive of how to get to its stand at Olympia, and I can call to mind a now well-established firm week after week filling valuable space with equally puerile stuff. With reference to cars there is always something to be said: when one has to advertise tyres or wheels or other accessories perhaps it is harder always to be interesting and eye-catching. But it is done, and without doubt the picture in *The Autocar* I am writing of, depicting "Bibendum" pulling down and destroying his own wayside advertisements is the best advertisement tyre or car or part ever got. I have a great respect for "Mr. Bibendum," but I have always hated these roadside horrors, and now that they are to be done away with it is incumbent on every motorist who cares for the beauty of his scenery or the decency of his country-side to support the firms that show they are in earnest in doing away with their mistakes and abominations. France, in many places, is ruined by its raucous advertisement hoardings, in spite of a wise law that taxes every bill and poster. Some day, perhaps, we shall discover our own landscapes are being similarly spoiled and make our present byelaws into



THE HINDHEAD ACCIDENT. *Three views at the scene of the accident to the Victor tyre test car, which, as reported in our last issue, turned turtle while descending Hindhead, near Haslemere, Surrey, on Monday last week. The accident was due to a skid on the snow-covered road, the track of the off side back wheel being seen in one of the illustrations. The upper photograph shows the wreck of the car, which turned completely round in the course of the skid. The body became detached from the chassis and the occupants were pinned beneath it. The photograph was taken after the chassis had been set on its wheels. The five occupants of the car were all severely injured. The wrecked car is just discernible immediately under the cross in the distant view.*

On the Road.

realities. There was a case under the present Act heard before a bench of Somerset magistrates a few weeks ago. The proprietress of a small local hotel put up a timid little hoarding at a cross road about a mile from her home. She got a summons. When it was heard someone asked who was the original instigator of the prosecution. It came out that it was a local constable, and since the Act is one which deals with opinion and calls taste into question, it was naturally settled by the bench that such an official was not capable of authoritative judgment and his criticism could not be taken as gospel. So it was dismissed and that very inoffensive board remains, as do, for hundreds of miles each way, scores and scores of far more hideous, blatant, and useless eyesores, some, I regret to say, put up, partly at my own expense, by a leading motoring organisation that ought to show a better example. Now, perhaps, that the Michelin folk are breaking up their roadside terrors, the yellow offences that so often reduplicate unnecessities may share a like fate.

The mention of the reduplication, or rather the variety, of warning notices, raises the question as to whether the time has not arrived for one body to take over the job of putting up and being responsible for one brand of signpost, and one brand only. On the Continent very often officious advertisers in order to puff their wares almost go so far as to invent cross-roads, terrific descents, and other perils. But almost in every place where such things are necessary there are the neat little plaques of one pattern to be found, and with an exact description, even to the gradient of the hill one is approaching. Here there is no such uniformity, and very often because of repeated tin warnings of "wolf" one becomes careless and runs unnecessary risks because of it. A hill which was dangerous to a bicyclist is often but a gentle slope to a modern motor, and many of the C.T.C. warnings that still remain are about as useless as the peripatetic placard that users of steam rollers still put up because in their early days such things rendered roads impossible to most horses. To-day animals hardly notice them more than they do automobiles, and just so are many triangles and rusty boards unheeded by the motorist. What is wanted—if such things are needed at all—is one set of authorised road signs put up, at proper distances, by one authority in places where real experts deem them to be necessary, and no other at all

I am writing this from "foreign parts," and I have only just realised that my "copy" has to be in by Tuesday next. Otherwise I should have returned to my "moutons," because I do not at all like being accused of being a "heavy-handed" critic. However, at St Trompez the world seems very far away.

OWEN JOHN.

A 12 h.p. Swift demonstration car recently encountered the above obstruction on the Evesham-Coventry road. As the encounter took place at twenty miles per hour in the wind, rain, hail and snow at midnight it would be imagined that the results were serious, but as a matter of fact the car literally jumped the double trunk 25 inches thick. Not one of the occupants was seriously hurt and the car was driven home under its own power after a new front axle had been fitted—a striking testimony to Swift construction. The occupants of a Swift cycle car which was following saw the other car bound into the air and were fortunately able to pull up just in time to avoid following suit.

Bridge Closed for Three Months.

The borough surveyor of Boston, Mr. G. E. Clarke, M.Inst. C.E , has notified us that on and after April 5th the town bridge to Boston will be closed for three months for reconstruction Cars coming from Spalding, Fosdyke Bridge, etc., will turn to the left along Liquorpond Street, Queen Street, Sleaford Road, and along Carlton Road, Fydell Street over Grand Sluice Bridge, Norfolk Street, into Bargate. Cars from the west, etc., will turn to the left at Brothertoft Road (first turning to the left at entrance to the town), then to the right at Argyll Street, along Fydell Street, Grand Sluice Bridge as above Return *vice versa*. There will be no difficulty in finding the way. as these are the only alternative routes.

Thermo-syphon Water Circulation.

An Important Point in Design. By P.W.

THE thermo-syphon or natural system of circulation of the cooling water of engines is very widely used, not only on motor cars, but for stationary gas and oil engines. In the case of the latter the water tank is always arranged at a considerable height above the cylinder, and satisfactory results are generally obtained even with very high powers. In the early days of motor cars natural circulating systems were but little adopted, owing partly to the impossibility of arranging the water tank high enough. True, the Estcourt cooler was fitted to some of the earlier Daimler and Brooke cars, the radiator being arranged in front of the dashboard so that a good head was obtained, but with this exception a pump was nearly always used for the circulation. With modern improved radiators, however, the pump was gradually discarded and natural circulation relied upon with the radiator arranged in the ordinary position, its centre being little or no higher than the centre of the water jacket, so that the water "head" was very small. With short stroke vertical, or with horizontal, engines

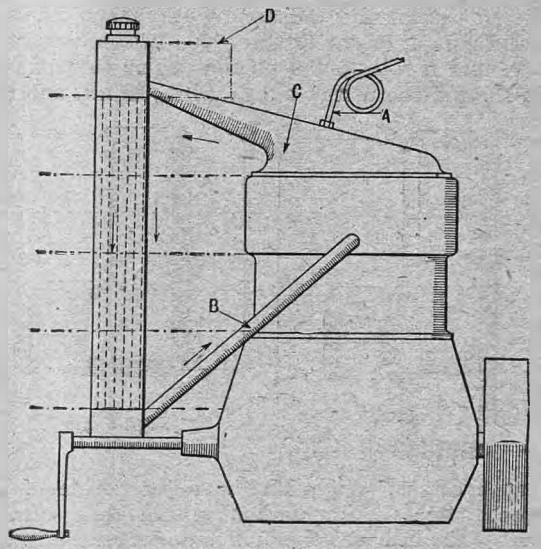


Fig. 1.

the "head" was larger and this worked satisfactorily, but the system is not all that can be desired on many modern cars, as anybody will agree who has seen much racing at Brooklands. Many racing cars provided with thermo-syphon cooling systems require frequent attention on account of overheating troubles, whilst others provided with pumps can travel long distances on the track without overheating.

With modern radiators and fans it seems almost a crime to have to fill up the radiator during a day's run, but many careful motorists will confess that, with thermo-syphon cooling, the water seems to be used up quicker than it should be. Also we hear more of pre-ignition and knocking than used to be the case. However, road travelling is nothing like so hard on a car as track racing, and it is at Brooklands that the thermo-syphon cooling system, as at present carried out on many cars, is shown up, and the writer hopes to give a satisfactory reason for failure when everything seems to be in order.

Of course, in the Standard Car Race and other races at Brooklands the cars were running with radiators, etc., made for use on the road, so too much stress should not be laid upon failures under what were really abnormal conditions, as far as the average user is concerned. At the same time, in climbing long hills or mountain passes, a cooling system which is inadequate on Brooklands will most probably give trouble during the climb, and a stop or stops have to be made to allow the water to cool, or for replenishment. It is not always easy to find water on a hill side.

In fig. 1 is shown diagrammatically a modern long stroke engine, with conventional radiator and water pipes. It is true the relative proportions have been slightly exaggerated, but this has been purposely done to demonstrate a point which appears later. The proportions are not, however, much exaggerated, and the arrangement is practically identical with that used on some cars. It will probably be a surprise to many readers to learn that the water in the case illustrated tries to circulate the wrong way, tending to fall through the engine and to rise in the radiator.

Owing to the high temperatures existing at the top of the water jacket this backward circulation is rendered impossible, so that the water remains stationary, boiling rapidly in the top of the water jacket. Thus steam is generated at that point, and a pressure set up which tends to blow the water out at both water pipes. The easier outlet is the top, so that the water in the top pipe C is blown into the top water tank of the radiator and out through the overflow pipe. On release of the steam pressure in this way the water rises again in the jackets, and the same sequence is followed. It is even found, if a small pipe be attached to the top water pipe as shown at A, the end of the pipe being higher than the top of the radiator, that a stream of water is forced out, showing that steam under pressure exists in the top of the water jacket and the outlet pipe. The water is gradually ejected from the radiator through the overflow pipe in the manner previously mentioned, and to compensate for this many manufacturers fit large tanks at the back of the radiator, projecting towards the engine as shown at D. The greater volume of water provided requires a greater time for ejection by way of the overflow pipe, and conversion into steam, so that the necessity for filling up is postponed, but the actual circulation is in no way improved. It will be understood from the previous remarks that the tops of the cylinders become seriously overheated, with the consequence that the cylinders expand unduly, allowing an unnecessary amount of oil to pass the pistons, and this is probably one of the causes of so much trouble being experienced with carbon deposit in modern long stroke, thermo-syphon-cooled engines.

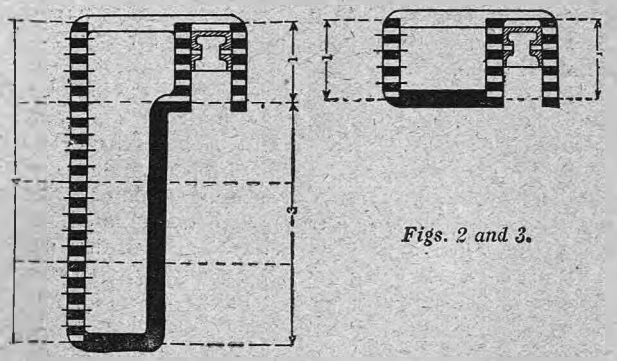
Messrs. White and Poppe, Ltd., have given considerable attention to this point, and the foregoing remarks are based on the diagrams herewith, and on explanations thereon afforded by Mr. Poppe. The diagrams represent a single-cylinder engine connected by almost vertical and horizontal pipes to a radiator. The radiator is divided by horizontal dotted lines into sections (four in the full length), and in the different examples the cylinder is assumed to occupy the three upper of the four sections in turn, the weights of the columns of water of the same cross-sectional area being analysed so as to ascertain the direction of the circulation.

Now for the water to circulate properly, *i.e.*, in the direction of the arrows shown in fig. 1, it is essential

Thermo-syphon Water Circulation.

that a water column of some unit section in the radiator be heavier than that on the right hand side of the system, for which purpose the average temperature of the whole water column referred to on the right must be higher than that of the corresponding water column in the radiator.

When the water leaves the cylinders it has attained its highest temperature of about 90° centigrade, and it

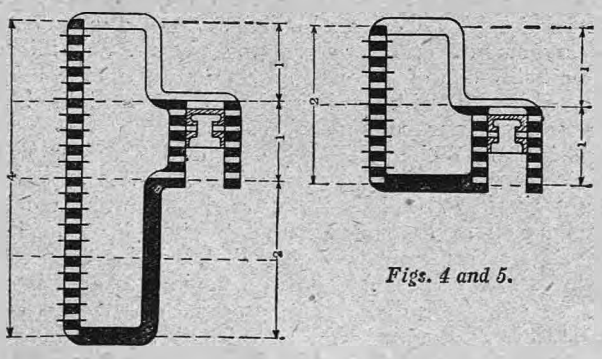


Figs. 2 and 3.

keeps that temperature until it enters the tube C (fig. 1) leading to the radiator. It then drops in temperature until it leaves the radiator. At the bottom of the radiator it has reached the lowest temperature it will attain, and it keeps that temperature until it enters the cylinder again. Here it rises until it reaches a temperature of 90° as previously stated.

We thus have practically three temperatures to deal with: that of the warmest water passing from the top of the cylinder to the radiator; that of the coldest water after it has left the radiator and enters into the cylinder; and the average of these. Just as the temperature of the water is the same when leaving the cylinder and entering the radiator, it is also the same leaving the radiator and entering the cylinder. The average temperature in the radiator and the cylinder must, therefore, be the same, and must lie half-way between that of the hottest and coldest water. If, therefore, the water leaving the cylinder is 90° centigrade, and that entering the cylinder is 70° centigrade, the average temperature in the cylinder must be near 80°.

The hotter the water the lighter it is, and for simplicity it will be assumed that the weight per square inch per unit length of warm water is 1 lb., the cold water 3 lbs., and the water of average temperature 2 lbs. per square inch per unit length. Of course, the

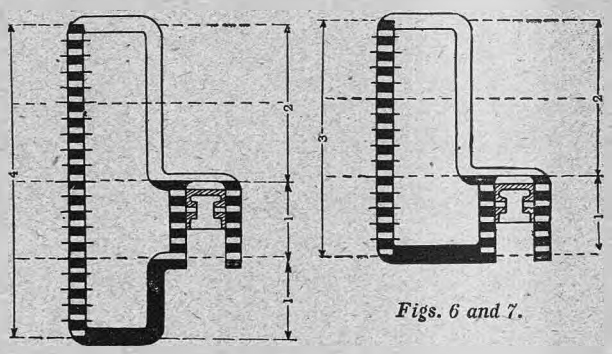


Figs. 4 and 5.

cold water would not weigh three times as much as the warm water, but as the cold water may weigh .3% more than the warm water, the relation, however, remains the same, so we will keep to the 1, 2, and 3 lbs. respectively for warm, average, and cold, because it shows our point more clearly.

In the somewhat exaggerated case shown in fig. 2 the radiator is 4 units long, the cylinder 1 unit, and the column of cold water 3 units. The weight of the water column on the radiator side will then be 4 units of 2 lbs. each, which equal 8 lbs., and on the other side we have 3 units of cold water at 3 lbs. each, that is 9 lbs., and one unit at 2 lbs., which make 11 lbs. on the engine side and 8 lbs. on the radiator side, giving the engine an excess of 3 lbs. The heavy part of the system is on the wrong side, therefore, and the water will not circulate the proper way. Now we will assume that the lower three units of the radiator have been removed (see fig. 3). Then there is one unit on the radiator side of 2 lbs., and on the engine the same; there is no excess on either side, and there is therefore no circulation in either direction.

In the case shown in fig. 4 there are four units on the radiator side at 2 lbs. each, which equal 8 lbs., and on the engine side one unit of hot water at 1 lb., one unit at 2 lbs., and two units at 3 lbs., in all 9 lbs. There are on the radiator side 8 lbs. weight of water, and on the engine side 9 lbs., so still the engine side is the heavier, which will cause the water to try to circulate the wrong way. If we take the same radiator and cut the column of two units of cold water out and shorten the radiator by two units, as in fig. 5, we then get on the radiator side two units at 2 lbs. each, that is 4 lbs., and on the engine side one unit at 1 lb. and one unit at 2 lbs., 3 lbs., in all, and there



Figs. 6 and 7.

is an excess of weight on the radiator side of 1 lb. Then there is a circulation in the right direction because the heavier column of water is on the radiator side.

In fig. 6 we have four units at 2 lbs. on the radiator side equalling 8 lbs., and two units at 1 lb., one unit at 2 lbs., and one unit at 3 lbs. on the engine side. Therefore we have 8 lbs. on the radiator side and 7 lbs. on the engine side, or an excess of 1 lb. on the radiator side, which would give a proper circulation As before we cut out one column of cold water (see fig. 7), and we get three units at 2 lbs., 6 lbs. in all, on the radiator side, and two units at 1 lb., plus one unit at 2 lbs., which equal 4 lbs. on the engine side, making 2 lbs. more on the radiator side. Before cutting away the cold water column we only had 1 lb. excess.

This last example shows that an improvement is always obtained by having no radiating surface below the bottom of the water jackets of the cylinders, and it will be seen that by taking part of the radiator away we increase the excess of weight by 50%, and the circulation is improved accordingly.

We will now take the same case over again, but assume that there is only a difference in weight of 1-10,000th between the coldest and the warmest water. The average water will be 1.00005, and the coldest

water 1.00010 lb. per sq. inch. per unit length. We get in the case shown in fig. 6 on the radiator side four sections at 1.00005, equal to 4.00020. We have two units on the engine side at 1 lb. equal 2.00000, one unit at 1.00005, and one unit at 1.00010, which makes altogether 4.00015, and an excess on the radiator of .00005. Now we take the cold water column off (fig.7), and we get three units at 1.00005, equal 3.00015 on the radiator side. On the engine side there are two units at 1.00000, equal 2 lbs., and one unit at 1.00005, altogether 3.00005 on the engine, therefore an excess on the radiator side of .00010. There is again an increase of 50%, which proves that we are not far out in taking for simplicity of reckoning 1, 2, and 3 lbs.

This article does not deal with the size of the radiator, but only shows that, even with a proper radiating surface, the whole system may be a failure owing to the mistake of having part of the radiating surface below the water jacket in the cylinder or cylinders.

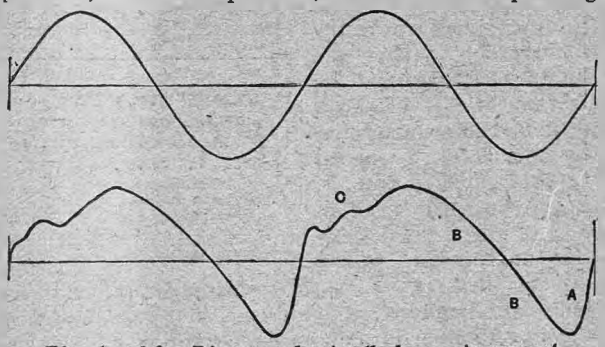
It will be clear that the larger the engine and the longer the stroke the higher must be the top of the cylinder. The troubles of circulation therefore apply more forcibly to engines of large size and long stroke, the difficulty being to arrange the radiator sufficiently high above the water jacket without making an unduly high bonnet. Convention demands that the radiator should be brought down to the starting handle, as shown in fig. 1, in order to hide the engine. The lower part of the radiator is, however, impeding circulation or tending to cause the water to circulate in the wrong direction. An improvement would be obtained if all the radiating surface below the water jacket were shielded so as to obtain something approaching the result shown in figs. 3, 5, and 7.

If the reader should have any doubts as to whether his circulation system is working properly he should examine his pipes B and C, and if the pipe B rise more than the pipe C he will know that the water is not circulating, but is merely stagnant, and will gradually boil away.

If the radiator be arranged in the front of the car, which is the more usual position, the circulation obviously improves going up hill, as in such a case the radiator is raised in relation to the water jacket. If the radiator be arranged behind the engine, as in the Renault and other cars, the water head decreases going up hill, and the possibilities for circulation troubles are magnified.

The Electric Autochime.

THE Electric Autochime, sold by Messrs. Seabrook Bros., Cambridge Circus, W.C., and Great Eastern Street, London, E.C., is claimed to produce, and does produce, a tone that is pleasing



Figs. 1 and 2.—Diagrams showing the harmonic curve of a pure note and the curve of the electric Autochime note.

and yet sufficiently penetrating to sound clearly above the noisiest traffic. In illustration of this, the firm send us the diagrams of two curves of some very interesting wave records, figs. 1 and 2, which they have had taken. Fig. 1 shows the harmonic curve of a pure note, such as that from a tuning fork, which is soothing rather than warning in its tone. Fig. 2 shows the curve of the Autochime wave. The irregularities which are the source of the warning "timbre" are shown clearly, but more interesting still, it is possible to trace at A the sudden acceleration of the diaphragm due to the pull of the trembler magnets, at B the rebound almost of pure harmonic form, and at C the "chattering" of the contact spring, and so over again.

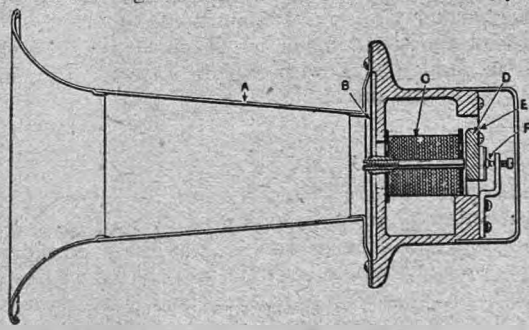


Fig. 3.—Sectional view of the electric Autochime horn.
A, trumpet. B, diaphragm. C, magnets. D, armature. E, spring support of armature. F, contacts.

Fig. 3 shows a section through one of these horns, while fig. 4 shows the instrument complete with its push-button.

The current consumed by these horns is claimed to be very small, while, as regards the voltage, they are wound to run on anything from four to twelve volts. Current at six volts is recommended as giving a powerful warning with a battery of moderate size.

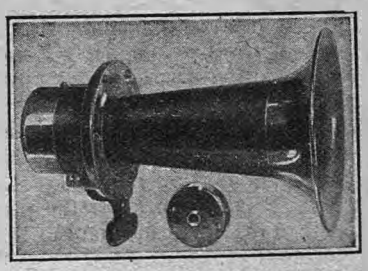


Fig. 4.—The electric Autochime horn with the push button switch provided.

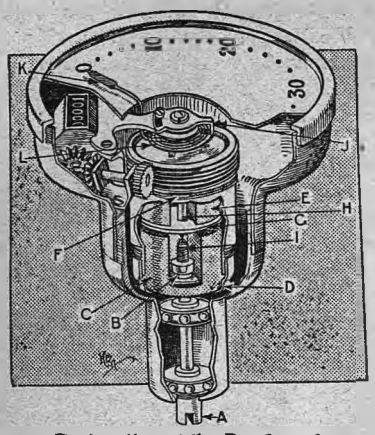
The model illustrated has a fitting for screwing to the wind screen or other convenient part, while a larger model has a swivel bracket which should greatly facilitate fixing. The price of the large model is £3 15s., while the smaller type is £2 17s. 6d.

As an instalment towards the cost of road improvement, the Government of Ontario, Canada, have provided a sum of £1,000,000 in the current year's estimates, and a Provincial Commission is to be appointed to deal with the entire matter. During the present year also the Government of Alberta propose to connect numerous market towns and shipping points to the main highways and feeders.

The Brookwood Speedometer.

A Magnetic Instrument of Simple Design.

THIS, the latest addition to the ranks of magnetic speedometers, is somewhat on the lines of at least one instrument of the kind already upon the market, but has several additional and certainly interesting features. By the fact that it is made with two magnets between which is set up the member of the apparatus affected by the eddy currents it is claimed, by those responsible for its presentation to the British public, that it is so rendered quite unaffected by changes of temperature, a failing alleged by many to appertain to magnetic speedometers generally.

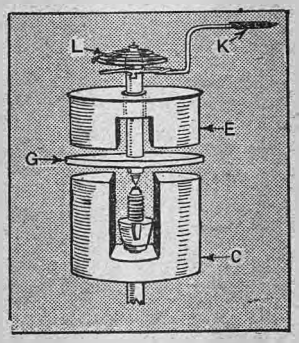


Part section of the Brookwood speedometer.

A, coupling end of driven spindle
B, upper end of driven spindle
C, lower magnet
D, brass casing enclosing magnets
E, upper magnet
F, worm thread driving distance recorder
G, aluminium disc
H, spindle of indicating hand and disc G
I, lower bearing of spindle H
J, bracket carrying upper bearing of spindle H
K, speed indicating hand
L, hair spring

However this may be, it is well to point out the means and method by which accuracy is said to be obtained. To describe the apparatus as illustrated herewith, A is the end of the driven spindle which attaches to the flex driven from one of the front wheels of the car, or off the propeller-shaft, the latter the preferable method for more reasons than one. This spindle A rotates in the two ball bearings shown, and above is screwed into the lower part of the lower magnet C, which is held fast with its overhead fellow E in the brass casing D. A bearing I is formed in the head of the spindle A, and in this bearing is carried the tapered end of the spindle H on which the horizontal aluminium disc G, called the indicating disc, is fixed and held between the upper and lower faces of the two magnets C and E. The spindle of the indicating disc G passes upwards between the pole pieces of the upper magnet, and is carried in a bearing in the bracket J, where it is attached to the hair spring L, and also carries the indicator hand K. The upper portion of the brass casing D has a worm thread F cut upon it for the purpose of actuating the distance recording mechanism through the worm wheel and bevel gearing shown.

It will be seen that owing to the fact that the indicating disc and its spindle rest only on a needle point bearing I in the end of the spindle A, and that its upper end is secured to one end of the hair spring L, it does not and cannot rotate with the magnets and the brass casing, which all go round solidly together when A is actuated by the driving flex. But by the effect of the eddy currents generated between the two magnets, the aluminium disc G desires to rotate in sympathy and in the same direction, carrying with it the indicator hand, and does so rotate as far as it is permitted by the tension of the hair spring to which it is attached at the top. The higher the speed of the rotation of the magnets, the stronger the flow of the current and the greater the tendency of the aluminium disc to follow and to overcome the tension of the spring. As we have pointed out, the indicator hand K being attached to the indicating disc spindle, the rotary movement thereof is accentuated on the dial in proportion to the speed of the car, and the speed in m.p.h. so indicated. The machine is carefully calibrated to effect this correctly. It will be seen, therefore, that taking the effect of the eddy currents for granted, the Brookwood double magneto speedometer has very few moving parts, and these entirely enclosed within the main casing. They are light, yet strong, and the instrument is of such form and so compact that by means of a special bracket supplied with it, it can be easily fixed in almost any desired position on the car. The driving flex is of special manufacture, all the links are chamfered at their ends and case-hardened, the flex rotating in a close coiled spring casing. As will be seen from the first sketch, this speedometer possesses a very clear and evenly spaced dial, a very commendable feature.



Enlarged view of the double magnets, and other details of the Brookwood speedometer.

C, lower magnet
E, upper magnet
G, aluminium disc
K, indicating hand
L, hair spring

This interesting and ingenious accessory is put upon the market by the Brookwood Double Magnetic Speedometer Co., 25, Denmark Street, W.C. The price of the speedometer is £6 6s. complete with all fittings, and £7 7s. with trip distance recorder incorporated in the mechanism.

Eastbourne, Bexhill, and Hastings Road.

There is no likelihood of the ambitious scheme of the Eastbourne Corporation for a coast road to connect Eastbourne, Bexhill, and Hastings being carried out. As the result of a recent conference between representatives of the three local authorities it has been agreed that the most feasible plan would be to improve the road from the Eastbourne main road to Pevensey Bay, and thence continue it along the coast towards the Sluice, constructing a new piece of road from a point half a mile west of the Star Inn. The road would cross the railway and continue along to Cooding on the north side of the railway, the land for this section having been promised by Earl de la Warr. The foregoing scheme would constitute a considerable improvement, but steps should also be taken to give a more direct road between Bexhill and Hastings in order to cut off the narrow winding lane which intervenes between Bexhill and the Bull Inn, St. Leonard's. This will be partly accomplished by the decision of the Hastings Council to take advantage of a grant offered by the Road Board towards the cost of constructing a road across Glyne Gap parallel with the tramway.

Brooklands Easter Meeting.

Fine Racing, a Big Crowd, and Bright Weather make the Inaugural Meeting of 1913 a Great Success.

THE most marked impression at the immediate conclusion of the opening meeting at Brooklands was that the racing had been better than ever, and certainly the handicappers are to be congratulated on their success, for there were many more close finishes than usual. Early in the day the sky was threatening, and many doubts were expressed as to whether the coming downpour would hold off long enough to allow the programme to be commenced, but after the racing began the clouds dispersed slowly and finally the sun triumphed, once more providing the now proverbial Brooklands weather. Owing to the lowering sky in the morning a poor attendance was feared, but as far as could be judged by the eye it was quite the reverse, and the cars standing in the half-crown enclosure seemed to fill the latter to overflowing, almost all available level ground being occupied. This, however, gives in one sense a fictitious idea of the number present, because the members' enclosure just south of the paddock was under water, so a good many cars which would otherwise have been there were on the other side on the cement.

It seemed later that the presence of Goux with the Peugeot which last year won the Grand Prix in France had acted as a particular attraction, as the car was literally mobbed in the paddock and its early win was cheered as even good wins seldom are. If this surmise is correct it is scarcely to be wondered at, as the car's great speed, combined with Goux's dashing driving, made the events in which the Peugeot was a participant especially exciting. One has become accustomed to see rather old or well-known cars in the scratch place—such as the big Benz, which did not figure in this programme—and a new scratch car adds an interest, because it has a chance of winning, whereas the scratch veterans seem to be able only to secure first place at very rare times and occasions. Thus in the third race (the 100 m.p.h. short handicap), which Goux won in splendid style, all eyes were concentrated upon the big blue car's efforts as it caught up competitor after competitor. In this race it had a long tussle, which was really very well worth the watching, with the 30.1 h.p. six-cylinder Sunbeam driven by Crossman.

Amongst the other cars there were many old favourites. Mr. Bird's Coupe de l'Auto Sunbeam seemed to be going well, and to be much faster than last year, but probably the owner's improving acquaintance with it has had something to do with this. None of the old Mercédès distinguished themselves greatly, but Mr. Tate's big car (130 mm. × 180 mm.) twice put up a fine show against Mr. Bird's Sunbeam (80 mm. × 150 mm.), the Mercédès proving to be able to gain about a hundred yards in the lap on the smaller car. A car which is practically new is the Humber which won the sprint race, and did very well in several other events. This is, of course, a car with a comparatively small engine, the bore and stroke being 75 mm. and 130 mm., so its ability to win a very short race at the average of 68½ m.p.h. is quite remarkable.

Mr. Campbell, who is so well known as the driver of the old Darracqs of the "Blue Bird" series, had bad luck with number three of that ilk, as his magneto failed him in the 70 m.p.h. short handicap, in which he was expected to take a place, but otherwise there seemed to be singularly little trouble on the track, no cars stopping altogether save a cycle car, which stuck at the start of the special event for passenger-carrying motor cycles. It is curious in a way that in these days of reliable cars the absence of failures should be so noteworthy, but it is a fact that most meetings find the weak place in quite a number of competing cars. This serves to emphasise what a magnificent testing ground the track really is, for it is usually the untried vehicles that have to give up the ghost.

The animated scene in the paddock before the start of the first race.

The name of Mr. C. L. E. Geach in the programme as entrant of a Vauxhall had encouraged the hope that one of the record breakers of that breed would turn up, but Geach unfortunately scratched from every race. The same was the case with regard to the racing Singer, which was to have been driven by Mr. Percy Lambert of hundred miles in an hour fame, but the engine melted a big end in practice, and time was too short to allow the fitting of a new one, so the Singer stood very neglected in the corner of the paddock. We noticed on it, however, a little fitting which is testimony to the stresses borne by the frame; the bar which joins and stiffens the frame at the extreme front end having a swivelling pin joint at each end to allow either side member to rise or fall a little without straining the other.

The track, by the way, was in noticeably better order, many of the well-known bumps having dis-

Brooklands Easter Meeting.

appeared altogether. There seems still to be a fairly stiff one to be encountered on entering the finishing straight, but those on the top banking are completely smoothed out.

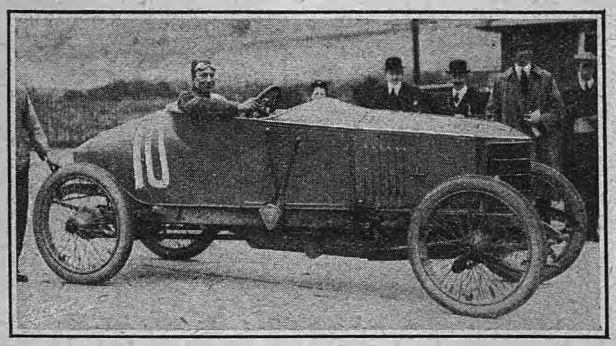
First Event.

THE EASTER PRIVATE COMPETITORS' HANDICAP; about 5¾ miles. For cars driven by and entered by private competitors of the Brooklands Automobile Racing Club. Starters:

	Bore and stroke.	c.c.	Start. m. s.
M. Campbell (59.6 Darracq) ...	155×140	10,567	scr.
R. Robertson-Shersby-Harvie (30.0 Rolland-Pilain)	110×165	6,272	0 4
C. A. Bird (15.9 Sunbeam)	80×150	3,016	0 4
A. W. Tate (41.9 Mercédès) ...	130×180	9,557	0 4
C. V. Stewart (48.6 Mercédès) ...	140×150	9,237	0 36
W. R. McBain (52.9 Lorraine-Dietrich)	146×180	12,054	0 42
O. D. Pollak (17.9 S.C.A.R.) ...	85×140	3,178	0 48
E. Erl (15.9 Hispano-Suiza) ...	80×180	3,619	0 52
S. S. Gairwar (20.1 Vermorel) ...	90×140	3,563	1 6
L. J. Cadbury (*20.1 Vauxhall) ...	90×120	3,054	1 24
Neville Hardy (†17.9 Vauxhall) ...	85×102	2,315	1 24
G. N. Cadbury (18.8 Straker-Squire)	87×120	2,853	1 36

* Prince Henry model with two-seater touring body.
† Ordinary model with similar body.

All the competitors made clean starts, but Mr. Cadbury's Vauxhall got away well and took the lead before leaving the home banking. It looked, in fact, as if the car had caught the handicappers napping, as it maintained the lead finely whilst the rest of the field bunched themselves



Mr. L. J. Cadbury on his 20.1 h.p. Vauxhall, winner of the Easter Private Competitors' Handicap.

together. At the finish, therefore, the winner had the straight to himself, while the second man also had a fair lead from the next three and four, which came up together. Quite an exciting moment occurred when Mr. Tate's Mercédès cut in between the Darracq and the S.C.A.R. at the bottom of the straight, but old "Blue Bird" was too fast for the Mercédès, and the latter could not force itself into third place. Result:

1, Mr. Cadbury's Vauxhall.
2, Mr. McBain's Lorraine-Dietrich.
3, Mr. Campbell's Darracq ("Blue Bird").

Second Event.

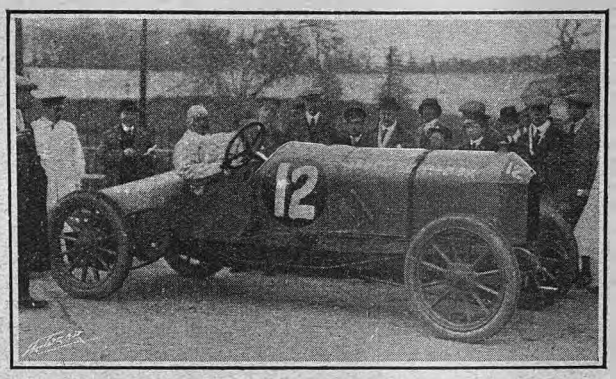
A motor cycle race (see *The Motor Cycle*).

Third Event.

THE TENTH 100 M.P.H. SHORT HANDICAP.—For cars of observed speeds of about 70 m.p.h. or more, for a flying lap; about 5¾ miles. Starters:

	Bore and stroke.	c.c.	Start. m. s.
H. Boissy (30.0 Peugeot)	110×200	7,603	scr.
L. Coatalen (30.1 Sunbeam, 6-cyl.)	90×160	6,107	0 10
M. Campbell (59.6 Darracq) ...	155×140	10,567	0 26
L. R. L. Squire (18.8 Straker-Squire)	87×120	2,853	0 26
C. A. Bird (15.9 Sunbeam)... ...	80×150	3,016	0 30
R. Robertson-Shersby-Harvie (30.0 Rolland-Pilain)	110×165	6,272	0 30
A. W. Tate (41.9 Mercédès) ...	130×180	9,557	0 30
C. V. Stewart (48.6 Mercédès) ...	140×150	9,237	1 2
N. S. Hind (35.7 Berliet)	120×140	6,334	1 4

This was one of the most exciting races that has ever been run on the track, it being almost anybody's race up till quite near the end. Again everyone got away well, the Peugeot (driven by Goux) making a clean and very fast start. All eyes were centred on the scratch man, who rapidly began to overhaul the field, finally having a hard fight to get by the Sunbeam, which was driven by Crossman



Mr. W. R. McBain on his 52.9 h.p. Lorraine-Dietrich, winner of the 100 m.p.h. Long Handicap, also placed second in the private competitors' handicap.

and not by Mr. Coatalen, as announced on the programme. The Peugeot was taken rather too high on the banking every time, as is habitual with French and Italian drivers. The other Sunbeam and the Mercédès driven by Tate had a struggle from the start, the latter gaining very slowly, but finally leading by about three hundred yards. Result:

1, Mr. Boissy's Peugeot.
2, Mr. Tate's Mercédès.
3, Mr. Bird's Sunbeam.

Fourth Event.

A motor cycle race (see *The Motor Cycle*).

Fifth Event.

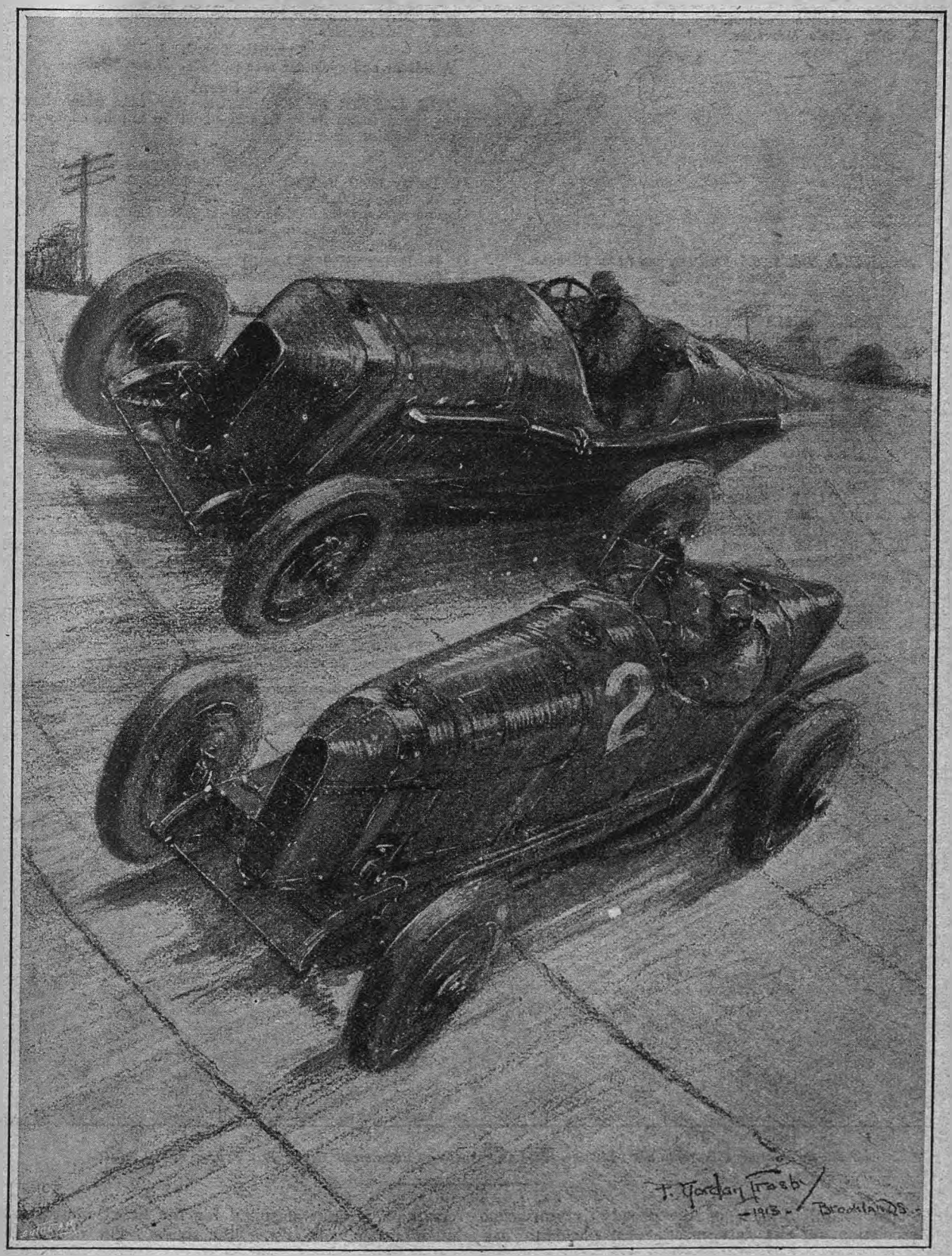
THE NINTH 100 M.P.H. LONG HANDICAP.—Same qualifications as the third event, but about 8½ miles.

	Bore and stroke.	c.c.	Start. m. s.
H. Boissy (30 Peugeot)	110×200	7,603	0 0
L. Coatalen (30.1 Sunbeam 6-cyl.)	90×160	6,107	0 15
L. R. L. Squire (18.8 Straker-Squire)	87×120	2,853	0 39
C. A. Bird (15.9 Sunbeam) ...	80×150	3,016	0 45
R. Robertson-Shersby-Harvie (30 Rolland-Pilain) ...	110×165	6,272	0 45
A. W. Tate (41.9 Mercédès) ...	130×180	9,557	0 45
G. Watney (48.6 Mercédès) ...	140×150	9,237	0 54
N. S. Hind (35.7 Berliet)	120×140	6,334	1 36
W. R. McBain (52.9 Lorraine-Dietrich ...	146×180	12,054	1 42

This was not so exciting a race as the third, perhaps partly because much the same field were running and the form of the cars was more or less known. Again Messrs. Bird and Tate had a tussle, which resulted similarly, but the Sunbeam did not seem to offer so much opposition to the Peugeot as in the shorter event. The Straker-Squire was obviously going pretty well, and it may be remarked in passing that this is a special model with huge overhead inlet valves. The old black Berliet stuck close to the winning Lorraine-Dietrich for a long way, but was altogether out of it at the end, the Peugeot pulling up and only failing to win

Goux on the 30.1 h.p. Grand Prix Peugeot which won the 100 m.p.h. Short Handicap, placed second in the 100 m.p.h Long Handicap and second in the Easter Sprint Race.

Passing at 100 Miles an Hour.

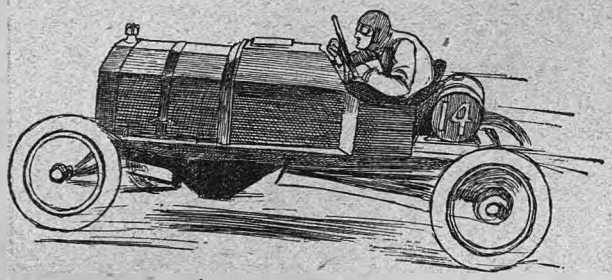


Goux, on the top of the banking, driving the Grand Prix Peugeot (7603 cc.) passing Mr. Coatalen's six-cylinder Sunbeam (6107 cc.) (Crossman driving) at over 100 m.p.h. after a desperate three miles struggle for supremacy in the 100 m.p.h. Short Handicap at Brooklands on Monday last. This tussle was characterised by many to be one of the most exciting neck and neck races ever witnessed at Brooklands.

Brooklands Easter Meeting.

again by a matter of a comparatively few yards. No. 3 was a good length of the straight behind the first and second cars. Result:

1. Mr. McBain's Lorraine-Dietrich.
2. Mr. Boissy's Peugeot.
3. Mr. Tate's Mercedes.



Mr. H. E. S. Huth's 22.5 Ford car, first in the 70 m.p.h. Short Handicap.

Sixth Event.

THE TENTH 70 M.P.H. SHORT HANDICAP.—For cars of observed speeds of 70 m.p.h. or less for a flying lap. About three miles:

	Bore and stroke.	c.c.	Start. m. s.
O. D. Pollak (17.9 S.C.A.R.) ...	85×140	3,178	0 0
H. C. Lambert (15.9 Crossley) ...	80×123	2,473	0 4
M. Campbell (24.8 Darracq) ...	100×160	5,027	0 9
W. R. McBain (15.9 Delage) ...	80×149	2,996	0 9
C. R. Engley (24.8 Turcat-Mery) ...	100×130	4.084	0 9
W. G. Tuck (13.9 Humber) ...	75×130	2,297	0 9
Neville Hardy (17.9 Vauxhall) ...	85×102	2,315	0 18
L. J. Cadbury (20.1 Vauxhall) ...	90×120	3,054	0 18
G. N. Cadbury (18.8 Straker-Squire)	87×120	2,853	0 24
W. T. Smith (13.9 Stoewer) ...	75× 89	1,929	0 24
H. K. Chambers (12.2 Laurin-Klement)	70×115	1,770	0 24
H. E. S. Huth (22.5 Ford) ...	95×102	2,895	0 39
C. V. Stewart (11.5 Richmond ...	68×120	1,743	0 39
T. B. Andre (8.9 Marlborough) ...	60×100	1,131	0 57

The result of this race being a win for the Ford was somewhat of a surprise, as cars of this make have usually been so treated by the handicappers that they have little chance of showing up in the first bunch. However, as the average speed at which the race was won was 56¾ m.p.h. the car must have had a very good tuning up. One or two of the small cars got away poorly, and the Richmond only went a few yards, after which it did not appear again till much later. The tiny Marlborough showed a good capacity for speed, and Tuck's Humber came into prominence looking as though it would carry off the prize, as, in fact, there is little doubt it would, had the race been somewhat prolonged. Result:

1. Mr. Huth's Ford.
2. Mr. Tuck's Humber.
3. Mr. Pollak's S.C.A.R.

Seventh Event.

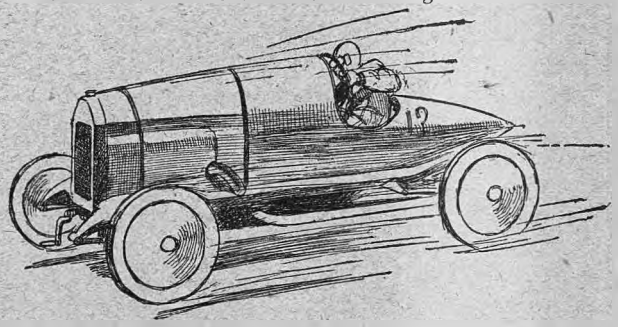
A sidecar and cycle car race (see *The Motor Cycle*).

Eighth Event.

THE EASTER SPRINT RACE.—For cars which have been timed to do flying laps at about 70 m.p.h. and over. About 2 miles. Starters:

	Bore and stroke.	c.c.	Start. m. s.
H. Boissy (30.0 Peugeot)	110×200	7,603	scr.
A. W. Tate (41.9 Mercedes) ...	130×180	9,557	0 10
Gordon Watney (48.6 Mercedes) ...	140×150	9,237	0 12
W. R. McBain (52.9 Lorraine-Dietrich)	146×180	12.054	0 22
O. D. Pollak (17.9 S.C.A.R.) ...	85×140	3,178	0 28
T. Cowper-Essex (48.6 Daimler) ...	140×150	9,237	0 30
H. C. Lambert (15.9 Crossley) ...	80×123	2,473	0 30
M. Campbell (24.8 Darracq) ...	100×160	5.027	0 33
W. G. Tuck (13.9 Humber) ...	75×130	2,297	0 35

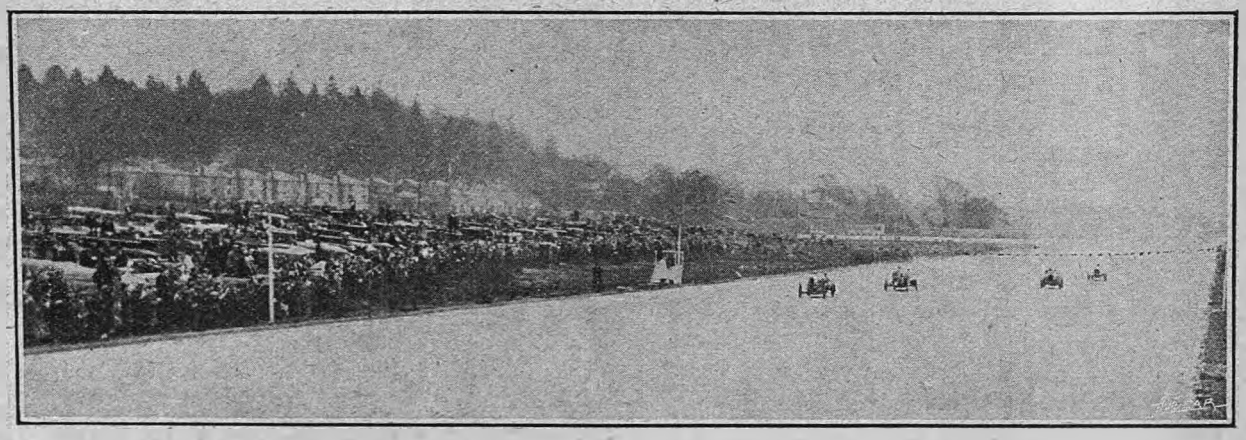
In this race the Humber came into its own carrying off the first prize by a clean start, which gave it a lead from its immediate neighbours, and a fine turn of speed which enabled those in front to be overtaken. The Peugeot had too much



The 13.9 Humber, driven by Mr. W. G. Tuck into first place in the Easter Sprint Race.

to do to get past so many in so short a distance, but after the Humber there was a fairly tight bunch, the entrance of the crowd to the straight being a very fine sight indeed. Result:

1. Mr. Tuck's Humber.
2. Mr. Boissy's Peugeot.
3. Mr. Campbell's Darracq.



The finish of the 100 m.p.h. Short Handicap, which was won by Goux on the Grand Prix Peugeot at 95¾ m.p.h.

The Bristol Branch of the Roads Improvement Association, at its last meeting, resolved to ask the Gloucestershire County Council to invite the assistance of the Road Board for the reconstruction of the roads from Warmley to the county boundary and Bitton Railway Station to Bitton, as their present condition is quite unsuited for the heavy motor and other traffic now using the roads. The dangerous nature of the high hedges within the area of the Bristol branch of the Association was also again prominently brought forward, and action is being taken to obtain improvement.

Parliament and the Road Board.

On Monday in the House of Commons Mr. Wedgwood Benn (Lord of the Treasury), replying to Mr. Charles Bathurst, said the grants made by the Road Board up to the present time for road crust improvement works amounted to £997,191, for widenings (including the improvement of corners and curves) to £85,391, and for new road construction (including road diversions and new bridges) to £85,814. The total sum paid into the Road Improvement Fund in respect of carriage licences and motor spirit duties up to the end of February was £2,998,343. Grants and loans to an aggregate amount of £2,687,000 had been indicated (including £997,191 formally made) by the Road Board to highway authorities, and £521,871 had been actually paid out under grants to various highway authorities throughout the kingdom. With regard to the development fund the cash balance was £296,743, and in addition there were invested funds which had accumulated to the extent of £2,500,000.

Members of Parliament are displaying considerable interest in the methods of the Road Board at the moment, and an attempt will be made (writes our Lobby correspondent) to raise a debate on the subject at an early date. With this object in view Mr. Bridgeman proposes to ask the Prime Minister if he will say what opportunity the House will have of discussing the administration of the Road Board Fund. Mr. Charles Bathurst will also endeavour to ascertain from the Treasury what portion of the sum of £85,391 granted by the Road Board for the purpose of widenings has been specifically allocated to and expended upon cutting off dangerous corners, and whether, considering the circumstances of the country districts he will represent to the Board the urgent necessity of devoting more of the Fund to this object. Meanwhile, the Select Committee on Motor Traffic continues to take evidence affecting motor omnibuses; at a later stage it will deal with the question of private motor cars

American and Canadian Characteristics.

Mr. Harvey Frost, who has just returned from a business tour of the United States and Canada, sends us some of his impressions. In the States he was surprised to find the best owners decidedly in favour of British-made vehicles, especially those showing originality in design and special finish in construction. Although "economy" is the watchword, motorists are keenly alive to the fact that hasty production and ill-digested design are wasteful in the end. The popularity of the small car means a large number of owner-drivers who take a pride in attending to small repairs and who welcome any really good labour-saving device. Smart appearance combined with first-class workmanship and finish seem to open the way everywhere, especially for British manufacturers. He was also struck by the business-like methods in the garages, everything being well arranged and no expense spared to keep every department in readiness for all classes of work. Tyre repairing he found to be a very important factor, and a very paying one. In most instances the tyre repairing department is separate from the other workshops or garages with the object of securing freedom from dust and dirt. Expense is not considered when good results are in view. In Canada, Mr. Frost says, the market for English goods is enormous. In addition to the reasons already mentioned in regard to the States, and which apply also to the Dominion, there is the additional factor of patriotism which is not a mere sentiment. Goods can be obtained from Europe at the same cost as from many of the far distant States, and as American produce is taxed much higher than that from England, the buyer has often the advantage of getting British goods at, or near, American prices. The actual inclusive cost of freight and duty on vulcanising materials sent from England amounts to 7½% on the initial cost, whilst it is 5% on the cost when purchased and brought from the adjacent American States. Canadians often pay, therefore, 2½% for their patriotism.

Trials of Electric Lighting Sets.

The following are the special regulations governing the certified trials of electric lighting sets in the competition for the cup offered by the proprietors of *Country Life* to be conducted by the Royal Automobile Club:

1. Entries must be made under the general regulations for certified trials. No entry will be accepted after September 15th, 1913.
2. The whole equipment must be entered for trial, and must be properly installed upon a car.
3. The distance run upon the road shall not be *less* than 2,000 miles.
4. All lamps (not less than two head lamps, two side lamps, and one tail lamp) shall be alight at the same time and for at least six hours every day.
5. The Technical Committee of the R.A.C. shall decide which of the performances as shown in the trials certificates is the best.
6. Any equipment which completes its trial before the 15th October, 1913, will be eligible.
7. The following data (*inter alia*) will appear upon the certificates, and any equipment entered for a certified trial in order to compete for the prize will be subjected to such tests as may be necessary to obtain such data:
   (*a*) Full description of equipment entered, including battery, and its fitting to car, together with weights of parts, and the wattage and candle power of the lamps.
   (*b*) Total distance run.
   (*c*) Number of lamps expended.
   (*d*) Wear of parts during trial and general condition after trial of the equipment, including accumulator.
   (*e*) The behaviour of the equipment at different car speeds on the various gears during tests on Brooklands track.
   (*f*) The convenience of the adjustments of the dynamo, control of the lamps.

A deer-hunting expedition by motor lorry is the latest novelty in the sporting line in America. A Mr. Willis, of Waco, Texas, with six of his friends, on a motor lorry traversed some of the worst roads in the wilds of Texas to the deer regions in the mountains. The lorry was loaded with about 12 cwts. of provisions and supplies, together with the tents and necessary equipment, and carried seven passengers. The trip lasted five days, and the party brought back with them a total of fifteen deer.

Sleeve Valve Patents.

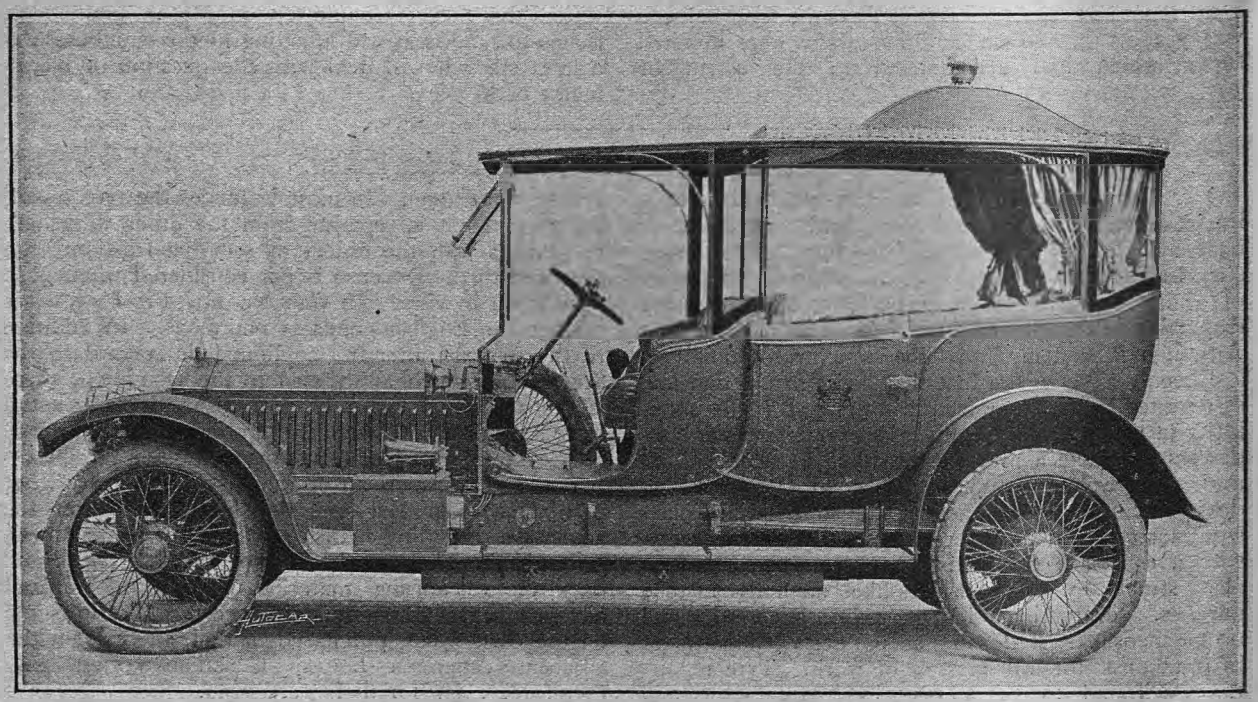
Argyll Engine Held to be No Infringement of the Knight.

THE Court of Appeal delivered their judgments in the case of Knight and Kilbourne *v.* Argylls, Ltd., on the 19th inst., the last day of the term. We briefly reported the hearing of the appeal in our issue of March 1st (page 371), and set out the main contentions of the appellants and the respondents respectively.

Lord Justice Buckley said the patentees' claim was for the combination of a cylinder with ports, a member telescoped with the cylinder, a piston in the cylinder, and means for imparting to the cylinder a movement substantially as described. This movement was the rectilineal movement set out on page 2 of the specification. The variability of the movement of the cylinder related to the covering and uncovering of the ports, and might exist as in the prior inventions of Dawson and King. The patentees were not confined to their drawings, but the claim was not for a principle but for the combination of parts. His Lordship drew distinctions between the heads, the ports, and the movements of the cylinders or sleeves in the plaintiffs' and the defendants' engines respectively. In his opinion neither the inefficiency of the Knight engine nor the mistake in the drawing was fatal to the validity of the plaintiffs' patent; in fact he considered the patent was good. But the defendants had not infringed, their movement was different and obtained by different means.

Lord Justice Hamilton was of opinion that Messrs. Knight and Kilbourne's claim was limited to the described mode of imparting movement. Means for imparting the movement were an essential part of the claim, and Dawson had found such means. If the claim were construed as for all or any means, it covered that which was not new; while if it covered only the specified means, the defendants did not infringe. The specification related to details, not principles, and the defendants' construction was essentially different. The Argyll engine was the first successful union of the sleeve valve and Otto cycle, and did not infringe the Knight patent. As to the mistake, not even the plaintiffs' counsel had any good to say for the drawings. Mr. Justice Neville, who had had the witnesses before him, had come to the conclusion that the defects in the drawings rendered the specification as a whole misleading, and he was not prepared to differ from him. The puzzle produced by the drawings was not of the kind to be solved by reading the specification.

Lord Justice Buckley intimated that the Master of the Rolls, who was not present in court on this occasion, agreed with the two judgments delivered, and therefore the appeal was unanimously dismissed with costs.



A STATE MOTOR CAR.—A 40-50 h.p. London-Edinburgh type Rolls-Royce, with a body by Messrs. Barker and Co., Ltd., built for the Nizam of Hyderabad. It will be noticed that the back part of the body is elevated to afford a raised seat for the Nizam. This seat is provided with folding arm rests, and there are also four collapsible seats in the interior. The domed roof is finished with silver beading and bordered with a massive silver fleur-de-lis pattern fender. A silver cap-of-maintenance surmounts the dome. The finish is a rich canary yellow with gold mountings, and old-gold silk brocade, laces and curtains. A C.A.V. dynamo lighting set, with silver-plated lamps, is installed.

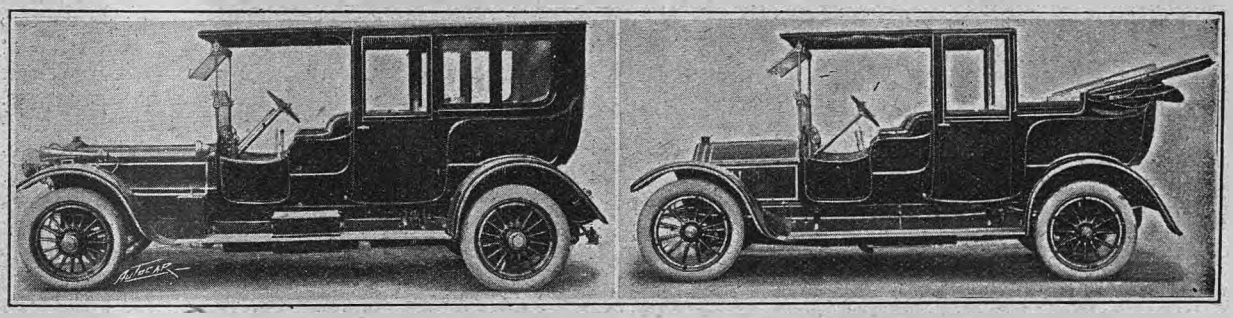
In acknowledging the description of the 15-30 h.p. Argyll, which appeared in our issue of March 15th, Mr. J. S. Matthews, managing director of Argylls. Ltd., says: "Our Mr. Perrot (the Argyll designer) frankly credits *The Autocar* with having made him think of diagonal brakes. The result is a triumph, but some of the papers are very slow to interest themselves in these brakes—this, I conclude, from the fact that *The Autocar* was the first to advance the idea"

The Grand Tour.

By Owen John.

NOTHING is new—not even a road guide. Because of an argument, I looked into a collection of old Baedekers, and amongst them I found a copy of Mr. Baedeker's "Manual of Conversation," printed in 1862, and was really an earlier one that had been "carefully revised and corrected by an Englishman." "*For the use of those travellers,*" ran the preface, "*whose residence is too limited in its duration to permit them to obtain any useful knowledge of the language of the country through which they may be travelling, the editor has added a number of brief questions upon the most ordinary topics.*"

I do not know if Mr. Baedeker still publishes this book, but the copy I have treats of almost prehistoric times, in that no mention, except in an added vocabulary, is made of railways or telegraphs, though the prevailing habit of driving in one's own conveyance brings it nearer home to the heart of the modern motorist than the usual guide books we get hold of to-day that talk of distances in railway fares and train hours. It is not a thick book, but it tells one all about everything in English, French, German, and Italian. Viewed with a modern eye, it might be deemed a trifle "swanky," but it must be remembered that travellers in those days had perforce to be men of wealth, and there were no coupons or cheap excursions to encourage the many.



A 57 h.p. Daimler limousine on the left and a 28-50 h.p. Mercédès limousine-landaulet on the right, specially built for and supplied to H.I.M., the Emperor of Japan, by Messrs. Hooper and Co., Ltd., 54, St. James's Street, London, S.W. The 28-50 h.p Mercédès affords interior accommodation for five people, three on the back seat and two on comfortable revolving armchair seats. The car is finished in red with black mouldings and gold lines. The interior is lined with drab cloth with lace to match incorporating the chrysanthemum. A special exhaust car-heater is fitted, and all the inside fittings are in mother-of-pearl and silver. The body on the 57 h.p. Daimler chassis is similar in size and design to that recently built by Messrs. Hooper and Co. for His Majesty King George V. It accommodates five people in a manner similar to the Mercedès, and is similarly finished.

Travelling then was the pastime of the rich, and how rich they were this little book tells. But even the rich have their troubles, and even the wealthy had to be as careful in drawing distinctions concerning the habits of their drivers as we have to-day. For instance, very early come these important phrases: (*a*) "The coachman is drunk," (*b*) "the driver is tipsy," which in the various tongues become (*a*) *betrunken*, (*b*) *berauscht*, (*a*) *ivre*, (*b*) *gris*, (*a*) *ebro*, (*b*) *brillo*.

But we are getting ahead. First of all we must arrive, and to do that we have to get across the sea. This is how they did it, and when we compare what was with what is—though the sea is ever the same, worse luck—we may rejoice for some things in that our lives are cast in less troublous times. I will let Mr. Baedeker tell his own tale very nearly right through.

"Gentlemen, they are going to sail and are only waiting for you. Get into the boat, gentlemen; take care not to hurt yourselves. I think the sea is very rough. The vessel is a great way out, and, if a gale of wind come on, the boat might upset before we can reach her!

"There is no danger.

"The wind increases! See that great wave which is coming to break against our vessel. *(Fancy looking out that in a book!)* I fear we shall have a storm: the sky is very dark toward the west. So far the wind is favourable and the ship sails well. But the sea is very rough, the waves are very high, the rolling of the vessel makes me sick. I have got a headache! The smell of the tar affects me! *(It's tar, is it? I never knew.)* I am very much inclined to vomit. Drink some Hollands; it will strengthen your stomach. I am very weak. I must lie down in my hammock. . . .

"Well, here we are safe and well; but not without having run some risk: what do you say of it, captain?

"On the contrary, gentlemen, we have had a very good voyage. We have made in a day and a half what commonly takes three, four, or even five days. *(That captain still lives.)*

"Take care that my carriage is not damaged in landing it from the boat."

But one generally purchased a carriage at Calais or Rouen or wherever one got to, and to be a carriage dealer where carriages had to be got rid of must have been a very paying job. This is how it was done.

Q.: I have a long journey to make, and I want a good and commodious carriage; have you one to sell?

A.: Have the goodness, sir, to walk into my warehouse, where you will see carriages of all kinds, coaches, berlines, vis-à-vis, post-chaises, calashes, phaetons, and cabriolets; there are plenty to choose from.

Q.: Here is a carriage that would suit me perhaps.

A.: It is a very neat good travelling chaise, although second-hand.

Q. (looking wise and, I expect, rubbing his chin): The wheels are in a very bad state, the body is too heavy, the shafts are too short, the pole is too thin, and the shape is quite old-fashioned.

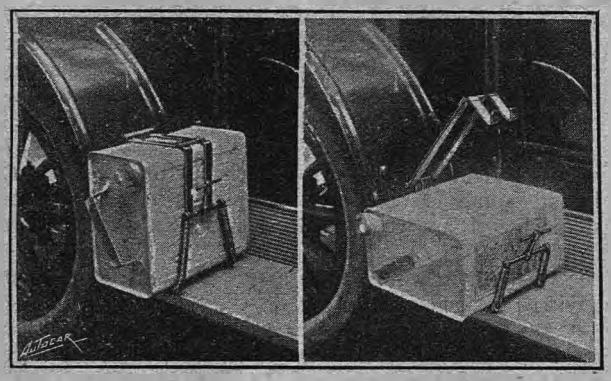
A (rather grieved): I beg your pardon, sir, you are mistaken; it is a carriage in the latest fashion, it is not six months since it was built, and it has been

The Grand Tour.

only one journey; but, if it is not to your taste, you can choose another. Look at that calash; it has four wheels and room for five persons.

Q. (not a whit abashed): Yes, I like the shape, but I am afraid the train, the axles, and the braces are too weak; see, the springs are too light.

A. (not a bit taken aback; I expect he was used to this criticism, and had a copy of his own): You fancy so, sir; but it is an elegant and strong-built carriage.



Two views of a spring holder for securing a spare petrol can to the running board. This had been introduced by the Hereford Motor Co., Hereford, and is made in two shapes for carrying the can either on edge or flat. It is sold finished in black, blue, or green enamel, at 7/-

Get in, you will find the seats very convenient; you see it is lined with fine cloth, and is very easy.

Q. (thinking about the price): I think the seats are too high and inconvenient.

A. It seems so to you, sir, because the stuffing of the cushions is new; but sit on the back seat, and you will find it very pleasant. *(Got 'im, I think.)*

Q. (last round): Is the axle tree strong? The nave, the spokes, the felloes, and the tyres of the wheels seem slight and weak.

A.: There is nothing to fear. All parts of it have been well selected and finished with care.

Q.: How much do you ask for it?

A.: Five thousand francs.

Q.: That is too dear for me; I cannot go to such a price.

A.: How much will you give?

Q.: I am afraid I shall say too little, even though I mention more than I am willing to give.

A. (suavely): You are at liberty, sir, to offer what you think it is worth; I shall not be vexed at that.

Q. (the true milord): You are an honest man. *(Joy of dealer.)* I will give you four thousand five hundred francs; but on condition that you also furnish the harness, the traces, the reins, and the splinter-bars for that price. *(Collapse of dealer.)*

I suppose he got his calash, for we next find him doing a bit of horse-coping. He pretends at first he only wants to go for a ride, but we will let him tell his own tale.

Q.: I wish to hire a horse to take a ride through the town and its environs *(Umgebungen)*. Have you one to let out? If I like it I might buy it. *(Tapping his boot with gold-mounted cane, I expect.)*

A.: Yes, sir, I have sorrel-horses, white spotted, dapple-grey, bay, grey, spotted grey, black, white, dun, spotted, pie-bald, and cream-coloured.

Q. (having recovered): I care little about his colour, provided he has not a bald-face and is handsome and tractable.

A.: Here is a horse five years old, perfectly well broke.

Q.: Mount him and make him trot and gallop; I must see he has no defects.

A.: Very well; the stable boy will put on his bridle and saddle, and you shall mount him.

Q.: This horse walks, trots, and gallops well; but he has the fault of kicking and rearing.

A.: I beg your pardon, sir, he is perfectly well broke, and quite gentle; but as he is a young horse full of spirit *(pulldro spiritoso)* you must neither spur him nor whip him. *(May I be forgiven?)*

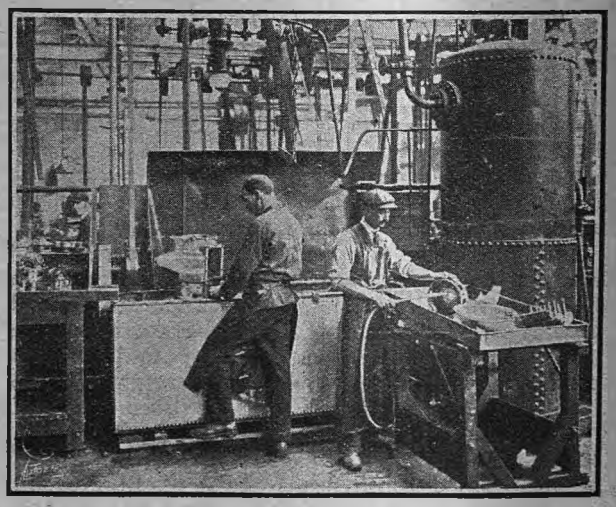
Q.: How much do you ask for him?

A.: Fifty pounds have been offered for him more than once, which I have refused; you shall have him for sixty.

Q.: That is very dear. Such a price frightens me! *(This fellow's brother keeps a garage.)*

A.: Examine, sir, the head, chest, and the legs of this horse. He is faultless in all points. His mouth is so fine that he could almost drink out of a glass.

Well, he was bought, and they began to set forth. But (quite rightly) our friends made much fuss as to whether their luggage was strapped on tightly, and then they cross-questioned somebody about the road itself. The author (a German) evidently got mixed up as to whether the road was paved or *pavé*—two very different kinds of surface—and gets a trifle at sea when he asks, "Can one go on the side without driving on the *pavé*?" I know what he means. Then he begins to worry about the inns. Are the beds clean? Can you get clean sheets easily? Sometimes, he is answered, it is difficult to get them at all. "Is living dear at the inns?" If you go with a *vetburino* or by the diligence it will cost you about four francs a meal, but six to ten if you go by the post. Does the diligence stop to sleep? Is the road safe? *(This is what must have given the old ladies the creeps.)* Do you ever hear of *robbers?* It is very safe, but still it is not prudent to travel after sunset. I have also heard that it is not prudent to travel along



After each unit of a Napier car has been through its test and before it is built into the chassis it is taken to pieces and scoured by the injection of paraffin under an air pressure of 100 lbs. per square inch. The photograph shows a base chamber and the outer member of the clutch being cleaned by this process, which should entirely remove the filings, scrapings and turnings so frequently found by users of some cars in the lubricants of the engine, clutch, gear box, back axle, etc.

certain parts of the road at daybreak. That's true, comes the answer, when there are woods, forests, or ravines. *(In a hushed whisper.)* Are the postilions insolent? No, never when they are well paid.

Gentlemen. It is time to set off. Take these two hats and put them in the vet. Put this cane and umbrella in the sword-case. Postilion, mind you go slowly when the road is bad, and when you make a turn; we do not wish either to be jolted or overturned. Go on the side of the road as much as you can, to avoid jolting, and then go quick. If you meet with ruts or stones, go on the pavement.

A.: I shall try to please you, sirs.

Q.: How fortunate we are to have fine weather.

A.: I am afraid it will rain; it is too hot.

Q.: Is this road safe? Are there any robbers on this road?

A.: It is very safe here; but when we have passed the bridge into the thick wood it is not very safe at night.

Q.: To whom does that palace belong?

A.: It belongs to Prince N

Q.: Postilion, stop; we wish to get down; a spoke of one of the wheels is broke; some of the harness is undone; a spring is also broke, and one of the horse's shoes is come off. . . . It begins to get dark. Do not leave us in the middle of the road during the night: whip your horses and get on, and be careful not to overturn us.

A.: You need not be afraid. We can now get to the post-house without any danger.

Q.: But the road is very steep and hilly; it is full of stones; there are precipices. Away from that ditch: it is a bog full of mud. You must put on the drag.

A.: If I put on the drag I must take it off again in two minutes; for at a few paces we shall get into a sandy road where the wheels will sink in up to the nave.

Q.: We should do well to get out, I think.

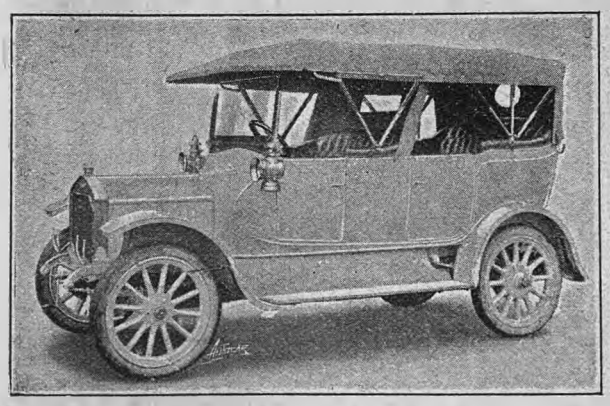
A.: I advise you not, for it has rained, and the road is slippery; in advancing one step, you lose two.

Q.: For my part, I shall get out of the carriage; I wish to walk a little.

A. (familiarly): No, my friend; it is dark; you do not know the road; you might make a false step; fall, and do yourself a great deal of harm; you might break an arm or a leg.

Q.: I shall ask these peasants.

A.: That's needless; here we are, thank God, at the inn safe and sound.



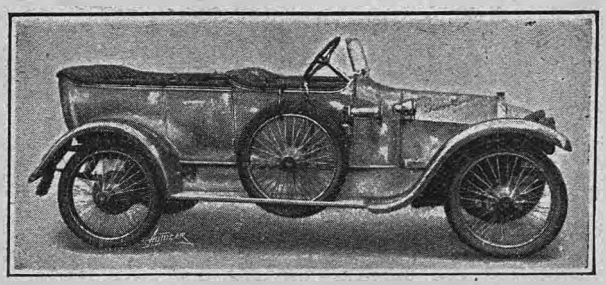
A 15 h.p. four-cylinder worm drive Albion car lately supplied to Mr. Chas. J. Grieve, Brauxholme Park, Hawick. The uncommon form of dash and side panelling should be noted.

The Grand Tour.

Having arrived, they order four good beds and determine to sup at the ordinary *(à table d'hôte)* and "thus hear some news," but before this they bid the waiter to "warm some water for us to wash with, and bring two bottles of good wine into our room with a decanter of water: we are very thirsty."

It is evident they had a courier, one Anthony.

Q.: Anthony, hear. When they put the sheets on our beds, do you be there, to see they are clean.



A 15.1 h.p. Mathis car with a polished aluminium body designed by Mr. T. V. West, Cheltenham, the metal work being carried out by Messrs. Kroll, Ltd., of Camden Town, and the wood-work and trimming by Messrs. W. G. Tibbles, of Cheltenham. The 15.1 h.p. Mathis has a four-cylinder engine with a bore and stroke of 78 × 118 mm. respectively. The tyres are 810 × 90 mm.

Host: Do not be afraid, gentlemen; in our house the same sheets are never given to two persons.

Supper being ready, our friend announces he has no appetite. "I could willingly," says he, "go to bed without any."

A.: Your appetite will improve as you eat. Come, come, there are some agreeable persons; you will be amused.

Q.: Good evening, gentlemen. Oh! Lord A., are you here? What has brought you into this country?

Lord A.: I am just come from Italy with my wife and the Marquis.

Q.: Lady A., I have the honour to present my respects to you. Were you much amused in Italy? Did you like the country?

Lady A.: Yes, sir, exceedingly. We were there three months without being wearied a single moment. I could have stayed there a year.

Lord A. (stuffily): Let us sit down; the supper is getting cold. We can talk at supper. Sit here by the side of my wife.

Q.: I shall be very well placed here opposite the Countess. Will you allow me to have the honour of helping you to some vermicelli?

Lord A.: No, sir, I thank you. I ate it so good in Italy that I do not choose to run the risk of eating it bad in France.

Q.: Yes, that is true; pastry is excellent in Italy.

After which they fall to in earnest, and thank each other for all sorts of viands, recommending such things as fried fish, ragoûts, endive, haricots, and mutton cutlets. "Sir," asks one, "will you take a pigeon or a quail?"

A.: Neither; give me some of that partridge.

Q.: Taste this *paté*, sir.

A.: With pleasure. Who chooses any hare? Here is some of the back.

Q.: What is there in that dish at the end of the table?

A.: It must be roast beef.

Q.: I have no more appetite. Pray, sir, what is there in that flask covered in straw before you?

A.: It is a liqueur; it is Maraschino.

The Grand Tour

Q.: Excuse me for tasting it before you.

A.: Don't mind that.

Q.: Waiter, go and fetch a corkscrew *(un rampinetto)* and draw this bottle of champagne. *(Pop, heard off.)*

Waiter: Drink it quick, sir, for it is very much up!

A.: Quick! Quick! Pass it to your neighbour on the right.

Q.: John, snuff the candles and give me the oil. What is that you are bringing?

John: A pike, which was swimming in the river five hours ago.

Q.: Allow me to have the honour of helping you.

A.: No, I thank you; I have eaten enough.

Q.: Does nobody eat any more? Take away and give us the dessert.

Lady A.: How! Grapes already? They cannot be ripe!

Q.: Madam, taste this apricot-marmalade.

Landlord (after much more): Have you made a good supper, sirs?

All: Yes, yes, yes. We are *(hic)* perfectly well satisfied.

Landlord: Sirs, I wish you a very good night.

All: Good night, landlord.

Lord A.: Let us play a game at picquet, that we may not go to bed with a full stomach. Waiter, bring cards.

Q.: For my part I shall go to bed. I wish you much amusement.

Myself: Oh! What a night!

(To be continued.)

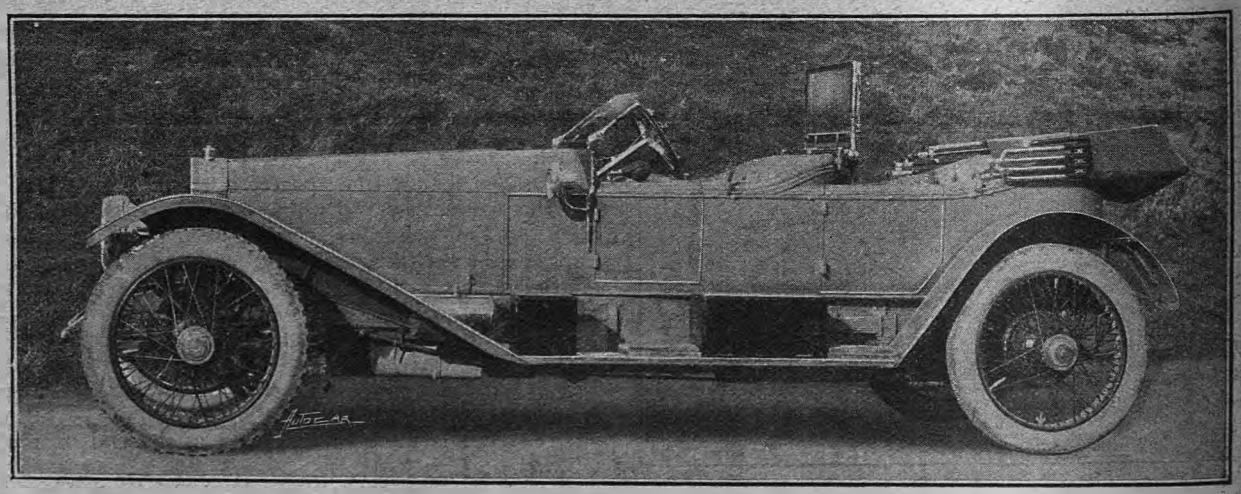
Three Years with an Elliott Speedometer.

IN the matter of mathematical instruments the name of Elliott has always been a word wherewith to conjure, and the good behaviour and durability of those used since youth upwards made us expect the best when it came to the employment of apparata like speedometers. Nor has disappointment followed in the train of our expectations. On our last three cars we have had in use a standard pattern Elliott speedometer, in which, as shown in the accompanying illustration, the speed indicating dial, with its running and maximum hands, is set above the distance and trip recorder. The dials are very clear, and either of them can be read at a glance. The small hand on the lower dial makes one revolution per mile of the small circle, which is marked in divisions representing 110 yards, or one-sixteenth of a mile each, while the long hand makes one revolution of the dial in a hundred miles, the circle over which it travels being divided up into divisions representing miles. The total dstance travelled from the time the instrument is fitted is shown in the four windows set across the face. The instrument can be fitted with a maximum speed indicating hand, a red hand, which is carried forward with the black hand, and left at the maximum point when the latter begins to retire.

The Elliott speedometer and distance recorder.

Friends riding on our cars have always remarked at the wonderful steadiness with which the needle in the upper dial indicates the speed of the car, no matter how rough the surface over which the car may be travelling. Its accuracy, too, when once adjusted by Messrs. Elliott Bros., has been remarkable, the error being, as far as we have been able to check it, not more than one-tenth to one-fifteenth of a mile in a hundred miles.

The instrument has registered altogether some fourteen to fifteen thousand miles, and has only been in the hands of the repairers upon one occasion for a very small defect. In this period also the driving-shaft or flex has only been renewed once. A dash-board bracket is supplied by which the instrument can be firmly attached and set at any desired angle. The price of the instrument shown in the accompanying illustration is £11 10s.



A sporting four-seater with taper bonnet and deep tapered scuttle on a Rolls-Royce chassis. The chassis is of the London-Edinburgh type, and may be distingnished chiefly by the rear suspension, consisting of inverted and centre hinged semi-elliptic springs.

Leaves from a Sportsman's Notebook.

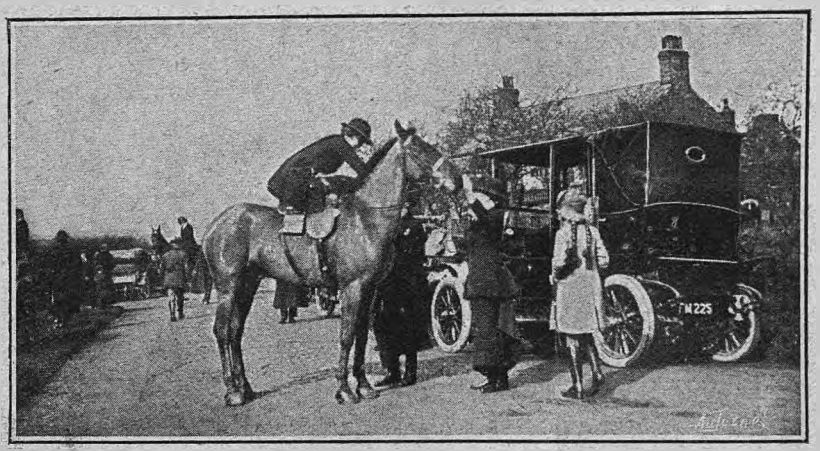
By J. Fairfax Blakeborough.

A Reluctant Ducal Request.

EXCEPT for the word "reluctantly" (which, unless it be ducal courtesy, I rather fail to understand in its present sense), the appeal of the Duke of Beaufort differs little from those of his contemporary masters of hounds during the last two or three years *apropos* of motorists and hunting. That word "reluctantly" has worried me. I am afraid my list of sporting friends does not go any higher than the Marquisate, though the Duke of Leeds once asked me "where the something I was going" when I nearly cannoned into him at a fence we jumped together when he was mastering the Bedale Hounds. This does not by any means prove friendship with a duke, does it? Failing this, I am not able to translate the word in its strawberry-leaved sense. It may be that His Grace of Beaufort has waited longer than other masters of hounds before making the request to motorists, in the hope that he would not have to make it at all; it may be that he is an enthusiast of the motor himself, and therefore is reluctant to banish those who have been following his hounds. Whatever construction you put on the word, as employed, it must be one of kindly courtesy; with this I leave it to you. The appeal runs:

> I am reluctantly obliged to ask those who have been following my hounds in motor cars kindly to refrain from doing so, as they have unwillingly interfered much with our sport, through heading foxes, and on one or two occasions with neighbouring packs some of the hounds have been seriously injured. There is no objection to motor cars coming to the meet, but I appeal to all sportsmen not to follow the hounds during the day in them.

There is a tolerance in the foregoing which demands respect—no dictatorial, high falutin' command, but a general appeal from a gentleman and a sportsman to gentlemen and sportsmen as such. One has little doubt that the Duke of Beaufort will find a ready response to the very proper request he makes in so considerate a manner. Reading between the lines, one would imagine that heretofore His Grace has refrained from saying anything on the subject, though cars have been driven after hounds. The heading of his own foxes and the injury to members of adjoining packs (I speak of canine members, of course) have compelled him—with reluctance—to issue the notice quoted.



WITH THE CHESHIRE HOUNDS. At a recent meet of the Cheshire Hounds a considerable number of cars were, as usual, in evidence.

A Warwickshire Appeal.

The Warwickshire Hunt Committee have issued an official notice requesting that motors be not driven nearer to fixtures than a quarter of a mile. To hunting people, who have sent on their horses, there is no hardship at all in this; indeed, it is often more convenient to mount at a distance from hounds and easier to find horses and get at them than amongst a crowd. A great many hunting folk have, almost from the inception of the car as an adjunct to hunting, adopted this plan. The hardship is to those who do not ride to hounds but love the picturesqueness of "the meet" (Assheton-Smith hated the term "meet") and like to watch the hounds and see the field assemble. Many of these have been in the habit of motoring miles from neighbouring towns to catch a glimpse of hounds, and not a few of them have respected masterial wishes and the sport of others and returned homewards so soon as the pack has moved away. The Warwickshire *fiat* will rob them of their pleasure. The *raison d'être* of it is probably a dual one—(1) to minimise the danger of horses being made restive at trysts and hounds being injured, and (2) to dispense altogether with motors at fixtures, and so put an end to the motor hunt—following brigade. The request may seem a little selfish on the face of it, but analysis will show that it is, after all, only made in the best

A group of chauffeur-grooms and groom-chauffeurs at a recent meet of hounds at Ascott House, Leighton Buzzard, the residence of Mr. Leopold de Rothschild. The fine tall man in uniform is, of course, "hors concours."

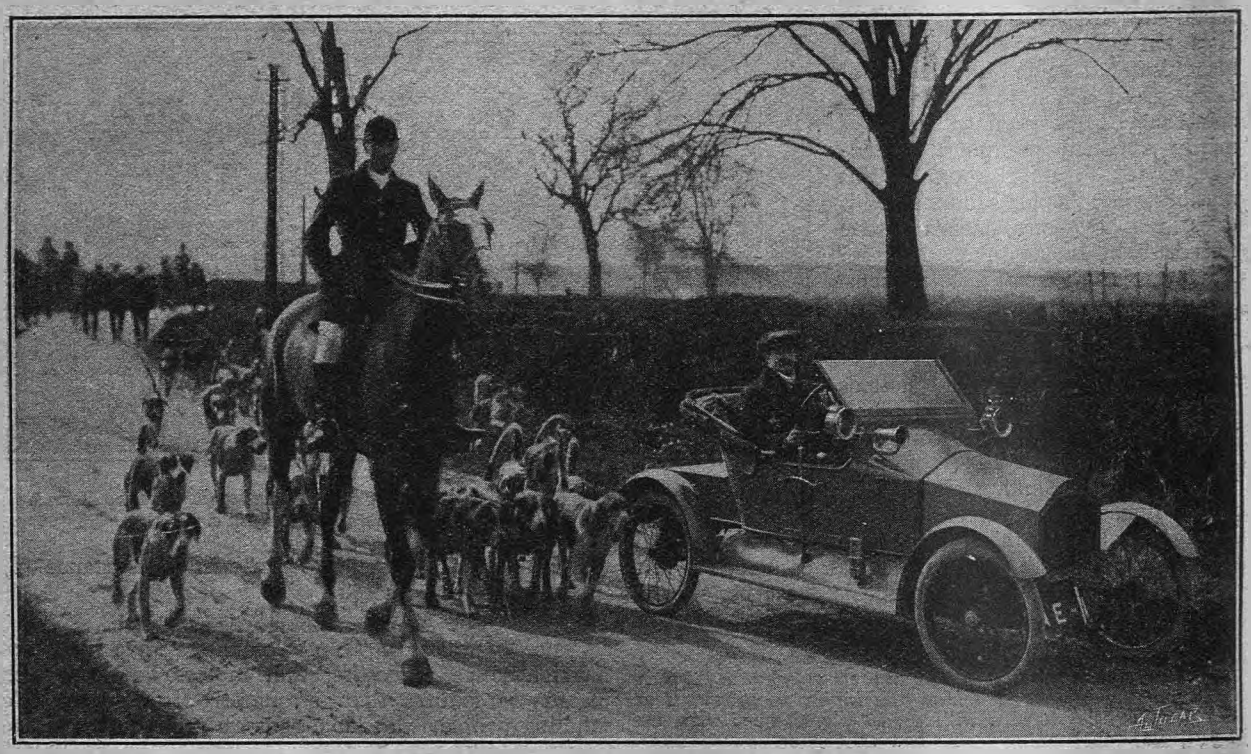
Leaves from a Sportsman's Notebook.

interests of sport. The late Squire Jack Bell, of Thirsk Hall, when once somewhat jeered at for not taking a nasty jump, said, "Thank God, in this land of liberty there is no law to make a man put his horse at a fence if he doesn't want," and probably some motorists will say likewise, "Thank God, in this land of liberty a man may motor to see a meet of hounds if he so wish."

The Reason Why.

After all, the masters of hounds are not making much ado about nothing, as some would suggest. Listen to a few sentences from the account of an incident which happened a short time ago with Lord Fitzhardinge's hounds, as chronicled by a *Field* correspondent:

"Unfortunately a motor car coming to pick up one of the field was so carelessly driven into a throng of horsemen and foot people surrounding the pack, that a bitch was run over and badly injured, though it is hoped, with care, to save her life. The Duke of Beaufort cites this incident in a notice issued by him forbidding motor cars any longer to follow his hounds; and doubtless Lord Fitzhardinge will do the same after this untoward experience."



MOTORS AND HUNTING. Going to the meet of the Badsworth Hounds at Wentbridge, on the Great North Road, between Doncaster and Pontefract. The miniature car on the right is one of the new Humberettes.

Speed Limit Applications.

THE inquiry into an application made by the Hertfordshire County Council for a reduced speed limit in respect of a portion of the Great North Road and certain side roads at Knebworth was held recently. The chief grounds for the application were the existence of a school and the presence of a cross-road. It was contended by the R.A.C. and the A.A. and M.U. in opposition that the school was at present adequately protected by school signs which had been supplied by the A.A. and M.U., and that the proper method of protecting the cross-road was by the erection of suitable warnings and proper regulation of the traffic at the cross-road, if necessary by a police constable.

The Bucks County Council having applied for a speed limit through Princes Risborough, a Local Government Board inquiry on the subject has been held. The Clerk of the Bucks County Council who appeared in support of the application referred to a resolution which had been passed by his council in August, 1908, to the effect that where continuous inhabited houses exist for a distance of a quarter of a mile on either or both sides of a highway the Local Government Board should be asked to impose a ten-mile speed limit upon motor cars at such places. The roads in Princes Risborough are unusually wide for a town of its size with adequate footpaths, and the only corners existing are easy curves presenting no difficulty of any kind to road users. It was shown that no accident had ever occurred in Princes Risborough with the exception of a case in which a dog belonging to a local inhabitant was run over and killed, and it appeared that it was in consequence of correspondence which had passed between the owner of the dog and the Parish Council that a resolution asking the County Council to apply for a speed limit was passed. It was contended by the objectors, the R.A.C. and the A.A. and M.U., that the application would never have been made had it not been for the resolution of the County Council referred to, and that unless and until Parliament laid down that a speed limit should be imposed in every inhabited area the Board would not be justified in complying with the application. Both matters are now under consideration by the Local Government Board whose decision will be made known in due course.

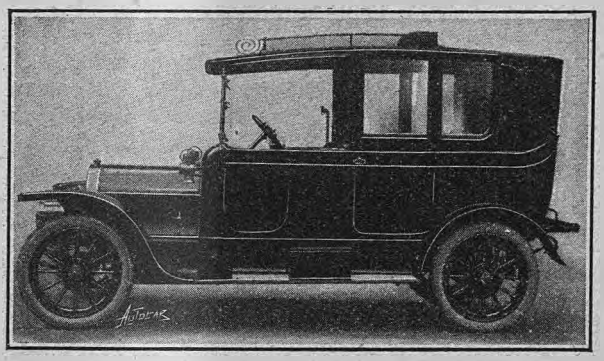
A.A. and M.U. Notes.

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

Whitcomb Street, Coventry Street, W.

Mirrors at Dangerous Corners.

Owing to the fact that a serious collision recently occurred at a dangerous corner in Canterbury between a motor car and a motor cycle, the City Surveyor, upon the instructions of his committee, wrote to the Association for information with regard to the practice of fixing mirrors on the sides of the roads at dangerous places so as to reflect approaching vehicles



A 17 h.p. Maudslay car supplied to a lady customer by Messrs. Sydney Westall & Co., 74, Great Portland Street, London, W.

and warn drivers. The Association has supplied the required information, and has also promised to inspect this danger spot, and to erect, if necessary, warning signs.

Special Work by Patrols.

The daily reports sent in by the A.A. and M.U. road patrols often refer to services of great value rendered to the general public, also to the local authorities. Last week the roadside telephone sentry box at Maidenhead Thicket was freely used by the police in tracking down three burglars who were escaping across the open country. For nearly two hours the patrol on duty was telephoning information to the police, and the men were finally arrested in Cherry Garden Lane. The evidence of another patrol who saw a man drunk while in charge of a car in the Midlands led to the man being fined. On the 16th inst. the patrol on the Doncaster-Barnby Moor road saw a driverless horse, attached to a light cart, running away. Dismounting from his bicycle, he was successful in getting in at the back of the cart and securing the reins

Latest Road Information.

CHESHIRE.—Members are warned to slow through Altrincham and Northwich.

GREAT NORTH ROAD.—Members are warned to slow through Seaton Burn, in Northumberland.

LAKE DISTRICT.—Kendal-Keswick Road: The making of the new road at Ings between the 6th and 7th milestones is still in progress

LANCASHIRE.—Road widening still in progress between Little Marton and Blackpool, protected at night; alternative route *vid* Moss Side and Lytham for Blackpool. Preston-Garstang Road: Members are warned to drive carefully between Withy Trees, Fulwood, and Broughton Village, also through Garstang. Blackpool-Poulton Road: Special care is necessary through Poulton-le-Fylde and district. Preston-Blackpool Road: Full width in bad condition on Brockholes Hill, two miles east of Preston.

YORKSHIRE.—Otley-Addingham Road: In bad condition on the main road, Burley in-Wharfedale being full of holes.

COVENTRY ROAD.—In bad condition right through, owing to loose metal. Caution is necessary at Hockliffe at the turning for Northampton, as new metal is being laid full width from the corner for about 100 yards, roller working. Tramlines are being repaired at Yardley and traffic is diverted.

LONDON-YARMOUTH ROAD.—Tramlines are being repaired in Lowestoft and road is completely blocked; alternative route, turn left along Bevan Street, then right along Clapham Road, then along Surrey Street or Gordon Road. Work has been resumed at Gunton, one and a half miles north of Lowestoft, half width, lights at night.

NORWICH-AYLSHAM ROAD.—Bridge at Hevingham still under repair; temporary bridge at Ingworth.

NORWICH-IPSWICH ROAD.—Broken bridge at Newton Flotman which cannot be seen until within twenty-five yards; great care is essential here.

ROYSTON-CAMBRIDGE ROAD.—New water main being laid through the village of Melbourne, lighted at night. Control likely to be working on the Newmarket-Trumpington Road.

BARNSTAPLE-LYNTON ROAD.—As the Shirwell route is being repaired and the Loxhore Cott route is in bad condition, members are advised to proceed *vid* Chefham and Bratton and Fleming.

BIDEFORD.—The whole of the Quay front is being relaid with stones from the end of the bridge to the corner of Bridgland Street, half-width Also, on Bideford Bridge there are some repairs in hand, and caution is necessary.

EXETER-BARNSTAPLE ROAD VIA CREDITON.—This road is in a most shocking state from Crediton to Barnstaple, especially between Lapford and South Molton Road.

BRIGHTON ROAD.- Control likely to be working in the Bletchworth ten-mile limit.

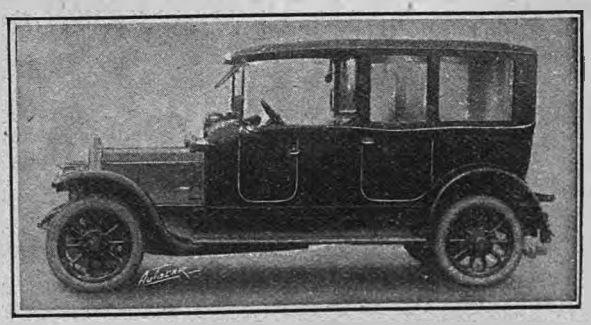
KENT.—Control likely to be working between Foots Cray and Swanley, at Sidcup to and from London, between Eltham and Lee, and also near the Bull Inn at Birchwood.

LONDON DISTRICT.—Controls are likely to be working at London Road, Figgs Marsh; High Road, Streatham; Streatham Road, Mitcham; Morden; Sutton; Shooters Hill Road, Charlton; Finchley; Kingston Hill; Putney; Wandsworth Common; between Enfield tram terminus and Waltham Road; Sunbury and Staines; Bedfont and Staines; between Finsbury Park Station and Manor House, N.

SOUTHAMPTON ROAD AND HANTS.—Winchester-Bournemouth Road: Under repair at Iford Bridge, full width; alternative route over Tuckton Bridge, where toll is paid; under repair at Hursley, full width. Southampton Road: Under repair between Staines Bridge and Egham, and between the 20th and 21st milestones from London.

SURREY.—Kingston-Leatherhead Road: Members are warned to slow down between Chessington and Hook as a control may be working. Portsmouth Road: Flashlight controls are likely to be working between Kingston and Esher. Control likely to be working between Epsom and Ewell. Repaving in Bridge Street and High Street, Godalming; alternative route, Chalk Road and Borough Road. These repairs are in hand full width, and will be carried on until May. Tarring has commenced on the Hog's Back, Guildford. Control likely to be working in the twenty-mile limit at Dorking.

SUSSEX.—Guildford-Chichester Road: Under repair one and a half miles from Petworth full width.



A 25 n.p. Talbot limousine, delivery of which was recently taken by Mr. F. C. Garrick, Roughwood Croft, Chalfont St. Giles, Bucks.

The Pearson-Cox Steam Car.

A Detailed Description of the Engine, Generator, Burner, etc., of the 1913 Model.

IF only because of the radical differences between a steamer and the now more ordinary petrol car, the Pearson-Cox design is of peculiar interest, an interest accentuated by the inherent cleverness and sound workmanship with which the design and construction have been carried out.

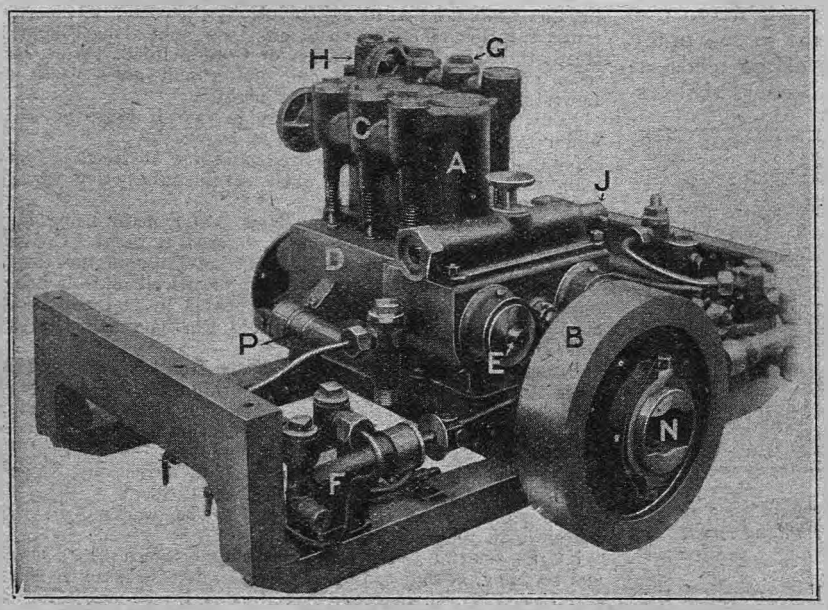


Fig. 1.—The Pearson-Cox three-cylinder engine on its bedplate.

A, cylinders
B, flywheel
C, exhaust valve pockets
D, crank case
E, end of exhaust camshaft
F, fuel pump
G, inlet valve pockets
H, throttle casing
J, lever operating sliding camshafts
N, socket of front universal joint of propeller-shaft
P, fuel hand pump

The car has a three-cylinder single-acting engine driven by the steam supplied from a semi-flash tubular boiler. This latter is heated by a lamp using vapour obtained from paraffin, or shale oil, that has been passed through a coil of pipe heated from the lamp itself.

Water is supplied to the boiler by a triple, or three barrel, reciprocating pump, the plungers of which are operated by eccentrics worked off the tail end of the crankshaft, and the amount of water injected to the boiler is varied to requirements by the control lever on the steering wheel which, when restricting speed, by-passes the supply back to the tank. The middle one of the three water pump eccentrics is also used to actuate a somewhat similar single pump that supplies the oil to the burner. The oil pump, which is single-acting, and has a 7/8in. stroke, draws oil from the main tank to supply at pressure to an auxiliary tank, whence the burner is fed, and as this auxiliary tank is gas-tight, and the oil at pressure displaces the air by compressing it to the top of the tank, a constant, steady, and elastic pressure—it should be 38 lbs. to the square inch—is available to feed the burner. This pressure can be maintained for some two hours, and if the car be kept standing for longer than that and the pressure allowed to fall, or for starting operations at the beginning of all things, a very convenient hand pump is used for raising the pressure.

A hand pump for starting is also provided on the feed water supply system, and when this is in action, a careful study of the pressure gauge will show how rapidly the steam pressure can rise, the needle going up quietly and steadily, for the boiler is not of the full flash type.

But to return to the burner: oil is forced from the tank through the vaporising coil located above the burner (fig. 3), where it is never raised to a temperature much above 500° Fahr. As this is considerably below the temperature at which the oil cracks, no decomposition takes place, and consequently no soot is deposited in the vaporiser, while the fuel is delivered to the jet in the form of pure vapour.

The jet of this latest model embodies two new features. The first of these is the enclosed needle valve control. As in the previous models a tapered needle regulates the flow of fuel through the jet, but whereas this needle valve used to extend through a gland at the bottom of the valve casing, it is now entirely enclosed together with the one arm and rocking shaft of the bell crank lever

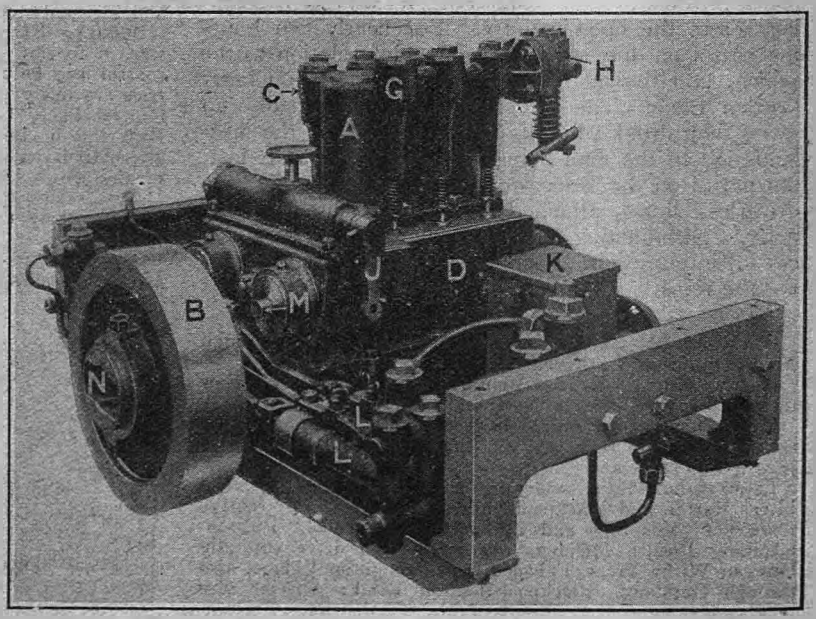


Fig. 2.—Off-side view of the Pearson-Cox steam engine.

A, cylinders
B, flywheel
C, exhaust valve pockets
D, crank case
G, inlet valve pockets
H, throttle casing
J, lever operating sliding camshafts
K, lubricator
L, water pumps
M, end of inlet camshaft
N, socket of front universal joint of propeller-shaft

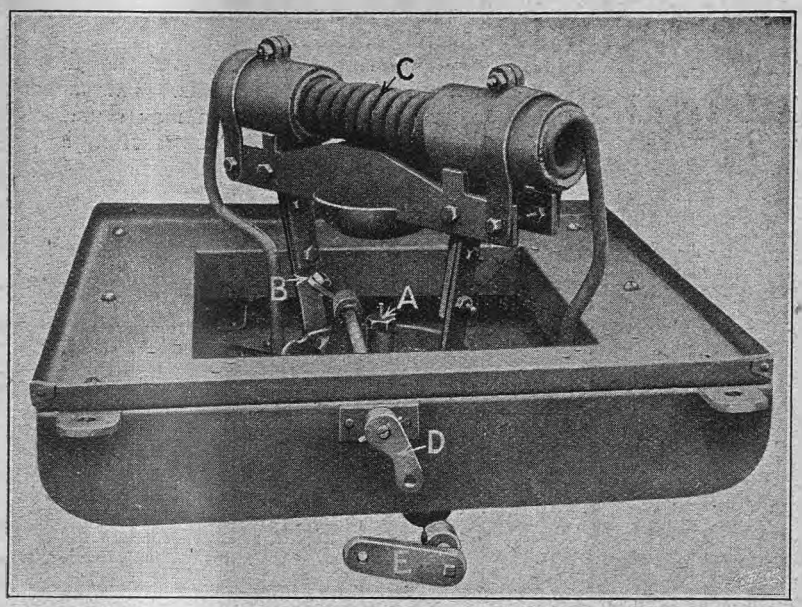


Fig. 3.—The vaporising coil and fuel jet.

A, jet
B, hinged nipple jet
C, vaporiser coil
D, lever operating hinged nipple jet
E, lever operating taper fuel valve

that operates it (see fig. 4). Also the gland has now been removed to the far end of the operating lever rocker shaft, and is only subjected to partial rotary movement instead of the reciprocating motion of the needle valve, as hitherto; with this arrangement there is no tendency for the valve to stick.

Now this taper needle in the jet causes the flow of fuel to spread as soon as it leaves the jet, and consequently a comparatively diffused flame is the result —quite sufficient for standing but not enough for running. Consequently a nipple jet is fixed like the arm of a lever on a rocking shaft that can be actuated through the usual lever arrangements by the driver, so that it can be swung over and come on top of the ordinary jet. Though the nipple jet is of the same diameter as the other, the upper corner, so to speak, of its bore catches the flow of paraffin just as it is spreading, and not only prevents dispersal, but tends to concentrate the jet. The effect, indeed, is much the same as that of a choke bore gun; the flame is prevented from spreading, and, being concentrated, is longer, able to reach higher, and take effect upon the upper tubes of the generator. Without the nipple jet and with the burner turned down low, with the car standing, 1.5 pints are consumed to the hour, while with the nipple jet and burner full on, the consumption works out to 2.27 gallons an hour, which is capable of giving an average of from 12 to 14 miles to the gallon of paraffin, according to road conditions. To start, the cold oil issuing at pressure from the jet can be ignited without trouble, and soon after it has been lit, the vaporiser is hot enough to convert the fuel from liquid to vapour, yet it is claimed that the burner never lights back.

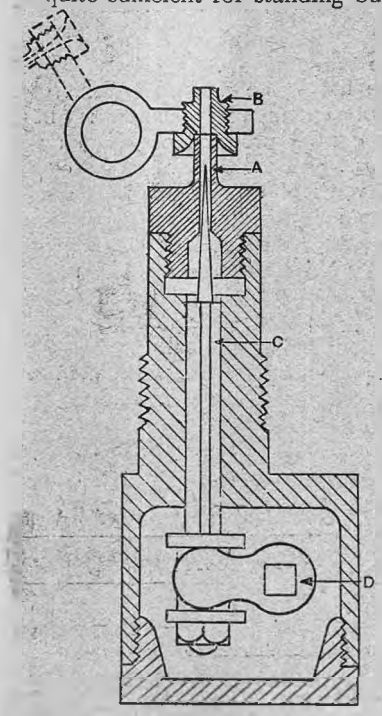


Fig. 4.—Section of the burner jet and control.

A, jet
B, nipple jet
C, triangular section needle valve controlling fuel supply
D, lever acting upon fuel valve and connected to lever E in fig. 3.

The Generator.

Turning now to the generator, the diagram (fig. 6) will show how the heated tubes, of which it is practically made up, are led so as to give the best effects in heating the water and steam during the course of its generation. In total length the tubing amounts to 140ft., and in the newest design the diameter has been increased from 5/8in. to 21-32in. It needs but little more than our diagrams to explain how first the water is forced into the heated generator tubes by hand pump, and how, when the steam from this drives the engine, the pumps are worked and continue to maintain a constant supply.

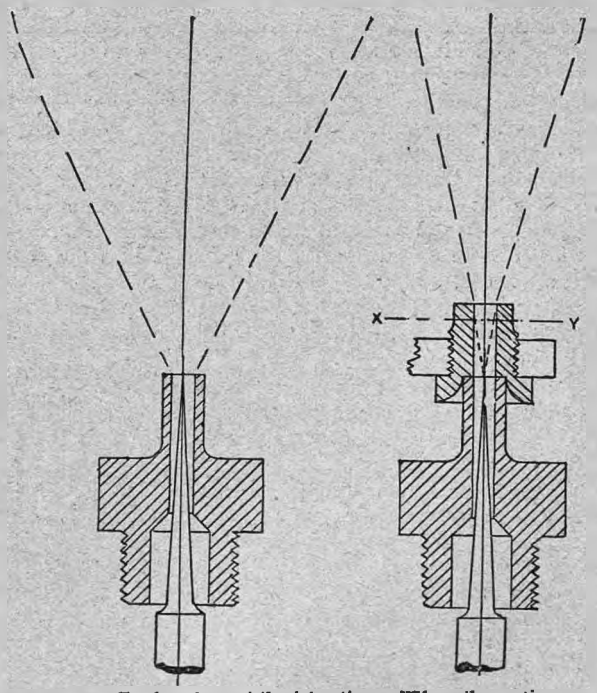


Fig. 5.—Explanatory of the jet action. When the engine is stationary the jet is without the nipple, as in the left-hand diagram. The fuel vapour flow then being free passes at a velocity sufficient to induce its own air supply, but when the engine starts and the "choke" tendency of the nipple is brought into action, as in the right-hand drawing, the velocity is decreased by the vapour impinging on the jet sides on line XY, and consequently less air is entrained. But with the engine running more air is wanted, and this deficiency is made up by the induction fan hereafter mentioned.

The Pearson-Cox Steam Car.

As the tubing of the generator is capable of withstanding out-pressure of 7,000 lbs. to the square inch, the actual working pressure, ranging from 150 to 400 lbs. to the square inch, puts no great tax on the construction, and by the time the steam issues from the boiler, it has been superheated to a temperature of 800° F. This superheating means that a large margin of heat is imparted to the steam, which enables it to come in contact with the relatively cooler cylinder walls and yet not condense; and this avoidance of condensation losses means not only material economy, but elimination of the danger of water forming in the cylinders and leading to their consequent breakage.

Disposal of Exhaust Gases.

But we have not yet done with the burner. The tubes forming the generator are enclosed in a sheet steel casing, which also serves to guide, so to speak, the flame of the burner over the tubes.

But some means are required for increasing, according to engine requirements, the draught on the burner when the engine is running, and, therefore, at the point of outflow of the burner gases from the generator a turbine fan driven from the engine is fitted, as shown in fig. 8. This

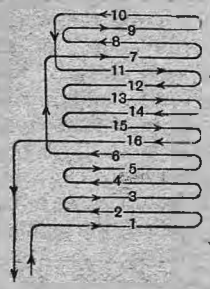


Fig. 6.—Diagram explaining the water circulation in the Pearson-Cox generator. The arrows show the direction of the steam and water flow.

induces the draught, and consequently the burner flame, in proportion to the speed at which the engine runs, but to deal with gases at such temperatures—sometimes up to 1,500° F.—is an exceedingly difficult matter for a fan, owing to the contraction and expansion of the blades. Accordingly, a very special design has to be employed in which the blades are each practically made of two steel plates overlapping each other to allow the slight necessary movement by expansion. The fan is of the outflow type—that is to say the gases leave the generator at the centre of the fan, which then catches them and throws them outwards, at high velocity, into the outer atmosphere, but as the fan is enclosed around the upper half of its periphery, the gases are passed downwards, and thus kept away from the occupants of the car.

But, while such an arrangement will regulate the draught to the speed of the engine, it does not do so to all engine requirements, for when the car is ascending a hill, or when the engine is running at any time slowly but under heavy load and requires a comparatively large supply of steam, the fan at comparatively slow speed is causing comparatively slow draught. The draught on the burner, indeed, though in general more or less proportionate to the engine speed, should be always proportionate to the steam used, and for this reason, therefore, the gases are further induced, at a point just before they reach the fan, by the exhaust steam of the engine led through fifteen 1/8in. diameter jets, and these regulate the draught proportionately to the steam that the engine is using. Thus by the combination of fan and exhaust jets the draught is balanced to all engine requirements. This arrangement of fan and jet in description may sound complicated, but in fact the whole construction is perfectly simple.

Engine Details.

Turning now to the engine, which has three cylinders very simply formed in one casting, as the use of superheated steam is particularly severe on glands and sliding valves, the single-acting principle and poppet type valves are employed. In bore the cylinders are 61 mm., while the stroke has been increased from 61 mm. (2⅜in.) to 76 mm. (3in.). As the pistons receive impulses on each down stroke, the turning effort of a three-cylinder steam engine is equivalent in evenness to that of a six-cylinder petrol car, or rather more so, seeing that the steam gives a much more evenly maintained pressure than the explosion of a petrol charge. In the mere manner of their lifting and closing the valves differ in no way from those of an ordinary petrol engine, but as the principle of valve working with steam is so different from that of the internal combustion engine, in this latest model important modifications have been introduced in the cam profiles.

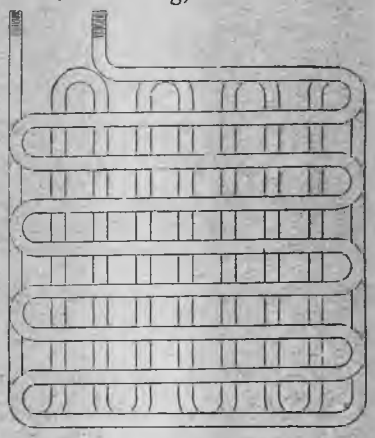


Fig. 7.—The arrangement of two layers of generator tubes.

Expansive Working of Steam.

For economy steam has to be worked expansively, and the principle of expansive working is best explained thus. If the total pressure of steam on a piston be, say, 100 lbs., and the stroke of the cylinder is 6in., the total work of that piston in a single stroke amounts to 600 inch-lbs. (50 foot-lbs. if preferred). Fig. 9 represents such a cylinder, A B as the bore, B C as the stroke. We may, therefore, regard the total figure ABCD as representing graphically the amount of steam supplied at boiler pressure to the cylinder in a single stroke, and if at the same time we regard

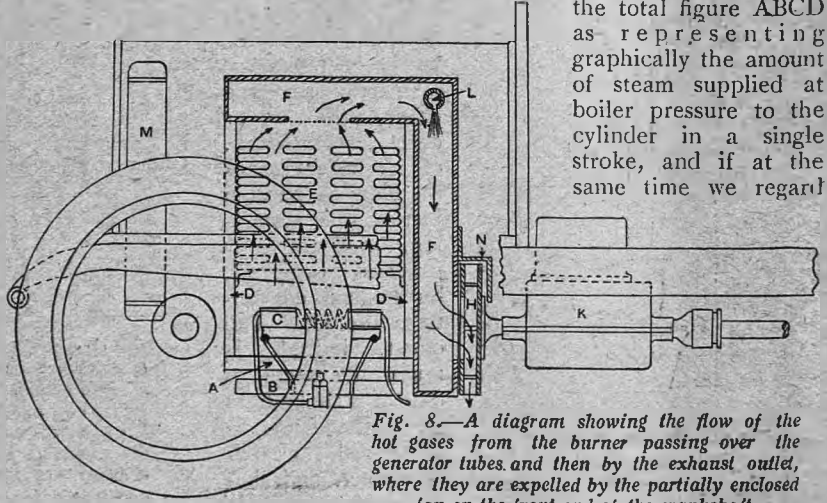
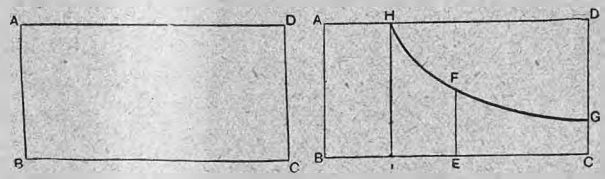


Fig. 8.—A diagram showing the flow of the hot gases from the burner passing over the generator tubes and then by the exhaust outlet, where they are expelled by the partially enclosed fan on the front end of the crankshaft.

A, air inlet passage to burner tray
B, burner tray
C, vaporiser
D, generator casing
E, generator sections
F, generator flue
H, centrifugal fan
K, engine
L, exhaust steam jets
M, condenser
N, fan guard enclosing top half of fan outflow

A B as indicating the total pressure on the piston and B C as the stroke, the total figure A B C D may also be taken as representing, in inch or foot-lbs., the amount of work done by the piston in a single stroke. But supposing that we cut off the supply of steam from the boiler when the piston has only travelled a quarter of its stroke, the steam pressure in the cylinder still continues to act and force the piston outwards, and still does work on the piston, although as the piston continues to move out and the quarter cylinder full of steam has to fill a larger space, it naturally falls in pressure. By Boyle's law the pressure of gas is inversely proportional to the space it occupies, and thus by the time the piston has reached half-stroke, the original quarter-cylinder full of steam, having to fill twice its original space, has dropped to half its pressure; this at half-stroke may, therefore, be represented by the height of the line E F (fig. 10). Taking a fresh start from here by the time the piston has reached the end of its stroke, the steam again has to fill double the space that it did at half-stroke; consequently the pressure has dropped to half that represented by E F. Let C G represent this final pressure,



Figs. 9 and 10.—Diagrams representing full pressure throughout the stroke, and the expansion of steam with the supply cut off at quarter stroke.

and if we were to work out the pressures all along the stroke, we should find that a line like H F G would represent the fall of steam pressure in the cylinder throughout the stroke. Judging this diagram on the same basis as that in fig. 9 it amounts to this, then; that while A B I H represents the amount of steam used, the work done by that steam on the piston is represented by the fig. A B C G F H, and though the total amount of work is not as much as when steam at full boiler pressure is admitted to the cylinder throughout the stroke, as in fig. 9, yet for the amount of steam used, the work obtained in the second case is far greater than in the first. Obviously, therefore, if we employ four cylinders cutting off steam at quarter stroke, we shall obtain much more useful work from them than a single cylinder of the same size, taking full steam pressure for the full length of its stroke, although the four cylinders in this case use no more steam than the one. Of course, in this expansion, no account is taken of other losses that occur in actual practice, but it is sufficient to explain the principle of the often mentioned method of using steam or pressure gases expansively.

On the foregoing basis, therefore, obviously if we cut off our boiler steam supply early in the stroke, we use our steam economically, and if we cut it off late in the stroke, though we shall not be obtaining the same value in *power for steam used*, we shall still be getting considerably more *actual power*. The relative amount of this extra power in figs. 9 and 10 is shown by the area H F G D in the latter diagram.

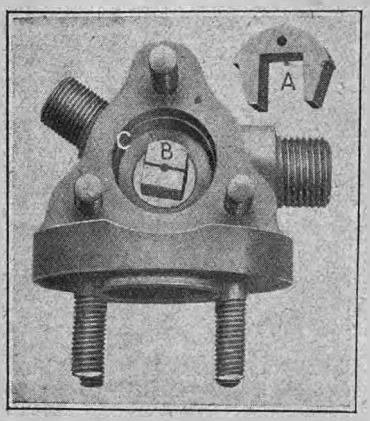


Fig. 12.—The throttle valve and casing. The actual valve A is seen detached; it is rotated in its casing C by the square headed shaft B, and moves thereon, to be held steam tight against the casing by the steam pressure behind it.

Accordingly, when we want extra power for short periods, as in going up a hill, we can obtain it by making the point at which the steam supply to the cylinder is cut off later in the stroke. Such a method may not, strictly speaking, be economical, but the waste for such short periods is more or less negligible, although it would not be a commercial proposition to run for long periods like this.

The Camshafts.

It has already been explained how in the Pearson-Cox car the burner draught, and consequently the steam supply, can be varied to the requirements of the engine, which adjustment, being brought about by the work of the engine itself, is obviously dependent on the handling of the throttle valve, but for economical working the variable expansion system is also adopted. As in any case steam has to be admitted at the beginning of the stroke, variable expansion becomes only a matter of allowing the inlet valve to close earlier or later, according to requirements, and this fact is simply obtained by designing the inlet camshaft to slide so that it can bring under the tappets varying widths of cam profiles to give various lengths of inlet valve opening periods. In fig. 11 the inlet valve camshaft is shown above, and this, when in such a position as to bring the narrow part of the cam face under the valve tappet, admits steam to the cylinder for only a short length of the stroke, and consequently uses the steam most economically to its utmost expansion. As a matter of fact, with this end of the cam in action, the steam supplied to the cylinder is cut off when the crank has turned only 60° on its working

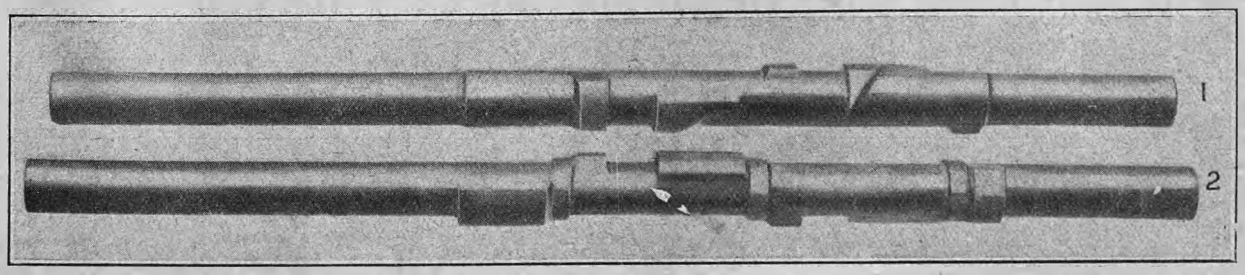


Fig. 11.—The sliding camshafts—inlet (1) at the top and exhaust (2) below.

The Pearson-Cox Steam Car.

stroke, but if we slide the camshaft along, the valve opening period will be longer and longer until by the time the widest end of the cam face is under the valve tappet steam continues to be supplied to the cylinders

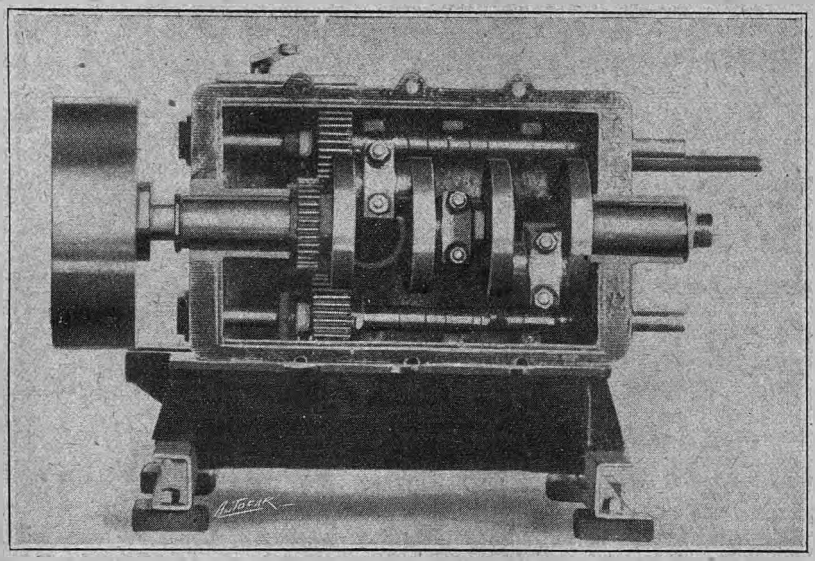


Fig. 13.—An under view of the engine, with the lower half of the crank case removed.

almost till the end of the stroke—through 160° of crank revolution to be exact—consequently, since steam can be admitted to each cylinder through such a wide range of movement, if one crank is on its dead centre steam can always act on another.

Roughly speaking, then, with the narrow end of the cam in action, steam is being cut off at about 25% of the stroke; with the wide end of the cam it is not cut off till approximately 97% of the stroke has been traversed by the piston. The sliding of the camshaft is regulated by a lever held in the required position at various notches on a corresponding sector plate. It will be noticed that the narrow end of the cam face is of some length; this is to give greater bearing surface, because it is in this position that the engine practically does all its running. Only special requirements of the most temporary nature require a later cut off; indeed, even for a really stiff hill the camshaft has to be moved only one or two notches.

So much for the inlet valve; the exhaust valve, of course, requires no such variation. It is similar to that of the petrol engine only with later timing, opening with the crank pin at a point about 10° from the bottom dead centre and closing again at 15-20° before the crank pin reaches its upper dead centre, this early closing giving cushioning of some sort to the pistons.

The photograph, however, shows two sets of cams; one set is for the forward running, the other for the reverse, and the latter on the inlet camshaft is seen to be of a much simpler shape than the forward gear cam. This is because so little running is done in reverse that variable cut-off of the steam supply would not be worth while. Forward or reverse rotation of the engine is obtained merely by sliding the camshafts along so as to bring either set of cams under the tappets as required, but both camshafts are so designed that, when in midway position, neither set of cams is in action, and the exhaust valve tappets rotate on the rings turned on their camshaft, preventing the exhaust valves from shutting while the inlet valves, running right down on the shaft circumference, between the back and forward motion cams, never open. Thus the engine in neutral sets up no back pressure.

A Special Lubricator.

One of the difficulties of the designers of this engine has been to get a suitable type of lubricator, and this they have at last been compelled to manufacture for themselves. The wormshaft of the lubricator is pulley driven from the engine, and its worm engages with a worm wheel giving the shaft it drives a gear reduction of 50 to 1. On this worm wheel shaft an eccentric cam is also secured, and this operates a single action plunger pump, the return stroke of which is caused by a helical spring. All this mechanism works within the tank of the lubricator (seen in fig. 2), which, though it contains barely two pints, can, it is claimed, supply enough oil for 150 miles of travelling.

The Throttle Valve.

The supply of steam to the cylinder is also regulated by a floating type of throttle valve, shown in fig. 12, in which the valve is shown separately. It fits over the square end of the regulator spindle working in the valve chamber, so that the pressure on the back of the valve forces the latter (which is free to slide in that direction on the square spindle) against the wall of the cylindrical valve chamber on the outlet side, so that the pressure of steam itself ensures the necessary steam-tightness.

After being used in the engine, the steam is passed through a condenser, consisting of a series of copper wire gilled tubes placed in the usual radiator position, which enables the car to run some five or six miles to the gallon of water, according to road conditions, and as the capacity of the water tank is fifteen gallons, the car has a range of some seventy-five to ninety miles without having to fill up.

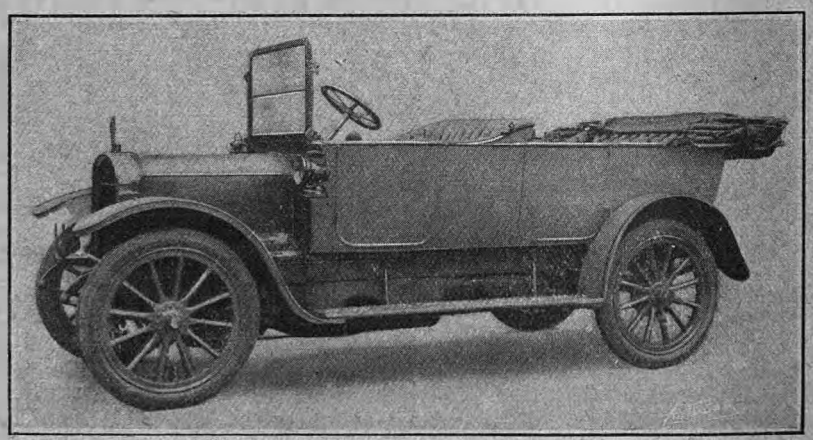
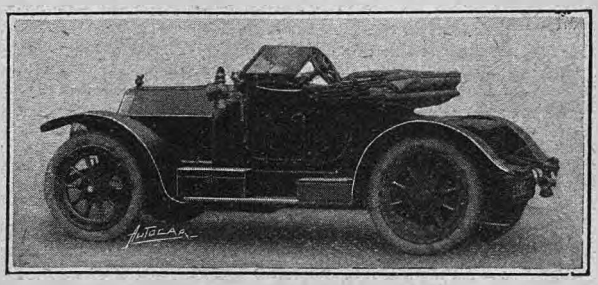


Fig. 14.—A complete Pearson-Cox steam car, with four-five seated touring body.

General Details.

As regards the car itself, very little detailed description is necessary. The engine drives the back axle direct through a universally jointed propeller-shaft and bevel gearing from the 750 revolutions of the engine speed down to the axle at a ratio of 3.8 to 1, without any gear variation transmission. The wheelbase is 8ft. 6in., and the 1913 design gives a slightly lower position of steering wheel with more rake to the column. Circumstances only permitted us a very short run on the car, but that short experience was quite enough to indicate its wide range of power, rapid and easy acceleration, and pleasant riding capacities. It is, perhaps, too much to say that it was quieter than the very best petrol cars, for the simple reason that the latter are practically noiseless, but the same epithet applies to the Pearson-Cox car, and indeed it is certainly quieter than very many good petrol cars.

It may be added that the heating surface of the 15 h.p. generator is 23 square feet, and the Treasury rating of the engine is 7.6 h.p., bringing it into the £3 3s. class for taxation.



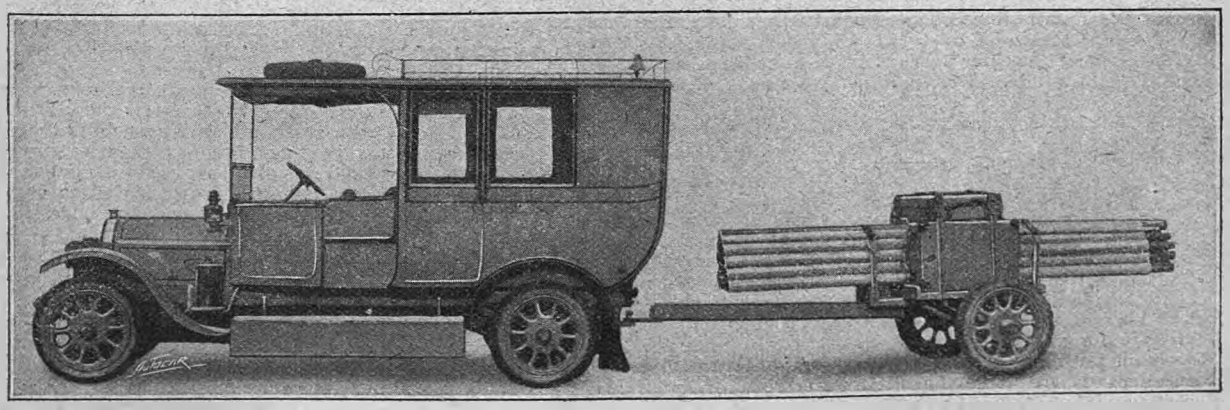
A two-seated Nazzaro car with N.B. body-work supplied to Mr. A. W. Bullivant, Queen Anne's Mansions, London, S.W., by Messrs. Newton & Bennett, Ltd., London and Manchester.

Motoring in Australia.

IN framing its programme of events for the forthcoming season, the New South Wales Automobile Club, known as the Automobile Club of Australasia, has put forth an ambitious scheme for a reliability trial between Sydney and Melbourne. The club's reliability trials have hitherto proved very successful, but they have always been kept strictly within the confines of the state, and the total entries have never been large. The proposal is to hold an annual run between the two capitals, under strict sealed-bonnet conditions, including on the way a hill-climbing and a petrol consumption test. The start will be made alternately, one year from Sydney and the next from Melbourne. As the run is about 600 miles, over a great variety of country, on roads which may be classed as ranging from bad to indifferent, the trial should prove an interesting test. The motorists of New South Wales have taken up the idea enthusiastically, but the Victorians have not as yet given a warm response.

The rapid progress of motoring in N.S.W. is shown by the annual report of the Traffic Superintendent for 1912. Last year the number of registered cars rose from 3,992 to 5,985, an average increase of forty per week. Worked out on a population basis, this gives one car to every 283 persons in the State. At the end of the present year New South Wales will have at least 8,000 cars, or one to every 250 persons. It must be remembered also that in Australia the commercial motor vehicle is as yet in its infancy, and that as soon as business men awake to the advantages of the self-propelled vehicle the rate of increase will be largely augmented. The motor cycle is also growing in popularity, and during 1912 the number of these machines in use in the state increased from 2,793 to 3,819.

The execrable state of the roads, particularly around Sydney, has induced motorists to form what is called a Good Roads Association. The chief difficulty lies in the administration of the Local Government Act, as the shires and municipalities into which the State is divided will not spend the money necessary to keep the main roads in order, although they have hitherto received a large subsidy from the State for this purpose. This year the Government has withdrawn the subsidy, and proposes to distribute the money in such a way as to secure its proper expenditure on the main roads. The idea of putting an increased tax on cars has been abandoned for the present, though in Victoria a sliding scale horse-power tax, ranging from two to six guineas per car, has been adopted.



A portable Marconi station mounted on a specially arranged 23 h.p. six-cylinder Star chassis and trailer. This is one of four similar Star cars which have been supplied to the Marconi Wireless Telegraph Co., Ltd., for field-station work. It will be noticed that, as with the car, the trailer is fitted with pneumatic tyres and Sankey steel wheels.

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.

ARE PROVINCIAL SHOWS NECESSARY?

[19364.]—I read with interest Mr. Ernest Rosenheim's letter in *The Autocar* of March 1st (page 372) regarding provincial shows, and fully endorse his opinion thereon.

Shows at any time are a splendid excuse for spending money. How much do they genuinely earn for anybody, except, of course, the S.M.M.T.? Olympia, I grant, is, to some extent, a necessity, although the overcrowding spoils many chances of it being very useful. It is an exhibition and nothing more, and we provincial agents can only treat it as such.

With regard to Manchester, overcrowding is *not* a feature. What about the first day of the Show this year? I do not think I exaggerate very much when I state that not at any time during the day were there more than twenty or thirty in the building (pleasure section), at one time, outside of those in the trade. The attendance on the other days improved, I grant (especially on the shop assistants' half holiday).

How many cars were sold at the Show that would not have been sold without it? I know the S.M.M.T. need not trouble themselves one iota over this question, but we poor stand-holders have to. It is the old, old story of sheep driving; where one goes, the others follow. Who is going to have the pluck, to say nothing of influence, to set the example by not supporting the unworthy cause?

I do not know the figures regarding the gate money of this last Manchester Show, but I trust it was poor enough to condemn another show from our worthy Society's point of view.

The manufacturers and concessionnaires also have a means of helping to put a stop to this useless expense by refusing to show except at Olympia, and to disallow their agents from doing so either. Perhaps Mr. Rosenheim will let us have his views on this point. The manufacturers in some instances may not agree to this, as often there is a new model shown at Manchester, which could not be got ready in time for Olympia. An answer to this would be to make the Olympia Show earlier in the year—"but this is another story."

As a trade social function, Manchester Show is a great success, as it brings together almost every member of the trade throughout the kingdom in that luxurious, although somewhat expensive resort, the Midland Hotel. Even Olympia cannot boast of this advantage, for attractions in London are many and various, whereas in Manchester—?. This is all very pleasant, but when the Show expenses are added up (by expenses I do not include those incurred outside of the Show), and we find what all these amount to—well is it worth it? Echo answers, "No."

What was one of the reasons for forming the S.M.M.T., but to put a stop to the indiscriminating number of provincial shows that were being held throughout the country? But we cannot hope for much support from them on the question of putting a stop to expensive provincial shows, unless, as I have already said, it touches their pockets, and I trust if it has not done so this year, it will do so in the near future.

F. A. KLIPSCH.

MOTOR CAR FUELS.

[19365.]—I have read Dr. Ormandy's article, "The Truth about Benzole," in which he advocates the admixture of alcohol and benzole as an ideal motor fuel. Many writers have said, if the Government would relax the very stringent Excise regulations and duty, that the manufacture of alcohol would become a large, important industry.

I have for several years carried out costly experiments to obtain tar from peat for the purposes of some of my inventions where large quantities are required in the operations. One of these is a hard dustless road approved by Colonel R. E. Crompton as a suitable motor surface, and given the name of "Strongite."

In a special process of distilling peat, I obtain four times the quantity per ton of peat that has hitherto been obtained by any of the German and other experts, and at a very low cost. One of the by-products is methylic alcohol, a spirit which can be sold, including distribution, at 1s. per gallon. This would easily beat petrol and benzole if sold at much less than the present prices.

The question of duty has been raised when I have suggested the advisability of capital for large operations. I have had the matter fully discussed with the experts of H.M. Customs and Excise, and have a letter from them, as the authority for my use, that there is no duty on methylic alcohol in any form, as I propose to manufacture it from peat or sawdust, so long as it is not rectified for potable (drinkable) use.

The importance of this declaration at the present time, with petrol and benzole at 1s. 9d. and 1s. 5d. per gallon, should enable a few enterprising commercial men to come in with the necessary capital to put crude methylic alcohol on the market at popular prices. The fact that this can be done is obvious, as the other products from peat all have a ready market. The charcoal, 40% per ton, sells at £4 to £5 per ton for high-class steel-making. Acetic acid sells at £30 per ton, and when made into acetone £90 and over per ton. This is used for cordite in H.M. Navy, etc., and the supply practically at present depends on Germany, so that this industry would have some claim also to Government recognition.

The tar is a principal product. The demand for it has been long assured for other of my inventions, viz., smokeless fuel from waste small coal and ore blocks for steel works, in addition to roads. The "Strongite" road construction, on which a large quantity of tar will be required, is not surface spraying, which in wet, rainy weather is a nuisance, and quickly washed away. The ordinary old road is simply scarified and dug up to any required depth, passed through a mixing machine with the tar, etc., added, all in a cold state, re-spread, and rolled, and sets hard immediately, while the cost of new metalling is saved. Even sand when laid in this way makes a hard road, the cost of added materials in addition to the tar being small.

Peat is all over the kingdom, Scotland, England, and Wales in many parts, while Ireland is one-third of its area all bog, so that there is no lack of raw material to be got.

It is proposed to form a powerful syndicate to operate, and there is ample prospect of good results as a dividend producer.

R. F. STRONG.

[19366.]—I was interested to read the letter [19291] from Messrs. Southern Automobiles of Blackheath, recording the fact that they ran an old and somewhat worn out 14-22 h.p. Germain at a speed of 57 m.p.h. at Brooklands. I personally own a similar 1906 car, and know of several which, like it, are capable at any time of doing 55 m.p.h. and over on the level road, fitted with the original carburetter supplied with the chassis. I agree with the Southern Automobiles that the S.U. carburetter fitted by them is about the most perfect type made, but the great value of their experiment lies in the fact that the performance published was achieved on a mixture of benzole and paraffin, costing, I suppose, under 1s. a gallon?

It would be interesting to hear what the consumption is of this mixture with the S.U. carburetter, and if the ignition timing as compared with petrol was varied to any extent.

MAJOR.

SPECIFIC GRAVITY OF PETROL.

[19367.]—It may interest your readers to know the specific gravities of the various brands of petrol now in general use. The difficulty in starting, and the filthy smell from the exhaust suggested this investigation. My own belief is, that not only has petrol risen in price, but that it has at

the same time fallen considerably in quality. The following are the specific gravities in question: Shell (1), .720; Pratt (1), .727; Pratt (2), .734; Taxibus, .741; Shell (2), .741, and a little over, but not quite .742.

It will be observed that the differences are uniformly .007, *i.e.*, Pratt (1) is .007 heavier than Shell (1); and Pratt (2) is .007 heavier than Pratt (1), while the others are .007 heavier than Pratt (2).

On examining these figures one wonders many things: If "Pratt" is a company separate from "Shell," why does it not market the .720 brand, for that fraction must come off before the .727 fraction, and is more valuable as a commercial article. Of course, if "Shell" and "Pratt" are one and the same, then everything is perfectly clear.

JOHN MCLACHLAN, M.D.

INCREASE IN THE PRICE OF PETROL.

[19368.]—Is it not a fact that each rise in price in petrol has been instituted by the proprietors of Shell spirit, the British Petroleum Co., Ltd.? If I am right, surely the remedy is in the hands of motorists. ERIC W. WALFORD.

INTERNATIONAL TOURIST TROPHY RACE, ISLE OF MAN.

[19369.]—With a view of entering three of our standard 15.9 cars for the above race, we wrote to the Royal Automobile Club on the 17th inst. as follows:

> "With reference to the regulations concerning the International Race for the Tourist Trophy, to be held in the Isle of Man, September 25th, we shall be glad if you will kindly explain the meaning of regulation No 4. According to the rules, the bore shall not exceed 90 mm. and the stroke 140 mm. It is quite obvious that our 20 h.p. car of 90 bore × 150 stroke is excluded from taking part, but we shall be glad to hear whether our 15.9 with 80 bore × 150 stroke comes within the regulations. Your early reply will oblige."

The Secretary's letter in reply was as follows:

> "I have your letter of the 17th inst., with regard to the International Tourist Trophy Race, to be held in the Isle of Man in September next. Referring to the regulation to which you allude, I regret to have to tell you that your 80 bore × 150 stroke engine would not be eligible, as the maximum stroke has to be fixed at 140 mm."

We can hardly believe that the Royal Automobile Club should organise a race which, although intended to be a standard car race, is framed in such a manner that only a very limited number of manufacturers will be able to take part, and, as a matter of fact, distinctly favours such manufacturers who happen to have a standard engine complying with these dimensions, whereas other firms whose engine capacity is much smaller than allowed by the rules are prevented from taking part.

We should have thought that it would have been much fairer and simpler to limit the cylinder capacity, a practice usually adopted for road races, instead of limiting the bore and stroke, especially as the race is a standard car race, and manufacturers have, consequently, no opportunity for building special engines.

For the past four or five years we have competed regularly in Continental road races and in the Isle of Man with standard cars, and, to our idea, we were handicapping ourselves quite enough by intending to enter 80 × 150 engines for the Isle of Man Tourist Trophy Race in which engines with cylinder capacity of 90 × 140 are allowed to take part.

As the originators of long stroke engines in England, we were, naturally, anxious to prove to the motoring public at large the capabilities of the 15 9 standard Calthorpe car, and we are very disappointed, to say the least, that the peculiar rule framed by the Royal Automobile Club should prevent us from taking part in the race.

Our sole idea in bringing this matter before you is to give an opportunity for a general discussion as to the merits of the rules of the Isle of Man Race, as no doubt other manufacturers who are anxious to enter their standard cars will be prevented from doing so for the same reason as ourselves.

THE CALTHORPE MOTOR CO., LTD.

PARAFFIN ENGINES.

[19370.]—On page 477 of your issue of March 15th [letter 19333] reference is made to the well-known fact that it is quite the usual thing for marine engines to operate on paraffin fuel.

Whilst it is quite an easy matter to run a petrol engine on paraffin in a way, yet our experience and that of most paraffin engine builders is that the engine itself must be built for paraffin, and that many points such as water-cooling, cylinder compression, strength of parts, revolutions, and so on must be adapted for this particular fuel. The most difficult point, we believe, will be found to be the vaporiser, which is a thing that cannot be designed from calculations, and yet must be such that the engine can be throttled right down or suddenly opened out the same as if operating on petrol. In this respect we, as paraffin engine builders, have for many years supplied Parsons engines both with plain valves and concentric valves. Another matter that has to be studied in marine work is that the engine may have to run for days together giving the utmost ounce of power of which it is capable, but yet be equal to throttling down and running smoothly without load, etc. This is work such as a motor car engine does not meet with, and is really equivalent to a car engine having to drive a car all day long up the steepest hill that it will just do on top gear without any easing.

But apart from the difficulties indicated, there is also that rooted antipathy to the slightest smell of paraffin in connection with a motor car, and the fact that any carelessness in filling tanks or neglecting to keep the machinery clean must result in the spread of paraffin over the car in a most objectionable way. In spite of what one hears there is really to-day no well-known and thoroughly tested device for starting a paraffin engine cold on this fuel, therefore, petrol, or some such spirit, will have to be used at present for starting up the engine.

We are, of course, aware of several devices with which engines have been started cold on occasion, but what we mean is that there is no device in universal use as a commercial proposition to this end.

If only paraffin could be used one's running costs would be halved, but, unfortunately, there are one or two drawbacks, which appear to be sufficient to make paraffin next to impossible as a car fuel to-day.

We have often wondered why commercial vehicles are not more often fitted with engines designed and built for using paraffin, and may say that we have already supplied Parsons engines for such work as this, including tractors, self-propelled rail cars, and all sorts of industrial and agricultural requirements. THE PARSONS MOTOR CO., LTD.

STARTING ENGINES IN COLD WEATHER.

[19371.]—Increased gumminess in cold weather militates against the sharp quick pull required by a magneto. The same power is doubtless applied, but the same sharpness is not attained. I think this is often overlooked.

I have a 14-18 h.p. car, Zenith carburetter, Bosch magneto. I can start when car is stone cold, and garage has been down to 35° Fahr., with fuel 75% benzole and 25% petrol. I simply inject paraffin, and spin engine five or six revolutions to free it. The car will then start with the usual half pull if switched on.

The Zenith carburetter seems peculiarly well suited to benzole. I have made no alterations whatsoever, and results are most successful. Benzole seems a gain all round, with so far no objections to its use, and I have been watching results very carefully. I did 8,200 miles last year at 26.1 m.p.g., and with above mixture am improving on this. M.H.E.

ACCELERATOR AND DECELERATOR CONTROL.

[19372.]—With reference to the letter of Mr. Philip T. Kenway [19351] in your issue of March 22nd, I am naturally very much interested in this subject, a combined decelerator and shaft brake pedal having been a standard fitting of the De Dion Bouton ever since that car was put on the market. We have never yet received any criticism of our system of control from anybody who has driven a De Dion Bouton car with standard control for more than an hour.

Last year the De Dion Bouton Co. marketed two models on which an accelerator pedal was fitted, as a means of taking the public "pulse" on this matter of control, but the reception accorded to this departure from our standard control system was such that our 1913 models are uniformly fitted with the standard combination of decelerator and brake pedal.

Whenever I ask for an opinion of our control system from a De Dion Bouton owner or driver who has previously been accustomed to an accelerator-controlled car, I am told that there is no possible doubt of the theoretical and actual correctness of the De Dion Bouton system.

This is a matter in which there is a considerable tendency to follow general practice, and I am sure that the almost universal fitting of an accelerator pedal is merely a concession to a preference based upon unfamiliarity with the decelerator

Correspondence.

system. The great point of our system of control is that in any emergency no harm can be done by the complete depression of both pedals.

Taking the veriest novice at the wheel of a car, his instinctive procedure, in a tight corner, would probably be to jam down both pedals. If he does this in the case of a car fitted with the De Dion Bouton type of control system his left foot disengages the clutch, his right foot throttles the engine (for the first portion of the pedal's movement), and then applies the foot brake.

Give the same novice a car with a clutch pedal, a brake pedal, and an accelerator pedal, and there is a distinct possibility that in the instinctive jamming down of both feet the novice will touch, if only momentarily, the accelerator pedal, and so urge his car forward into disaster.

Apart from this, everybody will admit that the ideal method of reducing the momentum of a car is by the diminution of its supply of gas, and as our control system compels the throttling down of the engine before the foot brake comes into action it enforces theoretically correct driving.

De Dion Bouton owners, were they to take a vote upon this matter, would, naturally, speak in favour of the De Dion Bouton system of control, but what is far more important to me is the fact that the leading writers upon automobilism, notably members of your own staff, invariably make a point of expressing approval of our control system, in spite of the fact that 99% of the cars they test are fitted with accelerator control, and that, therefore, their experience should tend to make them severely critical of our system, if it were capable of being criticised.

J. W. Stocks, Managing Director,
De Dion Bouton (1907), Ltd.

WEIGHT PER HORSE-POWER.

[19373.]—We notice in your issue of March 15th a short article on a certain aero engine. In the course of the article the writer remarks: . . . "whilst the 120 h.p. Austro-Daimler, which put up such a good performance on the Cody biplane during the Military Aeroplane Trials last year, weighs 3.9 lbs. per h.p., and has a petrol consumption of .6 pint per b.h.p. hour."

We should be glad if you would point out that 3.9 lbs. per h.p. is the weight of the complete power unit—the engine with radiator, all water connections, two magnetos, etc. This 120 h.p. Austro-Daimler aero engine develops 120 h.p. at the low revolution speed of 1,200 r.p.m., so that the propeller can be driven direct.

The 120 h.p. aero engine will develop considerably more power at a higher revolution speed, the maximum b.h.p. developed being approximately 135 b.h.p.—this at about 1,400 r.p.m.

When this maximum h.p. is taken into consideration, it will be seen that the weight is 3.5 lbs. per h.p., and this with the radiator, water pipes, lubricator, magnetos, etc. We would call attention to the remarkable achievement in the designing of a complete power unit weighing only 3.9 lbs. per h.p. when turning at a crankshaft speed of no more than 1,200 r.p.m.

The petrol consumption of the engine fitted to the Cody biplane in the British Military Aeroplane Trials was .6 pint per h.p.-hour; the oil consumption was .028 pint per h.p.-hour.

We think that, when comparisons are made or implied, such comparisons should be made on the same basis. When comparing the weight ratios of different engines, the fact should be mentioned that in one case the engine weight alone is taken into consideration, and that in the other case the weights of the engine, plus radiator, water pipes, two magnetos, etc., are included in the result. Also the figures obtained on the test bench should not be compared with the official results of trials made under actual flying conditions.

The Austrian Daimler Motor Co., Ltd.

EDGE HILL AND THE 20-40 H.P. METALLURGIQUE.

[19374.]—In the issue of *The Autocar* for March 8th (page 425) there appeared a short description of the behaviour of the 20-40 h.p. Metallurgique in which the following sentence occurred:

> "No doubt a driver who is thoroughly used to the car, and whose outlook on the world is more sanguine than our own, would have scaled Edge Hill on the second speed. We preferred, however, to take our corners nicely and keep the engine running at a good speed, so that we topped it off on the first and found how very nice the engine was when being run at a really high speed."

The climb up Edge Hill was not undertaken under the best conditions, especially since the driver had only just taken over the wheel and was therefore not familiar with the car, but we were so confident that the 20-40 h.p. Metallurgique not only *ought* to take this hill on second gear, but *would* do so, that on March 16th, we took this same car to Edge Hill for the purpose of giving it another trial. As we expected, the car—with four heavy passengers and complete equipment of hood and screen, etc.—ascended both this hill and Sunrising Hill on second gear, with such conspicuous ease, that we are quite prepared to guarantee that every car of this type will do the same thing.

The gears and weight of chassis, etc., were exactly the same as described in *The Autocar* for March 8th, except that the weight was probably a little heavier. In order that the driver's "outlook on the world" should have no possible effect upon the behaviour of the car, the start, both for Sunrising and Edge Hills, was made at the junction of the side roads at the foot of these hills, so that there was no possibility of getting a run at them.

We need hardly say that the car was standard in every respect. It will perhaps be of interest to note that on the outward journey Dashwood Hill was climbed very easily on third gear with a full complement of passengers.

Metallurgique, Ltd.
Oscar Cupper.

MOTOR CAR THEFT PREVENTION.

[19375.]—I have fitted to my car a safety auto-lock switch, supplied by Laurie and Marner (1911), Ltd., which fulfils all the requirements mentioned in letter No. 19318. It cuts off the petrol supply and isolates the magneto, yet allows the car to be freely moved in a garage, etc. Without knowing the combinations of numbers on the lock the engine cannot be run, and any owner can set the combination to suit himself.

J. H. Walters.

MOTOR CAR INSURANCE.

[19376.]—In order to differentiate between the careful (many) and careless (few), would it not be a good thing to make the no claim bonus cumulative? That is to say, give a 10% reduction on the *previous year's* premium and not on the schedule premium. I have written to this effect to the A.A., but have received no answer.

Could you not take up this matter in *The Autocar?* A careful driver would soon get his premium down to a reasonable figure.

W.C.R.

[19377.]—Following "Owen John's" remarks on this subject in August last, I wrote to you personally, in a letter too long to quote. It was an endeavour to be helpful both to readers of *The Autocar* and to "Owen John"; substantially, it was a plea for constructive as distinct from destructive criticism. I said that if "Owen John" could make any useful suggestion upon the matter I put forward, I would see to it that any practicable views of his received close and earnest attention in high places.

It is to be regretted that "holiday times and things of great moment" have intervened to prevent our having the pleasure of considering "Owen John's" reply while the burden of his doleful lay ran in our minds; but "better late than never." Unfortunately, it must be said that your esteemed contributor has not, in any sense of the term, given birth to that which may be considered a true reply, although the travail of its production is apparent. His further article is simply a re-statement and an amplification of his former case. Evidently he has learnt nothing, and I am afraid that his further education on this subject must be deemed hopeless. He accepts nothing but his own preconceptions, and complains that information available to people who thereby know more of these things than he does is not available to him. Does he try to make it available? Would it alter his view were it available? To "Owen John" I would say *experto credo.* (So sorry, I forgot we had sworn off classical misquotations.)

I can readily understand "Owen John's" dislike of exact information; but the following statements can be verified:

(a) The business of motor car insurance, to the motor car insurance companies, is not particularly profitable. Many of them have carried, and are still carrying, their business at a loss.

(b) No legal society embraces all insurers. This and the reason for it must be apparent to anyone examining the problem with an open mind.

(c) There are not a number of middle-men between insured and insurer. In the large percentage of cases there is an agent only, who takes far too much com-

mission—anything from 15% to 30%. I agree that 10% is ample for the work the agent does in most cases; but I do not see how anything short of a combination between the companies will effect a reduction, unless it be the millennium. This question constitutes a real grievance.

(d) Information obtained by circular letter, as suggested by "Owen John," would be just as reliable as most of the deductions made by "Owen John" regarding motor car insurance. Those he makes on other subjects may be equally reliable; but I have no means of checking them. As things are, underwriters experience the greatest difficulty in obtaining exact information as to the history of proposed policy holders, where there is reason to believe the risk represents something more than normal. "Owen John's" idea is positively ludicrous. One might just as well expect to obtain from "Owen John" himself (honest man) an accurate record of his own youthful *laches*. Bless us and save us, motorists are not supermen!

(e) Differentiation between "road angels" (such as "Owen John," the Editor, and myself), and "nuts, road-hogs, and well-known colliders," is impossible—just as impossible as your publication of a black-list of the glorious company of the latter, and for the same reason.

(f) Big shipping and railway companies carry their own risk, for a reason that should be obvious to anyone applying commonsense to the problem. If a man or corporation have a big enough field, it does not pay him or it to insure. He can provide his own organisation, and so save the agent's commission. His working expenses will be no greater than those of the companies.

(g) Of the relations between the A.A. and its allied company I know nothing certainly. [See letter from the Secretary of the A.A. and M.U. below.—ED.] But with regard to the R.A.C., "Owen John" will learn, with dismay, that this particular object of his continued displeasure takes no commission whatever; but hands over the whole premium to one or other of the companies issuing its policy.

"Owen John" should try, when considering this problem, to remember that it takes two to make an accident as a rule; and the motorist, or one of the motorists, may be entirely innocent and free from all blame. Carrying the thing to an absurd conclusion, the innocent party may be "a nut, rod-hog, or a well-known collider"; or he may conceivably be a "road angel," etc., etc. (See specification under "e.") Another bar to differentiation.

"Owen John" instances, amongst other advantages, to be derived from his scheme, "that members might obtain "greater recompense for their accidents." "Owen John" seems to forget that an insurance policy is a contract of indemnity, and to obtain more than that to which one is properly entitled is an immoral proceeding and contrary to public policy. I seldom see eye to eye with "Owen John"; but I did think he was a decent fellow, although a motorist.

Again, "Owen John" attempts to lead the world at large to believe that his "imagination . . . . boggles." Frankly, this I refuse to accept, and no "statistics on the subject" would cause me to do so (*vide* "Owen John"). "Owen John's" imagination is, I am quite sure, equal to the realisation of anything he writes himself, however the rest of poor mortals may feel about it.

Whenever I permit myself to read "Owen John's" discursions (sometimes as a prophylactic to undue optimism, generally as a solemn warning) I picture his Utopia. A long, straight road in a world inhabited only by "Owen John," a "Zedel" car, and a body by Vincent of Reading. The road to be the only straight thing in "a world awry," it runs between orchards of trees gravid with bitter apples and other Dead Sea fruit. An *Autocar* published hourly—"Owen John" sole contributor and solitary reader. One motor organisation with "Owen John" as Lord High Admiral, Pooh-Bah, Stenson Orde, and general bottle washer—as sole member he could complain of the staff, policy, and organisation *nemine contradicente* (there ought to be a fine for this). As his own insurer he would pay his own claims, and would be responsible for any accident that he brought about himself. He could call himself names (there would be no one to object), and ultimately he would repose in a solitary grave (may the day be long away) in a cemetery with a solitary tombstone bearing the solitary word "Ego"—which, as we have foresworn foreign misquotations, might be freely translated as the solitary word "Me." My imagination will not carry me to the ultimate destination of "Rosinante"—I refer to the "Zedel" car with the body by Vincent of Reading. I am not sure that, in the circumstances, damage by fire will be covered. But let that pass. *De mortuis* . . . . . (So sorry!)

All the foregoing more in sorrow than anger

C. McKODIE TURRELL.

[19378.]—In the course of an interesting article on motor car insurance, which appeared in your issue of the 15th inst., your contributor "Owen John," in referring to the attitude of the motoring organisations in regard to insurance companies, states that "even some part of the premiums, if we insure through them (the motoring organisations), are attracted to their funds as agents."

The official policy of the Automobile Association and Motor Union is issued by the Motor Union Insurance Co., Ltd. and, in order that there may be no misunderstanding as to the position, I would like to say emphatically that the Association does not directly or indirectly derive any commission or financial benefit whatever in respect of members' insurance premiums.

The suggestion is so utterly devoid of foundation that I I do not suppose anyone will treat it as a serious statement, nor perhaps did "Owen John" intend it to be interpreted literally, but in view of the fact that a disclaimer appears in your issue of the 15th inst. on behalf of another organisation, I shall be much obliged if you will kindly publish this letter, lest silence on the part of the Association should be misconstrued.

STENSON COOKE,
Secretary Automobile Association and Motor Union.

TRADE TRUSTS AND THE CONSUMER.

[19379.]—I think Mr. Gamage's letter [No. 19329] on this subject is somewhat misleading when he states that the price of petrol to the ordinary motorist in the United States is 8d. per gallon and in England 1s. 9d. per gallon.

I was touring in the States last September, and the average price for petrol was twenty-two cents or 11d. per gallon. Add to this 3d. for duty, and then allow a fair sum for transportation, and I think your readers will agree that 1s. 6d., which was the price ruling in England at that time, was a fair and reasonable one. I am not aware of the price ruling in the United States to-day, but I should think it most likely that it has increased as much there as in England during the last six months.

J. RICE.

THE TRAINING OF AUTOMOBILE ENGINEERS.

[19380.]—As members of that much maligned class of "premium pupil," may we be allowed, through the medium of your correspondence columns, to take up the cudgels on our own behalf?

On reading the opinions of certain people, recently expressed in *The Autocar*, the mind of the lay person would come to the natural conclusion that premium pupils, as a class, were an entirely bad lot, and, in this instance, as is generally the case, the sins of the few are visited upon the heads of the many.

We desire to do away with such an erroneous and misleading impression.

The pupil pays a premium, and, accordingly, expects certain advantages above the ordinary apprentice.

If the premium pupil is to work under the same conditions as the six o'clock man, will the author of letter 19335 kindly inform us as to the reasons for paying any premium at all?

In his letter he points out that the pupil must be distinguished from the apprentice, and yet requires both to work under precisely similar conditions, which is obviously unfair.

Another statement, referring to the pupil—"gives more trouble than he is worth." May we suggest to the writer that, as far as our knowledge extends, the majority of present-day engineering firms are not exactly philanthropic institutions.

From the trend of "H.W.O.'s" letter, one becomes impressed with the idea that the author has a little grievance to air.

Certainly his remarks might give one a slight clue as to the identity of a previously mentioned motor mechanic.

In our humble opinion, we do not consider that firms, referred to in previous letters, by the poetic phrase of "premium snatchers," lose a great deal by taking on premium pupils.

"H.W.O." will no doubt satisfy our pardonable curiosity by informing us whether he reached his present stage of presumed proficiency by the "errand running," etc., process, or did he fall a prey to those "ravenous premium snatchers?"

We should like to admit that the major part of the whole

Correspondence.

matter rests with the pupil as to whether he becomes a success or otherwise, and are pleased to state that all the ex-pupils of our firm, with barely an exception, are proving themselves worthy of the responsible positions in which they are at present placed. PREMIUM PUPILS.

THE HOLYHEAD ROAD.

[19381.]—I am sorry to say that "Berwyn" is correct in reporting that parts of the Merionethshire portion of the Holyhead Road (from the Druid to the Denbighshire boundary) and part of the Denbighshire Road (from Pont Ty Gwyn to Pont Moelfre) are in a bad condition. The County Councils of Denbighshire and Merioneth, in the last twelve months, have spent large sums (over £300 per mile) in their endeavour to get this road into good order, and the contractors for the Birkenhead Waterworks have contributed a considerable sum towards this expense.

But the weight of the traction engines and trucks is far heavier than any loads Telford anticipated when he made the great Holyhead Road, and part of this road has a blue clay subsoil which is soft in wet weather, but gets firm as soon as the winter rains cease.

And this year the weather has been abnormally bad. From October 14th, 1912, to March 18th, 1913, we have had 31in. of rain with short spells of intense frost. As I write the country is covered with snow, and we had twelve degrees of frost on the night of the 17th inst.

But "Berwyn" is, in my opinion, quite wrong in suggesting another route, as the road from Chirk to Llangollen is in good order. The road from Llangollen to Corwen is good, as is the road from Corwen to Ruthin, and the road from Ruthin to Cerrig-y-Druidion is in better order than the road from Denbigh to Pentre Voelas.

I know the road well. I was one of Her late Majesty's Commissioners of the Holyhead Road from 1872 to the expiration of the trust. I own four motor cars, which I mainly use on the Holyhead Road, and, with a week of fine weather, I hope all danger to motors will cease.

CHARLES S. MAINWARING (Lieut.-Colonel).

[19382.]—Referring to letter 19316, signed "Berwyn," Llangollen need not have been mentioned in his complaint, as anyone wishing to avoid the part of the Holyhead Road at Cerrig-y-Druidion can easily do so, and motorists need have no fear of coming this way as usual.

JAMES S. SHAW.

[19383.]—It is a source of astonishment to me every time I come over that portion of the Holyhead Road between Corwen Station and Cerrig that the councils concerned calmly submit to having their highroad in such a dangerous and abominable state owing to the road trains carrying heavy material to the new waterworks. I understand the latter will take seven years to complete.

Surely there is some law to compel the contractors to lay a light railway to carry their stuff, rather than imperil people's lives on the main Holyhead Road. F.Y.

BIRKENHEAD FERRIES FOR MOTOR CARS.

[19384.]—You reported last week that the Birkenhead Corporation have forbidden motor cars on their passenger boats. The last luggage boat will leave Birkenhead at 10.20 p.m. and Liverpool 10.35 p.m.; on Sunday, 9.45 and 10 p.m. respectively.

I think the motoring public should strongly protest against this decision. It will be a most trying difficulty for the motorist residing in the suburbs of Liverpool to have to leave his car in Birkenhead and travel to his residence by tram or taxi. It will also lead to a race on the Chester to Birkenhead and other roads to catch the last boat, and more than one will be disappointed to find the boat gone after racing to catch it.

It is a very easy matter for the Corporation to avoid a recurrence of the last accident. The sliding doors are certainly not strong enough, and if the Corporation made substantial pressed steel doors the cars would not go through. They could as an alternative issue instructions not to start the engine until the boat is secured on the stage and all the passengers are off.

This is a very serious matter for Liverpool hotel-keepers and traders in general. We are all aware that it does not pay the Corporation to run the luggage boats for motors only; hence the reason for combining the crossing of motor cars with their passenger boats.

There is almost enough traffic on the Woodside Ferry to call for the building of a new boat with a sufficiently high bridge to take a high limousine or landaulet, and so built as to take six or twelve cars, and sufficiently strong doors to prevent the cars running through them. Thus with the passengers it would be a very good paying undertaking, as in the past only low cars could cross by the passenger boats.

If the Birkenhead Corporation put a special boat into service, a great number of the Liverpool and other motorists would take advantage of it. The traffic would thus increase, and necessitate a larger and more convenient boat.

Similar accidents can happen, with more serious results, on the Runcorn transporter bridge. The gates are frightfully weak, and the drop would be very serious.

I hope that you will start a campaign to make the Birkenhead Corporation alter their decision and suggest the alteration to the Runcorn transporter bridge. THEO.

THE MOTORING ORGANISATIONS.

[19385.]—Having regard to the fact that the annual meeting of the Royal Automobile Club is to be held on the 31st inst., it is perhaps matter for regret that there has not been time to make arrangements whereby the views that have been expressed in the press lately regarding the policy of the Club might be brought to the official notice of the management.

Very many correspondents in sympathy with the views expressed have written to the Club in their individual capacities, and I would like now to suggest, as time is so short, that others who have not done so should also write stating briefly their views. Those who are full members will, it is hoped, do what they can by being present at the meeting to give such support as is possible to their views. Those of us who are associated or affiliated, but not full members, will not strictly be entitled to be heard on this occasion and must be content with writing.

With regard to the proposal for a joint letter of protest, may I ask those interested and who are writing their friends to push ahead now as rapidly as possible? I shall be pleased to send all information to all writing me direct, and cordially invite sympathetic co-operation. A. W. FARNSWORTH.

Devonshire Club, S.W.

SUMMARY OF CORRESPONDENCE.

OPENING FOR REPAIR WORKS AND GARAGE.—A correspondent ("P.W.") would be glad of information as to a likely place for opening a good motor repair works and garage.

GARAGE ACCOMMODATION.—"Tourist" recommends Whipple's Garage, of Grantham, as being one of the very few really obliging firms he has dealt with. He says: "I was utterly stranded, owing to timing gear trouble, and they spared no time or trouble to put it right. The work was done overtime, although it was the day of the local fair. The charge, too, was unusually moderate."

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

	Price. Net.	By post.
"Complete Hints and Tips for Automobilists"	2/6	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. Mecredy	7/6	7/10
"The Autocar" Log Book	1/6	1/8
Motors and Motoring. Prof. Spooner	2/-	2/4
"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.

Flashes.

Motor cars are being used in Japan in increasing numbers, so much so that the *Japan Times*, of Tokio, has recently started a column of "Auto Gossip."

* * *

That Switzerland is an important market for automobiles is evident from the fact that the importation of foreign cars and chassis into the Republic last year attained a value of £295,864, as contrasted with only £267,696 in 1911.

* * *

As is well known, the Institution of Automobile Engineers has already formed a branch in the North of England with its headquarters at Manchester. A leading North-country paper suggested last week the formation of a branch in Glasgow, and there is also under consideration the formation of a joint Birmingham and Coventry branch.

* * *

With regard to the paragraph in our issue of March 15th, in which it was stated that Mr. Burns, President of the Local Government Board, has arranged for a series of experiments to be undertaken at the National Physical Laboratory, with a view to ascertaining how far it may be practicable to frame regulations prohibiting the use of dazzling head lights on motor cars, it is worthy of note that, while in Burmah a local police rule requires all ordinary motor head lights to be fitted with a hood extending 6in. to 8in. over the lamp so as to deflect the beams, an exception is made in the case of the Blériot "No-Glare" lamps, which, as they automatically achieve the object in view, are allowed to pass without a hood.

It has been proposed by an American tyre company that a series of certified tyre tests should be undertaken with the same make of tyre by the Automobile Club of America and the Royal Automobile Club of Great Britain. The American test would be conducted by the technical department of the A.C.A., and, like the English trial, would be over a total distance of 10,000 miles.

The celebrated Ram Corner at Guildford which projects into the main road between London and Portsmouth and is about to be demolished. The actual roadway is only 13ft. wide. The Road Board have made a special contribution of £3,000 towards the improvement scheme, and the Surrey County Council are making a grant of £2,750, the Guildford Corporation providing the balance.

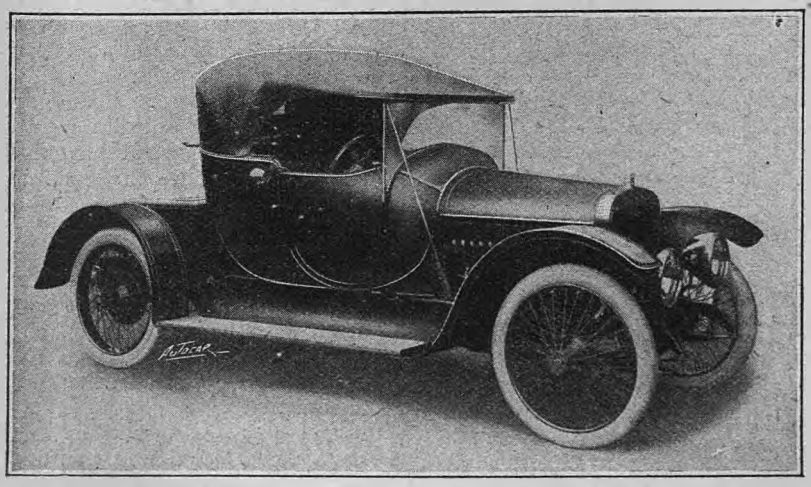
The Automobile Club of Milan proposes to organise a race for voiturettes in September next. The event will probably be held on the Brescia circuit.

* * *

The well-known Standard cars in their four and six-cylinder models may now be inspected in London in the handsome and spacious establishment of the Pytchley Autocar Co., 179 and 181, Great Portland Street, W. Very shortly too it will be possible to inspect here the new 9.5 h.p. four-cylinder All-British Standard, a perfect miniature car with a taking and comfortable two-seated body. The little car will have a three-speed gear box, 7ft. 6in. wheelbase, 4ft. wheel gauge, complete with hood, screen, five lamps, spare wheel and tyre for £185. The reputation already enjoyed by this car's big brothers should be voucher for its own quality.

* * *

The First Baltic Automobile Club of Riga will undertake a long-distance trial during the forthcoming summer. The cars will be sent by steamer from Riga to Stockholm, where the start will take place in the beginning of July. On the trip through Sweden, which will go by way of Dalecorlia and Gothenburg and back to Stockholm, the Russians will be joined by members of the Royal Swedish A.C.



A 15.9 h.p. Hispano-Suiza car which was supplied to the order of Mr. King, of Eathorpe Park, by the Regent Garage, Leamington, the bodywork being designed and carried out by Messrs. Hollick and Pratt, Ltd., Coventry. It will be noticed that the scuttle dash, which is hand-hammered, is of uncommon design. The steering is well raked and allows of a low seat being fitted. In this case the seat cushion rests on the floor boards, the thickness of the cushion being about fifteen inches. A Charleville one-man hood is fitted covered with leather, and is specially arranged to allow a good view on each side. The interior panels of the door are of mahogany, which gives an exceedingly neat finish.

Flashes.

The Royal Hungarian Automobile Club is organising a reliability trial to extend over eight days, starting from Budapest on May 25th, ending in Budapest on June 11th The distance to be covered will be about 1,312 miles.

* * *

Some interesting figures as to the increase in the cost of road maintenance were given at a recent meeting of the Westmorland County Council. Sixteen years ago the maintenance of each mile of main roads in the rural areas was £32 14s., to-day it is £38 3s., equal to an increase of seventeen per cent. In the same period the cost of maintaining urban roads has risen from £70 12s. to £114, or about sixty-two per cent. The increased expenditure is attributed entirely to the development of motor traffic, especially in the Lake District. But there is more than an equivalent in the added trade which motoring tourists bring each year to the county.

* * *

A story of heroism by an A.A. scout was reported recently from Dorchester, where Frank Arthur Jeffery, the scout in question, with great difficulty and at considerable personal risk, rescued a would-be suicide from the River Frome. The drowning man was struggling in midstream when Jeffery saw him.

* * *

The Dunlop Rubber Co., Ltd., and the Dunlop Pneumatic Tyre Co., Ltd., have confirmed the resolutions concerning the increase of capital and other matters passed at a meeting held last month. The resolutions authorise the increase of the capital to £1,800,000 by the creation of 600,000 preference shares of £1 each.

For a considerable distance between Lancing and Worthing the sea during the great Easter storm covered the Brighton-Worthing road with thousands of tons of shingle, in some places to a depth of three or four feet, and some great holes like that shown on the right of the picture were scored in the roadway.

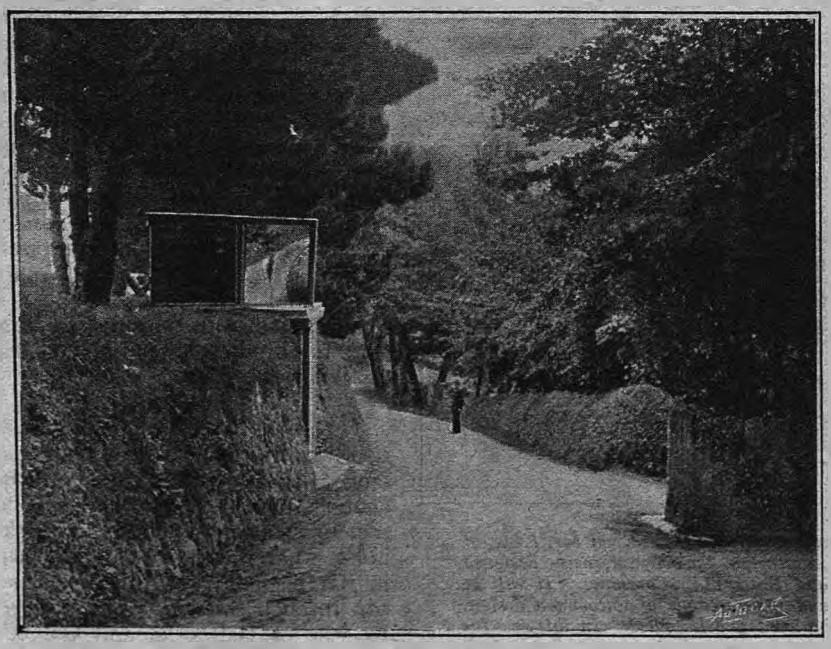
In the Calcutta-Gaya motor cycle road race over a distance of 307 miles the official car, a two year old 20 h.p. Berliet shod with Palmer cord tyres, which was placed at the disposal of the Clerk of the Course by the Maharajah of Tikari, created an Indian record for an ordinary touring car by covering the distance in ten and a half hours actual time with six passengers and luggage on board. The speed works out at 29.24 miles per hour, which is good for a run of such duration on Indian roads.

* * *

In connection with the prize of 2,000 guineas offered by the Society of Motor Manufacturers and Traders, Ltd., for home-grown motor car fuel to substitute petrol, Sir Boverton Redwood has kindly undertaken to settle the conditions for this competition.

* * *

A correspondent "C.H." informs us that on several Sundays recently the police have been working a trap on the Streatham high road, either along the foot of Streatham Common, or a few yards further on in the direction of Brighton. Our informant expresses doubts as to the correctness of the timing, and thinks a useful purpose would be served if any of our readers who have been caught would send him, through *The Autocar*, details stating date, speed alleged, court at which the case was heard, and further, if possible, the hour at which the car was stopped. The amount of fine would possibly make interesting data when compared with speed.



USE OF MIRRORS AT CROSS ROADS. Not far from Berry Pomeroy Castle, Totnes, there has been erected a useful mirror, which shows the approaching traffic along a by-lane. In the photograph is seen a figure on the main road and also one on the by-lane reflected in the mirror.

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.

Queries 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. 2600.—Carburetter for 30 h.p. Wolseley.

My Wolseley 30-34 h.p. car, dating from 1908, was running about 8½ m.p.g. with its original carburetter. I put on a Zenith a year ago and it now runs about 10½ m.p.g.—G.T.P.

No. 2604.—Solder Explosion.

This explosion was caused by the heated solder on the cold flagstone turning the moisture in the stone to steam, and, it being unable to expand, blew a portion of the stone up, and, of course, anything which was on top of it.—F. THOMAS.

No. 2599.—6 h.p. Baby Peugeot.

I have a Baby Peugeot car, 1913 model, which has done nearly 2,000 miles general touring, and am pleased to say that it runs extremely well. My petrol consumption works out at 36 m.p.g., and as this is my first car, and being quite a novice, I consider it a very good performance. I can easily get 40 m.p.h., at which speed the car is very steady and easy to steer. The upkeep is certainly very normal, as I have yet to have my first puncture.—TOUCH WOOD.

No. 2595.—Retreading Pragma-filled Tyres.

It would be a mistake to attempt to retread any tyre that has been run with a filling. Most of the fillings for tyres have oil in them in some form or another, and this communicates itself to the canvas, with the result that when heated, as a tyre must be for vulcanising, it has a bad effect upon the canvas, besides reclaiming the rubber that has been put on the canvas in the manufacture of the tyre. We would, therefore, advise motorists not to attempt to have a tyre retreaded that has not been run with an inner tube. There is another reason, and that is, when you run a tyre with a filling, that is, not inflated with air, it usually happens that the layers of canvas with which the tyre is made up become parted. We are quite certain that any filling other than air is expensive to motorists, besides being unsatisfactory. It does not prevent tyre troubles, but increases them.—ALMAGAM, LIMITED.

No. 2596.—Changing Down.

I have driven a 15 h.p. Silent Knight (1911) Daimler over 7,000 miles, and have found the best method of changing gear down to be as follows: From third to second.—When speed drops to about 17 or 18 m.p.h. ease clutch, and bring lever half-way back, then in-clutch momentarily, and finally de-clutch, bringing lever smartly back. The load to be taken up gently when clutch is let in, and the throttle to be left fully open during the series of operations. From second to first.—As the engine begins to labour close throttle gradually four or five notches, and when the car is apparently about to stop ease the clutch very slightly and make the change quickly. Always bear in mind not to finish by letting the clutch in with a jerk, which is bad both for the mechanism and for the passengers. And do not attempt to get up any speed on the bottom gear. The 15 h.p. Daimler will climb any hill on its first speed, but it likes to do so leisurely.—H.M.

No. 2602.—New Pick Car.

I have had a New Pick car for over two years and have run over 16,000 miles and given it rough work. I had some trouble with the gear box the first week and again in another three weeks. Since then it has been all right. The engine has never given any trouble, is absolutely reliable, and will run whether clean or dirty. I had the valves ground in at 4,500 miles, and as the engine was very dirty I had it cleaned. At 11,000 miles I had the big ends and gudgeon pin taken up and valves ground in, and the steering overhauled. The car gets next to no attention, and has to work night or day, and be ready any time. I certainly consider it well worth the price charged. I know nothing of the new models beyond the fact that they are worm-driven, and I believe the gear box has been altered.—BW 787.

No. 2562.—20 h.p. Ford.

I fully agree with "A" in his reply to "C.P.R.," that 9 m.p.g. is ridiculous for a Ford, and that "C.P.R." is probably losing a lot by leakage as well as running on too rich a mixture. In a recent straightaway run in a new 1913 two-seater Ford, standard in every respect, with Holley carburetter, I got 36.4 miles out of an accurately measured gallon of .720 Shell with three people in the car. There was no assistance from the wind, the route was over undulating roads, which were nowhere perfectly dry. The average speed was 22 m.p.h., and the jet adjusted to the finest limit for satisfactory running. The engine fired regularly the whole time, and the car climbed a stretch of 1 in 10 at 25 m.p.h. without being at all extended. The jet was not adjusted during the run. This only works out at 29 ton-miles per gallon, and is not therefore extraordinary.—F.C.J.

No. 2603.—The Chateaux Country.

May would be a good month to visit the chateaux of the Loire, but June would be better still. As to the expense, a fortnight for two persons should cost about £30. Hotels, tips, fees at chateaux, etc., twenty francs per person per diem; running expenses of car, say, 800 miles at 3d. a mile, £10; remember petrol is more expensive in France. Maritime transport about £8. I should advise Dieppe route, and run after landing to Rouen, thirty six miles; next day to Orleans, 124 miles, the starting point of the chateaux district. A Michelin guide to France should be studied; much information as to a tour will be found on page 105. Take a few chateaux on the route from Orleans to Tours, which place make headquarters for doing the rest. Some of the best hotels are very good, but very expensive. If economy is an object, rooms should be seen and prices asked before the car is taken to the garage or luggage unloaded. Should the Boulogne route be preferred, then on landing drive to Beauvais, ninety-

NEW CARS

FOR EARLY DELIVERY, YOUR PRESENT CAR IN PART PAYMENT.

20 h.p. **MAXWELL,** 1913, 5-seater.. **£250**

11 h.p. **BRASIER,** 1913, 2-seater.. **£335**

14 h.p. **SINGER,** 1913, 4-seater.. **£375**

12/18 h.p. **RILEY,** 1913, 2-seater.. **£299**

12/18 h.p. **RILEY,** 1913, 4-seater.. **£340**

15 h.p. **CALTHORPE,** 1913, 4-seater.. **£350**

12-15 h.p. **CALTHORPE,** 1913, 2-seater **£273**

13.9 **B.S.A.,** 1913, 4-seater **£325**

SECOND-HAND CAR BARGAINS.

1912 15 h.p. **SINGER,** 5-seater, hood, screen, all lamps, beautifully fitted **£335**

1912 13·9 h.p. **B.S.A.,** 5-seater, **nearly new,** absolutely complete **£285**

1912 15 h.p. **CALTHORPE,** 4-seater, unused, hood, screen, R.W. wheels, special price to clear.

1910 18/23 **B.S.A.** landaulette, tip top condition, absolute bargain **£285**

1911 10 h.p. **RILEY** 2-seater, special car, ready to drive away **£160**

BURN & GOULD

LIMITED,

MIDLAND MOTOR EXCHANGE, BIRMINGHAM.

Telephone: 986 Midland.
Telegrams: "Mobile, Birmingham."

BARGAINS IN GUARANTEED SECOND-HAND CARS.

14-18 h.p. British Clement, 1911 Chassis, fitted with handsome torpedo body, Cape hood, folding glass windscreen. Painted white, upholstered in green leather. Complete with Stepney wheel and tyre, all lamps, etc., GUARANTEED **£325**

14-18 h.p. French Clement, fitted with limousine body by Vedrine. Recently overhauled and painted. In splendid condition. Fully equipped with five lamps, Stepney wheel and tyre, etc. **£150**

18 h.p. British Clement Chassis, delivered new in 1912, with single landaulette body. Painted dark green. Corduroy upholstery, with detachable covers. Well equipped with five lamps, detachable wheels, including spare wheel and tyre. Speedometer, etc., ready for the road. GUARANTEED **£425**

26 h.p. Metallurgique Chassis with Van den Plas Torpedo body. Rudge-Whitworth detachable wheels, and one spare wheel with tyre. Head lamps with D.A. outfit. Electric side and tail lamps. Cape hood. Folding windscreen. Klaxon and bulb horns. Speedometer, etc. **£350**

18 h.p. French Clement Chassis fitted with touring body, hood and glass windscreen. Fully equipped with head lamps, spare tyre, etc. Four-cylinder engine 95 x 130. Live axle. Four speeds gear box. Multiple disc clutch **£125**

For further particulars write:

THE CLEMENT MOTOR CO., LTD.,

Telephone: 1917 & 1918 Gerrard.

3, Leicester St., Leicester Square, LONDON, W.C.

CARBON IN CYLINDERS ANNIHILATED BY

Cyclean Regd. The Certain Remedy for Carbonised Cylinders

WITHOUT DISMANTLING ENGINE.

Time and Money Saved, Power and Speed increased.

QUICK. SIMPLE. SAFE.

THE INTERNAL COMBUSTION ENGINE CLEANING CO., LTD.,

3, London Wall Buildings, London, E.C.

Telegrams: "Cyclean, London." Telephone: London Wall 1976.

Chief Depot and Cleaning Garage—

1, BRICK ST., PICCADILLY, W.

AGENTS EVERYWHERE.

B44

Some Queries and Replies *(Continued)*.

nine miles, next day Orleans *viâ* Versailles, Chartres, 135 miles. "G.J.L." should read "A Summer in Touraine," by Frederic Lees, published by Methuen.—A. H. MONT-CHAUVE.

No. 2588.—Route to the Riviera.

The route *viâ* Haute Savoie presents no difficulties to the careful motorist and for the season he wishes to travel. It is the route *par excellence*. I give below my itinerary, which was checked and supplemented by the Michelin Touring Bureau in the most obliging way. Do not motor without their guide and Taride maps. Itinerary.—Rouen, St. Germain, Fontainebleau, *Sens, Avallon, Saulieu, *Autun, Macon, *Bourg, Pont d'Ain, Ambérieu, St. Rambert, Argis, Tenay, Les Hopitaux, Rossillon, Virieu le Grand, Artemare, Culoz, cross the Rhone, Ruffieux, along Lake Bourget to Aix les Bains, Chambéry, east road *viâ* Challes, Le Touvet, *Grenoble, Vif, Monestier, Clelles, La Croix Haute (summit), Aspres, Serres, Laragne, Sisteron, *Digne, Chateauredon, Barreme, Taulanne, Castellane, Escragnolles (summit), St. Vallier, and Grasse. Be careful from Ambérieu to Culoz to keep to the route above, as also between Chambéry and Grenoble. Road surfaces and grades splendid, but take also descents and zigzags very slowly, notably before Castellane and Grasse. All over this is a magnificent route. Stops advised at places marked *. Be careful no damage occurs in garages.—W. N. SMITH.

QUERIES.

No. 2611.—New 10 h.p. Swift.

CAN any reader kindly give experiences of this car? Are carburetter and engine oiling arrangements quite satisfactory?—J.M.

No. 2612.—Opening for Taxi.

WOULD any reader recommend me a town (seaside place preferred) where a private car or taxi could be made to pay by plying for hire?—ENERGY.

No. 2613.—15-18 h.p. Hupmobile.

I SHOULD be much obliged if any of your readers would give me their experiences with the four-seated 15-18 h.p. Hupmobile, with special reference to its reliability and cost of upkeep, especially as to repairs.—E.A.H.

No. 2614.—Zenith Carburetter on Ford Car.

WILL anyone who has tried a Zenith carburetter on a Ford car be good enough to give his experience? Does it give good results as regards power on hills, slow running, and mileage to the gallon? Also is there any reason to suppose that any other carburetter would be more suitable?—W.H.

No. 2615.—18-20 h.p. R.M.C. Car.

I AM thinking of buying an 18-20 h.p. R.M.C. two-seater American body. I should like to know some of your readers' experiences. What mileage will these cars do to the gallon on petrol and oil? Are they light on tyres, and do they skid? What sort of people are the agents to deal with in regard to breakages, such as crankshafts, axles, springs, etc.? Can the carburetter be adjusted easily? Are the cars good hill-climbers? Has anyone tried any other carburetter, and with what results? Has anyone tried benzole, and what is the best oil to use? How many miles will the car run without pistons being cleaned?—H.W.

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

I SHALL be glad of some of your readers' experiences with regard to either a Zenith, Claudel-Hobson, or Scott-Robinson carburetter on a modern 14-16 h.p. Belsize. At present I have an up-to-date carburetter on, but can only get 13 m.p.g., and I have tried different ways to improve, but with no result.—W. J. LAKE.

No. 2617.—Brake Lining.

I FIND that the brake liners of my 15 h.p. 1911 model Crossley are becoming thin. Could any of your readers give me their experience as regards wear, braking power, etc., of Raybestos or other lining when the shoes are lined with it? Are the brakes as effective, because this is a very hilly district (Douglas, I.O.M.)?—CROSSLEY OWNER.

No. 2618.—Stanley Steam Cars.

CAN any of your readers give me some information as to the behaviour in actual practice of the Stanley steam car? I know all its points from the makers' side, but what I want is the actual experience of some of those who have used the car, more particularly as to the life of the boiler, facilities for repairs, etc.—STEAM.

No. 2619.—Two-stroke Engines.

I AM experimenting with a two-stroke engine, which is giving fairly satisfactory results, but before spending any more time and money, would like to ask your readers who have driven Dolphin or Elmore cars to give me their experiences. I should like to know what inherent defects have prevented these apparently perfect engines from becoming popular.—T.B.W.

No. 2620.—Hollings Easy Starter and Petrol Economiser.

CAN any of your readers give me their experience after fitting the Hollings easy starter and petrol economiser? I have fitted one of these to my car, and find that after using the extra air tap for any considerable time, there is a difficulty in restarting, even though the engine be quite warm. Any information will be greatly esteemed, also the makers' name to enable me to communicate with them.—J.T.

No. 2621.—Desclee Tyres.

CAN any of your readers tell me where I can obtain the Desclee tyres? I used them some six or seven years ago, but cannot find if they are on sale now. The Desclee tyres had a jointed band of steel plates round the tread. I should like to get them (or some similar), as I know of nothing else that will stand up in the awful limestone roads round here (Co. Mayo). Any information will greatly oblige.—PAID DRIVER.

No. 2622.—15-20 h.p. Mitchell Car.

I SHOULD like to know if the 15-20 h.p. Mitchell two-seater is a really good top-gear climber with a turn of speed on the level, and whether it holds the road well over rough going, whether detachable rims or a Stepney are supplied with the car, and in what substantial respect the American chassis differs from the European beyond the latter's extra wheelbase? Will owner-drivers who have driven the car over 5,000 miles kindly tell me candidly what they think of the car?—HILLSIDE.

Week-end and Touring Notes.

A Month in France and Italy. By J. G. H. Soames.

It was on the first day of the month of August that I arrived at Newhaven in my 10 h.p. Riley (then in its fourth year) at the early hour of 8 a.m. My friend came to Newhaven by the boat train, and we crossed to Dieppe together, but not with the car, for after interminable discussions it was decided that there was not room for it among the passengers on the restricted area of the second-class deck. However, the next morning the car arrived by cargo boat, and was soon slung ashore, and after various and dilatory preliminaries, I left the quay, clinging against every instinct to the right-hand side of the road.

After *déjeuner* we strapped on our kit-bags—one behind the car and the other on the step—and started off. Our first halt was at the *octroi* on entering Rouen, not because our *rien à déclarer* was insufficient, but because the official on duty wished to discuss things in general, not excluding the *entente*. A first visit to Rouen on a small car left few impressions except that of execrable *pavé*. However, we were soon quit of it and running up the Seine valley by fresh green lanes. About seven o'clock we drove into the courtyard of the Grand Chèvre at Evreux, where the heraldic "bear and ragged staff," the picturesque fountain, the capacious bedrooms, the many-coursed dinner all pointed to an exhaustive reckoning in the morning, but a bill of fourteen francs each gave us a first insight into the cheapness of Continental touring

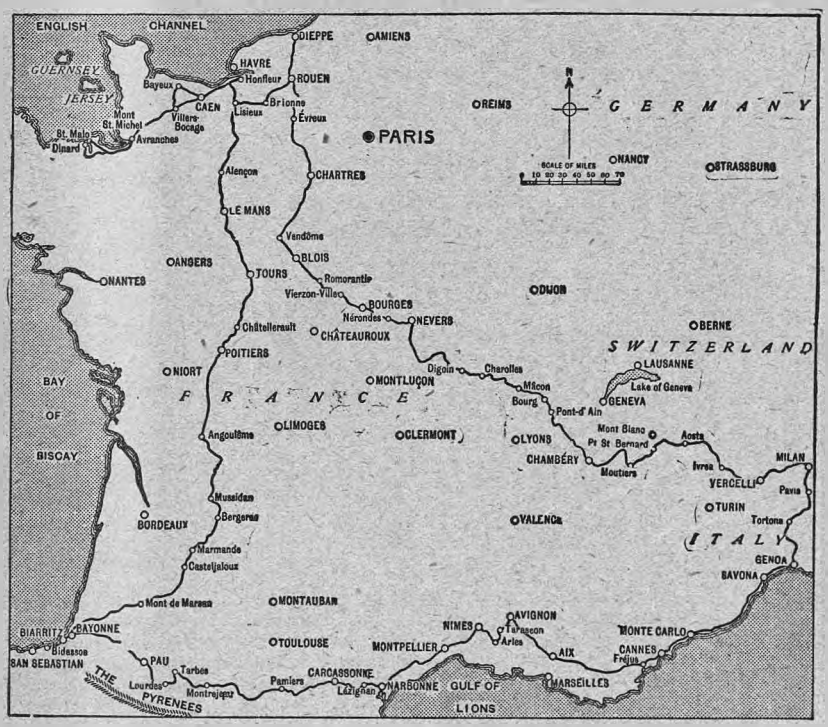
The next day we had an uneventful run to Blois, with *déjeuner* at Chartres, and a glimpse at its impressive cathedral.

Sunday morning was spent at the Château of Blois in admiration of its wonderful spiral staircase, and of its gorgeous mural decorations, painted in imitation of tapestries destroyed during the Revolution—surely sufficient inspiration for any designer of wall-papers. In the afternoon, having extricated the car from the garage by disturbing the "siesta" of several infuriated chauffeurs, we found a splendid sandy road to Romorantin: then on to the sleepy old town of Bourges—which we quitted with difficulty, as every inhabitant insisted on confusing his right and left hand—to arrive towards dusk at Nérondes—Hôtel de la Poste. After dinner, the one performer of the travelling circus present refused to act his part, as his audience, consisting of ourselves and a few gâmins, did not give great expectations of profit; so, after beating a monotonous tattoo for the best part of an hour, he retired into his van.

On Monday a picturesque run, by drowsy canals and still more drowsy bargees, and later, in the twilight, over the Cevennes, landed us at La Croix Blanche, where we had an excellent dinner consisting of roast meat, omelette, veal, "haricots verts," and peaches galore, with good "vin blanc," a large and comfortable bedroom, everything clean, nobody to tip, and all for 4fr. 50c. each.

Then, in the morning, on to Mâcon and over our first bit of bad road to Bourg; and finally a detour among the foot hills of the Alps brought us to Chambery.

On Wednesday, the only wet day during the whole tour, we pushed on to Moutiers, and a first puncture reminded us of possible interruptions to the clock-work precision of our tour. At 8.30 the next morning we set out for the Petit St. Bernard (7,180 feet), and, though delayed by the state of the road as far as Bourg St. Maurice (to which place a railway is being constructed), by formalities at the French Customs at Seez, and by the necessity of cleaning the carbon brushes



YOU MUST SEE The 'ENFIELD AUTOLETTE' AT McCURDS.

The 'Hottest' Thing on Four Wheels.

A PERFECT MINIATURE OF A PERFECT CAR.

£130

TWO-CYLINDER. THERMO SYPHON. BOSCH MAGNETO. ZENITH CARBURETTER. THREE-SPEED and REVERSE GEAR BOX. WORM DRIVEN LIVE AXLE. LEATHER CONE CLUTCH. WIRE WHEELS. RAKED STEERING. TORPEDO BODY.

QUALITY.
SILENCE.
SPEED.

McCURDS, Ltd.,
Store Street.

B45

LOOKERS LTD.

1913 Models in Stock.

LANCIA, 30 h.p. Palace limousine, with every possible accessory, dynamo lighting outfit, ready for the road; beautifully finished with inlaid panelling, etc. .. £950
LANCIA, 30 h.p., torpedo de luxe, dynamo lighting outfit, complete, ready for the road £735
STRAKER-SQUIRE, 15 h.p., with fine threequarter torpedo landaulette body, all complete (less tyres) £500
STRAKER-SQUIRE, 15 h.p., special torpedo, hood, screen, lamps, tools, etc., all complete (less tyres) £425
STRAKER-SQUIRE, 15 h.p., with fine two-seater body, with all accessories and tyres £414
FORD, Model T, touring car, all complete £150
FORD, Model T, with Looker's special torpedo body, all complete £190
FORD, Model T, two-seater, with dickey seat £136
FORD, Model T, with Looker's special landaulette body, all complete £240
SWIFT, 12 h.p., torpedo, latest model, spare wheel, lamps, tools, etc. (grey).. £350
SWIFT, 10 h.p., two-seater, torpedo, all complete, spare wheel, etc. £215

Special Bargain (New).

MITCHELL, 15-20 h.p., touring car, lamps, horn, tools, hood, etc.; list £250 **Offers wanted**

Used Car Bargains.

AUSTIN, 18-24 h.p., 4 speeds and reverse, 2 ignitions, semi-torpedo body, hood, screen, Stepney, 5 lamps, horn, tools, etc., painted dark green, and guaranteed in perfect condition £250
LANCHESTER, 28 h.p., 6-cyl., touring car, 2 screens, hood, lamps, tools, horn, Rudge wheels and spare, in perfect condition, any trial £250
FORD, Model T, Coupé Cabriolet, as new, ready for painting to choice £180
HUMBER, 15 h.p., side-entrance, in grand condition £75
DAIMLER, 28 h.p., 1-ton van, 2 ignitions, 4 speeds and reverse, as good as new, special at £125

5, 7, 9, 11, 13, 15 & 17, Hardman St., Deansgate MANCHESTER

Chester Depot—134, Foregate Street.

B46

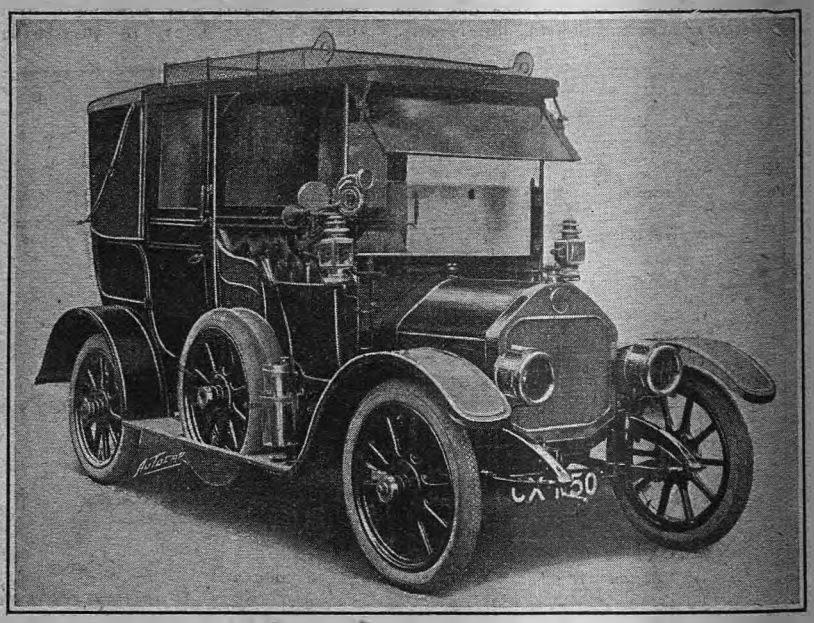
Week-end and Touring Notes (*Continued*).

on the magneto—I have a tendency to over-oil every part of the engine, since I was once instrumental in the seizing of the big end of a car—we were at the Hospice by two o'clock. The distance is forty miles; thirty-five miles were accomplished on second gear; the last five on the lowest, and only then did the car display the symptoms of a steam engine, but these were speedily relieved by the use of a canvas bucket, an indispensable accessory for almost all cars in Alpine touring. *Déjeuner* at the Hospice found us on Italian soil.

To visit Italy for the first time must always leave an unforgetable impression, but to descend *en auto* into the plain of Lombardy from the summit of an Alpine pass adds the charm of unfettered abandonment to its spell. I cut off the petrol and short-circuited the magneto, and for the greater part of the afternoon let the car run in top gear, only using the foot brake before rounding a hairpin corner or going through a tunnel with rough and slippery surface. The Italian Customs detained us but a few minutes, in spite of the disturbing presence of an American lady and her companion, whose chauffeur dashed off on their car in search of his effects. As on continuing our descent into the Val d'Aosta we never saw him again, the length of their wait for him must remain a mystery.

Our goal that evening was Aosta. I cannot attempt to describe the fascination of driving into its narrow streets, past houses crowding close to the picturesque Roman bridge over the Dora, or of leaving it the next morning under the arch of Augustus for Ivrea and the plain. We had an uneventful run to Milan, except that the driver of a cart, less wise than his mule, happened to awake at the critical moment, pulled right across the road and narrowly escaped colliding with the car. A train journey to Venice, some days spent there, and one day's insight at Verona into Italian methods of fleecing the tripper, do not form part of the chronicle of a motor tour.

On the 14th we left Milan for the Riviera by way of Genoa. My impressions of the Italian littoral are of blue sea and olive groves, of pot-holes and level crossings—where after an interminable delay the gatekeeper interrupts his lifelong *siesta* just in time to allow the motorist to cross before the train. Having discovered at Savona an hotel with a garage (the garage was only practicable on condition that the kitchen fire went out, as radiator and stove were in uncomfortable proximity), we spent the night there—a prey to a most poisonous breed of mosquitoes.



A 19.9 h.p. Valveless car with a single landaulet body. The chassis has the Valveless two-cylinder two-stroke engine, which has only six main working parts, i.e., two pistons, two connecting rods, and two crankshafts; ports in the cylinder walls serve as valves when uncovered by the movement of the pistons. Valveless cars are sold by Messrs. Dodson Motors, 34, Old Bond Street, London, W.

The next day we reached Monte Carlo; the French Customs officials took an unnecessary interest in our baggage, and spent some time in unravelling the protective wrapping of a small piece of Venetian glass. A profitable visit to the Casino supplied welcome stimulus, and after a night at the quaint village of Frejus, with its relics of Rome, we made for Avignon over glorious moorland roads. A quiet day spent there and in visiting Tarascon, Beaucaire, and Arles, imbued us with the spirit of Daudet and Provençal romance.

Sated with amphitheatres—we had seen four in four days—we started early from Nîmes for Montpellier and Narbonne and to skirt the Pyrenees. We slept at Montesquieu and Lézignan—with difficulty avoiding at the latter place a visit from the proprietor's second cousin, who wished to practise her English at our expense, but was satisfied by translating Baedeker in the next room for the enlightenment of the family and her own glorification.

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

They said that we were the first Englishmen they had ever seen. Misled by a signpost that required a strong north wind to recover its useful characteristics; translated into the middle ages by the Visigothic embattlements of Carcassonne; mystified by a pilgrimage to Lourdes at its most crowded time; and fascinated by the magnificent ridges of the Pyrenees, we duly arrived at Biarritz ten days after leaving Milan.

The next day being Sunday, everything pointed to a visit to San Sebastian and a bull fight, but here must be recorded the sole disappointment of our tour, as we spent the day within sight of the Bidassoa The excessive vibration caused by bad roads had damaged the distributer of the magneto; and as I failed to discover the defect myself, the services of two mechanics from Biarritz were required. At the end of four hours the car was a going concern once more, and my annoyance was somewhat dissipated by a charge of four francs for effecting it; when I gratefully suggested a greater indebtedness, they replied that they ought to have found out sooner where the mischief lay—a point of view that might be urged on the staff of many an English garage. Whenever we needed help in changing or mending tyres, we received the utmost consideration; at Carcassonne a mechanic voluntarily postponed the two hours consecrated to *déjeuner*, so that we might start the sooner. Only at Bergerac did the manager of a garage, under-estimating my knowledge of French, tell a man not to waste his time over a *petit auto de dix chevaux*.

After crossing the Landes, and after facing an exodus of apparently the whole population of that district (which we had previously considered to be almost uninhabited) from Casteljaloux market, a few days' run by way of Angoulême, Poitiers, and Tours brought us to Honfleur on August 30th. There my friend left me, and I finished up a most successful tour by a run to Dinard, a short stay there and then back to Dieppe with three up, visiting Mont St. Michel, Bayeux, and Caen on the way. When close to Dinard, and in the dark, I had an unpleasantly vivid demonstration of the ease with which accidents at level crossings occur in France; a full application of both brakes stopped the car only a few feet from the engine of an express train.

That French roads are all good appears to me an absolute fallacy; on our outward journey to Milan they were certainly excellent, except for short stretches, right over into Italy, but all the way back the reverse was the case, and except from Frejus to Avignon, and across the Landes, the surface was either washed out or full of deep pot-holes.

That touring on the Continent is much cheaper than in England is undoubtedly true—our hotel bills for a month, including four days at Venice, amounting only to £18 each. In all we covered 2,700 miles; the petrol accounted for £8 12s. (it might have been less if I had always bought it outside an "octroi")—an average of thirty-two miles to the gallon. The car is still in good condition; a coat of paint and a new tyre or two will, I confidently expect, be the only necessary outlay on it for a long time to come. The loss of a camera has unfortunately deprived us of a more permanent memorial of an unreservedly delightful summer holiday.

Flashes (*Continued*).

The whole of the shares of Heath's Garage, Ltd., Birmingham, with the exception of 250 preference shares, have recently been acquired by Mr. G. F. Heath.

The Maudslay Motor Co. have just been favoured with a second order for a Maudslay limousine for H.M. Army Council, the vehicle to be a duplicate of the one which they supplied in the autumn of last year.

A two-seater motor car with hood and screen was left at the Pioneer Motor Works, Towcester, three months ago and has not yet been called for. It is now suspected that the two men who left it had not come by it honestly. The police, however, are unable to trace the owner. Mr. Victor Ashby, the proprietor of the works, will be pleased to hand the car to the owner if he can be found.

The Goodyear Tyre and Rubber Co., Ltd., have opened a depot and showroom at Central House, Kingsway, London. The new London company will control the firm's business in the United Kingdom, Europe, Australasia, South Africa, India, and, in fact, every country in the world outside North and South America. The company maintain three factories—one at Bowmanville, Canada; another at Akron, Ohio, U.S.A.; and another at Rio de Janeiro, Brazil; and also operate their own cotton mill at Putnam, Conn.

Owing to the extension of the Kempshall Tyre Co.'s business in Scotland, a new depot has been opened in Glasgow at 27, Jamaica Street, where all Kempshall tyres and accessories can be obtained.

One of the oldest firms in the Bristol district connected with the motor industry is J. S. Willway and Sons, Ltd., of St. Augustine's Bridge, Bristol. Since 1905 their development has been remarkable, and with its latest additions their garage is stated to give storage room for over 100 motor cars, this quite apart from the large departments devoted to the sale of new and second-hand cars, repairs, sundries, and so forth. Indeed, the repairs and mechanical branch of the business is one of its most important aspects.

Messrs. Bentley and Bentley, Ltd., of Hanover Court, Hanover Street, W., the sole concessionnaires for Great Britain and the Colonies for the D.F.P. car, have sent us a copy of the latest D.F.P. catalogue. The makers, Doriot, Flandrin, and Parant, are essentially light four-cylinder car specialists; only three models are marketed, and these are: 10-12 h.p. (65 x 120), 12 15 h.p. (70 x 130), and 16 22 h p. (80 x 150). All are fitted with the 1913 model Claudel carburetters. With a view to overseas business, special models are made having the steering arm above the front axle and larger wheels than those fitted to cars for European service.

MESSRS.

CHAS. CLARK & SON, Ltd.,

WOLVERHAMPTON,

have the following really good Second-hand Cars for disposal, most of them will be fully guaranteed for two years:—

12-16 h.p. Sunbeam landaulette, quite equal to new ..**£350**

12-16 h.p. Wolseley landaulette, Sankey detachable wheels, all latest improvements **£325**

12-16 h.p. Sunbeam, flush-sided body, hood, screen, and all accessories.....**£275**

12-16 h.p. Sunbeam, flush-sided body, hood, screen, and all accessories.....**£225**

16-20 h.p. Wolseley, perfect condition, hood, screen, etc.**£250**

14-20 h.p. Wolseley, just been thoroughly overhauled, as new **£235**

20-25 h.p. Overland, 1913, only run 500 miles, cost £235 in December **£180**

15·9 h.p. Rover, dual ignition, guarantee as new **£225**

10-12 h.p. Alldays, with two-seated body, high doors, leather hood, only run 1,000 miles **£150**

10-12 h.p. 4-cyl. Renault, new, with two-seater body, very low price.

8 h.p. Rover, hood and screen **£50**

8 h.p. Rover, four-seated body, hood and screen **£50**

8 h.p. Rover, two-seater, hood and screen **£69**

12-16 h.p. Clement-Talbot, in good running order, five-seated body **£90**

B47

A YEAR'S MOTORING FOR £10 - 7 - 0.

Dr. Basil Jackson, 7, St. James Avenue, Brighton, writes:

'It is just a year since I had my 10 h.p. Hurtu from you, and, as I have kept a very careful record of my expenses up to date, I think you will be interested to hear them.

	£	s.	d.
Petrol—			
16 gals. at 1s. 5d.	1	2	10
70 „ 1s. 6d.	5	5	0
26 „ 1s. 7d.	2	1	2
Grease and oil	1	6	0
Taking down and cleaning valves, etc.	1	1	9
Cleaning gauze behind supply pipe to carburetter		1	0
New jets (which I have never used), 5/-		—	
New rubber to tyre pump (due to never being used, I think)		2	3
	£11	0	0
Less rebate on petrol		13	0
	£10	7	0

"Don't you think this phenomenal? I do. I have had no puncture or tyre trouble of any sort, and the tyres, though showing wear, are good for a great many miles yet. **The engine is running as sweetly as ever, and never jibs, although most of my work is up and down hill or through traffic,** so that one very rarely has the chance of letting her have a fair run. I drove her to Oxford and back last Whitsun with three up and luggage, and she waltzed the ninety odd miles in just over four hours, and I hardly had to change off top at all; three times, I think, coming back, except, of course, for traffic coming through Reading, etc. I am still more than satisfied, and am only sorry for those people who are ill-advised enough not to possess a Hurtu."

For Particulars and Catalogues of Hurtu Cars (10 and 14 h.p. 4-cyl.), please write

ARIEL AND GENERAL REPAIRS, LTD.,

Camberwell New Road, LONDON.

The Victorious

Sunbeam

and the

Stentophone.

This is the de luxe automobile alarm for this noted car—it is deep in tone, easy to operate, never chokes. Below we also add a few of the other well-known makes with which customers are getting excellent results.

Sunbeams	2"	Black N.-plated	16/-	Hand Control.
Arrol-Johnston	1⅝"	Brass	15/-	Pedal Control
Calthorpes	1⅝"	„	15/-	2/- extra.
Wolseley	1½"	„	13/6	
Singer & Alldays	1½"	„	13/6	If N. or
Rover & Riley	1¼"	„	12/6	B.N.P. in
Humber	1¼"	„	12/6	place of Brass,
Humberette	1¼"	„	12/6	1/- extra.

They are made in seven sizes and no doubt one of them will fit your car.

Retail Prices:

1½," 1¼" 12/6 1⅜", 1½" 13/6 1⅝", 1⅝", 2" 15/-
Postage 4d.

Flanders Fitment 2/- Postage 6d.

No Horn required.

Does not Choke.

Your garage can supply you, or

THE STENTOPHONE CO.,

Patentee, Moseley, Birmingham.

"The Autocar" Share List.

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

Issued Capital.	Amt. of Share	Name of Company.	Present Prices.		Last Year. Highest	Last Year. Lowest.	This Y Highest.	This Y Lowest.	Last Div.	Div. Payable
£									%	
2,520	1/-	Abingdon-Ecco, Ltd.	1/9	2/-	3/-	2/3	3/3	3/-	Nil	Nov.
45,000	£5	Alldays & Onions (£3 paid)	3½	4	4½	3⅞	3⅞	3⅞	15	Ap/Oc
50,000	£5	„ „ 6% Cum. Pref.	5¼	5⅜	5⅜	5 3/32	5⅜	5⅜	6	Ap/Oc
209,802	10/-	Argylls, Ltd.	4/9	5/3	6/-	4/-	5/3	4/9	Nil	Dec.
150,000	£1	Belsize Motors, Ltd.	26/-	27/-	28/1½	25/-	27/6	26/-	12	My/N
100,000	£1	„ „ Cum. Pref.	19/9	20/3	20/9	20/-	20/3	20/-	6	Fb/Au
44,771	£1	Bowden Brake, Ltd.	4/3	5/-	7/-	3/1½	5/-	5/-	Nil	Dec.
766,982	£1	Birm'gham Sm'l Arms, Ld.	48/3	49/-	53/3	46/3	50/-	48/9	20	Mr/Sp
203,150	£5	„ „ Cum. Pref.	5½	5¾	5 13/16	5 7/16	5⅜	5½	5	Mr/Sp
75,000	£5	Brampton Bros. Cum. Pref.	4 sellers		4⅜	3 11/16	4	3⅞	6	Oct.
100,000	£1	Brooks, J. B., & Co., Ltd.	35/3	36/-	37/6	31/-	36/6	35/-	15	My/Nv
100,000	£5	„ „ Cum. Pref.	5⅜	5½	5½	5¼	5¼	5½	5	My/Nv
100,000	£5	Brown Bros. Cum. Pref.	4½ bid		5	4⅜	4⅝	4 11/16	6	Ap/Oc
380,000	£1	Charron Par. Pref. Ord.	8/7½	9/4½	11/6	8/-	9/6	7/9	7	Ju/Dc
200,000	£1	Clément-Gladiator	2/9	3/3	3/-	1/6	3/-	2/1½	Nil	Dec.
100,000	£1	„ „ 6% Cum. Pref.	12/-	14/-	14/9	10/4½	13/6	12/6	6	Ju/Dc
55,000	£1	Components, Ltd.	6/9	7/3	6/9	4/-	7/9	6/1½	Nil	Dec.
25,347	£1	„ „ 7% Cum. Pref.	13/- bid		15/-	11/4½	12/3	12/-	7	Dec.
275,000	£1	Darracq. A., & Co., Ltd.	10/9	11/-	18/4½	8/9	15/-	9/9	Nil	Ju/Dc
375,000	£1	„ 7% Cum. Pref. Ord.	12/6	13/6	19/1½	11/10½	16/-	13/9	7	Ap/Oc
159,229	£1	De Dion-Bouton, 7% Ord.	8/-	9/-	11/3	8/9	8/9	7/6	6	Dec.
1,000,000	£1	Dunlop Rubber	36/-	38/-	56/9	27/6	39/6	35/6	12½	Ap/Oc
200,000	£1	„ „ Cum. Pref.	19/9 sellers		21/-	17/-	20/-	18/6	6	MJSD
312,785	£1	„ „ Income Stock	17/6	18/-	19/-	15/6	19/-	17/6	5	Ju/Dc
624,995	£1	Dunlop Tyre, 8% Ord.	15/9	16/3	18/7½	10/-	18/-	13/9	10	Ju/Dc
994,990	£1	„ „ 5% Cum. Pref.	12/9	13/3	16/9	10/6	15/1½	12/7½	5	Ju/Dc
499,962	£1	„ „ Deferred	10/-	10/4½	15/-	6/3	10/1½	8/-	Nil	Ju/Dc
99,977	£1	Enfield Cycle	20/6	21/6	19/9	13/9	21/9	18/-	5	Oct.
24,985	£1	„ „ Cum. Pref.	21/-	22/-	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	£1	Humber, Ltd. (New)	11/-	11/3	7/6	3/7½	11/1½	6/9	Nil	Nov.
331,495	£1	„ „ 6% Cum. Pref.	16/3	16/7½	11/-	6/9	16/9	10/1½	Nil	Nov.
50,000	£1	James Cycle	14/6	16/-	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	£5	Lucas, Joseph, Ltd.	9½	10	9⅝	9	9 9/16	9⅜	15	Ap/Nv
100,000	£5	„ „ Cum. Pref.	5¼	5½	5½	5¼	5½	5½	5	Mr/Sp
73,385	£1	New Hudson Cycle Co.	26/6	27/-	24/6	14/6	28/-	24/6	10	Nov.
18,033	£1	„ „ Cum. Pref.	19/6	20/-	20/-	18/-	19/6	19/6	6	Mr/Nv
50,000	4/-	Premier Cycle	4/10½	5/-	5/-	3/-	5/3	4/4½	15	Sept.
125,000	10/-	„ „ Cum. Pref.	7/10½	8/-	8/9	6/9	8/1½	7/3	7½	Sept.
31,000	£1	Riley (Coventry), Ltd.	5/6	6/3	8/9	5/3	7/4½	5/3	Nil	Feb.
200,000	£1	Rolls-Royce	44/6	45/6	47/3	36/3	48/6	45/-	30	Jn/Ju
138,668	£1	Rover	38/3	38/6	31/3	12/6	40/-	30/9	10	Nov.
100,000	£1	Rudge-Whitworth, Ltd.	24/6	25/-	24/-	15/-	25/3	22/6	5	Oct.
100,000	£5	„ „ 6% Cum. Pref.	3¾	4	5 1/16	3⅞	4	3⅞	*12	Oct.
41,621	6/-	Siddeley-Deasy	10/9 bid		10/6	6/-	10/9	8/10½	8⅛	Dec.
50,007	£1	Singer & Co., Ltd.	16/-	16/4½	19/6	6/6	19/1½	16/-	Nil	Oct.
70,000	£1	Star Engineering, Ltd.	14/-	15/-	18/6	10/6	17/-	13/10½	5	Mar.
69,157	£1	„ „ Cum. Pref.	16/6	17/6	18/-	15/4½	17/6	17/-	7	Mar.
87,550	£1	Stepney Wheel	31/-	32/6	35/-	30/-	32/6	31/-	20	Mr/Oc
120,000	£1	Sunbeam Motor Car	53/-	54/-	59/-	37/6	56/6	52/-	25	Nov.
30,000	£1	„ „ 6% Cum. Pref.	22/-	23/6	23/3	20/4½	22/6	22/6	6	Ap/Nv
80,000	£1	Swift Cycle	22/6	23/-	21/9	13/-	24/-	20/9	6	Dec.
100,000	£1	„ „ 6½% Cum. Pref.	17/-	17/6	17/3	14/10½	17/-	16/3	6½	Ju/Dc
80,000	£1	Triumph Cycle	72/6	73/6	71/6	43/9	74/6	68/-	30	Nov.
50,000	£1	„ „ 5% Cum. Par. Pref.	23/-	24/-	23/6	20/7½	23/3	21/6	6½	Nov.

* Including all arrears.

The market has been firm considering the holidays, Humbers, James Cycle and Deasys being in request.

"The Autocar" Diary.

March.

31.—Automobile Proprietary and R.A.C. Members' Annual General Meeting.

April.

1-15.—Monaco Motor Boat Meeting.
2, 5 and 9.—Examinations for R.A.C. Driving Certificates, Pall Mall, 9 a.m.
9.—Institution of Automobile Engineers' Meeting.

May.

8, 11 and 12.—A.C. de la Sarthe et de l'Ouest. Le Mans Meeting.
11 and 12.—Targa Florio Race.
18.—Opening of the Russian Automobile Exhibition.
24.—Cardiff CC. Annual Hill-climb.
4 and 6.—Tourist Trophy Races, Isle of Man (see *The Motor Cycle*).

June.

7.—Shelsley Walsh Hill-climb.
19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly.
21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Porthcawl.

July.

12.—Grand Prix Race. Picardie Circuit.
12.—Cardiff M.C. Gymkhana.
28.—Grand Prix de France and Coupe de la Sarthe. Le Mans.

August.

10.—Mont Ventoux. Hill Climb.

September.

21.—Coupe de l'Auto, Boulogne Circuit.
25.—International Stock Car Race, Isle of Man.

"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 Agency, 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: 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.