

# THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 913.

SATURDAY, APRIL 19TH, 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).

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### Subscription Rates.

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

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## Notes.

### The Road of the Future.

Last week we published Colonel R. E. Crompton's invaluable paper before the Institution of Automobile Engineers upon "The Wheel and the Road," and we do not hesitate to say that it is by far the most valuable contribution to the subject which has ever been made; indeed, the Automobile Engineers are to be congratulated on their extreme good fortune in the importance and value of the papers which have been read before their members during the present session. Without being in any way invidious we may say that the three which, undoubtedly, stand out are those upon "The Training of Automobile Engineers,"

which will have far-reaching results; Mr. F. W. Lanchester's paper on "Worm Gearing"; and now Colonel Crompton's paper upon "The Wheel and the Road." These two last are particularly noteworthy in that they are the considered conclusions of two keen intellects upon subjects that have occupied them for many years and on which they have specialised intensely.

### A Considered Pronouncement.

Almost every sentence in Colonel Crompton's paper is worthy of the most careful study, but, perhaps, the most important of all is that in which he does not hesitate to say "personally, I think that the gradual introduction of methods of covering our roads with a satisfactory and smooth-running wearing coat or carpet of sand or other silicious matter bound by pitch or bitumen, at a cost which can be borne by the rate-payers, is only a question of engineering study, of the use of suitable machinery and suitable methods of rolling, and of the organisation of staff and workmen, and I feel confident that I am supported in this, my personal opinion, by all the best of the English as well as of the foreign road engineers who have paid close attention to the subject." It should be borne in mind that this is not the statement of a visionary or an enthusiast, but is that of the Road Board engineer, who has had the immense advantage of carefully studying the various methods of modern road making all over the country, and we believe everyone who heard Colonel Crompton read his paper felt that this statement of his was sound, and that his conclusion arrived at was fully justified by the facts which he had placed before his audience before making it.

Everyone knows now that it is easy enough to make a good road, but it has been felt hitherto that to do this was necessarily so costly that it could only be carried out in a few very exceptional cases. On the other hand, Colonel Crompton has stated that it is a practical possibility which will be realised. Nevertheless, it must not be imagined that it will be realised at once; it will be a very long time indeed under our present system of multitudinous road authorities before all are brought up to the standard of the best. Even if the control of the roads were nationalised to-morrow it would be a slow process, but under the existing conditions of a multiplicity of authorities it must, necessarily, be slower still. However, the levelling up process is proceeding steadily, if not rapidly, and as the road engineers and road surveyors in district after district gradually become experienced in the modern methods the condition of the roads will as steadily improve.

### Skilled Labour Needed.

Incidentally, Colonel Crompton touched upon one of the greatest difficulties, and that is in the organising of the labour. The labour from being almost absolutely unintelligent will have to be gradually educated till the trade of road building and road maintenance becomes a recognised matter of skilled labour, and is not a mere brainless handling of stones, dirt, and water.

*Notes.*

This education of the road foremen and labourers must, necessarily, be slow, as even now in the most enlightened counties one frequently sees road menders doing the stupidest things imaginable, so that the improvement can only proceed slowly and from the top downwards.

**Liquid Fuel from Coal.**

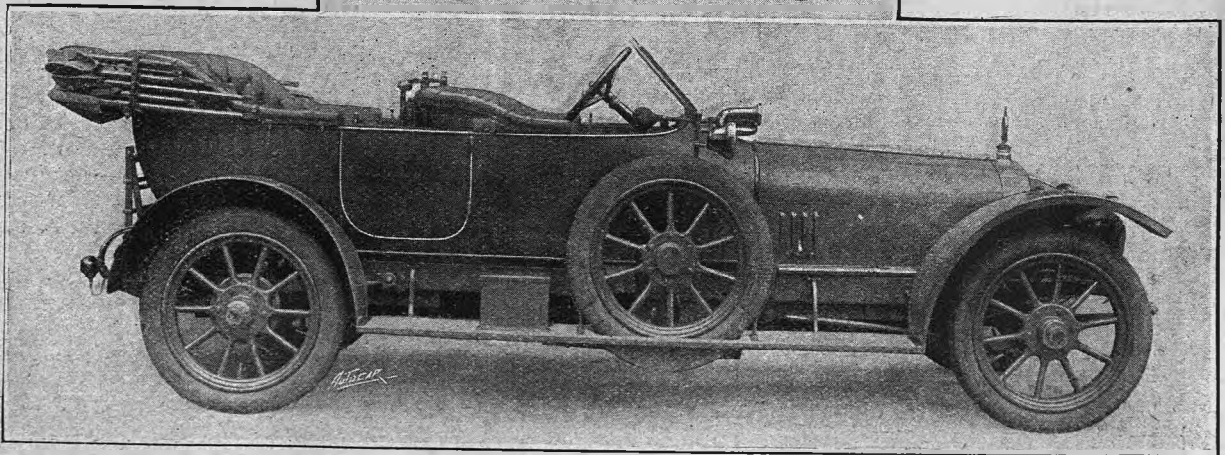
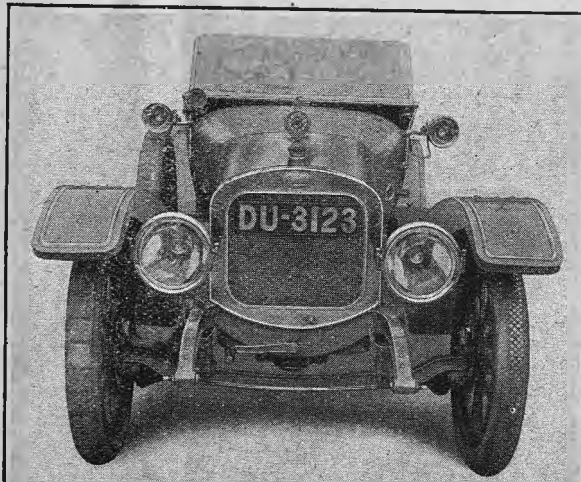
Processes and rumours of processes of alleged newness in the production of liquid fuel from coal are numerous at the present time, and we must hope that one or more of them will come to maturity. Quite apart from other considerations, one of the great practical defects of the processes used up to the present time is that they depend, or, rather, the price of the liquid fuel suitable for motor cars depends, upon the sale of the coke, ammonia, and so on. The actual yield in gallons of liquid fuel from a ton of coal is so small that this fuel can only be sold to compete with petrol at its present high price when the other by-products also command a good market.

Now, it is a striking fact that every, or almost every, new process has claims made for it with regard to the amount of liquid fuel which can be obtained from a ton. The present yield of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  gallons per ton, as is the case with benzole, is regarded as hopeless, as indeed it is, if the supply of benzole is to be sufficiently increased to make it a real rival of petrol. While it is a great gain if any process can give us, say, even four or five gallons without affecting the value of the other residuals, yet, from the motorist's point of view, the only real chance of substantial relief lies in something far more promising than this. What the motorist wants—whether he can get it is another matter altogether—is a process which will result in so many gallons of benzole

or its equivalent being obtained from a ton of coal that it is a commercial proposition to treat this coal for the sake of its liquid fuel alone, or at any rate mainly for its liquid fuel. Not only so, but, again from the motorist's standpoint, this ideal process should not necessitate unduly costly tackle or be impeded by any manufacturing objections.

Even if such a process were launched to-morrow, it would take a very long while to manufacture motor spirit from coal on such a scale that it would really seriously compete with petrol, but this is, undoubtedly, the kind of process which is wanted. Impossible as this ideal may appear to many, we cannot help feeling very strongly that anything which falls very much short of it will fail to give substantial relief to the tension in the fuel market; but it is also obvious that, if such a process could be discovered or invented, nothing but the most searching tests carried out by the most eminent authorities would convince the average man that it really paid to treat coal for the sake of its liquid fuel. As to gas managers, coke manufacturers, and others, who really know the principles of coal distillation, they would possibly want still more conclusive evidence before they were absolutely convinced, yet the fact remains that these are the very men who undoubtedly realise more clearly than anyone else what little relief to the present position will really be given unless and until coal can be distilled almost, if not quite, for the sake of its liquid fuel alone.

Although there is nothing strikingly novel among the road construction exhibits at the Building Trades Exhibition that continues at Olympia until the 26th of this month, those who are interested in this subject will find displays of various road material contractors. Examples of modern road materials are in evidence.



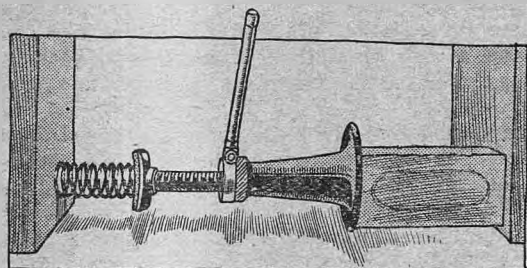
A 25-30 h.p. six-cylinder Sunbeam, with standard open body. The engine is  $90 \times 160$  mm., the cylinders being cast in two groups. There are four speeds, the top being 2.9 to 1, with  $880 \times 120$  mm. wheels. The wheelbase is 11ft. 2½ in. The car affords a most delightful combination of speed, power and smoothness of running, having all the efficiency that one associates with a Sunbeam with the smoothness and silence that one, as naturally, associates with a six-cylinder engine. The engine is quite devoid of periodic vibration, though no damper or other such device is fitted. The back screen is an Anster and the lighting by a C.A.V. electric equipment, while the hood has the very simple one-man Rotax fittings.

## Useful Hints and Tips.

### Refitting Valve Springs.

**T**HERE are many tools made for compressing valve springs when in position on the engine and it is desired to remove them. The same tools can often be successfully used when a spring is to be refitted, and it is desired to compress the spring so that the cup and cotter may be put in place. But occasionally it happens that a valve spring is so long and stiff that it is very difficult to put it back in position. That is to say, after putting the upper end round the valve guide the spring needs compressing to a considerable extent to lift it over the valve tappet. In such cases the average valve spring lifter is of no use.

We recently found ourselves in this difficulty, and decided that the only way of refitting the spring was to compress it first in a vice and keep it compressed during the refitting by the familiar method of tying it so with thick string, one piece at each side. But the trouble was, there was no vice available, and eventually we hit upon the plan shown in the accompanying sketch. The spring presses against one side of an open doorway and a brick against the other side. By fixing a jack in between the two the desired pressure



*A method of compressing a valve or clutch spring so that it may be held compressed with string or wire while it is being fitted in position. The spring and the brick press against the sides of an open doorway, and provide an excellent alternative when a parallel vice is not available.*

can be obtained, and the spring compressed until the coils touch, if necessary. It is advisable, however, before the coils are fully compressed, to put the lengths of string (copper wire is even better) in position ready to be drawn up tight and secured before the jack is screwed back.

This plan can, of course, be adopted when springs are to be refitted without the use of a spring lifter. There are some engines with springs which can easily be lifted with a screwdriver on a suitable fulcrum, or even without a tool at all, but the majority of present-day valve springs present some difficulty in the refitting. The plan shown in the sketch can be used with advantage in the refitting of many clutch springs, which must often be compressed considerably before the adjusting nut can be approached to its bolt or thread.

### Loose Glass in Wind Screen.

The average glass wind screen is formed of a sheet of plate glass held in a wooden or metal frame, and, in the majority of cases, is provided with a strip rubber packing on each side of the glass in the groove of the frame. After some use the rubber contracts as it perishes, and even if it does not allow the glass to rattle, it allows rain water to pass down into the groove, round the bottom of the glass, up the other side and out, back into the car or on the occupants. We recently experienced this trouble, and the water

which flew back into our faces carried with it some of the sulphur used in the vulcanising of the rubber; at any rate, it was thick and white and left nasty stains on clothes and rugs. We tried several plans which suggested themselves in an endeavour to stop the leak without fitting new and thicker rubber packing strips, and eventually hit upon an idea of using the tyre stopping which is sold for filling up superficial gashes in treads of tyres, and which we always carry on the car. This thick pliable filling was without difficulty pushed down, a little at a time, tightly between the front of the glass and the front rubber packing strip, in the same way as putty is used by glaziers, although it was not left protruding beyond the frame, and was almost unnoticeable when the job was finished. We have since used the car in heavy rainstorms and find the cure most complete, not a drop of rain passing behind the glass by this way.

### Greasing the Springs.

For several years I faithfully followed the makers' instructions about greasing the springs of my car. The process consists of jacking the weight off the wheels, plunging a knife blade into a can of grease, prising the leaves microscopically apart with a screwdriver, and pushing the knife blade through. The comparative uselessness of this method finally dawned on my trustful soul, both by reason of the rust dimly discernible through the minute interstices, also by the grievous squeaking which shortly returned to trouble me; and, lastly, but not least, because such grease as I laboriously inserted was obviously squeezed out again as soon as the weight came back on the springs. My last car got so bad that one day I took the springs to pieces—a job I will never tackle single-handed again—polished off all the rust, and rubbed some graphite grease well home. Then it occurred to me that I should have to repeat the work pretty regularly, and I decided that if there were no alternative I should prefer to sell the car and buy a pedal tricycle. Finally I drilled a number of fine holes in all the leaves, setting those in the lower leaves out of register with those above them, and afterwards I periodically jacked the wheels up, and injected oil into the holes of the upper springs, leaving it to percolate during the night. This stopped the squeaking, but I could see that water would work in during bad weather driving unless I protected the holes in the upper leaf. To begin with I made some L-ended spring clips which snicked over the top holes; but I found these were apt to jar off, and replacements became a nuisance. After that I got long strips of flat spring steel, inserted pegs over each hole, and lashed them over the holes in the top spring with waxed twine; I ought to have screwed or riveted their tips into the top spring, but this meant dismantling the springs again, a job for which I had no fancy. I should like to warn owners who keep their cars three or four years that the makers' provision is hopelessly inadequate for necessary lubrication, and that old springs will squeak worse every year. My own method is clumsy, but it has not led to the leaves snapping across the holes, as a mechanic prophesied when I made them. The little forcing clamps as sold by Messrs. G. T. Riches and Brown Bros. should prove to be satisfactory. These have small wedge-shaped teeth, designed to be forced by a screw-handle between the leaves, which can then be lubricated with a suitable lubricant. I recommend a thin graphite grease.—RUNABOUT.

## Some Bavarian Pearls.\*

Bad Reichenhall and Berchtesgaden—The Wondrous Königssee—Ramsau and the Hintersee.

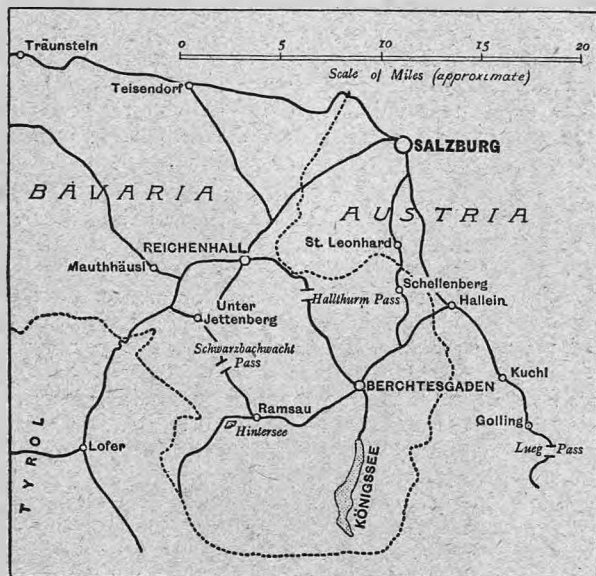
By Chas. L. Freeston, F.R.G.S., Author of "The High-roads of the Alps," "The Passes of the Pyrenees," etc.

IN the course of one's continental travels there is nothing so baffling at times as the curiosities of frontier delimitation. The traveller by train, it may be, has nothing more to think about than the possible annoyance of being aroused in the middle of the night in order to pay a reluctant visit to a *douane*,

the most disconcerting fashion. If sailing up the Lake of Lugano by steamer, moreover, one may note with amusement the sudden quickening into activity of the Swiss customs officers on board when the imaginary frontier line on the water has been crossed, and still more amusing is the spectacle of the powerful Swiss navy at anchor, in the shape of sundry gun-boats of Lilliputian dimensions.

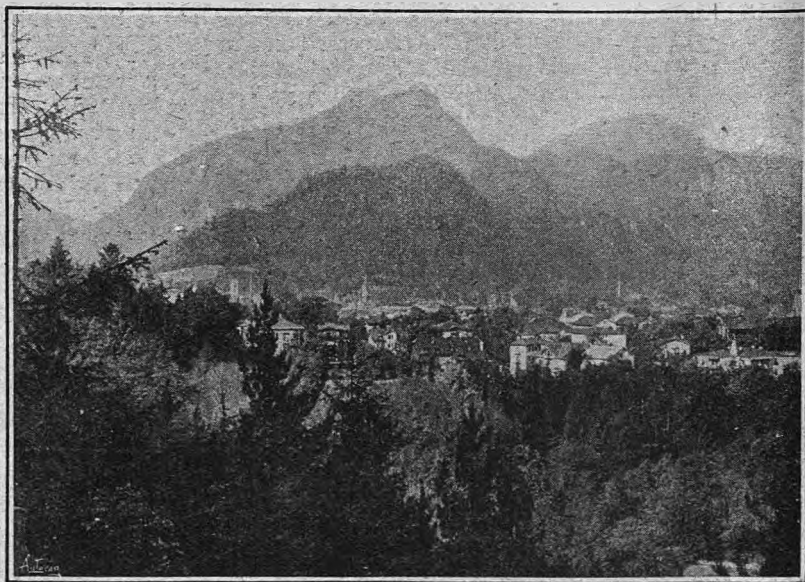
Curiosities of this kind are not by any means due to the physical conformation of the country, as might readily be imagined if a mountain barrier or river offered a natural line of frontage. On the contrary, the explanation is to be sought for in the history of past warfare, for at some period or other one country has wrested a strip of territory from another and contrived to hold it, or an invader may have been driven back and lost part of his own territory as well as what he had set out to capture. There is a wonderfully interesting field of study in this connection, and anyone, for example, who will take the trouble to examine a map of Europe of a hundred years ago will be amazed at the contrast it presents to what we know to-day.

The special case of peculiarity in territorial demarcation which we have to consider at this juncture is that of Bavaria's encroachment on the Salzburg province; or, possibly, it may be that Salzburg has encroached upon Bavaria! Be that as it may, one must needs be very careful, if approaching the city of Salzburg from Tyrol, to keep within Austrian territory if unprovided with a German triptyque, for it is impossible to proceed directly from Lofer to Salzburg without crossing the Bavarian frontier. The actual boundary, unfortunately, is imperfectly marked on the average map, and it is necessary to be primed with the facts of the case before embarking upon a tour in this particular region.



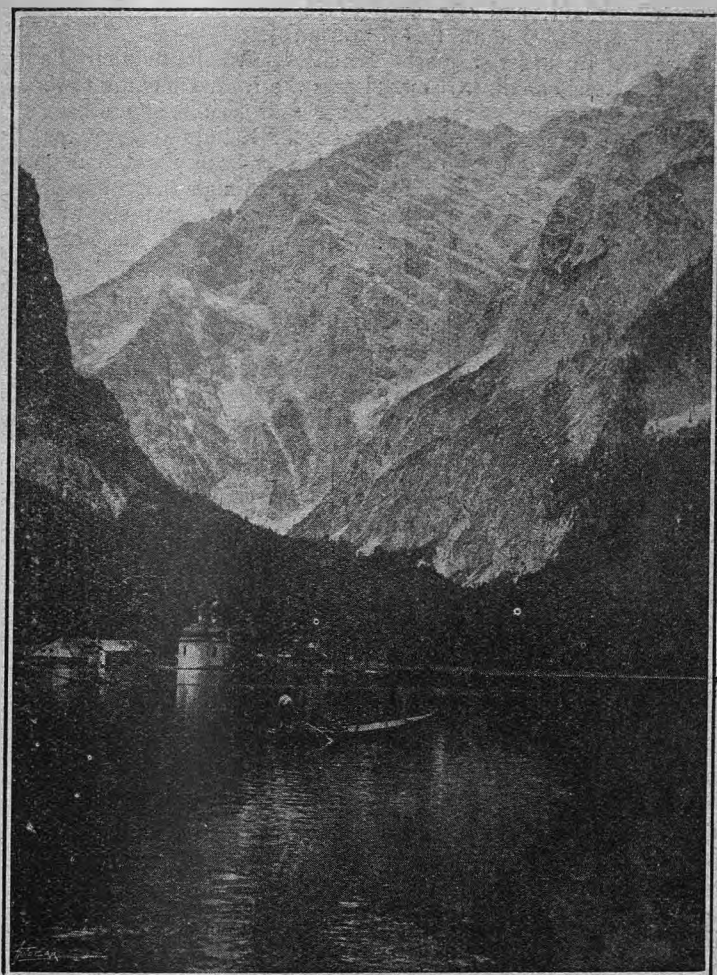
*dogana*, *zollamt*, or whatever name the customs house may bear, according to the country he is entering. To the road tourist, however, the whole question of custom houses is one of much greater moment, for he may cross the frontiers a dozen times to every once of the railway traveller. The man with a car is not simply making a bee line, as near as may be, across the map, but is roving about to see all that is worth seeing, and in this way he comes to realise the extraordinary intersections in unexpected places which frontiers may present.

One of the most curious, for example, is the share of Switzerland in the North Italian Lakes. Here we have four sheets of water lying side by side, as it were—Como, Lugano, Maggiore, and Orta. The whole of the country in which they lie so entrancingly is Italian in character, and the whole of the Lago di Como is, in fact, in Italy; but though the Lake of Lugano does not run nearly so far north it is more than half of it Swiss; the tongue of Helvetic territory, moreover, which here projects into Italy includes a small portion of Lake Maggiore also. Anyone doing the Lombardy lake district thoroughly by road, therefore, has to skip about from custom house to custom house in



A view of Bad Reichenhall, one of Bavaria's most popular spas.

\* All rights reserved.



*St. Bartholoma, on the Königssee.*

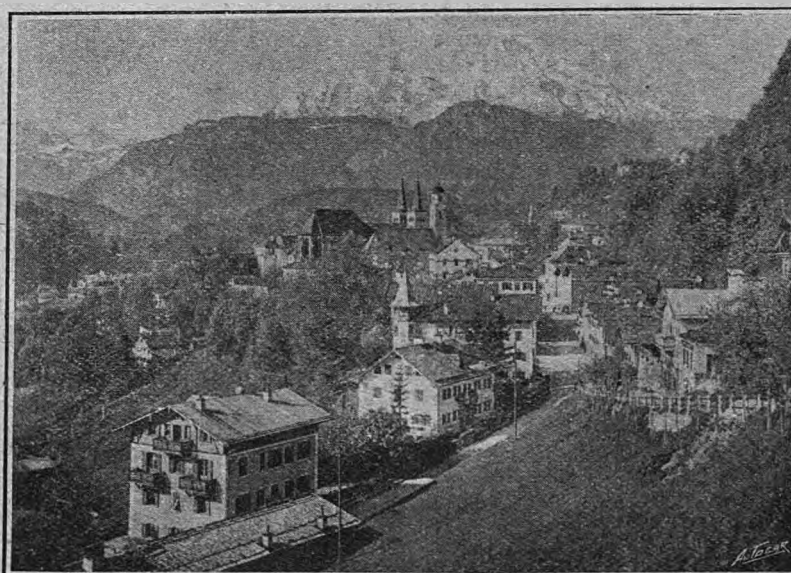
Nothing could well be more profitless, however, than to omit Berchtesgaden from the itinerary, for it is undoubtedly one of the most charming places in Europe, and I am compelled to include it in a description of Austria, although it is actually outside the fold. If it so happen, by the way, that the motorist has approached Salzburg from Germany direct, and he wishes to see Berchtesgaden and the Königssee before passing on to the Salzkammergut, it will pay him not to enter Salzburg first. In order to reduce the halts at custom houses to the minimum number, it will be advisable to turn off at Teisendorf, on the road from Traunstein to Salzburg, and proceed to Reichenhall and thence to Berchtesgaden and the Königssee, after which he may strike northwards for Salzburg, and will not leave Bavaria until he reaches Schellenberg.

From Salzburg itself one may make the round trip, of course, to Berchtesgaden and Reichenhall—for both are worth visiting—in either direction, but on the whole I should advise that Reichenhall should be the first objective, as the views

*Some Bavarian Pearls.* available on the road from there to Berchtesgaden are seen to best advantage when taken in the direction named. It is only a matter of twelve kilometres from Salzburg to Reichenhall, by way of Wals, or Walsenberg, where the frontier is crossed and Bavaria is entered; at the fork we avoid the road to the left and keep straight on.

Reichenhall—or Bad Reichenhall, to give it its full name—stands at a height of 1,545 feet, on the river Saalach, and is therefore only a couple of hundred feet higher than Salzburg. It is a bright and prosperous looking little town, and boasts a large number of hotels, partly as the result of its fame as a "cure" resort, and partly by reason of its fine situation amid an amphitheatre of peaks. Its salt springs number fifteen, in addition to which it receives the surplus brine pumped up from Berchtesgaden; in fact, there is a series of conduits, fifty miles in length, connecting the two towns named with Rosenheim and Traunstein. There is a Royal Cur-Park at Reichenhall, with salt baths and other curative methods, including the "pine-needle inhalation" cure, while at the Kirchberg Bath House, in addition to baths, there is a whey cure also. But the air alone of Reichenhall is almost enough to restore the pulmonary invalid to health, so beneficently ozonised is its quality. Of pleasant walks there is an infinite variety, and in this respect it vies with Berchtesgaden itself.

Of the available local drives there is one which is conspicuously enjoyable, viz., that to the Thumsee and on to the Mauthhäusl. The road passes through Bad Kirchberg and leads to the ruined castle of Karlstein, opposite which is the tiny pilgrimage chapel of St. Pankratz, standing picturesquely at the top of a wooded hill. The little lake of Thum (1,730 feet) is reached in about four kilometres from Reichenhall; it is only threequarters of a mile long and



*Beautiful Berchtesgaden, with the Grosse and Kleine Watzmann in the background.*

*Some Bavarian Pearls.*

one quarter broad, but is charmingly situated beneath well-wooded slopes, surmounted by the massive Ristfeuchthorn. At a fork two kilometres further on we keep to the right and rise to the Mauthhäusl (2,075 feet), finely situated above the valley of the Weissbach, with gorges and a waterfall in the vicinity. Unfortu-

behold, and one may go far to find anything more attractive than this Bavarian jewel

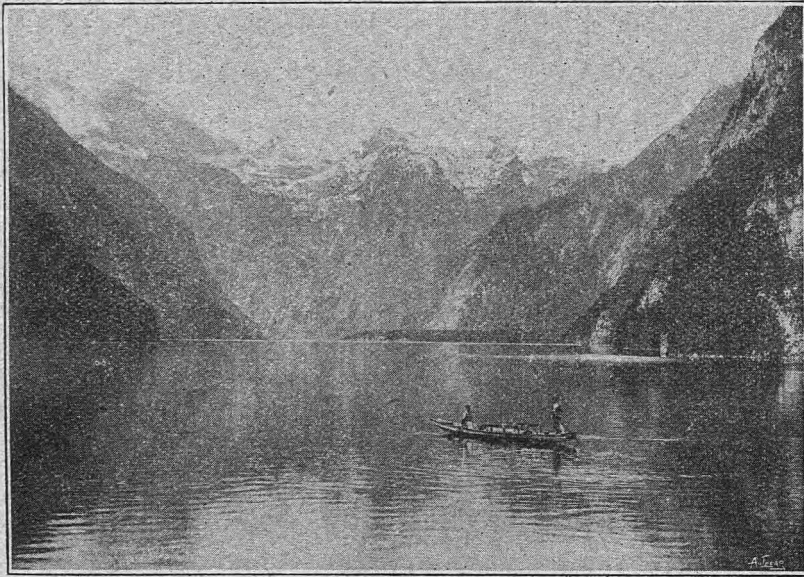
In many respects Berchtesgaden is another Bad Reichenhall. Of inhabitants the former has the fewer, but the propinquity of the wondrous Königssee brings an increasingly large number of visitors year by year.

They come for beauty's sake alone, however, for though Berchtesgaden has its salt-works, and salt-water baths are available at the hotels, it is not a spa in the same sense that Reichenhall is. The Salzbergwerk, or salt-mine, by the way, is well worth a visit in itself, for it contains a subterranean lake, which is crossed by boat. To reach the mine one must follow the Bergwerks-Allee for two kilometres.

Of pleasant walks and drives the choice is almost endless, and unhappy is the lot of the tourist who cannot afford the time to stay here for an indefinite period. Paramount above all other excursions, however, is that to the Königssee. It lies six kilometres south of the town, than which it is just one hundred feet higher, and one may drive right up to the lake—but no further, as there is nothing in the nature of a road on either shore. The cause is obvious on arrival,

for the rocks by which it is environed rise precipitously from its borders. It is from this point of view that the Königssee must be judged; it is not a lake to drive round at a sauntering pace, but one to admire from the placid bosom of the water itself.

Highly important is it, therefore, that one should choose not only the right kind of day—a bright one—but also the right time of day; in an unsuitable light the scene loses half its attractiveness, for some of the closely surrounding mountains rise 6,500 feet above the lake, and a brilliant sun is needed to convert their presence from one of gloomy oppression to rugged grandeur. The best times are said to be in the early



*The Königssee, Germany's most beautiful lake.*

nately, the next stage of the road on towards Träunstein is closed to motor cars in the season—May 1st to September 30th—but the little run out from Reichenhall is well worth doing.

A fine road, of splendid surface, runs in eighteen kilometres to Berchtesgaden, over the Hallthurm Pass (2,252 feet), and the journey is memorable for the magnificent views, first ahead, and then on the right, of the Watzmann mountains, the Kleine and the Grosse respectively, which tower above the landscape with superbly beautiful effect. Though the highest peak of the Watzmann group—which is threefold really, though only twin pinnacles are visible from the road—is under nine thousand feet in altitude, it stands, nevertheless, so commandingly above its attendant foothills as to appear much higher than it actually is, and the road view is one of the best of its type in the Alps; indeed, it is only exceeded in majesty by those in which the mountains themselves are materially higher, such as the Ortler on the far-famed Stelvio Pass in Austria, and La Meije, on the Col du Lautaret in France.

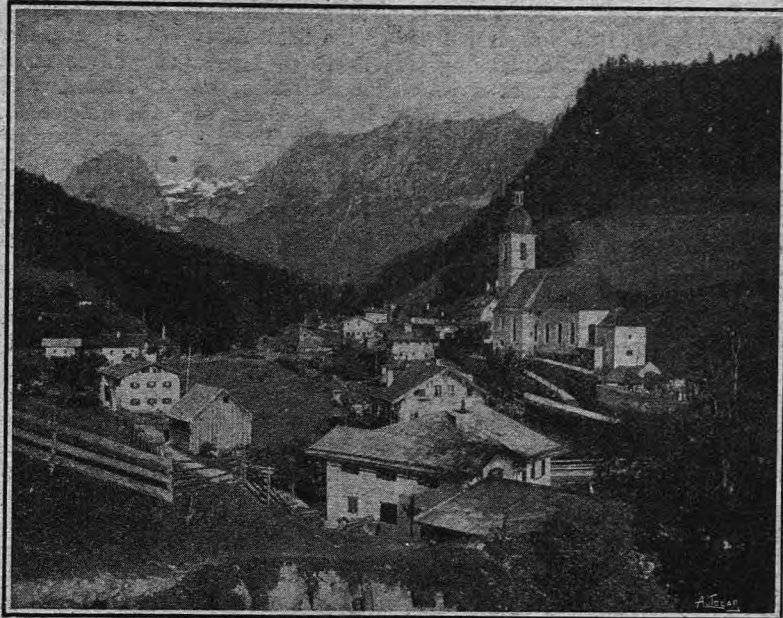
But if the Watzmann is beautiful from the road, even more so is the picture which presents itself when Berchtesgaden itself is attained. The snow-capped peaks still dominate the landscape, but a foreground is superimposed which is, of the most inviting description. Nestling among wooded hills, the royal castle, the hotels, the villas and pretty huts of the little town make up a scene which it is a delight to



*The secluded Obersee, with the peaks of the Teufelshorner beyond.*

morning or late in the afternoon. Steamboats are not allowed to profane the sanctity of this secluded treasure-house of beauty, but little electric launches now ply to and fro at stated times. Unquestionably, however, the one and only way to see the Königssee to supreme advantage is to take a rowing boat, "manned" by lusty Bavarian lasses who revel in their task, and whose muscular arms would give joy to the apostles of physical culture.

At the point of embarkation, where there is the little village of Königssee and a couple of hotels, the full view of the lake is that out by the island of Christlieger and the Falkenstein rock, on which there is a cross to the memory of a boat-load of pilgrims who were wrecked here in the eighteenth century. When the rock has been rounded, however, the whole lake comes into view and presents a spectacle which is unique in Europe. But for the presence of humanity on the water in the boats, one enjoys a splendid isolation from the world, amid lofty walls of grey rock which disappear vertically into the depths of the lake. A pistol shot is echoed from rock to rock and magnified in volume until it sounds like a rolling peal of thunder. Save at the two extremities, there is



Ramsau, near Berchtesgaden.

only one spot in the entire lake where soil has been washed up to afford space for a settlement, and this is at St. Bartholoma, a little promontory where there are a hunting-box and a pilgrimage church. One is allowed to land here at option, and the forester attached to the hunting-box keeps a little restaurant.



The Hintersee, a charming lake near Ramsau.

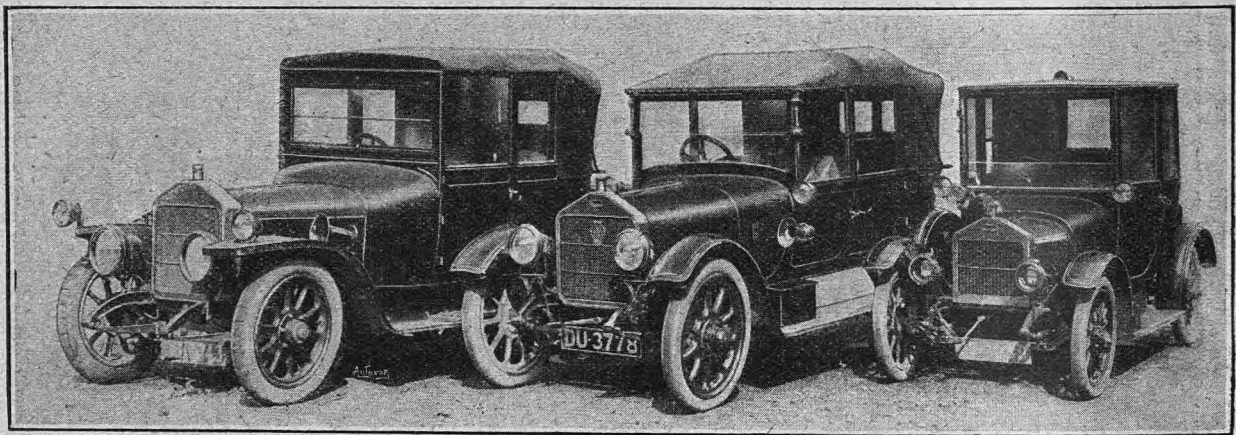
*Some Bavarian Pearls.*

From St. Bartholoma, which is about three-fourths of the way up, it is a short journey to the Salet-Alpe, where there is another landing stage. From here a ten minutes' walk across a rock-strewn pasture, on which there is a chalet belonging to the Duke of Meiningen, brings one to another lake, the Obersee. No boats ever cross its surface, and it is even remoter from the world than the Königssee itself. The Obersee is about a mile long, and seems literally embedded among massive rocks of limestone. The return journey down the Königssee affords the opportunity of enjoying its beauties anew from different points of view; they are impressive at almost every point.

It goes without saying that the resources of this region are not to be measured by a sail alone; one needs to leave the lake wherever it is possible to do so, and ascend the footpaths to special points of view. At the Kessel promontory, for example, on the opposite side to St. Bartholoma, one may land from a rowing

fully reflected from the rocky walls of the Hohe Göll. The run to the Hintersee and back from Berchtesgaden is only a matter of twenty kilometres.

Assuming that Berchtesgaden has been approached from Reichenhall, it now only remains to say that the return journey to Salzburg may be made by way of Hallein, or directly through Schellenberg—the latter for choice. At a fork about four kilometres beyond Berchtesgaden, where a signpost says "Nach Hallein," one must turn sharply to the left, after which there is no ambiguity about the route. Before Schellenberg is reached the valley contracts, and the river Ache is crossed. Between Schellenberg and St. Leonhard the Bavarian and Austrian custom houses have to be passed. If the tourist has come by way of Munich, and is now entering Austrian territory for the first time, he must not be alarmed if the officials request him to remove his spare wheel and covers, and to take them into an outhouse opposite the *zollamt* to be



*POSITIVE, COMPARATIVE, SUPERLATIVE! Three sizes of Singer cars—the 10 h.p. 63 x 80 mm., the 14 h.p. 78 x 125 mm., and the 20 h.p. 90 x 130 mm. All have four cylinders, and the two larger cars have j.c. 1-speed gear boxes. The bodies shown were built by Charlesworth Bodies, Ltd., Coventry.*

boat, though not from the electric launches, and visit the Kesselbach waterfall, about ten minutes' walk above the lake. Two more important and larger diversions are those to the Malerwinkel ("Painter's Corner") and the Rabenwand. The paths to each of these ascend from the north-east corner of the lake, not far from Königssee village. The half-hour's walk to the Malerwinkel unfolds a delightful view of the green promontory of St. Bartholoma, and the splendid pyramid of the Schönfeldspitze in the background, while the Rabenwand, which may be reached in three-quarters of an hour, is high enough (2,985 feet) to command a view of the entire lake.

Pressed for time as the touring motorist nearly always is, it is none the less quite worth his while to do something more than merely call at Berchtesgaden and sail up and down the Königssee; the lake itself is deserving of the best part of a day, if the weather be kind, while the town is one to linger in as long as ever the itinerary will permit. Before departing, moreover, he should by all means run out to Ramsau, on the south-west, and would, indeed, be able to make a charming round trip to Reichenhall and back to Berchtesgaden, but for the fact that the Schwarzbach-wacht Pass (2,918 feet), between Ramsau and Unter-Jettenberg, is forbidden to motor vehicles. Ramsau itself, however, is not only beautifully centred in a wooded valley, with a fine environment of mountains, but is also near to the Hintersee, a placid little lake in which the rays of the setting sun are often beauti-

put on the scales. Duty is charged on tyres if the equipment be above a certain weight, and a Rudge-Whitworth or other wheel of that type is weighed as rubber. The allowance, however, is ample to cover ordinary touring outfits without the exaction of duty.

Eventually the valley expands again, and the beautiful city of Salzburg is seen from afar, and entered after a run of twenty-eight kilometres from Berchtesgaden. It will have been realised ere now that no great mileage has been covered in the itinerary just described, but in the way of supreme attractiveness, and scenes from which it is difficult to tear one's self away, it would not be easy to find its superior.

We heard a good tale from India the other day which has the merit of being true. A gallant British officer in the Indian Army was coming home, and had a 14-20 h.p. Wolseley which he wanted to sell in India before returning. One of the native princes, who was both wealthy and fond of motor cars, struck him as a likely purchaser. The prince was not keen, as he explained he already had forty cars, but the officer with much difficulty persuaded him to increase his stud by one. Two years later the officer was back in the same part of India, and recognised his car coming down the road with the princely owner at the wheel. The prince, seeing the officer, pulled up and thanked him for selling him the car, as he said he liked it so much that he always drove it himself in preference to others in his stud.



## Notes on Paraffin.

Including Details of Two Well-tested Systems. By Eric W. Walford.

THE chief reason why paraffin cannot be used in ordinary motor car engines with existing carburettors is that considerably more heat is required to convert the paraffin into vapour than is the case with petrol. The same applies in a smaller degree to benzole and other fuels heavier than petrol but lighter than paraffin, although many petrol carburettors can deal with these fuels, but not with paraffin unless this is mixed with a lighter fuel.

The majority of heavy oil engines convert the liquid paraffin into a vapour just before admission to the engine, but such systems are not altogether practical on motor car engines, and generally a carburetter is used in which liquid paraffin is mixed with air in the required proportions, and the mixture so formed is passed through a vaporiser or heater, in which it is converted into a fixed gas, that is to say a gas which will not recondense into liquid form. This fixed gas is supplied to the engine in the ordinary way. This sounds very simple, and in the case of a stationary engine running at constant load and uniform speed the difficulties are not very great, but these conditions do not obtain on a motor car. At times a motor car is running with the throttle wide open for many minutes together, in which case the vaporiser is apt to become too hot, whilst during long periods of slow running the vaporiser is liable to be insufficiently heated. Further, the motorist desires to be able to start up his engine immediately and give it little or no attention during driving. Heavy oil engines as used for stationary work require some little attention at first until they have settled down to their normal running. These points constitute the chief difficulties standing in the way of the general adoption of paraffin for motor car work, but there is no doubt they can be overcome.

In the White and Poppe system, which is illustrated in figs. 1, 2, 3, and 4, an ordinary White and Poppe carburetter is arranged at A, delivering gas through the elbow B to the vaporiser pipe C. This passes

through the exhaust branch D, to which the exhaust gases are admitted from the cylinders through the four openings E. The fresh gas passes out from the vaporiser tube C by the pipe F to the ordinary induction pipe G, which is arranged in this case on the opposite side from the exhaust branch, and is often

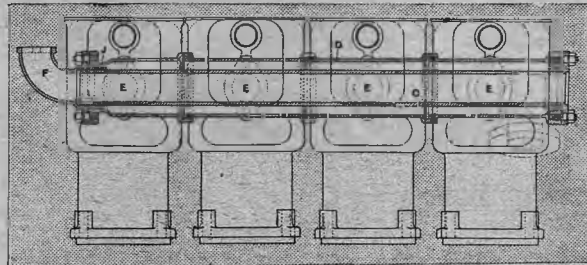


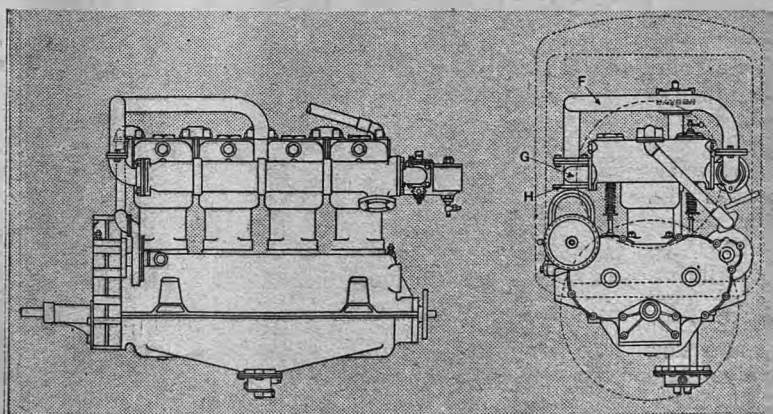
Fig. 4.—A section of the White and Poppe vaporiser.  
C, inner tube of heavy section. D, outer casing of exhaust manifold.  
E, exhaust ports. F, mixture outlet. J, expansion joint.

fitted with an additional carburetter which is bolted up to the flange H. The supplementary carburetter which is attached at H supplies the inlet pipe with petrol vapour in the ordinary way, the carburetter A being used for paraffin.

To start up, the petrol carburetter is used until the vaporiser is sufficiently heated. It is not essential that there should be two carburettors, as a single carburetter A can be used, being first supplied with petrol and then with paraffin. On one car fitted with this system, of which I have had a little experience, the petrol carburetter was shut off after two or three miles running, and the paraffin carburetter was then used. By this time the vaporiser was sufficiently hot to gasify the liquid paraffin. As far as one could tell, precisely the same results were obtained with paraffin as with petrol, and this system is being used on Dennis motor lorries as well as on certain private cars. It is applicable in different ways to suit different types of White and Poppe engines.

The manner in which the objections referred to are overcome is somewhat ingenious. It will be noted that the walls of the vaporiser pipe C are very thick, and the pipe is made of some metal of high heat conductivity, such as copper, and is rigidly attached at one end and held in an expansion joint J at the other. This thick copper tube is therefore free to expand, and, being thick, it retains the heat a considerable time, so that when once heated up the engine can be run slowly for long periods without failure of the vaporiser. Similarly, if the engine be raced for any length of time the thick copper pipe does not become excessively hot near the exhaust ports E, and firing of the paraffin vapour is prevented.

I have been afforded an opportunity of examining the condition of the



Figs. 1, 2 and 3.—Elevation, plan and end view of an engine fitted with the White and Poppe paraffin fuel system.

- A, carburetter
- B, fuel supply to vaporiser
- D, exhaust manifold and vaporiser
- F, fuel pipe from vaporiser
- G, inlet manifold
- H, flange for petrol carburetter

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pistons and valves of a 28 h.p. Dennis lorry to which the device is fitted. The valves after 1,500 miles running showed no signs of pitting, and the valve heads and piston heads were covered with a slight deposit of fine soft carbon quite different in tex-

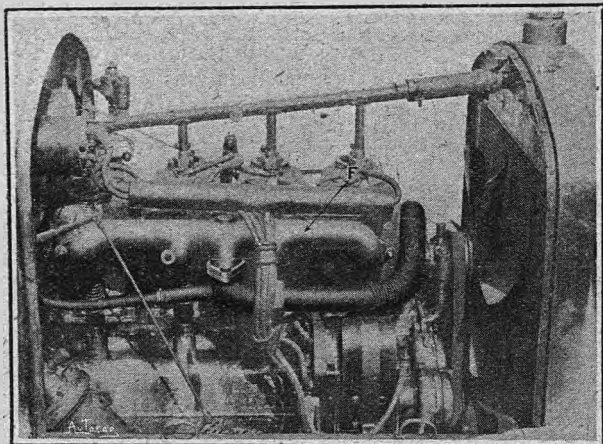


Fig. 5.—The Halliday system. The inlet side of the engine showing the vapour pipe on the right and the moist air pipe on the left.

ture from the usual thick, hard, caked carbon experienced after running on petrol. The interior of the main supply pipe running through the heater was quite clean, and the oil which had been drained from the crank case had no smell of paraffin.

It is possible to start without the use of petrol, as openings are made in the exhaust branch so that a lamp or heater can be used to warm the vaporiser.

Another system is the Halliday paraffin carburetter, which is handled by the Winchester Carburetter Co., 11, Gresham Street, London, E.C., and is arranged in a somewhat similar manner to the White and Poppe, but differs in many respects. Figs. 5, 6, and 7 are illustrations taken from a demonstration car which has been running successfully for many months. In fig. 6 it will be seen that the carburetter is arranged just behind the dashboard, and is supplied with hot air from the exhaust box by the pipe B. It delivers its mixture into a vaporising tube C (fig. 10) contained within the exhaust branch D (fig. 7), and the vapour passes off by the vapour pipe E to the induction pipe F on the other side of the engine. Just before the gas enters the induction pipe it has added to it a small quantity of moist hot air, which is supplied in a manner described hereafter. The carburetter, which is shown separately in figs. 8 and 9, is provided with two float chambers fed with petrol and paraffin respectively, and from these either fuel is supplied to a jet nozzle which stands vertically in the spraying chamber. A two-way tap G (fig. 8) beneath the jet nozzle controls the feed of fuel to the jet. Surrounding the choke tube is an automatic air inlet valve and a slow running by-pass H is used, these parts being substantially such as are used in ordinary petrol carburetters. The lever controlling the two-way tap G is coupled to a corresponding lever K on the spindle of the water tap L. This tap controls the admission of water from the water inlet pipe M to an ordinary jet nozzle. Around this jet nozzle air is drawn from the hot air pipe passing out through the moist air outlet N shown in figs. 6 and 8. The quantity of moist air is controlled by the lever K, which is coupled to the main throttle lever O, so that as the throttle is opened more moist air is supplied, and *vice versa*. The con-

trol of moist air is, therefore, automatic, and follows the movement of the throttle, and the turning on or off of the water is coupled with the manipulation of the two-way tap G. When petrol is used the water supply is cut off, being supplied only with paraffin.

The vaporiser itself is of rather peculiar construction, and is shown in fig. 10, which depicts the vaporiser pipe C exposed after being withdrawn from the exhaust branch. At each side of the vapour pipe is provided a rib P which forms a partition preventing the passage of the exhaust gas from one side of the pipe to the other except through the cross tubes R. These cross tubes are arranged spirally, and they taper throughout their length. In the vapour pipe they constitute a spiral baffle which breaks up the gas as it passes through the vaporiser, so that ample heating is obtained at low engine speeds.

I have on three occasions made somewhat interesting tests of this system. In the first case the car had been standing in the open some three or four hours, with the result that the radiator was apparently quite cold. The engine was started up on petrol and the paraffin was turned on after about thirty seconds running. The car behaved exactly the same as on petrol, and very rarely was there noticeable more than the smallest trace of smoke. Acceleration was good and the general behaviour was satisfactory. On a recent occasion I travelled about thirty miles on this car, when at the outset, after the car had been standing about half an hour, the engine was started up on paraffin, and on the run it was found that the behaviour of the car corresponded very closely with what one would expect when petrol was in use. There was practically no smoke at any time after the first fifty yards running, this initial smoking probably being due to the fact that the engine was rather cold. On a later occasion the car had been standing in the open for about an hour in a very exposed place, and it was again started up on paraffin.

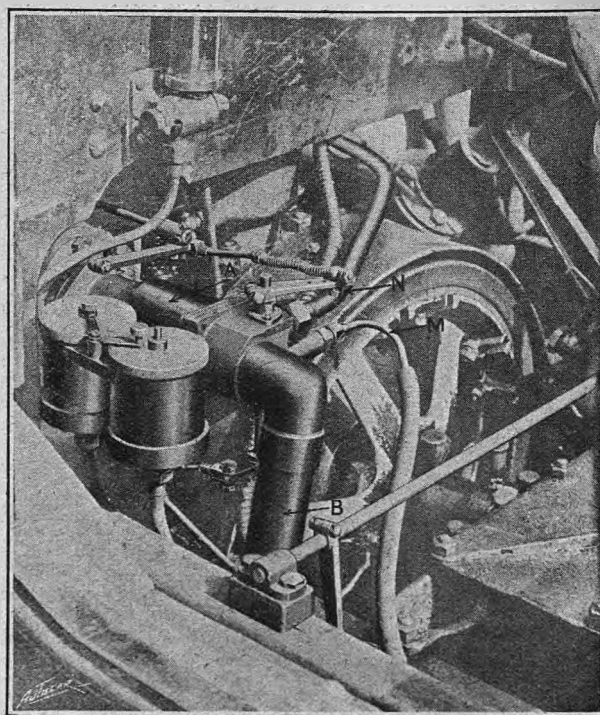


Fig. 6.—View showing the carburetter behind the dashboard, the hot air pipe (B), moist air pipe (N), and water pipe (M).

There is no doubt that this system has been very thoroughly carried out on the demonstration car with the result that the inventor, Mr. T. E. Halliday, can practically dispense with the use of petrol except for preliminary starting in the morning. This is, as far as I am aware, the only system in which one can start on paraffin after standing for an hour in the open. The consumption is claimed to be slightly better than when petrol is used, and only a small quantity of water is used, something like a quart in ninety miles.

It is quite common practice to use water with paraffin engines to avoid thumping. In the Westmancort paraffin carburetter, which is used for motor boats, there is fitted a water feed. Without the water an engine fitted with this carburetter thumps very badly, but this immediately stops when the water is turned on.

Recently I fitted a paraffin vaporiser and water feed to a stationary engine used for electric light work. In this engine the conditions are much easier than on a motor car engine, as the engine is running at constant load, and is controlled by the lift of the

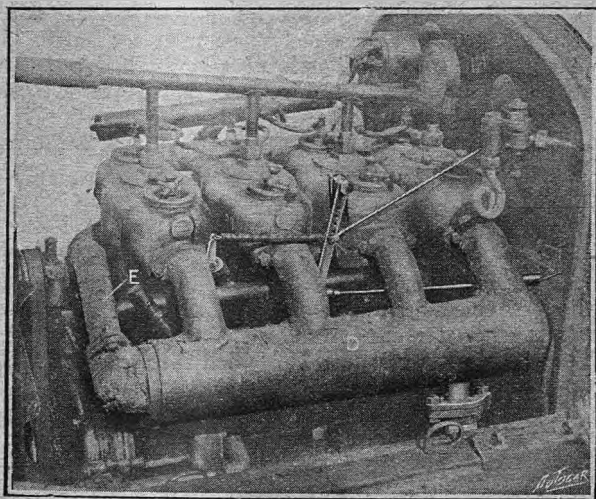


Fig. 7.—Exhaust side of the engine showing the vaporiser D and the vaporiser pipe E.

exhaust valve, so that there is no throttling down or great variation in temperature. I fitted the vaporiser chamber outside the exhaust pipe for the sake of simplicity, and supplied the water to the vaporiser through a small sight-feed lubricator. The vaporiser jacket is lagged with heat retaining material, and also the pipe from the vaporiser to the inlet valve. The carburetter is of a simple type with a single jet nozzle and a screwdown needle valve for controlling the fuel outlet, while the air inlet to the carburetter consists of a shutter adjustable by hand. It is a very good carburetter for experimental purposes, as it can be easily adjusted when the engine is running.

The float chamber is supplied with either petrol or paraffin, and petrol is used for the first five minutes' running, after which the paraffin is turned on and water slowly admitted. As the mixed fuel slowly changes from petrol to paraffin the jet outlet has to be slightly increased by unscrewing the needle valve over the jet. From this it might appear that with paraffin the consumption is heavier than with petrol, but this is not necessarily the case, as paraffin is a heavier fuel and therefore stands at a lower level in the jet than petrol. Further, it is more viscous, and for this additional reason the jet outlet requires to be larger.

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This system works very satisfactorily, but I think it is a mistake to supply the water to the vaporiser as it tends to lower its temperature. The best adjustment for this engine is about one drop every three seconds, so that the quantity used in this 3 h.p.

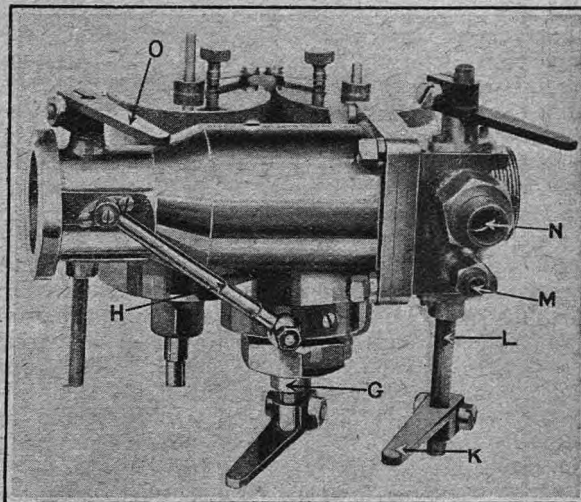


Fig. 8.—The carburetter and the moist air device, receiving water by the tube M and delivering hot moist air by the pipe N.

engine is much greater than that consumed in the Halliday paraffin system. If the water be shut off the engine pre-ignites, and I am inclined to think that a slightly lower compression is better with paraffin than with petrol.

I have also been using a stationary electric light engine of the two-stroke type, in which the air is compressed in the crank chamber, and on its transfer to the combustion chamber it sprays paraffin into the cylinder. In this case something in the nature of a scent spray effect is obtained, with the result that half a teaspoonful of petrol alone is used for starting. This is admitted direct to the cylinder or crank chamber so as to provide the first two or three explosions, after which the engine picks up automatically on paraffin even in the coldest weather. The paraffin is sprayed on to a baffle on the piston, but the small amount of petrol employed cannot possibly be sufficient to heat

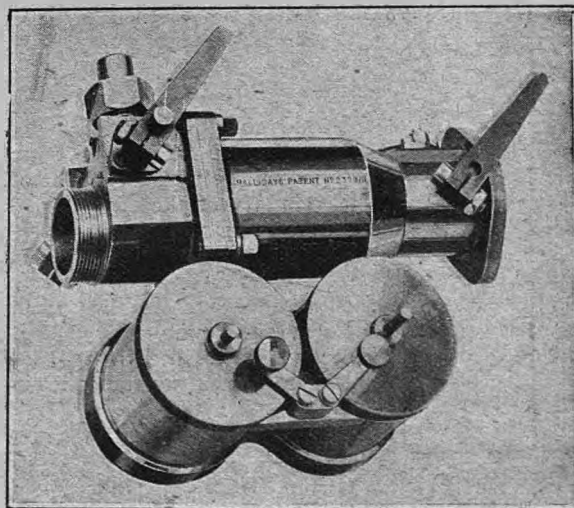


Fig. 9.—Plan view of the carburetter showing the two float chambers and the throttle and moist air control levers.

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this baffle; part of the combustion chamber is not provided with a water jacket. The compression pressure is low, and the engine is capable of control by throttling in the ordinary way.

Those who have had much experience of paraffin in ordinary vertical engines have probably found trouble with their main engine bearings. In fact, with the two-stroke engine referred to three months' running was sufficient to wear out a big end bearing. The reason for this may be that during the last few revolutions, after the engine is switched off, paraffin is drawn into the cylinder, and, as the engine cools down, this condenses and travels down past the piston, and on its way washes away the cylinder oil, and on its arrival in the crank chamber it dilutes the oil there and causes the bearings to be scored. Unless provision is made to cope with this, much trouble is liable to be experienced in vertical engines. To prevent trouble from this cause I generally finish the running on petrol, so that three or four minutes before I stop the engine I change over from paraffin to petrol. The same objection applies to some extent to the use of petrol-paraffin mixture in ordinary engines, but it can be overcome if one stop the engine by completely shutting the throttle or by turning off the fuel tap and allowing the carburettor to empty itself, so that during the last few revolutions air alone is drawn into the engine.

It is impossible to feel very happy concerning the general adoption of paraffin for private use. Paraffin is not a desirable liquid to have on the car; every

drop spilt during filling causes an objectionable smell, and the inevitable leakage and creeping which occur are a nuisance. Further, paraffin is not very easy to obtain when motoring, as the vendors of paraffin are not prepared to supply motorists, say, on a Sunday afternoon, as is the garage proprietor. Again, paraffin varies considerably in quality. Not only do the different brands vary in themselves, but one cannot be sure of obtaining the desired brand, and, moreover, that from the bottom of a barrel is often of different composition

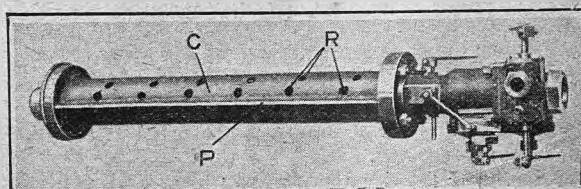


Fig. 10.—The vaporiser with outer wall removed, showing the partition webs (P) and the cross tubes (R).

from the remainder. Although paraffin is a cheap fuel, and one that it is almost impossible to tax, yet it does not form an ideal one for use in this country, as we still remain in the hands of a trust, and paraffin cannot be produced in this country. However, on the score of cheapness it is probably the best fuel for commercial work, and there seems to be a great future for satisfactory carburetting systems.

### The Inter-club Gala Day at Brooklands.

The programme for the Inter-club Meeting and Gala Day of the Associated Clubs at Brooklands on the 31st May has now been arranged as follows:

1. Hill-climb; for teams of four cars each, entered by Associated Clubs.
2. Relay Race; for teams of two cars each, entered by Associated Clubs.
3. All-comers' Open Cycle Car Handicap Race.
4. Motor Cycle Inter-club Team Race; for teams of three motor cycles each, entered by the A.C.U. Affiliated Clubs, each team to be composed of one single-cylinder machine, one multi-cylinder machine, and one passenger machine.
5. All-comers' Open Motor Car Handicap Race.
6. Skilful Driving Race and Hill-climb.
7. (If time permit) Blindfold Driving Race.

This programme follows on the lines of last year, when the meeting was so successful. The most interesting new feature introduced into this programme is the open cycle car race, for which four trophies and prizes are offered.

The following cups have already been offered for competition, in addition to those provided by the Associated Clubs: The proprietors of *The Autocar*, *The Car Illustrated*, *The Motor Cycle*, Brooklands A.R.C., Hampshire A.C., Mr. Charles Braun, Mr. Percy W. Northey, and Mr. E. A. Rosenheim.

A special feature will be a number of free passenger aeroplane flights with Brooklands pilots. Visitors will be entitled to take part in a raffle, without charge, for a certain number of flights arranged to take place during the afternoon.

### Lancashire A.C. Open and Closed Hill-climb.

An open and closed hill-climbing competition promoted by the Lancashire A.C. will be held on Saturday, May 3rd, at Waddington Fells, near Clitheroe. Entries must reach the secretary of the club, Mr. J. Campbell, 5, Sudell Cross, Blackburn, by twelve o'clock noon, on April 25th. There will be events for amateur members of the club, an open event for cars and an open event for cycle cars. The h.p. of the competing cars will be deemed to be the cubic capacity of the cylinders in centimetres divided by 150, and the figure of merit will be arrived at by the following formula:

Total weight in lbs.

Time in seconds  $\times$  h.p.

The following prizes will be awarded: Event A, closed (four-seaters), for fastest time, and for 1st, 2nd, 3rd, and 4th best four performances on for-

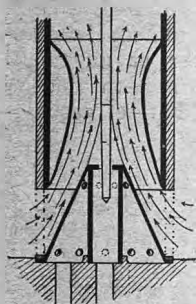
mula. Event B, closed (two-seaters), for fastest time and for best performance on formula. Event C, open, gold medal for fastest time and four silver cups value ten guineas each for best performance on formula in the respective sections of cylinder capacity as follows: Section 1, maximum cylinder capacity in cubic centimetres 1,639, minimum nil. Section 2, maximum 2,458, minimum 1,640. Section 3, maximum 3,769, minimum 2,459. Section 4, maximum unlimited, minimum 3,770. Event D, cycle cars, for fastest time and for best performance on formula.

For the second year in succession Mr. Edgar Stafford, vice-president of the Manchester Motor Club, on his 15 h.p. Napier, recently won the reliability trial promoted annually by this club. The same car was used on each occasion.

## The Cox Streamline Carburetter.

Regulation of the Throttle, Choke Tube, Petrol, and Air by one moving part.

ONE of the best-known amateur competitors in hill-climbs and other events is Mr. Arthur Cox, of Birmingham, whose many fine performances on his two-cylinder V-engined Riley have from time to time been chronicled in our columns. This faithful car he has now driven some fifty thousand miles, and although it shows every outward and visible sign of hard work, it is running as well as ever, and we have sat behind plenty of four-cylinder engines that do not run as smoothly or pull as well.



*Detail view showing the jet, the end of the taper needle and the choke tube raised to the position it assumes with the throttle almost fully open. The arrows denote the direction of the ingoing air.*

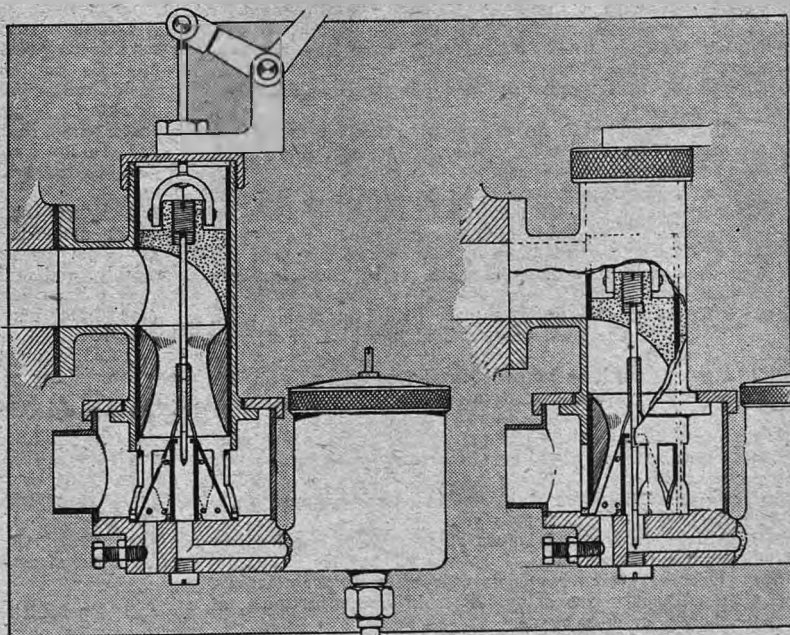
For many years Mr. Cox has recreated himself with experimental work, particularly in connection with carburetters, and for the last two years or so he has settled down to a very simple type of single-jet carburetter, which he has worked upon steadily and has now developed to such a satisfactory stage that it is about to be put on the market by the Electric Ignition Co., Sampson Road North, Birmingham. As a matter of fact, it is nearly a year ago since Mr. Cox obtained such results with his carburetter that he was confident that he had produced a really good thing, but, as this stage was reached at the end of the spring of 1912, he decided that he would use it right through the winter of 1912-13, so that he could satisfy himself absolutely that he had not inadvertently produced what is known as a summer carburetter. In this matter he has not experimented alone, as he has had a number of his carburetters made and fourteen or fifteen have been in use on various motor vehicles, from a motor bicycle up to a 50 h.p. car, and in each case results have been achieved as satisfactory as those which he has himself obtained on his own Riley.

From the section drawing it will be seen that the carburetter itself is almost absurdly simple, and it may be said to consist of an L pipe with a jet in it. The jet takes the form of a  $\frac{1}{4}$  in. tube with a cap having an orifice of about  $\frac{1}{8}$  in. Into this orifice a taper needle is entered and withdrawn as the throttle is closed or opened. At its closed position there is still a small annular space between the needle and the side of the jet orifice, and, of course, as the needle is raised the area of the orifice and, consequently, the supply of petrol is correspondingly increased. Round this jet is a series of air ports having taper bottoms which are not sharp V tapers

but slightly curved, and these ports are opened or closed as the needle is moved up and down in consonance with the opening or closing of the throttle. The throttle consists of a tube with a curved passage in it, this passage registering with the inlet pipe. The tubular throttle, further, carries the needle for the jet, and as it is raised or lowered, *i.e.*, opened or closed, it also opens or closes the air ports. When the throttle is fully open the needle is raised high in the jet and the air ports are also wide open, and it will be seen that on full throttle the carburetter is of the most open type, providing a perfectly free passage for the air, both before and after carburation, into the engine.

This kind of carburetter is well-known to be satisfactory for high speeds and full power, but it is difficult to get easy starting and good slow pulling with it, and the way Mr. Cox has overcome the difficulty is as ingenious as it is simple. In the slow running and starting position the throttle is practically closed, the air ports are closed all but a fraction, only just the fine point of the V being open, and the needle is well into the jet orifice, so that the annular space between it and the jet orifice is very small indeed. It will be noticed that around the jet tube is a petticoat, or cone, in which some small holes are bored, and there are holes beneath it through which air is drawn, in addition to that passing through the tiny apertures at the bottom of the V slots. The larger of these under holes can be adjusted by means of a bolt and nut, so that the adjustment can be set for slow running.

The throttle is formed in one piece with the choke tube, and consequently the latter moves up and down with it. In the slow running position, therefore, the



*Two part sectional views of the Cox carburetter. On the left the throttle is shown fully open, while the choke tube and taper jet needle are both raised high. On the right is a view showing the relative positions of the details when the throttle is shut down for slow running. It will be seen that the outside surface of the choke tube forms a sliding shutter for the air inlet holes. The jet is shown in solid black a bridge piece with an extension being formed above it to act as a guide for the taper needle. This guide or spider performs no other function.*

*The Cox Streamline Carburetter.*

most restricted diameter of the bore of the choke is at the same level as the top of the jet, so that the negative pressure is maintained despite the throttle closing and the resultant loss in engine speed. At the other extreme, *i.e.*, full throttle, the choke is raised high and the top of the jet is in the largest diameter of the choke tube, as shown in the left hand view.

It will be realised that at all times the petrol issuing from the jet is of annular form—that is to say, it takes the form of a very thin-walled cylinder, or pipe, of petrol, and, the clearance between the needle and the jet being infinitesimal in the starting or nearly closed position, the atomisation is remarkably good, besides which the suction on the jet is very strong, so that plenty of petrol is obtained for starting, slow running, and acceleration.

It will be noticed on studying the drawings that the carburetter has been designed to provide the minimum

of resistance to the passage of the air and carburetted air through it; indeed, all its proportions are the result of patient experiment.

As to the running, we may say that it is really remarkable, as, quite apart from easy starting and good slow pulling, as well as great vitality at higher speeds, it is possible to handle the throttle in the most brutal manner, and to "saw" it backwards and forwards from full open to closed without producing a single miss, while, as to a pop back, there is not a suspicion of it. Of course, we are not advocating driving in this brutal manner, but it is the finest possible rough and ready test that can be applied to a carburetter, as it shows that, approximately, the instrument is automatically providing a correct mixture at all times, otherwise the sudden variations of suction due to sudden openings of the throttle would upset carburation hopelessly.

## Rules for Drivers and Pedestrians.

### Outlined by the Scottish A.C.

**A** CONCISE and at the same time comprehensive set of rules for the guidance of road users has been prepared and issued to local education authorities throughout Scotland for the instruction of the rising generation. Incidentally the rules and recommendations will be equally useful, as reminders of what their duties and responsibilities are, to all who travel upon the streets and highways, whether as drivers of vehicles or as pedestrians. Although there may be in them nothing that is not already well-known we make no apology for reproducing them in full, as they present in a convenient form free from legal verbiage all that it is really necessary to know and observe to ensure the safe and proper use of the roads by all classes of users.

#### Drivers and Riders of Motors, Horse Vehicles, Horses, or Cycles.

(a) On meeting traffic approaching from the opposite direction keep to the left.

(b) On overtaking traffic proceeding in the same direction, pass on the right.

The foregoing rules do not apply to meeting or passing a man in charge of a led horse, when keep, if possible, to the side nearest the man.

Nor do they necessarily apply to overtaking tramcars by motor cars, which may be overtaken by them on either side of the road, having regard to the safety of the proceeding and all the circumstances of the case. In the case of double lines of tram rails, the near side should be preferred.

(c) On entering or crossing a main road from a side road, do so slowly and use great care, and always give priority to main road traffic.

(d) Keep as near as possible to the correct side of the road, particularly when driving a slow-going vehicle.

(e) Keep your proper side in rounding corners.

(f) Never turn to the right or the left or cross the road without holding out your arm to warn vehicles coming behind you.

(g) Never turn to the right without being assured there is no vehicle overtaking to pass you.

(h) Always look round before starting from the kerb or leaving your direct course.

(j) Overtake a slower vehicle only after proper warning, and then without undue delay. Refrain from overtaking at corners, bends, or cross roads.

(k) Passing pedestrians, horses, cyclists, and other vehicles, give the maximum space possible.

(l) Always give way to faster traffic.

Show courtesy and consideration always.

#### Pedestrians.

(a) Foot passengers reverse the rule of the road applicable to vehicles whether on the footpath or on the main road—that is, they keep to the right. It will consequently be seen that on the roadway where there is no footpath they face

approaching traffic. The advantage and greater safety of this course is evidenced by the fact that railway servants walking on the line are ordered to adopt the same course.

(b) Do not step off a pavement to cross a road until you have definitely decided your manner of crossing, and then—cross at once.

(c) Do not hesitate after partly crossing, and turn back. Drivers coming either way may have seen you, and to upset their calculations by hesitation or alteration of your apparently premeditated course may cause accident.

(d) Look to the right before you cross.

(e) Cross all streets in the direction opposed to the traffic, not with it. Vehicular traffic may be expected to come from your right. The safest course is to cross diagonally (bearing right) to the centre of the road (where the order of traffic reverses), and then turn to the left, thus  $\searrow$ . In this way you face the approaching traffic on both sides of the road. Never step off the pavement so as to move to the left.

(f) Remember that if there is any stopping or hesitation in crossing, the safest part of the street is the centre.

(g) Use island rests, if any, or cross where there is a constable on point duty.

(h) Do not leave the kerb in front of a slow-moving vehicle, unless you are satisfied no fast-moving vehicle is overtaking. A slow vehicle is usually nearer the kerb than a faster one will be.

(j) Do not cross where a side street enters, without having regard to the traffic both in the side street and the main street.

(k) When crossing the street do not obscure your view with an umbrella.

(l) Foot passengers should not step off the pavement suddenly, and unless to cross—a swift or silent cycle, motor car, or other vehicle might be coming up behind.

(m) After dark, keep to the right side when there is no footpath.

(n) Always get out of the way at the first signal from any overtaking or approaching vehicle, and in walking on a road without pavements be careful always to walk against the traffic.

(o) In alighting from tramcars or buses, do not do so when they are moving, as overtaking drivers do not expect such a thing to be done.

(p) Never go immediately round the back of a vehicle from which you have alighted. From the shelter of the vehicle, satisfy yourself that it is safe to cross to the other side of the street or roadway.

#### Requests to Children.

(a) Do not throw stones, caps, or anything else at motor cars, cycles, or other vehicles.

(b) Do not hang on to moving vehicles.

(c) Never rush from school playgrounds or any house entry on to the roadway, and especially if there is no footpath on the roadway, without satisfying yourself that the road is free from traffic.

(d) Never rush in front of motor cars, tramway cars, or cycles, or stand in front of approaching vehicles of any kind.

(e) Never run in the roadway looking behind you at another boy or girl chasing you.

## The Wheel and the Road.

The Discussion on Colonel R. E. Crompton's Paper before the Institution of Automobile Engineers. The Paper itself was reported in "The Autocar" last week, vide page 654 et seq.

THE discussion on Colonel Crompton's paper was an animated one, and full of interest. It was opened by Sir George Gibb, the chairman of the Road Board. Sir John Macdonald, a member of the Board, also took part in it, so, with the author of the paper, who is engineer to the Road Board, we had three members of that body helping towards the same end of spreading the knowledge of how the modern road should be made. Mr. F. W. Lanchester, Professor Unwin, Mr. Francis Wood, the borough engineer of Fulham, and a number of others also contributed to the discussion.

Sir George Gibb strongly supported Colonel Crompton in his advocacy of the "carpeted" road, *i.e.*, a strength crust to bear the weight, and a carpet or surface crust on the top of it to provide a good, smooth, dustless and mudless surface, which could be repaired or renewed without disturbing the strength crust at all. This idea of the permanent foundation with the readily renewable and comparatively cheap wearing surface was, he (Sir George) was convinced, the solution of the problem so far as their present knowledge went. It must be borne in mind that the use of the roads to-day was of a very violent and destructive nature, and he would like to dwell upon the point brought out by Colonel Crompton that the users of traction engines and traction engine waggons and of motor waggons and trailers should consider this fact more than they did. He could not help feeling that, if more consideration were given to the road by the users of heavy traffic, the present tremendous burden on the ratepayers would be to some extent reduced. Nowadays it was no use making a road that was good for light traffic: it had to be made to stand heavy and fast traffic; and this was one of the great points in favour of the carpet system, as it was so easy to renew any sectional failure due either to overloading or other local cause.

Then Mr. F. W. Lanchester emphasised the fact that to obtain a steel-tyred wheel which would have no more destructive effect upon the road than a rubber-tyred wheel it was necessary to multiply the diameter by three; in other words, the standard 40-4 in. steel wheel now employed for motor lorries and similar vehicles would have to be increased to 120 in. He did not think that Colonel Crompton had altogether considered the fact that the average buyer of a motor lorry would not accept such a size of wheel. It was not the designer's or the manufacturer's fault, but the fact that wheels so large were inconvenient, and that no buyer would purchase a machine to which they were fitted. Mr. Lanchester also pointed out an interesting fact, which was news to many, that with worn wood pavement it would be noticed that the blocks had "flowed" with the traffic; that is to say, if the lines of the blocks across the road were followed, they would be found to be curved instead of running straight across the road, as they did originally, and, of course, curved in opposite directions, as the traffic one way caused a flow of the wood in the opposite direction to that caused by the traffic on the other side of the road.

Sir John Macdonald said that it was too often forgotten that we never had good roads in the water-bound macadam era. People were very fond of talking about the good roads which were to be found be-

fore motor cars were used, but he never found them nor did he know anybody who really had. The term "waterbound macadam" was an insult to Macadam's memory and life work: Macadam made no water-bound roads—the very essence of his system was that they should be made dry. It was the steam roller that brought in the so-called waterbound macadam system, in which the stones were watered and then too often had mud thrown upon them which was rolled in only to ooze out again in a very short time. Sir John spoke of these methods of water binding and mud binding as though they were things of the past, but, unfortunately, they are still very much in the present: it is only in the more enlightened districts that the waterbound macadam road is no longer made. Sir John Macdonald dealt with his observations of the road surface on the Thames Embankment, which from being the worst road in London had now with its modern construction become one of the best, and it was free from potholes; in fact, almost free from signs of wear now after three years of tremendously heavy usage. He had made careful observations at certain points where the road surface was joined up to granite or wood, and the two surfaces still remained absolutely at the same level, proving, at any rate, that the wear was no greater than that of granite or wood. Among other points, in reference to potholes Sir John mentioned that in Scotland there were certain roads which were barred to motor cars absolutely. How was it that on these roads we found potholes as bad as, or worse than any which could be found on a much motored and much neglected highway?

In his reply to the discussion Colonel Crompton said that, unquestionably the burden of the roads was the question of the moment, and that he felt with Sir George Gibb that so much might be done if the users of heavy vehicles would consider and try to lessen the damage they did. As he pointed out, the small steel-tyred wheel was responsible for much of the worst damage done, but it had been urged upon him that the inconvenience of large wheels would be such that no user would tolerate it. It was obvious that the only possible way to obtain consideration was to legislate: they must either have solid rubber tyres or large wheels, and he understood that of the two solid rubber tyres were preferred. Personally, he could not see why for many purposes large wheels could not be used; they were inconvenient in loading and unloading, and that was a serious matter for town delivery, but the wear they complained of was mainly on the country roads, and surely, now that it was customary to load tea in the Docks and send it straight to Birmingham by motor lorry it could not be any very great hardship if the large wheels made it somewhat more difficult to load and unload. Of course, there were many other long hauls besides the London-Birmingham one, but he mentioned it as typical. With regard to slippery road surfaces when bitumen was used, he would like to point out again that the carpet of bitumen and sand was not slippery when coarse sand was used. Now, lime and bitumen, while making a very good surface indeed, was very slippery under certain conditions of weather, but it was only a question of having sand of the right coarseness to obtain a surface which held together well, and as it wore did not resolve itself into superficial slime. With regard to the road testing

*The Wheel and the Road.*

machine which had been set up in the National Physical Laboratory by the Road Board, and which he had dealt with in his paper, he thought it would be of the very greatest service in testing materials and methods. He did not imagine that it would take the place of experimental work on ordinary roads, but it would serve as an invaluable guide, because surfaces could be tested under identical conditions, so that they might have two or more materials under test at the same time, and when they realised that the machine would wear out an ordinary waterbound

macadam road in about four hours, and that without any single wheel upon it exceeding a one ton load, it was obvious that they could do at Teddington in a few days what on the actual road would take them years to accomplish. Laboratory work was never final or complete, but it was an invaluable guide in engineering to the suitability of material and methods, and this was what he claimed, and all he claimed, for the testing machine which the Road Board had set up at the National Physical Laboratory to help them to determine the suitability of different materials and treatment.

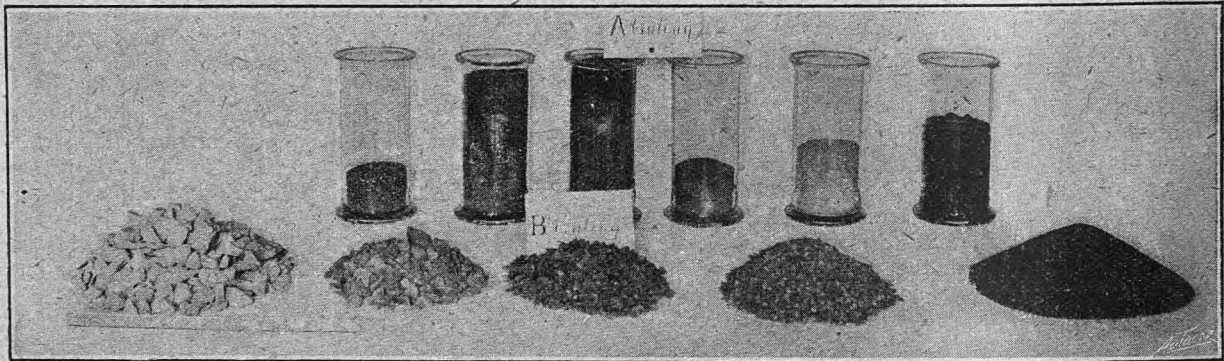


Fig. 1.—The materials used in “carpeted” road construction.

**Modern Road Materials and Testing Apparatus.**

Colonel Crompton, at the close of his paper on “The Wheel and the Road,” read before the Institution of Automobile Engineers on the 9th inst., referred to some minor apparatus used at the National Physical Laboratory and in his own laboratory in connection with experiments with and the testing of road materials. In order to give our readers some idea of the care and consideration which have been given to the subject

a proportion of Portland cement, which combines with the bitumen and gives to that substance what the

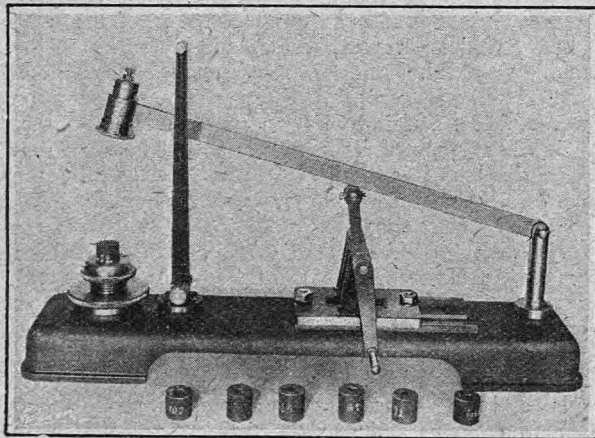


Fig. 2.—An instrument for testing bitumen for toughness.

and to the apparatus, we give herewith illustrations and brief references to the materials used in the road construction recommended by Colonel Crompton and to the machines and the tests for which they are used.

Fig. 1 shows, as to the materials in the glass jars, the exact proportions used in forming the upper crust of a road. Taking the jars from the left, the first one contains 7½% of grit intended solely to prevent skidding and as a foothold to horses. The next three contain allotted quantities of graded sands giving a body to the material and arranged in the order of fineness. The next or fifth jar from the left contains

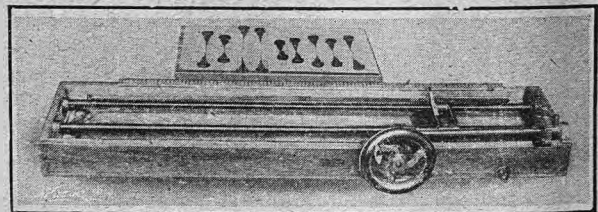


Fig. 3.—A ductility tester with “stretched” specimens behind.

painter calls body, and enables a given quantity of bitumen to cover a greater area of grains of sand.

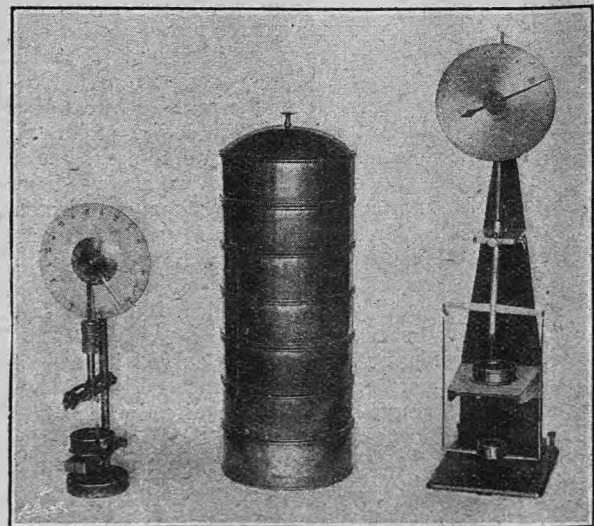


Fig. 4.—A sieve and two penetrometers. The latter is for testing the resistance of the bitumen to penetration.



The bitumen and the Portland cement are of equal weight, and form about 25% of the whole. The amount of bitumen is shown in the right-hand jar. Below the jars are shown the samples of graded stones,

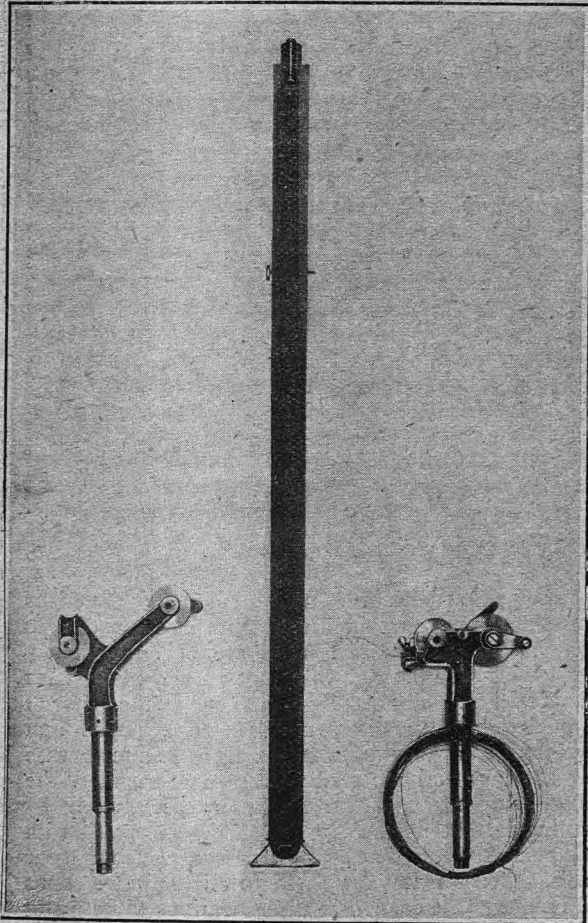


Fig. 5.—Apparatus for measuring road wear.

used for the lower half of the road thickness. The size of this metalling can be estimated by comparison with the one-foot rule on the left of the illustration.

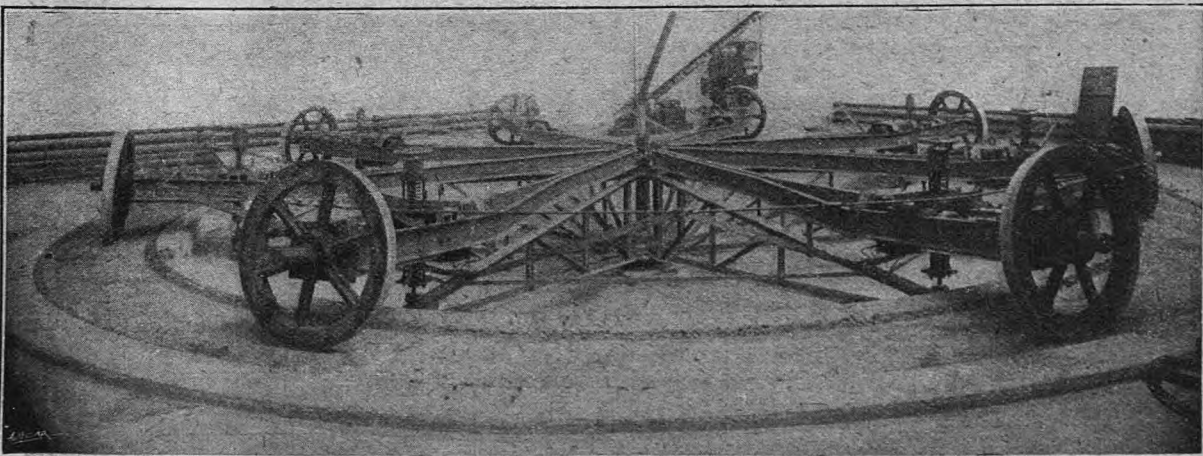
Fig. 2 shows a percussion testing hammer, an instrument which is used for testing the toughness of the

bituminous material by the number of blows of certain impact that it will stand before cracking. The machine shown in fig. 3 is known as the ductility tester. The specimens shown are samples of bitumen which have been subjected to test with this machine. The specimens are made up in exactly the same way as with a cement tester, and operated by the machine in a similar manner. Fig. 4 shows a laboratory sieve and two penetrometers. The tall one is of American design, and the other was made by Colonel Crompton, being an improvement on the former. These instruments are used to test the consistency of the bituminous materials employed in road surfacing, by measuring the distance a weighted needle penetrates after being dropped a known height. The apparatus used for measuring the wear of the road surface is shown in fig. 5. The wire is stretched across the road from each of the two standards, which are held in sockets sunk at the sides of the road, and the amount of wear taken by the vertical rule.

### British-American Motor Trade.

In the House of Commons on Monday last, Mr. F. Hall asked what was the total value of the motor cars and their component parts imported into this country from the United States in 1912; if he can state what percentage of this sum represents labour; and what was the total value of the motor cars exported to the United States during the same period?

Mr. Buxton: The total value of the imports of motor cars and parts from the United States of America in 1912 was £1,234,000, of which £763,000 represented complete cars, £56,000 chassis, and £415,000 other parts of motor cars. I cannot say how much of these sums represents the cost of labour, but, according to the Bureau of the United States Census, motor car builders in the States returned their wages bill in 1909 at about twenty per cent. of their output, in addition to which an appreciable part of the cost of materials used (whose value was rather more than half the value of the output) no doubt represents wages paid to persons engaged in the manufacture of such materials. The exports of motor cars and parts of United Kingdom manufacture to the United States in 1912 were valued at £88,000, and, in addition, imported motor cars and parts to the value of £37,000 were re-exported from the United Kingdom to the same destination.



The Crompton road-testing machine erected for the Road Board at the National Physical Laboratory. Being indoors the various road materials can be tested under varying simulated climatic conditions with any desired type of wheel or load. (See "The Autocar" last week, page 656.)

## The Morris-Oxford Light Car.

Four Cylinders, 60 × 90 mm.; Unit System; Multiple Disc Clutch; Worm Drive.

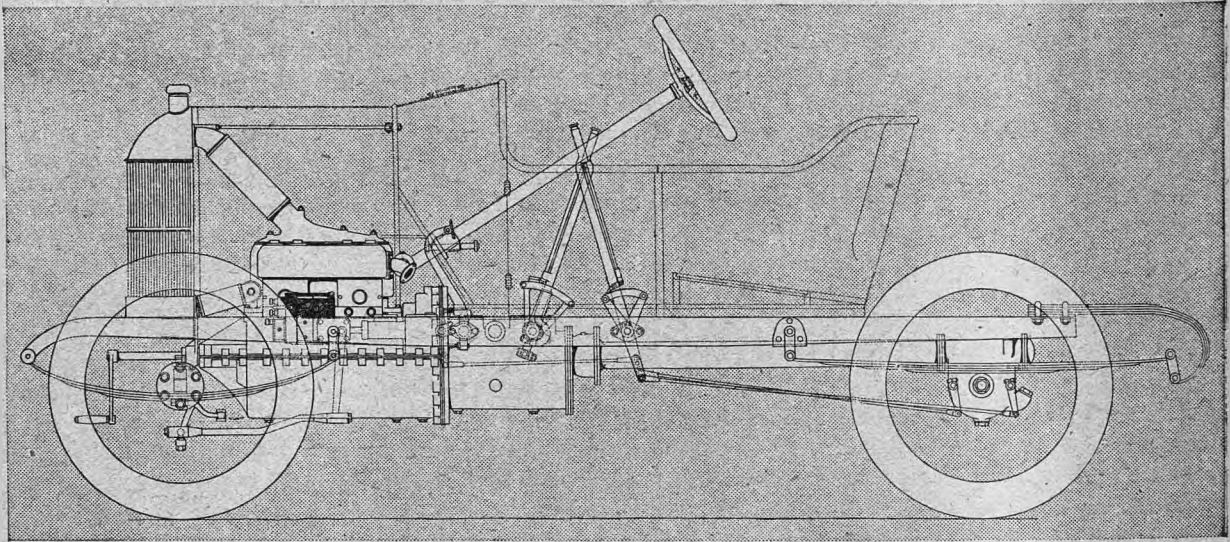


Fig. 1.—Elevation of the Morris-Oxford light car showing the bonnet, dash and body in outline.

THIS newcomer to the ranks of miniature cars made its first appearance at the Manchester Show, and undoubtedly created a most favourable impression on account of its excellence of design. Without attempting to enter the field of the cycle car proper, it aims at being essentially a miniature motor car, and such indeed it is, possessing all the attributes of a full size car but—and here is where it differs from many of the small cars on the road—it is also made with all the care that is bestowed upon the highest priced cars, a point that we can vouch for, as we have seen the greater portion of it in process of manufacture.

The engine, clutch, and gear box are built by Messrs. White and Poppe on the unit system, the whole unit being compact in the extreme. The four cylinders are cast *en bloc*, the bore and stroke being 60 × 90 mm. respectively, giving roughly an R.A.C. rating of 9 h.p., which carries a tax of £3 3s. Both the inlet and exhaust manifolds are cast with the cylinders, the exhaust being water cooled. The valves

are arranged on both sides of the engine, operated by adjustable tappets provided with fibre insets to deaden tapping. The valves and ports are of large dimensions, giving free passage to the gases and making for high efficiency. The timing gears are at the back of the engine, and the camshafts are so arranged that they may be withdrawn from the front complete with their bearings and replaced in the same manner, the timing being arranged in the latter case merely by engaging castellations on the end of the camshafts with similar castellations in the boss of the camshaft gear wheels. Cover plates are fitted to all the valve stems. The crankshaft is carried in three bearings white metal lined, and arranged to be easily accessible for the adjustment of the big ends by dropping the lower half of the crank case.

At this point it may be well to mention that throughout the car no keys or keyways are used. Castellations are employed in all cases rigidly to connect the parts, the only exception to this practice being that the flywheel is keyed to the crankshaft.

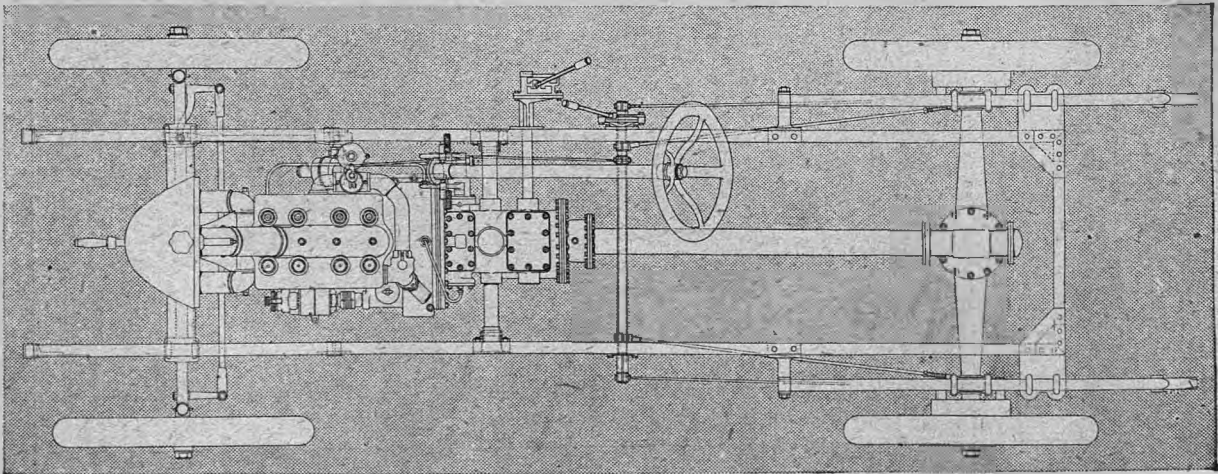


Fig. 2.—A plan view of the Morris-Oxford light car showing the power unit and general arrangement.

Behind the timing gear is the flywheel, which is machined from a solid steel disc, and, as is usual, carries the clutch, which in this case is of the multiple disc type composed of thirty-six alternate plates of hardened steel and bronze. A clutch stop is also provided.

The flywheel also serves the purpose of a centrifugal pump, as all the oil in the engine, clutch case, and gear box gravitates to the bottom of the flywheel

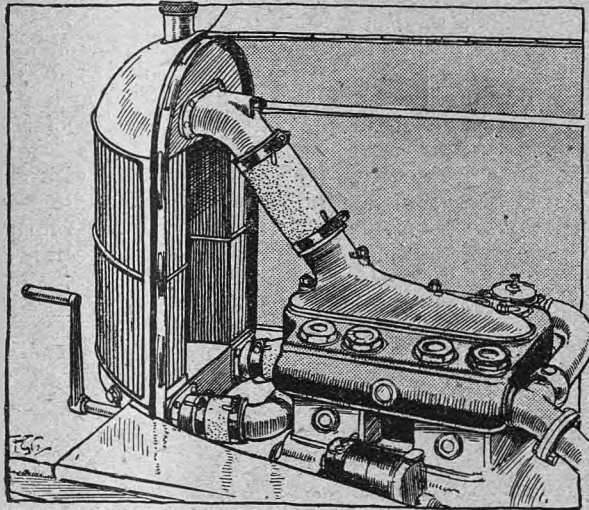


Fig. 3.—The Morris - Oxford engine. The special radiator and unusual arrangement of the water piping and water levels should be noted.

pit, whence it is picked up by the flywheel and distributed to the various points of application by way of an indicator on the dash.

The three-speed gear box is a neat piece of design, the gears affording the two reductions, the direct drive and the reverse, being contained as a single unit in a light cylindrical shell, which in turn is carried in a cylindrical extension of the clutch case, the back cover plate which holds the shell in place carrying the hous-

ing for the spherical end of the propeller-shaft casing.

The general arrangement of the power unit, which is three-point suspended, may be gathered from the sectional drawing below. This unit also carries the gear striking lever and mechanism and the clutch pedal and operating gear, as well as the accelerator pedal. The steering gear box is carried independently of the main frame, being bolted to the power unit casting. Ignition is by a Bosch high-tension magneto with fixed ignition point, control being by means of an accelerator pedal connected to the throttle of the White and Poppe carburetter, which is set to the slow running position by a simple device on the accelerator pedal. Special attention has been paid to the cooling, which is on the thermo-syphon system, and is sufficiently effective on this to enable a fan to be dispensed with.

From the gear box the drive is transmitted by an enclosed propeller-shaft to a worm driven back axle which closely follows standard practice. The driving shafts and differential are removable for inspection without dismantling the axle. Incidentally it should be noted that the whole of the transmission from the front of the engine to the road wheels is entirely enclosed and dust and oilproof.

The chassis is of pressed steel and is carried on exceptionally long springs, semi-elliptic in front and threequarter elliptic behind, those in front being 32in. long and the rear ones 40in. long. The wheels are of the Sankey steel detachable variety with 700 x 80 mm. tyres, and the brakes are arranged side by side on the back wheels, special lips being formed in the axle casings to prevent the access of oil to the brake drums. The steering is of the worm and wheel type, with a large steering wheel and the column raked to a comfortable and convenient angle. The front axle is of H-section forged steel, and the wheelbase is 7ft. with a track of 3ft. 4in., the overall length being 10ft. 5in. With regard to its performance on the road we have not yet had an opportunity of judging, but we understand that the car is guaranteed to cover from 5 to 55 m.p.h. on top gear, and to consume only

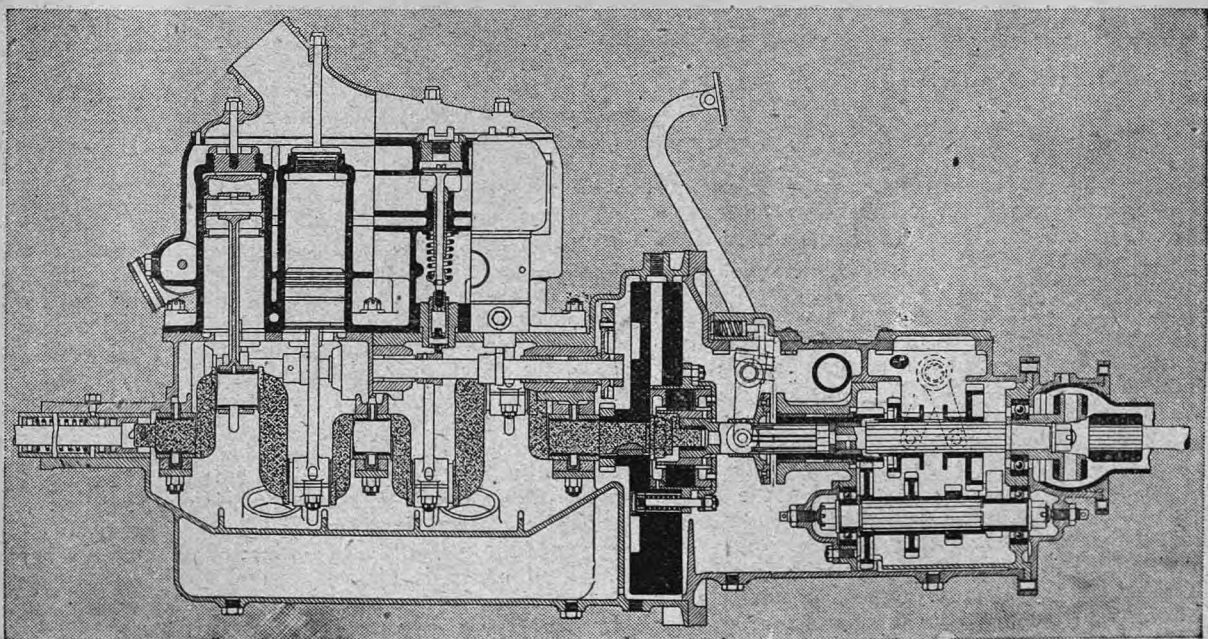


Fig. 4.—The power unit of the Morris-Oxford light car.

about one gallon of petrol on a fifty mile run. The complete price includes hood, screen, two acetylene head lamps, side and tail lamps, spare Sankey wheel, and the usual accessories and tools.

As an instance of the extreme care which is exercised in the construction of the unit, all the parts of which, by the way, are made on most elaborate jigs, the following clearances which are worked to are interesting.

The cylinder bores are machined to a .002in. limit, while the pistons are carefully ground to a .002in. limit. The limit on the cylinders is a plus limit and on the pistons a minus limit, and for practical purposes it is difficult to cut these limits down finer, therefore a marking system is adopted to overcome the difficulties of having too much or too little clearance.

The pistons that come out dead size are marked No. 1, those .001in. under dead size No. 2, and those .002in. under dead size No. 3. The same is done with the cylinders. The cylinders .002in. over dead size are marked No. 1, those .001in. over dead size No. 2, and those dead size No. 3. In assembling, every No. 1 cylinder has to have a No. 1 piston, etc., so a uni-

form clearance of .002in. is obtained for all pistons in the cylinders.

All the bores have to undergo a hydraulic test under a pressure of 600 to 700 lbs., and the water jackets are also hydraulically tested. After running in, all the piston rings are tested for clearance in the slots. This clearance must on no account exceed .004in. The gudgeon pins are ground to a .0002in. limit.

All connecting rods are machined down to the same weight, and at the same time the balance is taken into consideration, and great care is taken in testing the alignment of the bearings at each end. The main journals in the crank case are bored and reamed in such a way that the crankshaft can be dropped into the bearings without the preliminary application of a scraper.

The seats of the valves are carefully ground with a special grinding tool to ensure a perfect concentricity with the valve stems. The bottom ends of the valve stems are hardened, and are also subjected to a severe test to ensure against brittleness.

The sale of this car is in the hands of W.R.M. Motors, Ltd., Longwall, Oxford, and the price complete, fully equipped for the road, is £175.

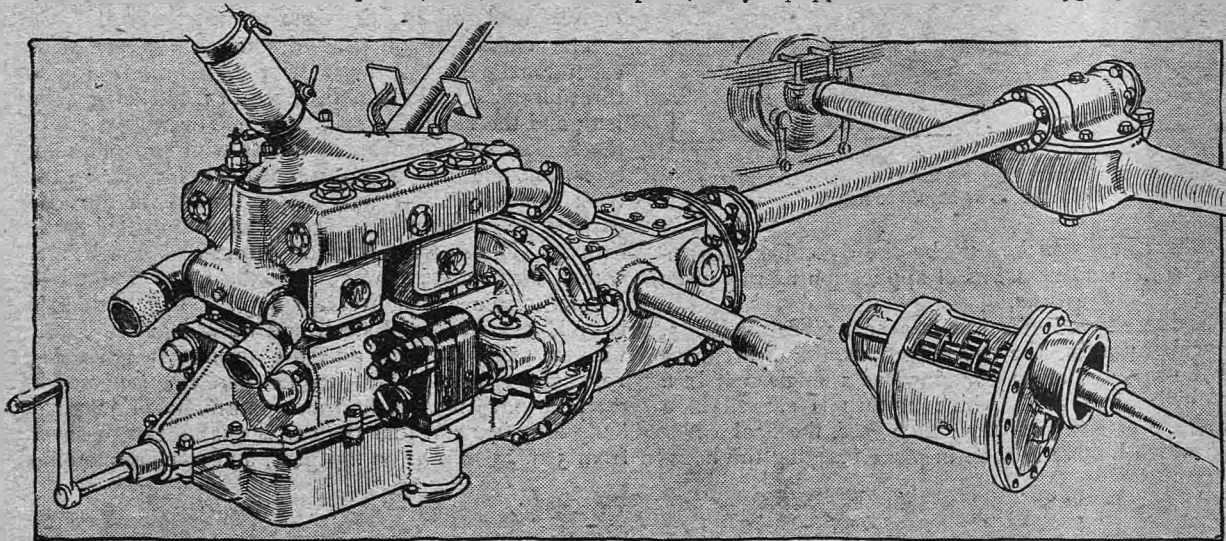


Fig. 5.—The Morris-Oxford engine and transmission. Detached is the shell carrying the gears; clutch-stop and half of the socket for the spherical head of the propeller-shaft casing.

### Prizes for Drivers of Napier Cars.

To encourage drivers of privately owned Napier cars to secure the best possible results at the least possible running expense from the cars of which they have charge, Napier Motors, Ltd., 14, New Burlington Street, London, W., have instituted a competition in which they will make awards to drivers of Napier cars whose running records are the most meritorious during a period of six months from April 15th to October 15th, 1913. The awards will be made on records showing average costs per mile, made up as follows: (1) On repair charges. (2) On running cost, including petrol consumption, tyres, oil, etc. To the twelve drivers whose records in the period of six months are considered by the judges to be most worthy of reward will be awarded as prizes six gold watches ranging in value from £35 to £4 in respect of six-cylinder cars, and six similar prizes for drivers of four-cylinder cars. Drivers whose cars are entered in this competition will be required to send to Napier Motors, Ltd.,

monthly reports of mileage and running expenses, each report to be attested by the owner of the car. The reports received will be placed in the hands of three gentlemen who will act as judges, to be appointed by the committee of the Automobile Association and Motor Union. Competing cars must have travelled at least 5,000 miles in the period named, except where the competitor owns and is using more than one Napier car, in which case the competitor may enter one or all such cars, any of which will be eligible that has travelled at least 2,500 miles in the period of the competition. Each car of an owner having more than one must be entered individually. The age and horsepower of the car will be taken into consideration when making the awards.

In addition to the foregoing prizes Napier Motors, Ltd., will present to the driver who sends in the best suggestion for any improvement in Napier cars from a driver's point of view a gold watch, value £6.

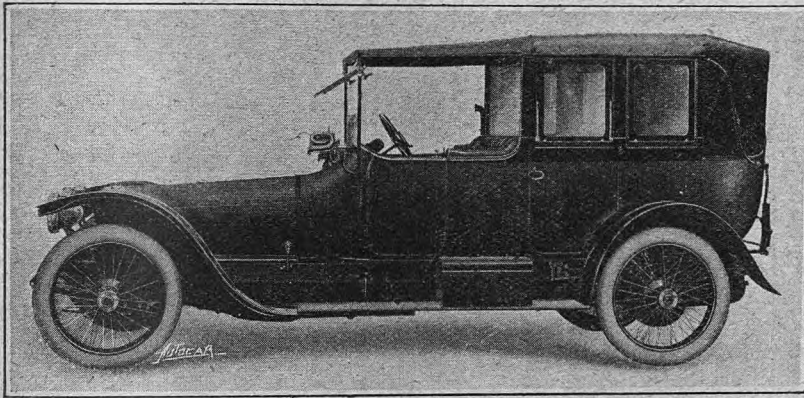
## On the Road.

### Revolving Lights at Dangerous Corners. Car Lighting in General.

"Over the edge of the purple down,  
Where the single lamplight gleams,  
Know ye the road to Merciful Town,  
That is hard by the Sea of Dreams?"

—The Brushwood Boy.

IF the writers who wrote about it because they did not know what else to write about will pardon me, may I be allowed to remark that of all the foolish topics and ridiculous suggestions I have ever heard of, the latest one, to buoy or illumine certain (reputed) dangerous cross-roads and corners, is about the low-water mark. One is tempted to wonder if the people



A smart threequarter cabriolet body by Messrs. Alford and Alder, on a 45 h.p. Sheffield-Simplex chassis. The hood is arranged to fold down very compactly and with little overhang. The hood action is automatic and easily operated by one person. The finish is grey with leather and cloth upholstery to match.

responsible for the notion have ever driven a car at all in the dark anywhere, let alone in the country, if they have any conception of the number of corners and cross-roads that exist, and if they realise how wicked a thing it would be to call attention to one danger and to neglect a precisely similar one somewhere else. One wiseacre remarks to the effect that "now motors are beginning to be used at night," etc., the idea may be considered. Was there ever a time since motors began that they were not used at night?

But enough of expressing surprise and wonder. Let me point out to those who do not know how treacherous a thing is an isolated light. And if a single lamp-post be an element of danger—as one knows it is—how much more mischievous would be one that behaved like a lighthouse, that flickered, that played at being a magic lantern, or a beacon. One moment a flash: the next moment darkness.

How would one distinguish it from an approaching car, or, worse still, how would one distinguish an approaching car from it? Far better that the R.A.C. and A.A. should encourage their road guides and scouts to breed glow-worms to illumine road-ends and turnings dangerous.

Another project authoritatively discussed is that of lighting all main roads at night. Concerning this all

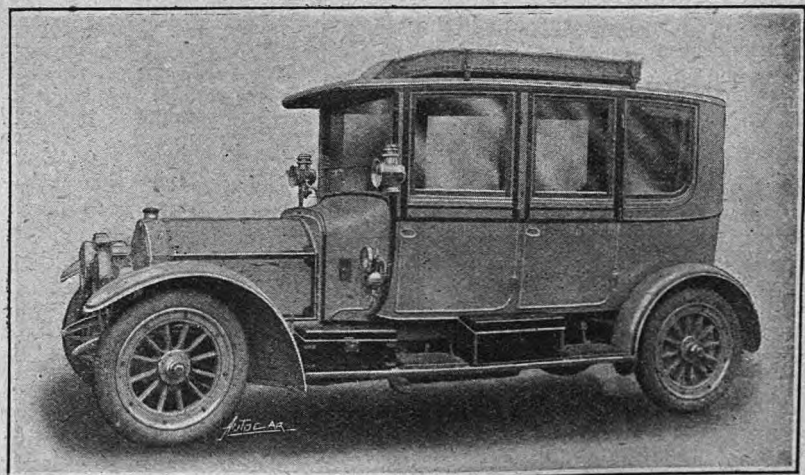
I need remark is that the idea was mooted in *The Autocar* correspondence columns some years ago, and somebody suggested that the place for its author was a public institution where not only were lights kept going all night, but also there were night-keepers.

But this is no place for jesting, let us consider the question in a reasonable spirit. We hard-working folk who have to drive our own cars at all times and in all seasons know well that it is infinitely easier and safer to drive at night on dark roads than in sparsely-lit suburban streets.

We know the possible bogeymen that live just beyond the last lamp, the hidden terrors that exist immediately the other side of the brightly-illuminated shop or public-house window that sends its dazzling shaft of light across the village road. Unless the road is straight even our best head lamps sometimes fail to indicate what is beyond it, and any suspicion of fog makes it an impenetrable barrier. We knew this before there were such things as motors, and for every one shop window then there are half a dozen now. Fancy a revolving one!

Most people, I expect, know the beacon at the entrance to Dover harbour, and how at night its beams in procession blind one every five seconds as the boat backs in and the passengers stand in a mass ready to get ashore. Fancy that at Maidenhead Thicket or outside Altrincham to a man driving a car in the rain. No!—as our pastor says to wake us up—we do not want lights at night, we want darkness. For darkness, utter, clear darkness, the darkness that makes any light visible, is our best friend, and with it and our head lights we should not be afraid of anything, and need meet with no accidents.

Moonlight, patchy inky shadows of trees blotching a leaf-strewn road, is worse than useless. I knew of a herd of black and white cattle that got run into by



A 45-50 h.p. Mercedes, with a totally enclosed body built to the order of Mr. M. F. Stapylton, Tolnes, Devon, by Messrs. Hill & Boll, Ycovil. The car carries six passengers, and is fitted with Warland Dual rims.

*On the Road.*

every car that came along the Daventry road one moonlight night.

And what is the most dangerous time of day? Surely the half-hour between the time we ought to light up and the time the law says we must. It is wiser, really, to avoid the twilight altogether, to halt until it is really dark. But in the blackest hours one must carry head lights, and so, with them, there should be no risks, for all other cars must have them too, and even the silly cart lamps show up far brighter than they really are.

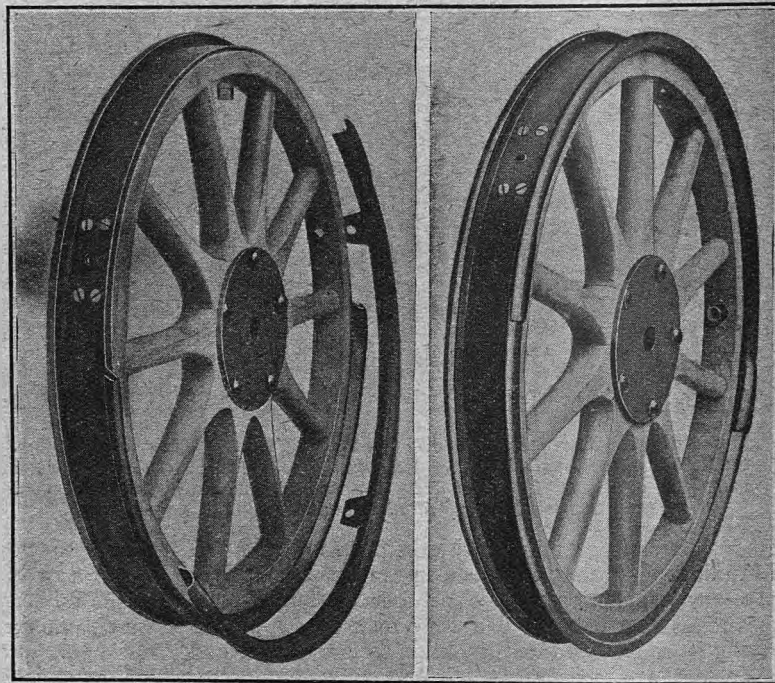
Perhaps these idealists are not aware how very disconcerting even the reflections on one's screen of the lamps of a following car or a bicycle are, especially if it be rainy and the gleams are multiplied a thousandfold by the drops. That is why in towns it is safer not to look through the screen at all, but to set it so as to see over it or between the panels. With spasmodic lighthouses we should be as migrating birds and meet their fate, while I tremble to consider the doom of anyone behind a young horse on passing a revolving beacon for the first time. The driver would probably see "stars," even if he escaped inspecting brighter glories still.

Although we may fail to find any aspects of sense in this proposal, yet there is no doubt that in many ways our laws might be amended with regard to the head lights on cars. For instance, in France the necessity for a car to carry a green light on its near side is of use, while in Paris brilliant head lamps are not supposed to be allowed in the streets. This latter regulation is one we might copy, because they are of no real use in well-lighted streets, and there is very little hardship in lighting up when the country or the dim suburbs are entered. For acetylene lamps there are any number of dodges to diminish brilliance, and with electric head lights one snap of a switch is all that is necessary.

I have heard it suggested that electric head lights might be clicked out when passing horses. In my humble opinion the last states of that car and those horses might be a good deal worse than the first. Yet we should welcome any simple and proved methods of avoiding dazzling horses and drivers, and no doubt with a little encouragement we shall very soon all discover a satisfactory means.

I have of late discussed the question of electric lighting for cars, and I find that some first-class firms now provide on their engines a place for a dynamo where it will not be in the way of everything else. This is as it should be, for putting a gadget about the size of a Trundle cheese inside a properly packed bonnet as an afterthought is hard on the original designer, and will probably reflect no credit on him or on the maker of the dynamo. Very many places are chosen as the resort of the dynamo, and to each, unless properly designed, there seem to be many drawbacks.

Undoubtedly, though the electric lighting of cars is making great headway and improving every day, it is still a great responsibility to advise any friend to fit it up in the place of proved acetylene lamps. Not that all acetylenes are reliable—very far from it—and the cheapest types in this case are undoubtedly the most trying. Yet some kinds are so simple, so easy, and so economical, for a person who only uses head lights occasionally, that no perfection of electric lighting could be an improvement where money is an object and a dynamo is a mystery. Perhaps of all kinds—although I have never had it on my own cars—what is known as D.A. is the system that appeals to me most, in spite of the fact that it does not appear to



**A NEW DETACHABLE FLANGE RIM.** This device is being marketed by Mr. M. Whittingham Jones, 27, Edgbaston Road, Birmingham, and as may be seen is almost a complete rim, one half of one flange only being detachable. The detachable portion is provided with three tongues which slip under the fixed portion and are secured with three set screws. The detachable portion is dovetailed snugly at all points where water is likely to obtain ingress. We understand that arrangements are being made to convert practically any type of wheel—wire, wood, or steel. The advantage of this arrangement over the usual fixed flange is that the last portion of each side of the tyre to be fitted has not to be forced over a flange, while the first fitted section is not so liable to slip off in refitting as in the case of a completely detachable flange. For wire and steel wheels the lip is left intact between the tongues.

be the cheapest form of satisfactory head lighting. But I loathe the raw carbide and cold water in the dark nearly as much as I dislike handling air tubes in the rain.

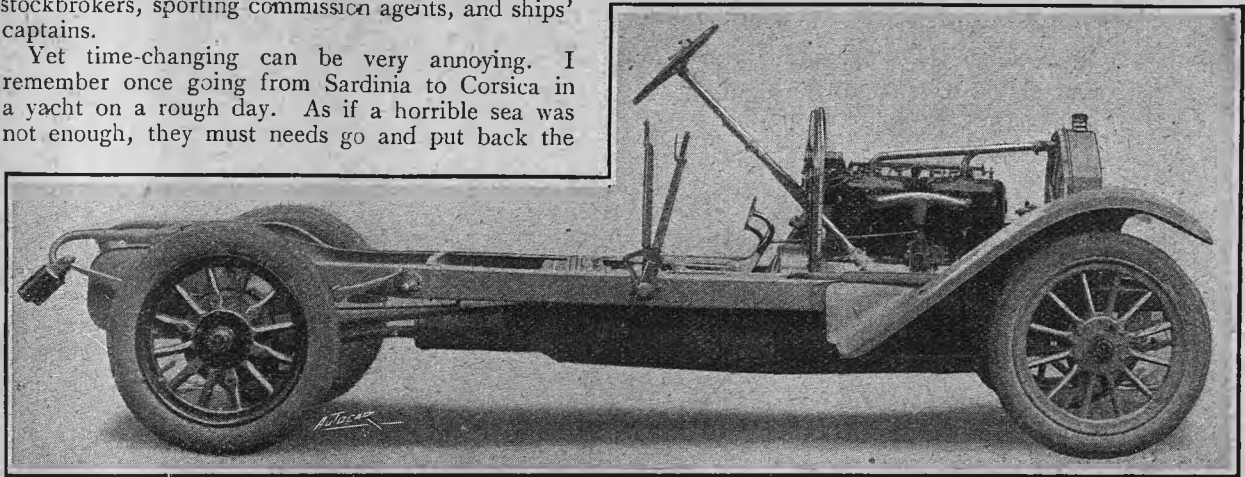
While on the topic of lights and lighting, it is extraordinary to notice what an effect the decision that the French Government came to some few years back as to synchronising their time with ours has had on lighting up. When France was twenty minutes ahead of us, in March six o'clock was a very suitable time to end a run. Now that she has altered it is gloomy at half past five on a dull day, and any attempt to judge the time by the sun at midday invariably provokes a debate. I think France made an error in paying us the compliment. We should have been wiser in taking our time from her and upsetting all astronomical calculations. Ireland, I read, refuses to

come into line with us. Which I consider is very wise of Ireland, though the motive behind it is not altogether one of convenience. Yet Ireland has now to some extent the advantages of the Daylight Saving Bill, and when one comes to consider that if she changed to our time midday at Mont Blanc and Achill Island would be identical, one can see the folly of a hard and fast rule entirely to suit the wishes of the stockbrokers, sporting commission agents, and ships' captains.

Yet time-changing can be very annoying. I remember once going from Sardinia to Corsica in a yacht on a rough day. As if a horrible sea was not enough, they must needs go and put back the

*On the Road.*

There is a dangerous habit, on the increase nowadays perhaps only because motoring itself increases, for a car with weak head lamps, or perhaps no head lamps at all, to run immediately behind a car with good ones and to borrow its illumination of the road. Undoubtedly a good idea for the second car as long as everything goes well, but a sudden stop of the first



**THE 100 H.P. BENZ CHASSIS.** The off-side of the new four-cylinder 100 h.p. Benz, which has a bore and stroke of 130 mm. x 190 mm. The valves are all on one side, with a chain-driven camshaft. Two sets of sparking plugs are installed, a switch enabling one or both sets to be utilised. The inlet pipe leaves the carburettor vertically, branches at right angles, and enters the cylinder castings between cylinders 1 and 2, and 3 and 4. Inlet passages are formed in the cylinders, but instead of ending short at the valve pockets continue through the casing to a connecting pipe. This is devised to equalise the supply of mixture to all the cylinders. The connecting pipe is visible in the near-side view of the chassis. Four speeds are fitted and a water-cooled brake on the back of the gear box. Two pedals connect with this, one acting direct, the other inter-connected with the clutch. Final drive is by bevel. The wheelbase is 11ft. 1in., track 4ft. 8½in., tyres 895 x 135 mm., and chassis weight 24 cwt.

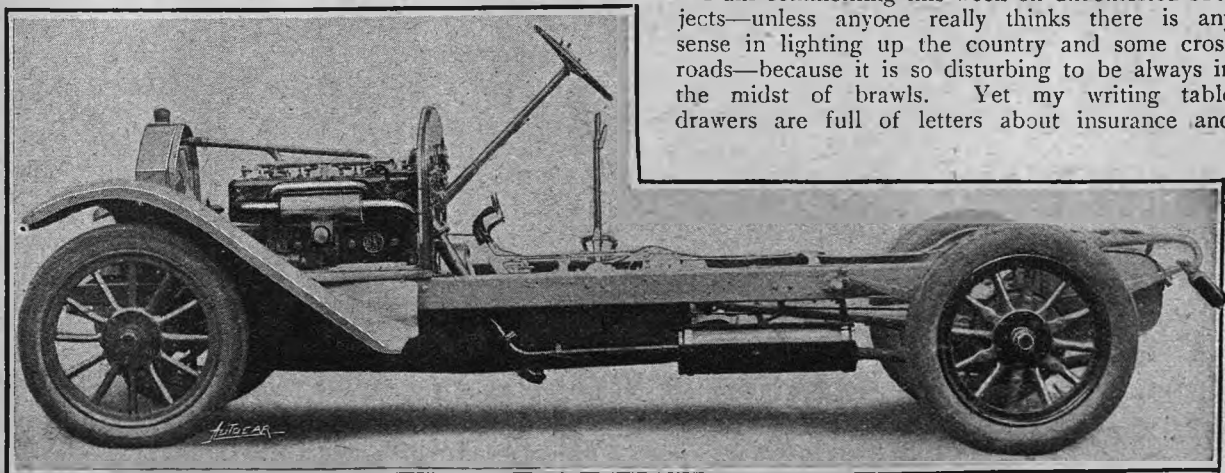
clock one hour as well, thereby lengthening the voyage by another sixty minutes of agony. I daresay in reality the distance was no greater, but the necessity for comprehending it was too much for a brain that needed nothing at all extra to make it whirl and spin. To-day, I suppose, the journey would be an additional twenty minutes. I should explain that our voyage was from Cagliari to Ajaccio, not across the narrow straits where the guns of the two nations point at each other.

But I stray from the topic of lamp-lighting, although the usual Mediterranean lighthouses with their timed "flashes" would not be unlike some of the proposed cross road indicators.

car or a too immediate return to the centre of the road by anything that it passed would result in certain disaster, probably of the very worst type. For it is very unlikely that the driver of the vehicle passing would be able to see anything at all other than the brilliant head lamps of the leading car.

In early bicycling days I remember an accident from a similar cause on a smaller scale, but this was not because the second cycle wanted the light of the first one, but because its rider had no light at all and rode close behind the other to pretend to the policeman at the corner that they were two men on a tandem. The plan failed because their wheels touched at that corner.

I am commenting this week on uncontested subjects—unless anyone really thinks there is any sense in lighting up the country and some cross roads—because it is so disturbing to be always in the midst of brawls. Yet my writing table drawers are full of letters about insurance and



**THE 100 H.P. BENZ.** Near-side view of the new 100 h.p. four-cylinder Benz chassis. The connecting pipe of the inlet passages in the cylinder pairs can be seen over the exhaust branch.

*On the Road.*

over-insurance of all kinds and sorts, from all conditions of men, and all couched in particularly kind phraseology. One correspondent sends me the balance sheet of one of our newest motor car insurance societies and I agree with him in thinking that by its profits it cannot be such a cut-throat, strenuous, competitive business as some of my critics have tried to make it out.

Many other private motorists have come to the conclusions I have set forth, while, on the other hand, many gentlemen concerned with insurance have pointed out how little margin of profit there is in the business at all. Yet insurance generally is a paying game,

and certain companies are rich beyond imagination.

Honestly, I wish our organisations would see to the matter with an unprejudiced eye. Since they have vigorously disclaimed any profits to themselves from the use of their initials, there is no reason why they should not enquire if lower premiums to respectable motorists are not feasible.

Their other duties are getting fewer, the causes that brought one of them into existence hardly now exist. Is it impossible that this very important subject should be discussed? Personally I know of none other that is more important, and I am sick of talk and more talk.

OWEN JOHN.

## Benzole.

### Some Firms from Whom it May be Obtained.

#### Distillers and Distributers.

##### CUMBERLAND

*Flimby*.—West Cumberland Bye-Product Co., Ltd.

##### DURHAM

*Durham*.—New Brancepeth Colliery.

*Ferryhill*.—Dean and Chapter Colliery Co.

*Gateshead-on-Tyne*.—Judge, Brand and Co., Ltd.

*Newcastle-on-Tyne*.—Team Bye-Product Co., Ltd., Dunston.

*Sunderland*.—Brotherton and Co.

##### LANCASHIRE

*Accrington*.—The Altham and Hanwood Colliery.

*Church*.—W. Metcalf, Ltd.

*Manchester*.—Clayton Aniline Co., Ltd.

„ Crawfords, Ltd., Chorlton Road.

„ Hardman and Holden, Miles Platting.

„ J. E. C. Lord, Ship Canal Tar Works, Weaste.

„ H. N. Morris and Co., Ltd., Gorton Brook

Chemical Works, S.E.

*Wigan*.—Wigan Coal and Iron Co., Ltd.

*Liverpool*.—Brotherton and Co.

„ Bradbury and Hirsch, 11, Dale Street.

##### LONDON

Blagden, Waugh and Co., 4, Lloyds Avenue, E.C.

S. Bowley and Son, Battersea, S.W.

Burt, Boulton and Haywood, 64, Cannon Street, E.C.

Thos. Crow and Sons, West Ham, E.

Gas Light and Coke Co., Ltd., Westminster, Beckton, and Goswell Road.

Gas Lighting Improvement Co., Salisbury House, E.C.

Otto Gas Co., Queen Street Place.

Product Works, Beckton and North Woolwich.

South Metropolitan Gas Co., East Greenwich.

##### STAFFORDSHIRE

*Kidsgrave*.—Birchenwood Colliery Co., Ltd.

*Stoke*.—Talk o' th' Hill Colliery, near Stoke.

*Tunstall*.—Staffordshire Chemical Co., Ltd., Chatterley.

*Wolverhampton*.—Sadler and Co., Ltd.

„ Major and Co., Ltd.

##### YORKSHIRE

*Barnsley*.—Mitchell Main Colliery Co.

„ The Old Silkstone Chemical Works, Ltd., Darton,

near Barnsley.

*Cleckheaton*.—Henry Ellison, Ltd.

*Dewsbury*.—J. B. Brown and Co., Ltd., Manufacturing

Chemists, Savile Town.

*Huddersfield*.—J. W. Leitch and Co., Milnsbridge Chemical

Works.

*Hull*.—Blenkin and Son, 76, Queen Street.

„ Blundell, Spence and Co., Ltd.

„ E. Hardman and Co., Bedford Street, Wilmington.

„ Major and Co., Ltd., Sculcoates.

*Knottingley*.—Stainsby and Lyon, Ltd., Aire Tar Works.

*Leeds*.—Brotherton and Co., Ltd.

„ George Exley and Son, Hunslet Lane.

„ J. G. Roper and Sons, Low Fold Mills, East Street.

*Middlesbrough*.—Bolckow, Vaughan and Co., Ltd.

„ Cochrane and Co.

„ R. Heath and Co.

„ Major and Co., Ltd.

„ Sadler and Co., Ltd.

*Normanton*.—Whitwood Chemical Works.

*Rotherham*.—Ellison and Mitchell Ltd., Don Chemical Works,

Kilnhurst, near Rotherham.

*Sheffield*.—Newton, Chambers and Co., Ltd., the Laboratory, Thorncliffe, near Sheffield; also Rockingham Chemical Works, near Birdwell, by Sheffield.

##### NORTH WALES

##### FLINTSHIRE

*Prestatyn*.—Meldrum and Co. (Delivered free in Cheshire Shropshire, and North Wales.)

##### SCOTLAND

##### AYRSHIRE

*Glengarnock*.—The Glengarnock Chemical Co.

##### LANARKSHIRE

*Glasgow*.—William Baird and Co., Ltd., West Street.

„ Brotherton and Co., Troyan Chemical Works.

„ Provan Chemical Works.

##### LINLITHGOWSHIRE

*Linlithgow*.—Philipstoun Oil Co.

„ James Ross and Co., Ltd.

#### Dealers and Retailers.

##### CHESHIRE

*Altrincham*.—C. Alexander, 132, Ashley Road, Hale.

*Birkenhead*.—The Mersey Motor Co., Ltd., Conway Street.

##### ESSEX

*Colchester*.—Adams and Co., 47, Culver Street.

##### KENT

*Deal*.—C. J. Lindsell and Co., Broad Street Garage.

##### LANCASHIRE

*Liverpool*.—Trueman Motor Co., Ltd., 54, Trueman Street.

*Manchester*.—Baxendale and Co., Ltd., Miller Street Works

##### LEICESTERSHIRE

*Leicester*.—Green and Co., Evesham Road.

##### LONDON

Ariel and General Repairs, Ltd., Camberwell New Road, S.E.

Clifford and Co., Motor Works, Main Road, Sidcup, S.E.

Finchley Road Garage, Ltd., Lymington Road, Hampstead,

N.W.

Gamage, Ltd., Holborn, E.C.

Ormerod and Co., Chelsea Garage, 85, King's Road, Chelsea.

Southern Automobiles, Ltd., Blackheath, S.E.

G. Stone and Co., Park Garage, Thornton Road, Chapham

Park, S.W.

##### SURREY

*Aldershot*.—Aldershot and District Traction Co., Ltd.,

Halincote Garage, Halincote Road.

*Byfleet*.—The Byfleet Automobile Engineering Co., Old

Woking Road.

*Egham*.—The Egham Motor Co., 1, 2, and 157, High Street.

*Weybridge*.—Brooklands A.R.C. Brooklands Track.

##### WARWICKSHIRE

*Birmingham*.—Arthur E. Hooke, 167, High Street, Erdington.

„ M. Whittingham Jones, 27, Edgbaston Road.

##### YORKSHIRE

*Leeds*.—R. Wilkie, 68, Albion Street.

*Scarborough*.—J. S. Atkinson, Belle Vue Street and Fals

grave Road.

„ Castlehouse, Ltd., Victoria Road.

„ Castlehouse and Turner, Somerset Terrace

„ T. M. Hebron, Falsgrave Road.

„ Walker and Hutton, St. Nicholas Cliff.

##### SCOTLAND

##### INVERNESS-SHIRE

*Inverness*.—Macrae and Dick, motor engineers.



## The Automobile Golfing Society.

### The Contest for "The Autocar" Challenge Trophy.

QUITE the most successful meeting which the Automobile Golfing Society has ever held was that which took place on Saturday and Sunday on the links of the Hunstanton Golf Club, which was also the scene of last year's spring meeting. The chief item of the programme was the annual contest by medal play for *The Autocar* Challenge Cup, which was first put up for competition in 1910.

A party of thirty-two players foregathered by road and rail at the Le Strange Arms and Golf Links Hotel on Friday evening, at which time the outlook was unpromising in the extreme. Snow was falling heavily, and a bitterly cold wind was blowing, and it was quite on the cards that the meeting would have to be abandoned. In the hope of better conditions on the morrow, however, the usual auction sweepstakes was held and realised a considerable pool.

Saturday morning seemed no better, the links being still white with snow, and after an inspection of the course by the Society's captain, Mr. A. S. Mays-Smith, and Mr. Fishwick, the secretary of the Hunstanton Golf Club, it was decided to defer play until after lunch, at all events. At one time it looked as if more snow would fall, but matters brightened up suddenly, the snow disappeared as if by magic, and there was a hasty call for early lunch in the hope of bringing off two rounds before evening.

The first couple got away at 1.15 p.m., and the others quickly followed. The course was found to be in fine condition, save that the greens were tricky after their soaking. It may be mentioned here that the Hunstanton links measures 2,820 yards out and 2,810 yards home, the longest hole being the second, 540 yards, and the shortest the sixteenth, 110 yards. To golfers accustomed to play on inland links the chief obstacles to success, of course, are the huge natural bunkers of heavy sand, one of which, facing the first tee, was the grave of many ambitions at the very outset. At another, guarding the sixth green, a player was observed—"tell it not in Gath"—to take nine strokes to get out, and recorded sixteen for the hole!

There was some fine play, notwithstanding, and particularly excellent was the performance of the ultimate winner, Mr. Kevitt Rotherham, of Coventry, who returned a card of 83—7=76. The bogey of the course is 78, and considering the high wind prevailing, the difficult state of the greens, and the presence of some amount of casual water, Mr. Rotherham's achievement was highly creditable and richly deserved the cup. Mr. J. C. Woodall was second, with 86—3=83, and received a box of Blériot balls. It was

news, by the way, to the players that M. Blériot had become a manufacturer of golf balls, but it was generally admitted that he ought to know something about "flight."

As the evenings are lengthening out, it was found practicable to bring off the second contest that had been arranged, a foursome contest by stroke play. The morning's opponents became partners, and chose their pairs at option. Coventry was again to the fore when the result was declared, as Messrs. B. Tuke and A. H. Rotherham, and Messrs. A. Hill and E. M. C. Instone, who tied for first place, all hailed from the city of three spires. It was agreed to play the deciding round on the Coventry golf course on some future date.

At the dinner which followed, presided over by Mr. A. S. Mays-Smith, with Mr. H. M. Hobson (hon. secretary) in the vice-chair, *The Autocar* Cup was duly presented to Mr. Kevitt Rotherham, as holder for the year, with musical honours. The toast of *The Autocar* was acknowledged by Mr. Harry J. Swindley, who congratulated the members, on behalf of the paper, upon the success of the spring meeting. It was decided to hold a team match on the following day between players of "under forty" and "over forty" respectively; on analysis it was found that by lending a couple of seniors to the "juveniles" two equal sides of sixteen could be arranged, and these were paired according to their handicaps, Mr. R. S. Lees (+ 2) captaining the "Under Forty" and Mr. A. S. Mays-Smith (+ 1) the "Over Forty" contingents.

The weather on Sunday was perfect, and the match was played under most delightful conditions, the wind having died down under a bright sun, and the greens having recovered their tone. "Youth will be served" in most things, but not in golf, and, despite the fact that a borrowed Senior, Mr. J. W. Stocks, obligingly won his match for the Juniors, they were beaten by 11 to 6, including the byes, or 10 to 5 without.

Friendly matches occupied the attention of those who did not set off by road immediately after lunch, four ball foursomes being the most popular arrangement. The London contingent made the return journey at 6.20 p.m., a saloon carriage being provided by the G.E.R. Co.

The course has not yet been fixed for the summer meeting of the Society, which will be held some time in June, and at which the *pièce de résistance* will be a contest for the new trophy presented by the Society of Motor Manufacturers and Traders.

### Golfing Remarks. By Owen John.

This is not the official account of the struggle of the Automobile Golfing Society for *The Autocar* Cup; another has seen to that. This is how it was done and how the lions lay down together without any thoughts of lambs. The tale ought to begin—"It was an old-fashioned Christmas eve. Big fires blazed in all the rooms of the Old Le Strange Arms at Hunstanton. Outside the snow whirled across the wind-swept salt marshes, and one by one the weary dazed travellers came out of the darkness into the light and shook the white covering from off their frozen garments. How the wind howled! How the drifts blocked the roads!"

As a matter of fact it was April 11th and not Christmas eve at all. But it was a much better imitation of an old-fashioned Noël than most Decembers put up, and the only question heard was as to whether play would be possible on the morrow or not.

But the members of the A.G.S. are optimistic men, and though the roads were deep in snow, and deeper, ever deeper, it lay on the links, the usual sweep was drawn, put up, and sold by Mr. Harry Smith just as if it were ordinary spring weather as spoken of by poets and advertisement agents. Therefore, the snow gave it up as a bad job and ceased to fall. Next morning, however, it still lay, and a cold stinging blast came

*The Automobile Golfing Society.*

direct off the North Sea from the North Pole. Then the snow went, slowly at first, but afterwards in double quick time, so that at mid-day the sun was out and the links at Hunstanton looked absolutely ordinary. How *The Autocar* Cup was won for Coventry in the person of Mr. Kevitt Rotherham with a very fine score another tells: let me make a few criticisms on style. Generally speaking, the chief fault of A.G.S. is a tendency to quote the past and their doings elsewhere. Indeed, with assistance, I am preparing a list of excuses for golfers on strange links, which book should secure a large sale. Yet among them there are some very fine golfers, though not all. Personally, I do not think it would be very good form for me to win the cup—people might talk—therefore I keep well in the crowd. After the competitions, many prizes were presented, including two umbrellas—both gone to Coventry with the cup—and a box of a new type of balls. Now since golf balls are not motoring necessities I feel myself at liberty to remark on their absurd cost, which is only due in the beginning to the fancy—or petrol—price of rubber at one time, and forgetfulness to notice that it went down again shortly afterwards. Inside they are very nearly all alike, except that some are more fancifully stuffed than others.

Golfers—I am not really a golfer—are very droll about the balls they play with. Some like the spots concave, some convex, some with crosses on them, some with crescents and all sorts of little devices at each end. But they are all white outside and all equally good at hiding themselves. Fashions in golfing garments this year lay in a more sober direction than usual, and the costumes of some really good players (handicap, say, under 16) were quite ordinary looking. Otherwise, it may be noted, auction bridge has quite knocked out the usual ordinary variety, while poker seems coming back into its own again.

While on this subject—and when the snow lay round about, deep and crisp and even, there seemed a likelihood that no outside games would be able to be played—it might be of interest to say that, in the opinion of one or two players, it is possible to open

a jackpot on nothing; the penalty being given as doubling the pool, and an authority from the American Bar was quoted. However, it seemed that the majority were more in favour of looking on the practice as involving something more sudden.

To return to golf once more—or less—at the banquet, which followed the strenuous competition for *The Autocar* Cup, many speeches were made and a telegram was read out announcing that the Brooklands hour record was cut. This was followed by a remark from one that the carburetter fitted was a ———, another that it was on ——— tyres, while several other refinements that the said car was fitted with were mentioned, and it was agreed that if only the rest of the party had known about the matter much trouble would have been taken in preparing other, and more wonderful, messages still. After which it was agreed that a match between those over forty years of age and those under forty should be played, with a result that once again it was proved that the younger generation is quite unable to cope with that of a riper vintage.

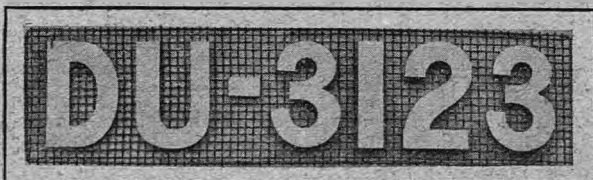
The A.G.S.—though I say it myself—is a great and wonderful institution, and it is very beautiful to see keen business rivals agreeing so sweetly in their play.

Perhaps it was because the snow the party arrived in gave way to glorious sunshine, or perhaps it was because at the Le Strange Hotel everything is made so comfortable and the food is so good, that this meeting proved so thoroughly enjoyable. That it will be memorable always is certain, if only for the tales of the snow-benighted motorists as to what happened to them. So fierce indeed was the tempest that all head lamps were blocked up, while one driver simply gave up the ghost near Oundle from sheer terror. I had hoped to have arrived on a new and beautiful Lancia; that the coachbuilders failed to have it ready for the occasion puts me under an eternal obligation to them.

For photographs of the links and groups of players on them see any photographs in any illustrated journals that go in for that sort of thing. All such pictures are exactly alike and equally uninteresting.

## Radiator Number Plates.

**M**ANY motorists will be interested in the new number plates which have been brought out by Messrs. Taylors, Green Lane, Wolverhampton: they object to the number plate on the front axle, not only because of its appearance, but because



*The Taylor number plate for radiators, by the use of which the effective area of the radiator is not appreciably reduced.*

it gets so dirty on a muddy day that the figures are completely obliterated, and in some districts this may bring them into trouble with the police, who are content with merely pointing out that the plate is dirty. Some motorists attempt to overcome the difficulty by having the number painted on the radiator in white letters, but this, again, is not accepted in some cap-

tious districts because, unless the letters are frequently repainted, they very soon become difficult to decipher.

The difficulty has been overcome by the Taylor plate seen in the illustration. Aluminium letters and figures are riveted to a black enamelled copper wire panel which is bolted to the radiator by four long bolts passing through the radiator tubes, and, of course, with soft felt washers introduced between the perforated wire plate and the radiator, and again between the nuts and the radiator, so that expansion and contraction can take place freely without any rubbing action on the radiator which will be likely to lead to leakage. One of these plates in position is seen on the car illustrated on page 676.

We should add that these plates are really well made and finished throughout. The price is 7s. 6d., and in ordering it is necessary to send the width across the cooling surface of the radiator (so that the plate may not be too wide), and also the thickness of the radiator so that the bolts may be long enough.

An equally well made plate of the usual type with aluminium lettering and base is also supplied by the same firm for the back of the car.

## The 20 h.p. La Buire.

**Staggered Twin Pinions for the Constant Mesh Wheels. The Demultiplier Gear in the Back Axle.**

**T**HE 20 h.p. La Buire is one of the most interesting cars which comes to us from France, differing considerably in many details from the standard practice on both sides of the Channel. It is handled in this country by the Hollingdrake Automobile Co., Ltd., Prince's Street, Stockport.

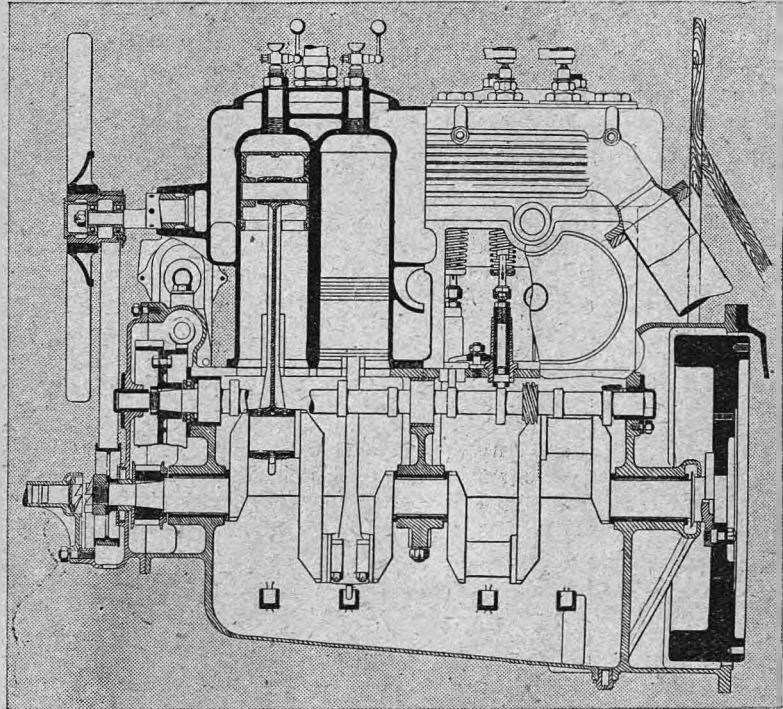
The frame is, as usual, of channel section steel, the forward part being kept unusually narrow to afford a very full steering lock, the engine being supported by brackets from the side members themselves. The cross members are of the same section, one beneath the radiator, and the second and central member downswept to take the end of the gear box on a pivotal bearing, where it is carried on a rocking trunnion. Semi-elliptical springs of good length are used forward, and threequarter elliptical springs behind.

The four cylinders (90 mm. bore x 160 mm. stroke) are cast *en bloc*, and the motor unit system with an open clutch is adopted. Compression taps are fitted over the combustion chambers, the most satisfactory position, as priming can be introduced directly on to the top of the piston, which is not the case when these taps are set in the exhaust valve caps. A Zenith carburetter is fitted as standard.

Forced water circulation is used, the pump and magneto being driven by skew gear, through a cross-shaft in front of the engine, from a skew gear wheel bolted to the driven wheel of the camshaft. This places both the pump and magneto in particularly accessible positions. The pistons are of excellent length with three rings above the gudgeon

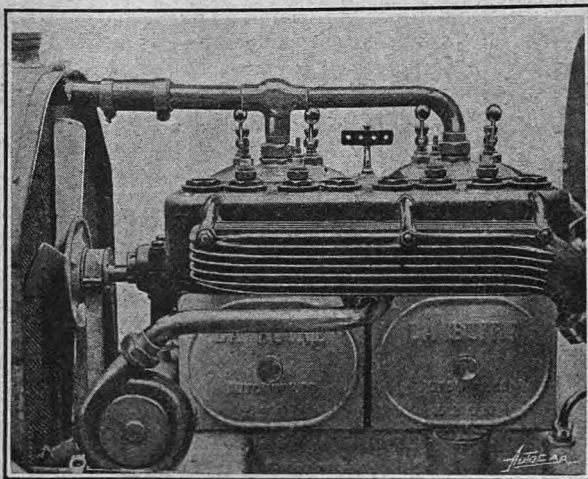
pin and a scavenger ring at the piston mouth. The camshaft is silent chain driven from the crankshaft.

The flanged exhaust trunk is bolted to the cylinder casting, and the valves are enclosed by easily accessible cover plates. The valve stems and the tappet rods

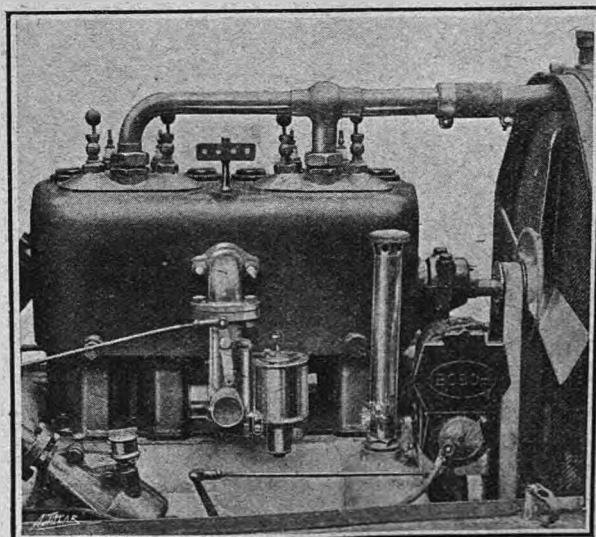


Part section of the 20 h.p. La Buire engine.

are guided in long bearings, the tappet rods bearing on the cams through rollers as shown. The upper end of the tappet rod carries a buffer block which is kept in contact with the valve stems by means of a helical spring.



Near-side view of the 20 h.p. La Buire engine, showing the water pump driven by a cross-shaft at the front of the engine, the detachable valve tappet covers, and the eccentric adjustment of the fan.

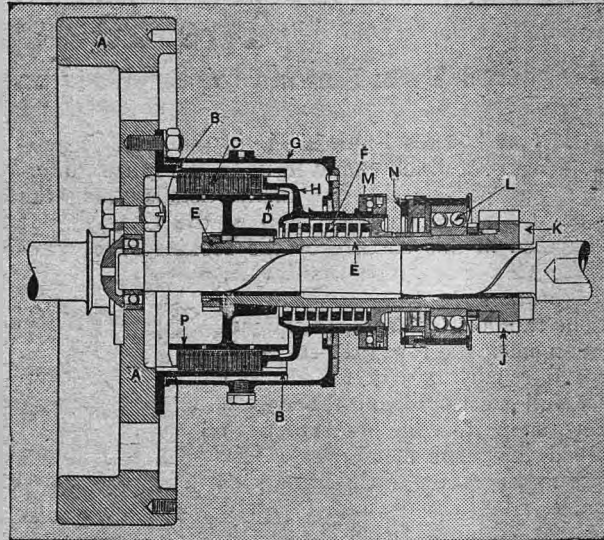


Off-side view of the 20 h.p. La Buire engine, showing the accessible position of the Bosch magneto and the Zenith carburetter.

*The 20 h.p. La Buire.*

The crankshaft rotates in three white metal lined bearings of excellent length, particularly with regard to the rearward bearing. The camshaft is also carried by four bearings, one at the extreme front end being fitted in the distribution gear case cover, so that the camshaft chain gear wheel and the skew gear wheel driving the cross-shaft are carried between two bearings, and any bad effect likely to result from the overhang of the distribution gear is thus avoided. A thrust bearing is also fitted to take the end thrust of the skew gearing. This is a wise provision which is often omitted, the shoulders on the journal bearings of the camshaft being called upon to take this thrust.

The lubrication of the engine is by means of a combined forced and trough lubrication system. The toothed wheel oil pump placed at the bottom of the crank chamber is driven by skew gear off the camshaft, and forces oil to the three crankshaft bearings, and also to leads which keep the transverse troughs replenished. Into the latter the hollow dippers on the ends of the connecting rods are immersed at each revolution, so serving oil to the big ends, the cams and camshaft bearings, gudgeon pins and cylinder walls. The circulation of the oil is verified by an indicator fitted to the dashboard. A thrower ring is formed on the rear end of the crankshaft to prevent the escape of oil from the crank chamber. On the lower right hand side of the crank chamber is placed a three-way cock for emptying and verifying the level of the oil in the sump. The lever operating this cock is handily placed, and moves to three positions—closed, oil level, and empty.



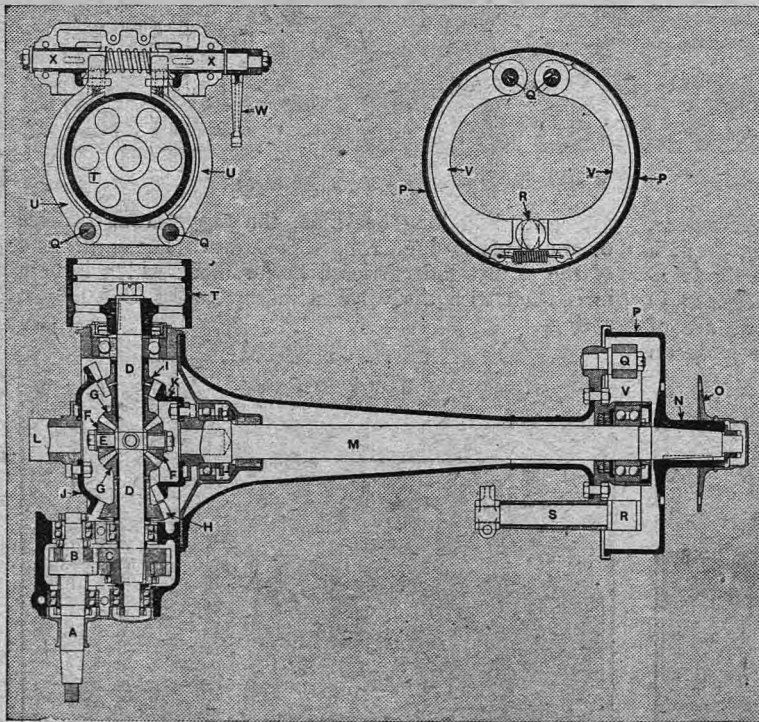
*Vertical section of the flywheel and clutch of the 20 h.p. La Buire.*

- |                          |   |
|--------------------------|---|
| A, flywheel              | J, driving wheels of intermediate gear        |
| B, driving clutch member | K, driving portion of direct drive dog clutch |
| C, clutch plates         | L, front bearing of gear box                  |
| D, driven clutch member  | M, clutch striking ball race                  |
| E, clutch sleeve         | N, clutch stop                                |
| F, clutch spring         |   |
| G, clutch casing         |   |
| H, clutch thrust member  |   |

The clutch is of the multi-disc type, and with the driving drum bolted to the flywheel. The driven portion of the clutch is keyed to a hollow sleeve through which the intermediate gear-shaft is carried to a ball spigot bearing in the centre of the web of the flywheel. Oil reaches this bearing and the clutch itself through the centre of the crankshaft, which is bored for the purpose, and the two bushed bearings on the clutchshaft have helical grooves cut for the service of the oil thereto. The clutch striking ring is provided with a ball thrust bearing.

The gear box provides four speeds and reverse, a special feature being the twin form of intermediate gear in which the teeth of the half wheels are slightly staggered in order to avoid gear noise at this point. The primary gear-shaft is castellated and is carried at its rearward end in a double ball bearing with felt stuffing boxes. The secondary gearshaft is carried in double ball bearings. The driving gear wheels thereon are secured on the keyed portions and can be separately renewed. The gear striking lever and the striking gear are entirely within the box.

The rear end of the primary gear-shaft carries the universal joint connecting with the hollow propeller-shaft, this joint being encased in a metal dustproof casing. At the rear of the propeller-shaft is a flexible block joint. The bridged type of back axle as hereafter described has formed an interesting feature of the La Buire chassis for some time past, but in the chassis under review this has been supplemented by the Demultiplier device



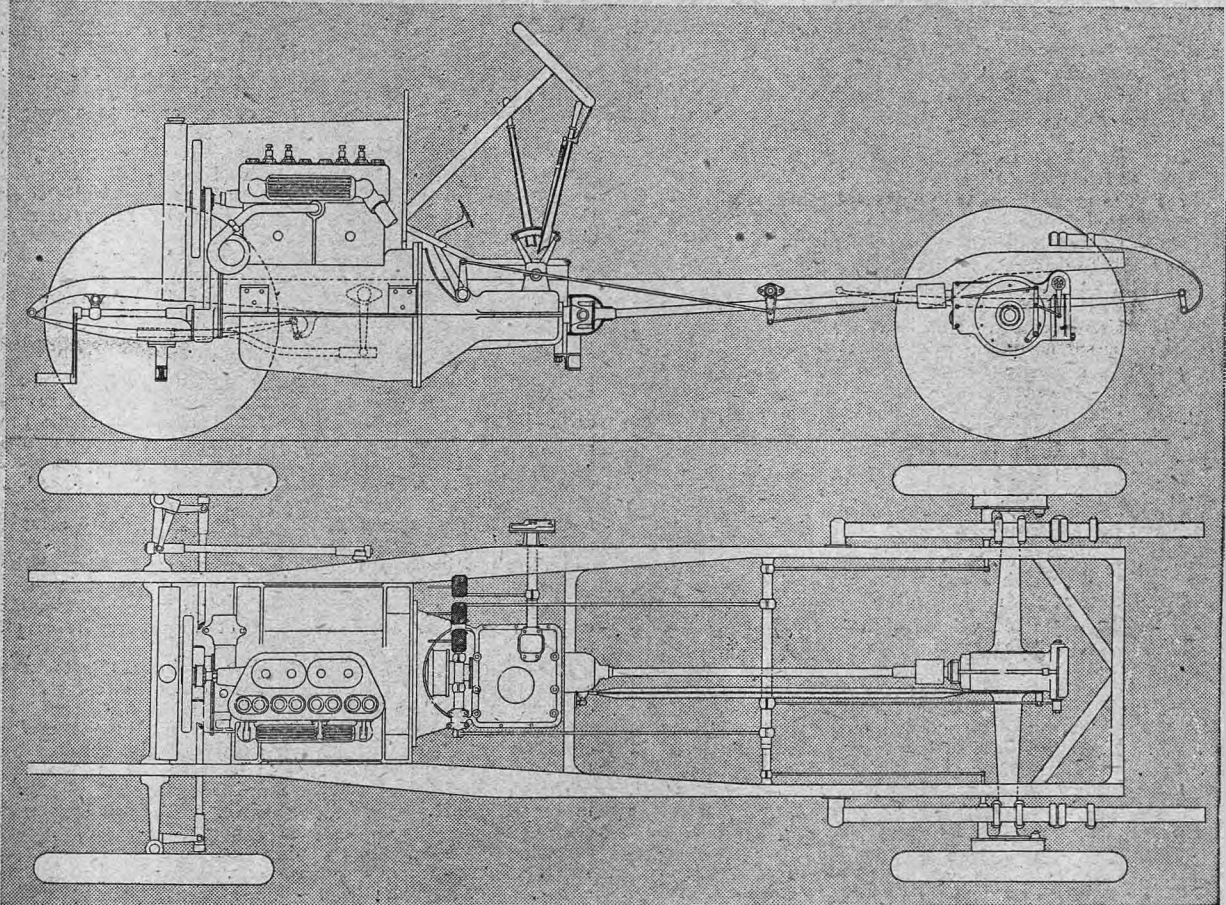
*Horizontal transverse section of the back axle of the 20 h.p. La Buire.*

- |  |  |
|--|--|
| A, driving pinion-shaft                            | N, road wheel hub                              |
| B and C, driving and driven pinions                | O, flange                                      |
| D, differential gearshaft                          | P, brake drum                                  |
| E, differential gear star piece                    | Q, brake shoe pivots                           |
| F, planet wheels of differential gear              | R, brake shoe cam                              |
| G, sun wheels of differential gear                 | S, brake cam spindle                           |
| H, driving bevel pinion to off-side driving-shaft  | T, brake drum on end of differential gearshaft |
| I, driving bevel pinion to near-side driving-shaft | U, brake shoes of differential gear brake      |
| J, driven crown wheel to off-side driving-shaft    | V, brake shoes of wheel brake                  |
| K, driven crown wheel to near-side driving-shaft   | W, brake application lever                     |
| L, off-side driving-shaft                          | X, brake contracting rod                       |
| M, near-side driving-shaft                         |  |

formed by the two driving pinions B and the two driven pinions C. It will be seen that the joint of the propeller-shaft connects with a layshaft running in two double ball bearings in a forward extension of the differential gear case and carrying two driving pinions B which mesh with the two driven pinions C on the differential gearshaft. The drive is conveyed from the differential gear box to the near side driving wheel through the planet wheels F, a sun wheel G, and the crown wheel K, while the rotation of the offside driving wheel is obtained through the planet wheels F, the other sun

strengthened and lightened, and the shape of the teeth improved. It has also been possible to bring the propeller-shaft into a practically horizontal position when the car is loaded, so greatly reducing the wear on the universals. The driving and driven pinions B and C are made with double helical teeth, so ensuring silent running without end thrust on the shaft. The makers also claim that if at any time it be necessary to alter the ratio of the back axle drive it is a very simple matter to introduce two fresh wheels in the Demultiplier gear, no change being required in the bevel drive.

*The 20 h.p. La Buire.*



*Elevation and plan of the 20 h.p. La Buire chassis.*

wheel G, and the crown bevel J. The crown wheels are bolted directly to the ends of the road driving shafts which are carried at the centre in single and at the outer ends in double ball bearings, with thrust bearings outside the former. Each double ball bearing is carried in a socket bolted to the splayed flanges of the drawn steel tapered axle casing, the driving wheels themselves being set upon the tapered and keyed end of the driving axle. It will be seen that the differential gearshaft is carried through a ball bearing to the rear of the differential gear casing, and bears there a brake drum which is operated upon by two encircling shoes.

The advantages claimed for the La Buire axle are a considerable reduction in weight without in any way detracting from the strength of the axle, also the decrease of the reduction ratio between the driving bevels and the crown wheels. Further, it is suggested that gear noise is reduced, the bevel wheels

The brake drums of the driving wheels form part of the hubs, the brakes taking effect thereon being of the internally expanding order, separately pivoted and expanded by an oval cam and retained from contact with the inner periphery of the brake drum by a helical spring as shown. A girder form of torque member is carried forward from the back axle to a vertical rocking standard bolted to the down-swept cross-member carrying the back of the gear box. The steering is well raked, worm and sector being used in the steering gear box, the steering rod being kept above, and the steering distance tube behind the front axle.

H.R.H. the Prince of Wales paid a visit on Wednesday last week to the Mercedes Works at Unterturkheim, making a thorough inspection of the works, and displaying the greatest interest in all he saw.

# The Select Committee on Motor Traffic.

## Evidence on Behalf of the Roads Improvement Association.

**B**EFORE the Select Committee on Motor Traffic on Tuesday and Thursday last week, Capt. H. H. P. Deasy, representing the Roads Improvement Association, gave evidence, in the course of which he made a number of valuable suggestions for the better regulation of traffic.

All traffic regulations, he said, should be simple and as few as possible.

With a view to preventing accidents on the highways, and to making drivers of all vehicles, as well as pedestrians, more careful, and all classes of the public more reasonable and considerate to each other, the public should be educated in every feasible manner to appreciate:

- (a) The altered conditions of road traffic.
- (b) The necessity, in the public interests, and especially in the commercial interests, of safe, satisfactory, and reasonably rapid road traffic composed to a great extent of vehicles propelled by mechanical means.
- (c) The necessity in the public and commercial interests to afford adequate facilities for, and to prevent obstruction to, road traffic of all kinds.
- (d) That drivers of mechanically propelled vehicles must not, independently of any speed limit, whether of a local or general nature, under any circumstances, or in any place, drive recklessly, or to the danger of the public.
- (e) The necessity for people wishing to cross roads, not to attempt to do so, in their own interests, until they have looked in the direction from which the traffic nearest to them is proceeding, and ascertain that it is safe to cross.
- (f) That all pedestrians should walk on the footpath, or footpaths, as far as circumstances permit, and keep to the left of the footpath.
- (g) That where there is no footpath, pedestrians should keep to the right of the road in order to face the traffic which is nearest to them, and close to the edge of the road.

The greatly increased volume of road traffic of all kinds, the necessity of safe, satisfactory, and reasonably rapid means of transit, and the very regrettable lack of standardisation of regulations and guiding principles affecting road traffic, render it very advisable to appoint a Traffic Board.

If the Traffic Board be a small one, and the right men appointed to it, there should be a very marked improvement in the conduct of traffic, and far fewer accidents. The expense of the Traffic Board should be comparatively small. The Traffic Board, in addition to such other duties as the Committee may recommend to be undertaken by it, should:

- (a) Make every endeavour to improve the traffic-bearing capacity of the existing highways consistent with adequate safety for the public, before recommending any scheme to provide additional facilities for traffic which would involve a large net expenditure of money.
- (b) Formulate rules of the road, regulations, and bye-laws affecting ordinary road traffic, to be enforced by the proper authorities.
- (c) Report on all schemes affecting road traffic which are to be submitted to Parliament, in such a manner as it considers is likely to be of assistance to Parliament.
- (d) Report annually, and whenever necessary, to Parliament.
- (e) Enquire into the sufficiency of the provisions of the Acts relating to the erection of buildings adjoining roads, and report to Government, stating whether or not they should be extended, and if so, in what manner, and if it is advisable that they should be consolidated.

The provisions of Section I. of the Motor Car Act, 1903, should apply to drivers of all mechanically propelled vehicles.

A printed copy of the law relating to traffic on the highways should be issued with every driver's licence and renewal of same, and to every person who registers a mechanically propelled vehicle, with a view to obtaining better compliance with the law and, therefore, better protection for the public.

There should be reconsideration of the law and all procedure connected with the arrest and prosecution of drivers of motor cars, and other vehicles, for being in an unfit condition from the effects of alcohol, drugs, or from any other similar cause, and excepting illness, to drive vehicles.

All who aid, abet, or urge drivers to break the law, and those who endeavour to cause justice to be defeated, should be prosecuted and adequately punished on conviction.

Any person who obstructs road traffic in any way, or who commits on a highway any act which is likely to cause an accident, or which is calculated to endanger the safety of the public, should be prosecuted and punished.

All drivers of vehicles about to turn them to the right, or to stop them, should be obliged to give suitable signals in adequate time before any turning, or stopping movement is commenced, irrespective of the amount of traffic which may be on the road at the time.

Experiments should be carried out in order to ascertain if it is advisable to use on motor cars head lights which move automatically with the steering. If necessary Article 11, Section 7 (ii.) of the Motor Cars (Use and Construction) Order, 1904, should be amended so as to make it quite clear that the use of such movable head lights is likely to conduce to the safety of the public.

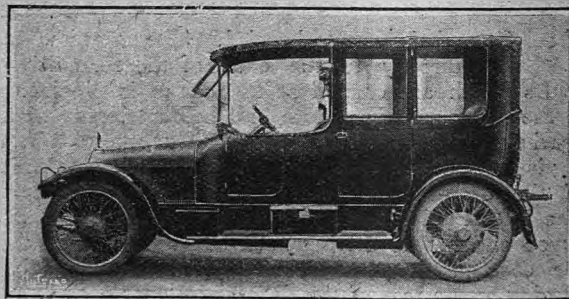
Whoever is in charge of sheep, cattle, and/or pigs on a highway used by vehicular traffic, within one hour after sunset, and one hour before sunrise, should be responsible that one, or more, lamps showing an adequate light of a suitable colour, or colours, are carried in front of, and not far from, the animals. It would appear that the best plan to adopt is to have one lamp showing a red light in all directions, and another lamp showing a green light in all directions, carried horizontally, or one vertically above the other, but in either case close together. Both these lamps should be carried at such a height, and in such a manner, that the light from them is visible at an adequate distance.

It should be obligatory on all traffic wishing to emerge from a side road, or one of lesser importance, on to a main road, or one of greater importance, to enter the latter very carefully, and in no case until the volume and nature of the traffic on the more important road justifies the action and will not be unduly interfered with, or obstructed. Traffic on main roads should have right of way over traffic on roads of lesser importance.

It should be obligatory for all slow-moving traffic to keep as near as possible to the left of the road so as to minimise obstruction to faster traffic.

The erection of central standards, except in the centre of refuges, should be prohibited as a general rule, because they are dangerous obstructions to traffic in most cases.

There should be an adequate number of suitable refuges in the streets, so situated that when pedestrians are proceeding to, or from, them, it will not be necessary to pay attention to traffic coming from more than one direction. If this guiding principle is carried out, as far as the circumstances of each individual case permit, pedestrians will be able to cross streets where there is much vehicular traffic with far more safety.



A 25-30 h.p. Armstrong-Whitworth recently delivered by Messrs. J. Coxeter and Co., Ltd., 81, Victoria Street, Westminster, London, S.W. The back portion of the body has been arranged to fold back parallel with the body lines and to project rearward only eight inches. The extension over the driver is also arranged to fold back. The interior is warmed by means of a radiator heated by hot water pumped from the engine.

# On the Track.

More Records Beaten by the Peugeot. 106.2 Miles in One Hour.

SUCH experienced drivers as Messieurs Jules Goux and Georges Boillot would not, perhaps, care to admit that, when they first drove the mighty Peugeot on the Track, they were at a considerable disadvantage as compared with men who knew the Track well. They had to discover the effect of its unique configuration upon speed and steering, and at first they felt the full effect of this disadvantage. On Saturday, however, the most critical observers were pleased to see that Goux had mastered the Track in spite of the fact that, although he had a fine car beneath him, it was one that was not built for track racing, though well found in all essentials.

On previous occasions it was especially the Frenchman's method of taking the banking by the Pond which met with so much criticism. It is well-known that all newcomers find it hard to resist the temptation to

course to be altered until it leaves the banking for the railway straight.

Another feature of the driving on Saturday was the height at which the Cobham banking was taken, and the car left its mark there. At this point, and, indeed, all round the edge of the track, the surface has become darkened by the action of the weather, and the Peugeot partly cleaned this off, leaving a polished band scarcely two feet from the edge. Another little effect was produced high up on the banking near the Members' Bridge, where quite a large slab of cement was dislodged. The Derihon shock absorbers fitted to the car appeared to be quite as effective as this type usually is, and at the speeds attained and maintained an efficient device of this kind is an absolute necessity. B.N.D. steel was used for the pistons, connecting rods, etc.

Of the actual run on Saturday there is little to be said. A start was made with Goux at the wheel at 9.30 a.m., and the first lap was done in 1m. 51<sup>3</sup>/<sub>5</sub>s., with succeeding laps at 106.65 m.p.h., 107.57 m.p.h., 107.80 m.p.h., and so on, always over 105; and twice just reaching 108, till the Talbot record for 50 miles in 29m. 2.50s. = 103.30 m.p.h. was beaten, Goux's time being 28m. 18.65s. = 105.97 m.p.h.

The succeeding laps were covered at pretty much the same speed, although in the 22nd and 31st it dropped to a little under 104<sup>1</sup>/<sub>2</sub>, and in the 35th rose to nearly 109. The Talbot records for the 100 miles and the hour were beaten, the figures being:

Peugeot	...	100 miles in 56m. 29.93s. = 106.20 m.p.h.
Talbot	...	100 miles in 57m. 49.38s. = 103.76 m.p.h.
Peugeot	...	1 <sup>06</sup> / <sub>100</sub> mls. 387 yds. in 1 hour = 106.22 m.p.h.
Talbot	...	103 mls. 1470 yds. in 1 hour = 103.84 m.p.h.

Soon after these results were achieved a stop was made in the 41st lap to change tyres, the time for the lap in which this change was made working out at 3m. 57s. Then Boillot assumed charge of the car, and the running was not so consistent. His second lap was done at 106.19, the third at 107.34, the fourth at 105.74, the fifth at 104.41, the sixth at 101.64, and the seventh at 107.57, and so on. In the 55th lap a world's record, held by the Lorraine-Dietrich, was taken (that for 150 miles), the time for this being 1h. 28m. 35.67s. = 101.59 m.p.h., against 1h. 31m. 52.06s. = 97.97 m.p.h. for the Dietrich.

In the next lap the carburettor caught fire and put a stop to the attempt on the long records, and though it was thought possible to get a new one fitted and go for the short records, this project was ultimately abandoned for the day.

The Frenchmen are to be congratulated on their success. They have shown the most dogged perseverance, and deserve the credit. They know every detail of their car, and are able to make any and every adjustment and repair. There exists between them and the car almost that intimacy that exists between a tried horse and its rider, and the car as it bounds along at 100 m.p.h. never ceases to "converse" with its driver if the driver can but hear it. With hand and ear attuned to all its ways, such a driver thus knows exactly what is going on beneath the bonnet. Here lies the romance of this sport of speed, a fitting theme for a word painter like Kipling.

The Talbot people are not going to let the Peugeot remain long in possession of these records if they can help it, and it is understood that at 2 p.m. on Satur-

RECORDS AT BROOKLANDS IRRESPECTIVE OF SIZE OF CAR. FLYING STARTS EXCEPT WHERE OTHERWISE STATED.			
<b>1/4 MILE STANDING START</b> W.M. COLLIER J. HUNTER-JACK 34.38.92 35.00.00 35.00.00 A.R.D.	<b>1/4 MILE</b> W.M. COLLIER J. HUNTER-JACK 34.38.92 35.00.00 35.00.00 A.R.D.	<b>1 KILOMETRE STANDING START</b> W.M. COLLIER J. HUNTER-JACK 34.38.92 35.00.00 35.00.00 A.R.D.	<b>1 KILOMETRE</b> W.M. COLLIER J. HUNTER-JACK 34.38.92 35.00.00 35.00.00 A.R.D.
<b>1 MILE STANDING START</b> W.M. COLLIER J. HUNTER-JACK 14.54.50 15.00.00 15.00.00 A.R.D.	<b>1 MILE</b> W.M. COLLIER J. HUNTER-JACK 14.54.50 15.00.00 15.00.00 A.R.D.	<b>50 MILES</b> J. HUNTER-JACK 25.5 TALBOT 25.5 TALBOT 18.2.15.	<b>100 MILES</b> J. HUNTER-JACK 25.5 TALBOT 25.5 TALBOT 15.2.15.
<b>150 MILES</b> W.M. LETTS LORRAINE-DIETRICH 27.11.12	<b>200 MILES</b> W.M. LETTS LORRAINE-DIETRICH 27.11.12	<b>300 MILES</b> R. WARRNER 34.85. THAMES 34.85. THAMES 5.11.09	<b>1 HOUR</b> J. HUNTER-JACK 25.5 TALBOT 25.5 TALBOT 15.2.15.
<b>2 HOURS</b> W.M. LETTS LORRAINE-DIETRICH 27.11.12	<b>3 HOURS</b> W.M. LETTS LORRAINE-DIETRICH 27.11.12	<b>12 HOURS</b> L. COATALEN 15.9 SUNBEAM 21.9.12	<b>24 HOURS</b> S.F. EDGE 60 NAPIER 29.6.07

An illustration of the Brooklands record table, which was photographed a few days ago. No fewer than fourteen of the sixteen records shown were accomplished on Palmer cord tyres. Eleven of the fourteen are world's records. This shows clearly the appreciation in which the Palmer tyre is held by would-be record breakers.

follow the slight inward bend of the track near the fork instead of keeping well to the right as the veterans do. The inevitable result is that when the newcomers reach the banking above the pond they ascend it diagonally, and in after efforts to take a course parallel to the edge they experience a series of zig-zag movements, and are unable to overcome this zig-zagging tendency for a considerable distance, thus imposing an enormous strain on the tyres and losing much in speed. The correct method is to keep well to the right on passing the Itala works and to maintain the same course relative to the edge of the track all the way. By so doing a car strikes the banking at the correct altitude, and without any need for its,

*On the Track.*

day Mr. Percy Lambert will endeavour to regain them. It is not too much to expect to see the speeds for these distances put up to something like 110 m.p.h. One wonders where it will stop!

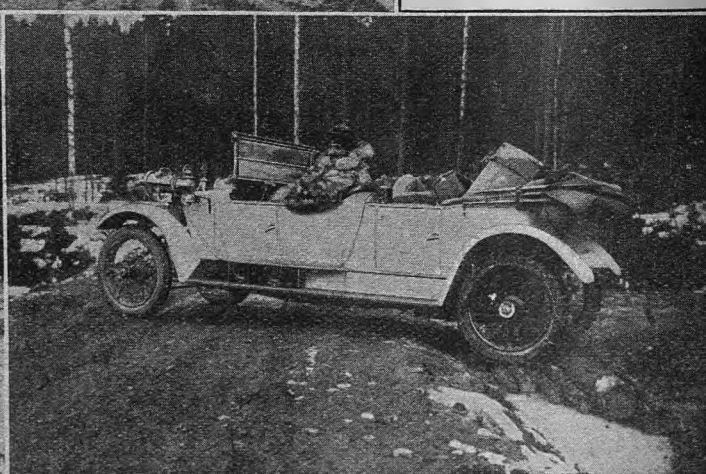
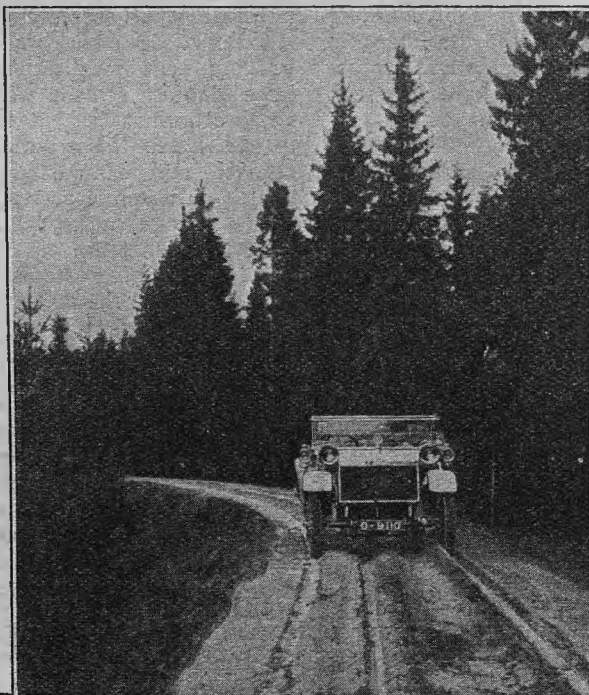
The Brooklands programme for Whit-Monday is now out. There are the usual six car events, two cycle events and a cycle car handicap—cycle cars only this time. There is also, however, an extra race of the greatest moment—the 100 m.p.h. Benzole Handicap. The importance of this event is shown by the fact that the first prize of £100 and a cup is to be given by the Royal Automobile Club, while the Society of Motor Manufacturers and Traders and the Automobile Association are conjointly giving the second and third prizes of £50 and £20. But there is still another prize—a cup—for the car which, having also run in the 100 m.p.h. Long Handicap, does the best speed in the benzole race in comparison with that done in the 100 m.p.h. Long. The idea of this is obvious, and also of the condition which enables a competitor in the 100 m.p.h. Long to enter for the benzole race at an entry fee of £2, while another competitor, not

entered for the 100 m.p.h. Long, must pay £8. It is the comparison that is wanted. Without this the race would serve little purpose.

If it can be demonstrated that these big racing cars can do as well on benzole as on petrol, it will be worth more than columns of theory on the subject.

The benzole race is to be the last car race of the day, and thus no competitor can suggest that the use of benzole might militate against his success in another event. Another feature of the programme is that there are to be cash prizes in the 100 m.p.h. Long and Short Races, and so quite apart from the points prizes there is £330 in cash to be picked up by the high-powered cars in addition to the cups in the sprint race and the benzole race. This should have an appreciable effect on the entries.

Mr. Norman Neill is giving a points cup for private competitors again this year, and it is to apply to the Easter meeting. The points are to be awarded on the same system as for the Shell and Pratt's prizes, and not on last year's system, which gave such an undue advantage to a competitor who merely ran a car in each event.



**THE SWEDISH TRIALS.** These illustrations show the 38 h.p. Lanchester in the Swedish Trials for which it was awarded a bronze plaque. A similar plaque was also awarded the 25 h.p. Lanchester entered by the Swedish agent. The severity of the trials may be gathered from the deep ruts which were frozen hard, thereby imposing great stress on the axles, springs, steering, etc., as well as on the driver. In some places the ruts were eight inches deep. Frozen water courses into which logs had been thrown to level the surface somewhat were also frequent.

"It seems to be taken for granted," writes a correspondent, "that benzole may be sold and delivered in five gallon tins, but the law restricts the capacity of the tins in which it may be distributed and stored to two gallons. The London County Council inspectors are on the watch for cases, and it is likely that a full crop of summonses may be brought into court before very long."

Speaking of the excellent electric ambulances provided by the Corporation of London, Dr. Waldo, the City coroner, at an inquest the other day, said that by comparison the Metropolitan Police hand ambulances were a disgrace to the richest metropolis in the world. They were used in a haphazard way and without any telephonic arrangement such as obtained in the city of London.



## Body Design and Construction.

### A 30 h.p. Six-cylinder Vauxhall Car for the St. Petersburg Motor Exhibition.

THE flush-sided limousine illustrated herewith has just been completed by the Regent Carriage Co., Ltd., 158, New King's Road, S.W., to the order of Vauxhall Motors, Ltd., for exhibition at the forthcoming motor show at St. Petersburg.

The general lines of the design are very pleasing, embodying, as will be seen, a well domed roof with round back and crown panel. The body is constructed on the Regent Co.'s "Metaklad" system, in which a strong but light skeleton ash framing is covered with jointless steel panels. By this it is not meant that the entire covering is beaten out of a single sheet of steel

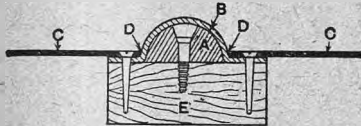


Fig. 1.—The "Metaklad" system of panel jointing.

- A, aluminium moulding
- B, metal covering strip
- C, panels
- D, soldered joints
- E, wood frame member

—which, even were it possible, would be impracticable—but only that the panels are fitted in sections to the framework, and afterwards all the joints are pinned and soldered so that they become practically jointless. The method in which this is effected is shown in the diagrams figs. 1 and 2, the former showing how two adjacent panel sheets are joined up on either side of an aluminium moulding A. This moulding is first of all secured to one of the wood frame members E, and is then covered with a strip of sheet steel B, which is pinned down by small iron nails. The panel sheets C are then brought up to position and also closely pinned, the holes being countersunk so that the pin heads are, if anything, below the surface. The two joints D are then carefully soldered, and the solder is run over the pin heads, the whole being afterwards cleaned off with sandpaper. It is found that the solder finds its way well in between the panels and the strip B and makes a thoroughly secure joint, which, at the same time,

is not apparent as a joint. Fig. 2 shows how, in a similar manner, the upper panel sheet is beaten out to form the broad elbow line moulding and secured under the top edge of the lower panel.

The method of construction seems admirable, and should entirely eliminate the parting and showing up of joints, which is so common even in the highest class of ordinary bodywork, and so unsightly.

The elbow line in this body is straight, and carried through to the scuttle dash, which latter is moulded to harmonise with the bonnet. The C.A.V. electric side lamps are neatly housed into the dash, and as the front glass rings screw in, there is no possibility of any looseness or rattle in these fittings.

There is a neat metal framed Beatson wind screen, with fixed lower portion and

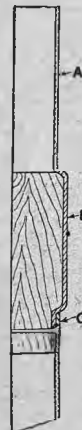


Fig. 2.—Section of the elbow line moulding.

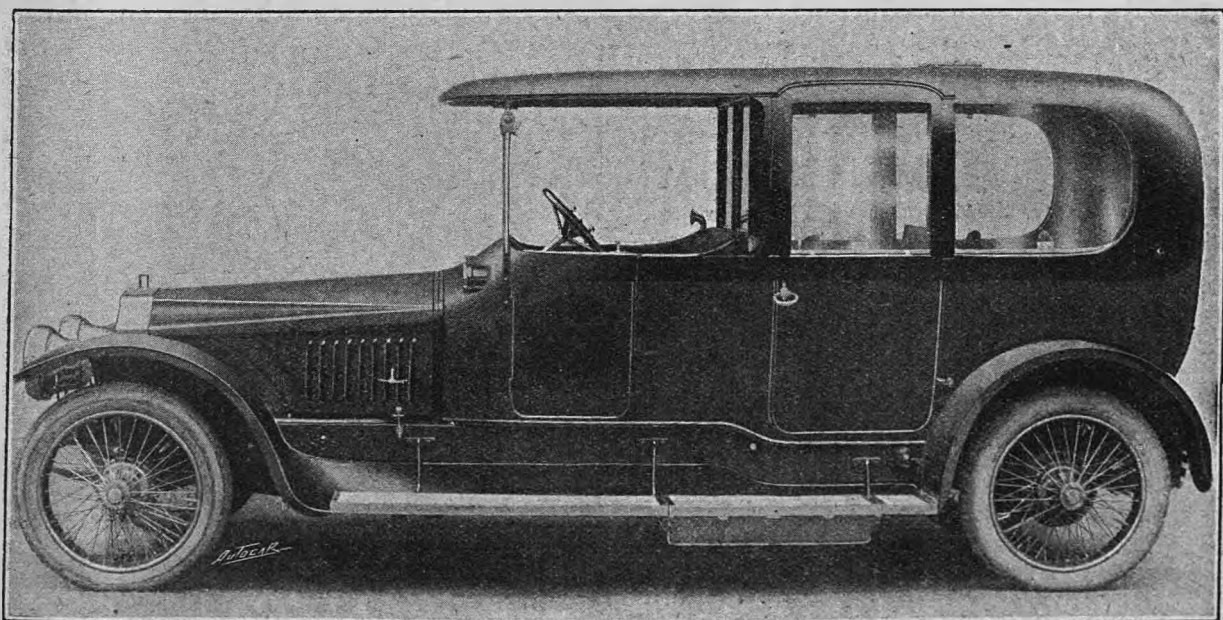
- A, top panel. B, shaped moulding. C, soldered and riveted joint.

an upper portion which swings inwards or outwards at will.

The cast aluminium tool boxes built into the long side steps are an interesting feature, and a considerable improvement on wood-built boxes. Each box is cast in a piece, and part of the step forms the lid.

The wire wheels (silver plated, like all the other fittings of this car) are provided with large wings of the slightly domed type, with side flanges, and are secured to the stays by a process which does not require any bolt heads or nuts to show on top. The description of the outside may be concluded with the statement that the finish of the main panels is in smoked peacock green, whilst the top and mouldings are black japanned.

The interior is carried out in woven grey silk upholstery, with polished grey harewood in the roof panelling



The 30 h.p. six-cylinder Vauxhall with a special body by the Regent Carriage Co., which has been built for exhibition at the St. Petersburg Motor Show.

*Body Design and Construction.*

and round the doors and windows. The scheme might be called "a study in ovals," for in the roof is a large oval of upholstery surrounded by a heavy frame curved and moulded to suit the sweep of the roof; the door panels, the rear corner cupboards and centre light, the upholstered panel behind the front seats, and even the flush plate with the two electric light switches, are all of oval design, and the general effect is distinctly happy.

In the centre of the roof there is a round opening for ventilation surmounted by an outside metal framed glass flap, which opens or closes easily from inside.

The width of the body across the back seat is made somewhat narrow in order to avoid a deeply cut-in wheel arch, and thus to enable the rather large quarter lights to drop almost out of sight. These windows, and also those of the doors, are held in quite narrow metal frames, which, being sunk in the rims, are not visible. They are an easy fit in the rims, and lift over plates just as wood framed windows do. There are no lifting straps, but only finger lifters to each window, and as those in the rear quarters are somewhat heavy,

they are provided with springs underneath partly to balance the weight. To prevent rattle the top of each window is provided with spring and ball silencers, and there is also a sliding bolt by which the window can be held in any desired position while open.

The rear seat is by means of two screws adjustable as regards its fore and aft depth, and also in the angle of the back squab. The occasional seats are wood framed and designed to fold up compactly so as to stow away in two recesses under the front seats, where they can be hidden by removable polished and ornamented covering boards.

The rear corner cupboards, oval, japanned and let in flush, are fitted as companions, and contain the usual fittings, with clock and barometer respectively as the centre ornament of each door. All fittings are of silver and mother of pearl. All the windows are provided with sun screens consisting of thick gauge celluloid ground on one face working in narrow inner rims.

It will be seen that all details have been thoughtfully carried out, and we think the car will do credit to the country.

## The 35 h.p. Rotary Valve Itala.

IT is now nearly eighteen months since we first tried the rotary valve Itala, and a few days since we had the opportunity of again driving in one of the latest examples of that make.

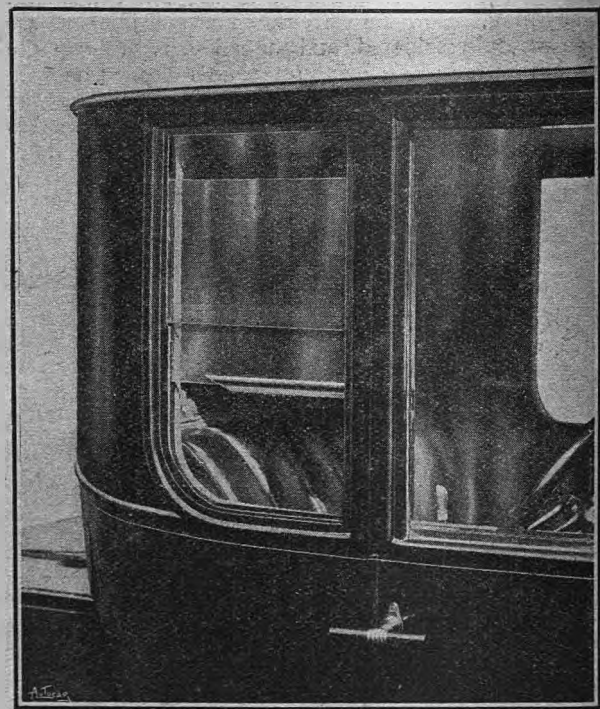
The four-cylinder engine of the 35 h.p. model remains at 105 mm. bore by 150 mm. stroke, and this provides an engine which stands midway between the small and the large types, giving many of the advantages of both.

What particularly struck us at the time we tried the first rotary valve Itala was even more noticeable on our second trip the other day. It seems possible with this system to give in one engine a combination of touring smoothness and silence with something very nearly akin to competition efficiency; in other words, while the engine is remarkably lively and powerful, it is also smooth and, of course, silent, though incidentally, this in the opinion of the Itala engineers is the least of all its virtues: they did not bring the engine out to secure silence but as a means of simplifying the valve gear (as they certainly have done), and also to provide a valve gear which once right would keep in good condition for much longer periods than a poppet valve. Their expectations have been so fully realised that they have not only introduced the smaller model, the 25 h.p., with rotary valves, but are also engaged on something very much larger.

When trying a car with a special engine one is inclined to concentrate one's attention wholly upon the motor, but it is well to mention that the bevel drive of the Itala back axle is as noiseless as any worm we have ever sat over. The brakes are above reproach, and the way the car holds the rough road at high speeds even when lightly loaded is remarkable, the more so as this particular car had 820 x 120 mm. tyres, the standard being 880 x 120 mm.

During the course of our trial trip Mr. H. R. Pope, the chairman of Itala Automobiles, Ltd., showed us the Itala repair works at Brooklands. As many of our readers know, this useful establishment is situated within the Brooklands grounds, but what many do not know is that it is very well appointed with modern machine tools operated by skilled workmen under the guidance of one of the most skilled

foremen from the Itala factory in Turin. At Brooklands a good stock of spare parts is kept, but the facilities are such that, should any part be required which is not in stock, it can easily be manufactured on the spot. Incidentally, the situation of the works has many advantages. Those in charge do not go about with their eyes closed; they pick up a good deal of very useful and practical information, and keep in touch with the very latest mechanical developments.



In view of the attention which is at present being paid by the authorities to the "inside driving" type of body, the above is interesting as showing a sliding window which enables the driver to put out his arm to signal to following traffic. It is fitted to a 10 h.p. Singer coupé, the property of Mr. Gray Hill, of Charlesworth Bodies, Ltd. Coventry.

## Correspondence.

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

Letters of a personal nature will be withheld.

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

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

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

### THE WORM GEAR CHALLENGE.

[19432].—We have noted Messrs. David Brown and Sons' communication to you under the title of "Worm Gear: A Challenge" [19386].

Messrs. David Brown and Sons have not hesitated to declare that certain gears which they manufacture are of higher efficiency than those which we manufacture, but they apparently are not prepared to substantiate their statement.

We would point out that we have been to great pains to build a special testing machine, and for our own information, and for the information of the public, we have had an exhaustive series of tests of the Lanchester worm gear which we manufacture. We have duly published the more important of these results in the form of the report of the National Physical Laboratory; Mr. Lanchester has also given wider and more detailed publicity in his paper read recently before the Institution of Automobile Engineers.

We have made no attack on Messrs. David Brown and Sons, and we have made no attack on the product of their factory; they, however, have elected to make the statement that their parallel type of worm gear is still more efficient than our published results, and that their worm gears are, they contend, better in divers other ways for the purposes of automobile propulsion. We do not ourselves believe that Messrs. David Brown and Sons' statements in this respect are correct. We are, moreover, quite sure that Messrs. David Brown and Sons themselves have made the statements as to efficiency *with no means at their disposal for ascertaining whether they are correct or not.*

As the thing recently stood, we were in the position of a man with an accurate balance arguing with a man who relied on a coal merchant's steel-yard. Mr. Lanchester clearly demonstrated the unreliability of the data on which Messrs. David Brown and Sons were relying in a previous letter to *The Autocar*.

We have since gone to the length of offering the use of our machine to Messrs. David Brown and Sons, or any other firm interested, and, as the only reply possible to Messrs. David Brown and Sons' assertions, we issued our challenge, and it is up to Messrs. David Brown and Sons to take or leave this challenge *as it stands.*

We should not mind, in a friendly contest of this kind, doing our best to adjust the details of the conditions to suit our competitors, but we maintain that we have already gone a considerable distance and cannot be fairly called upon to conduct the whole tests *de novo.*

We should like to add a few words on the subject of Messrs. David Brown and Sons' remarks in detail. Firstly, we would point out that the *question of efficiency has been the main object of our tests*; we can test, and have tested, worm gear to destruction without the use of our new testing machine. Our original adoption of the Lanchester gear was, in fact, based mainly on such a test made as a comparison between the Lanchester gear and worm gear of the ordinary parallel type; beyond this our own wide experience, and that of the Lanchester Company before us, tell us that the durability of the Lanchester gear is not under question.

The apparent discrepancy referred to by Messrs. David Brown and Sons on the question of temperature is easily explained. The worm gear box was maintained approximately at a given temperature artificially, the temperatures selected being those encountered in a gear box under ordinary conditions in motor car usage; in some cases, however, tests at very much higher temperatures were intentionally employed.

With regard to Messrs. David Brown and Sons' remarks as to testing to destruction, any other suggestion of a reasonable basis of test would have our careful consideration. Many of Messrs. David Brown and Sons' remarks and criticisms are founded on a printer's error. In the terms of our challenge as published, the torque should not have been 100, but 1,000 lb. ft. In our original destruction tests (on the results of which we adopted the Lanchester gear), the parallel worm was softened and showed the usual blue temper

discolouration at loads which the Lanchester gear withstood without injury.

We do not understand the concluding paragraph of Messrs. David Brown and Sons' letter. Their suggestion appears to be that we are to cut some special Lanchester gear to their proportions or standards and they will cut parallel gear to the Lanchester proportions or standards. We cannot conceive what can be the intention of this paragraph, unless it is to put unnecessary difficulties in the way of the tests being made. The broad question under discussion is whether for given centres (which in the motor car is the limiting factor) the parallel type of gear as made by Messrs. David Brown and Sons is better or worse, or is more efficient or less efficient, than the Lanchester gear as made by ourselves.

Our testing machine has now been offered and definitely accepted by the National Physical Laboratory, and consequently any question as to the authority who should certify the proposed test is no longer open to discussion.

In conclusion, we should like to say that we think that Messrs. David Brown and Sons should take the first opportunity of justifying the claims they have made on behalf of their gear. We have previously offered to allow them the use of our testing machine, now the property of the National Physical Laboratory; if we can incidentally be of any other service to them, it would be a great pleasure to us to witness their gears being tested under the same rigorous conditions as those to which we have submitted the product of our own factory.

THE DAIMLER CO., LTD.

Percy Martin, Managing Director.

### ADVERTISING.

[19433].—Referring to the letter [No. 19422] signed by a Mr. Yarworth Jones, I do wish the people who advertise under the name of the Victor Tyre Company, Ltd., would take his advice and let us know what they are advertising about. Their advertisements lately have, so far as one can judge, been principally concerned about the illness and death of a person labelled "R.A.C.": are they doctors or undertakers or what? Their very latest picture depicts a race apparently at Brooklands, though it is headed "Another Grand National," but I don't see any jumps. What does it all mean? If these advertisements are intended in some subtle fashion to advertise a motor car tyre, why don't they tell us the price of the tyres and where they can be obtained out of London, and if they are made in Great Britain? Some of us like to support home industries. PUZZLED.

### ROAD CONSTRUCTION.

[19434].—With reference to letter No. 19394, I beg to inform Mr. C. M. Nainby that it is not the road locomotive that damages the roads as he suggests, and his remarks as to reducing the weight of the engine would not help the roads one item. The light engine is inclined to slip and damage the road much more than a heavy road locomotive. For instance, a motor waggon has three times the weight on its wheels in proportion to a road locomotive, causing much greater strain. Where the motor waggon rolls along the road it leaves an impression. The roads are made for traffic, and not traffic for the roads. When we get the whole of the main roads built to a proper standard, it will be to the advantage of all concerned. NORMAN E. BOX.

### THE RULES OF THE ROAD AND FOOTPATH.

[19435].—The Scottish A.C. has issued to all the School Boards in Scotland some "Rules and Recommendations for the Use of the Road." This is a good step in the right direction, but it is a great pity that the recommendations to pedestrians should have been set out as they are.

Under the caption "Pedestrians" it is set out: (a.) Foot passengers reverse the rule of the road applicable to vehicles, *whether on the footpath or* (the italics are mine) on the main road—that is, they keep to the right. It will consequently be

*Correspondence.*

seen that on the roadway where there is no footpath they face approaching traffic. The advantage and greater safety of this course is evidenced by the fact that railway servants walking on the line are ordered to adopt the same course."

If, instead of the words "whether on the footpath or" the word "when" had been inserted it would have intelligently covered all country roads and highways where there are no footpaths or sidewalks. Then, if the recommendation had been added to as follows: "When walking on the footpath keep to the left when passing other pedestrians, thereby ensuring that the foot passenger nearest the kerb shall be facing the oncoming vehicular traffic in the roadway or street," it would have intelligently covered all large towns and cities. If the latter part of the recommendation were adhered to the recommendation (1) could be deleted. It reads as follows:

(1.) "Foot passengers should not step off the pavement suddenly, and unless to cross the street—a swift or silent cycle, motor car, or other vehicle, might be coming up behind." I would like to draw your attention, sir, specially to the "coming up behind." The way to avoid that is for all pedestrians, when walking on the sidewalks, to

KEEP TO THE LEFT.

[19436.]—The rule to keep to the left, except when overtaking, says nothing about traffic at crossings. The rules formulated for such cases at sea may be interesting as guides, and I give them as far as they can reasonably apply. I have substituted *vehicle*, *near*, and *off* for *vessel* or *steam vessel*, *starboard*, and *port*, allowing for the reversal of the sea rule on land:

ART. 18.—When two *vehicles* are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to her *near side*, so that each may pass on the *off* side of the other.

ART. 19.—When two *vehicles* are crossing, so as to involve risk of collision, the *vehicle* which has the other on her own *near* side shall keep out of the way of the other.

ART. 21.—When by any of these rules one of two *vehicles* is to keep out of the way, the other shall keep her course and speed.

ART. 22.—Every *vehicle* which is directed by these rules to keep out of the way of another *vehicle* shall, if the circumstances of the case admit, avoid crossing ahead of the other.

ART. 24.—Notwithstanding anything contained in these rules, every *vehicle* overtaking any other shall keep out of the way of the overtaken *vehicle*.

ART. 25.—Every *vehicle* shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the *near* side of such *vehicle*.

The sea rules are based on reasons that apply just as well on land, as an example will show:

A and B are travelling on intersecting roads, each keeping the proper side of his own road. A is going north, B east, and they are approaching the crossing so as to involve risk of collision unless one of them alters his course or his speed. It is obvious that A can avoid a collision in three ways if B keeps course and speed. He can turn west, he can turn east, he can slow down. But if A keeps course and speed, B has only one way of avoiding a collision, and that is by slowing down. It is proper that A, with three times B's resources, should keep out of the way, and the rule tells him to do so.

In effect, the rule, if adopted on land, is equivalent to painting on the *off* side of every vehicle a warning to all other vehicles to keep clear, just as a ship's red port light is a warning to all other ships. Each driver has to save his *NEAR* side by careful steering.

If by the adoption of the rule drivers could count on a little more respect being paid to their *off* side by other vehicles, they would be free to give a little more attention to saving their own *near* side from collision with anything, for example, vehicles coming out of roads on their left or foot passengers stepping into the roadway. It might even be found better for the driver to sit on the *near* side.

D. BRADY.

## FLEXIBLE PROPELLER-SHAFTS.

[19437.]—With regard to the paragraph entitled "Flexible Propeller-shafts," which appeared in *The Autocar* of the 5th inst. (page 586), I would like to make the following suggestions:

Why have the shaft flexible for its whole length? Why not have a spring connection at each end, composed of two helical springs, wound in opposite directions, and placed concentrically (the inner one taking the forward drive and the outer the reverse)? I think this construction should

eliminate the unbalanced forces, or "skipping-rope" action, which you commented on, inseparably from a shaft flexible for its entire length, more especially if it were enclosed in a torque tube. A similar joint might be employed between clutch and gear box

Perhaps some of your readers would give their opinions.  
R. Y. GALLOWAY.

## DRIVING HINTS.

[19438.]—May I suggest publication of the following road hints. Doubtless there are many similar ones that might be added, but if any of your readers think of these on any drive they take they will find most of them infringed by some driver or other:

1. (a) Before turning to the right hold out right arm and hand horizontally to the right.
- (b) Before turning to the left hold out the right arm and hand horizontally to the right, but with a forward sweeping action of the forearm and wrist.
- (c) When you are going to stop hold up the right forearm and hand vertically, the upper arm being horizontal.
- (d) On slowing down hold out the right arm and hand horizontally to the right, but with a backward patting motion of the hand from the wrist. If properly and clearly done there is no likelihood of this being mistaken for (b).
2. Get in the general habit of keeping to the left centre of the road.
3. When about to overtake always sound a warning and see all is clear of oncoming traffic. Never attempt to force your way through to the detriment of anything meeting you. Never overtake on sharp curves or where you cannot see well ahead.
4. After overtaking get well ahead before you incline again to the left; many drivers cut over too soon, forgetting that often the overtaken vehicle is travelling almost as fast as they are.
5. When an overtaking car sounds to warn that it wishes to pass, should there be obstacles ahead that prevent your then giving it room, keep well out and make the slow down sign (d); if all clear keep well to your left and make the sign (b), thus in either case showing that you hear it.
6. Approach main roads slowly with good control, sharp look out, and sound, keeping to your proper side and not cutting corners. Main road traffic has the right of way. This also applies to exits from drives.
7. If you have to stop on the road draw in to the side as much as possible, and, before stopping, consider what spot is likely to be the least inconvenient to other traffic.
8. When turning on the road do not hold up other traffic but remain stationary while it passes.
9. If backing for any distance do so on that side of the road proper to the direction in which you are travelling backwards.
10. Endeavour to avoid puddles from which your wheels will splash passers-by.
11. Slow down a little for all villages, and do not sound in them more than is necessary. It is not usually advisable to overtake vehicles in villages.
12. Do not crowd cyclists on to the edges of the road; these are often greasy and may cause them to slip, and remember when they are riding in masses that it is dangerous to throw them into confusion.
13. Pay attention to road signs, even though many are unnecessary.
14. When on the road behave invariably with the greatest consideration to all other road users; do not expect too many to behave in the same way to you.

M.H.E.

## LIGHTING OF VEHICLES.

[19439.]—Why one universal law for England, Scotland, and Ireland has not long ago been passed is more than strange. If all wheeled conveyances, passenger or otherwise, on the road after dark, if self, animal, or otherwise propelled, had two lights back and front, the former showing a red and the latter white lights, and each on the extreme outside edge of the vehicle to which it was attached, many accidents would be avoided, and such glaring lights as are now used on motors would no longer be necessary. The dazzling lights now often on the front of a car are without doubt most confusing, and anything tending to dispense with their use would be a blessing, and nothing could conduce more towards this than if all other vehicles were properly lighted both fore and aft. The practice of carrying only one light is most dangerous, as the following incident shows.

I was motoring in the neighbourhood of Maryborough (Queen's County) slowly, taking a curve, when I came upon what seemed to be one vehicle with two lights, but it was afterwards found to be two carts with one light each. The man in charge of one of the carts drew over to his left; the driver of the other horse was on the wrong side of the road but practically in a line with the other cart, the space between the two lights being not more than was quite possible for both to be on one cart, as they were on the reverse sides, i.e., carter No. 1 had his light on the near-side and carter No. 2 on the off. The night was very dark and foggy. I came quite close, intending to pass on my right side of the road, when the head of one of the horses came into view; if such had not been the case, I should have come "end on" to the cart that was on its wrong side. As a matter of fact the centre of the road was clear, and thus we passed with a cart on each side of us. In case of an accident and the result is argued in a court of law, one of the first questions asked is whether all parties were on their proper sides of the road.

Now it is much easier for a driver to keep to the left (although many drivers quite unnecessarily will ride in the centre) and so save having to make way for approaching traffic, and at night safer, if but for one thing, namely, unlighted vehicles travelling in the same direction, but as things are at present it is almost dangerous to adopt such a course, and for one's own protection, the offside of the road has to be taken; particularly, is this so, or there are, of course, fewer unlighted vehicles fore than aft, and, though it may not be generally known, an approaching noise is more readily heard than a retreating one.

Directly after passing the carts, I overtook a donkey and cart with a woman driving, holding a lantern, on each side of which the cart occupied some two feet of the road, and from the rear not a glimmer of the light was to be seen

EDWARD T. HUMPHRIES.

#### ELECTRIC LIGHTING TESTS.

[19440].—The proposals *re* head light tests are timely and of importance to all motorists. For the last six months I have been experimenting with head lights procured from the Cyanide Plant Supply Co., and have found no difficulty whatever in discovering a tree across the road at a distance of 400 yards, and a milestone, direction post, or concealed turning sign at 300 yards. Night driving is thus a pleasure. On the other hand, members of the public, including an athlete running at night "picked up" at a distance of 300 yards, have assured me that my lights caused no dazzle nor the slightest inconvenience. This is probably due to the system whereby the near light has merely a general illuminating effect on the road and the sidewalks, whereas the off light, immediately in front of the steering wheel, is furnished with an entirely different type of bulb, which projects a thin pencil of light through the general illumination straight ahead into the distance. Anything in the track of the car is thus illumined for many seconds prior to its coming into focus of the generally diffused rays of the near lamp.

At the distance at which it is first picked up, and, whilst the car occupant never loses sight of it, the object picked up, keeping to its own side of the road, passes out of the direction of the brilliant pencil of light long before its rays could cause inconvenience.

I should add that the total consumption, including rear light, is under  $3\frac{1}{2}$  amps. at 12 volts. I have seen many electric installations with faulty bulbs, and unfocused bulbs, and inefficient current, which are the cause of much worry, if not disaster, to users. With my present installation I have no worry or trouble whatever, and driving at night at the same pace as by day is undiluted joy.

SATISFIED.

[19441].—I am pleased these tests are making headway, and had hoped to see my jet lamp, the Diva, competing. I am sorry to see (according to letter 19392, rule 4, viz., "Not less than two head lights") it is debarred from competing. Although it has only one electric bulb, it throws forward five beams of light, which, I suppose, make it difficult to class. I hope the rule will be flexible enough to allow it to compete. It will be a great pity and an injustice to the makers if not allowed to enter tests, as I feel sure it would come out top dog. The usual disclaimer.

N 3921.

#### ROAD DANGERS.

[19442].—I would like to point out the absolute necessity of early attention to the special perils of many country roads, owing to the fact that they are without any

side footpaths whatever, while others have footpaths on alternate sides, that is to say, for a short distance on one side and then at short intervals crossing to the opposite side. A friend of mine, who motors very considerably after dark, tells me that, although he is a very careful man, he has had more near shaves of running down foot passengers by reason of this alternation than from any other cause whatever. Of course other motorists, who are neither careful nor considerate, may argue that pedestrians should look out, listen, and cross carefully. Quite so. Of course every foot passenger on a country road after dark should listen and look out, but they don't. A woman with a perambulator, or even with a walking child, runs some risk, as she goes blinking along, feeling her way rather than seeing where the right place is to cross from one side of the road to the other.

HENRY HARRIS.

#### MIRRORS AT DANGEROUS CORNERS.

[19443].—Some time ago I noticed a picture and an account of a looking-glass erected at a cross road to enable motorists coming from one road to see the other road reflected, and, at the same time, any vehicles coming along it. I think it was in Kent or Surrey, but am not sure. I shall be glad of any account of it as to its efficiency in the first place, and secondly, as to cost, size, etc.

A.G.B.

[An illustration of a similar mirror was published in our issue of March 29th (page 572).—Ed.]

#### MISCHIEVOUS BOYS.

[19444].—A very common practice among boys generally on seeing a car standing unattended is to write all over the panels with their fingers, doing considerable damage, especially to the more expensive ones. It has lately become intolerable. The mischievous urchins write on the back panels, particularly where they are out of sight of the driver, and are very difficult to catch red handed. What redress is there, and what is the proper way to proceed? Should the police prosecute, or private individuals? I think the police should. Will someone enlighten me?

CHAUFFEUR.

#### AMERICAN PETROL PRICES.

[19445].—I notice in the letter [19415] which you publish over my signature you have either made a clerical error or else I have done so. The figure by which American prices of petrol should be multiplied is  $\frac{7}{8}$ , and not  $\frac{3}{4}$  as stated.

PERCY C. C. ISHERWOOD.

#### PASSING TRAMCARS.

[19446].—My attention has been arrested several times of late by comments drawing attention to the fact that the correct side on which to pass a tram car is the "near" side. Some few years ago a case was fought by the Bradford Automobile Club, in conjunction with the R.A.C., and taken to the High Court. The decision was to the effect that trams were to be passed on the "off" side. The case was known as *Burton v. Nicholson*. I believe. Recently I was stopped by a constable in Leicester for passing on the "off" side. Surely this is a matter which should be settled one way or the other.

SYDNEY S. DIXON.

[The strict observance of the rule imposed upon motorists by the Use and Construction Order, 1904, Article IV. (3) and (4), made under the Motor Car Act of 1903, which required them to meet all vehicles, including tram cars, on the left and to pass on the right, has been cancelled by the Local Government Board on account of its impracticability in many instances, where trams were concerned. This alteration was made as the result of a decision given in the High Court on January 12th, 1909. The Local Government Board rescinded the clauses of the Order referred to so as to leave it open to motorists to use their own discretion in order to avoid risk of danger when meeting or passing trams.—Ed.]

#### RECOMMENDED REPAIRERS.

[19447].—The knowledge of where to find a garage where skilled labour is employed, which is moderate in its charges, business-like and courteous in its attention, is, unfortunately, all too rare, and I feel pleasure in bringing such an one to the notice of your readers. Whilst driving through a village on my way home from Bourhemouth the back axle of my car suddenly began to give forth ominous grating sounds. I left my passengers and drove slowly into Winchester (five miles distant), where I fortunately came across the George Garage, Jewry Street. The trouble (a broken ball and three damaged teeth on bevel) was soon located. A car was placed

## Correspondence.

at my disposal to fetch my passengers. The next morning a telephone message was sent to the makers at Coventry, and the bevel and broken ball were despatched per post to them. The new parts were received from Coventry by return post. The cost of dismantling back axle, cardan-shaft, torque stays, taking off hubs, thorough washing and cleansing and erecting back axle, fitting new bevel pinion and thirty-eight new steel balls, testing car, etc., was £1 5s., the most reasonable charge I have received during ten years of motoring. Usual disclaimer.

DOUGLAS STUART.

## STEAM CAR DESIGN.

[19448.]—Your very interesting description of the Pearson-Cox car (pages 560-5, *The Autocar*, March 29th) again raises the question of the superiority of the petrol car. It is a pity that (now the White company have dropped the manufacture of steam cars) the Pearson-Cox people do not incorporate in their car the best features of the White car. The White boiler and burner and the Pearson-Cox engine would make an ideal car, only perhaps to be improved upon by making the engine of 90° V-type, but still adhering to the Pearson-Cox valve arrangement. The White car consumes far less water than the Pearson-Cox, and it is not unusual on fair undulating main roads to run forty miles per gallon of water and fourteen to fifteen miles per gallon of paraffin.

ENGINEER.

## TRAPS IN ESSEX.

[19449.]—For the last two years I have taken my licences out in Essex, in which county I am a householder, instead of in London, as a protest against the trapping of motorists in the Metropolis. Hitherto I have found the Essex roads fairly free, but I regret to inform you Witham is now trying to equal Godalming in its palmy days.

Recently the ten-mile speed limit has been extended so as to include the whole town. On a recent Sunday my chauffeur was driving through at quite a reasonable pace—the police in their evidence could not even make it 20 m.p.h.—and he was caught in a furlong trap in the widest part of the High Street. Had the trap been where there is a real danger—down by the gas works—no reasonable motorist could object, but up at the Kelvedon end of Witham when there was not a soul in sight, to be fined £2 for doing under 20 m.p.h. is sheer extortion.

I have made it a custom to stop at Witham in the past, but will not spend another penny in that town until the police are more reasonable in their attitude, and I hope you will use your influence to induce motorists in general to follow this example.

Before taking out my licences next year, I shall consult your list of clean counties, and regret that Essex, in which I do most of my motoring, is not entitled to a place on the list.

E. A. SERRÉ.

## ROUTES TO IRELAND.

[19450.]—I think motorists who contemplate going to Ireland with their cars by Fishguard should know the following facts: In addition to the Great-Western boats from Fishguard to Rosslare and Waterford, there is a direct boat running to Cork on Tuesday, Thursday, and Saturday. I wrote to the Great-Western, both in London and to Fishguard, for information concerning this direct Cork boat, but had no reply from either office, the reason being (which I did not know) that the Cork boat belongs to a different company. At the same time, the G.W.R. might have had the civility to write and say so. Application to the Cork Steam Boat Co., at Cork or Fishguard, will receive prompt attention. If the motorist crosses by the Great Western boat, he is obliged to empty his petrol tank. The company's servant in my case used a pump to empty my tank that leaked so badly that at least one gallon of petrol out of five gallons went on to the quay. The rest was put into the usual petrol cans and stored on the company's premises at 3d. per tin per month and 1d. a week afterwards to be kept till the return, a voucher being given. Two sealed tins of Shell were carried; the company were willing to buy from me at 2s. 3d. a tin. I chose to have them stored instead.

RANZO.

## CHEAP MOTOR SPIRIT.

[19451.]—With reference to Mr. Lowcock's welcome letter [19387], it would be interesting to know if he finds the extra air inlet necessary with benzole. Must it be led off the exhaust pipe? I drive a Darracq of the same type, and as these cars are very popular it would be interesting to know where he fits the "extra air" and what form it takes. It seems to me that the small hole at the top of the inlet pipe, where it branches, would be a very suitable place. Does

he or any other reader know if it is possible to get 90's benzole in Scotland or near Edinburgh? I find that Strathclyde spirit can be used with little alteration.

NORMAN M. YOUNG.

## CAMPHOR IN PETROL.

[19452.]—I shall be glad if you will allow me to testify to the very beneficial results obtained through the use of camphor mixed with petrol. My car is a 10-12 h.p. Belsize fitted with Sthenos carburetter. The engine starts up quicker in the morning and, in less than a minute, accelerates sufficiently to drive, whereas before it took fully five minutes, sometimes more, as directly one attempted to open the throttle the engine choked and stopped. On hills the pulling power is very marked; one very long gradient which I used to take at 25 m.p.h. on top. I now do it at 30 m.p.h. The consumption of petrol is about the same.

ERNEST SMITH.

## IRREGULAR FIRING.

[19453.]—In reply to Mr. Williams [letter No. 19388], I had a similar trouble with my car, using petrol only, and eventually traced the trouble to pre-ignition on the sparking plugs. The plugs should not project beyond the threads of the hole into which they screw; if they do, the projecting threads become incandescent and give rise to the trouble described. After trying various plugs, I found the most suitable to be Mascot, and if Mr. Williams will fit these plugs, taking care that they do not project, as described, I think he will find an improvement in the running.

R. KIRKE, JUN.

## COMPOSITION-FILLED TYRES.

[19454.]—I have followed with considerable interest the correspondence in *The Autocar* dealing with "composition-filled tyres." In common with a good many others, I should be glad to adopt some process that would do away with the constant trouble of bursts and punctures in pneumatic tyres, but there is one point of importance which I have not yet seen referred to, namely, the strain to which the axles of the car are subjected when a more or less unyielding substance is employed instead of air.

F.B.

## CYLINDER CLEANING.

[19455.]—I was rather amused to note the surprise expressed by "Red Rock" [19397] that an engine should run 30,000 miles without removal of cylinders. His question, What would the owner think of a parent who boasted he had a child six years old and that child had never been cleaned or washed? is decidedly against his argument. Does not "Red Rock" know that some children need cleaning and washing much more frequently than others? Their natures are different. One child will, for instance, eat a piece of bread and jam and the deposit be hardly noticeable; another, doing the same thing will manage completely to disguise itself with jam. The same refers to petrol engines; they "feed" differently. I had an old 16-20 h.p. Chenard-Walcker car which had its cylinders off after nearly three years' running (41,000 miles), and then the cylinder heads and pistons showed only a very small amount of deposit, certainly not enough to cause pre-ignition (the engine was down for overhaul). Again, a little 7 h.p. two-cylinder Charron ran 17,000 odd miles before requiring a clean. A 1911 car I now have needs cleaning every 3,000 to 4,000 miles (and this with trough and scoop system lubrication and a multiple jet carburetter).

In conclusion, I consider it would have been much better if your correspondent had said, "My engine needs cleaning every 5,000 miles," etc., instead of making such a bold and sweeping statement.

WM. WHEELER.

## THE TRAINING OF AUTOMOBILE ENGINEERS.

[19456.]—Might I be permitted to ask Mr. Harry Woollen [letter No. 19429], or possibly another reader, if he could give me any idea of the cost of five years' training at "Les Arts des Métiers," inclusive of living expenses, or from whom I could obtain a prospectus. I am sure this would be of interest to other readers as well.

EUSTACE J. BEDFORD.

## PREMIUM PUPILS AND REPAIRS.

[19457.]—Permit me to draw attention to a practice now much in vogue which affects adversely the interests of a good many car owners, and others.

I allude to what is known as the "Premium Pupil System" in operation in most garages and repair shops throughout the kingdom. The car owner who has the welfare of his car at heart can have but a small idea

as to exactly what extent this system touches him, and I would advise him before garaging or leaving his car for repairs to enquire into the matter at any establishment he may have in view.

In a case recently within my knowledge trouble ensued between a car owner and the garage people over the fact of his car being rendered unfit for driving owing to its being driven (?) and "tinkered" with in his absence by pupils belonging to the firm storing the car. This firm boast a "works," as distinct from a garage, for the repair, etc., of clients' cars. These are in every way inadequate for the proper handling of cars, space being cramped and unweatherproofed, and machine tools (except for two or three, old, worn-out, and practically useless) non-existent. Now to the point. One man is employed to do the whole of the mechanical work, overhauling, etc., and "assisting" him are six "premium pupils"! The result, as may be imagined by those familiar with the difficulties of motor overhauling, etc., and having some idea of the less practical side of the modern pupil from 15 to 17 years of age, whose fond parents start him in life with a "premium," is chaos!

From the youths' point of view, it seems incredible that parents should not enquire more strictly into the management and make-up of the concern to which they part with a premium.

H. C. DART.

ENGLISH CARS IN THE GRAND PRIX.

[19458.]—I notice that as yet there are only four cars entered for the Grand Prix by English manufacturers. Does this mean lack of capital, or want of faith in their own products, or is not the expenditure justified by the results?

The cars entered, presumably, are Sunbeams, as representatives of English manufacture, against other countries' representatives. I am sure we all wish them the best of luck.

EUSTACE J. BEDFORD.

THE CROSS AT CARDINGTON, BEDFORDSHIRE.

[19459.]—Under the heading of "Week-end and Touring Notes" in *The Autocar* of April 5th (page 621), "R.G." suggests that an Eleanor cross exists at Cardington, Bedfordshire. This is quite erroneous. The cross is comparatively modern, and, as far as I know, has no historical interest whatsoever.

T. B. PORTER.

NOVELISTS' MOTOR TECHNICALITIES.

[19460.]—One of the criticisms of Mr. Rudyard Kipling's writings is that his technical details savour too much of the notebook, but even this would seem to be preferable to the average novelist's technicalities, of which the following quotation is a sample: "The chauffeur returned to the garage and set about adjusting a crank which was a shade more eccentric than had been intended." ("No Other Way," by Louis Tracey.)

C. A. BRANSTON.

MUSEUM HOURS.

[19461.]—Could something be done to induce those in authority to open museums, picture galleries, etc., before 10 a.m.? The usual hours 10 a.m. to 4 p.m. debar many motorists and travellers from inspecting the sights of the town they spend the night in. Surely during the summer months it should not be a difficult matter to have them open from 8 or 8.30 a.m. to 5 or 6 p.m.

JOHN L. KIRK.

COMMISSION ON EMPLOYMENT.

[19462.]—I can fully endorse the letter [19404] of your correspondent, "Unemployed," having held several situations in private service; the offering of money for an introduction is surely quite legitimate. I would, however, go more fully into the matter of the information obtainable by a chauffeur with regard to any contemplated situation, but particularly private service. Certainly, the actual advertisement is a poor guide and merely informs the applicant as to whether he is eligible to apply or not. Further, a first interview is often grossly misleading. One is cross-examined by some (apparently) benevolent old gentleman whose ambition appears to be to devote the remainder of his life to your interests; but there is another side to the picture, and (if you be married) when you have removed wife and children (if any) and furniture some sixty or one hundred miles you begin to arrive at the real state of affairs. To give two true instances of what I mean—In a berth in the North of England it transpired that whatever time the car came in at night or early morning, the whole car (wire wheels) had to be thoroughly washed down to the last spoke. Secondly—In a berth at a south coast watering place, in addition to the sole care of two "corks," an electric lift had to be examined

Correspondence.

at 7 a.m., every day, and the driver was held responsible for its correct working. These items were mentioned after the man was engaged. Surely some such system, as now used by the *Daily Mail* in advertisements for domestic servants, might be followed, otherwise there may be much vexation of spirit. For obvious reasons I should prefer my name and address to remain in obscurity.

H.S.

MOTOR TAXATION.

[19463.]—The present Government system of taxation (by bore and number of cylinders) is totally unfair and misguided. Cars should be taxed for the part they take in wearing out the roads. What does it matter to the Government if a car is 3 or 300 h.p. as long as it is not heavy on its tyres? The taxation basis should be founded on axle weight reckoned in tons and fractions of a ton. For instance, a General Motor 'bus (2 tons F.A.W. and 4 tons B.A.W.) should be taxed at £40, which is quite justifiable, considering the great part played in the destruction of roads by these clumsy vehicles.

TAXIMOBILE.

A DANGEROUS CORNER.

[19464.]—May I draw your attention to a very dangerous corner at Andover, where the Milway and Salisbury roads meet? The Milway Road, much used locally, joins the main Andover-Salisbury and Andover-Marlboro' Roads, and also leads to the junction station. Some little time back danger signals were put up on the Andover-Marlboro' Road, after several accidents, but, so far, none have been put at the other and much more dangerous corner. There is a bit of a hill down on the Salisbury Road, which is straight, and a stranger would hardly see the turning and think he had a clear run, while on the other hand, people turning from the Milway Road into the Salisbury Road, and going towards Salisbury, can see practically nothing owing to the high bank. A short time back I just escaped a serious accident at the corner I mention, and both my car and the other one were seriously damaged. I have heard that there have been other accidents there, but have no personal knowledge of them. The hedge has lately been cut a little, but the high bank blocks the view. I should be glad to show the corner in question.

EDWARD RICHARDS (Major).

SUMMARY OF CORRESPONDENCE.

A FORMALITY.—The Rom Tyre and Rubber Co. (1909), Ltd., 36, Brooke Street, Holborn, London, E.C., write to explain that the paragraph appearing in the *London Gazette* of March 21st of the winding up of the Rom Tyre and Rubber Co., Ltd., refers to the old parent company, and is simply a matter of form to comply with the Companies' Acts, all assets and liabilities being taken over by the Rom Tyre and Rubber Co. (1909), Ltd., when the capital was increased in November of that year.

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## Flashes.

The Automobile Club of Milan proposes to organise a race for three-litre cars, to be held on the Brescia circuit in September next.

\* \* \*

Although there may be others exhibiting through their agents, the name of only one British firm, Messrs Newton and Bennett, Ltd., appears in the list of 168 exhibits of cars and chassis at the International Motor Car Exhibition which opens in Turin on the 26th inst., and will continue until the 11th May. All the leading Italian firms are, of course, showing, while American, German, and French builders will be well represented.

\* \* \*

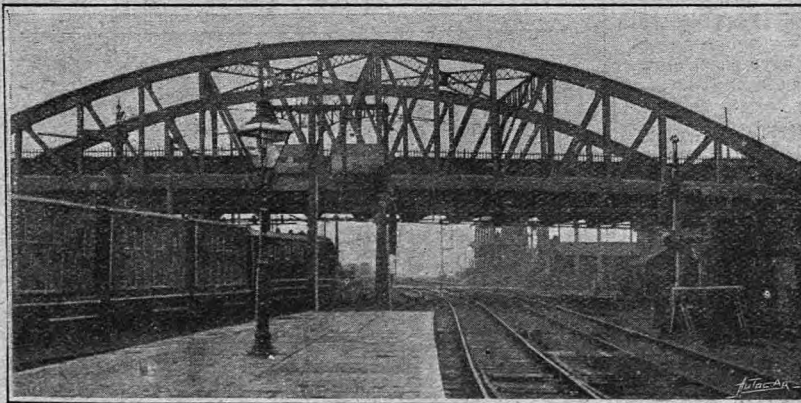
The Greek Government have ratified the Automobile Convention, and international travelling passes will be available for Greece from 1st May.

\* \* \*

A letter has been received from a member of the Scottish Automobile Club stating that last week-end he was able to pass over the Glencroe Road, using great caution. The whole of the débris deposited during the recent landslide had not yet been removed, but by deviating at one part on to an adjacent cart track, the road is now quite passable. A letter has also been received from the district county clerks advising the Club that it is possible for traffic to get through, but that motorists using the road must do so at their own risk.

\* \* \*

A 15-30 h.p. Argyll sleeve valve engine, after being tuned up for racing, has, we are informed, developed 54½ h.p. on the brake. It is believed that nothing like this power has been hitherto attained from a sleeve valve engine of 80 x 130 mm., and it is hoped that the Argyll engine, which has already figured on Brooklands, will soon make another appearance there.

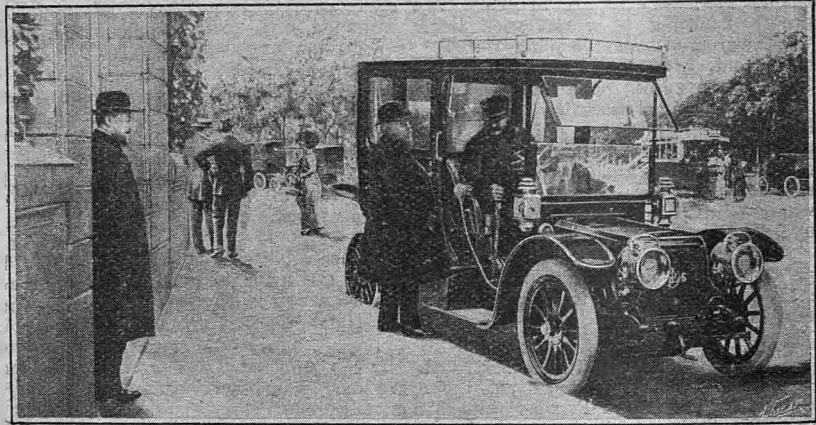


On page 954 of our issue of May 25th last year we dealt with projected road improvements at Peterborough, namely, the substitution of road bridges for level crossings over the G.N.R. and G.E.R. The first of these new bridges, the one over the Great Northern Railway is now practically ready for traffic, and it is to be hoped that the G.E.R. will follow the good example set by the other line, and go forward with their part of the scheme, for the level crossing on the London Road is a source of great delay and annoyance, not only to motorists but to all forms of road traffic. The new bridge over the G.N.R. is shown above.

It is expected that three Isotta-Fraschini cars will be entered for the Indianapolis 500 mile race.

\* \* \*

The Victoria Bridge, Queen's Ferry, Flint, will be closed from April 28th to the 2nd of May. The county surveyor of Flint has very courteously given good notice of this intention, and it may be well to



The President of the French Republic, M. Poincaré, entering a 25 h.p. Knight-Panhard. Although this particular car is not the property of M. Poincaré, it may be remembered that the President is a keen motorist.

mention to those who do not know the district well that Queen's Ferry bridge is the only road crossing the Dee below Chester, and the only road from Birkenhead direct into Wales. For the time being those desirous of passing into Wales from Birkenhead will have to go *via* Chester.

\* \* \*

On Wednesday, 9th inst., the Clément-Talbot Co. took the opportunity of a little lunch at the Imperial Restaurant, Regent Street, to present Mr. Percy Lambert with a suitably inscribed gold medal in commemoration of his great feat of driving the now historic 25 h.p. Talbot 103¾ miles in sixty minutes, being the first man and the first road machine to cover 100 miles in an hour. The gathering of motor journalists and friends was presided over by the chairman of the Clément-Talbot Co., the Right Hon. the Earl of Shrewsbury and Talbot.

\* \* \*

The attention of the R.A.C. has been drawn to the difficulties attending the embarking and disembarking of motor cars on and from the Great Central Railway Co.'s boats plying between Hull and New Holland. The R.A.C. has invited other bodies, including the A.A. and M.U., to assist in the endeavour to effect an improvement.

\* \* \*

Quite a new departure is announced from Wilmington, U.S.A. Under a Bill passed by the authorities of the State of Delaware, and which has already come into force, family motor car driving licences are now obtainable, at a cost of 32s. per annum. Hitherto each person, no matter how many were in a family, had to take out a separate licence at a cost of 25s. per year.



## 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. 2619.—Dolphin Two-stroke Car.

I have the Dolphin two-stroke car that was in the Olympia Show, 1909. I bought it in March, 1910, and have it in almost daily use. Have done over 30,000 miles, and it runs as well as ever; have driven it every mile myself. I should be pleased to know if any other Dolphin owner has had as many miles out of his car. Rather heavy on petrol, but exceedingly light on tyres (680 x 120 mm.)—FRED PIGOT.

#### No. 2628.—S.U. Carburettor on 12-16 h.p. Wolseley.

In reply to query No. 2628, I average 25 m.p.g., using an S.U. carburettor, on my 1912 12-16 h.p. Wolseley. The engine starts easily enough in the warm weather, but during the winter I find it necessary to stop the air aperture with a rag, which is immediately removed when the engine starts. This renders the starting of the engine quite easy. I am now having fitted a shutter, which can be operated from without the bonnet, by which the air aperture can be momentarily covered when starting.—N 3726.

#### No. 2622.—Mitchell Car.

My experience of these cars, dating from 1910, is that they are very reliable and run without much attention, and last well. I use my car about 5,000 miles per annum, and think, therefore, I must have run my Mitchell about 15,000 miles; it now runs as quietly and with as much power as when I purchased it, and I should think, by the perfect condition of the parts everywhere on the car, that it has a very long life before it. I add the usual disclaimer.—A.S.O.

#### No. 2629.—11.9 h.p. Humber.

I bought one of these cars (four-seater) last September, and it has since run over 4,000 miles without either a single involuntary stop or a hitch of any kind. I live in a hilly Welsh county, and have never had the slightest difficulty in negotiating any hill. Charging gear, either up or down, is as simple as possible, and gives no trouble whatever. Petrol consumption depends upon so many things, amongst others the nature of the country and the state of the roads. The other day I had a sixty-one miles run, and the consumption was two and a quarter gallons (measured), or, say, nearly 28 m.p.g. That the car is reliable I have already shown, and can only add that it is as comfortable as it is well finished, and I should think it is eminently suitable for a lady. I have had no carbonisation to deal with so far. Your enquirer says he would appreciate its weak points, but up to now I have not found any. I was a complete novice when I bought the car. Usual disclaimer.—HUMBER CAR No. D 659.

#### No. 2631.—Warland Dual Rims.

As an owner-driver I have pleasure in saying that for the past eighteen months I have had Warland Dual

rims fitted to my car, during which time I have covered some 17,840 miles on all sorts of roads, including some bad snow in the North last winter and floods in Devon in January of this year. Not once have I had any cause to complain of rust, although I never grease any part of the device. I have always found the space between the two flanges quite watertight. Once in particular I had occasion to remove the rim and tyre from my near back wheel, which had been untouched for some 3,000 miles; there was no sign of rust or suggestion of sticking, either of the rim on the wheel or the tyre on the rim.—NO MORE LEVERS.

#### No. 2634.—Insurance Policy Rebates.

"X" is wrong in thinking that the amount of his net premium will alter if the order in which the rebates are deducted is varied. The figures in his calculation were as follows:

Premium ...	£20	0	0
Deduct 25% ...	5	0	0
	£15	0	0
„ 15% ...	2	5	0
	£12	15	0
„ 15% ...	1	18	3
	£10	16	9

Varying the order of the rebates the result is the same:

Premium ...	£20	0	0
Deduct 15% ...	3	0	0
	£17	0	0
„ 15% ...	2	11	0
	£14	9	0
„ 25% ...	3	12	3
	£10	16	9

The following is the explanation: In "X's" calculation the premium after the first rebate is 75% of £20, or

$$£20 \times \frac{75}{100}$$

After deducting the second

$$\text{rebate the premium is } 85\% \text{ of the previous amount, or } £20 \times \frac{75}{100} \times \frac{85}{100}$$

The final premium is 85% of the last

$$\text{mentioned amount, or } £20 \times \frac{75}{100} \times \frac{85}{100}$$

In the second calculation the

$$\text{final figures would be } £20 \times \frac{85}{100} \times \frac{85}{100}$$

which, of course, gives the same

result.—W.S.W.

### STEAM CAR REPLY.

#### No. 2618.—Stanley Steam Car.

My experience of the Stanley car for four years confirms all the good points claimed for it, and it may be useful to add that four personal friends owning Stanleys have had the same experience as myself. Its behaviour upon the road may be summed up in the word "beautiful."

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Call and see the new 15.9 h.p. Germain chassis. The best value for money ever offered.

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Chassis price, £350.

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Immediate delivery of a new 20 h.p. GERMAIN, with Silent Knight engine, torpedo body, hood and screen, £500.

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- 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 Stearny wheel and tyre, all lamps, etc., GUARANTEED ..... **£325**
- 14-18 h.p. British Clement Chassis, 1911** model, with handsome four-seated landaulette body, in splendid condition, painted blue and upholstered in corduroy, C.A.V. Dynamo set, Dunlop detachable rims and spare tyres. Price **£335**
- 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**
- 18-28 h.p. British Clement Torpedo Touring Car,** painted dark red, fitted with Cape hood, windscreen, Sankey detachable steel wheels with two spares and tyres, full equipment of acetylene head lamps, etc. .... **£325**

For further particulars write:

**THE CLEMENT MOTOR CO., LTD.,**  
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## Some Queries and Replies (Continued).

So far as repairs are concerned, they are so seldom required that they are scarcely worth considering, for anyone who can handle a screwdriver or has access to any mechanic owning a lathe can generally manage any little job that may crop up. Replacements are easily and quickly obtainable from the Stanley Co.'s depots. The boiler is no trouble whatever. It is a good plan to have a piece of hose-pipe permanently led from the inside of the garage into a convenient drain, so that the blow-off steam discharges clear of the garage. It is a curious fact, which I will not attempt to explain scientifically, that a Stanley boiler never furs up. I have seen an old one cut up after six years' use, and it did not contain an eggcupful of sediment. The life of the boiler may safely be set down as three years minimum, though a friend is now running a Stanley with the boiler six years old, apparently as good as ever. My own experience is, after four years' running, boiler apparently as perfect as at first. Mileage does not count in reckoning the life of a boiler; in fact, I should say the more it is used the better it is for it. I am not a mechanic, yet I was able in a few days to probe and understand the "mysteries" of the steamer.—SWANGLIDE.

### QUERIES.

**No. 2643.—Carburettor for S.-K. Siddeley-Deasy.**

**CAN** any of your readers recommend from personal experience a carburettor suitable for an 1824 h.p. four-cylinder Knight engine Siddeley-Deasy (1912) car, which will give good results?—E.T.T.

**No. 2644.—12 h.p. Valveless Darracq.**

**MAY** I ask if any of your readers can give me particulars of the 12 h.p. Valveless Darracq, as to general running, silence, miles per gallon of petrol, hill-climbing powers, etc., and whether suitable for medical work?—A.E.W.

**No. 2645.—10 h.p. Four-cylinder Swift.**

**WILL** any user of a 10 h.p. four-cylinder Swift please give petrol consumption, speed, whether easy riding with standard 700x85 tyres. Are good lamps fitted, and is the seat wide enough to take three adults without being too uncomfortable?—KEBAR.

**No. 2646.—Portland Hills.**

**CAN** any of your readers tell me what the gradients are of two hills in the Isle of Portland? The first is in Chiswell, and joins an easier gradient on the left in the main street. The second is about a mile further on, and bends sharply to the right at the steepest part.—F.S.H.

**No. 2647.—The Lodge Lighting System.**

**I** SHALL be glad of the experience of any of your readers who may have Lodge's lighting system fitted to their cars, more particularly as regards the electric head lights, it being noted that the bulbs are in a position different from that of most of the other electric lighting systems.—A.B.M.

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

**I** WOULD very much appreciate the views of users of this or former models as to the general characteristics of the car, freedom from trouble, wearing qualities, ease of riding, stability of bodywork and chassis, and

silence of both. What mileage per gallon may be expected with intelligent driving, using standard Claudel? Have any other carburettors given better results? What is the experience of running on benzole?—LOND.

**No. 2649.—Tour in Scotland.**

**CAN** any reader suggest a route and principal places of interest for a week's run from Glasgow via the Trossachs, up the east coast of Scotland and back to Glasgow?—J.A.S.

**No. 2650.—Sthenos Carburettor on Rover.**

**IF** any of your readers have fitted a No. 3 Sthenos carburettor to an 8 h.p. Rover car, will they kindly say what were the sizes of the petrol feeder and pilot jet that gave the most satisfactory combination for easy starting? I have been able to get very satisfactory running with the carburettor, but difficulty in starting is a drawback.—W. WADDEN, Junr.

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

**I** HAVE run above about 1,300 miles, and am very pleased with it, but find the petrol consumption averages 20-21 m.p.g., and I believe this is too high. I have adjusted the carburettor by setting the ignition right back, opening throttle three to four notches, and turning needle valve until the engine gives best running. I have endeavoured, in driving, to keep the spark well advanced—as far as possible without engine knocking—but this has not assisted the consumption, and I should be much obliged if any reader who has passed through this difficulty will say what he thinks I ought to try with a view to improvement. I usually drive about 23-25 m.p.h., which averages 20-21 m.p.h. I have been told that an extra air valve is likely to help me, and if any reader has experience of fitting one on a Ford carburettor I shall be much obliged if he will advise me upon the fixing of it, and whether it reduces the consumption of petrol.—T.W.M.

**No. 2652.—Slipping Speed Lever.**

**WILL** any driver of a 1912 25 h.p. Daimler, who has had frequent trouble with fourth speed slipping into neutral, state his experiences and how the fault was remedied. In my car (although the speed lever is held by a peg in each position in the gate), the lever will sometimes remain in position for many miles, and then, during the next twenty miles, will slip out without any apparent reason. It does not seem to matter whether the roads are good, bad, up or downhill, this gear will disengage with most annoying frequency. I have also had the lower gear slip out when climbing steep hills. All the pinions are good as new. I wonder if the fault is constructional and peculiar to this particular type, as I have driven Daimlers of all powers for ten years, and never had this trouble.—DAIMLER GEAR BOX.

In reply to the above query, the Daimler Co. (to whom a proof was submitted) state they are unable to give any reason why the car in question should display the defect complained of, but they will be very pleased to examine the car if it is presented at one of their depots, and they are quite sure that some slight adjustment of the change-speed lever or one of the connecting links will effect a completely satisfactory repair. Possibly the querist will write to Daimler Co. at Coventry.

# Week-end and Touring Notes.

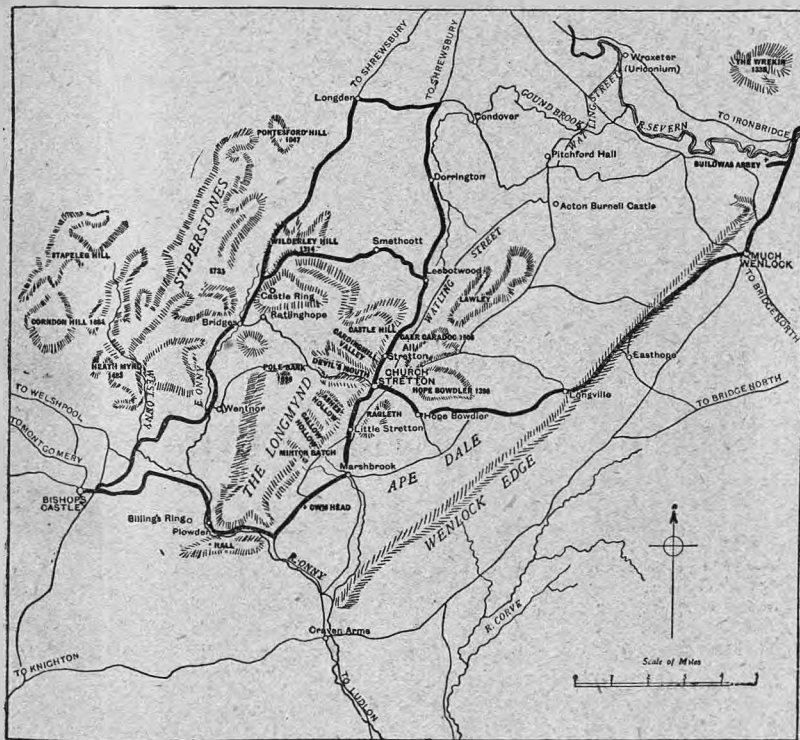
The Longmynd and Wenlock Edge. By John Lloyd Warden Page.

(Concluded from page 673.)

To Church Stretton I apologise. I have left it to the last, as I was in a hurry to get away from it, for we wretched people who take photographs have to follow the sun, and I am no Joshua to command the luminary to stand still. Well, Church Stretton is made up of old and new. The old consists of a street long and narrow, so under the hills that it can get very little sunshine between October and April; the new, of a wide and up-to-date—horrible expression—thoroughfare pointing to the railway station. And beyond is a Church Stretton still newer, an eruption of villas and lodging houses looking down with fine modern scorn on poor, old, ill-used Watling Street. Oh, for a charge of dynamite to blow the whole concern to smithereens! But alas! it will not restore the dear old hollow lane with its high hedges and wild flowers.

and there was talk of bringing in the waters from a saline spring at Wentnor on the other side of the Longmynd. Perhaps they have been brought by this time. But the main asset of the little town must always be its scenery. Few towns have such a range of hills at the back doors: few such a valley as the Carding Mill with its offshoot the Light Spout, so called from its waterfall: few so picturesque, or, indeed, so mountainous a golf course. I know I left it with regret.

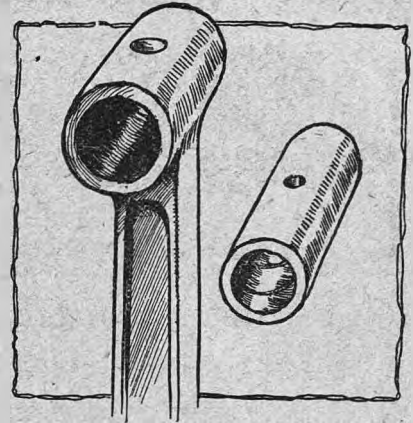
I passed up the long ascent between wooded Hazler and the rocky ridge of Hope Bowdler with the curious pyramidal rock of the Gasr rising right over the road, and dropped to Hope Bowdler hamlet and Ape Dale, a long valley shut in between Caer Caradoc, Lawley, and the range of Wenlock Edge. This is a delightful run. The road is of the best: the scenery green



Older Church Stretton possesses one or two ancient houses, and the church is worth a visit. It dates from Norman times, as may be seen by the doors of the nave and the western buttresses. The tower, which springs from the centre, is supported by fine Transition arches, and is mostly of the same period. "The larger Decorated windows," says Mr. Cobbold, "were probably inserted in 1619, the date carved high up on the west wall of the nave, at a time when imitation of Decorated work was a good deal in vogue in the district."

The place is purely residential, and a resort for those who like the quieter aspects of a country life. Church Stretton, it is true, aims some day at something more ambitious: it has started an aerated water manufactory,

meadow powdered with cowslips: here and there a half-timbered farm or cottage. Presently the Wrekin appeared, twelve miles away to the north, and I came to Longville (which is not long at all, but very short) at the very foot of the Edge. Up the side the road rose easily, and in a few minutes I found myself looking down upon the tree tops below, for this western side falls very steeply. Yet, compared with the Longmynd, the Edge is quite low, and Caradoc looked a very mountain. But it really is an edge, and at times there seemed only just room for the road which runs the whole distance along its summit. All the way it is wooded, but here and there comes a vista of undulating park land on the one hand, of Caradoc and his fellows on the other. Half-way, buried beneath the eastern slope, lies the



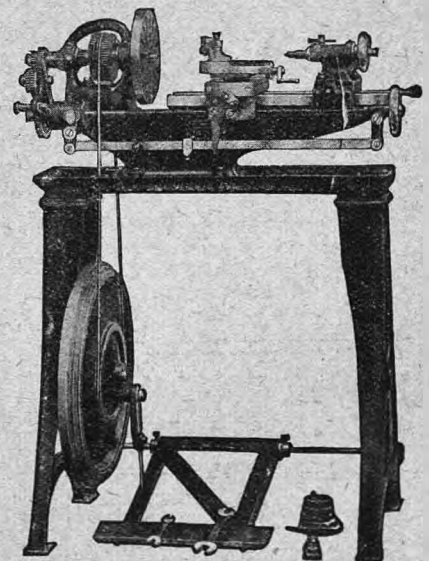
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- 1913 13.9 h.p. **B.S.A.**, 5-seater body, hood, screen, lamps, etc. . . . . **£325**
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## Week-end and Touring Notes (Continued).

pretty village of Easthope; then follows a long descent to Much Wenlock.

Much Wenlock is interesting. There is a grand old half-timbered Guildhall, a Norman church, and the ruins of an abbey, successor to a nunnery founded as long ago as the seventh century by Milburga, daughter of King Merwald

And the ancient sandstone walls moulder into beauty among the pleasantest surroundings. The present proprietress, a noted botanist, has made the place bright with flowers, and the enclosure with its lawns and paterres is a feast of colour. The Prior's House, the best preserved portion of the buildings, is her residence.

The abbey is open from 10 to 7, except on Sundays. Before and after these hours you can only gaze at it from afar. Never was ruin so protected by padlocked gate and barbed wire, and quite rightly so. For the average tripper has no respect for property.

I do not know that there is a great deal more to be seen at Much Wenlock; but you might, at any rate, stroll up Hospital Street, where there are two old houses bearing the dates 1682 and 1693, the Talbot Inn, once the dwelling of the Almoner, and the entrance gateway and a wing of Ashfield Hall, in later days the Blue Bridge Inn, where Charles of merry memory is said to have lain once upon a time, and where he doubtless chucked the serving wenches under the chin, as was his wont. And, as you leave the town by Shineton Street you might cast an eye at the Jail House, another half-timbered structure. The Parish Register says it was "reared over the prison house in 1577."



The Guildhall, Much Wenlock.

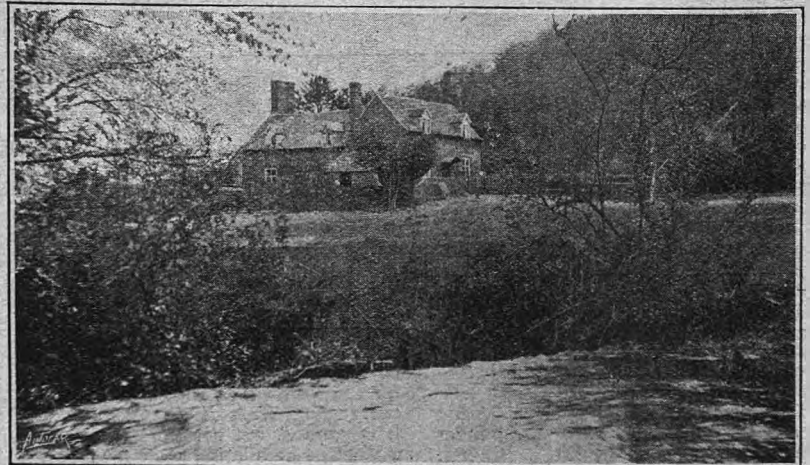
and granddaughter of more famous Penda, the heathen king who became a convert and actually, it is said, laid the foundation stone. Two hundred years later the building was restored by no less a person than Leofric, Earl of Mercia, by desire of his wife, the Lady Godiva, mother of Hereward the Wake—the princess who rode naked through the streets of Coventry and thereby bought exemption from an execrated tax. Ultimately the nunnery was demolished, and in 1060 the present building arose under the fostering care of Roger de Montgomery, Earl of Arundel. Here he planted a community of Cluniac monks, who remained in peace until the dissolution of the monasteries.

Fragmentary as are the remains of this once splendid abbey, they are not to be passed by on the other side.

A pretty run through a valley wooded and winding brought me to another abbey, that of Buildwas, which sits by the banks of the Severn. This—

Brotherhood of columns old,

A ruin rough and grey,  
is in far better preservation than the abbey at Much Wenlock. The outer walls of the church are almost entire, and impressive in their stern simplicity. For the building dates from 1135, the period of Late Norman and Early English, its founder was Roger de Clinton, once Bishop of Lichfield, and its inmates were Cistercians. These Cistercians got into trouble with Rostandus, the Pope's legate. They refused to be bled for the benefit of either His Holiness or His Majesty, and there was a royal row. The king—I think it was that ruffian John—summoned the recalcitrants to Reading, and, almost speechless with passion, thus addressed the abbot, "What is the meaning, Abbot, that you refuse to supply my necessities? Am I not your patron?" And the sturdy ecclesiastic replied, "I

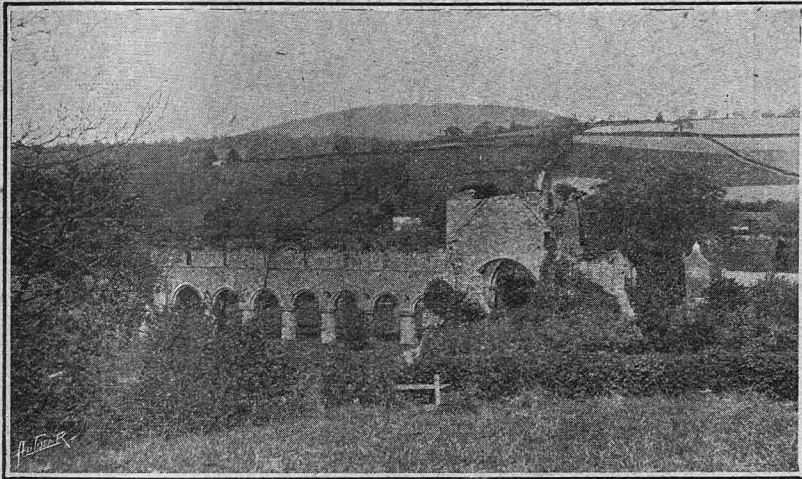


On the road to Buildwas.

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

would to God, sir, you were our patron, our father, and defender; but it does not become your Majesty to extort money from those who can only assist you with their prayers. Let the exemplary piety of the King of France be a precedent to your Majesty in this respect." This reference to his arch

At Buildwas Abbey my tour came practically to an end. I crossed the Severn, passing another fine old stone and timber mansion close to the bridge, and came in a mile or two to Iron-bridge, which, though in the loveliest of situations—for it is perched above the deep glen of the Severn with a



Buildwas Abbey and the Wrekin.

enemy Philip was too much for the royal drunkard. "I demand both your money and your prayers," he roared. "How is that consistent?" replied the Abbot, "for one of them you must be without." Which of them the king went without I do not remember—probably the prayers.

background of wood towering to the skyline—has been entirely ruined by man and his works. Apart from the surroundings, the place has but one feature—the lofty iron bridge of a single span (if I remember rightly), which may or may not give the town its name.

**Flashes** (Continued).

The N.S.U. Motor Co., Ltd., 186, Great Portland Street, London, W., inform us that the manufacturers of N.S.U. cars have been officially appointed automobile manufacturers to H.M. King of Roumania, who is placing orders for several cars.

Messrs. Blériot, Ltd., of 57-59, Long Acre, W.C., have recently fitted up a Blériot car of Prince Alexander of Battenberg, with the Blériot electric installation.

Messrs. G. H. Smith and Co. (London), Ltd., 14a, Great Marlborough Street, W., inform us that they have been appointed sole wholesale British representatives for the United Kingdom for the Hydra lighting accumulators and dry batteries. They have also opened a depot at 171, Spon Street, Coventry.

The Westminster Motor Car Garage, Ltd., sole concessionaires for Great Britain and Ireland for Turcat-Mery cars, inform us that they have removed to larger premises in Greycoat Street, about fifty yards from the Army and Navy Stores, Westminster.

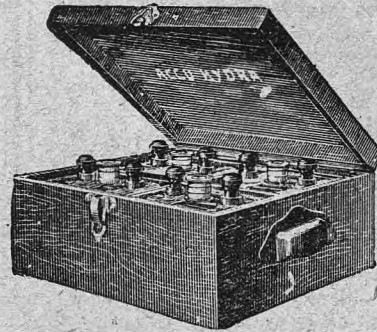
Napier Motors, Ltd., remind us, in connection with their claim as to the Napier being the "proved best car," that the Royal Automobile Club has awarded this particular make of car no less than twenty-three certificates, which is more than three times as many as have been awarded any other make of car.

The motor engineering business of Messrs. Wilfred Foulis, Ltd., Sunbury Mews, Belford Road, Edinburgh, who hold agencies for Blériot, Hetchkiss, Stoewer, and Dclage cars, is henceforth to be known as the "Belford Motor Co., Ltd.," the alteration of name having been decided upon at a recent meeting of shareholders.

The Warland Dual Rim Co., of Alma Street, Aston, Birmingham, inform us that they have had a film taken, mainly, of course, to demonstrate the advantages of rapid tyre changing by means of the Warland Dual rim system, but which, at the same time, incorporates an exciting motor bandit plot. The Warland Dual Rim Co. are willing to loan this film for either three or six days to any picture house desirous of borrowing it.

An amalgamation has been concluded between the Parsons Garage, Ltd., of Town Quay, Southampton, and the business of Mr. J. S. Kemball. The result of this amalgamation is that the garage and repair works of the Parsons Co. and the similar premises with lock-up motor houses of Mr. Kemball at the Broadway, Portswood, Southampton, and another depot at Woolston, Southampton, will be combined as one business under the style of "Parsons and Kemball, Ltd." The new company's car agencies include the Renault, Arrol-Johnston, Overland, etc.

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- 20 h.p. JUNIOR Torpedo... £125
- 12 h.p. DARRACQ Torpedo, as new... £175
- 20 h.p. STANOKD, six-cylinder 5-seater, brand new... £250
- 12 h.p. ROVER 1912 Torpedo... £290
- 15-9 h.p. STAR Torpedo... £160
- 12 h.p. DARRACQ, 4-seater, 1912, Torpedo, new... £285
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- 12-16 h.p. SUNBEA 4, late 1911, Torpedo... £295

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- 10-12 h.p. BELSIZE, 1912, as new... £195
- 10 h.p. DARRACQ, Sports type, soiled... £180
- 12-14 h.p. METALLURGIQUE, 1910 model, Torpedo... £210

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

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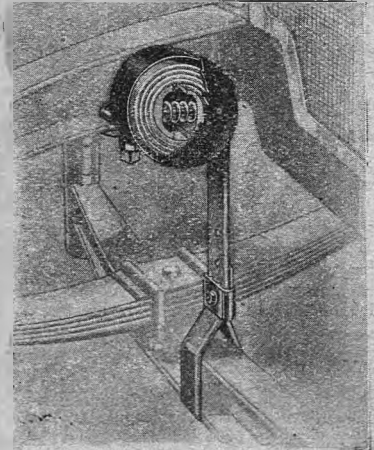
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## "The Autocar" Share List.

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

Issued Capital.	Amt. of Share	NAME OF COMPANY.	Present Prices.	Last Year.		This Year.		Last Div.	Div. Payable	
				Highest	Lowest	Highest	Lowest			
£2,520	1/-	Abingdon-Ecco, Ltd. ....	3/- 4/-	3/-	2/3	3/6	3/-	% Nil	Nov.	
45,000	£5	Alldays & Onions (£3 paid)	3 1/2 bid	4 1/2	3 1/2	3 1/2	3 1/2	1/6	Ap/Dc	
50,000	£5	" " 6% Cum. Pref.	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	2/6	Ap/Dc	
209,802	10/-	Argylls, Ltd. ....	5/6 5/9	6/-	4/-	6/-	4/9	2/6	Dec.	
150,000	£1	Belsize Motors, Ltd. ....	26/- 26/9	28/1 1/2	25/-	27/6	26/-	12	My/Nv	
100,000	£1	" " Cum. Pref.	20/3	20/3	20/3	20/3	20/3	6	Fb/Au	
44,771	£1	Bowden Brake, Ltd. ....	5/-	5/-	3/1 1/2	5/-	3/-	1/-	Dec.	
766,982	£1	Birmingham Sm'l Arms, Ld.	47/6 48/-	53/3	46 3/4	50/-	47/9	20	Mr/Sp	
203,150	£5	" " Cum. Pref.	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp	
73,000	£1	Brampton Bros. Cum. Pref.	4	4	3 1/2	4	3 1/2	6	Oct.	
100,000	£1	Brooks, J. B., & Co., Ltd.	36/- 36/6	37/6	31/-	36/6	35/-	15	My/Nv	
100,000	£1	" " Cum. Pref.	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	My/Nv	
100,000	£1	Brown Bros. Cum. Pref. ...	4 1/2	5	4 1/2	4 1/2	4 1/2	6	Ap/Oc	
380,000	£1	Charron Par. Pref. Ord. ...	11/1 1/2	11/4 1/2	11/6	8/-	11/4 1/2	7/9	7	Ju/Dc
200,000	£1	Clement-Gladiator Cum. Pref.	3/6	4/-	3/-	1/6	6/-	2/1 1/2	Nil	Dec.
100,000	£1	" " 6% Cum. Pref.	14/-	16/-	14/9	10/4 1/2	15/-	12/6	6	Ju/Dc
55,000	£1	Components, Ltd. ....	6/9	7/3	6/9	4/-	7/9	6/1 1/2	Nil	Dec.
25,347	£1	" " 7% Cum. Pref.	13/-	bid	15/-	11/4 1/2	13/-	12/-	7	Dec.
275,000	£1	Darracq, A. & Co., Ltd. ....	13/-	13/3	18/4 1/2	8/9	15/-	9/9	Nil	Ju/Dc
375,000	£1	" " 7% Cum. Pref. Ord.	14/9	15/-	19/1 1/2	11/10 1/2	16/-	13/-	7	Ap/Oc
159,239	£1	De Dion-Bouton, 7% Ord.	8/-	8/6	11/3	8/9	8/9	7/6	6	Dec.
2,000,000	£1	Dunlop Rubber ....	36/- 37/-	56/9	27/6	39/6	35/6	12 1/2	Ap/Oc	
312,785	£1	" " Cum. Pref.	18/6	19/4 1/2	21/-	17/-	20/-	18/6	6	MJSD
624,995	£1	" " Income Stock	17/-	bid	19/-	15/6	19/-	17/6	5	Ju/Dc
994,990	£1	Dunlop Parent Co. 8% Ord.	15/3	16/-	18/7 1/2	10/-	18/-	13/9	10	Ju/Dc
499,962	£1	" " 5% Cum. Pref.	13/-	13/6	16/9	10/6	15 1/2	12/7 1/2	5	Ju/Dc
99,977	£1	" " Deferred ....	9/9	10/3	15/-	6/3	10/1 1/2	8/-	Nil	Ju/Dc
24,985	£1	Enfield Cycle ....	21/-	21/6	19/9	13/9	21/9	18/-	5	Oct.
292,904	£1	" " Cum. Pref.	20/6	21/6	21/3	20/6	23/-	21/-	7	Fb/Oc
831,495	£1	Humber, Ltd. (New) ....	12/-	12/3	7/6	3/7 1/2	14/-	6/9	Nil	Nov.
50,000	£1	" " 6% Cum. Pref.	16/7 1/2	16/10 1/2	11/-	6/9	17/9	10/1 1/2	Nil	Nov.
100,000	£5	James Cycle ....	14/-	15/-	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	£5	Lucas, Joseph, Ltd. ....	9 1/2	10	9 1/2	9	9 1/2	9 1/2	15	Ap/Nv
73,885	£1	" " Cum. Pref.	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp
18,033	£1	New Hudson Cycle Co. ....	25/3	25/6	24/6	14/6	28/-	24/6	10	Nov.
50,000	£1	" " Cum. Pref.	18/6	19/6	20/-	18/-	19/6	19/6	6	Mr/Nv
125,000	10/-	Premier Cycle ....	5/1 1/2	5/3	5/-	3/-	5/6	4/1 1/2	15	Sept.
31,000	£1	" " Cum. Pref.	8/3	8/6	8/9	6/9	8/3	7/3	7 1/2	Sept.
200,000	£1	Riley (Coventry), Ltd. ....	6/6	7/-	8/9	5/3	7/4 1/2	5/3	Nil	Feb.
138,662	£1	Rolls-Royce ....	44/9	44/9	47/3	36/3	48/6	44/6	30	Jan/Ju
100,000	£1	Rover ....	39/6	39/10 1/2	31/3	12/6	40/-	30/9	10	Nov.
100,000	£1	Rudge-Whitworth, Ltd. ....	24/-	24/6	24/-	15/-	25/3	22/6	5	Oct.
100,000	£5	" " 6% Cum. Pref.	3 1/2	4 1/2	5 1/2	3 1/2	4	3 1/2	12	Oct.
41,621	6/-	Siddelev-Deasy ....	10/6	11/6	10/6	6/-	10/9	8/10 1/2	8 1/2	Dec.
50,007	£1	Singer & Co., Ltd. ....	17/6	19/-	19/6	6/6	19/1 1/2	16/-	Nil	Oct.
70,000	£1	Star Engineering, Ltd. ....	14/-	bid	18/6	10/6	17/-	13/6	5	Mar.
69,157	£1	" " Cum. Pref.	18/-	18/-	18/-	15/4 1/2	17/6	17/-	7	Mar.
87,550	£1	Stepney Wheel ....	29/6	30/6	35/-	30/-	32/6	31/-	20	Mr/Oc
120,000	£1	Sunbeam Motor Car ....	55/-	56/-	59/-	37/6	56/6	52/-	25	Nov.
30,000	£1	" " 6% Cum. Pref.	21/6	22/6	23/3	20/4 1/2	22/6	22/6	6	Ap/Nv
80,000	£1	Swift Cycle ....	21/1 1/2	21/3	21/9	13/-	24/-	20/9	6	Dec.
100,000	£1	" " 6 1/2% Cum. Pref.	17/-	17/6	17/3	14/10 1/2	17/3	16/3	6 1/2	Ju/Dc
80,000	£1	Triumph Cycle ....	77/-	bid	71/6	43/9	77/-	68/-	30	Nov.
50,000	£1	" " 5% Cum. Par. Pref.	24/6	25/-	23/6	20/7 1/2	24/6	21/6	61	Nov.

\* Including all arrears.

Triumph ordinary and preference and Charron preferred ordinary have been a strong market. Humber ordinary have recovered some of their recent fall. There has not been much business passing, but prices kept very firm.

## "The Autocar" Diary.

- April.**
  - 19.—Coventry and Warwickshire M.C. Cycle Car Trial.
  - 22.—Leicestershire A.C. General Meeting.
  - 23 and 30.—Examinations for R.A.C. Driving Certificates, Pall Mall, 9 a.m.
  - 26.—Manchester A.C. Run to Nantwich.
- May.**
  - 3.—Hampshire A.C. Meet at Heron Court, Christchurch.
  - 3.—Lancashire A.C. Hill-climb.
  - 7.—Examinations for R.A.C. Driving Certificates, Pall Mall, 9 a.m.
  - 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 M.C. Annual Hill-climb.
- June.**
  - 4 and 6.—Tourist Trophy Races, Isle of Man (see *The Motor Cycle*).
  - 7.—Shelsley Walsh Hill-climb.
  - 10-17.—Austrian Alpine Tour.
  - 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.
  - 19 and 20.—R.A.C. of Belgium Grand Prix Race.
  - 28.—Grand Prix de France and Coupe de la Sarthe. Le Mans.
- August.**
  - 10.—Mont Ventoux Hill Climb.
- September.**
  - 21.—Coups de l'Auto, Boulogne Circuit.
  - 25.—International Stock Car Race, Isle of Man.

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