

# THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 687. Vol. XXI.] SATURDAY, DECEMBER 19TH, 1908. [PRICE 3D.

## The Autocar.

(Published Weekly.)

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 every Friday.

The THREEPENNY EDITION, printed on Art paper.

The PENNY EDITION, printed upon thinner paper.

The FOREIGN EDITION, price 3d., printed on specially light bank paper for circulation abroad.

Editorial Office :

COVENTRY.

Publishing Offices :

20, TUDOR STREET, LONDON, E.C., England.

### CONTENTS.

	PAGE
NOTES .. .. .	991-992
R.A.C. DUST TRIALS. REVIEW OF 1908—PROJECTS OF 1909 ..	992
USEFUL HINTS AND TIPS .. .. .	993
THE WEIGHT OF MOTOR CAR AND PARTS .. .. .	994-995
AN EIGHT-CYLINDER AEROPLANE MOTOR (ILLUSTRATED) ..	996
MOTOR UNION NOTES .. .. .	997
THE WRIGHT AND VOISIN FLYING MACHINES (ILLUSTRATED) ..	998-1002
THE AUTOCAR LECTURES—THE NEW E.I.C. SPARKING PLUG (ILLUSTRATED)—THE CHAS. JARROTT RECORD BOOK (ILLUSTRATED) ..	1003
ON THE PARIS SHOW (ILLUSTRATED) .. .. .	1004-1006
A GOOD COIL (ILLUSTRATED)—ANNUAL DINNER OF THE ROYAL A.C. AND ASSOCIATED CLUBS .. .. .	1007
ON THE TRACK (ILLUSTRATED) .. .. .	1008
CORRESPONDENCE (ILLUSTRATED) .. .. .	1013-1020
AERONAUTICS .. .. .	1021-1022
A COMMERCIAL TRAVELLER'S CAR—ANOTHER DETACHABLE RIM	1023
FLASHES (ILLUSTRATED) .. .. .	1024
CLUB DOINGS .. .. .	1025
SOME QUERIES AND REPLIES .. .. .	1026

### Subscription Rates :

British Isles—Home edition, 16s.; penny (thin paper) edition, 6s. 6d.  
Abroad (thin paper edition), 22s. 8d. per annum.

## Notes.

### The Grand Prix Race Doomed.

As we announced last week, something very like annihilation appears to threaten the Grand Prix of the Automobile Club of France; a thunderbolt has fallen from the blue upon it, and that in the very earliest stages of its inception. Everything was in course of arrangement, after much consideration and discussion the circuit had been chosen, the very roads were under special repair, much expense had already been incurred, when suddenly it transpired that the signatures of many of the leading French motor car makers were appended to an agreement by which they bound themselves reciprocally not to take part in any race in 1909.

At the recent International Congress held to decide

the dimensions of racing cars, the French proposals were accepted by all present without cavil or objection. This being so, surely it would appear that the mere fact of the French proposals being so adopted imposed a moral obligation upon the Automobile Club of France to make preparations for and carry out the race. This appears to have been the view the Club did take, for it has already gone far in provisioning for the Grand Prix of 1909.

Now we find that the leaders, the head and front of the abstentionist propaganda, are actually members of that very Commission Sportive, the particular body or committee existing specially for and charged with the organisation of such events. In such case, the only thing left for the members to do—at least from an English point of view—would be at once to tender their resignation from the committee, although it would probably be refused. Each signatory has engaged under his signature to forfeit £4,000 to the other signatories should he race in France during 1909, and is bound to accept the jurisdiction of the Paris courts in connection therewith. Moreover, there is a majority of the signatories who seek to make the obligation cover all racing in foreign countries. Amongst those outside the anti-racing caucus the validity of this arrangement is considered more than doubtful, for even were its principles not void by reason of certain omissions which would entail its nullity in French law, it is very questionable whether any court would endorse such damages.

Why therefore was this arrangement entered into if not as a combine against the competition of foreign cars, and out of dread of again failing to win the Grand Prix? The F.I.A.T. people have wisely refused to sign, and though the Mercedes Co. are said to have appended their sign manual, they are resting on the oars of victory; the Benz folks are not considered serious, the remainder being all French firms, who have entered cars in races during the past two years without gaining successes. Further, it is suggested that the members of the old brigade of makers have a wholesome fear of the smaller French makers, who, though unsuccessful with engines of 150 mm., have done, and are likely to do, exceptionally well with engines of 130 mm. and under. We feel that this attempted home and foreign boycott is the outcome of a short-sighted policy, even more regrettable and more foolish than the hysterical anti-racing agitation in this country. It is worse when coupled with the proposed abandonment of the 1909 show, for it looks as if France was going to give up her position in the motor world without a struggle. The Grand Prix matter has passed through three stages: (1.) Resolution to hold the race. (2.) A minimum of thirty entries before 31st December. (3.) Minimum raised to forty. The latter can hardly be hoped for, and therefore the Grand Prix is doomed because there is no dead certainty of a French victory.

If the Grand Prix be not held, the Grand Prix of Voiturettes will also fall to the ground, as it is held upon the same circuit the day before the great race,

and it would not pay to prepare the circuit and to properly guard it for the small race alone. The only thing against the Grand Prix is that even now the engines used are too large. It is true that under the new international agreement they will be smaller in 1909 than ever before, but for all that they are still needlessly large. Under the circumstances it becomes still more desirable that a good international race should be held in the Isle of Man next year; otherwise with France abstaining from a great international race there will be practically no big events at all next year. With a strictly limited size of engine and a limited time for practice, the cost of a race in the Isle of Man would be very much smaller to the entrants than the races in France have been, and, moreover, the conditions would be fairer, inasmuch as every competitor would have to cross the water. It is true that the journey for the English competitors would be shorter, but, after all, the sea journey would only be twenty miles less, as the French or other foreign cars could be landed at Dover and driven across to Liverpool.

#### Anti-motoring Activity.

During last week two meetings of an anti-motoring character were held. One was the annual meeting of the Highways Protection League and the other a meeting in Manchester to form a provincial branch of the same league. Now the Highways Protection League is only a very small body of people indeed, but for its size it makes an extraordinarily large volume of sound, and receives in the public press a great deal more attention than its importance warrants, more particularly as it is backed up by the handful of anti-motoring members of Parliament whose names crop up with tiresome persistency whenever there is any possible chance of doing the motor car and those who use it a bad turn. Indeed, we had almost said that it would be a good thing for automobilism if three or four of the pro-motoring members of Parliament were half as active on behalf of motoring.

We have no intention of exaggerating the importance of the Highways Protection League, as it is of really

no importance at all in itself, but it may do much harm by misleading public opinion. Small as it is, it is organised against motoring, and it cannot be said that the motoring bodies are organised against it. For instance, after the exaggerations and hysterical outpourings, not to mention a few downright misstatements which were uttered at the general meeting of the league, we do not find any attempt in the papers next day to correct the wrong impression circulated. The Royal A.C., the Motor Union, the Automobile Association, and the Society of Motor Manufacturers were alike dumb. Because they know that the league is so small in numbers they seem to think it does not matter what it says or does, and it continues its outpourings against motoring without the least effort being made by the representative motoring bodies to undo the harm which it does.

The general public does not know it is an insignificant body, but swallows all it says against motoring, even when it is stated that the motor car manufacturers are not opposed to the Highways Protection League. Then again at Manchester there was no organised attempt to present the other side of the question. It would have been imagined that the local clubs would have endeavoured to look after their own interests, but so far as we know only one Manchester automobilist, Mr. Rowcliffe, had the enterprise to attend the meeting and to point out that there were two sides to the question. He deserves the thanks of all automobilists, Mancunian automobilists in particular, but it would have been a good thing for the movement if the powerful clubs in Manchester and district had been represented, as the total attendance at the meeting was only 100, and fifty or sixty motorists would at least have prevented the voting from being all one way. When will the motoring organisations awake to their responsibilities and realise that one of their most important duties at the present time is to use every effort to stem the torrent of combined misrepresentation and half-truth which is being continually poured forth by the anti-motorist? Some kind of organised effort is needed to counteract the lies which are propagated.

### R.A.C. DUST TRIALS. Review of 1908—Projects for 1909.

A meeting open to the makers of the cars in the recent dust trials and to the entrants in the experimental class was held on Friday at the Royal A.C.

After a few words of explanation as to the reasons for asking the makers to meet the Dust Committee, the meeting adjourned to one of the motor houses, where six of the most interesting cars had been, at the committee's request, sent for inspection, namely, the three winning cars—the Buick, Reo, and Dennis—and the Stanley, Chenard-Walcker, and Cadillac.

It was pointed out that as long as cars were as high off the ground as the Stanley and Cadillac there was apparently no real necessity for the underpart to be smoothly cased in, but that in lower cars, like the first two winners, a smooth under-surface was a necessity. Sketches of variously shaped and sloped under-shields were shown which the committee had tried successively on the same car; all of them had given practically the same result. Within fairly wide limits, therefore, it appeared of no great importance what exact shape of under-shield was used so long as it was reasonably smooth.

Messrs. Dennis had, at the committee's request, run a car with various sizes of cross petrol tanks behind

to determine roughly what could be used without bad dust effect, and the diagrams of these were shown.\*

On returning to the Club, suggestions and remarks were asked for regarding next year's Dust Meeting. With regard to date, it was mentioned that June was proposed, if possible, and if no grounds were shown against it, and it was agreed that, subject to a clear week being allowed after the Scottish Trials, it would be quite suitable.

The views of makers were asked as to the desirability of having two classes, and, after some discussion, it was agreed that it would be desirable, the general opinion being that the division should be by tyres under 90 mm. and tyres 90 mm. and over (standard size as specified in makers' lists).

A suggestion was made that, as all cars now used non-skids of some kind, they should be made obligatory on all cars. This and several suggestions for interesting tests were noted by the committee to be adopted, if possible.

\*These and the previous diagrams can be seen at the Club at any time by those interested in the matter, and it is hardly necessary to add that any other information that the Dust Committee has is always at the disposition of any makers, whether entrants or not in the trials.

## USEFUL HINTS AND TIPS.

LETTERS FROM ONE MOTORING ENTHUSIAST TO ANOTHER. BY MARCUS W. BOURDON.

### Loose Bodies on Chassis.

Dear F.,—I must tell you of a peculiar experience which fell to my lot last week-end.

I drove, entirely alone in the car, on Saturday to the South Coast, and soon after starting and whilst still running over some of the rough roads of the suburbs I noticed a noise each time the car passed over any more than ordinary unevenness in the road. The noise referred to gave me the impression that something heavy, such as the lifting jack, was jolting about in the tool space at the back. I stopped near Croydon with the idea of making things secure, but, to my surprise, all the heavy tools and impedimenta were quite firmly fitted in their correct places. I started off again, only to notice that the jolting noise got worse as time went on. I thought that the chassis was bumping on the axle by reason of a broken or strained spring, that the differential casing was hitting the floor, or something of that sort, but another stop and a further examination showed the impossibility of any of such causing the trouble. It got so bad at last that I could feel the jolt of whatever was loose or defective right through the car. Near Crawley a large car passed me going in the same direction, and as it went by, one of the occupants called to me, "Look at your body!" I stopped, went to the back of the car, and looked round carefully, but could see nothing loose, broken, or defective.

However, I went on once more, and in Crawley I saw the car which had passed me stopped in front of the hotel there, so I went inside and asked the man what he meant when he called out, "Look at your body." "Why," he said, "it's loose on the chassis; just before we passed you we distinctly saw it lift away from the frame two or three inches when you went over a bump in the road."

And there was the explanation of the bumping and jolting I had heard and felt.

The body should have been secured to the pressed steel frame by four bolts, but I found that both of the rear pair were missing, and that the body was only being held in position by two at the front end, and they were loose. This experience brings to light another detail which should receive periodical examination, for the thought of what might happen at a corner, taken rather fast, if one of the front bolts had fallen out as well will make me rather careful of this point in future. Why, the body might leave the chassis completely, and such an experience would be more novel than pleasant, I am thinking!

I came across what I thought was rather a good tip the other day. When returning from Reading to town I saw a large industrial motor vehicle standing at the side of the road and the driver apparently working at the clutch. I stopped and asked if he wanted anything, and, although receiving a reply in the negative, I remained for a few minutes to see what the trouble was. It appeared that the leather of the clutch was worn a good deal—so much so that the metal portion of the cone was making contact with the arms of the flywheel, and consequently slipping badly.

The driver was attempting to improve matters temporarily by a method he assured me he had used before with success, and I can quite imagine he spoke truthfully. He had drawn the clutch back and removed the screws securing the leather (two or three

at a time), and was fitting sections of several thicknesses of brown paper between the leather and the metal, so enlarging the cone, and securing the same effect as fitting thicker leather. I thought it rather a good idea for a temporary repair.

### Dangers of Injecting Paraffin into a Hot Engine.

I was telling you just now that I went to the coast at the last week-end. Well, just after I arrived and was putting my car away in the garage of the hotel, a P—— car came in which was being driven by its owner. You will no doubt remember that these cars, like yours, are fitted with a drip-feed lubricator on the dashboard, and at one end of the oil tank is a space for paraffin with a small hand pump attached.

Directly the driver stopped his engine, which was rather warmer than it should have been, I noticed that he worked the paraffin pump rather vigorously for a few moments, the effect of this being, of course, to inject paraffin into the cylinders.

Next morning when I went to the garage I found that he was experiencing a rather severe trouble. His engine after running a few seconds had stopped, and when he attempted to start it again he found he could not make it budge an inch with the starting handle. It had positively seized up, and only after half an hour's work, removing the valve caps, priming the cylinders with a mixture of oil and paraffin, and then putting in the first speed and obtaining the help of two or three men to jerk the car backwards and forwards was he able to make any movement of the engine at all. He had it running at last, but what harm had been done by both the trouble and the method of curing it, or either, it is difficult to suggest. What had happened was the following, I feel sure:

The paraffin which had been injected overnight had washed the pistons and walls of cylinders quite clean of oil, and then the heat of the engine had dried up the paraffin itself, leaving the rubbing surfaces absolutely without lubrication.

The first few seconds running in the morning—and before the lubricating oil had had time to work up to the top of the cylinders again—caused one or more of the pistons to seize slightly.

This proves, to my mind, that one should not inject paraffin into the cylinders of a hot engine. The pumps are fitted for the purpose of injecting paraffin into the cylinders when the engine is difficult to turn and start "from the cold" owing to thickness and stickiness of the oil on the cylinder walls. If you still have the fitment on your car, take warning from the experience I have related, and do not use paraffin to wash out cylinders which are still hot.

### TO NOVICES.

The intending motorist and the new motorist cannot always follow all the terms used in articles published in *The Autocar*, despite the fact that technical subjects are dealt with as plainly as possible. All who experience difficulties of this sort are referred to "The Autocar Handbook" (1s. 9d. post paid), which is designed to help one to a clear understanding of such subjects. Those who wish for practical hints and tips concerning the driving, adjustment, and maintenance of their cars are referred to "Useful Hints and Tips for Automobileists" (2s. 6d. post paid). Both can be obtained from our publishers, Eliffe and Sons, Ltd., 20, Tudor Street, London, E.C.

# THE WEIGHT OF MOTOR CAR AND PARTS.\*

BY MERVYN O'GORMAN. (Concluded from page 978.)

**Pistons, Piston Rings, and Gudgeon Pins.**—The weight of these parts together is the most important in a car, and is interesting in a manner totally different from the general question of weight-saving previously alluded to. They affect vibration, friction losses in the engine, and inertia stresses. The cars whose piston weights have been taken give an intelligible curve of piston weight in relation to cylinder diameter squared. It was somewhat difficult to select the best feature for the ordinates. Should we expect to find that diameter, or diameter cubed, or squared, proportional to the weight? This search was interesting in itself. From elementary considerations as to the shape of a piston, Lanchester suggests that the weight of similar pistons should vary as the cube of the bore (where bore and stroke are not widely different), but when plotted this curve was found to bend over too much towards the axis of ordinates. When re-plotted with bore as ordinates the curve bent over toward the axis of weight (fig. 1); accordingly it was plotted a third time in relation to bore squared, and then one was pleased to find that a group of engines chosen at random gave a strong indication that a straight line through the origin (fig. 1, curve A) was the representative curve. I believe this result to be more than mere coincidence, and that the curve gives an indication of the effect on design of the conditions under which engines have to be worked. It will be seen that engines exhibiting unusual lightness in this reciprocating part have their points to the left of the average line.

Instead of only plotting a curve, it is possible to draw a shaded belt within which the parts weighed should fall for some legitimate percentage variation from the mean. Any piston found to be on the left of this belt is, of course, substantially lighter than usual, and if this result is obtained without drawbacks, a step forward in knowledge has been made by those in the running who can read.

It is pleasing to note that these points which are to the right of the belt belong generally to engines of older date than the others, thus showing the march of progress with time.

Thus the 40 h.p. Iris, the Rolls-Royce, the Berliet are all of recent date, whereas (those on the extreme right) the 18 h.p. Dennis is 1905, the 28 h.p. Daimler is 1905, the Gladiator is 1906, and the Winton is of American origin. The Sunbeam, which is dated 1906, seems to be ahead of its time in this respect. In drawing the line or curve, I have assumed that when there is no piston there is no piston weight, and accordingly the line passes through the origin.

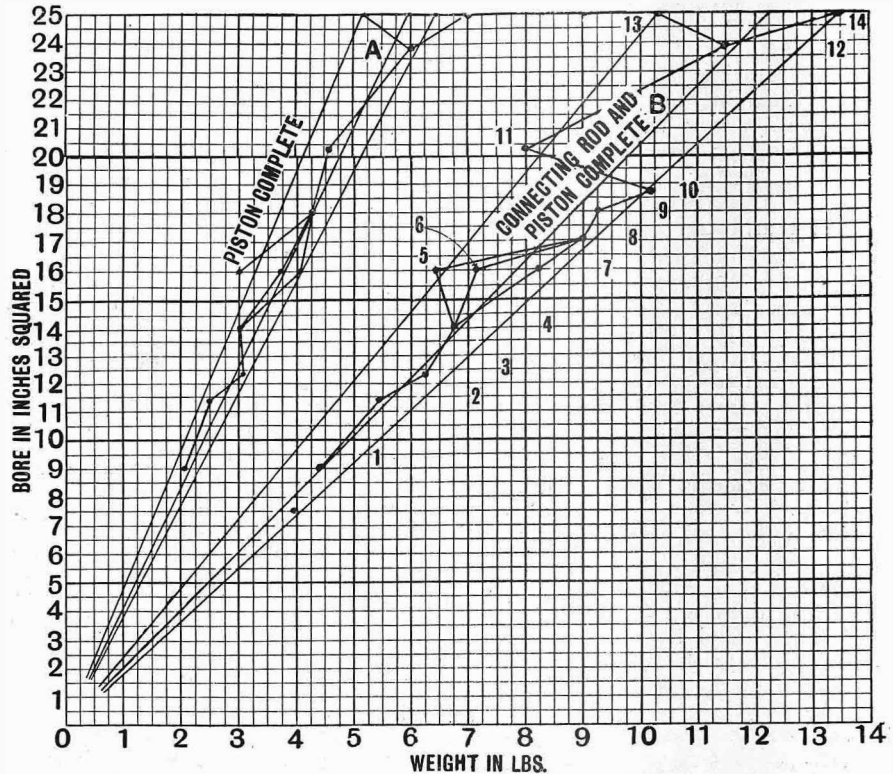
**Piston and Connecting Rod Complete.**—This case is represented by fig. 1, curve B. It is still more surprising to find the straight line law through the origin with  $D^2$ , but we must remember that the length of stroke in none of these engines is much more than normal, so that, on looking for the effect of longer strokes in increasing the weight of the connecting rod, we do not find it till we separate out connecting rods alone. The curve for these is evidently given by the interval between curves A and B, fig. 1.

On looking at connecting rod weights we find the Sunbeam ( $3\frac{1}{2}$ in.  $\times$   $4\frac{1}{2}$ in.), which has a somewhat longer stroke than was usual in 1906, is slightly on the heavy side, the same applies to the 30 h.p. Iris ( $4\frac{1}{2}$ in.  $\times$   $5\frac{1}{2}$ in.). The Berliet ( $4$ in.  $\times$   $4\frac{1}{2}$ in.) has relatively a lighter connecting rod than

one would expect. The Renault ( $3$ in.  $\times$   $4\frac{1}{2}$ in.) is light for the length of stroke if it be compared to the Darracq ( $2\frac{3}{4}$ in.  $\times$   $4$ in.).

In cases like the Berliet and Renault, which are certainly not notorious for troubles with weak connecting rods, and where the throw is not unusually short, one concludes that the material and design are on the good side, and in this something is learnt.

**Crankshaft.**—In this connection more than in any other part one is confronted with the difficulty that makers use widely different material. Thus it was actually possible a year or two ago to find a crankshaft in a well-known car with some 15 tons tensile strength, while at the same date another maker made his crankshaft of modern steel with 55 tons tensile strength. My attempt to correlate crankshaft weight



The various numbered dots on the curve represent various cars. 1, Renault. 2, Daimler. 3, Humber. 4, 20 h.p. Sunbeam (1905). 5, 22 h.p. Berliet. 6, 40 h.p. Napier (1907). 7, James and Browne. 8, 35 h.p. Gladiator. 9, 30 h.p. Iris. 10, 28 h.p. Daimler (1905). 11, 50 h.p. Rolls-Royce. 12, 40 h.p. Daimler (1907). 13, 40 h.p. Iris. 14, Winton (1908). Fig. 1.

is not very illuminating for lack of data. All that it is possible to say is that any person who weighs a crankshaft, and, comparing it to this curve or table, finds it to have an exceptionally light weight, should look carefully into its reputation, and make an analysis before seeking to emulate it in mere dimensions. If one had a much larger number of crankshafts such precautions would be less necessary in using the curves, and I would ask makers present to let me have this data for their own benefit later. The paucity of crankshaft data must be put down to the undesirability of detaching the flywheels therefrom.

**Cylinder Castings.**—This curve, if it may so be called, shows (per cylinder) that the increase of weight of cylinder castings with increasing size of engines is not noticeably less rapid than the increase of power, and less rapid than the square of the cylinder bore.

It is on such parts as these that the big-engined car gains in "liveliness." The weights given include cylinders, water-jacket, two valves, valve plugs, and the plate, if any, which closes the water space. Perhaps a noteworthy feature is the remarkably fine casting of the 18 h.p. Siddleley, which I believe gives no trouble in spite of its lightness.

In the case of the 10 h.p. Humber, the fact that each cylinder is cast separately makes for more weight in exchange

\*Paper read before the Incorporated Institution of Automobile Engineers by Mr. Mervyn O'Gorman, M.I.M.E., M.I.E.E., A.I.A.E., on Wednesday, December 9th.

for other advantages, whilst one would expect to find the little Darracq, all of whose cylinders are in one casting, unusually light.

**Valves.**—I have here a few particulars of the weights of valves of anonymous cars from Lembeck and Kendahl:

Head diameter.	Stem diameter	Length.	Weight.
43 mm.	8 mm.	130 mm.	.235 lb.
52 mm.	8 mm.	145 mm.	.319 lb.
51 mm.	9 mm.	170 mm.	.373 lb.
64 mm.	10 mm.	180 mm.	.52 lb.

I give these records for what they are worth for reference.

**Unsprung Weights.**

**Unsprung Weight on Back Axle.**—This feature, which is generally thought to be of great importance in relation to tyre wear, does not lend itself to curve plotting, though if one had a sufficient number of points it would be possible to eliminate to some extent the irregularities due to individual causes. Thus, when a small car is built to carry a landaulet, to seat four, and to run at slow speeds, the back axle, and with it the back springs, are inevitably heavy in relation to power. Apart from the power question, one would wish to keep light touring cars and heavy closed cars in separate classes for this purpose; as it is, I have simply given the points with notes to explain them. One generally used to suppose that chain-driven cars were much lighter than live-axle cars, so it is surprising, in the case of the one example of a chain-driven 40 h.p. Napier, to find that this is not so to a marked degree; the car, however, is an old one.

The weights plotted include axle, differential, share of propeller-shaft, axle tube, hubs, wheels, wheel caps (not tyres), brake drum, share of brake rods, share of torque rod, and stay rod, also the whole of the weight of the springs, save where the centre of support of the spring is fixed to the chassis. It will be seen that springs of the Lanchester type are not unsprung weight in this connection.

**Body Weights.**

**Carriage Body.**—There is no time to enter into details on the question of bodies. I will merely say that the ordinary five-seater, open body, with mudguards, steps, irons and lamps, frequently weighs 7 cwt. This is quite unnecessary. I have succeeded, by designing my own car body, and conducting some dozens of experiments on various woods, leathers, cloths, etc., in getting a weight of 4 cwt., without sacrificing comfort. A small landaulet complete as above often weighs 8 cwt., the large landaulet, or limousine, to seat five inside and two out, weighs 11 cwt., and in all cases about thirty per cent. of this weight is unnecessary. Half of this excess is unwittingly insisted on by the purchaser, who, not knowing what he really wants, asks for a copy of some ill-gotten car that he has seen, and the other half is

put on by the coachbuilders out of a lack of knowledge of the technical conditions of a car.

I have had carriages built by Holland and Holland, by Cole and Sen, by Hooper, Todd, and Wright, the Victoria Carriage Co., and many others, and I find that none of these makers had any means of weighing the carriage work or the parts on the premises. One maker—Todd and Wright—I have persuaded to install it. The cost is only about £3 10s., so that the expense is really no excuse. If the subject-matter is of any interest to the members of this Institution, I hope to have permission to invite them to be present at a lecture which I am to deliver before another body at a later date.

**How Lightness is an Excellence.**

Before concluding, I should like to say that other qualities being equal, lightness is an excellence, and is eminently desirable. It is no use sheltering under the assertion that light machinery may be flimsy, or is notoriously unreliable. If it is, then "other qualities are not equal." This is not a vicious circle, lightness is very difficult to get; it requires skill, brains, good workmanship, scientific knowledge, careful experimenting, and the very finest materials, with careful testing of all metal when delivered. This will have two results. At the outset, lightness is expensive; later, when the machinery is set up and the design simplified, I believe it makes for economy. Certainly it makes for liveliness, which is both a desirable, and, what is perhaps more important, a very saleable advantage. The only merit I can claim for correlating the various weights in curves is this: If one designer can show superior lightness in any part without laying himself open to any well-founded charge of flimsiness in that part, the sooner everyone else learns how light that part may safely be made the better. Owing to the complete isolation from one another of the technical staff of factories, it is only probable that excellence has been attained in one particular here and in another particular there. On the common and friendly meeting ground of the Institution can we not make a fair and free exchange of confidences so that English motor car making, which we have at heart, may move forward by leaps and bounds? It is very difficult to get people to put their knowledge into the common pool in this way, because no one likes to begin. To the credit of Humber, Iris, James and Browne, Rolls-Royce, Siddeley, stands the fact that they are not ashamed of their existing productions. Many others whom I have not asked may be willing to come forward. I am convinced that each person who subscribes to this pool will take out twice what he puts in. I have a suggestion to make to help matters, and it is this—that each maker lets me have the weight of his last year's models. Surely, there is very little risk in this. I will then willingly take on the work of analysis for another paper at a later date if the Institution should wish for it.

Name of Car.	H.P.	Bore and Stroke.	Piston Weight.	Piston and Connecting Rod Weight.	Crankshaft Weight.	Weight per Cylinder.	Engine Weight Complete.	Gear Box Weight.	Unsprung Weight of Back Axle.
	46D1.6S.4.	mm.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs.	lbs.
7-8 h.p. Renault	9.9	75 x 120	2 1	4 7	—	—	—	—	281
10 h.p. Siddeley	12.9	80 x 102	—	—	—	—	—	—	294
10-12 h.p. Darracq	22	86 x 102	2 8	5 8	33 8	30 0	398	223	514
10-12 h.p. Humber	23.2	89 x 96	3 1	6 4	23 8	18 8	251	—	233
16-20 h.p. Sunbeam	28.5	95 x 120	3 0	6 12	31 0	30 0	—	—	—
18 h.p. Dennis	29.4	95 x 130	—	9 0	40 0	50 0	546	—	—
18 h.p. Siddeley	30.9	102 x 112	—	—	—	28 0	507	—	427
22 h.p. Berliet	31.5	102 x 120	3 0	6 6	33 8	36 8	479	—	—
28 h.p. Daimler	33.5	110 x 150	—	10 2	—	—	—	—	—
25-35 h.p. Gladiator	35.9	105 x 140	—	9 0	49 0	49 0	—	—	—
30 h.p. Iris	36.2	108 x 133	4 4	9 4	51 0	44 4	545	—	381
40 h.p. Napier	39.2	102 x 102	3 12	7 2	42 0	37 8	727	—	385
35 h.p. Winton	46	127 x 127	7 1	13 6	48 0	—	—	—	—
40 h.p. Iris	46.9	127 x 133	5 3	10 3	51 0	49 0	562	—	381
30-40 h.p. Daimler	47	124 x 152	6 0	11 8	55 0	52 0	603	—	—
50 h.p. Rolls-Royce	50.6	114 x 120	4 10	8 15	46 8	34 0	646	—	460
(A)	26	90 x 120	3 8	5 12	—	29 4	—	—	—
(B)	35.75	110 x 120	5 11	9 0	—	35 13	—	—	—
(C)	42.7	120 x 130	5 11	12 5	—	45 3	—	—	—

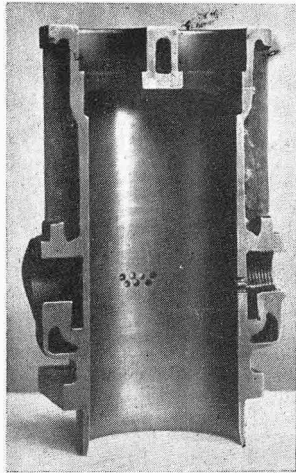
NOTE.—The piston weight includes piston rings, gudgeon pin, and locking device. The crankshaft weight of six-cylinder engines is taken as two-thirds the total weight for comparison with four cylinder engines. The engine weight includes carburettor and induction pipes, timing wheels, but not pump or magneto or water pipes.

To prevent confusion of names, Mr. C. E. Whittaker, agent for Great Britain and the Colonies for Messrs. Piedbauf, of Liege, the manufacturers of Imperia cars,

writes to explain that he is not the gentleman of the same name who is connected with Messrs. Weigel, Ltd., although he was formerly connected with the latter company.

## AN EIGHT-CYLINDER AEROPLANE MOTOR.

The Adams eight-cylinder V-type engine which, it will be remembered, attracted considerable attention at Cordingley's Show in March this year, is now under the ægis of the Aeroplane Engine Co., of Redbridge, Southampton, who



A section of the aeroplane engine showing auxiliary exhaust ports.

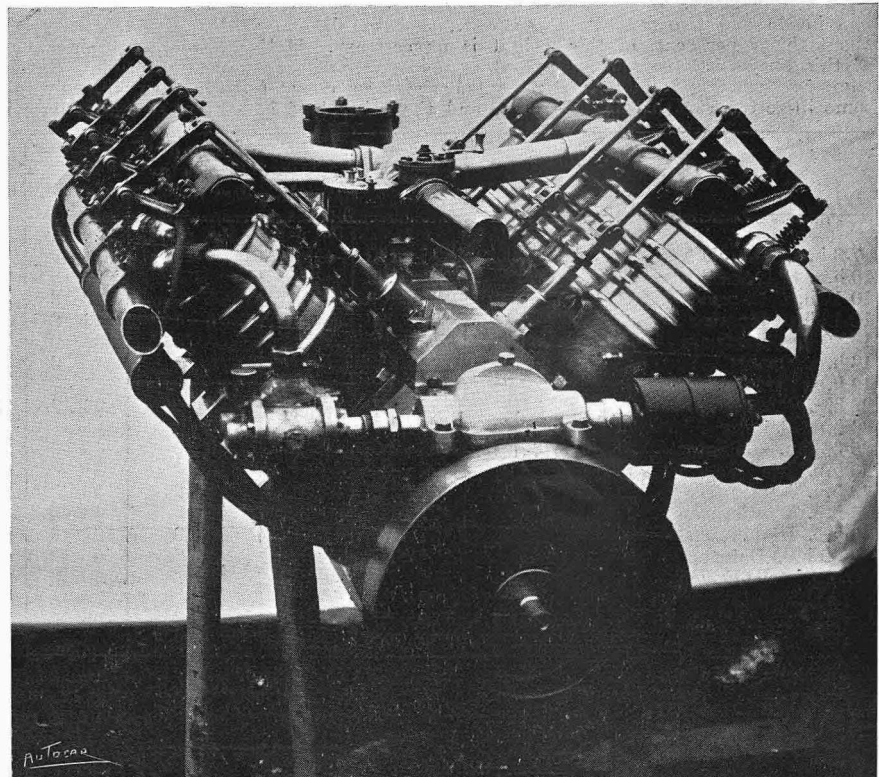
have acquired the sole rights. The eight separate cylinders of the motor are arranged in two groups of four on a common crank chamber, the sets being at right angles to one another and employing a four-throw ball bearing crankshaft, each pin carrying the connecting rods of a pair of opposite cylinders, which are staggered in relation to one another.

The engine possesses a number of novel and interesting features, amongst which are to be especially noted the steel water jackets, the valve actuating mechanism, and the auxiliary

water-cooled exhaust ports. As regards the first named, these consist of steel tubes provided with spun expansion ribs, the whole being held down by rings shrunk on to flanges cast in the cylinder walls, all valves and plugs being arranged in the cylinder heads, which are also afforded a large amount of water jacket space. The single camshaft is placed between the cylinders and vertically over the crankshaft, whence it is driven by enclosed spur gearing, the shaft running on ball bearings. It carries eight double-acting cams, each of which operates both the exhaust and the inlet valve of each cylinder by means of overhead rockers, the vertical tappet rod of which is designed both to push and to pull. The fulcrum of the rocking lever is between the valve stems, having a continuation beyond the inlet valve to the vertical rod. The rocker is therefore, as regards the exhaust valve, a lever of the first order, but as regards the inlet valve a lever of the second order, the lifts of the valves being equal. Auxiliary exhaust ports opened during the last half-inch of the stroke are provided by surrounding the cylinder with a water-cooled annular chamber communicating with the interior of the cylinder by a number of small holes, which represent an aggregate port area of 5in. by ½in. In order to overcome as far as possible the inherent

disadvantage of exhaust ports at the bottom of the stroke, namely, an immoderate discharge of oil through them, the piston is made longer than the stroke, so that these ports are never open to the crank chamber. The ports are open to the air, the noise of the exhaust being practically eliminated by the reduction of pressure due to its water-cooling, and to the disintegration caused by the small holes through which it passes. The inlet valve is opened at the top of the stroke and closed just as the piston in its downward travel commences to open the ports, the exhaust valve being timed in the usual way. The engine is fed by an eight-jet carburetter placed over the camshaft, and which is also provided with a fresh air engine brake arrangement. Dual ignition is fitted, there being a high-tension magneto driven at twice the speed of the engine, and also a high-tension distributor for coil ignition, mounted vertically upon and driven by skew gearing from the camshaft. The engine has a bore and stroke of 4in. and 4¾in. respectively, and is nominally rated at 100 h.p.

Following upon the resolutions passed by the committee of the R.A.C. and the General Committee that in their opinion the system adopted by certain companies for the sale of motor spirit, *i.e.*, by offering 5s. and 5s. 6d. respectively for every 100 seals taken from their cans, was contrary to the best interests of the user, the R.A.C. Committee report that a communication has been received from the Anglo-American Oil Co., Ltd., announcing that that company will abandon what is called the "silver seal bonus scheme" on the 28th February next. We, too, have received a similar communication.



The 100 h.p. eight-cylinder engine manufactured by the Aeroplane Engine Co., Ltd.

## Motor Union Notes.

(Communicated by the Secretary.)

Mr. W. Joynson-Hicks, M.P., Mr. C. H. Dodd, Mr. H. R. Oldfield, Mr. J. Kennedy, D.L., J.P., and the Secretary waited upon the President of the Local Government Board on December 14th. They placed before him facts, accumulated from experience, showing that local authorities should not, even if it is possible, be vested with the increased powers to impose reduced limits advocated by a number of anti-motoring members of Parliament.

The representatives of the leading petrol firms met the Executive Committee of the Union in conference on Monday last.

Sheffield and Hallamshire Motor Cycle Club held a special meeting on December 10th, and decided to become affiliated to the Motor Union. This club is the second largest Motor Cycling Club in the country with 140 members. It has hitherto been affiliated to the A.C.U., from which body it has now withdrawn.

Three more clubs—South Shields A.C., Sunderland and District A.C., and Sunderland and District Motor Cycle Club—have availed themselves of the arrangements made by the Union for supplying their members with the Motor Union edition of *The Autocar*.

A revised prospectus for motor cyclists is now in the press. It is proposed to present all motor cycling members with a button badge.

Received this week for the Defence Fund:

£5 5s., Blackpool, Fylde and District A.C.

£5, Chas. H. Waterlow, Esq.

£1 1s., F. Marsh, Esq.

10s., C. W. Smallman, Esq.

This Fund has a just claim on every motor car user, whether he be a member or not.

Adverting to the High Wycombe speed limit inquiry, one of the local motorists called by the Secretary as a witness, writes:

"I must congratulate you on your able management of the case on behalf of motorists. I shall be very pleased to become a member of the Motor Union, and herewith enclose cheque for one guinea."

While not opposing a ten miles limit on the congested section of the main road in Croydon at the Local Government Board inquiry, held on December 3rd, the Secretary of the Union maintained a restriction was not necessary for Wellesley Road and Park Lane, which are parallel to the main road. Motorists, he held, should be encouraged to use those roads in preference to the main one. He also objected to a limit on two important roads near the Crystal Palace.

The Union thanks motorists who have sent in notes regarding alterations in particulars given in the Foreign Handbook, as the result of tours undertaken last summer and autumn. The widespread circulation of the volume is shown by the fact that one suggestion came from a resident in the United States. Enquiries are still reaching the Touring Department from members about to pay winter visits to the Continent. A Southend member, who was recently supplied with two home routes, writes that he "followed both with perfect satisfaction and success."

A grant of £5 has been made by the Union towards the defence expenses of Mr. Jacob, a member of the Welsh A.C. He was defended by Mr. Leeder (of Messrs. Leeder and Morris, solicitors to the Union), the hearing occupying the Llandrindod Wells Bench for four hours. The summons was for reckless driving, and in dismissing it the justices held that the police had not proved, but had really admitted there was no danger to the public.

In company with representatives of the Surrey County Council, the Secretary was engaged on December 11th inspecting some of the roads for which speed restriction is desired by the local authorities. The inspection was made with a view to arriving at a compromise.

Badges for members of the General Committee and Hon. Local Correspondents are ready for issue, and may be obtained on application to the Secretary. Among members of the Union the new personal badge for cap or coat is becoming popular. It is a handsome production, and is sent post free for five shillings.

The Union was recently asked whether the Metropolitan Water Board is entitled to impose a water rate in respect to a motor car which is never washed on the premises in respect to which the rate is made. The reply is:

If the car is kept at the house an extra water rate can be charged, whether the owner uses the water or not. If, however, the car is kept at a garage, I do not think the authority is entitled to charge.

The amount asked for is 10s., considerably below the maximum charge the Board has power to make.

During November ten special caution, fifty-five school, and ten concealed-turning signs were issued, bringing the totals to 69, 336, and 125 respectively, and the aggregate to 530. To denote concealed turnings the Union has adopted a new sign of the diamond shape approved by the Local Government Board. It will show the words "concealed turning" in white letters on a red background.

Local authorities which ordered signs last month were Middlesex County Council, Chard Corporation, Surrey Education Committee, Guildford Rural Council, and Dorset County Council (at Fontmell Parva). Nine of the Union's danger signs are being erected on tramway posts by the Rochester City Council. The Sussex County A.C. has ordered five signs for schools and concealed turnings, and the Union has presented several to the Eastbourne Rural Council for erection at dangerous places on the roads near Pevensey Castle and at East Dean. The Union's special signs have been substituted for the ordinary triangular signs which formerly stood at Stone Street Road, Kent.

The medal given to the Welsh A.C. has been presented to the winner, Captain D. Hughes-Morgan, J.P., the president of the club, who scored the best aggregate at the gymkhana. For two years past a Motor Union medal has been awarded to the Ross-on-Wye Golf Club for competition at its popular gymkhana. The winner on both occasions was Mr. C. L. Lewellyn, jun., who this year made the best general performance.

The Motor Union. Chairman, W. Joynson Hicks, M.P.

1, Albemarle Street, London, W. "Speedway, London." 9090 Gerrard.

# THE WRIGHT AND VOISIN FLYING MACHINES.

A COMPARISON.\* BY F. W. LANCHESTER.

The most successful types of flying machine or aerodrome at present in existence are those constructed by the Brothers Orville and Wilbur Wright, of the U.S.A., and by MM. Voisin Frères, of Billancourt, on the outskirts of Paris. The author of the present paper has recently had opportunities of witnessing both types of machine in flight—the former at the Champ de Manœuvres, at Champagne, near Le Mans, the latter in the hands of Mr. Farman, over the ground of the military camp at Mourmelon le Grand, near Chalons.

Although accurate information is on some points difficult to obtain, the reticence shown is perhaps no more than might be anticipated. The author has succeeded in collecting sufficient data to be able to give a consistent account of the performance of both machines, and to permit of an intelligent comparison being made between the two systems.

## The Wright Machine. Origin and Description.

The Wright machine can, metaphorically speaking, trace its ancestry back to the gliding apparatus of Otto Lilienthal. According to Gustave Lilienthal (brother of the famous aeronaut), two Lilienthal machines were sent to the United States—one to Octave Chanute the other to Herring. Chanute and Herring are said to have been associated in their experimental work. The gliding machine, originated by Lilienthal, was improved, especially as to its structural features and its method of control, successively by Chanute and the brothers Wright, until the latter, by the addition of a lightweight petrol motor and screw propellers, achieved, for the first time in history, free flight in a man-bearing machine propelled by its own motive power.

The Wright machine of the present day weighs complete when mounted by aeronaut, 1,100 lbs. (500 kilos), and has a total supporting surface measuring approximately 500 sq. ft. The ordinary maximum velocity of flight is forty miles per hour, or 58 ft. per second (= 64 kilometres per hour). The aerofoil consists of two equal superposed members of 250 sq. ft. each, the aspect ratio (lateral dimension in terms of fore and aft) is 6.2, the plan form is nearly rectangular, the extremities only being partially cut away and rounded off. The auxiliary surfaces consist of a double horizontal rudder placed in front, and a double vertical rudder astern, also two small vertical fixed fins of half-moon shape, placed between the members of the horizontal rudder. The total area of these auxiliary surfaces is about .3 of that of the aerofoil, or, say, 150 sq. ft.

The Wright machine is propelled by two screws of 8 ft. 6 in. diameter (2.6 metres), and, so far as the author has been able to estimate, the *effective* pitch is somewhat greater, being about 9 ft. or 9 ft. 6 in. These propellers are mounted on parallel shafts 11 ft. 6 in. (3.5 metres) apart, and are driven in opposite directions by chains direct from the motor-shaft, one chain being crossed. The number of teeth of the sprocket wheels, counted by the author, gave the ratio 10 : 35.

The motor is of the four-cylinder vertical type, the cylinder dimensions being variously given as from 106 to 108 mm. diameter by 100 to 102 mm. stroke, the probable dimensions being in inches, 4½ x 4. The total weight of the motor is reputed to be 200 lbs. (90 kilos), and its power is given as 24 h.p. at a normal speed of 1,200 r.p.m. According to another source of information, it is capable at a speed of 1,400 revolutions of developing 34 h.p. The two statements do not altogether agree, but may be explained by the fact that more than one engine has been fitted.

In conversation, the author understood Mr. Wright to say that he could fly with as little as 15 or 16 h.p., and that his reserve of power when unaccompanied amounted to forty per cent.<sup>1</sup> His gliding angle, he said, was about 7°.

## The Voisin Machine. Origin and Description.

MM. Voisin began their experimental work some years before their name was known to the general public, or rather some years before their machines came into public prominence through the exploits of Farman and Delagrangé, for comparatively few people even at the present time are even aware of the name of the makers of these most successful machines. In 1904 MM. Voisin constructed for Mr. Archdeacon some cellular kites of a large size, of very much the form of their

present type of machine. These were tested in tow of a motor launch on the Seine, and provided much of the data that MM. Voisin afterwards utilised in the construction of the flying machines that brought their work into public prominence.

The MM. Voisin and their engineer or works manager, M. Colliex (who is largely responsible for their designs), make no secret of the fact that they have based their work on that of pioneers such as Lilienthal, Langley, and others; and, in fact, they say that they never miss an opportunity of utilising any information or data on which they can lay hands. On the other hand, much of their work is based on their own researches. They appear to take little for granted, having equipped themselves with an "artificial wind" apparatus, with which they test their work on a small scale before finally settling a design.<sup>2</sup>

The Voisin factory is on a comparatively small scale. The output and work in hand at date includes (amongst others) some five machines of the Farman-Delagrangé type and four machines of a modified pattern with an aerofoil consisting of three superposed members. The former is the only type of machine for which flight data are to hand, and in the remarks that follow it is this type to which reference is made as the *Voisin machine*.<sup>3</sup>

It appears from statements made to the author by MM. Voisin (and confirmed by Mr. Farman himself), that, when their designs were prepared, the first order they obtained was from M. Delagrangé, and the second from Mr. Farman, who placed his order for what was practically a duplicate machine. That Farman made successful flights before Delagrangé was due in the main to the fact that he had made in advance appropriate arrangements for testing and trials on the Champ de Manœuvres at Issy des Moulineaux—a precaution that the latter neglected—and it would seem that it is hopeless to attempt to fly, at least, with a new machine, without some such provision. It also appears that the Delagrangé machine went through some kind of a history in its early state, the wheels fitted in the first instance not being arranged as it was subsequently found necessary to arrange them, namely, as castors, or, as the French express it "orientable." It is this provision that takes care of any slight side component of the wind when starting and alighting which might otherwise upset the machine.

The Voisin machine is given as weighing complete, with Mr. Farman "up," 1,540 lbs. (700 kilos), and has a total supporting surface of 535 sq. ft., this being the combined area of the horizontal members of the aerofoil and the tail, both being used for sustentation, though there are reasons for supposing that the pressure per sq. ft. on the aerofoil is greater than on that of the tail.

The ordinary maximum velocity of flight is approximately forty-five miles per hour or 66 ft. per second (= 72 kilometres per hour).

In addition to the horizontal sustaining members of the aerofoil and tail there are a number of vertical members whose function is to preserve and control the direction of flight and to give lateral stability. These have a total area of, approximately, 255 sq. ft.

The supporting surfaces of both aerofoil and tail are of rectangular plan form, the former being 10 metres x 2 metres, and, therefore, having an aspect ratio = 5. The aspect ratio of the tail members is 1.25; they are nearly square.

The Voisin machine is propelled by a single screw of 7 ft. 6 in. diameter (2.3 metres), of which the effective pitch is approximately 3 ft. (the actual pitch is much greater, the "slip" being excessive). The propeller is keyed direct to the motorshaft.

<sup>1</sup> It is of interest to note that the MM. Voisin and their staff are entirely responsible for the design of their machines, and *guarantee that they will fly*. The purchaser pays for his machine in part as a deposit, and the remainder when the machine has actually flown. It is time that the false impression that has been conveyed to the public by the press should be dispelled. Messrs. Delagrangé and Farman (Voisin's first customers) had no more to do with the design of their machines than the purchaser of a motor car from the manufacturer.

<sup>2</sup> So far as the author is informed the "triplane" type of Voisin machine (Goupy 1) has not performed so well as the earlier model (Farman type), though this may be due to the short time that it has been in the hands of the aeronauts. The author believes that the three members of the aerofoil are relatively too close to one another for best efficiency: their aspect ratio also is not good. Beyond this the position of the propeller (in front) is one not conducive to the best efficiency, and the ræ of the propeller in such a position may materially add to the body resistance. Finally, the machine is stated to be overweight.

<sup>3</sup> The author is of opinion that, although there may be nothing altogether inexact in this statement, it is, unless qualified in some way, capable of conveying an erroneous impression.

\* Paper read before the Aeronautical Society of Great Britain, on December 8th, 1908, by F. W. Lanchester.



The motor fitted to the Voisin (Farman) machine is an eight-cylinder Antoinette, 4.35in. diameter x 4.15in. stroke (110 mm. x 105 mm.), stated to give 49 b.h.p. at 1,100 revolutions per minute. Its weight is given as 265 lbs. (120 kilos.).

It is said that the gliding angle of the Voisin machine was at first approximately 1 : 5, or 11 degrees, but that by detail improvements in diminishing framework resistance by rounding off and covering in to form streamline sections, the gliding angle has been improved, and is now about .16 radian, that is between 1 : 6 and 1 : 7, or 9 degrees approximately.

**Comparison of the Two Machines.**

**WEIGHT.**—The first point to which we may direct our enquiry is that of the difference of weight. The Voisin machine is forty per cent. heavier than that of the Bros. Wright. Since the passenger accommodation of the two machines is almost identical (both machines have shown themselves capable of raising one person of ordinary size in addition to the aeronaut), it might be supposed that the less weight of the Wright machine is a definite advantage; in fact, it might be thought that the less weight betokens more scientific design; claims in this direction have, in fact, from time to time been made.

There is, however, one feature in which the machines differ, and which is unquestionably responsible for much of the difference in weight. The Voisin machine is fitted with a "chassis" with four wheels mounted to swivel freely, this being an essential feature of a well-designed alighting mechanism, the front wheels are provided with a spring

*The Wright and Voisin Flying Machines.*

**HORSE-POWER.**—The next point of comparison is that of the horse-power employed as related to the weight and velocity, thus touching on the question of the relative efficiency of the two machines.

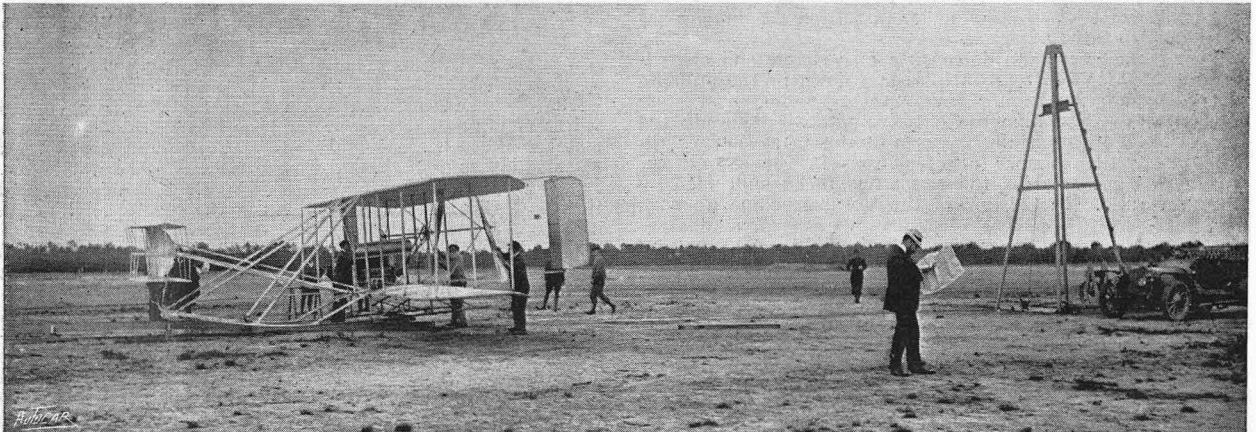
The author was shown<sup>5</sup> that for equal perfection of design the resistance to flight of two machines of equal weight is approximately independent of the velocity of flight, consequently the h.p. will vary directly as the velocity of flight, and the Voisin machine is entitled to more power, not only on account of its greater weight, but also on account of its greater velocity. In the absence of more exact information, we may take the velocity of the Voisin machine as being ten per cent. greater than that of the Wright; this is roughly in accordance with the figures already given.

The declared b.h.p. of the motors is sometimes not very reliable. It is customary to use the expression in a rather elastic manner. Let us make an estimate based on the cylinder dimensions and revolution speed of the two engines, assuming the same mean pressure for both. Employing the figures already given, and for the purpose of comparison assuming a mean pressure = 72 lbs. per square inch as appearing at the brake, we have, at the speeds corresponding to the declared b.h.p.,

Wright ... .. 4.25in. x 4in. at 1,200 revs., 24.7 b.h.p.  
Voisin (Antoinette) 4.35in. x 4.15in. at 1,100 revs., 49.2 b.h.p.

which agree remarkably well with the declared h.p. in both cases.

It is still questionable whether the declared speeds of revolution are those actually employed in flight. The author



Photograph by

The Wright machine showing the starting track and tower.

J. Thiodoresco

suspension to diminish the shock of landing or consequent on starting or alighting on rough ground. The Wright machine has no such provision, but possesses instead a pair of wooden runners of comparatively little weight.

The total weight of this "chassis" of the Voisin machine is said to exceed 1 cwt. (50 kilos.), and even if this is an exaggeration it certainly cannot be far short of that amount, and probably exceeds the corresponding weight carried by the Wright machine by at least 60 lbs. or 70 lbs. Now the total inert load carried by the two machines is otherwise about the same, and may be taken as about 200 lbs., representing the aeronaut and sundries, and it is evident that, other things being equal, the total weight of the machine should be proportional to the inert weight it has to raise, that is, in the ratio of 200 lbs. to 270 lbs. or thereabouts, and thus the greater weight of the Voisin machine is in most part explained.

If the runners of the Wright machine would do all that can be done by the Voisin mounting, then this additional weight would not be justified, but they will not do so. The Voisin machine can rise by itself from any reasonably smooth surface. The Wright is unable to take flight without its launching gear, hence it is not legitimate to attribute its relative lightness to the superiority of its design.<sup>4</sup>

<sup>4</sup> It has been recently reported that the Wright machine has undergone alterations by which it is enabled to rise from the ground by its own power. Whether the machine has been fitted with permanent wheels or whether it is mounted temporarily on a trolley which it leaves behind when it rises, the account does not say; probably it is the latter.

believes, in fact, that in both cases the speeds are, if anything, under-stated—at least, for the ordinary conditions of flight. They may, however, be taken in good faith, and we accept as a fact that the b.h.p. supplied to the Voisin machine is almost exactly double that fitted to the Wright.

On the above basis the Wright machine is fitted with 1 b.h.p. for every 45 lbs. sustained, which rate would give the Voisin machine 34 b.h.p., or, allowing for the difference

<sup>5</sup> "Aerial Flight"; Vol. II., *Aerodynamics*. Ch. VII.

<sup>6</sup> The rate of increase of altitude of a machine having a reserve of 40% would be quite sensational. Thus at 1,000 metres per minute velocity the power required for horizontal flight may be represented by a loss of altitude of about 130 metres per minute, and an additional 40% would give an actual rate of ascent of over 50 metres per minute. At the time of the author's visit a passenger of about 60 kilos. weight was being carried; the machine should still have been able to rise at a rate of over one metre in two seconds. It is on record that on one occasion Mr. Wright took up with him a passenger weighing 100 kilogrammes, but on the other hand on another occasion he failed after repeated attempts to raise another passenger of approximately this weight; it may consequently be inferred that an addition of 100 kilos. to the 500 kilos. normally carried, that is, an addition of about 20%, represents approximately the limit of the capacity of the machine. Beyond this Mr. Wright has admitted (at least to the author) that his gliding angle is about 7 degrees; this, at a gross weight of 1,100 lbs., gives 140 lbs. thrust required, and at 58ft. sec. the thrust h.p. becomes 14.5. Now Mr. Wright also agrees 21 b.h.p. as the power of his motor, which if 40% in excess of his requirements gives 17.1 b.h.p. as ordinarily utilised, or the total efficiency of gear and screw propeller would be 85%—a manifest absurdity. If Mr. Wright's statement may be taken to mean that the thrust h.p. required is about 15 to 16 h.p., and that his reserve of power is 40% to include that lost in propulsion, then the whole matter is clear. It is possible that the author misunderstood Mr. Wright's meaning.

*The Wright and Voisin Flying Machines.*

in the speed of flight, 38.5 h.p. should be sufficient to place the machines on an equal footing. But the actual h.p. of the Voisin is 49.2, or an excess of about twenty-eight per cent., and this excess must either be accounted for as a surplus of power—the measure of which is the rate that the machine can increase its altitude—or it represents a loss of efficiency in the propulsion or sustentation.

Now there does not seem to be any substantial difference between the reserve lifting power of two machines; they both appear to have about ten, or at most twenty, per cent. surplus power. Mr. Wright claims more, but the performance of his machine does not seem to bear out his claim.<sup>6</sup> We may consequently infer that the loss of power in the Voisin machine is correctly represented by the foregoing figures.

We will now endeavour with the data at our disposal to ascertain the cause of the loss of efficiency in the Voisin machine. The flight velocity and the motor revolution speed (together with the ratio of the gear reduction in the case of the Wright machine) allow us to calculate the effective pitch of the propellers. We already know their diameter, and from the pitch diameter ratio we can form a close estimate of their efficiency. We shall then be able to form an estimate of any remaining difference in the efficiency of the two machines.

Without going into the method by which the computation of the propeller efficiency is effected, it may be remarked that the method involves the assumption that, in each case, the designers have approximately determined the form of best efficiency under the restricted conditions of the pitch-diameter ratio adopted. That this assumption may not always be correct is obvious, but that it is somewhere near the truth in the two cases under discussion the author has been able to satisfy himself.

The method beyond this consists of a simple and elementary application of the principles laid down in the author's "Aerodynamics," Chapter IX.

Firstly, to determine the effective pitch. This in the case of the Voisin machine is given by the distance travelled, divided by the number of revolutions in the same time. In the Wright machine the result has to be multiplied by the gear ratio. In the case of the Voisin machine we have

$$\frac{66}{18.3} = 3.6\text{ft. as the effective propeller pitch; in the Wright}$$

$$\text{machine we have } \frac{58 \times 33}{20 \times 10} = 9.6\text{ft., or the diameter in terms}$$

of effective pitch in the two cases is: Voisin 2.1 and Wright .88.

The efficiencies found by the author as appropriate to these pitch ratios are respectively: Voisin .54, Wright .68; or, deducting in the latter case five per cent. on account of the chain drive (certainly not a too great allowance for the power consumed by a chain running at about 16ft. sec.), we have the total efficiency of propulsion: Voisin .54, Wright .63.

In the table that follows, column 1 gives the foot pounds given out by the respective motors per revolution on the basis already employed, i.e., 72 lbs. per square inch mean pressure. Col. 2 gives the feet traversed by the machine per motor revolution. Col. 3 gives the efficiency of propulsion as above. Col. 4 gives the thrust in pounds calculated from the three preceding columns. Col. 5 gives the weights of the machines, augmented by an amount that we have estimated would absorb the whole thrust in horizontal flight—that is, the maximum weight that can be sustained in flight. Col. 6 gives the resulting value of  $\tan \gamma$ ; and col. 7 gives the equivalent in degrees ( $\gamma$  is the gliding angle).

TABLE.

	1	2	3	4	5	6	7	8
	Ft. lbs.	Ft. per rev.	Efficiency.	Lbs. Thrust.	Weight.	$\tan \gamma$ .		$\gamma^\circ$
Wright...	708	2.9	.63	155	1300	.12		7°
Voisin ...	1550	3.6	.54	230	1720	.135		7° 40'

It would thus appear that, in addition to being considerably less efficient in its screw propeller (a tax paid for the constructional advantage of a direct drive), the Voisin machine is also slightly less efficient considered as a glider; that is to say, its gliding angle is not quite as good as that of the Wright machine—the machine is aerodynamically less efficient.

The reason of this may be due to the fact that it has a less aspect ratio, but it may quite well also be due to many other causes. The Voisin machine has relatively greater idle surface subject to skin friction; also the sustaining surfaces of the tail act on air that has already been trodden by the aerofoil.

The author is not altogether satisfied that the gliding angle is actually as low as that deduced above. It is possible that the motor, with the machine at the velocity stated in both cases, runs somewhat faster than that declared, and that consequently the pitch of the propellers is proportionately less, since this has been deduced from the revolution speed. An error of this kind, so long as it is much the same for both machines, would not materially affect the results, except that in both cases the gliding angle would be proportionately greater. The error may possibly amount to a matter of about 10%.

It is also worth while noting that what is termed the mean or actual pitch of the propeller blades will be greater than the effective pitch. The pitch as measured from the blade angle is probably in the Wright propeller about fifteen per cent. more than the effective pitch, and in the Voisin about twenty-five per cent. On this basis, the Voisin 3.6ft. becomes 4.5ft. (= 1.37 metres), and the Wright 9.6ft. becomes 11ft. (= 3.35 metres).

Taking the gliding gradient  $\tan \gamma$  for the Wright machine as .135, and that of the Voisin machine .150—values which the author considers most probably a close approximation to the truth—we may roughly look upon the resistance as accounted for as follows:

	Wright.	Voisin.
Skin friction, $\xi = .01$	40 lbs.	60 lbs.
Struts and wires	30 "	20 "
Aeronaut, motor, etc.	20 "	10 "
Radiator and tanks	5 "	25 "
Alighting gear	—	10 "
Sustentation (power expended aerodynamically)	60 "	100 "
	<u>155 lbs.</u>	<u>225 lbs.</u>

The above do not correspond exactly with the suggested values of  $\tan \gamma$ , but they are as near as the author can estimate at present. The addition in the case of the Wright machine is a trifle high, and that of the Voisin is a little low. Possibly the fault is with suggested values themselves, and there is really less difference between the gliding angles than has been supposed.

In conversation with the author, Mr. Wilbur Wright has stated that he makes no allowance for skin friction, and that he believes it to be negligible. There is evidently considerable scope yet for guesswork. It is quite likely the designers themselves could not give a much better approximate balance-sheet of the resistance account than that here presented. It is possible that the co-efficient of skin friction  $\xi$  is less than .01; for these large surfaces and high velocities it is conceivably no more than half this value. It is equally possible that the other direct resistances, struts, wires, etc., have been under-estimated; there may also be faults of as much as 10 or 15% in the estimate of the energy expended in sustentation, but it is quite certain that skin friction is not negligible, but that it is a substantial quantity of the order indicated. It is also quite certain that the gliding angle of the machines is round about the values given 1:6 to 1:8, and is nowhere near 1:12, as has been stated in a recent paper on the subject. It is also improbable that the efficiency of propulsion is in any case as high as 75%, as it has sometimes been represented (in the case of the Wright machine), although it may in both cases be a few per cent. greater than given in the present paper.

On the whole the advantage certainly rests with the Wright machine from the aerodynamic standpoint.

STABILITY.—We now pass on to consider the question of stability and control.

(1) *Longitudinal Stability.*

In the case of the Wright machine, it is claimed by Mr. Wright himself that the stability depends entirely on the skill and address of the aeronaut; in fact, if we are to credit the unchallenged account of Mr. Wright's declaration on the subject,<sup>7</sup> he does not believe in the possibility of safety under ordinary weather conditions being achieved by the inherent properties of the machine. He says that, sooner or later, the fatal puff must come that will end the flight.

The author's own observations on the flight of the Wright machine fully confirm the statement that Mr. Wright depends entirely upon his manipulative skill. It appears that in flight the leading plane travels through the air carrying little or no load. In the ordinary conditions of straight flight their direction is as nearly as can be estimated parallel

<sup>7</sup> See account of speech at banquet given by Aero Club de France—*New York Herald* (Paris edition), November 3rd, 1908.

to the frame of the main aerofoil, and both seem to move almost exactly edgewise. It follows from this that the machine cannot be automatically stable, for if the plane were fixed for any period of time, and if during that period the machine made the smallest pitching movement either one way or the other, the resulting change of pressure on the leading plane (or planes) would tend to exaggerate the initial movement, and the machine would turn over. The position of the machine with the leading planes fixed is comparable to an arrow travelling feather first, and this condition is one of instability.

In brief, not only does Mr. Wright design definitely for hand-controlled equilibrium, but he has no belief in the possibility of making a machine safe by its own inherent stability. The success of the Wright method shows that *there is at least more than one way to fly.*

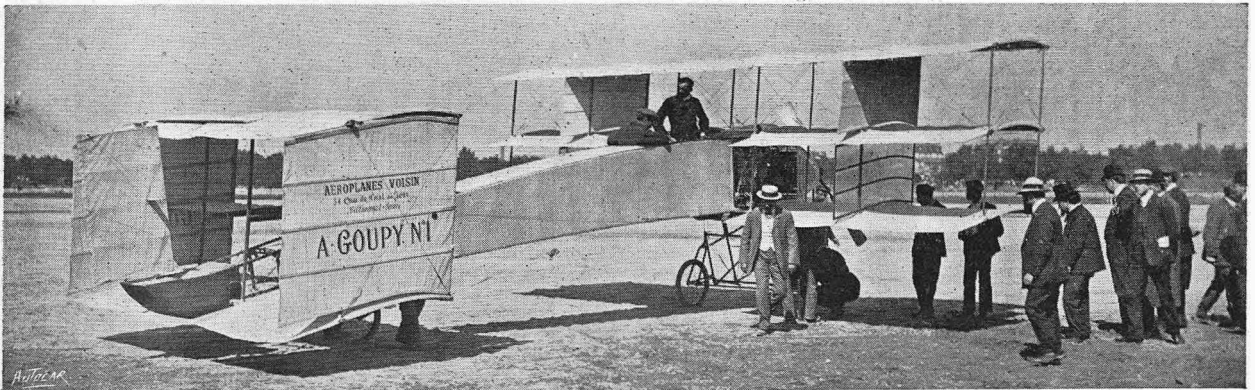
In the Voisin machine, on the contrary, it has been the intention of the designer that the machine should be automatically and inherently stable, and unquestionably to a great extent he has succeeded. The author is at present compelled to speak with some reserve as to the degree of success that MM. Voisin have achieved; they have promised to supply particulars that will enable the point to be investigated, but up to the time of writing this promise has not been redeemed. In the meantime, it may be remarked that the disposition of the organs of the Voisin machine are such as will give automatic stability if the following conditions are fulfilled: (1.) If the pressure is less (per square foot) on the tail than on the main aerofoil, so that the attitude of the aero-

### The Wright and Voisin Flying Machines.

(1.) A one-tenth scale model showed itself quite stable in gliding flight.

(2.) A machine mounted by Delagrange made a smooth glide to earth without the intervention of the aeronaut in any way when the ignition was cut off at eight metres altitude.

The first of these tests would be quite satisfactory if due precautions are taken to ensure that the model test is made under the conditions of corresponding speed. As a matter of fact, the velocity of the model was nearly half that of the full-sized machine instead of slightly less than one-third, as it should have been. In consequence, it follows from the equation that its factor of stability was about three times that of the full scale machine, so that the experiment cannot be considered conclusive. The evidence of the flight of the actual machine in the hands of Delagrange also is insufficient, for the horizontal distance that the machine would glide from a height of 8 metres altitude would be approximately 55 metres, and this is scarcely more than one quarter of a phase length. For this test to be considered satisfactory, the machine should be allowed some four or five free oscillations, and the phase length being about 600 feet, this involves a flight path of about 3,000 feet length, or a fall of about 500 feet, that is, 150 metres. There is thus no proof at present forthcoming as to the stability or otherwise of the flight path of the Voisin machine, but it is at least the intention of the makers that it should be longitudinally stable, and from conversations that the author has had with the MM. Voisin and with their engineer, M. Colliex, they



Photograph by

A view of a Voisin machine showing the "chassis" on which the machine alights.

J. Theodoreco.

drome to its line of flight is one of stable equilibrium. (2.) If the areas and disposition of the surfaces, the amount of inertia, the velocity of flight, and the natural gliding angle, are related to comply with the equation of stability,\* so that any oscillation in the vertical plane of flight will not tend to an increase of amplitude.

From the behaviour of the machine it is not possible to tell whether these conditions are complied with, because it is fitted with a horizontal rudder in front, by which the aeronaut can correct any departure from the straight line, and this appliance is unquestionably utilised to destroy any oscillation that would otherwise arise. It is a big rudder about one quarter the area of the aerofoil, and skilfully handled it would entirely mask the natural free oscillation period of the machine. From observation of the flight the author is of opinion that whether the machine has inherent stability or not, the actual fact is that its motion (in the sense under discussion) is just as much controlled by hand as the Wright machine. In the hands of a beginner the machine would, however, very likely be able to take care of the aeronaut to some extent, performing oscillations the while, until the aeronaut has learned to take care of the machine; this view is suggested by the fact that many of the observers who saw Farman and Delagrange early in their career witnessed the phugoid oscillation, whereas the author who saw Farman only a few weeks back could not detect any oscillation at all, except for a brief period after he first left the ground, and this in spite of the fact that the day was by no means calm—a very perceptible breeze was blowing.

M. Colliex, engineer to MM. Voisin, claims that the flight path of their machine is stable on the following grounds:

appear to be alive to many of the points that conduce to such stability.

#### (2) Lateral Stability.

In the Wright machine the lateral stability is under the direct control of the aeronaut. The "two wings" of the aerofoil being given a twist by straining the structure by means of wires arranged diagonally in the rear panels of the two end bays on either hand. This causes the wings to meet the air at different angles of incidence, and so any desired turning moment about the axis of flight (within certain limits) is at command. This mechanism is employed to neutralise the influence of wind gusts, and to correct the position of the machine should it acquire an undesirable list. It is also utilised to prevent the machine canting too much when turning, and to facilitate its employment in this respect, the rudder aft and the twisting of the wings are operated by one lever, the motion to the right and left being utilised to put tension on the diagonal wires one way or the other, and the movement forward and backward works the rudder.

It is desirable to correct a false impression that is current on the action of the wing twist. It has been supposed by some that it is used to give the cant required by the machine when turning, but such is not the case. If the rudder is used the machine almost immediately gets a cant owing to the greater pressure on the wing that in turning is moving faster through the air, and this cant becomes, if unchecked, far too severe. The twist is then used to check the cant, the

\* A certain patentee sent the author a specification of his invention in which a rudder was carefully arranged to act spirally, to give a cant in the direction of the banking, that is the direction in which the turning moment is already excessive. He might be well advised to take out another patent for the same device, arranged to act in exactly the opposite way.

\* "Aerial Flight." Vol. II. Aerodionetics. Ch. V. and VI.

*The Wright and Voisin Flying Machines.*

ing on the outer circle, that is farthest from the centre of curvature, being "feathered," the inner one having its angle of incidence increased.<sup>9</sup>

In the Voisin machine no hand adjustment is provided to enable the aeronaut to control the lateral stability, hence, in this case, it is definitely automatic. The Voisin machine is steered by means of a vertical rudder arranged between the fixed tail members, and there is apparently no special mechanism to prevent the over canting, consequently Farman in his flights commonly turns in a leisurely manner, employing a circle of considerable radius, whereas Wright may often be seen to perform sensational evolutions, turning with his wings canted to nearly 20 degrees on a radius of perhaps not more than sixty or seventy yards.

It is of interest to note that Farman has recently had fitted to his machine some adjustable flaps to give in effect the wing twist employed by Wright. Presumably, this is to facilitate turning, for the flight of the machine does not suggest that they are otherwise wanted; under other circumstances the lateral stability leaves little to be desired.

Summarising the comparison from the aerodynamic standpoint, the author is inclined to think that the Voisin machine has the advantage, as containing more of the features that will be embodied in the flying machine of the future. Mr. Wright's contention that it only requires a big enough puff of wind to upset a machine that depends upon its own inherent stability is certainly true, but probably the same is equally true of the hand-control machine. There is a limit to the extent of the control that can be exercised, and with hand-control we have, too, the possible failure of the human machine. The fact is that the secret of stability is contained in the one word *velocity*, and until it is possible to attain higher speeds of flight, we cannot hope to see the flying machine in everyday use.

There is one other point of comparison that, if space permitted, the author would like to make. As it is, a few words must suffice.

The constructional methods employed by Wright and Voisin present a striking contrast. The Wright machine is astonishing in its simplicity—not to say apparent crudity of detail—it is almost a matter of surprise that it holds together.

The Voisin machine has at least some pretensions to be considered an engineering job.

Mr. Wright defends his methods by asking what would be said by an engineer to the rigging of a sailing vessel if shown it for the first time, and to some extent the analogy is a good reply to the objection; still the author feels (perhaps wrongly) that there is a considerable amount of the Wright "mechanical detail" that might be revised with advantage—at least before the machine is placed in the hands of the private user. However, "the proof of the pudding is in the eating," and in spite of the rudimentary

character and aggressive simplicity of the constructional detail of the Wright machine, it appears not to come to pieces, but continues to fly day after day without showing any signs of weakness or disintegration.

On the question of the motor and transmission mechanism we tread on difficult ground, for the Voisin system of metal propeller is keyed direct to the crankshaft, and is so immeasurably superior, from the purely *mechanical standpoint*, to the chain drive and wooden propellers of Wright that comparison is unnecessary. Since, however, the simple and direct arrangement adopted by MM. Voisin is paid for at the price of about a fifteen per cent. tax on the transmitted horse-power, the question is evidently one of the balance of advantages and disadvantages that are of entirely different kinds. The author has reasons for supposing that, if in the machine of the future the geared propeller survives (for it is essentially the use of *gearing* in the Wright machine that permits the better proportions of propeller to be used), it will be in the form of a propeller or propellers centrally situated, thus resembling the Voisin arrangement, rather than in the distribution of propellers such as at present employed by the brothers Wright. The simplicity of the direct drive may, however, alone be sufficient to outweigh any economic advantages that gearing may possess.

I personally consider the Wright disposition of propellers to be a source of danger. If a torque is applied to an aerodrome about a vertical axis, rotation about this axis at once begins, and the outer wing, travelling through the air faster than the inner, experiences a greater lifting re-action, and if the torque is sufficient the machine is very soon (in nautical phraseology) on its "beam-ends." It is evident that, if one of the propellers fail from the fracture of a chain or other cause, unless the motor be instantly stopped, the whole power of the motor, and therefore the whole thrust, will be transmitted through the other propeller, causing a torque about a vertical axis that must be overwhelming. If the motor is promptly stopped, then much will depend whether the propeller that has failed is scotched or free. If it has jammed, then it will probably balance by its drag the other propeller, which is either stopped also or is driving the motor against its internal friction; if on the contrary it is free, then the drag of the other propeller will be unbalanced, and there is a serious torque in the opposite sense to that which would have existed if the motor had still been running. Whether Mr. Wright can, in the latter case, by wing-twisting and other contortions, save himself from destruction I do not know. It was said (*vide press*) a short time ago that a chain actually broke in flight, and the machine safely landed; the altitude when the accident occurred was stated to be only four or five metres, so that Mr. Wright did not have a fair chance of exhibiting his resources. It is to be hoped that he will not have such a mishap at a higher altitude.

deaf ears. Nevertheless, lest some people should be led away by the specious arguments and misrepresentations of this handful of alarmists, it behoves automobilists to stand up and meet them whenever possible. An attempt was made to form a branch at Manchester, and out of about a hundred people present Mr. W. E. Rowcliffe was the only motorist who attended to raise a voice against the motions that were proposed.

\* \* \*

The Acting British Consul at Bangkok (Mr. W. N. Dunn) reports that it would seem that Bangkok is one of the principal markets for motor cars in the East, the number now in use being about 300. The great majority of these cars are owned by Siamese and employed for pleasure purposes. The import shows no sign of slackening, and as long as it is the fashion to drive a motor car so long will the demand continue. The roads have been much improved in the last few years, the improvement being almost entirely due to the advent of motors. More British cars are now in evidence. It may be of interest to mention that the bodies of motor cars are now frequently made in Bangkok, a flourishing carriage-building industry having been in existence for some years.—*The Board of Trade Journal*.

The Highways Protection (otherwise anti-motorist) League held its annual meeting on the 9th inst. at the Westminster Palace Hotel, Lord Willoughby de Broke presiding. Posing as the champion of the poorer classes, Lord Willoughby remarked that Parliament would be well advised to make laws dealing with motorists before the people took the law into their own hands. Mr. J. Cathcart Wason, M.P., moved a resolution "urging on the Government the necessity for introducing at an early date legislation for the better protection of the public from the evils arising from motor traffic." Mr. Luke White, M.P., seconded, and Mr. Henry Craik, K.C., M.P., and Mr. Harold Cox, M.P., supported the motion, which was carried unanimously. The meeting was not largely attended, and it remains to be seen what effect the lowering of the annual subscription to 1s., which was decided upon, will have upon the fortunes of the organisation. We do not suppose for one moment that this straw at which the drowning league is grasping will save it from being engulfed; for, as we remarked in *The Autocar* last week, the people of this country are realising that the motor car is calculated to benefit them rather than to do them harm. The scares and abuse of not altogether disinterested agitators are falling largely upon

### "THE AUTOCAR" LECTURES.

Assistance and Appreciation at Newcastle-on-Tyne.

Of the audiences at the various centres at which *The Autocar* lectures have been delivered, Newcastle seems to have been one of the most interested and enthusiastic. At one of the lectures, Dr. W. R. Ormandy, the lecturer, mentioned that he should be glad to have the loan of a coil to illustrate the general principles of ignition. To his astonishment, at the next meeting he found the whole of the Physics Lecture Theatre bench at the University, where the course of lectures was delivered, covered with the finest display of electrical apparatus he had seen for a long time. There was apparatus to show the production of currents in coils by means of magnets and the action of one coil carrying a current on an insulated coil, the whole being connected to galvanometers throwing a spot on the wall visible to the whole of the audience. Coils were provided having condensers of variable capacity to show that not only did the capacity of the condenser affect tremendously the amount of sparking at the low-tension platinum make and break, but also to a high degree the intensity of the spark. Quite a number of other interesting pieces of apparatus were put out, and the Professor of Physics himself attended the lecture to give assistance in connection with the apparatus.

Dr. Ormandy, of course, thanked the professor and the authorities for the great trouble they had taken, and we, too, join with him in acknowledging this kindly interest and assistance. The attendance was over 120, and although the lecture lasted within a few minutes of two hours the audience remained undiminished till the close.

The course at the several centres is drawing to a close, and we may say that we are highly delighted with the results from an educational point of view.

### THE NEW E.I.C. SPARKING PLUG.



The new E.I.C. plug.

The excellent reputation borne for so long by the ignition specialities of the Electric Ignition Co., of Birmingham, will always ensure attention for any new article they may put forward. The new sparking plug illustrated herewith, which embodies the well-known E.I.C. principle of insulation by means of compressed mica plaques, presents several valuable features. The casing of the plug itself is of robust construction, and the threads are well and cleanly cut. The boss-headed conductor is generously insulated both as to its exposed parts and the section passing through the body of the plug. The conductor is carried well forward of the end of the plug, in order that the sparking points may stand well into the mass of fresh mixture—an excellent point with engines that have somewhat deep valve pockets. The twin earthing points are so shaped and set that there is no tendency whatever for the lodgment of oil or carbon, while the double spark which takes place doubly ensures ignition.

### THE CHAS. JARROTT RECORD BOOK.

Mr Jarrott is good enough to send us a specimen copy of a new Record Book which he has just designed and produced. In making the tabulated arrangements illustrated, Mr. Jarrott has kept in view the fact that it is impossible for an owner, except when he himself looks after his car, to keep a careful and accurate record of the expenditure entailed, as many of the smaller details can only be known to the particular individual who looks after the car. This being so the book is arranged in such form that a weekly sheet can be made by the person responsible, and handed to the owner, who can then keep his own accounts and abreast

THE CHARLES JARROTT RECORD BOOK.												
Report for Week ending												
MILES	PETROL	LUBRICATING	SUNDAY EXPENSES				TYRE REPAIRMENTS			REPLACEMENT		
			E	C	E	C	RE	RE	RE	RE		
SUNDAY												
MONDAY												
TUESDAY												
WEDNESDAY												
THURSDAY												
FRIDAY												
SATURDAY												
TOTAL												

A page spaced for a week's entries of the Charles Jarrott record book.

of his car expenditure at the same time. The sheet for each week being made detachable, any question concerning the abnormal running of the car can be referred to the makers, so that the owner may week by week have expert opinion as to the economical running of his car. This particularly applies to petrol consumption and tyre upkeep.

This book has been produced by Mr. Jarrott without any idea of profit, but simply as a little assistance to owners of motor cars in keeping down the running expenses, for the reason that he is of opinion that the excessive running expenditure of a car discourages the use of motor cars more than anything else. The retail price of this book is 5s.

*The Autocar*

**THREE EDITIONS. — EVERY FRIDAY.**

The Threepenny Edition.  
*Printed on Art Paper.*

The Penny Edition.  
*Printed on thinner paper.*

The Foreign Edition.  
*Printed on light "bank" paper  
for circulation abroad (price 3d.)*

*Both the threepenny and penny editions can be obtained from all Booksellers and Newsagents. There is no difference in these editions except in the quality of the paper on which they are printed.*

# ON THE PARIS SHOW.

BY OWEN JOHN.

## The Home of the Show.

There seems to be a popular impression in England that our motor exhibition at Olympia is something of the same sort of thing as the French one now on. But nothing could be further from the truth, with the important exception that both buildings contain cars. To begin at the outside, I do not know who was answerable for the architecture of Olympia, but he must have taken his ideas from a back view of an elephant feeding in a brickyard, and perhaps as things are it is just as well it was planted as many miles from civilisation as it is. Of course, with such an exterior one cannot look for great things in the picturesque line inside; but one never realises how tawdry and makeshift the whole place is until one sees for the first time the *Palais* in which the French automobile exhibition is held. Whereas a few sandwichmen and possibly a kite or balloon indicate at a distance that a motor show is on in London, in Paris Venetian masts, flags, banners, and decorations point the way from almost all directions in unmistakable fashion. Even music halls (in their advertisements) arrange special programmes, the most fashionable *restaurateurs* cater in their most extravagant manner for visitors, and nothing possible seems to be left undone to attract. Whether it does attract or not is another story.

To those who have never been to the Grand Palais I can only compare its situation and surroundings to those of a Buckingham Palace set in the open, and not backed by ordinary dwellings. I am not an admirer of Buckingham Palace; indeed, I am of opinion that most London railway stations are handsomer buildings. But if one approaches it from Trafalgar Square by the new avenue one can get some faint idea of the importance and setting of the place where the French exhibition is held. By daylight it is imposing enough, but by night its illumination, even in this economical year, appears almost supernatural. And withal it is but ten minutes' walk from the very centre of Paris; wide roads converge upon it, and the underground railway has an outlet at its very door. Therefore if, as I hear, there is a possibility that this may be the end of the big automobile shows in Paris, the fault certainly does not lie at the doors of its home. And now as to its inside.

## The Visitors.

Possibly I may unwittingly have got into the habit of skipping descriptive writings in the press, for I must confess that I had no conception that the show covered such an enormous extent of ground. I suppose the main hall is cruciform in shape, though its galleries, ante-chapels, extra-chapels, halls, and balconies serve to dwarf its real immensity and conceal its limitations. An enormous band, skied high up aloft, never seems to be a nuisance or dominate conversation, and undoubtedly assists the true seeker for automobile enlightenment by drawing off the multitude of sightseers who come just as much to be seen as to see. They listen to the music while they drink five o'clock tea at Rumpelmayers, and are well out of the way—unless you want tea yourself. This crowd interested me almost as much as the show itself. No doubt they all motored, as the world calls motoring nowadays, but I strongly suspect that their acquaintance with it began and ended for the most part with

getting in and out of luxurious limousines. Possibly I may be wrong, but certainly I can never imagine these young effeminate-looking, cloth-topped, curled dandies assisting even to change a tyre or doing anything else but bow profoundly with much sweeping of the hat to their lady friends clothed in even more weird-looking costumes than themselves. I should not mention this had these courtesies not seriously interfered time after time with my peregrinations in search of novelty. Of course, there were others, indubitably real automobilists, for did they not wear all day long thick fur coats, goggles on their Balaclava helmets, and the creakiest of leather gaiters? As the Salon was heated with innumerable gas stoves, they must have found it necessary to suffer in order to be beautiful, and my heart quite went out to two Americans, who, having acquired goat coats, bravely wore them. Talking of barbarians, I never realised the true international character of the show until I came across a real Eskimo, with long black hair, reindeer skin garments, and everything complete but snow and a team of dogs, closely followed by an Oriental with a delightful thing in pig-tails—the object of much scrutiny and handling by certain less timid of the feminine visitors.

## The Accessories.

All the aisles were carpeted, and the main ones were so wide that the only place there was anything of a crush was where twin gigantic Bibendums hand in hand guggled and bulged to the huge delight of the populace all over the place. Especially on Sunday afternoon, for—at a time when Olympia, during the show, is in the sole charge of a watchman and a few stray cats—all middle-class Paris, arm in arm or else in long family strings, seemed to find enjoyment and amusement in parading up and down and all around. The hall devoted to motoring garments ran a good second to Bibendum, and some of the masks and *surtouts* seemed to afford infinite gratification. The things we define as "motoring accessories" are indefinitely extended across the Channel, and I had to rack my brains often to try and make out what connection some of the stalls had with automobiles at all. But, of course, it is a cycle show as well, though that in itself does not bring the explanation any nearer. I must confess that some of the clothing made me smile, and I daresay that if I ever met a papa, mamma, and their children all dressed in precisely similarly cut striped jaguar skin (see Stand —), I should be inclined to wonder if the Zoo had not possibly got loose and come across my path. I can now quite picture what a "Hairy Ainu" is like, and realise the Wild Man from Borneo is not entirely the fabric of a poet's imagination.

## Decorations and Illuminations.

They tell me that the signs on the stands this year are quiet compared with those at former exhibitions. If this is so I can only wonder what they used to be like, because I cannot imagine anything more fairy-like and gorgeous than the view of the big hall after lighting-up time. The many coloured bulbs melting into the blaze of wall decoration, fading into the roof like the frozen trails of a thousand glorious rockets, while above, in the high domes, the pale, weird, unearthly mercury lamps, give the light that never was on

land or sea, and which, I am informed, is most unpopular with persons who do not desire to look dead before their time. To plagiarise one of the bravest of Frenchmen, "It's all jolly fine—but it's not business!" And I would go so far as to say that it is even bad for business, and that if, as they say, there will be no more shows, it will be because the promoters, in their desire to attract, have overshot the mark and wasted their money and taste to such an extent that the original purpose is overshadowed by the counter-attractions grown out of it itself.

#### Comparisons and Contrasts.

Candidly, if anyone were to say to me, "I want a car. Shall I go to look for it at Olympia or in Paris?" I should advise him—putting lingual, patriotic, and holiday reasons aside—to go to the London show, for exactly the same reasons that would appeal to me if I were deciding whether to buy a new golf club at a sports emporium or a good club maker's shop. If one wants a good foreign car, there are plenty to be seen at Olympia, and it is almost safe to write that the only foreign machines not to be seen at Olympia are untested and non-proven makes, though, of course, there are exceptions to this rather sweeping statement. Though Olympia is smaller, and the facilities for car display are not so ample, the earnest seeker can always examine what he really wants to, and the following very curious difference appeared to me between the habits of English and French buyers. Whereas at home buyers take advantage of the slack times of lunch and early morning to pursue their investigations, in Paris between twelve and two exhibitors tell me it is hardly worth their while to remain on their stands. Perhaps the Frenchman prefers to be one of a crowd and do his business *coram populo*, or perhaps it is that national mealtimes admit of no alteration or postponement. I cannot tell. The distribution of literature, too, is on an even bigger scale than with us, as instanced by the sight of one vigorous collector attended by two small girl caddies absolutely loaded up with catalogues, while one advertiser did nothing all day but lean over the gallery railings and distribute advertisements in the shape of swallows that flitted and curved into an ever-increasing crowd below. Of course, the cocoanut matting that is

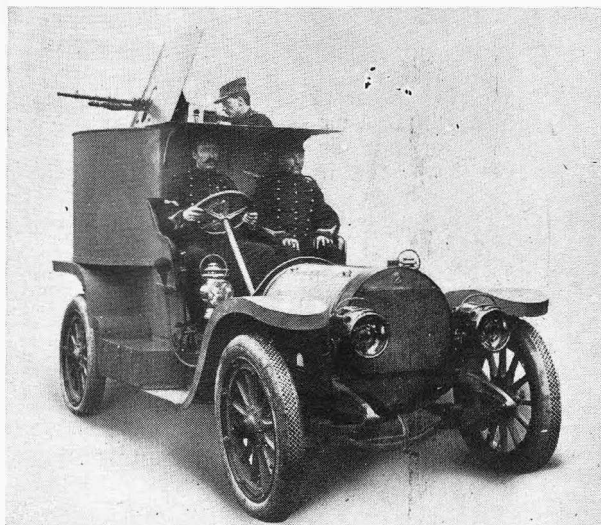
laid in all the passages makes walking and loafing much pleasanter than our hard cement. The observer cannot but be struck with the fact that nine-tenths of the visitors seem to spend their time in doing anything rather than examining the cars in their vicinity. One certainly cannot say the same with regard to the English crowd. They tell me that much good business was done, but evidently it is conducted in a different manner from ours, for, though I made a point of watching I seldom came across a group that answered to the well-known Olympia spectacle of Mr. ——— at the ——— Stand booking an order—or, at any rate, pretending to. Notices of cars sold were few, and very often when exhibited the name written was an English sounding one, the most notable exception being the 30 h.p. Wolseley-Siddeley chassis sold to Madame Fallières as a living example of all that is best in the *entente cordiale*. Everyone talked of this, and the smiling faces of the crowd that was always around the notice did one's heart good, and showed a real sentiment that bodes well for the future. The feeling I intend to convey is hard to describe, but it is of the same kind that arises in one when an unexpected regiment comes marching with the band playing down the village street.

#### The Cars Themselves.

Concerning the cars themselves that were on view there is no need for me to write, because the describing of them and their details is happily left to abler and more expert pens. But the tendency to make cars of between 12 and 20 h.p. is too marked to be overlooked, and if this size is deemed sufficient for France—where great wide roads lie straight for miles and miles between the towns, and immeasurable speed is of no danger—then in little crooked England, where a clear mile is the exception and not the rule, the same size ought to be equally valuable; not forgetting that a closed car, and consequently a much heavier one, is the almost universal type to be met with abroad. Of course, there were some quaint ideas.

The Darracq coach, with crest of boars' heads and hunting horns on the doors, coated bow-wows in the boot, and everything complete, made a great sensation, which, however, would be nothing to the *furor* it would create if ever by any chance it got into the ditch. Then, again, a little Sizaire-Naudin with a pointed nose and two eyes containing electric lamps was pure burlesque, while some genius had had the inspiration to turn a frame absolutely upside down and defy anybody to upset it by calling it the "Stabilia." But, considering the numbers of cars present, there were few freaks.

As to bodies, they were mostly good, but no better than our own best, though occasionally more unpractical. I am of opinion that the overcrowded and noisy gallery at Olympia is more interesting than that of the Salon, possibly because one has to go so far there to get at what one is in search of, and so can easily miss it altogether. Of course, there was an interested crowd around the Minerva-Knight engine, but it seems to me, considering how well known Daimlers are on the Continent, that it was a pity they were not represented as *the* firm who have faith enough in them to make no other kind of engine. An Italian Napier came in for a lot of observation; but I failed to find any direct English representative other than the victorious Siddeley above mentioned. It is not my business, but, from a national point of view, I should like to have seen, say, specimens of a Lanchester, a Rolls-Royce,



A Hotchkiss quick-firing gun mounted upon a 30-40 h.p. Hotchkiss car chassis. Six of these armoured vehicles were recently supplied to a European Government.

an Austin, and a Sheffield-Simplex, for I feel sure they would help to remove the prevalent idea that there are but very few good cars made in England. Whereas there are any number, though certain manufacturers, from some reason or other, are content to lie on their oars and imagine their products are incapable of further improvement, and that when Protection comes they will enter into the sole right of eating the fruits of their labours. That this is very far from the case is shown by the many arrangements I have heard of for the manufacture of French-designed cars in England; and when such machines as Renaults, Delahayes, Zedels, Delaunays, De Dions, and innumerable others are turned out inside our borders to compete with our own, these self-satisfied ones will find that success is not the simple thing it appeared to be.

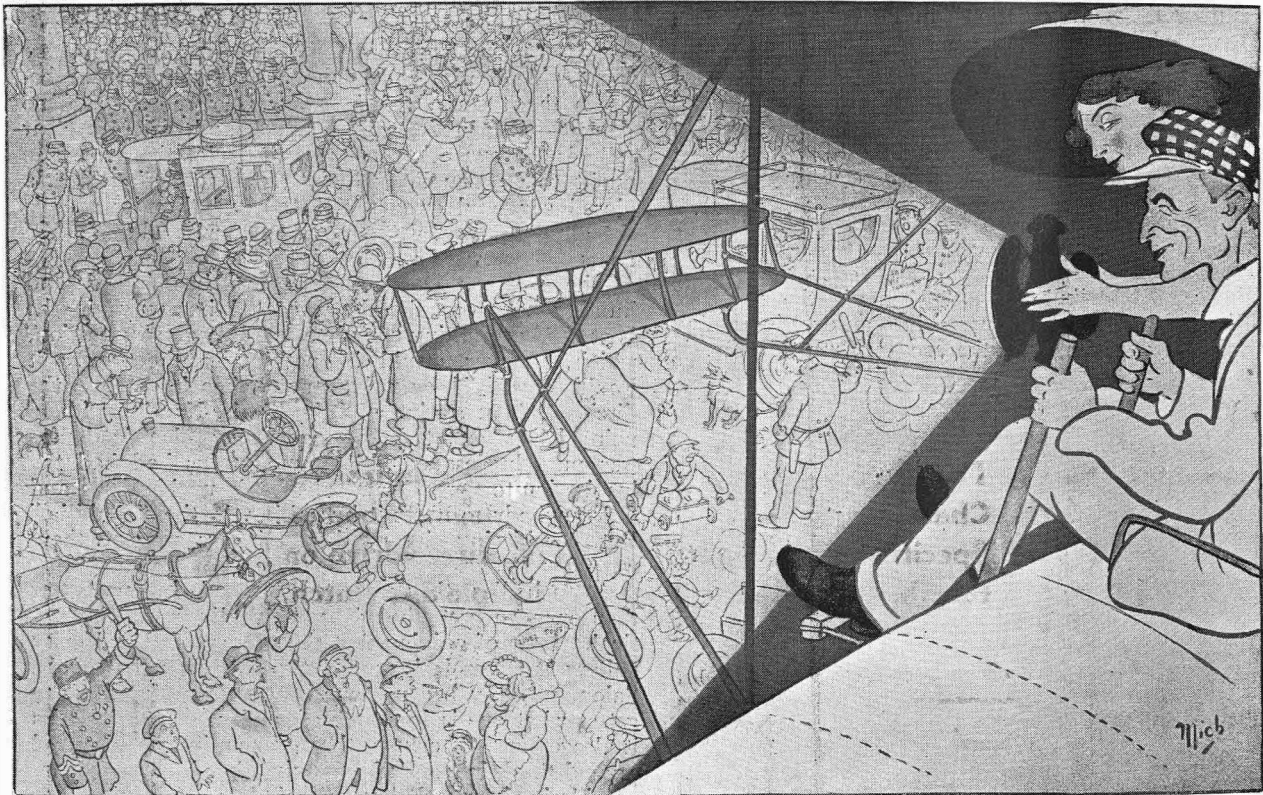
Once upon a time the great distinction lay in price, and English cars were undoubtedly cheaper, but now that is all altered, and many of the most famous houses in France sell 12 h.p. four-cylindered cars at not much more than a couple of hundred pounds, and for a little more invest them with delightful covered bodies that make you long for immediate possession. The car I have in mind is a yellow, window-paned Grégoire *désobligeante*, though a 12-14 h.p. Delahaye, covered in, took five of us out to Versailles on Sunday afternoon, and went as if it had at least 30 h.p. beneath its little bonnet. It is quite easy, round, and in Paris, to tell how well your car is going, because

cars stream by all the time, every driver goes his fastest, and everything combines to frighten strangers out of their wits with narrow shaves and squeaks.

I do not think any cars die in France, for one sees, side by side with the latest thing in sumptuous limousines, quaint old rattle-traps that might be a dozen years old, each and every one carefully converted into a closed vehicle.

To conclude, one of the most hopeful signs for our country I saw in Paris was the crowd of young English gentlemen connected with the industry who had come over for the purpose of improving their minds. It did one good to see them trooping into the Salon as soon as it was opened and not leaving it till the gates were all but shut. Not for them, then, were the advertised delights of Paris that are supposed to appeal so much to our countrymen abroad, but, after a quiet evening meal, and over big pipes, they sat and talked of carburetters, suspensions, clutches, and what not till sleep overtook them one by one and they went to their rooms to prepare for another long day of instruction and invention. One night I heard some idle journalist inviting a party of them to come out with him to some music hall or *café*. But their leader just looked up and thanked him with the expressive phrase that M. Tate gave to the world, "*Je ne pense pas*," and the scientific discussion went on uninterruptedly. And I, too, do not think also. *Pas demi!*

OWEN JOHN.



FROM THE PARIS SALON. La Vie Parisienne. Je Pai promis, Wilbur, de te montrer le Salon de l'Automobile. Eh bien! Regarde. A la clarte éblouissante du Phare Ducellier aucun détail ne l'échappera.

The R.A.C. having asked the Society of Motor Manufacturers to be represented at the January meeting of its dust committee, the Society has resolved to accept the invitation.

The M.U. is indebted to a number of readers who have forwarded designs for devices to enable retailers of petrol to show in their shop windows the price of spirit.



## A GOOD COIL.

For some time past we have been trying a four-cylinder single trembler coil made by Messrs. J. B. Brooks and Co., Ltd., Great Charles Street, Birmingham. As will be seen from the illustration, the four coils are separate, and anyone of them is easily remov-

able. With the four trembler coil, as a moderate hill was attacked and the speed began to fall away, the power of the engine very soon dropped to such an extent that it was necessary to change down, but with the single trembler coil the engine maintained its power

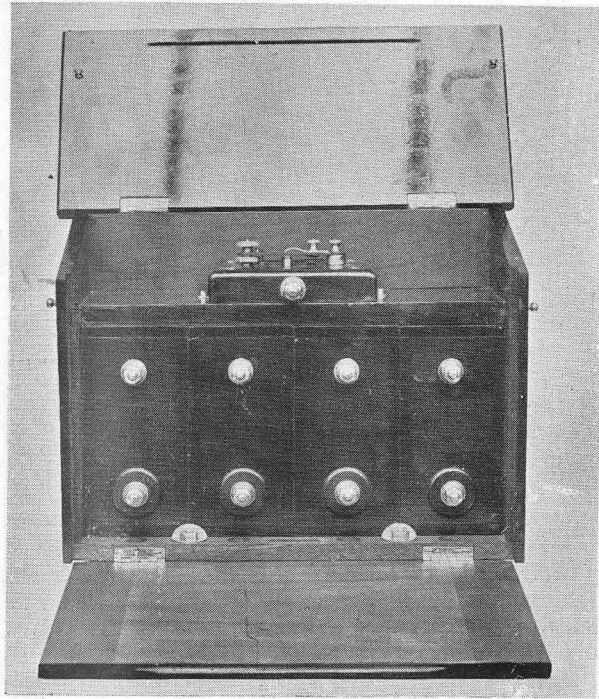


Fig. 1.—The Brooks coil complete, with its top and front lid open.



Fig. 2.—The Brooks coil with the trembler block detached and one of the coils withdrawn.

able without disturbing the others, but there is a single trembler which is common to the set of four coils. We have tried this coil upon a car which was fired by a good four trembler coil, and it improved its running very considerably. When running light the engine would run slightly slower, and with scarcely any inclination to miss an explosion. Under load the difference in favour of the Brooks coil was still more notice-

much better and the moment of changing down was postponed considerably, or, in the case of the easier grades, rendered unnecessary. At high engine speeds as tested by climbing on the lowest gear, there was also no question about the advantage of the single trembler coil.

In both cases the same commutator was used.

## ANNUAL DINNER OF THE ROYAL A.C. AND ASSOCIATED CLUBS.

Signs are already in evidence, says the secretary of the R.A.C. in his weekly report, that the first annual dinner of the R.A.C. and associated clubs, which will take place at the Hotel Cecil on Thursday, January 14th, will make a great reunion of motorists from all parts of the country, and the function promises actually to be the largest gathering of provincial motorists as represented in the associated clubs that has yet been held.

Every possible effort is being expended to make the dinner one for the associated clubs principally, and one of the means of attaining this happy end will be the arrangement of special tables for members of each of the clubs and their guests. There will be no "top table" in the generally accepted sense of the word, but a series of small tables will be set, and these will have the effect of bringing motoring acquaintances more closely together and at the same time enable them to converse more freely. The dinner will thus be not only "social," but "sociable." It is hoped to set apart at least one table for every club, and

the clubs are already beginning to vie with each other to fill their tables more amply. The hon. secretaries of the various clubs have been invited as guests of the chairman and the General Committee. Many ladies will, it is expected, be present. The chairman of the Club, H.S.H. Prince Francis of Teck, will preside. Members and associates who desire to be present should make immediate application to the secretary for their tickets at 7s. 6d. each.

Mr. James Radley, of Bedford, was charged at the Tavistock Petty Sessions on Wednesday with driving a motor car recklessly and in a manner dangerous to the public near Tavistock on the 18th ult. The evidence showed that defendant ran into a flock of sheep in the dark and killed five of them. Mr. Percy Pearce, in defence, submitted that there was no case, because two charges had been preferred in the summons; this was not permitted under the Summary Jurisdiction Act. After some discussion, the Bench decided that Mr. Pearce was right, and dismissed the case.

## ON THE TRACK. By H. C. Lafone.

We are getting to expect regularity in running nowadays, and especially is this the case at Brooklands, where outside conditions are practically constant, and it is merely a matter of consistency in the car's own behaviour. On Friday last week the well-known Continental driver Hieronimus came down to see what track speeds he could extract from the little 14-16 h.p. Laurin and Klement racer, which had already distinguished itself during the past season at several foreign hill-climbing competitions, notably that held at Semmering, where the car won its class. There was no track record to establish, for there is no standard Brooklands class for anything below the 26 h.p. machines with cylinder bores of 100 mm., but the Laurin and Klement's performance will need a good deal of beating by any car of equal engine dimensions. The four-cylinder motor had a bore of 86 mm., and a stroke—according to report—of something like 150 mm., but the height of the cylinders certainly gave the impression of a longer stroke than this. I shall be extremely glad to see the day when the B.A.R.C. will publish the stroke of all cars which run on the track, for until that day comes it is a hopeless task to endeavour usefully to compare the values of the different performances. Mr. A. V. Ebbelwhite hand-timed the Laurin and Klement's speed, for the R.A.C., over the flying half-mile, five laps (13 miles 1,456 yards), and 10 laps (27 miles 1,153 yards), the electric apparatus not being used at all. The actual time for the flying half-mile was 24 $\frac{3}{5}$ s., at the rate of 73.77 miles an hour, a decidedly fine achievement, considering the cold and blustering wind which swept the track. The five laps' time was 11m. 29 $\frac{3}{5}$ s., at the rate of 72.15 miles an hour; and the 10 laps were covered in 22m. 58 $\frac{3}{5}$ s., at

practically the same average speed. It is extremely interesting, as regards regularity of running, to note that the first and last five laps were completed with a difference in time between them of  $\frac{3}{5}$ s. only.



16 h.p. racing Laurin-Klement car which made such a remarkable performance on December 2nd. The bore is 86 mm. and the stroke is said to be about 150 mm.

On the same afternoon a few Oxford University motor cycle enthusiasts had some private speed trials on the track. As usual, they thoroughly enjoyed themselves, and had an interesting and instructive time.

It may interest readers of *The Autocar* to know that the B.A.R.C. is just starting a school of instruction in connection with the electric apparatus invented by Colonel H. C. L. Holden. Mr. Rodakowski proposes to spend some of his declining years in giving lessons to those who seek to take on the mantle which fell from his shoulders when he resigned his position as official timekeeper. The instrument which will be used for demonstration purposes at the B.A.R.C.'s London office is that recently approved by the International Conference, and a knowledge of its mechanism will enable a pupil to operate the instrument in the timing box at Brooklands.

### ROYAL A.C. TRIALS OF MOTOR VEHICLES.

With the new year a series of individual trials will be carried out under the Club's official observation at the request of a number of manufacturers. There are already six applications in hand for such trials.

This side of the Club's work is being vigorously pushed, in order that those desiring a certificate of the performance of their cars or accessories may take full advantage of the Club's organisation in this respect, it being recognised that these certificates carry very great weight with the public.

The M.U. booklet containing a list of recommended maps, road books, etc., is in the press, and when ready it will be sent to members on application. The Touring Department has received a collection of the "Borough" series of guides, published by Mr. E. J. Burrow, of Cheltenham, who is a member of the Union. These can be seen by callers.

### EXPERIMENTAL GROUND FOR ENGLAND.

The Aeronautical Society of Great Britain has acquired a site to be used as an experimental ground for members. The land is situated near Dangeham Station, on the London, Tilbury, and Southend Railway, being about half a mile long and the same distance in width. The greater part of it is flat, and suitable for the trial of full-sized machines. On one portion to the south there are steep mounds some 50ft. high, which will be convenient for testing models. It is intended to build sheds to accommodate full-sized machines, and as soon as funds permit a properly equipped scientific establishment containing whirling table and other aeronautical testing apparatus will be installed. This announcement was made at the forty-third annual meeting of the Aeronautical Society.

"Useful Hints and Tips for Automobilitists."—Under this title "Useful Hints and Tips" have been reprinted from *The Autocar* in booklet form. The third edition now on sale has been thoroughly revised and brought up to date. The book can be obtained from *The Autocar* Offices, 20, Tudor Street, London, E.C., price 2s. 6d.; post paid, 2s. 1nd.

## THE COST OF A CAR.

BY CAPT. THEO. MASUI.

It will be readily understood that the data necessary for the composition of an article such as the following are only at the command of those who occupy a similar position to that of its writer, Captain Theo Masui, whose name is familiar to our readers as that of the Agent General for Germain cars in Great Britain and the Colonies.

### General Costs.

As the majority of makes of motor cars are now being marketed at a normal value, and the buying public appear to be seeking after cheap cars rather than expensive ones, it may be interesting to classify the heads under which the total value of a motor car is made up. It should be noted that in the present instance the cost of experiments, tools, patterns, etc., necessary to establish the actual type of car supplied by a manufacturer, is not taken into consideration, but a model is dealt with, the initial costs in the production of which have been written off by virtue of its standardisation and popularity.

On a powerful car, which has a small *clientèle*, and, of course, a comparatively limited output, these items are of considerable importance. In the cost of a motor car one has to consider:

The raw material.

The workmanship.

The general expenses and normal profit of the manufacturers and retailers.

The Germain Works have made the following table showing for their principal type of car, viz., the 14 h.p. Chainless, the cost of raw material and parts, which must be purchased before commencing to manufacture a series of chassis.

Table of percentages of cost of raw material used in building a Germain Chainless chassis:

Tyres	...	...	...	...	21.7%
Steel	...	...	...	...	10.6%
Aluminium castings	...	...	...	...	9.2%
Axles	...	...	...	...	8.4%
Rubber tubing, aprons, nuts, bolts, etc.	...	...	...	...	8.2%
Magneto and fittings	...	...	...	...	8.2%
Ball bearings	...	...	...	...	7.4%
Radiator	...	...	...	...	6.4%
Chassis	...	...	...	...	3.8%
Bronze castings	...	...	...	...	3.4%
Forgings	...	...	...	...	2.8%
Springs	...	...	...	...	2.6%
Cast iron	...	...	...	...	1.8%
Steel tubing	...	...	...	...	1.5%
Paint work	...	...	...	...	1.4%
Lubricating materials	...	...	...	...	1.4%
Wood work	...	...	...	...	1.2%
					100.0%

From an examination of this table, one can deduce some very interesting points. The proportion of tyre cost is somewhat astonishing, and it will therefore be realised that the first question to be taken into consideration is that of the weight of a car, this weight being the criterion of the initial cost of tyres as well as of their upkeep afterwards. The second item of cost is steel. In a car of the 14 h.p. Germain type, 1,300 lbs. of steel of various types and qualities in the rough are required. A penny saved in the cost of each lb. would therefore reduce the cost by £5 8s. 4d. The price of steel can vary from a few pence per lb. to 2s. and more per lb., and one can imagine what difference it can make in the cost of a car to use good or common steel.

By replacing aluminium with cast steel or iron, a new economy would be realised, but again the important question of weight would intervene, and the economy would only be for the manufacturer.

Then comes the front axle a point on which rests the safety of the occupants of the car. A good axle costs anything up to £20, some racing axles costing £70 or more, whereas a cheap axle can be bought for £2 or £3. To all outward appearances they are identical, and nobody would be able to recognise the good one from the cheap one by mere inspection.

An expensive magneto and a good radiator can be replaced by common and cheap types, but with this reduction in price there would be a proportional increase of possible breakdown.

The sundries and other parts come to a more moderate proportion, and certainly an economy could be realised on most of this material. After the material comes the cost of workmen's time in manufacturing. Of course, absolute standardisation is presupposed, without which one cannot have a perfect motor car. With a well-equipped works, well-designed tools, and the cost of labour not excessive, the men's time expended on a chassis amounts to about 10% of its value.

### The Real Criterion.

What is more expensive and important is the case-hardening and tempering, and then the necessary rectification of all the working parts. If these operations are not made, which is often the case in cheap cars, the machines at the beginning would certainly look identical, and the cheap one would run as well as, if not better and more silently than, a car more conscientiously made, but after a time all the soft moving parts would start to wear, and then the car would rapidly go to pieces, and it would be impossible to have it repaired. Case-hardening, tempering, and rectification are expensive operations, but they are the only guarantees against wear and tear.

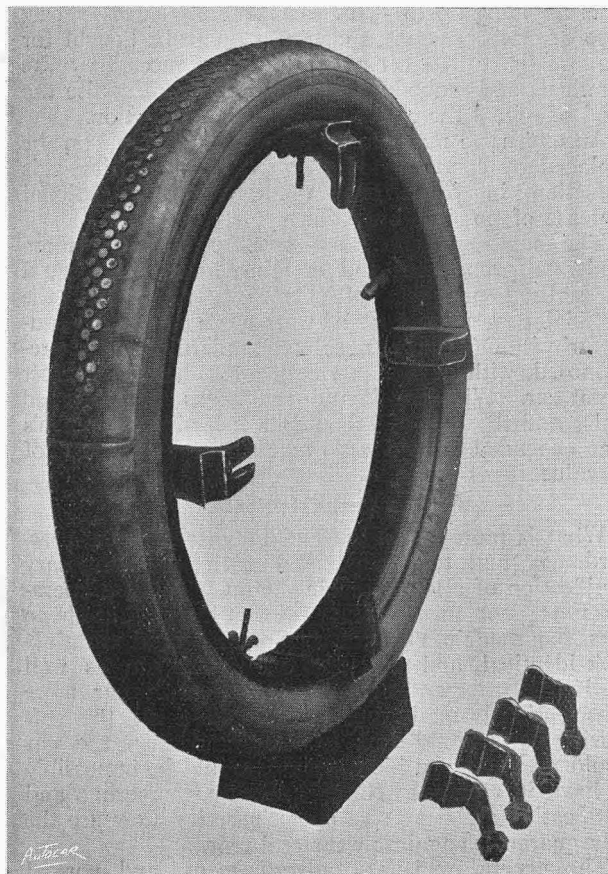
The general expenses, advertisement, and normal trade profit which then come add to the price of a car. These are generally in good firms in proportion to amount of output, and are points which it is more difficult to account for. It is not surprising to find, therefore, that two cars absolutely identical to outward appearances, and running equally well, may vary in value and price up to about 40%. Many buyers are not in a position to realise the difference between these two cars when new, and a trial run cannot give them any guarantee. There is only one point, and that is their confidence in the firm they deal with, and of its stability and experience.

The value of a good motor car cannot come below a certain sum, and, personally, we believe that the actual prices in the majority of cases are perfectly normal, and cannot become cheaper, but will most probably go higher, as the manufacturers will shortly see that at these prices they cannot make the necessary profit to keep alive an industry which has this drawback—that it rises and falls according to fashion.

The second annual dinner of the Northern Section of the Automobile Association will be held at the Midland Hotel, Manchester, on Friday, February 5th, 1909.

## THE HALL SPARE WHEEL.

In our issue of November 7th, page 716, we referred to a spare wheel, the invention of Mr. J. H. Hall, of Moor, Sheffield. We now give a photograph of the device, which is not really a complete wheel, but a rim, on the inner periphery of which are riveted four plates, having their outer ends hook-shaped, with a pendant forked lug underneath. When it is



The Hall spare wheel, showing the forked lugs and the clamps.

required to place the spare in position in the event of a burst or puncture, the rim is simply butted up against the car wheel, so that the four hooks engage the fixed rim of the wheel. Four clamps, which are shown separately, are then fitted to hold the rim in place. These clamps are saaped to follow the contour of the felloe, and have at one end a substantial hook, which engages the fixed rim, the other end being drawn out in the form of a bolt which engages the forked end of the lugs. The nuts being screwed up, the spare rim is thus tightly clamped against the fixed rim.

One of the most interesting chassis at Olympia was that of the new small model 15 h.p. White steam car. Motorists in Manchester and district will be interested to know that this chassis has been sent to Manchester, and will be at the White Co.'s showrooms in Albion Street, Gaythorn, for a fortnight from Monday next. It will be remembered that the new 1909 White engines are provided with the Joy valve gear and piston valves. The new engine was described in our issue of November 7th, pages 717 and 718, and all Mancunian motorists who were not able to see it at Olympia should take the opportunity of examining it while it is in their midst.

## A SCOTTISH CONVICTION ANNULLED.

An appeal case of some interest to motorists was heard in the Court of Session last week. The point at issue was the police timing arrangement of motor cars, and the case came before the court under a bill of suspension presented for Allan M'Gregor Connell, shipbuilder, of Kilmarnock, Dumbartonshire, against the Procurator Fiscal for the county. On July 15th last the complainer was prosecuted in the Sheriff Court at Dumbaron on a charge of driving a motor car at the rate of thirty-six miles per hour on a quarter-mile section of the Balloch-Drymen public road, contrary to Section 9 of the Motor Car Act of 1903, and he was mulcted in a penalty of £5, with the alternative of fourteen days' imprisonment.

At the trial before the sheriff an objection raised on behalf of the complainer of want of specification of the alleged offence was repelled. The case for the prosecution rested on the evidence of two police constables. The complainer in rebutting this charge brought an Ordnance survey map of the road in question, and proved that the distance between the two points specified by the constables was 390 yards, or 50 yards short of a quarter of a mile. The contention of the complainer was upheld by the evidence of a Glasgow architect. For the complainer it was averred that the case for the prosecution rested on the measurements of the police "trap" being correct, and the defence, having demonstrated that these measurements were substantially and materially untrue, claimed his acquittal. The only evidence of excessive speed was that of the two constables standing with a stop-watch at the west end of the trap, and in order to estimate with any degree of precision the time taken by the car to travel over the trap it was essential that a person should stand at the east end of the trap and note by means of a stop-watch the exact time when the car entered the trap, or else to signal to the constable at the west end of the trap at the moment when the car entered the trap. Objection was taken to the form of sentence as being illegal and contrary to the form prescribed in the Summary Jurisdiction Act. The prosecution maintained that the case was duly proved by competent evidence, and that no intimation was given on behalf of the complainer before the trial that the particular points of the measured quarter of a mile were in dispute.

Lord Ardwall, who gave the leading opinion, said that the first point they were asked to consider was one on which he thought they could dispose of the case, namely, that the complaint was irrelevant and wanting in specification. He thought the complaint ought to have specified distinctly what was meant by a quarter of a mile. It was not sufficient to say that it was opposite Catter Bog Farm. Lord Pearson concurred. The Lord Justice-Clerk said there was a danger in the interests of justice by the omission of two or three lines necessary to give specification. The conviction was therefore set aside and ten guineas expenses allowed.

The twice adjourned inquest upon the two victims of the collision which occurred between a trap and a motor car near Whitwick, Leicestershire, has resulted in a verdict not only exonerating the motorist from all blame, but attributing the accident to want of care on the part of the driver of the horsed vehicle.

## THE NUMBER OF MOTOR VEHICLES.

The current issue of the Royal Automobile Club *Journal* contains a tabulated statement of the number of motor vehicles registered in the United Kingdom up to September 30th last. This work has been compiled in the Associates' Department of the Royal A.C. from returns furnished to the Royal, Scottish, and Irish Automobile Clubs by the various registration authorities. We append the table of totals as they are given in the *Journal*:

	Private cars.	Trade vehicles.	Public conveyances.	Motor cycles.	Totals.
England and Wales...	63,240	11,172	5,461	67,472	137,345
Scotland ... ..	5,231	810	384	4,482	10,907
Ireland ... ..	2,910	122	35	3,072	6,139
Grand totals ...	71,381	12,104	5,880	65,026	164,391

It would be more than interesting to know whether the returns of the registration authorities take into account the registrations which have lapsed since January 1st, 1904, the date on which the Act came into operation. Unless the elapsed numbers have been deducted on all the returns, the figures given can only be taken as totals, and not as representing the actual number of vehicles in use at the end of September last. *The Autocar* first published similar tables of returns in 1904—then compiled by Mr. E. Shrapnell Smith—and continued doing so up to June 30th, 1907, at which date it was very clear that the number of registrations which had lapsed on account of cars being sold without numbers and no new ones being bought on which to use them, failure to transfer numbers on sale of car, and various other causes, had become sufficiently large to seriously affect the figures as giving an accurate statement of the cars actually in use. On the publication of our last figures in *The Autocar* of July 27th, 1907, we estimated that an approximately correct figure could be arrived at by a deduction of five per cent. from the totals of returns of motor vehicles and motor cycles.

## SUGGESTED TAX ON PETROL.

In connection with the many rumours which are afloat in the lobby as to the character of next year's Budget (says our Parliamentary correspondent) there is one especially deserving of attention from motorists. It is no less than that a duty should be imposed on petrol. I have the best reason for saying that the matter is engaging the attention of Treasury experts, and that many interviews have been held between representatives of the departments and leading men in the motoring industry. It will be interesting to watch the development of this movement, which, from information I have, is one which finds special favour with Mr. Lloyd George.

Mr. Mervyn O'Gorman asks us to make the following correction in his paper on "The Weights of Motor Car Parts," the first portion of which appeared in *The Autocar* last week (page 977): The horse-power at the road wheels of a car on a hill is represented by the equation:

$$\text{H.P.} = \frac{WH}{T 550} + \frac{WLr}{T 550} + .00004535 V^3 A.$$

In the footnote corresponding to this W should be the weight in pounds, not in hundredweights.

## THE L.I.A.T. CONGRESS.

At the invitation of the Motor Union the L.I.A.T. (International League of Automobile Tourists) will visit England next July for the purpose of holding its annual congress. Delegates will arrive on July 7th, and on the three following days will assemble in congress, the headquarters being the Hotel Great Central, London. On July 11th the official tour (by road or rail) will commence through some of the most lovely parts of England and Wales, ending at Swansea, where on the 15th and 16th various social functions will be held and visits paid to places of interest. The Motor Union Committee will meet on the morning of July 17th at Swansea, with a dinner in the evening. On the 18th the party will return to London and disperse, so that there will be twelve days of business, touring, and festivities. Further particulars will be announced in due course, and in the meantime may be obtained from the secretary of the Motor Union.

## SHEFFIELD-SIMPLEX PROJECTS.

Some months since we referred to our extremely satisfactory trial of a six-cylinder 45 h.p. Sheffield-Simplex car of the new gear-boxless type. At the time we tried the car it performed excellently, but the engine was admittedly untuned. It has since been carefully adjusted, and we recently made a short run in the London suburbs upon it. There was no opportunity of accurately timing or measuring, but the car certainly gave us the impression of being equal to anything which has been done in the way of top gear performances; it could be run down to a crawl upon the top gear and would keep on crawling without the least shock or jar. Then it could be accelerated, and would get away without any shock or clutch slipping. Speaking of the Sheffield-Simplex reminds us that the Sheffield-Simplex Motor Works, Ltd., intend to produce smaller models, in addition to their two interesting six-cylinder 45 h.p. cars. These are being designed on the same lines as the larger cars, and will, we are assured, embody the same refinement in detail and manufacture.

## LANTERNS FOR COWS AND SHEEP.

Cumberland motorists are obtaining signatures to a petition which is to be presented to the Cumberland County Council with regard to the necessity for more comprehensive road regulations. Amongst those who have already signed are the Dean of Carlisle and the High Sheriff of Cumberland.

The petition asks the Council "to make a byelaw causing persons when driving sheep, cattle, or horses along the roads at night to carry a lighted lantern or lamp which shall be visible in both directions; or in case of large droves exceeding three horses, six cattle, or twelve sheep, each drove to be preceded by a light in addition to the drover's light." The petition also "presses for a more stringent enforcement of the byelaw prohibiting the straying of sheep and animals on the highway."

*[The Autocar Map for Motorists.—Invaluable when touring or contemplating a tour. This map is supplied in three styles, i.e.—(1) varnished and with roads marked in red; (2) on suitable materials for marking in the roads traversed or to be traversed; (3) folded in case, suitable for carrying in car. Size of map 4ft. 8in. x 3ft. 9in. Price 8s. 10d., carriage paid, in any one of the three styles, obtainable at the offices of The Autocar, 20 Tudor Street, London, E.C.]*

## SMALL CAR TALK. By Runabout.

### Maintenance Contracts.

A very interesting sidelight is cast upon the upkeep question by a letter from a well-known motor agency in answer to a request for terms *re* the entire maintenance of a small car. The car is a 6 h.p. De Dion two-seater, several years old, being of the type which has no reverse gear. The agency was asked to quote absolutely inclusive terms, to cover washing, garage, tyres, petrol, oil, repairs, adjustments, an annual overhaul, insurance against fire, theft, third party risks, etc. In fact, the only money the owner can possibly disburse after clinching the contract, is any expenditure on labour incurred by mishaps away from home; the agency will only supply labour under the contract at their own garage. Thus, if he breaks down eight miles away, he is responsible for bringing the car back to garage; or if he smashed an axle up in Scotland, the agency would provide a new axle in any case, but would not supply labour to fit it, unless he brought the car to their works. The terms quoted are 3d. per mile, as registered by a hub mileage indicator. The owner happens to be a doctor employing the car in his practice, and covering 8,000 miles annually; consequently his contract will be about £100 per annum.

### Some Deductions.

The owner in question can now comfort himself with the assurance that his motoring expenditure cannot possibly exceed a fixed and very moderate figure; for if he do not indulge in long tours, the sole addition to the above annual charge consists of depreciation. He finds his little car suits his purpose well, and he has no intention of getting a larger vehicle. The agency contract to keep the car in perfect running order by supplying all replacements needed, and by taking up or replacing all worn parts once a year in a general overhaul. Knowing the quality of the material that is put into De Dion cars, I have no hesitation in saying that this car will be as good in ten years as it is to-day; his depreciation is "running depreciation," not selling depreciation, and may be ignored in his accounts. Finally, a firm of repairers are bound to leave themselves with a fairish margin in contracts of this sort. Motorists good, bad, and indifferent will take advantage of the scheme, though no doubt the firm will only quote for approved makes of car. In drawing up their scale of terms they must allow for the man who uses his brakes roughly, and so halves the life of his tyres; they must allow for the man who is careless about his carburation, and wastes petrol; they must allow for the man who slams in his clutch, and twists a gearshaft every now and then: and so forth. But even then they are able to quote at the rate of 3d. per mile for a 6 h.p. car. On June 13th I published an estimate of the upkeep of a 6 h.p. two-seater, which worked out at a fraction over 2d. a mile, and was fiercely criticised on the score of optimism. But when we see one of the most experienced firms in the country willing to contract for the running of a five year old car at 3d. a mile, taking the bad drivers in with the good, and still ensuring themselves both a fair profit and a fair margin of safety, it is obvious that the careful and efficient amateur can reduce his running charges to the 2d. which I originally estimated from my own experience.

### Retreading Tyres.

Retreading worn tyres is often denounced by motorists, and many small car owners consequently

take no advantage of this invaluable method of reducing upkeep charges. If the *personnel* of those who decry retreading is analysed, it will be found that most of the denunciation proceeds from owners of big cars. Obviously a retreaded cover will not last very long on the hind wheels of a car that scales the best part of two tons; and, at the same time, as such cars are capable of very high speeds, it is unsafe to put a rather dubious tyre on their front wheels, as a burst at speed may mean a very ugly smash. The case of a small car is widely different. Its maximum speed is so low that a very doubtful cover, indeed, may be run on a front wheel without any fear of disastrous results arising from a burst under any circumstances. Hence it is always worth while retreading a small size cover, even if its condition is rather bad, and if the cover is simply worn, the fabric remaining intact and free from damp-rot, retreading is usually a magnificent investment. I know of an 80 mm. tyre on the rear wheel of a 10-12 h.p. car which has actually covered nearly 10,000 miles, having been twice retreaded, while often we have had occasion to marvel at the manner in which exceedingly dicky tyres stand up on the front wheels of small cars. Only last summer I was driving a small car for two months, and taking it out almost daily. At the beginning of the period the off front cover was past praying for, and as we had detachable wheels on both axles, plus a spare, we decided to run that faulty cover till it burst; and it ran nearly 2,000 miles before it gave up the ghost, though when it started the distance no retreader would have touched it at any price.

### A Hill-climbing Car.

I am sure the De Dion Co. will forgive me if I explain a point relating to the sensational Alpine performances of my old friend, Mr. Douglas Fawcett, on one of their 8 h.p. cars. Some car owners are yellow with envy at some of the extraordinary ascents he has made, over roads which are little better than boulder-strewn mule tracks in many instances, and including gradients of a severity unknown in England, often exceeding 1 in 3. It must not be thought he is driving a standard De Dion. His car comprises certain features which may perhaps become standard on the 1909 De Dion single-cylinders, such as a long stroke, an extraordinarily efficient plate clutch, generous cooling system, and so forth. But in two respects at least it differs from next year's standard small De Dions, viz., that it has extra large brakes, which are also water-cooled, and very low gear ratios. For instance, the car will climb a 1 in 10 grade several miles in length on its top gear, a performance no standard 20 h.p. car could emulate, and on its low gear it will climb a long piece of 1 in 2½ if the wheels can get a grip; or, again, it can be started from rest on top gear on rises of ten per cent. In other words, it is a car specially constructed to do freak work. I do not say this in any disrespect of the De Dion climbing qualities; I shall never forget how the tiny 4½ h.p. De Dion tonneau used to clamber up the precipitous lanes of Devonshire as early as 1902, and the later De Dions have never surrendered one iota of the high reputation which the earliest babies of that big family so worthily won. My sole point is that the standard 8 h.p. De Dion will no more climb a long stretch of 1 in 2½ than any other maker's standard cars will do it.

## 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.

Inquirers 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.

## CARBURETTER CONSTRUCTION.

[13723.]—Have we reached finality in carburetter construction? I think not. Some time ago there was some correspondence respecting the running of cars at night, some contending that cars did run better at night, and other that they did not. In my humble opinion there is no question about it, and I consider that the condition of the atmosphere has a lot to do with the better running of cars at night, due to the humidity and different density of the air as compared to the day time, when the air is lighter and drier.

Admitting these as facts, I consider that carburetters are to be improved by: Firstly, mixing a damp vapour—say a whiff of steam from the radiator—with the petrol when required; secondly, by keeping the carburetter at a proper temperature, and in order to do the thing properly a carburetter should be fitted with a thermometer. I would also recommend separate levers to control the flow of the petrol and the inlet of the air, because I consider that there are times when you can run with the air inlet wide open and the petrol almost shut off. Most carburetters seem to shut off an equal proportion of air and petrol. Car manufacturers with forced petrol supply could have their carburetters above the engine, and could secure quite a distinctive design by covering them up with a brass helmet, after the style of our railway engines. The helmet could be made to take off and give easy access to the carburetter. This would give quite a new and novel style of bonnet.

I am certain that there are more improvements to be made in carburation than many people realise. J. WILLIAMS.

## INDIVIDUALITY OF DESIGN.

[13724.]—Olympia has left me in a wilderness of nothingness. One thing I should like to ask above all others is, What is becoming of the individuality of the respective leading manufacturers? Then, What is the use of the show? And how many more than one will there be held at the Olympia? When one comes to survey the radical changes and departures from old proven principles, boasted superiority and advantages that have taken place in motor car construction, it will soon be easy to imagine motor cars like a brass band that is composed of cornets only. Why has the Daimler firm, who have built one of the finest and quietest cars on the market, left the ranks of orthodoxy and built and fitted such an engine as the Knight—in short, any engine but their own—to apparently the entire elimination of their standard design? Surely the Daimler engine was good enough.

I have read all the papers on the new Daimler engine. Friends and fellow tradesmen have asked me of it. I have even read the bulletin. It is progressing as favourably as can be expected, and in any case rather better than anticipated. I have been so surfeited with enquiries about the Silent Knight—and so has everyone else knowing anything of motor cars—that I am now more silent than the night about it. I notice, too, that the discourses on its mechanical probabilities gradually trail off to stocks and shares, and ultimately percentages, which are in all probability the origin of the invasion of the discarded slide valve for internal combustion engines. Who would buy a gas engine now with slide valves? It is nearly the same thing. I made a steam engine in 1902 with sliding ports arranged similarly to those in the Daimler engine, but in this case the cross-head moved the inner shell radially, and I am bound to say it worked all right until the shell stuck.

One more thing before I leave the subject. Why did the designer allow the opportunity of adopting an auxiliary exhaust port to go unneeded? Surely this would have been advantageous where two shells are expected to work vertically under tremendous heat and enormous frictional contact. Now why has the Lanchester firm left their own beaten track, and eventually submitted to the prejudices of the

buying public? They might just as well now build the ordinary bonnet and radiator, and so drop one of the finest cars that was ever built. Ask any driver of a Lanchester, new or old, which form of steering he would prefer, and I am quite certain that ninety-nine out of a hundred would plump for the tiller. You could drive the car through the eye of a needle with it, comparatively speaking. The control, too, is modified. I cannot imagine anything neater or more efficacious than their hand speed lever control, without pedals and side levers, and certainly their cars cannot be driven anything like so gracefully as was possible with the tiller steering and left-hand control. Wire wheels, too, they knew they were right. I hope they will not adopt as a standard design any pampering improvement, to the detriment of the whole of this most successful and distinctive car. It occurs to me, however, that the man who already owns and drives a car of the conventional type is the person who has induced the Lanchester firm to take this step; for I believe all owners and drivers of the typical Lanchester are faithful to it. I should strongly advise prospective purchasers of these cars to try the original. The difference is the beauty of it. Surely the man who rows a boat can paddle a canoe and enjoy the change of position and condition. How many of the advocates of the chain drive, too, are giving their attention to live axles? I quite expect to see Mercedes steam car and Panhard electromobile, for instance, in the near future.

Now that the show is past, let us ask, Which is *the* car, the best value for money, handiest, simplest, and most reliable, of course? All makes were not represented. One of my choice of a car was not there. I shall endeavour to say more on these matters, and on steam cars in particular, at some future time. HERBERT J. CHAPMAN.

## PRIVATE OWNERS AND THEIR DRIVERS.

[13725.]—A gentleman writing under the above heading [letter No. 13656] has found a solution for the "Chauffeur Problem" quite easy. What a pity he did not put his views before the public before and save all the present commotion. His solution is quite simple, and it is wonderful that no one else ever thought of it. Simply the highly-trained mechanic, with his seven years' apprenticeship to engineering, generally two or three foreign languages, valuable touring experiences, usually a lot of costly tools, etc.—all the above can (or ought to) be got for the princely sum of £2 5s. or £3 a week, for which the mechanic must daily risk his life, liberty, and living. That is one class of man. The other, which is most in demand, we hear, is a man who must thoroughly understand his car, and do all the necessary repairs with tools at hand, must have had workshop experience, at least a year on the road, and all for 30s. a week and his room or cottage.

But what of the man in the making? Take such a man as myself. I started as apprentice to fitting and turning, and was there three years, when I left for home and financial reasons. Next I was fitter's mate in a locomotive works, cleaning, gland-packing, steam raising, and ultimately stoker on the line. Then I was a brake fitter in the electric car sheds, and got a good insight into electric work, driving two years, and also some stationary engine work. I then joined the army for a period of four years, and had discipline and respect for my superiors knocked into me. On coming out of the service I decided to try motor driving for a living as the best outlet for my all-round experience. I have been at it now three years, and am reckoned by one or two in authority to be a decent man at the game, and have given entire satisfaction to two employers, who have been very pleased at a marked reduction in expenses, and general satisfaction given by cars in my charge.

I try to improve my knowledge in every way, and add to my small stock of tools as often as I can afford it, and hope to blossom into a motor mechanic in time. Now I am told that I am not worth more than 30s. and rooms at most, and understand that I can never get a place as head driver, as I have not the necessary indenture papers to prove I am capable. Verily I made a bad speculation when I plumped for motor driving, as before enlistment I was drawing 38s. a week, and was not subject to such things as endorsements, police traps, night work, and all the rest of the motoring and private service evils. But I am not going to despair;

*Correspondence.*

employers do not all think alike, I hope. I must say, though, that I fail to see that any comparison whatever can be drawn between a stud groom and a motor driver. There are different conditions altogether to contend with, for if a man lives with horses all his life he never becomes a farrier unless he specially trains for it, and if he does not understand his charge to that extent he is well paid at 30s. and house, although I doubt if one could be got for that amount even.

L. A. STEWART.

[13726].—Having read letter 13634 by "Mechanician," and letter 13656, I should like to say how exactly "Car Owner" has expressed facts. The word mechanic is too often assumed, and should be prohibited by the R.A.C., or some other authority. It is a misrepresentation of facts, and is only discovered at the expense of the owner.

A driver who claims to be able to take down his engine, grind in valves, repair tyres, and service a car is not necessarily a mechanic. He only uses the tools usually found in the car boot. If he can use a lathe, true up a bearing, etc., and has had a shop experience, he is a mechanic, or should be allowed to use the title.

I might add that I get daily letters asking what are my fees to teach mechanics so as to make the pupil a mechanic-driver. My answer is, "I never undertake to teach mechanics in the proper sense of the term, but I do undertake to teach a driver all about a car, its working, adjustments, and wayside repairs, but to teach a man to be a mechanic would take at least five years, at the end of which he would be entitled to receive £3 or £4 per week. Such a man is only required in the country, or where a model workshop is provided

A. E. BENNETT.

[13727].—I would like to reply to your correspondent. "Car Owner since 1898" [letter No. 13656]. I would ask him, How can a man apprenticed to one trade be considered competent in another? He says, "The mechanic should have been apprenticed," but "not necessarily to the motor trade." Such a man, if an all-round mechanic, might pass in a fitter's shop, but as a private mechanic he would be quite incompetent, because to drive and attend to a motor car requires special training.

Let us consider the various duties of a mechanic. There is first the driving, which it is admitted requires experience of at least two years. He must understand fitting, have a knowledge of electricity, and understand tyre work, vulcanising, etc., not to mention the care of coachwork. Surely a man possessing such qualifications is not to be compared to a stud-groom, whose work is finished when he has discovered that the horses in his charge are unwell or one required a shoe, or the carriage wheels require attention. Now the mechanic has not only to find that his charge is "unwell," but he has to find the nature of the complaint, and, what is more, remedy it; therefore there can be no comparison between a mechanic and a stud-groom or coachman.

There is another point I would like to inform him. A workshop fitted with tools that cost less than £10 is all that is necessary to do all ordinary repairs (I would compile a list for him with pleasure). When any serious repair is to be done, the part is taken down and delivered to the factory, which not only saves time but money, for, as he must know, the largest item on a repair bill of that nature is cost of time in taking down and reassembling. This is where the employment of a competent man pays, and also by receiving skilled attention at all times serious repairs are very rare.

As to his statement that coachmen are the better drivers, I will not discuss this. I am afraid he has not had experience of fully competent mechanics. The wages he offers perhaps have something to do with his failure, but in my opinion the man who has done a lot of cycling makes the most skilful driver, because he has to know the condition of roads, and the terror of side-slip is ever present in wet. What does a coachman know of such things as banking at corners, speed round curves, and other matters which a cyclist has to know?

The other parts of his letter corroborate my statement that the so-called chauffeur-mechanic is costly to employ. I would call your correspondent's attention to the article in *The Autocar* of September 19th, which puts the whole matter very clearly. I will just quote one part: "It seems difficult to make owners understand that it is true economy to employ a really good man who is something more than a mere driver. . . . The owner economises by getting a cheap and incompetent man, and then what he saves in wages is lost by the incompetence of the driver. . . . We are convinced that

nearly all the trouble is traceable to the employment of a half-qualified chauffeur." I am afraid that this able article was unnoticed, and I would be glad to see it reprinted in a more conspicuous position, which it deserves. I recommend it to the attention of your most prejudiced contributor. "Owen John."

I would also like to tell the correspondent who replied in the query column of the issue of November 28th, although he states he has ten years' experience of chauffeurs, he is wrong. It is the rule almost without exception to pay touring expenses and make no deduction. This is only reasonable when it comes to be considered. The class of men he has employed cannot be taken to be any guide as to what results would have been obtained had he engaged and paid a fair wage to a proper man. As to his experience with Frenchmen, all I can say is that it is just the reverse of most people's; in fact, the whole letter is so condemnatory of Englishmen that one fancies that he cannot claim England as his nationality; but I do not believe such a letter will have any effect on the employment of Englishmen—in fact, the letter is worthy of "Owen John." MECHANICIAN.

#### TRUING CYLINDERS.

[13728].—A great many people put up with poor compression and consequent loss of power in the belief that reboring cylinders will possibly weaken them and lead to overheating or other troubles.

Certainly reboring in the ordinary way is not so advisable as grinding out with an abrasive wheel, the reason being that far less metal has to be moved by the latter process. This is because a worn cylinder has a hard polished surface or "skin," and the boring tool must get a clear cut under this in order to make a true job, and even then a finishing cut is desirable, and perhaps subsequent lapping.

Now in re-truing cylinders by grinding, a little carborundum wheel is employed which revolves at some 6,000 revolutions per minute. Only about .001in. is the depth of the cut taken each time the grinding wheel travels down the bore, and as soon as it is parallel and true no further operations are necessary. In this way the minimum possible amount of metal is removed.

A. E. S. CRAIG.

#### EXPERIENCES.

[13729].—The recent fine performances of the 20 h.p. Vauxhall influenced my selection of this make of car, and on Tuesday last week I took delivery of the chassis, to which a temporary body had been affixed, and started off from Luton, with an engineering companion, for the North. I am pleased to testify to the superb performance of this most up-to-date car, which brought us up to Harrogate in excellent time, without a stop for the slightest mechanical adjustment, on a petrol consumption of about eighteen miles to the gallon.

Owing to the deplorable condition of the roads, caused by the heavy rains and the repairing operations everywhere in progress, the engine and transmission were put to a severe test, and the fact that the only stops were for petrol and refreshments speaks well for the design, material, and workmanship of this much discussed car.

I should state that with the new Simms-Bosch dual ignition we were able to make several starts from the switch, which was a pure delight. At no time did the radiator get anything like hot, and not an ounce of water was lost. Hills were taken on top gear with the greatest ease, and only was it necessary to drop to the third on two hills, within five miles of home, and then owing to traffic.

It is with great pleasure that I am able to write so favourably of this new model (which I believe to be the first of its type turned out from the works since Mr. Kidner's victorious car), and thus, from actual road experience under trying conditions, confirm the makers' claims for exceptional power, flexibility, speed, silence, economy, and simplicity.

ARTHUR E. ARCHER.

#### THE CHAUFFEUR DIFFICULTY.

[13730].—The scornful remarks made by some of your chauffeur-mechanic correspondents about ex-coachmen drivers are rather ill-natured. One is, of course, sorry to hear of men out of work, but now that there are so many excellent repair shops all over the country, the ordinary car owner does not want to keep an engineer, but a reliable driver.

When motoring became general, numbers of prospective car owners had in their employment as coachmen faithful and intelligent servants, of many years' standing, and sooner than part with them they had them taught motor driving,



and one has only to look around to see that this arrangement has in almost every case proved satisfactory. Experience has shown that such men soon learn to use the tools on a car and to keep it in good running order. The ex-coachman can wash a car and keep the bodywork better than a mechanic, he is almost always a more considerate and often a better driver, and he looks and behaves like a gentleman's servant.

In large establishments where many cars are kept, a chauffeur-mechanic may be considered necessary, but for small places the ex-coachman can give good service and satisfaction to the car owner.

CAR OWNER.

#### FEAR OF PROSECUTION.

[13731].—I have just completed a delightful tour in North Wales, and it has only been marred by the fear of a prosecution for some "offence" I may have unwittingly committed. I was seized with a bad attack of this unholy terror after perusing your paper last week, in which I read that one of your subscribers had been fined and had his license endorsed for passing a person near the hotel I stopped at near Llanrwst. From what I heard in the district, I gather that certain members of a local club there have conceived the idea of treating this portion of the country as their own exclusive recreation ground, and much resent other motorists trespassing on their preserves. From the complaint of your correspondent they appear to be somewhat successful in persecuting intruders, and this is possibly due to the fact that in these little Welsh villages they are allowed to exercise a degree of power and influence inconceivable to the ordinary English mind. Your admirable paper has always pleaded for careful and considerate driving, which no one endorses more heartily than I do, but pray do not let us deteriorate to such a degree that we lay ourselves open to impositions through ultra-politeness, otherwise we shall shortly have to stop to salute with a respectful "Good morning" every farmyard bantam and bull pup we may meet taking a stroll on the public highway.

L. L.

#### THE RENAULT TYPE OF CAR.

[13732].—Like your correspondent, A. J. Stannah [13621], I have always wondered why so many firms waste time and money in placing on the market freaks, etc., that very rarely last more than a season, sometimes hardly that. Each show brings new ideas, only to be forgotten before the next exhibition. If the making and selling of motors is to be conducted for the purpose of dividends to the shareholders, no better example can be mentioned than that of Renault—and a similar car built in England should be a certain success—but the fact of Ariel Motors making such a model is very little known, and few visitors to Olympia were aware that a 20 h.p. Ariel on Renault lines could be purchased at a much less price than its French sister.

It would be interesting to learn why Ariels did not carry out the idea more completely, and adopt thermo-syphon cooling and radiator on the dash instead of crossing it with Charron characteristics.

It is an improvement certainly to use mechanical lubrication and gate gear. These changes in Renault practice are for the owners' benefit. At first sight the radiator being placed in front low down à la Charron seems to improve the accessibility considerably, but if the idea was to imitate such an excellent model, why not carry it out more completely?

There should be a good demand for an all British car of moderate horse-power, and if Ariels, Ltd., would also place on the market a smaller model of, say, 8 to 10 h.p., there must be thousands of buyers awaiting such an all-British car. The chassis price ought not to cost more than £250.

ALSO INTERESTED.

#### MOTORIST'S EXPERIENCE OF GAOL.

[13733].—The following account of a somewhat unpleasant experience will, I hope, serve as a warning to fellow-motorists. The moral is so well summed up in the magistrate's words (quoted hereafter) that I shall not attempt to enlarge upon them.

On Thursday, December 3rd, I attended the South-western Police Court to answer a summons charging me with driving at the rate of 28 m.p.h. on the Portsmouth Road. I went into the witness box, and stated that my speedometer did not exceed 20 m.p.h. whilst passing through the trap, and also handed in a letter from the makers of the speedometer guaranteeing it to be correct. In spite of this I was fined £2 and 2s. costs, and when I stated that I had not sufficient money with me to pay, was told by the magistrate (Mr. Paul Taylor) that it was very silly to come to the South-western

#### Correspondence.

Court without money. Time to fetch the money from town was refused, and I was locked in a cell from 3.45 p.m. till 5 p.m. (after wiring for the money); then, as the money had not arrived, was bundled into a compartment of the "Black Maria" with a cabman who had half murdered his wife, who during the ride to Wandsworth Gaol treated me to an account of prison life in the best cabman's style.

On arrival at the gaol I was told to line up with my fellow unfortunates, and was told that my sentence was fourteen days (my friend the cabman's was only seven). I was then offered a tin of "skilly" and told to remove my boots and collar; to this I objected, and after a lot of trouble was given permission to retain my own clothes till seven o'clock (it was then 5.30). Till six o'clock I had to stand in the corridor, and was treated to the edifying spectacle of a procession of "drunks and disorderlies" stripping and bathing.

At 6 p.m. I was put into another cell, but at half-past came the welcome news that my money had arrived. A note was then made of my height, occupation, colour of eyes and hair, age, and place of birth. I was asked what standard I was in when I left school, and when I said I had not been to a board school was asked if I could read and write. Eventually I was entered on the discharge sheet as "well educated" (what honour!), and at seven o'clock cast out on the world once more, branded for life as a GAOL BIRD.

#### A NEW THING IN CARS.

[13734].—With reference to the article contained in your issue of November 28th, headed "A New Thing in Cars," we would like to put before you a few facts which, in the interests of ordinary truth and justice, you will no doubt make public.

We are afraid we must deny the fact that "the high brow of the born inventor" in question was the seat of the idea or design of the car described in this article, and, with a modesty as near as possible equalling that described in your "Owen John's" article, we would say that the so-called inventor was at the time of the trial run driving a car which was our property, the original design of which emanated from our managing director, and the technical design of the entire car, with the exception of a few ordinary details such as spring shackles, radius rods, etc., was the result of our technical staff and not of the gentleman you mention.

The car itself unquestionably has all the advantages and features enumerated in your article, but if anybody wishes to know anything about this car he should refer to us, who are not only the original designers, but hold the entire working drawings, details of electrical design, and last, but not least, the actual article.

We trust you will pardon our correcting you in this manner, and beg to assure you that we are fully convinced that your article was written in perfect good faith, and that the writer thereof was merely labouring under a misapprehension.

RHODES MOTORS LTD. AND REDUCED.

#### MOTORISTS AND CYCLISTS.

[13735].—I notice in *The Autocar* for November 28th that your correspondent "AE 508" [letter No. 13643] draws attention to the evils of the cyclist. We all know what the cyclist is, but then—well, we must not say too much, for perhaps he will be a motorist some day. It is a well proved fact, however, that the cyclist, more the rule than the exception, is given to a selfish desire for the middle of the road, and few motorists, I think, are unable to give an account of some "near shave" on account of the non-observance of the rule and common courtesy of the road.

Toward the end of the letter he draws attention to the well-known fact that a large proportion of the cyclists who frequent the country roads on dark nights are almost undiscernible on account of their carrying no rear light, or even a tolerably bright light in front.

This reminds me of a cyclist I saw one right not so long ago. He evidently thought he would be on the safe side, and had invested in a red and white light lamp, but through ignorance I suppose he had managed to get the red light pointing forwards and the white light behind. I leave you to consider what might happen on a dark night in such a case.

Now may I draw attention to a matter which seems very common in this district in regard to the new Lights on Vehicles Act? I refer to the way in which the drivers of slow moving carts, etc., allow their rear red lights to be carried. It is quite a common thing to see red lights shown in all directions except behind. To give an example of what

*Correspondence.*

occurs every day, I was returning home from the station at night about a fortnight ago. It is only a matter of about ten minutes' walk, but in that time I saw a good variety of red light display. I passed in all seven slow-moving vehicles. Only two of these had respectable red rear lights made out of red glass, two others had no red light at all, and out of the other three, whose red lights were painted on the glass, one pointed directly forward and the other two were pointing towards the sides of the vehicles.

Cyclists can be blamed, and rightly so, for not carrying a red light, but I think that at the same time we should see that the red lights on other vehicles are made to shine out rearwards.

Might I in closing ask the question which I believe has been asked several times before—Who will carry a rear red light on his cycle and so set the example for others?

H. LOMAS.

**BALL BEARING CRANKSHAFTS.**

[13736.] Referring to the letters on the above subject now appearing in your most interesting paper, I beg to state that, being connected with the motor axle trade, I have seen axle arms ruined by the breaking of a ball, although those used have been of the highest quality (English and foreign). If this is possible from the effects of a road shock, the probability becomes much greater when receiving the greater shocks from heavy explosions.

A crankshaft made from suitable steel (such as Ubas) case hardened, and fitted with plain bearings (not white metal), will give greater satisfaction and wear out all the ball bearings. Many manufacturers use either chrome, vanadium, or nickel steel, leaving them soft, because they will not stand straightening after being hardened. (This refers to cranks cut from the solid.) This we demonstrated on a four-throw crank last year to a Coventry firm, whereas one made from suitable steel was straightened, and ran to  $\frac{1}{4}$  of an inch. I may say that the hardening was done with burnt leather, and by a firm of fifty years' experience in axle work.

C. C. HEPWELL.

[13737.]—Mr. Whittaker's letter [No. 13687] on ball bearing crankshafts is of interest. As the designer of a ball bearing crankshaft which has proved itself particularly successful, perhaps a few remarks of mine may be of interest.

In the first place, what are the advantages of ball bearings? Briefly, they are as follow:

(1.) A much less effort is required to start a shaft rotating with a given load than is the case with a shaft supported on plain bearings. Messrs. Hoffmann illustrated this point at Olympia very emphatically.

(2.) A total (or very nearly total) absence of wear.

Now these two points alone, viewed by themselves, appear most excellent, and so they undoubtedly are, but it would never do for us to dismiss the subject without further investigation.

We must remember there is nothing new in ball bearing crankshafts. For two or three seasons a firm of highest Continental repute made a speciality of supporting their crankshafts on ball bearings, but we now find they have entirely abandoned the practice. Why? Obviously not without due reason. Therefore, let us consider the other side of the question. Ball bearings are expensive, particularly the larger sizes that are requisite for supporting crankshafts.

Do they render the crankshaft of cheaper construction? By no means; rather considerably the reverse.

Is the engine lighter as a whole? Here again the reverse is the case.

Is the cost of upkeep less? Not if proper lubrication is employed with plain bearings.

What about the relative initial cost of engines fitted with plain bearings and ball bearings respectively? My sure opinion is the ball bearing is considerably more expensive.

Any other points? Yes, that of noise. A properly lubricated plain bearing has no metallic contact with its journal, being supported on a film of oil, but this film is impossible with a ball bearing. Consequently a quite appreciable noise emanates from a ball bearing crankshaft, and it therefore is obvious, other things being equal, the plain bearing shaft will run very much more silently if a proper force feed system of lubrication is employed.

When we come to consider the fact that a petrol motor is never under load when being started from rest, we may dismiss from our minds the apparent advantage first mentioned—that of low starting resistance—remembering above

all that when under way the resistance to movement is practically the same for both types of bearings.

Considering the other parts of a motor car to which ball bearings are fitted, it is patent that in nearly every case (e.g., road wheels, axleshafts, etc., etc.) these parts have to be put in motion when under load, and herein lies the great advantage of fitting ball bearings.

To sum up, I contend ball bearings are not really warranted for the crankshaft, because from impartial examination it is not possible for any great or appreciable advantage to be thereby gained—it may rather be otherwise.

Rather, I say, perfect the lubrication system to abolish the wear of plain bearings; the outlay will be less than in fitting ball bearings.

I give these few points absolutely impartially. It is not, as Mr. Whittaker suggests, a question of prejudice to an innovation—rather is it a question of commonsense reasoning. Designers and users must alike remember "it is possible to have too much of a good thing." A. W. REEVES.

**FRAMES AND BODIES.**

[13738.] We notice that in your issue of the 21st inst. in your general review of the show at Olympia the writer declares that "no chassis frame is, or should be, absolutely rigid," and that "the body is a rigid structure, and its sufferings are proclaimed by groans, squeaks, and the peeling of paint."

Surely this statement is a little open to question. Personally, I was always under the impression that the makers aimed at getting as much rigidity as possible in the frame. Otherwise, we body-makers should certainly construct our bodies with edge-plates.

CAR BODY.

[Perhaps our correspondent will explain why bodies by the best carriage makers, and built of the selected seasoned woods on which they justly pride themselves, should in many cases become loose in the doors and should groan and squeak after a few months' usage.—Ed.]

**RACING AND THE PUBLIC.**

[13739.]—The Four Inch Race is supposed by some to give results that will establish the correct relation between bore and stroke. This is, of course, incorrect. Limit the bore and more power will be obtained by increasing the stroke to an otherwise undesirable degree. Limit the stroke, and more power will be obtained by increasing the bore to an otherwise undesirable degree. Either restriction produces freaks that are not so useful to design as the results that racing may produce. There are many formulæ of varying degrees of refinement that take into account both bore and stroke. Races under any of these will produce more useful results. The matter is well enough understood to furnish a formula that will make victory possible to an engine differing little, if any, from the ideal engine for a motor car.

There is another restriction, the bearings of which on the development of the motor car deserve very careful consideration. I mean the minimum weight. At first sight this appears a wise restriction, since it removes from the designer the temptation to increase speed and rapidity of getting up speed, by a ruthless cutting away of the vital parts of the car and its consequent safety.

That it is possible to reduce weight by sacrificing reliability to the point of danger is indisputable, and for this reason the entry of any car should be subject to the veto of the ruling body, who would exclude any car that in essentials was insufficiently strong. The ruling body should be technically sound enough for its decisions to be made without fear, and accepted without cavil, and such being the case the minimum weight limit would cease.

Enormous reductions in weight would inevitably result, and in some few cases weak designs would be allowed to compete, and disaster might result (though motor car accidents appear remarkably harmless), but the ideal car would be brought much nearer realisation.

By the ideal car, I mean the one that will with economy travel at a better average speed without at any point exceeding a certain limit (legal or otherwise).

A light car means less reduction of speed uphill. It means a quicker increase of speed after a stoppage, and since the limit of speed depends on area rather than weight, the light car will not be able to reach an appreciably higher speed than a heavy one. Let us hope that these points (all of them points that directly or indirectly benefit the public apart from the motorist) will be borne in mind by the R.A.C.—the body that rules our sport.

JOHN. V. PUGH.

## SOLUTIONS TO AN IGNITION PROBLEM.

[13740].—Last year I had the same trouble with my two-cylinder car as that described by your correspondent. I tried new coils, accumulators, wires and plugs, and changed the wire on coil to the other cylinder, but it was no better. I now thought, if gas is going into the bad cylinder, why does it not explode in silencer when the good cylinder has fired? The inlet pipe was T shaped, so I plugged up the end on the good cylinder and tried the engine, with the result that the bad cylinder was now working. So I cut off the end from inlet pipe and fixed another pipe on to bottom near the carburettor. The top end I fixed on the inlet valve dome and again tried the motor. Both cylinders were now working, but the good one was still the best, as it had the best lead. I made two new pipes of equal shape and length, and they now work the same. Perhaps your correspondent may be able to try this. BR 51.

[13741].—In my solution [letter 13703] of last week I omitted to state a very important factor in the reversal of the order of firing, namely, that it is necessary to reverse the order of the valve cycles respectively to one another, and so to make it clearer will split the last test under "fault-finding" into two tests, as it is really intended.

To test the timing of the valves, turn the crank round, as in ignition tests, and note the position of cams on opening and closing relative to the position of the cranks.

IV., V., and VI.—Connect up as in either diagram which reverses the order of firing in the two cylinders, which necessitates the reversal of the relative valve cycles to suit. To do this it is necessary to place the cams working valves to No. 2 cylinder in respective positions ahead that they now hold in the rear of cams working No. 1—90°.

It is not necessary to cut new keyways for this experiment. A slightly taper key, bedded to shaft, and a good fit to slot in cam, if tightened home will hold them sufficiently for the test. MOTOR.

13742.—With reference to your article, "A Solution Wanted," in *The Autocar* of November 28th, I think that there are many more possible explanations than your contributor gives. In the first place, I think the placing of the cylinders with regard to the flywheel has no material effect on the working. I gather from your article that the cylinder that caused the trouble was the one placed furthest from the flywheel. I may mention that I have had personal experience with a two-cylinder car which had the same defect, only in my case the cylinder that worked badly was the one placed nearest the flywheel.

It would seem as if a more probable cause of the trouble were a slight difference in the compression chambers, which could be derived from three or four different sources:

(1.) There might be a minute and almost invisible flaw in the casting of compression chamber, which would in itself produce a marked difference in the compression and working.

(2.) The crankshaft might possibly not be in exact level with the cylinder heads, thus causing the stroke and compression of one of the cylinders to be slightly altered, thereby producing the irregular running.

(3.) Supposing the crankshaft to be level, a big-end bearing fitted badly on to the shaft would give sufficient cause to produce the same effect.

(4.) The last and most improbable cause I can think of is that the counter weights might not be exact.

In a word, the explanations that I can suggest are two, namely, the stroke of one of the cylinders is not exactly equal to that of the other; or, as your correspondent himself has suggested, the reception of the gas is more favourable to one than to the other. F. T. P.

## HIGHLY GLAZED PAPER.

[13743].—Might I suggest that, in the interest and for the comfort of the many subscribers to your paper, you should adopt a very important alteration, and that is, have it printed on a much less highly glazed paper?

If so, I venture to think that 99% (if not 100%) of the readers would infinitely prefer it. Whether I read it during the day, or at night I find it most difficult to adjust it at such an angle as will free itself from the very trying glare which the highly glazed surface produces. It is very bad for the eyes, and altogether makes it very unpleasant to read it. Compare your paper to the *Practical Engineer* (which is another paper I take in), and see how much pleasanter it is to read that than yours merely on account of the ques-

## Correspondence.

tion of glaze. I like your periodical in other respects very much, otherwise I should cease to subscribe to it, and take in another, but as I feel that I am only echoing the feelings of many others, I venture to make the suggestion to you for your consideration. H. L. T. B.

[Our correspondent's suggestion is quite a novel one. However, there may be other readers who experience the same inconvenience that he experiences, and if there are we should like to have their opinions on the matter. In the meantime we may point out to them that the penny edition is not printed upon so highly glazed a paper as the three-penny edition, and that there is, consequently, no glare from it when read in a high light. It should also be pointed out that this highly finished paper is used in order that the illustrations may print as well and as clearly as possible. With a less highly burnished paper the clearness and detail of the illustrations is necessarily lost to some extent.—Ed.]

## MR. EDGE'S WITHDRAWAL FROM RACING.

[13744].—I have seen in your columns another letter from Mr. Jarrott, and I notice he is making a still further effort to misrepresent me in regard to my giving up racing.

I can assure him I am just as anxious as he is that there should be no misunderstanding on this matter, but at the same time I think Mr. Jarrott's personalities are to be deprecated. I think it would be infinitely better to appoint some independent person as arbitrator to consider the matter privately, and then advise your readers whether Mr. Jarrott or myself is right.

In the meantime I propose to answer Mr. Jarrott's queries fully and openly.

First, he says that after my withdrawal from racing I have, through one of my drivers, taken part in speed record attempts at the track. My answer to this is that the statement is absolutely untrue, and he could easily find this out by applying to the officials who deal with the record attempts. Surely a letter from the Brooklands authorities, stating definitely that I have not done anything of the sort, should be sufficient.

Certainly I do not pretend to control privately-owned Napier cars, and the fact that the 90 h.p. Napier racer "Samson" was for sale at £800 does not make the possibility of it being privately owned impossible.

In regard to his queries—

(1.) His first letter distinctly says, "I now see from the papers that one of Mr. Edge's cars, driven by one of his own drivers, has, during the last few days, been making records at Brooklands." My answer to this is that Mr. Jarrott's statement is absolutely incorrect, and until he brings some independent witness to back up his statement I cannot deal further with it. Neither I, nor anybody else on my behalf, has attempted or made records at Brooklands since my letter to *The Times*.

(2.) Certainly Mr. Newton has obtained records at Brooklands, and if Mr. Jarrott will take the trouble to find out the tyres which he used, some explanation of the records may be found to clear Mr. Jarrott's brain on this matter.

(3.) Mr. Jarrott states that I sent out advertisements to the press broadcast in regard to the result of these records, either by myself or through my advertising agents. My answer is that neither directly nor indirectly has a single notice ever gone out from me or my company on the matter. I call upon Mr. Jarrott to prove his statement, which, if true, he can easily do by obtaining one of these advertisements which he states I sent out broadcast.

(4.) He states that these record attempts were part of my advertising programme. I defy him to prove his statement in any shape or form.

(5.) His further suggestion that I sent out notice to some people that Mr. Newton was going to attempt the 90 h.p. record is also incorrect, and I see it has called forth a very clear letter from Mr. Lafone, who wrote the note in question, stating clearly that it was a mistake his suggesting or inferring that I had entered or was running a car, and also stating clearly that he heard that the record was to be attempted from the B.A.R.C., and not from myself or anybody connected with my firm.

Before Mr. Jarrott wrote his letter he could have obtained this information from the writer of the notes in question, and I must express surprise he did not do so.

As to his suggestion that he believes in "playing the game" either in sport or business, I leave the opinion of him on this point to those who have read this last letter of his. His letters seem to me to be written with a mere effort to gain self-advertisement, without even the condoning

*Correspondence.*

feature of at the same time doing something useful to the motor movement as a whole.

My letter to *The Times*, and every sentiment contained in it, stands as true to-day as it did on September 22nd, when I wrote it, and I have nothing to alter, explain, or withdraw.

I trust with this explanation these unsportsmanlike attacks on me will cease, as in my opinion they are neither useful, entertaining, nor gentlemanly.

S. F. EDGE.

[13745.]—Regarding the letter from Mr. Charles Jarrott under this head, it is evident that the writer is mistaken as to the meaning of Mr. Edge's now famous declaration.

What, I take it, he does infer is he does not intend to take part himself in any more racing, or to enter himself any more Napier cars in races. This being clearly understood I now await information on the following points:

- (1.) Will any Napier racing cars be built and raced in 1909?
- (2.) Will a team of Napiers be entered for the 1909 Grand Prix, seeing that it is an open invitation for Napiers to compete, the restrictions re detachable wheels being removed, and as you point out, the engine dimensions, etc., greatly favour Napiers?

CHAIN DRIVE.

[13746.]—Your correspondent, Mr. R. J. Creamer, states in his letter [No. 13712], "We have become so used to thinking of Edge and Napier cars *in one breath* (the italics are my own) that a special performance," etc. I shall be very interested to know how Mr. Creamer does this. The performance is one which would, I am sure, create quite a stir in psychological circles. I leave it to Mr. Edge to claim that the six-cylinder principle induces such a state of calm to the nervous system as to thus merge the senses.

PHGENICIAN.

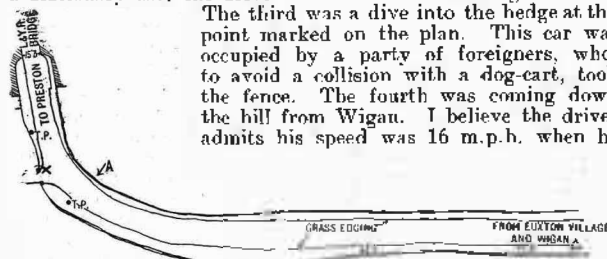
[This correspondence is now closed.—ED.]

A NORTH-COUNTRY DANGER SPOT.

[13747.]—My attention has been drawn to the sketch of a North-country danger spot in *The Autocar* of November 21st. As this sketch is not right, I got Mr. H. J. Samuels, of Chorley, to make me a plan, which I beg to enclose for your inspection. You will see the curve is not so serious as shown in your sketch, and that the red triangle is about 160 yards from the corner. This distance is ample for any driver to get command of his car. Then again, the road from the railway bridge to the Preston turn is almost straight, the driver having a clear run of 300 yards.

In reference to the five accidents, the first was a collision between a motor cyclist and a motor car. No one that I hear of can remember hearing the driver of the car sound his horn, but he was on the right side of the road. The second was at the Preston turn, when a cyclist collided with a stationary car, the driver of which was sounding his horn.

The third was a dive into the hedge at the point marked on the plan. This car was occupied by a party of foreigners, who, to avoid a collision with a dog-cart, took the fence. The fourth was coming down the hill from Wigau. I believe the driver admits his speed was 16 m.p.h. when he



The corner at Euxton, near Chorley, Lancashire. The post near the point marked x has been run into several times, but A is where accidents generally occur. The distance from the triangle on the right to x is 150 yds. T P is telegraph post. The diagram has been drawn to scale by Mr. H. J. Samuels, Surveyor, Devonshire Road, Chorley.

skidded and struck the gate-post and damaged the car. The fifth accident took place five days after the fourth. From what I heard, I gather that the driver's brakes were defective. He started from London on the Wednesday and drove all night. At five o'clock in the morning he drove into two cows, knocking one down and partly running over it; then when he came by the other accident he had either to take the fence or kill a horse. He told me he had been summoned five times, and had had his license endorsed four times. To my mind it clearly proves he is not fit to drive.

Whilst there is a vast improvement in the speed and care

of many of the drivers, others use this road as if it were made only for motorists, and delight to turn and laugh at the country people on Sunday when they have spoiled their clothes and filled their eyes and ears with slush and dirt. We are glad to see sensible people on the road, but consider that motorists ought to show more regard both for carriages and those who have to walk.

J. CLAYTON.

GRAND PRIX VAUXHALLS.

[13748.]—I, like Mr. Madeley [letter 13690], am a great admirer of Vauxhall, and should be very pleased to see a team of their cars entered for the Grand Prix. If I were more wealthy I should like to undertake the job of running one of them myself. They say "every little helps," so I am prepared to subscribe £10 towards expenses entailed by running them, having great faith that they will not disgrace England. As I shall probably be leaving Europe shortly, I enclose cheque to you, to be used in the event of it being wanted, and on condition that the driver is experienced and not likely to try conclusions with the ditch at the first corner.

E. H.

RUNNING COSTS.

[13749.]—At various times statistics of running costs have been given in your paper.

I append particulars of running costs of my 10-12 h.p. Humber landaulet from July 15th to Nov. 30th inclusive. The car is this year's make, but I did not purchase it new. I shall be glad if your readers will criticise these figures. The chief point that strikes me is the inordinate consumption of petrol. I am given to understand that a far greater mileage per gallon should be attained, but I have been unable to effect any improvement, although I have tried various experiments, and have sought the advice of several experts on the matter.

F. H. COOKE.

ANALYSIS SHOWING COST PER MILE FOR RUNNING 10-12 H.P. HUMBER LANDAULET FROM JULY 15TH TO NOVEMBER 30TH, 1908, BUT EXCLUSIVE OF DELIVERY OF CAR, FOR WHICH THE VENDORS PROVIDED PETROL.

	July.	Aug.	Sept.	Oct.	Nov.
Miles run .....	287	1,038	790	456	460
Miles run per gallon of petrol	16.16	16.16	16.12	14.27	14.37
	d.	d.	d.	d.	d.
Petrol .....	1.00	.77	£.99	.84	.84
Lubricating oil .....	.39	.20	£.47	.31	.10
Tyres .....	—	.05	£.70	.105	.80
Repairs .....	.82	.27	£.39	.06	£.08
Chauffeur .....	3.14	1.95	1.30	2.45	2.61
Rent .....	.51	£.26	.33	.58	.56
Licenses and insurance .....	.66	.33	.42	.75	.72
Sundries .....	.21	.26	1.33	.05	.20
Total cost per mile run .....	6.73	4.07	5.93	6.13	5.91

ANTI-MOTORIST AGITATION.

[13750.]—I have just read an account of the Highways Protection League meeting in London. There is an old saying "Live and let live," and I think it would be wise if Lord Willoughby de Broke took this axiom to heart instead of railing against motors in the manner he does. His lordship must know there are many motorists in the country who do not hunt, but who nevertheless permit their coverts to be drawn and their land ridden over without a word of complaint. It would be a sad day if the necessity for recrimination should ever arise.

MOTORIST.

PORLOCK HILL.

[13751.]—I saw in one of your numbers for August, 1908, that the Hon. Leopold Canning declares it impossible for a 6 h.p. car to climb Porlock Hill. I took the hill on my way to Lynton on a 6 h.p. Rover (November 23rd), and climbed it without the slightest difficulty with a ten-stone passenger and a good weight in luggage. They pointed out the hill to me at Porlock village, and told me I should not be able to climb it, as it was very rough and stony. The road eases off to about 1 in 7 or 8 after two very steep corners. I stopped there while my passenger took a photograph, and restarted without any difficulty.

L. WIX.

## A PREMIUM ON EXTRAVAGANCE IN PETROL.

[13752.]-I have read letter 13077, and I fully agree with the suggestion it contained that the discount represented by the premium on the seals should be given to the owners of cars.

I should like to point out that I have had the pleasure of finding a dealer in the S.W. who has smartly solved this irritating problem. He invoices (to the owners) the petrol at 10d. per gallon (instead of the usual 10½d.) when the seals are left or returned to him by his own customer.

I find this solution not only a reasonably honest one, but also very favourable to the interest of the majority of buyers, who cannot buy 100 cans of petrol from now to the end of February next. No need to say that I am now dealing with this reasonable dealer and recommending him to my motorist friends.

F. DUFFY.

## FRONT WHEEL BRAKES.

[13753.]-I have read Mr. Renouf's second letter [13695], and I would now ask the privilege of clearing up the real points at issue which he has somewhat obscured.

In his letter published in *The Autocar* of November 23th, Mr. Renouf modestly writes: "The Allen-Liversidge device was one of the very first I myself designed four years ago, but shelved in favour of the better one, etc. . . . I am, therefore, delighted to learn that even my most inferior device for actuating front wheel brakes is giving such good results; but it is absurd to compare it to the only perfect combination—the one in which the pivotal lines lie in the central plane of the wheel. A patentee cannot show all possible variations of his invention; it is his duty to indicate what he believes to be the best way, and that I have done."

If this means anything it means that Mr. Renouf lays claim not only to the Allen-Liversidge invention, but also to exclusive rights over the combination of steering centre in the plane of the wheel; or at least, he leaves this inference to be drawn by the public. Nothing, however, could be farther from the fact. Mr. Renouf himself in a recent letter to the writer says that his "statement as to his earlier experiments is by no means to be understood as implying any prior legal publication." I accept this explanation so far as it goes, but my appreciation of his courtesy would have been less constrained had he given to his explanation the same publicity which he has given to his statement.

Mr. Renouf tells us that he "shelved" the Allen-Liversidge device because it was "inferior." The question arises, did he try it to find it inferior? If so, why does he now have to "learn what it is giving such good results?" If, on the other hand, it was only an idea with him, which he discarded without any realisation of its possibilities in practice, why does he now presume to speak of it as "my most inferior device?" But Mr. Renouf forgets that in the very same letter he says that the only apparent difference between the Allen-Liversidge patent (which is his "most inferior device") and his present, "only perfect" one, is that in the first case "the roller is placed horizontally," and, in the latter case, it is placed "vertically." This is, indeed, an amazingly slight difference to differentiate between the two extremes of "most inferior" and "only perfect." The absurdity of such a statement is apparent on its face; and I am constrained to say that the gentleman who makes it (if he really believes what he says) has never at any time grasped the principles underlying the Allen-Liversidge invention.

In this connection we might take note of another tell-tale statement made by Mr. Renouf in the same letter. He says, "Where the pivotal lines lie in the central plane of the wheel absolute security is obtained even if one of the brakes fails or is left off altogether." From this and other indications I gather that Mr. Renouf's experience of front wheel brakes on motor cars has been limited to theory only, otherwise he would know that when only one front wheel is braked (irrespective altogether of the question of irreversibility of steering) the tendency to sideslip on a greasy road is set up the same as when the back wheel brakes are applied. It is only when the two front wheels are braked evenly that the car is steadied and kept in its straight course.

Although Mr. Renouf has now repudiated his implied claim to prior rights in the Allen-Liversidge invention, he still leaves it to be inferred that the combination of the steering centre in the plane of the wheel is one of the features of his own patent. He therefore imposes upon me the necessity of stating that this is by no means the case. Such an arrangement has long been in public use, although confined to a few isolated cases. The manufacturers have not, as a rule, been inclined to adopt it, because theoretical perfection in steer-

## Correspondence.

ing was found unnecessary in practice, and because the same object could be attained, where desired, by inclining the steering pivot outside the plane of the wheel. Personally, I should have no objection whatever to placing the steering pivot inside the plane of the wheel as an alternative to the inclination of the steering pivot, as this would not affect in any way the application of the Allen-Liversidge principle. The brake device would still be mounted on the steering centre inside the plane of the wheel, although the brake drum itself would be on the outside. So long as the brake device operates on the steering centre it is quite immaterial whether the brake drum is placed in the same plane or not, inasmuch as the line of pull is always kept at a constant distance from the steering centre, and parallel to the plane of the wheel, at whatever angle the wheel may happen to be turned. But Mr. Renouf would fain have us believe that such an absolute arrangement is only to be classed among the "near enoughts." I would ask him how much nearer he would have us hit a target than the centre of the bull's-eye. Mr. Renouf seems to have overlooked the principle that so long as the brake devices on the two steering centres are exactly equal in diameter and operate in the same plane as the steering, the line of pull can be left optional to suit the convenience of construction. Had he recognised this principle four years ago, it is hardly likely that he would have restricted himself in his patent to that form of brake device which operates "through the steering pivot along the pivotal line," the disadvantages of which I briefly dealt with in my letter [13694] to *The Autocar* of last week.

But Mr. Renouf has failed to grasp still another feature of the Allen-Liversidge arrangement, when he says, "as the wrap of the cable increases on one roller and decreases on the other, the frictional effect will prefer to take the easier line of resistance by pulling one brake lever more than another." He seemingly does not understand that the Allen-Liversidge devices, in addition to being mounted on the steering centres, have been made independently rotatable, so that they rotate with the brake action independently of the steering action. The consequence is that the pulling strain on the levers, transmitted through these devices, remains the same no matter how unequally the cable wraps around them, just as would be the case with an ordinary windlass. In the same way the cable itself is free to move over the rotating pulleys, under the steering action, whether the brakes are on or off. It is this slight movement of the cable which Mr. Renouf has criticised in another place as a "sawing" action. He seems to forget that this is a very common movement in the case of all lifts and other moving mechanical devices where cables are used. But it is curious to note that this very same movement is employed by himself in his own design for the purpose of putting on the brakes. In his case, however, he calls it "rolling." In our case he terms it "sawing." This nice point of difference the reader will no doubt appreciate. When thus boiled down we find that Mr. Renouf's only real claim to monopoly is confined to that form of brake mechanism which operates "through the steering pivot along the pivotal line."

THOS. G. ALLEN.

## CHAIN OR GEAR DRIVE.

[13754.]-Inspection of the exhibits at the recent Olympia Show disclosed the fact that the majority of cars were fitted with the live axle and propeller-shaft drive. At the first blush it would appear that this was so on account of the superiority of this system over the chain, and it is interesting to analyse the question to see whether this is the case or whether other causes have assisted in determining the line which designers have taken.

Many years ago when the subject of chain *versus* gear drive was agitating the cycling world, Professor Archibald Sharp found in a series of experiments that the percentage of work transmitted by a clean and well lubricated chain was nearly ninety-nine per cent.

The bevel wheels which are used on motor cars depend for their efficiency as well as silence and lasting properties on perfect alignment and correct meshing. When these wheels are carried in a rigid gear box isolated from road shocks by the springs and the tyres, these conditions are fulfilled as nearly as they ever can be on a road vehicle. The casing of a live axle, on the other hand, which contains these wheels is from the nature of its work subject to continuous deflection and distortion from the road shocks, and unless it is made abnormally heavy must fail to satisfy the conditions I have mentioned. Any additional weight, moreover, which is put into the live axle casing with a view to making it better able to withstand the road shocks without undue deflection, being

*Correspondence.*

carried directly on the tyres without the intervention of springs, acts adversely on the tyres, causes premature and unnecessary wear, and increases the tyre bill.

The question of side-slip, too, very largely depends on the "unsprung weight" in a car, and it is a well-known fact that the less the unsprung weight the less the tendency to sideslip.

Owing to the fact that in the live axle car the gear box is carried by the springs, and the bevel wheels carried by the tyres only, a universally-jointed propeller-shaft has to be used to compensate not only for differences in alignment due to road shocks, but also those due to varying loads. It is obvious that the propeller-shaft can only be truly in line with the two shafts which it connects when the load is such that these shafts are in line with each other—a condition which can only be fulfilled with one particular load, and then only when the car is at rest.

The angle which this shaft makes with the others is, therefore, constantly changing, and with it the velocity ratio; the excessive wear and tear on the universal joints being the unhappy result.

That these are not merely theoretical considerations is shown by the fact that while in the Scottish Reliability Trials for 1905, 1906, and 1907 there were twenty-one failures in transmission gear, there was not one caused by chains.

It would appear, then, that the chain drive must suffer under some peculiar disadvantage for it to be superseded by a system possessing so many defects.

In the chain driven car the axle having only to carry the load may be exceedingly light, as any slight deflection which takes place will with the chain transmission cause no loss of efficiency. It therefore scores on the point of unsprung weight. Tyres last longer, and there is less sideslip. The bevel wheels and differential are safe from harm, isolated by the springs from road shocks. The advantage of being able to alter the gear ratio by changing sprockets is another point which cannot be too strongly insisted on.

It is obvious, then, that the disadvantage which has caused so many designers to discard the chain is difficulty of lubrication, and the consequent increase of noise and wear.

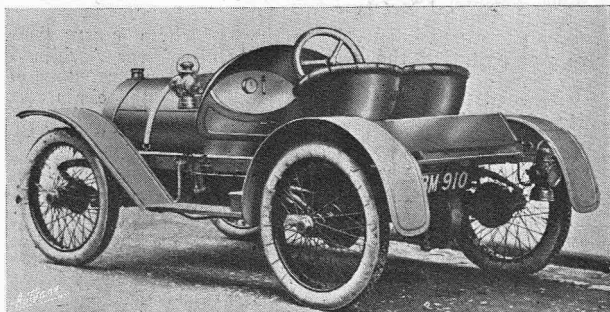
This can be entirely overcome by enclosing the chains in such a manner that they run in a bath of oil out of reach of dirt and grit. When this is done the silence of the chain drive is equal to that of the live axle, and it is almost everlasting.

Cars fitted with chain cases have from time to time been exhibited, but with very few exceptions have disappeared, apparently because the designers found it easier to design a live axle than a properly fitting chain case.

My company has been approached by nearly every well known British and foreign motor car manufacturer with a view to fitting oil bath chain cases to their cars, but when it has been pointed out that structural alterations were required nothing more has been done.

I think I have proved that the only points where the chain drive as usually constructed suffers in comparison with the live axle are those of silence and sufficient lubrication, and I am prepared to demonstrate that with the oil bath chain case, as made by the Sunbeam Motor Car Co., these two matters are effectually dealt with, thus making the chain-driven car the more perfect of the two.

FREDERIC EASTMEAD.

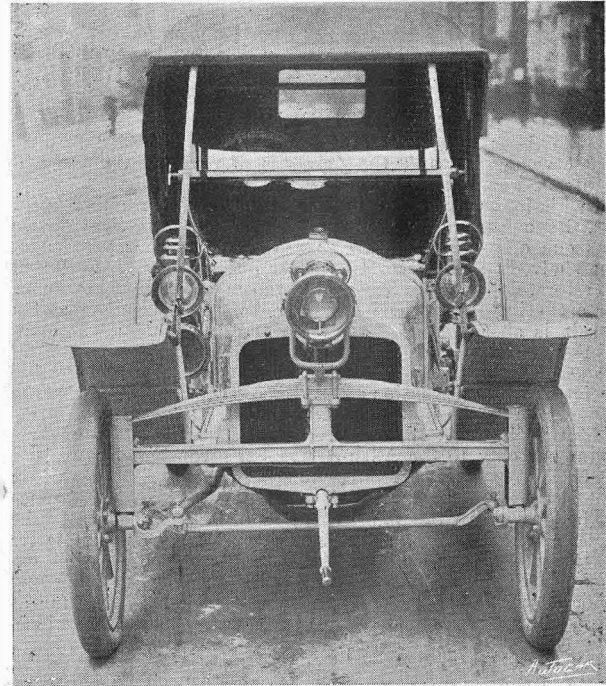


A smart little 10 h.p. Adams car fitted with two-seater body and a long bonnet, giving it an exceedingly rakish appearance. Altogether the car is quite uncommon looking.

## SMALL CARS AT THE SHOW.

[13755].—I read with great interest your article on the new small cars at the show, appearing in last week's issue. I would like, however, to correct your contributor with reference to one point he mentions, namely, in regard to the springing of the Sizaire car. He refers to the S.K. car as having a similar suspension in front to that of the Sizaire. In this he is inaccurate.

In the case of the S.K. car the suspension is arranged similar to the old Panhard racer suspension, which gave a



considerable amount of trouble through the front springs breaking.

The suspension on the Sizaire car, as may be seen from the accompanying photograph, is quite different. The spring carrying the weight of the chassis rests upon two steering heads, which take the form of long spindles. In this way each front wheel is able to rise quite independently of the other.

The photograph I enclose [reproduced above.—Ed.] makes the matter perfectly clear.

CHAS. JARROTT.

## THE 15 H.P. HUMBER.

[13756].—Owing to the striking reduction I have made in the price of the 1909 15 h.p. Humber car, there still appears to be some doubt as to the models I am offering. It must be obvious to anyone that, as I am the sole vendor of this model, the explanation of "sour grapes" may safely be applied to "Humber Agent's" and other trade criticism; but, perhaps to clear all doubts, a further explanation from me is necessary.

I am not one of the Humber Co.'s authorised agents, but on the opening day of the recent Olympia Show I entered into a contract with Messrs. Humber, Ltd., to purchase the output of the 1909 15 h.p. model. My contract is not for an old or obsolete car, but the new and improved standard model, as described in the 1909 catalogue, and listed at £315. By contracting in the way I have I am able to sell this car, which was remarkably good value at £315, for £250.

THOS. GILLET.

[We think it only fair to Mr. Gillett to add that he has called upon us to show us the contract for purchase between himself and Messrs. Humber, Ltd., and the cars in question are clearly described in the following words: "15 h.p. Coventry Humber standard cars as described in the price list of Humber, Ltd., for 1909." Further, we have a copy of the 1909 list of Humber, Ltd., before us in which this model is included. This finally disposes of any possible doubt as to the date of the cars offered by Mr. Gillett.—Ed.]

## AERONAUTICS.

### Airships in Warfare.

Wars, or at any rate rumours of wars, have been the keynote of the last week or so in aerial circles. Airships have come so much into prominence recently as to turn the attention of governments and military authorities to the new force so suddenly risen amongst us. That it is a quantity which is anything but negligible is admitted by the leading European nations, and, grudgingly, perhaps, by ourselves. Indeed, our British lethargy on this point has become serious, and therefore the line taken by the Duke of Argyll at the meeting of the Aero Club last week is distinctly a wise one.

Speaking of aviation, to use the French term, the Duke pointed out that the science had now passed out of the region of the pleasantries and become a question which should be seriously considered by every nation. The apathy of the British people was becoming dangerous, as not only were France and Germany far ahead of us in aeronautics, but also the sea was no longer a protection to us since the coming of the dirigible airship. Even at the present time, said the speaker, we could all be overlooked and spied upon, while it is quite probable that airships carrying 13 or 14 cwts. in addition to their equipment could make themselves extremely disagreeable.

The same subject was dealt with in Berlin last week by Councillor Rudolf Martin, whose remarks were clear enough to show that our position is no longer regarded by the Germans as impregnable. Herr Rudolf, who is not one who speaks without his book, was quite open on this point, going so far, indeed, as to say that aeronautical progress was now sufficiently advanced to drive the British nation off the high seas. The dirigible airships already owned by Germany were capable of crossing the Channel several times without having to stop for supplies, while—what is a greater menace to us still—a syndicate to build large numbers of aeroplanes is likely to be formed shortly. Judging by Herr Rudolf's remarks on this occasion, the German authorities have already approached Mr. Wilbur Wright with a view to arranging for a supply of aeroplanes. In whatever spirit one may take remarks of this character, it seems clear enough that other nations are wide awake to the strategic value of flying machines, and we should, at any rate, make certain that they do not have the whip hand in the matter.

### Some Recent Papers on Aeronautics.

A large number of interesting papers have been read recently on various aspects of aerial navigation. Among those of particular interest were two on the programme of the last meeting of the Aeronautical Society of Great Britain, entitled "The Wright and Voisin Flying Machines" and "Experiences with the Wright Flying Machine," the former of which is dealt with elsewhere. They gave the views of Mr. F. W. Lanchester and Major Baden Powell, and were very instructive as giving practical and comparative data. Major Baden Powell strongly urged the need of our pushing ahead with practical aeronautics in view of its military importance. At the same meeting, Mr. Eric Stuart Bruce, formerly hon. secretary to the society, gave it as his view that future flying machines would probably consist of a combination of the aeroplane and lifting screw systems. Sir Hiram Maxim on the same occasion spoke highly of the military

value of the Wright machine, which, he said, with a little improvement would be a very efficient military weapon.

### Some New Airships.

Hardly a week passes now without our hearing of some newcomer in the aerial field. Generally, the aviator is content to make use of a standard type of machine, occasionally introducing a slight modification, but now and then launching out fearlessly on a track of his own. Of the latter class is the inventor of the Message flying machine, whose design, particularly in regard to the vessel's passenger carrying capacity, has somewhat of novelty about it. The machine—of which a model is on view at the Motor Club, Prince's Buildings—is of the multiplane type, the lifting or bearing surfaces being four in number and arranged like a flight of stairs. The second plane is placed behind and above the first, the third behind and above the second, the same arrangement being found in the case of the fourth. A number of propellers between the planes gives the propulsive power, and the induced air currents can be deflected downwards by supplementary planes attached to the rear of the second and third supporting surfaces. The main framework carries the car, which accommodates the mechanic and passengers. To a rigid shaft depending from the framework is attached a basket from which the navigator directs operations. The Message flying machine is certainly ingenious, but is as yet in an imperfect state.

Another rigid type of dirigible is just appearing in Germany. Similar in character to the Zeppelins, it also has an elliptical balloon for obtaining lifting power, but the framework is of light wood. Two engines, each of 150 h.p., are fitted, driving a number of propellers of reputed peculiar design. A compensating chamber is added to the balloon, so as to prevent strain on the envelope or loss of gas when the temperature varies. The inventor, Professor Schuette, who is attached to the Dantzig Technical College, estimates the speed as forty-five miles an hour, and the duration of flight as being at least thirty hours.

### The Aero Club Annual Dinner.

At the annual dinner of the Aero Club held at the Hotel Ritz on Thursday last week the chair was taken by His Grace the Duke of Argyll, K.T. (president), supported by Mr. Roger Wallace, K.C. (chairman of the Club), Mr. Edward Seymour, Mr. Edward Manville, Professor Huntington, the Hon. C. S. Rolls, Sir Hiram Maxim, Captain Grubb, D.S.O., Major Trollope (late of H.M. Balloon Factory), Messrs. J. W. Orde, F. R. Simms, W. Rees Jeffreys, W. W. Beaumont, and a number of ladies.

Interesting letters were read from Lord Roberts, Mr. Haldane, Lord Esher, Mr. Wilbur Wright, and others.

The Chairman spoke as to the danger of this country remaining behind other countries in the perfection and development of the airship as a military weapon of the future.

Mr. Roger Wallace announced the formation of the Aero Club League, which was really a change of title from the Aero Club Institute formed some two years ago. This League would be open to everyone interested in the movement, and the subscription was only ten shillings.

The Hon. C. S. Rolls referred to the Aero Club League, and said it was intended to make this a great

national movement similar to the Aerial League of France and the great National Subscription in Germany, which had enabled a factory to be started for the construction of a number of German military airships. The Club believed there were hundreds, if not thousands, of persons who would send in their ten shillings and join the League if they thought their money would go to enhancing the position of this country in the practical navigation of the air. From an aeronautical point of view, Great Britain was no longer an island. The high average speeds of airships due to their taking a bee line and not having to slow up for other traffic or police traps would be so great that the crossing of the Channel by an enemy's airship would be a mere incident in its journey, and the time had come when a move should be made to induce the Government to spend more money, so that before long this country should have not only the command of the sea, but also of the air. Correcting the erroneous impression that the Aero Club only concerned itself with ordinary ballooning, he said the more serious side of the Club's work was not much heard of, for the Club had not thought the time was yet ripe to appeal to the public for funds, the reason being that, owing to the multiplicity of inventors and inventions untried in the past, it would be extremely difficult to utilise any such funds in a manner likely to produce any useful results. Ballooning itself was merely a sport, and except for learning to read heights and learning about air currents it was like most other sports, practically useless, and the Aero Club was the first to appreciate the comparative uselessness of the ordinary balloon, for it was the first to move at the recent meeting of the International Federation that the rules of the Gordon-Bennett Race should be so altered as to produce a competition of some practical utility, instead of a race which was more or less hazardous and had very little useful result. It was also entirely due to the initiative of the Aero Club that next year the first great International Aeroplane Race will be held.

#### A New Gordon Bennett Cup.

Notwithstanding the way in which our French friends dealt with the automobile Gordon Bennett Cup, Mr. James Gordon Bennett has offered, through Count Henry de la Vaulx and Mr. Courtland Bishop, a cup as an award in an international aviation contest. This cup will be of the value of £500, and will repose in the care of the Aero Club of France for the International Aeronautical Federation. In addition to the cup, Mr. James Gordon Bennett offers sums of £1,000 each to provide for the costs of the three annual events. The International Aeronautical Federation, therefore, thanks to the generosity of Mr. James Gordon Bennett, finds itself in possession of two international cups, one for spherical balloons and the other for flying machines. Count Henry de la Vaulx has notified Mr. James Gordon Bennett of the acceptance of his munificent offer by the Aero Club of France.

The conditions of the contest are not yet issued in detail, but the main features will be as follow: The contest will be a long-distance event over a course to be previously determined. The winner will be the competitor who completes the course perfectly. If several competitors finish the course, the winner will be that competitor who does so in the shortest time. Every year before the end of the month of January the International Aeronautical Federation will indicate the main features of the event, and name the club charged with carrying out the same. The competition

will be open to aeroplanes of all systems, and the race will be decided each year between May 1st and November 15th, the date being fixed by the club responsible for the event for that particular year. The competition will be decided in the country of the cupholder, but for the first time the event will be run from Paris by the Aero Club of France, who will accept the first entries.

#### Salon de l'Aviation.

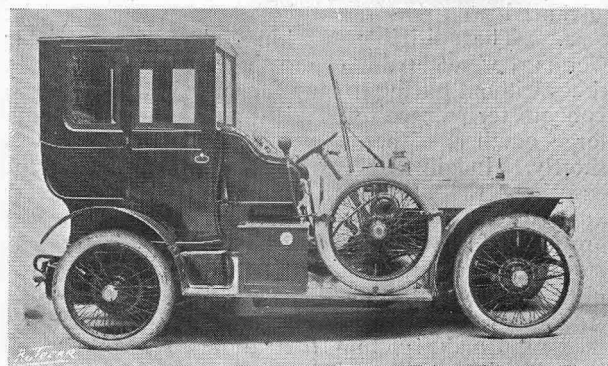
The first Salon de l'Aviation, devoted to aeroplanes, airships, and balloons, will be held from December 24th to December 30th next in the Grand Palais, Paris, and promises to be most interesting. Hundreds of specimens and reduced models of aeroplanes will be exhibited, and most probably also some of the first flying machines designed years ago.

#### Miscellaneous.

The Ligue Nationale Aérienne is organising a series of lectures, the object of which is to teach would-be aeroplanists the theoretical and practical knowledge necessary in connection with the elements.

It is announced that a meeting of the International Aeronautic Federation to discuss the German award in the Coupe Internationale will be held towards the end of this month.

Comte de Lambert and M. Bernheim have visited Hyeres (South of France) for the purpose of selecting, on behalf of Mr. Wilbur Wright, a trial ground for the American aeroplane's further experiments. They inspected the ground belonging to the Costebelle Golf Club, and expressed themselves satisfactorily impressed with it. Mr. Wright, it is stated, will probably use this ground for the purpose of training for the aeroplane competitions at Monaco next January.



Sir Henry Norman, M.P., has recently had his car fitted with Rudge-Whitworth detachable wire wheels. He is leaving shortly for a tour to Biskra, the most southerly town in the Sahara, and intends to go on until the desert sands become impassable. The car is a 40 h.p. Berliet.

Work on the new premises for the Royal A.C. has commenced, and will proceed continuously until the Club is housed in Pall Mall. The plans of the new building are on exhibition in the committee room of the Club, where there is also a handsome plaster model of the exterior of the new building.

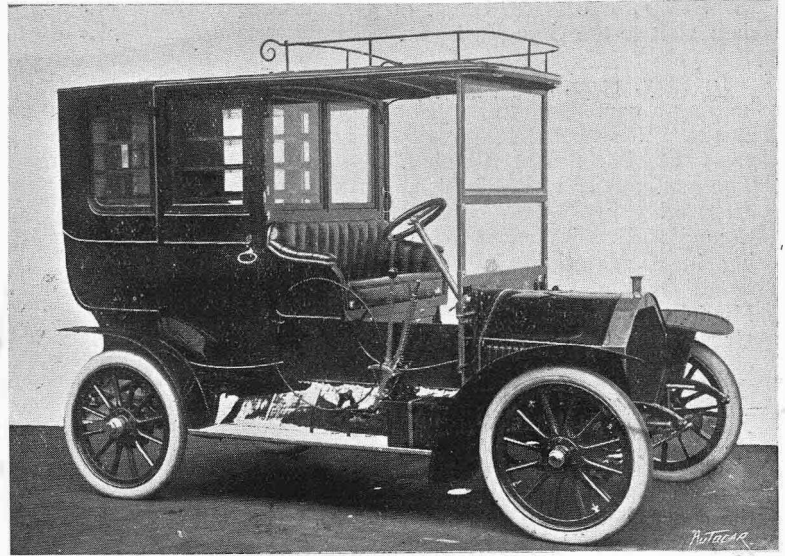
\* \* \*

Although the last monthly election of members to the R.A.C. only took place on December 2nd, we understand there are already sixty new applicants for membership, and, judging from the number of letters received asking for proposal forms to be sent, there seems to be a likelihood that the month of December will create a record in applications for membership.



## A COMMERCIAL TRAVELLER'S CAR.

The 10-12 h.p. Humber traveller's car is especially designed for the purpose for which it is intended. One of these vehicles, as shown, is now in the hands of the London depot, at 32, Holborn Viaduct, and the Humber Co. will be pleased to demonstrate its utility to any firm employing travellers in London. They are open to refer intending purchasers to reputable London firms who have experience of their well-known motor vehicles, and who can give useful information with regard to the general running and expenses. The running costs have been considerably reduced, the petrol consumption being only one gallon to twenty miles, or less than  $\frac{1}{2}$ d. per mile. Owing to the improvement in tyres, it is also possible to enter into a maintenance contract with the tyre manufacturers at a fraction over 1d. a mile for this type of vehicle. Messrs. Humbers, Ltd., assert that, including drivers and repairs, running costs should not exceed about  $3\frac{1}{2}$ d. per mile. The cost thus stipulated



A 10-12 h.p. Humber with traveller's brougham body.

includes the carrying of two persons and a load of luggage or samples of about half a ton per car.

## ANOTHER DETACHABLE RIM.

A recent addition to the already large number of devices for simplifying the manipulation of tyres is the Hinton and Egginton detachable rim, of which we reproduce two photographs. In its general working it does not differ from the majority of detachable rims, as it has a fixed shrunk-on bonding rim on the wheel, over which slides a loose rim carrying the tyre. In detail, however, it differs somewhat.

On reference to fig. 1 it will be seen that the loose rim which carries the tyre is split, one half only A being shown in fig. 1. This half rim A has riveted upon it six equidistantly placed hooks B, which are mounted upon pins, and are free to turn back, as shown at B<sub>1</sub> and B<sub>2</sub>, B<sub>2</sub> being partially turned back and B<sub>1</sub> B<sub>1</sub> wholly so. When all six hooks are turned back the rim is completed by the replacement of the remaining portion D (fig. 2). The hooks B are then turned over to embrace the ring D, which thus holds the tyre cover firmly in the rim. The hooks B are designed to just spring over the lip of D.

The complete rim with tyre mounted is now ready to place upon the wheel. This operation is similar to that employed on other rims. The valve hole is turned to the top of the wheel, the valve stem placed through it, and the rim and tyre

pushed into place. Slots are cut in the bonding rim and felloes in which to bed the plates holding the hooks B. The rim is held in place by the lugs C which pass over the bolt heads E, and are held thereon, of course, by nuts. Owing to the design of fastening, the pressure in the tyre serves to keep the

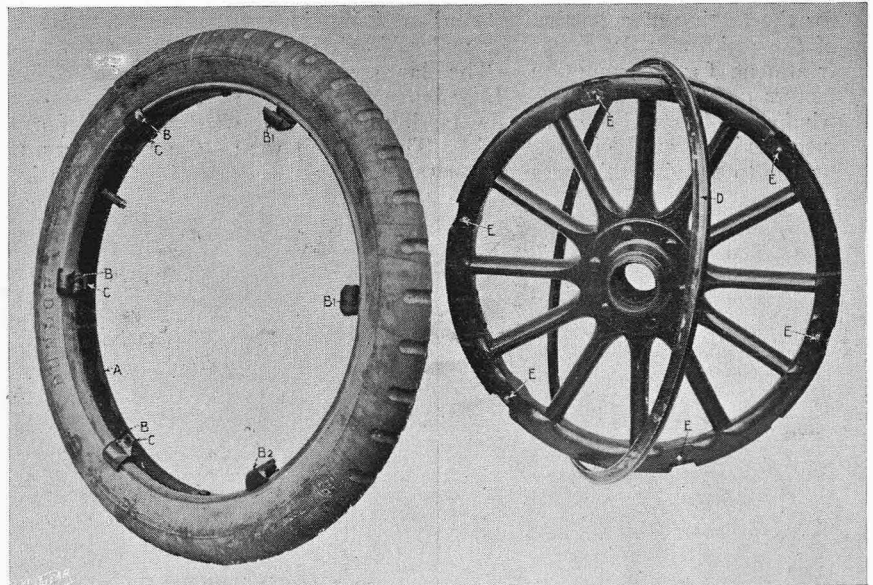


Fig. 1. The Hinton & Egginton detachable rim. Fig. 2.

A, half rim      B, hooks      C, lugs      D, loose half of rim      E, fixing bolts

loose rim tight up to the hooks, the lugs of which are also retained firmly in position against the wheel felloe by the internal pressure of the tyre.

## Flashes.

Provincial members of the M.U. found the members' room at 1, Albemarle Street of great service during their visit to the Olympia Show.

\* \* \*

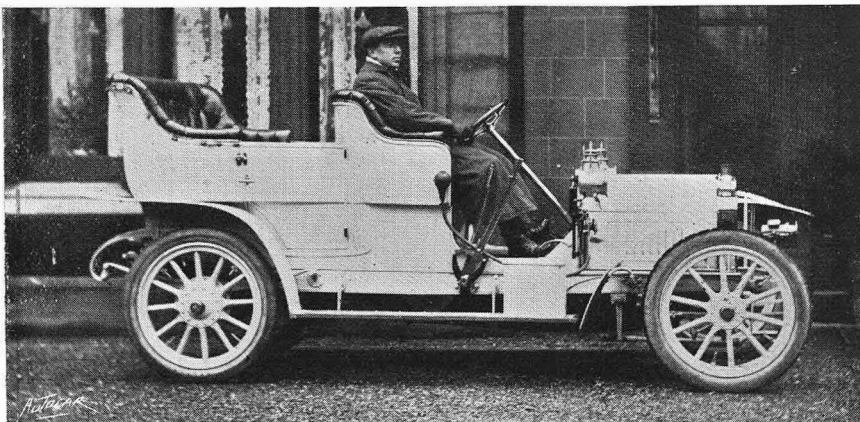
In May, 1909, the County Councils Association is holding a conference to consider the resolutions passed at the International Road Congress at Paris last October. The conference, which is being arranged by the County Councils Association, is working in co-operation with representatives of the Association of Municipal Corporations, the Urban District Councils Association, the Rural District Councils Association, the Association of Municipal and County Engineers, and the County Surveyors' Society. Persons wishing to take part in the conference will be charged £1, which will entitle them to a *précis* of the proceedings and all other papers printed. The address of the secretary is Caxton House, Tothill Street, Westminster, S.W. It is expected that all the motoring associations will be represented, and particularly the Roads Improvement Association. The Society of Motor Manufacturers and Traders has decided to accept the invitation to participate in the conference.

\* \* \*

The Royal Automobile Club of Portugal has elected H.S.H. Prince Francis of Teck, K.C.V.O., D.S.O., an honorary member of that Club.

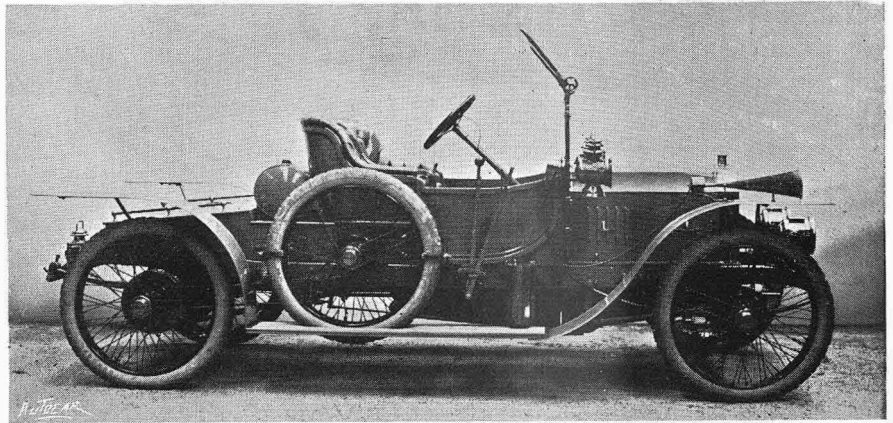
\* \* \*

At the last meeting of the Beckenham Urban Council, a somewhat unusual application was received for the tarring of a particular road. Living in one of the residences is a patient undergoing open air treatment for consumption. The large number of motors created a dust, which blew into open bedroom windows. It was hoped that by tarring the road the inconvenience would be removed. The Council were unable to accede to the request at present.



The first of the new 1909 15 h.p. Minerva cars to be delivered in this country. It was supplied to Mr. C. Turner Leech, of Derby, by the Midland Counties Motor Garage, Leicester. It has a bore and stroke of 85 x 110 mm., with the cylinders cast *en bloc*, Nieuport magneto ignition, and four-speed gear box. The body is by Morgan.

A short time ago a collision occurred between a motor car driven by Prince Jitendra of Cooch Behar and another car at the cross roads near Wimborne, whereby both cars were seriously damaged and several of the passengers injured. The Prince was summoned by the police for driving to the danger of the public, and the case came before the Dorset County bench of magistrates at Wimborne on December 11th. Mr.



A speedy looking 20 h.p. Vauxhall car. The vehicle is finished in lemon yellow and is the second of this make which its owner, Mr. A. R. Peart, has purchased.

Staplee Firth appeared for the defence, and stated that the Prince was desirous of the magistrates hearing the case, and was willing to submit to their ruling, but that as he was the son of a ruling prince he was afraid the Court had no jurisdiction. After considerable deliberation and discussion of the matter with their clerk, the magistrates came to the conclusion that they had no jurisdiction to try the case, which was therefore dismissed.

\* \* \*

The Thornton Engineering Co., Ltd., of Bradford, brought an action in the local county court against a horse dealer for damages (£15) under the following circumstances: The company's manager, while driving a motor car one night up Holling's Hill, met the defendant driving a horse and trap, a person in the trap leading another horse by a halter. It appears that the led horse spread itself across the road, so that the motor car, the driver of which did not see the animal, came into collision with it. The occupants

of the motor car were thrown out, and the horse was so injured that it had to be slaughtered. A counter-claim was brought against the company for the value of the horse, but Judge Bompas gave judgment for the plaintiff on both the claim and the counter-claim with costs.

\* \* \*

On and after January 1st next carriage and motor vehicle licences will no longer be obtainable from local Inland Revenue offices, but from money order offices of the Post Office.

\* \* \*

Carlisle City Council has decided to apply for a ten-mile speed limit in "the streets of the city."

## CLUB DOINGS.

### Cheshire A.C.

An interesting announcement was made by Colonel Hammersley, chief constable of Cheshire, in responding to the toast of "Our Guests" at the annual dinner of the Cheshire Automobile Club. He stated that he did not agree with policemen hiding behind hedges; he considered it a rotten system. His method was to place long distance controls on the road, extending from nine to twenty-seven and thirty miles. Of 900 cars which were timed, only twelve exceeded twenty-five miles an hour. Automobilmism had been undergoing a rather stormy time, but he thought they could now see clearly in front. The people who had had the greatest amount of kicking were the police. The future now depended upon motorists themselves. If they would be considerate, as most of those in Cheshire were, the turmoil would cease, and they would be welcomed on the road like other traffic.

### Nottinghamshire A.C.

A committee meeting was held at headquarters (Victoria Station Hotel) on Friday, December 11th.

The question of the appointment of official repairers was considered, and a resolution was passed that a recommendation be sent from this club to the Royal Automobile Club: "That the number of official repairers appointed for Nottingham be limited to two." A small club committee was appointed to deal with the question of the appointment of official hotels.

In connection with the winter programme, the hon. secretary reported that he had made arrangements for Mr. Knight to deliver a lecture on his new engine on January 22nd, 1909. It was decided to ask Mr. Edge to come and lecture early in February, probably in reply to Mr. Knight's lecture.

The annual meeting was fixed for January 28th, 1909. It was decided that the prizes won at club competitions during the summer be presented at the annual dinner, which is to be held on January 8th.

### Devon and Cornwall A.C.

At a meeting of the committee held on Thursday, the 3rd inst., the result of the postcard poll of members on the question of future affiliation was declared as follows:

For the Motor Union	71
For the R.A.C.	16

Majority for the Motor Union ... 55

Sixty-four members refrained from voting, by which it was assumed they preferred to leave the matter in the hands of the committee. It was, therefore, resolved to affiliate with the Motor Union for the year 1909.

Some letters from Mr. J. W. Orde, secretary of the R.A.C., were read, stating that the circular the committee had sent to members on the question contained statements which were incorrect, viz., that the resolutions of the General Committee (as representing the wishes of the associated clubs) were subject to revision by the committee of the R.A.C., and also that association with the R.A.C. would appear to interfere with the liberty of action of associated clubs. After due consideration of the letters, the committee were still of opinion that the statements made in the circular to members were justifiable, having regard to the fact that the resolution of the General Committee at the Norwich meeting with regard to dual affiliation was not adopted by the R.A.C. Committee. Respecting the second point, it was felt that the concluding clause of the "scheme for association" with the R.A.C. certainly does interfere with the liberty of action of associated clubs, in that it was there laid down that such clubs must be associated with the R.A.C. *only*, thus preventing them from joining hands with any other organisation, however useful its sphere of action may be. This, the committee ventured to think, is not in the best interests of automobilism.

### Welsh A.C.

The second annual banquet of the Welsh Automobile Club was held at the Hotel Metropole, Swansea, on Friday evening, the president of the club (Captain D. Hughes-Morgan, J.P.) in the chair.

After the loyal toasts, Mr. T. J. Williams proposed "Motoring." He declared that there was no better cure for insomnia than motoring. Motoring provided much employment. There were over 100,000 motoring licenses in existence, from 70,000 to 80,000 chauffeurs, and something like 30,000 skilled mechanics in Great Britain. There was also the auxiliary employe for coachwork and the rubber

trade. As a fact, motoring to-day was one of the three best of our industries. Motorists, he added, were more sinned against than sinning.

The Hon. Stephen Coleridge responded.

"The Motor Union of Great Britain and Ireland" was given by Mr. Basil Valentin.

Mr. Rees Jeffreys, secretary of the M.U., replied, calling attention to the annual meet of the Union to be held in Swansea next July. The Union expected great things from that meeting, and proposed to do great things. They were going to concentrate on that event and make it not only of national but of international importance. The International Association was in the habit of holding an international congress. Last year it was held in Sweden, but next year it was coming to England, on the Motor Union's invitation. It was proposed to have a congress in London for one week, and then to bring the delegates down to Wales, and he could promise the visitors that they were likely to receive in Swansea a most hearty welcome.

Councillor David Davies submitted "The Welsh Automobile Club."

The President replied, and said the club consisted of 160 members. He afterwards presented the trophies won during the year to Mr. Ernest Leeder for hill-climbing, and to Mr. M. Whittington (Neath) and Mr. T. J. Williams (Maesygwernen) for reliability runs, and Mr. Talfourd Strick, jun., for cycle climb.

Mr. Rees Jeffreys presented the medal of the Motor Union to the president.

### Hertfordshire County A.C.

On Thursday, 10th December, the annual dinner of the Hertfordshire County Automobile Club at the Hotel Russell was the occasion for the assembling of a number of members and friends, although the experiment of having it on a Thursday instead of a Saturday was doubtless responsible for a smaller attendance than usual. Mr. S. Saker, the deservedly popular chairman of the club, presided, and a most enjoyable evening was spent.

Some interesting speeches followed the excellent and well served dinner, among those speaking being Messrs. S. Saker, Ernest Webster, H. W. Colliver, Victor Beveridge, D. Corre Glen, Cutler, T. Williams, and E. H. Arnold.

The health of the Chairman and Mrs. Saker was drunk with musical honours, and it was with no uncertain voice that they were acclaimed "jolly good fellows." The excellent musical programme was under the direction of Mr. H. Sainsbury.

### Manchester A.C.

A meeting of the committee was held on Monday, December 7th. It was announced that a satisfactory arrangement had been made with the Lancashire A.C., defining the spheres of action of the respective clubs, and the arrangements reported by the sub-committee were confirmed.

In view of the decision of the club to associate with the Royal A.C., the secretary was requested to obtain a specimen associate badge, and a special design incorporating the club badge, for the use of members.

## REVIEW.

A book for the reflective archaeologically inclined motorist is an interesting volume on Wells and Glastonbury, written by Thomas Scott Holmes, and delightfully illustrated by Edmund H. New. There are to-day motorists who make use of their cars to transport them through delightful scenery from one point of interest to another, but call halts at such points in order that they may study and enjoy the picturesque and archaeological features which distinguish them. To such motorists books like the "Wells and Glastonbury," of Methuen and Co. are indispensable, for not only do they direct attention to what is worthy of attention, but by the research and descriptive skill of their authors they invest localities with absorbing interest. After the perusal of this delightful book a tour of the ancient ecclesiastical towns of Glastonbury and Wells is trebly fascinating, for one is able to people the ancient streets afresh with the long line of bishops and abbots, priors, deans, monks, and friars whose worlds centred in these two venerable towns, but who now have passed away for ever, and, except for the architectural examples of their profound piety, have "left not a wrack behind."—"Wells and Glastonbury," by Thos. Scott Holmes, Methuen, 4s. 6d. nett.

## SOME QUERIES AND REPLIES.

Readers are invited to send in replies to the queries of their fellow readers. Letters should be addressed to the Editor of *The Autocar*, Coventry.

### QUERIES.

#### No. 796.—The Piccolo Car.

I SHOULD be grateful to any readers of *The Autocar* if they would give me their experience of a 6-8 h.p. Piccolo two-seater, air-cooled.—J.E.T.

#### No. 797.—12-14 h.p. F.I.A.T. Car.

CAN any reader give me experience of 12-14 h.p. F.I.A.T., if reliable, etc.—INTERESTED.

#### No. 798.—8 h.p. Rover Car.

I SHOULD feel greatly obliged if any owner of an 8 h.p. Rover who has tried fitting an extra air inlet would give me the benefit of his experience. If any improvement to the running up hill with full throttle.—J.B.G.

#### No. 799.—Rims.

I SHOULD be grateful to any of your readers who have tried either the Moseley rim (used with Dunlop tyres), or the Beresford rim, if they would give me their opinion as to their suitability, and if they found them satisfactory.—E.J.F.

#### No. 800.—Chains and Tyres.

I BOUGHT a pair of Parsons non-skids, and after using them about 250 miles was surprised to find the treads of the tyres loose. The tyres are Michelins, smooth treads, and were in excellent condition. Can any other user of these non-skids tell me if they have had the same trouble, and the cause?—B 3165.

#### No. 801.—K.T. Tyres.

CAN any user of the K.T. tyres tell me if the tyre would be useful on the back wheel of a 20 h.p. Beeston Humber? Do they slow a car, or pull the car down? That is to say, do they shake the car to such an extent as to loosen the bolts like solid tyres do?—P.H.

THESE tyres appear to me to be admirable in every way for cars giving not more than thirty miles an hour, but I have hesitated to adopt them because I am told (a) that for cars under one ton weight the cardan shaft will certainly be broken when touring, and (b) that they are not resilient for light cars. Would your readers kindly give their experience?—MOTOR UNIONIST.

#### No. 802.—20-25 h.p. Crossley Car.

I AM thinking of buying a 20-25 h.p. Crossley car. Will some of your readers tell me if this car (1) is a good hill-climber, as it will be used in a very hilly country? (2) Is the expanding Crossley clutch as good and as easy to use as the ordinary disc? (3) Is it heavy on tyres? (4) Is the carburetter complicated?—R.M.

#### No. 803.—Engine Tuning.

THERE is a matter on which I am sure many of your readers besides myself would be very glad of enlightenment by your expert writers. It is, what is the art and science of engine tuning? One often reads of engines being specially tuned up for a hill-climb, for a race, for slow and silent running, for power alone, and so on. How is this done? or rather, how can an amateur do it? because raising the compression, altering gears, and things of that kind are beyond the scope of anyone without a regular shop at his back. It is always much easier to take a concrete case if possible. Take a 15 h.p. Panhard (I only take this as being the car I know most about), how can this engine be tuned up (a) for a hill-climb, (b) for a race at Brooklands, (c) for a consumption test, (d) for silence and slow running, (e) for power only? I have not the least idea how to do all this, though I know a 15 h.p. Panhard inside out. I

know how to put it in perfect order, but not how to make variations in its running. I could do them all by playing about with the compression, if that was possible, but surely that is not the only secret of engine tuning? Why is it exactly that trade cars can always beat private cars in hill-climbs and races? Is it entirely a question of gears and compression? My notion, e.g., of setting a Krebs carburetter is to get it so that it just will not pop back, and no more. I do not know any other way of doing it.—D.M.

### REPLIES.

#### No. 782.—Charging Accumulators and Heating Motor Houses.

I wonder your correspondent does not try the Dynaphor for both heating his motor house and charging his accumulators at the same time, or alternatively heating and lighting the house. I find the apparatus very economical, costing about one-tenth of a penny per hour for gas. It gives about 5 volts, so is quite sufficient to charge one ignition cell at a time, and, of course, will light a 4 volt lamp. If more light or heat is required it is necessary to install additional apparatus or to invest in one of the larger sizes. I, however, should advise the use of two of the 5 volt, especially as I understand the new pattern for 1909 will be much lower in price.—J.H.M.

#### No. 785.—Carburetter Trouble.

I am interested in the letter of "Puzzled." I have lately bought a 1908 8-10 h.p. Darracq, and have had similar trouble with flooding of carburetter, especially when car was running slowly or standing throttled down. The jet was raised, but no good resulted. The Darracq Co. then supplied a fresh carburetter. Since fitting this jet has also had to be raised and the air inlet lengthened towards the exhaust pipe, so that the incoming air may be warmed. This has greatly improved the running, but the trouble now is the missing of the back cylinder, mostly when throttled down, and I am told this is bound to occur with all two-cylinder cars, and that it is due to the exhaust gases from the front cylinder being sucked up the exhaust pipe of back cylinder. Perhaps this may be "Puzzled's" trouble?—CYLINDER.

#### No. 774.—14-16 h.p. Belsize Car.

I have run one of these cars over 4,000 miles. It has been very light on tyres, those sent out with it being good for 2,000 miles or more yet. On good roads with careful driving it will do twenty-five miles to the gallon. It is a splendid hill-climber, very quiet on the direct drive, and pulls very well at low engine speeds. The single lever control makes it easy to drive in traffic. It will easily do thirty-five per hour on good roads. I have never had the slightest trouble with either the clutch or lubrication system, which is a great deal more than I can say for the four previous cars I have had. The car never smokes, and after 4,000 miles the

piston heads and valves are practically clear of carbon, which speaks volumes for the lubrication system. I have found no weak points out yet, though I consider it rather highly geared on second speed. My car is a late model with W. and P. carburetter. If "A.J.E." cares to write me privately I shall be very pleased to give him any further information he wants.—M.E.

#### No. 778.—The Zedel Car.

I drove a 15 h.p. Zedel through the last 2,000 Miles Trial, and "Puzzled" might care to write me re above car and I shall be pleased to give him any information.—J.W.J.

I am pleased to give my experience of the 15 h.p. Zedel car. The car is, I consider, quite reliable. It is decidedly good on hills and requires but little attention. The only little trouble I have had is with choked petrol feed. The change speed is delightfully easy and quick, and the car possesses many little refinements unknown to most cars I have seen of this power.—H.W.

#### No. 790.—20 h.p. Rover Car.

I have driven a 20 h.p. Rover 9,000 miles since September, 1907. Since that time I have had no engine troubles. I have to take the cylinders off to clean away carbon deposit about every 1,800 to 2,000 miles. After a tour to Scotland and back last summer, I found the aluminium back axle casing cracked, and the company supplied me with a new one of wrought iron, which is now their standard. The three-point suspension I find perfect, and delightfully easy, but twice a leaf has broken and had to be replaced. I am perfectly satisfied in every way with its running, but consider that in this very hilly country it is geared too highly on the second speed. The clutch is very good, and the engine brake a great point in a hilly country. I had to have the clutch out the other day, and it is very ungetatable; but that is the same with many other makes. I get on four twenty-three miles to a gallon, and I consider the car is light on tyres. Mine is a 1908, though bought in 1907.—P. NAISH.

#### No. 779.—Divisible and Detachable Rim.

I have run a 10-12 h.p. Humber car for about 3,000 miles since I had the Beresford detachable flange rims fitted about eighteen months back, and I can thoroughly recommend same from my own personal experience. Since using these rims I feel confident that I have saved many pounds in my tyre account, as in the first place there is no danger of nipping the inner tubes with levers, or of destroying the beaded edges of the covers with the straining necessary to detach with ordinary rims. Then again, I am not troubled with the rusting of rims, as it is not much trouble to examine them occasionally and paint, if necessary, with some anti-rust solution, and the tyres last much better if well chalked round the inside occasionally. I should not care now to be without them, and as far as I can see, they are the simplest and safest thing on the market, having nothing to get out of order, and it is a simple matter to replace a cover or tube in a few seconds, apart from the inflating.—C. J. WAIN.