

# THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 534. VOL. XVI.

SATURDAY, JANUARY 13TH, 1906.

[PRICE 3D.]

## THE AUTOCAR.

(Published Weekly.)

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

EDITORIAL OFFICE:

COVENTRY.

PUBLISHING OFFICES:

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

### CONTENTS

	PAGE
NOTES: MOTOR CARS AT THE ELECTION—DAZZLING LIGHTS ...	35-36
USEFUL HINTS AND TIPS: ON ELECTRICAL MATTERS ...	37
THE RICHARD-BRASIER CARS OF 1906 (illustrated) ...	38-39
CHRISTMAS AT LAND'S END (illustrated) ...	40-41
GEAR-DRIVEN CARS—CONFIRMATION OF THE INVALIDITY OF THE RENAULT PATENT (illustrated) ...	42-43
FLYING: A RECORD OF AERIAL NAVIGATION ...	44-46
CONTINENTAL NOTES AND NEWS (illustrated) ...	47-4
FROM NICE NORTHWARDS (illustrated) ...	49-50
INCOMPETENT INSTRUCTORS ...	50
OCCASIONAL GOSSIP. By "The Autocrat" ...	51
THE WELLER LIGHT ENGAGE GEAR (illustrated) ...	52
CORRESPONDENCE: A WARNING TRIANGLE—POLICE STOP WATCHES— TO LAY DUST—PUMP V. NATURAL CIRCULATION—PRICES OF MOTORS IN NEW ZEALAND—AN ALL-BRITISH SHOW—RACING FOR THE IMPROVEMENT OF CARS—FUEL ALLOWANCE IN TOURIST TROPHY RACE—SPRING WHEELS— CANDIDATES AT THE ELECTION—SIX V. FOUR-CYLINDER CARS—FRENCH AND BRITISH CARS—SUMMARY OF CORRESPONDENCE ...	53-56
A RENEWABLE TYRE TREAD (illustrated) ...	57
THE 20 H.P. BRITISH-BUILT TALBOT CAR ...	58
THE RENAULT PATENT IN FRANCE ...	58
THE QUADRANT CROSS-ROLLER GEAR ...	58
ELEMENTARY LESSONS ON MOTOR CARS (continued) ...	59
DETAILS OF CARS AT THE SHOWS ...	60
THE CRYSTAL PALACE SHOW ...	60
THE MIDDLETON HUB TRIAL ...	60
SOME QUERIES AND REPLIES ...	61-62
FLASHES ...	63-64
MOTOR CAR RADIATORS OR COOLERS ...	65
CLUB DOINGS: CLUB FIXTURES—NORTHAMPTONSHIRE A.C.—MOTOR YACHT CLUB ...	66
THE 5,000 MILES HUMBER TRIAL ...	66

### "THE AUTOCAR" SUBSCRIPTION RATES.

British Isles, 16s. Abroad (thin paper edition), 22s. 8d. per annum.

## Notes.

### Motor Cars at the Election.

From the correspondence we have received upon the subject, as well as from direct enquiries which we have made in many districts, we find that the majority of motorists who are proposing to use their cars at the General Election have taken steps to satisfy themselves as to the attitude of their candidates before promising to place cars at their disposal. One or two lists have been published of candidates who are believed to be favourably inclined towards automobilism. Many of the names can be verified at sight as those of well-known motorists, but we do not think these lists, however carefully compiled, should be taken as a guide.

It does not necessarily follow that because a candidate is a member of the Automobile Club, or owns a motor car, that he will be fully cognisant of the position of affairs. He may be a motorist in his individual capacity, but an anti-motorist, or something very nearly approaching to it, in his parliamentary capacity. This attitude is inconsistent, not to say ridiculous, but it is one which is often adopted in other walks of life than those which converge on Westminster.

As our readers know perfectly well, we urge them to absolutely satisfy themselves on the spot about their own candidates before they place cars at their service; otherwise, they may find out, when it is too late, that they have been helping a man who will turn against them in the House of Commons. In thus satisfying themselves there is no need to make themselves obnoxious. They have merely, when approached by a candidate or his agent with a request to lend their cars, to produce for the candidate's signature the form which we published a fortnight since, unless, of course, they are personally acquainted with the views of the candidate on the subject. They must not assume that their man is all right because someone who has compiled a list believes him to be so; nor, as we have shown, should they take the matter for granted even though they know he owns a motor car.

A candidate who is sound on the question will have no objection whatever to stating his views, and if he is not sound, the motor should be sent to some other constituency, where it can be used in the interests of a man who will not turn against it should he have the power to do so later. Already it has been made clear that at least one candidate who has driven about an agricultural district in a motor car is telling his constituents that he does not like cars, and he knows *they* do not, but he merely uses one for the convenience of his electoral campaign. This gentleman has been franker than some of the candidates, whom it is too readily assumed are friends of automobilism.

An instance of a candidate who seeks to pacify friends and foes alike is brought to our notice from the Kingston division of Surrey. Here Mr. G. Cave declines to commit himself either way, and would fain sit upon the fence. In response to a request for a statement of his views he says, "It is rather too bad of your motorist friends to ask me to pledge myself to the particular amendments of the Act recommended by *The Autocar*. [See supplement to *The Autocar*, December 30th, 1905.] The Motor Commissioners' recommendations may be quite different, and yet may satisfy all reasonable men. Is it not enough to say that I am *not* an 'anti-motorist,' that I dislike the law as it stands, and that (whether elected or not) I should be glad to see it amended so as to satisfy the careful motorist without endangering the public?"

This is all very well, but it is delightfully vague. Candidates should be pressed for a more definite pronouncement, and any vagueness should be interpreted at its true value. The motor question is not now one to be toyed with, and candidates must express their serious convictions in regard to it.

### Dazzling Lights.

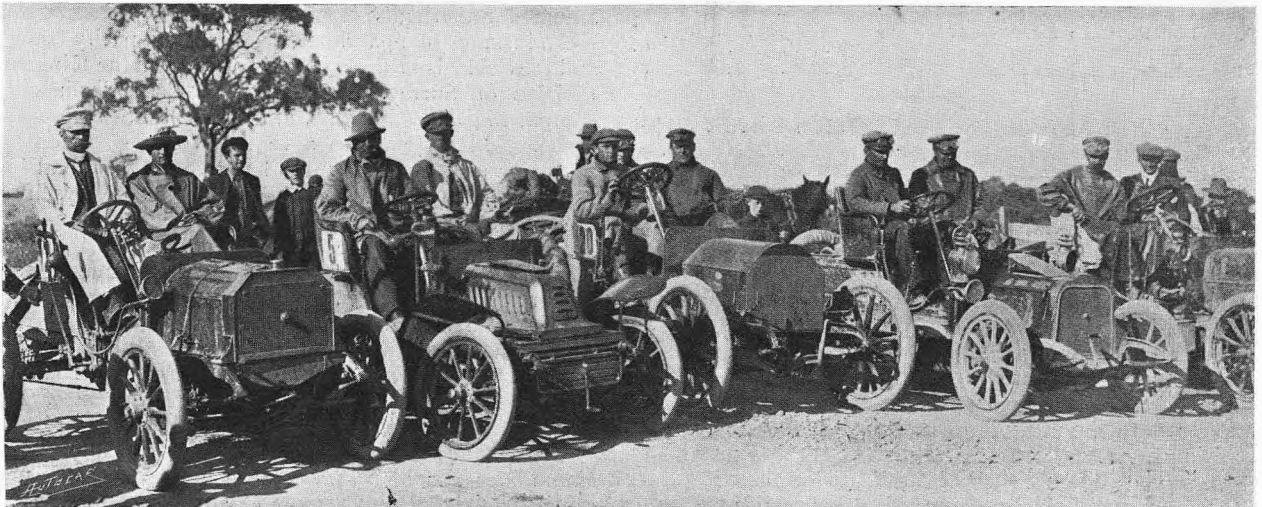
The members of the Cyclists' Touring Club have been urged in the January issue of their *Gazette* to obtain pledges from their parliamentary candidates that they will vote in favour of legislation under the following heads: (1) An Act rendering it compulsory for all vehicles to carry lights at night; (2) an amendment of the Motor Car Acts whereby greater protection may be afforded to cyclists and other road users on the King's highway; and (3) an improvement in our methods of road administration. As the three requisitions stand, there is nothing to which an automobilist would object, but we find that No. 2 is divided into four sub-headings. One deals with the question of dust, and asks that motorists shall be penalised if they drive fast enough on a dusty road to obscure the view of other road users. This is nothing short of ridiculous. Any considerate motorist will do all he can to reduce dust by reducing his speed when near other traffic, but there are times when a horse carriage or a good breeze will raise the dust sufficiently to obscure the view of everyone on or near the road; but such a clause would give rise to all sorts of injustices, as there are plenty of prejudiced people who would swear that the dust raised by the wind or other traffic was caused by some unfortunate motorist. It seems to be forgotten that bicyclists often raise clouds of dust, especially when they ride in company.

Two other requisitions are to the effect that the cyclist shall be allowed six clear feet whenever possible by motor car drivers when meeting or overtaking him, and that it shall be deemed an offence for a car to be driven round a blind corner on the wrong side. These are perfectly reasonable in themselves, though there is no need for any special legislation on the subject. The really unreasonable suggestion is in the last, which is to the effect "that the searchlights carried by motor cars shall be shaded or obscured so that the rays may be deflected below the line of vision." This is quite an impracticable suggestion, and it seems to be entirely forgotten that on a dark night cycle lamps dazzle those who meet them. The powerful gas lamps used by many bicyclists are just as bad as motor car lamps. They may not be so powerful, but the fact remains that if one is foolish enough to look at them one can see nothing else. The whole danger of meet-

ing lamps is that at the moment of passing one cannot see what is behind, and this applies almost as much to oil lamps as to gas lamps. When riding a bicycle, we have never found the least inconvenience from powerful motor car lamps, provided we have had a good lamp ourselves, but we confess that when using a poor lamp we have been dazzled alike by motor car lamps and bicycle lamps.

It is quite forgotten, too, that without powerful lamps motor cars would be dangerous machines at night unless they were driven at a crawl; in fact, the same remark applies to a bicycle which has not a powerful lamp, and to diminish its light is to court danger, and is quite impracticable. There is one way, and only one way, with which we are acquainted by which powerful head lights can be made an assistance to all other road users, and that is by the simple expedient of having a powerful tail light which is put on the back of the car and directed backwards. This illuminates the road behind the car, so that when one meets the head lights there is not that feeling of an impenetrable wall of blackness behind them, but we suppose this would not suit other traffic conditions, because it would dazzle people behind the light.

For too many years, carriages have been allowed to go about lightless, and now that motorists and many cyclists are setting them a good example we find that an outcry is raised by the very men who have for years been dazzling horse drivers with their brilliant acetylene lamps. They may urge that their lamps are not so dazzling as motor car lamps, and we can only say that this is a matter of opinion. In our opinion, one is as bad as the other; in fact, the half measures of the bicycle lamp are, if anything, worse, because while they dazzle they do not illuminate either in width or distance, as does the larger and more powerful motor car lamp. We may say that in this matter the National Cyclists' Union is working in concert with the Touring Club, and we are sorry that both bodies should have introduced into their otherwise reasonable requisitions one which is not only foolish in itself, but inconsistent. Horse drivers, on the introduction of gas lamps for cycles, had much more reasonable grounds of complaint against cyclists on account of their dazzling lights than cyclists have against motorists at the present time. Cyclists should remember this, and be more tolerant.



The five competitors and their cars who tied for the Dunlop Cup. Reading from left to right they are as follows: H. Tarrant (8 h.p. Tarrant); S. Day (8 h.p. De Dion); G. Hobbs (18 h.p. Mercedes); W. B. Wilkinson (10 h.p. Talbot); W. R. Grimswade (10 h.p. Argyll).

## USEFUL HINTS AND TIPS.

### ON ELECTRICAL MATTERS.

#### Setting of Sparking Plug Points.

When a magneto is used for the production of ignition current, care should be taken to see that the spark gaps of the sparking plugs are about half those employed with accumulator-provided current.

#### Low-tension Insulated Switches for Magnetos.

All low-tension switches of magneto machines should be insulated where they have to be handled. The insulation may take the form of an ebonite handle or a rubber tube pressed over the metallic handle. When the engine is running and it is desired to switch off, and the handle is uninsulated, if one hand is on the metal switch and the other on any metallic part of the car which is not insulated from the magneto, a terrific shock is experienced. We know of one case where a serious accident very nearly occurred by this happening to a driver whilst steering a car. The car in question was fitted with the magneto and battery system of ignition, with a two-way switch. Whilst running, the driver desired to switch off from the magneto on to the accumulators, and, owing to the switch not being insulated, the operation of switching over caused a shock to be transmitted from the magneto through the body of the driver to the steering wheel, causing him to lose control of the machine and run up the side of a bank in the road.

#### Replacing Magnetos Correctly.

Some magnetos are driven off one of the distribution wheel shafts by means of an Oldham coupling. This coupling consists of two tongues cut on a disc, the tongues being at right angles. One of these tongues meshes with a groove in a boss on the distribution wheel shaft, while the other meshes with a groove on the magneto shaft. Before taking down magnetos, it is always as well to carefully mark the jaws and the tongues, so that they may be inserted in the same place when putting back in position. During the time that the magneto is down, the engine crankshaft should not be rotated, because if it is it might possibly happen that the driving wheel of the magneto will receive a revolution, so that the mark again comes to the top, and, apparently, is correct for the engaging of the joint driving the magneto. Such, however, may not be the case, and the firing may take place in a totally opposite position to that which it should. Thus in trying to start up the magneto it will be found that back firing is occasioned in the carburetter. It is always as well, after parts have been uncoupled in this manner, to check the timing before trying to start up the engine.

#### Remedying a Misfiring Magneto.

With high-tension magneto ignition, the presence of water is undesirable, and if firing is found to be irregular after the car has been washed it is probable that the high-tension current is shorting somewhere through moisture. A few weeks ago, when starting out, after washing, with our 12-16 h.p. Clément-Talbot, which is fitted with the Masson high-tension magneto, we found No. 2 cylinder backfiring in a very bewildering manner. The spark gap showed that when it did

fire it did so very irregularly, and, as we say, fired out of time. ~~Rescue~~ was at once had to the contact-breaker and the high-tension distributor, but both were found clean and in good order. With the misbehaving cylinder cut right out, the remaining three fired perfectly, and for the time we were nonplussed as to the cause of the trouble. Presently it was noted that the vulcanite block, which is made with four brass spigots to thrust into the holes above the distributor, and from which the high-tension wires run to the sparking plugs, was cracked across lengthwise, and testing each cylinder singly by a single wire all showed themselves to be functioning as they should. But directly the vulcanite block and the original wires were replaced the incorrect firing of No. 2 cylinder recommenced. It was clear then that some water had got into the crack in the vulcanite block and was upsetting things. A new block put matters to rights at once.

#### A Substitute for a Governor.

It is generally found that single-cylinder cars, and, in fact, most of the less expensive ones, are somewhat difficult to drive nicely in traffic. The constant manipulating of the clutch necessitates frequent acceleration or slowing down of the engine. This is generally done by keeping the hand on the advance spark lever, so that when the clutch is taken out this is moved back to slow the engine down on running light. On letting the clutch in again, the spark is advanced to enable the engine to give the required power for driving. For these operations two hands are necessary—one on the steering wheel and one on the sparking lever. If, in addition, it is necessary to change speed rapidly, or to use the hand brakes, either the steering wheel must be let go altogether or the engine must be allowed to race—that is, if it is not fitted with a governor of some kind. This partly applies to speed-changing. When changing up, the engine has to be slowed from the moment the clutch is withdrawn until the higher gear and clutch are engaged, when the spark can be advanced. If this is not done, the moment the clutch is depressed as a preliminary to gear-changing, the engine races objectionably. A simple way to overcome the difficulty is to connect the clutch pedal to the contact-breaker, so that when the clutch pedal is depressed to withdraw the clutch the sparking is retarded, but allowed to return immediately the clutch is re-engaged. This is done by disconnecting the contact-breaker from its advance spark lever, and fitting a spring tending to advance it to its utmost. A wire or rod is then fitted from the contact-breaker to the usual control lever, enabling it to be set in any position by pulling it back by means of the hand lever against the action of the spring. This leaves the contact-breaker controllable in exactly the same manner as before. From the clutch pedal or some part of the clutch connections a wire is led to the contact-breaker in such a way as to pull it back to its most retarded position when the clutch pedal is fully depressed. This can best be done by means of wires, though they are somewhat unreliable; if rods are used, a sliding connection must be made between the clutch rod and hand lever rod to allow the contact-breaker to be retarded by the clutch rod without necessitating any movement of the hand lever.

"Useful Hints and Tips for Automobilists."—Under this title "Useful Hints and Tips" have been reprinted from *The Autocar* in book form. 2s. 5d., post paid 2s. 9d. from *The Autocar* Offices, 20, Tudor Street, London, E.C.

# THE RICHARD-BRASIER CARS OF 1906.

(Concluded from page 5.)

The clutch fitted to all but the 40 h.p. R.-B. cars is of the leather-covered cone type. In the 50 h.p., this is supplemented by two locking bars forming part of the male portion of the cone, and locking up to the flywheel after the connection between the male and female portions of the clutch have become positive. These locking bars are withdrawn from contact with the flywheel before the cone portion of the clutch is affected by pressure upon the clutch pedal. A double cardan-shaft conveys the drive from the clutch to the primary gearshaft, and its construction is such that it allows the cone to be easily dismounted. It will be noted that at the forward end of the cardan-shaft is a plunging joint, whilst at the rear end is the usual universal joint.

With regard to the steering, this does not present any very notable features, with the exception that it is thoroughly well designed and well constructed.

The new change-speed gear is somewhat on the same lines as that of the cars of 1905. It has four speeds forward and reverse, all actuated by a side lever. The shafts rotate in ball bearings, as shown, but the former have been much strengthened, and the toothed wheels made heavier in the present type. The design of the gear is clearly set out in fig. 5, which shows that only one sliding sleeve B is used, this being operated

by means of a gear-striking bar and fork. The driven intermediate wheel D has internally-cut teeth, with which the toothed wheel on the end of the sliding sleeve engages for the direct drive. On the outer end of the sleeve carrying this driven intermediate wheel is set the driving bevel wheel, meshing with the driven

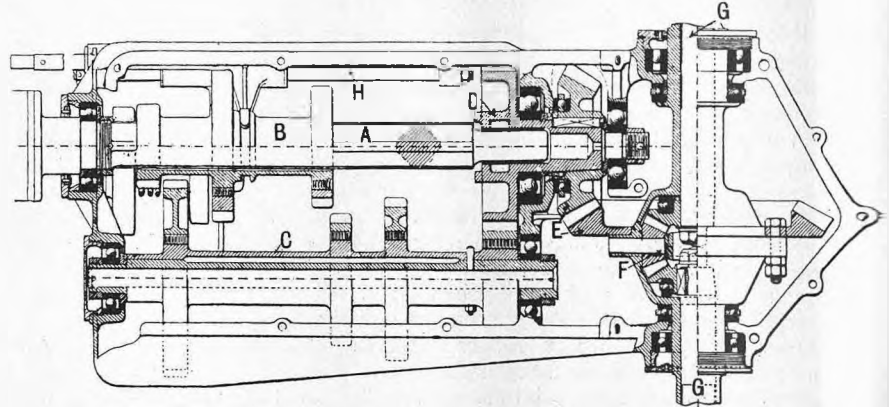


Fig. 5.—The change speed gear on the 24 h.p. Richard-Brasier car.  
 A, primary gearshaft  
 B, sliding sleeve on A carrying gear wheels  
 C, secondary gearshaft  
 D, bevel pin on shaft and gear wheel for first, second, and third speeds  
 E, bevel gear wheels  
 F, differential gear  
 G, countershaft  
 H, gear striking rod

bevel ring bolted to the differential gear box. It will be noted that the intermediate sleeve runs in two ball bearings, one a tail bearing in rear of the driving bevel pinion, which has a thrust ball bearing fitted close up to its web. The countershaft G G is also carried in ball bearings, and is fitted with two thrust bearings, as shown.

In the 14 h.p. Richard-Brasier car, the drive is by

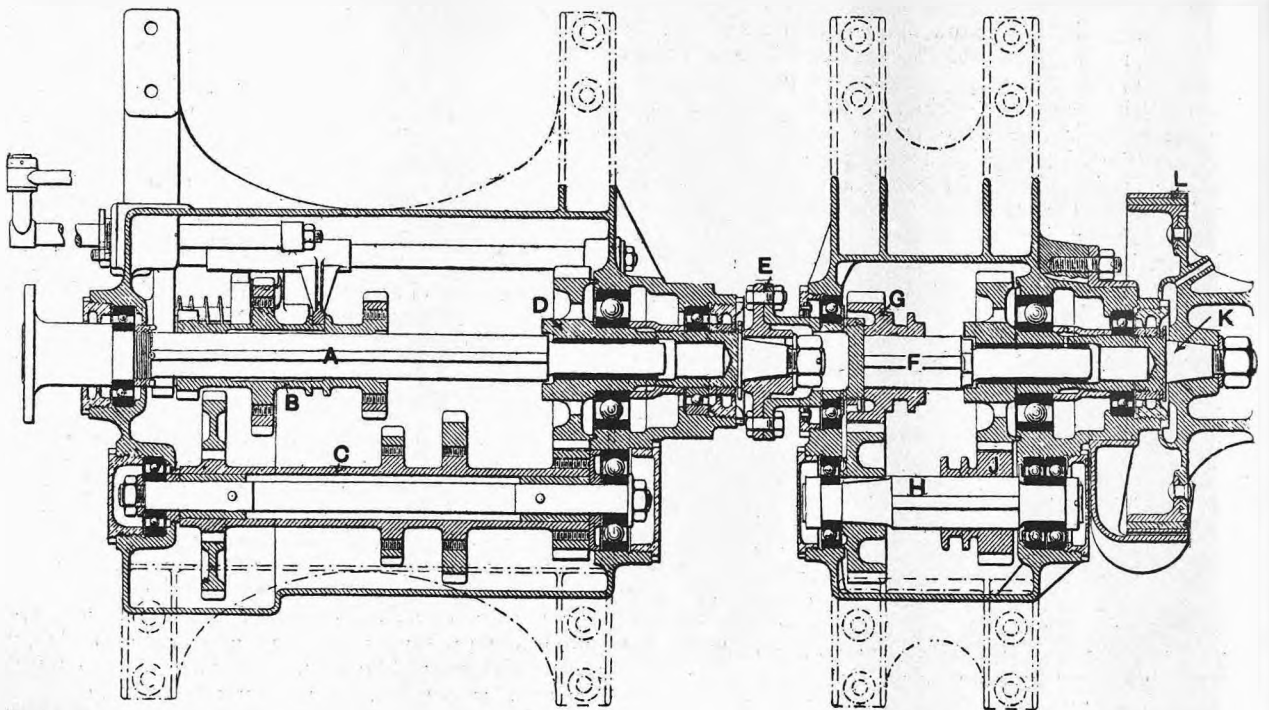


Fig. 6.—The Richard-Brasier change-speed and reducing gear for mountainous districts.

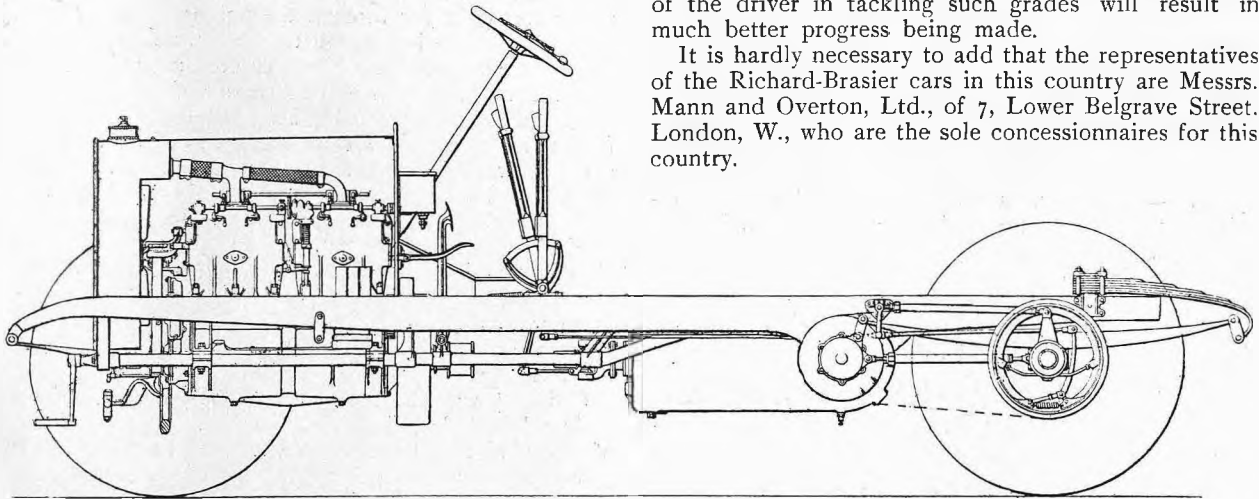
- |                             |  |                                      |                                     |
|-----------------------------|--|--------------------------------------|-------------------------------------|
| A, primary gearshaft        | D, third gearshaft forming detached continuation of A  | F, first gearshaft to reducing gear  | J, sliding gear sleeve on H         |
| B, sliding gear sleeve on A | E, coupling to the primary gearshaft in reducing gear. | G, sliding gear sleeve on F          | K, third gearshaft to reducing gear |
| C, secondary gearshaft      |  | H, second gearshaft to reducing gear | L, brake drum                       |

propeller shaft and live axle, but in the 25 and 50 h.p. the transmission is by chains from the chain sprockets on the ends of the countershaft. The mounting of the countershaft of the 24 and 40 h.p. Richard-Brasier cars is very clearly shown in fig. 5. We may perhaps add that especial care has been taken with the thrust bearings on the live axle, a ball bearing also being inserted between the inner ends of the latter.

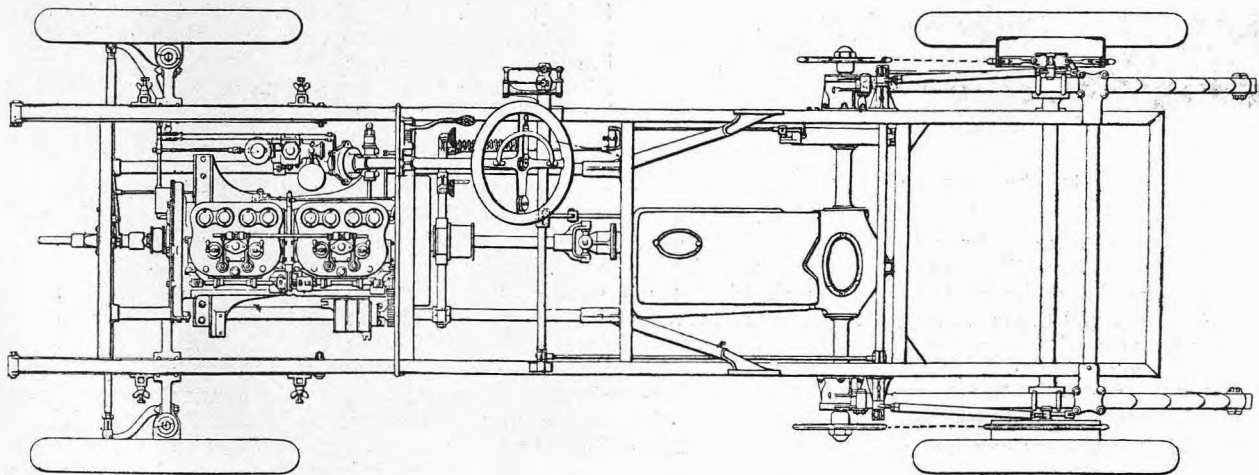
In fig. 6 is shown a supplementary reducing gear. It is interposed between the end of the gear box proper and the driving bevel pinion (not shown). It will be easily seen that when the positive clutch on the sleeve

is locked up with the corresponding clutch the drive from the gear box proper passes directly through the reducing box, but when the gear in the reducing box is in the position shown in the drawing it will be seen that the drive passes from G on the shaft F to the gear wheel fixed to the shaft H, thence to the shaft K, by the medium of the two spur wheels, giving a reduction of 2 to 1.7. This reducer is fitted by Messrs. Richard-Brasier to cars intended for use in mountainous districts, where long inclines are tackled for long periods, and where the gradients are such that the fact of eight speeds being at the disposal of the driver in tackling such grades will result in much better progress being made.

It is hardly necessary to add that the representatives of the Richard-Brasier cars in this country are Messrs. Mann and Overton, Ltd., of 7, Lower Belgrave Street, London, W., who are the sole concessionaires for this country.



Side elevation of the 24 h.p. Richard-Brasier touring car chassis.



Plan view of the 24 h.p. Richard-Brasier chassis.

The United Motor Industries, Ltd., dividend for the year ending September 30th, 1905, was recently declared at the rate of ten per cent. At an extraordinary general meeting it was decided, in consequence of the great increase of the business, and also for the purpose of carrying through certain further developments contemplated, to substantially increase the capital of the company. Mr. G. H. Smith has been appointed managing director.

\* \* \*

Whatever may be the fact of a general election upon the business of the country, it certainly appears to have a beneficial effect upon motor car makers. Mr. Coleman told us a few days since that quite a number

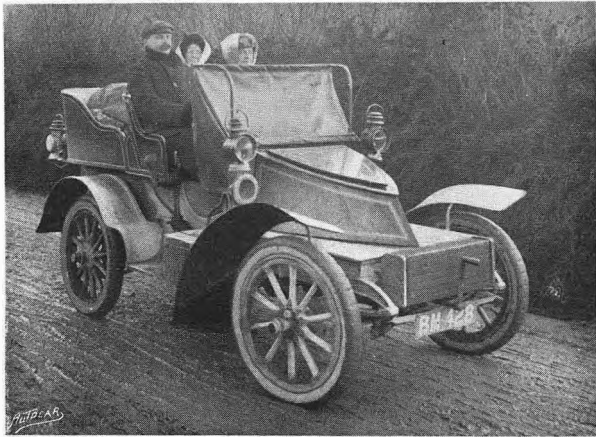
of White steam cars were being used for the election, and he had found it necessary to accelerate his supply of cars so as to have some more ready, as people who were in no hurry for delivery now want the machines immediately. However, the cable brings the United States so near to us that as soon as the general election was announced Mr. Coleman had no difficulty in arranging for an extra supply of cars to be sent over, and as he has always had some double phaeton and other bodies practically ready to fit to the standard 18 h.p. cars, there is no doubt that quite a fair proportion of the election work will be done on brand-new Whites, and we hope they will only be used in the aid of pro-motor candidates.

## CHRISTMAS AT LAND'S END.

A 655 MILES RUN. By A. E. ASH.

### A Winter Rig.

When contemplating a long run during the winter months it is wise to make some provision against cold and wet, and the photograph below depicts our car (an ordinary 14 h.p. Vauxhall tonneau) fitted up with a more or less novel wind screen. A leather apron is suspended from a bar carried on davits, one advantage of which is the ease with which either end may be detached or the whole swung out of the way. The leather hangs in a curved sweep, which shoots the wind upwards, clear of the occupants' heads. Small side curtains serve to make the arrangement still more snug. It is infinitely better than a glass shield, inasmuch as it induces no back draught in the nape of the neck; is light and easily stowed when not wanted, and last, but by no means least, is not dangerous should an involuntary header be taken through it. The height of



The 14 h.p. Vauxhall in winter rig.

the leather screen and the curve should be carefully designed to get the best results. The former should allow of the driver sitting comfortably back, and the sight line striking the road three yards ahead of the front wheels, and the curve should be such as to throw the wind clear of the passengers' faces. The arrangement shown works admirably, and the comfort of driving behind it requires to be tried to be thoroughly appreciated. With the above screen, side curtains, side doors, and a foot-warmer heated by the exhaust gases, our comfort was complete.

For the foot-warmer a  $\frac{3}{4}$ in. copper pipe was taken off the main exhaust pipe immediately in the rear of the exhaust collecting bottle, and before the gases enter the first silencer. This  $\frac{3}{4}$ in. pipe, which can be opened or closed by a cock at will, came through the floor-board just behind the dash, and is coupled by a simple union to a gun-metal box into which two bicycle tubes  $1\frac{1}{8}$ in. bore were expanded.

Owing to the tonneau being entered by a turn-over front seat, these tubes could be run the full length of the car, and ended by being expanded into another brass box, out of which a  $\frac{3}{4}$ in. bore pipe led the gases down through the floor of the car. It will thus be seen that, far from causing additional back pressure, the engine, besides having the usual egress through the silencer, has the additional path through this heater, and no noise was apparent from the heater exhaust. The tube and brass boxes are encased in a latticed

wooden box. In practice the whole worked admirably, and gave a constant warmth round the feet and legs.

### The Start of the Tour.

We (two ladies, the writer, and luggage) left Luton at 9 a.m. on Saturday, the 23rd December. Running to the London and Oxford main road, we turned towards London for a quarter of a mile, and then sharp off to the right for Slough, through to Windsor, over the river, up the hill, round the castle, and out on the Ascot Road. Very shortly we entered a portion of the Great Park, and even at this season of the year it is a charming picture of English park land. Three or four miles of park and we were through the lodge gates and rapidly bringing royal Ascot in sight. A mile further and we ran out on to the main road between Staines and Basingstoke, just before Bagshot. The road rises gently through the latter, past the "Golden Farmer," and then a two and a half miles run down into Blackwater, and thence undulating to Basingstoke. Here we took the road to the right for Overton and renowned Andover, leaving the Winchester road to the left.

Salisbury was the next town of importance, principally celebrated at the time of our run by the amount of unrolled metal on the roads. Thence through Wilton and eighteen miles into Sherborne, the pageant place. As it was now five o'clock, and dark, we pulled up for the night (distance, 140 miles), putting up at Digby's Hotel, a hunting house, and well ordered, where tea and hot water asked for at 7 in the morning, and breakfast for 8.30 a.m., received precise attention. Sunday saw us all aboard and off by 9.40 a.m., weather beautiful. Roads rather soft and greasy. Yeovil was only five miles on, and seven beyond we ran into Crewkerne. We rose 600ft. in the next three miles, and passed the "Windwhistle Inn"—its name is very suggestive. In the next two miles the road descends 500ft., bringing us to Chard, when we again climbed 400ft. in about a mile, followed by a deep descent and a further climb of 600ft. inside of three miles. Thirty-five miles from Sherborne, having again come down 600ft., we were into Honiton. It is a striking village, being one straight, wide street, one mile long, and about 100ft. wide between the houses. It was now we began to feel ourselves in the English Riviera; furze, broom, geranium, etc., being seen in bloom, and the sun shining warmly most of the day. Exeter, fifteen miles further on, was reached just after noon. Fifty-two miles in fairly good time over such hilly country and greasy roads. We went on to Okehampton. The road skirts Dartmoor, over which we got some fine views; at one part the road reached 1,000ft. above sea level. There is a steep dip into Okehampton, and perhaps a word of warning is not out of place here; throughout Devon and Cornwall it may be taken as an accepted fact that you dip down into and have to climb out of every village or town. Out of Okehampton we again rose to the 1,000ft. level. The road surfaces were magnificent since leaving Exeter—mostly straight, smooth, and wide, although undulating. Passing through a number of villages we soon reached Launceston. The next twenty miles was over lonely moorland, but with beautiful road, and we dropped into Bodmin, 4.40 p.m., a precipitous descent, and here indeed the driver wants to be sure of his brakes. The

gradient in the narrow main street must be 1 in 5 or 6, with nasty twists in it. Distance, 115 miles.

#### At Land's End.

Christmas Day dawned with beautiful sunshine. Breakfast, ordered for nine o'clock prompt, did not materialise to time, and it was not till eleven o'clock that we took the road for Truro—a fine run over the moor. Scores of worked out tin mines are to be seen, the invariable index being a long tapering chimney adjacent to a tall rectangular stone building in varied stages of decay, which in the old days housed the working parts of the old Watt beam pumping engine. Nearing Redruth one saw chimneys and work-a-day life everywhere; electric trams ran right through to Camborne, and we traversed about six miles of greasy, filthy roads with bad surface. We felt relief on clearing Camborne, but it was short lived, as we found Hayle was little better, and there were some four miles of unrolled metal (in patches) to negotiate. At last we were clear, and bore down on Penzance, getting a fine view of St. Michael's Mount. Land's End was reached at 3 p.m.; distance, sixty miles.

The Land's End Hotel, a comfortable and homely house, gave us shelter and an excellent Christmas dinner, and the charges were perfectly reasonable.

Tuesday we were up at daybreak—another bright, charming day—and, under the guidance of a fisherman, were taken the round of the features of the promontory.

#### The Return Journey.

It was nearly noon when we regretfully turned our backs on the "End," and made up the coast road through Sennen, St. Just, St. Ives, and then round Hayle. This is a rough, hilly road, but rich in lovely views of sea and landscape. We were glad to get clear again of Camborne, Redruth, and on to New Quay. We pressed on, and pulled up at Wadebridge for the night. Distance, 65 miles.

Leaving here at 9.30 a.m. on Wednesday, we ran to Tintagel, which presents a very fine picture of frowning headlands and sea, and is celebrated for King Arthur's Castle and Round Table. Thence through Boscastle, a picturesque tiny land-locked harbour (the ascent out of which for the first two hundred yards is very severe, rising 850 feet in something less than two miles), on to Bude, and up the coast to Clovelly (Chas. Kingsley's favourite place). The road descends steeply from the moorland to the cliff line, and Clovelly lies nestling in a cleft in the cliff. A vehicle can only get within about one hundred yards of the top of this cleft or ravine, wherein lies the main street, if we may give it such a name. We next made Bideford, where, hunting for petrol, we found two shops which were closed for three clear days' holiday. Things were looking black, when two ladies in a carriage and pair (evidently keen motorists) drove up and told us where we could obtain the needed fuel. It was an act of courtesy much appreciated, for though we were not actually *in extremis* (not having touched our emergency reserve) it was wiser to fill up. We pushed on to Barnstaple, and then, skirting Exmoor Forest, pulled up at Brampton for the night. Distance, 94 miles.

#### In the Christmas Fog.

Up to now the weather had been delightful, but Thursday broke wet and foggy, and 180 miles lay between us and home. We got off at 9 a.m., and before reaching Taunton (twenty-one miles) had a

little *contretemps* which we thought was going to stop our flight. We were bowling along in the fog down a gentle incline with a rather narrow road, and came suddenly upon a horse and trap, the former having an argument with his master, and backing the trap right across the road. There was nothing for it but the ditch and grass, and, as bad luck would have it, there was one of those cross drains just at the very place. It was bumpy-bump with a vengeance, and how the axles and body kept company is beyond the comprehension of the writer, but it survived, and, counting up casualties, found all was well, except the front near wheel showing a small wobble. Once more under way, the roads were fearfully muddy and greasy, and to get back to the crown of the road after passing another vehicle was high art. We mowed down Taunton, Glastonbury, Wells, Frome, Swindon, and reached Oxford at 5.20 in darkness and fog, and after some tea decided to push on. All went well to Thame.

The road to Aylesbury was not so easy, the fog being patchy, and at times demanding less than walking pace. We got into Aylesbury all right about 9 p.m., and then groped our way along the Tring road for Ivinghoe, which, with much jubilation, we eventually reached. After rounding the church, the writer, flattering himself he knew the road, thought all would be plain sailing, and went bowling along, bearing up to the left at the corner, where stands a house. Suddenly we were all "chucked"—there is no other word for it—in a heap about the car. When the earthquake ceased and we gathered our scattered senses, the writer got down, and with lamp investigated. In the fog, on rounding the corner, we had hugged the storm gutter-way too closely. The before-mentioned house, situated on the corner of a long hill, has a 12in. pipe under its drive way for letting the storm water through to the gully. This 18in. high obstruction we had charged at some eighteen miles per hour, and hence the earthquake. The reader can judge of the shock when a handbag, a rug, and a macintosh coat were thrown clear out of the tonneau. The engine was still running, and, as further investigation disclosed no damage, on we went. We reached Dunstable, the fog getting worse and worse, and, as the writer now really knew every inch of the road, we were able to make respectable speed by keeping one side lamp standing on the knife-board step, and shining on the grass edging along the road, and in this way reached Luton 11.30 p.m. Distance, 180 miles. Total distance, 654 miles.



Rear view of the Vauxhall car, showing better the height of the wind screen.

## GEAR-DRIVEN CARS.

### CONFIRMATION OF THE INVALIDITY OF THE RENAULT PATENT.

On December 30th we published counsel's opinion upon the Renault patent, which has been upheld as a master patent in two courts in France, and which, it is suggested, may attain a similar importance in this country. It will be remembered that Mr. Douglas Leechman's opinion was perfectly definite, and to the effect that the Renault patent was invalid. Certain information has since been placed before us by the secretary of the British Empire Motor Trades Alliance. This makes it quite clear that in the French appeal courts the view taken was a very comprehensive one, the judgment being as follows:

Held as patentable, the invention consisting substantially in a combination of elements effecting a direct drive between the motor and differential gearing of a motor car, by prolonging the shaft of the motor up to the differential gear without any other intermediary, this shaft being separated or drawn apart for speed changing.

Held that this combination of the direct drive on the top speed with separation of the shaft into two parts for the lower speeds which distinguishes the invention of Renault, is not to be found in the alleged anticipations of Tauzin, Schmidt, and Whitney.

This judgment, it should be understood, was that of the first Court of Appeal. Whether the case will be taken to the highest court is extremely doubtful, as the French makers appear to be accepting Renault's claims without further contest. However, as the French judgment dwelt so strongly upon the fact that the Renault gear provided not only direct drive, but also means for separating the shaft, so that it could drive compound, we deemed it advisable to submit the evidence to Mr. Leechman to ascertain whether, in his opinion, it affected the position so far as this country was concerned. The question that we instructed our solicitor to put to counsel was:

#### The Question to Counsel.

Referring to his recent opinion as to the validity of the Renault patent, No. 3,981 of 1899, counsel is now requested to advise having regard to the further light which has been thrown upon the position in France by the communication of the British Empire Motor Trades Alliance, and to give his further opinion generally.

#### Counsel's Opinion.

My opinion of the 26th ult. was directed to Renault's specification No. 3,981 of 1899, so far as it concerns the cardanshaft system of transmission. After perusing the communication of the British Empire Motor Trades Alliance I am still of the opinion already expressed.

Referring now more particularly to the speed-changing mechanism, described in Renault's specification, this comprises a friction clutchshaft, a pinion keyed upon the clutchshaft, and capable of sliding longitudinally thereon, and a double pinion presumably loosely mounted upon such shaft. The sliding pinion and the double pinion are provided with clutch claws, which are normally engaged by a spring. Two lateral shafts are arranged parallel to the clutchshaft, and carry spur wheels which can be brought into gear with

the spur wheels on the clutchshaft by eccentric movements of such lateral shafts. The operation of moving either lateral shaft also effects the disengagement of the claw clutch connection between the sliding and double pinions on the clutchshaft. The double pinion carries a brake drum, and this drum is connected by means of a cardan joint to the propeller shaft. The propeller shaft in turn is connected by a second cardan joint to a short shaft carrying the pinion of the bevel gear. Normally, the sliding pinion and double pinion are connected by the claw clutch, and the rotating movement is transmitted directly without the medium of any gearing from the flywheel to the friction clutch, from the latter to the clutchshaft, thence to the sliding pinion, the double pinion, and brake drum, and from this last to the first cardan joint, and so on to the bevel pinion. The two lower speeds and the reverse are worked through the lateral shafts.

From the information supplied by the British Empire Motor Trades Alliance it appears that the French courts held Renault's invention to consist, in substance, in a combination of elements effecting a direct drive between the motor and differential gear of the car by prolonging the shafts of the motor itself up to the differential gear without any other intermediary, this shaft being separated or drawn apart for the speed changing.

They further held that the drive from the motor to the wheels by means of a connection comprising two cardan joints was not *per se* new. But, in their opinion, Renault's invention did not consist in this arrangement, but in the combination thereof with the described system of speed-changing gear. The fact that the defendant moved his pinions longitudinally instead of laterally, as described by Renault, was considered immaterial, the lateral shifting of the shafts carrying the change-speed pinions to bring these into gear with the pinions of the driving shaft when the latter is drawn apart, only forming an accessory element of the invention claimed.

The Whitney specification, No. 10,020 of 1898, seems to have been discovered late, and to have received very scant consideration. It describes a variable speed gear, which is introduced into, and forms a part of, the power-transmitting connections between the motor and the driving wheels axle. It is applied either to the propeller shaft itself (when the rear cardan joint is dispensed with) or to the short pinion shaft beyond the rear cardan joint. The shaft is made in two co-axial parts, which are connected by a two-speed gear of the bevel differential type, one bevel wheel being fixed to a non-rotating part. The other bevel wheel is keyed to one part of the shaft, and may be moved longitudinally thereon, together with the spider carrying the bevel pinions.

Two members of a claw clutch are connected to the respective parts of the shaft. When the claw clutch is engaged, motion is transmitted direct from one part of the shaft to the other, without passing through the bevel gearing. This effects the top speed. For the lower speed, the claw clutch is disengaged, and the movable bevel wheel and pinions are brought into gear with the fixed bevel wheel, when the one part of the shaft rotates the other part at half speed through the bevel gearing.

While Whitney's gear is placed in such a position that it has only one end free to move independently of the road wheels, such partial independence is sufficient to accomplish Renault's object of avoiding the use of chains and belts, while leaving the springs free to act.

Of course, the decisions of the French Courts do not affect Renault's British patent. The methods of interpretation in France and England differ materially. The British rights must be considered in relation to the claims set out in the specification, and in relation to possible anticipations.

Renault's specification contains no broad claim for the direct drive on top speed, and the separation of the shaft into two parts for the lower speeds. The nearest approach to it is found in Claims 1 and 5.

Claim 1 reads: "An improved driving and speed-changing mechanism for motor vehicles, characterised by the fact that the movement is transmitted from the motor to the driving wheels directly by gear wheels without the medium of chains or belts, though the motor and the speed-changing mechanism be supported on springs, and capable of being moved independently from the wheels, the said mechanism comprising, moreover, the above-described peculiar devices enabling the movement to be transmitted through two gear wheels only, and the changes of speed to be effected while reducing the friction to a minimum, substantially as and for the purposes specified."

The reference to the "above described peculiar devices," and the existence of Whitney's specification, should prevent a wide interpretation being put upon Claim 1. For example, it would probably be held not to extend to gearing in which the lateral shafts or the pinions thereon were adapted to be moved longitudinally, instead of eccentrically, into and out of gear.

Claim 5 is as follows: "In a gearing for motor vehicles, the combination of a primary movement member driven from the motor, a clutch working with said member, a shaft driven by the clutch, the shaft being in two sections with a releasable connection between them, variable speed gear for driving the sections of the shaft, and movement-transmitting devices in connection with said shaft."

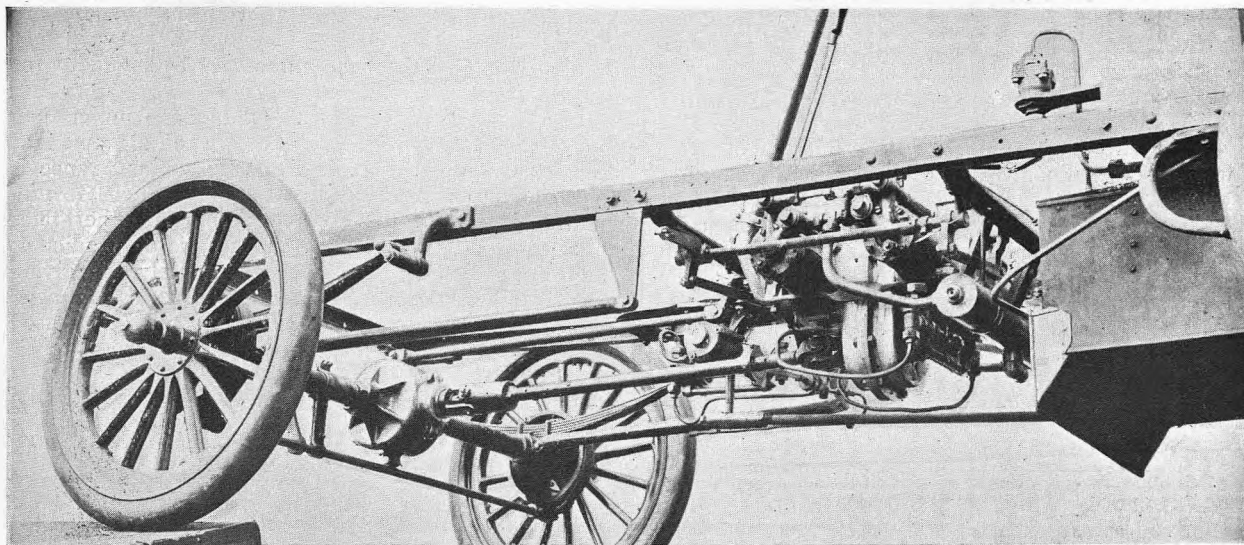
The clutch working with the primary movement member is the friction clutch. Apart from this clutch, all the elements of the claim are found in Whitney's, and anyone substituting an internal combustion motor for his steam motor (and such a substitution is fully contemplated by Whitney) would naturally introduce a friction clutch. The most usual place to introduce the clutch would be at the junction with the "primary movement member." In this way the whole of Renault's Claim 5 may be said to be anticipated, but it is difficult to say definitely how far any particular one of our courts might go in this direction.

The other two claims (6 and 7) are specific to eccentrically-mounted lateral shafts. Like Claim 5, they differ verbally from the body of the specification in that they refer to the shaft itself being in two connectable sections, instead of the connection being effected through the sliding and double pinions respectively. But the whole specification appears to be open to attacks on minor grounds.

While, therefore, I am still of opinion that Renault's patent is invalid by reason of the anticipation of Claim 4 by Alleyne and Whitney, I am further of opinion that Claim 5 also is very liable to be held to be anticipated by Whitney.

DOUGLAS LEECHMAN.

1, Crown Office Row, Temple.  
Jan. 10th, 1906.



Argent Archer, photographer.

Kensington, W.

The Albany steam car which is held to be an anticipation of the Renault patent. The frame is a new one, but the axle and transmission-shaft are taken from a car built by Mr. F. Lamplugh in 1896-7. It will be observed that those two important features, the universal-jointed propeller-shaft and direct bevel drive on the balance-gear axle, are embodied in Mr. Lamplugh's drive, which anticipates the Renault by some two years. It will be noticed, too, that in addition to having a universal joint at each end of the propeller-shaft there is a telescopic joint at the back end, so that it is an example of particularly advanced construction considering the date of its design.

Referring to an illustration which we lately published of a Maxim gun mounted on a Wolsley car, a South African subscriber tells us that in 1900 he was in command of the cycle section of the Cape Town Local Defence Force, when he suggested that a

Maxim should be fitted to his 23½ h.p. Eadie quad. This was done in the military workshops, and several demonstrations were made with the machine. This was, we believe, the first time on which a motor was actually used in active warfare.

## FLYING: A RECORD OF AERIAL NAVIGATION.

### THE WRIGHT FLYING MACHINE.

We believe we can claim the distinction of being the first to point out that if flying became possible in our time it would be due to the motor car, because the motor car had brought about the high speed internal combustion engine—an engine extraordinarily light for the power developed. This was some years ago, and we firmly adhered to the opinion, though it would appear that if the reports which have come to hand concerning the performances of the flying machine built by the Brothers Wright, of Dayton, Ohio, be true, lightness, in comparison with power developed, is not of such vital importance as we believed. However, this is by the way. For some time past paragraphs have been published in the papers about the reported success of the Wright Bros. with their flying machine, and, while these have excited interest in this country, it is nothing compared with the excitement which they have caused in France. Speaking broadly, the French are much keener on the solution of the problem of flight than we are, or perhaps we should say there are more of them interested in it. They have unquestionably hampered themselves by dabbling too long with balloons and machines which depend more or less upon the balloon for their sustentation. We have no faith whatever in machines which are in any way dependent upon a gas bag for their support. If it is not found possible to construct a flying machine heavier than air there is nothing for it but to go on experimenting till the task is successfully accomplished, and the question at the moment is whether the Wright Bros. have successfully accomplished the feat or not.

The French are particularly interested in the matter, because the Wright Bros. have stated that they expect to win the Deutsch prize referred to elsewhere. It has never been seriously anticipated by the French that this prize would go out of their own country, and they naturally regard the claims of the Wrights with considerable suspicion. However, it is having one beneficial effect; it appears to be turning their attention from the balloon to the aeroplane, and they have shown so much resource and originality in connection with the motor car that we feel justified in expecting that now the Wrights have turned their thoughts in the practical direction the French will once again excel.

To turn from France to America, there is no doubt whatever that the Wright Bros. have conducted a

series of experiments with aeroplanes. These have been recorded before a scientific society, and the results have been accepted without question—in fact, so long as the Wrights did not attempt to propel their aeroplane no one expressed the least doubt as to their good faith. They are not overburdened with this world's goods, and have experimented steadily and pluckily for some years, and it is only this year that they have arrived at such a stage when they felt safe in adding propulsive power to their aeroplane. With this apparatus they worked assiduously, and gradually accumulated sufficient practical knowledge to make a gliding machine which they could direct and generally control with something approaching certainty. It should be understood that the machine they made was simply an apparatus which if once started would not fall to the earth, but would come down at an angle gradually without harm to itself or its occupant. Having devised a machine of this sort, it appears, speaking very roughly, to consist of outstretched wings, in the centre of which the navigator lies, assuming much the same position as a bird when flying. The wings, however, are not used for propulsion, but merely to sustain the machine sufficiently to enable the gliding descent to be made.

We are not going into the whole question of aeroplanes at the moment; we are only touching upon the vital point that they shall be so made as to prevent the machine to which they are attached from falling like a stone. If this birdlike descent can be assured so that it is practically a certainty, the other problems in connection with aerial flight are, by comparison, simple, inasmuch as they are safe. It is, of course, assumed that the machine is sufficiently stable to preserve its equilibrium—that is to say, it will not topple over in mid air, and so lose its facility for gentle descent.

It is stated that the Bros. Wright have undertaken to cover fifty kilometres in an hour in the air, and that they have made over their rights, so far as France is concerned, to a representative of the French Government. However, this, like most of the other tales concerning their later performances, is contradicted, and for the moment we must content ourselves by giving extracts from various French and American papers. The American account was, we understand, suppressed



A reproduction of the winter scene painted on the Du Cros-Mercedes stand at Olympia

by the Wrights, as they considered it premature, but an enterprising representative of one of our French contemporaries managed to obtain a copy. The following is a translation from *Les Sports*:

**Local Account of the Wrights' Success.**

"O. and W. Wright, two Dayton citizens who made several trials of a flying machine last December on the Atlantic coast, North Carolina, renewed their trials yesterday (October 5th). They experimented with their most recent apparatus before ten witnesses in the large Huffman field near here. The machine rose from the start to a height of 25ft., but, owing to lack of petrol, the motor had to be stopped. The aeroplane then descended gradually on to the grass. The petrol pipe was repaired on the ground, and a new trial was held an hour later. This time the machine made the complete circuit of the field, which measures about a quarter of a mile round. Before going into the shed, the aeronaut had the audacity to describe an immense figure of eight at a height of about 40ft. The problem of the new locomotion is solved. During eight weeks the Bros. Wright have worked mysteriously night and day. When they arrived yesterday at Springfield they were sure of success. They had to inaugurate a fresh system of starting. Here the success has again been complete. The machine came out of the shed on an inclined plane about 1ft. wide. It is fitted on a very ingenious runner which slides on a rail to the extremity of an inclined plane, when the motor, being already started by hand, it immediately begins to rise. The motor is a 24 h.p., and the whole apparatus is about 40ft. long and 6ft. wide. The panniers or baskets are made of canvas. The motive power is in the centre, and the aeronaut is placed flat with his chest and stomach lying on a cushion. He guides the affair with two cords. When the machine has started, the screws revolve at very high speed.

"It appears that before long the Bros. Wright will attain a speed of forty miles an hour. They absolutely declare that the absence of all wind is as bad for their machine as a violent gale.

**An Interviewer's Description of the Machine.**

"We went to the place—an immense field, about ninety acres. During our journey in the tram, Mr. Wright recounted all that had been done since 1905. Nothing has been changed since September 15th. The frame is of larch wood. The length is about 40ft. The petrol motor is specially constructed, and made by the Wrights themselves, and is something like the Pope-Toledo. It has a power of from 12 to 15 h.p.,

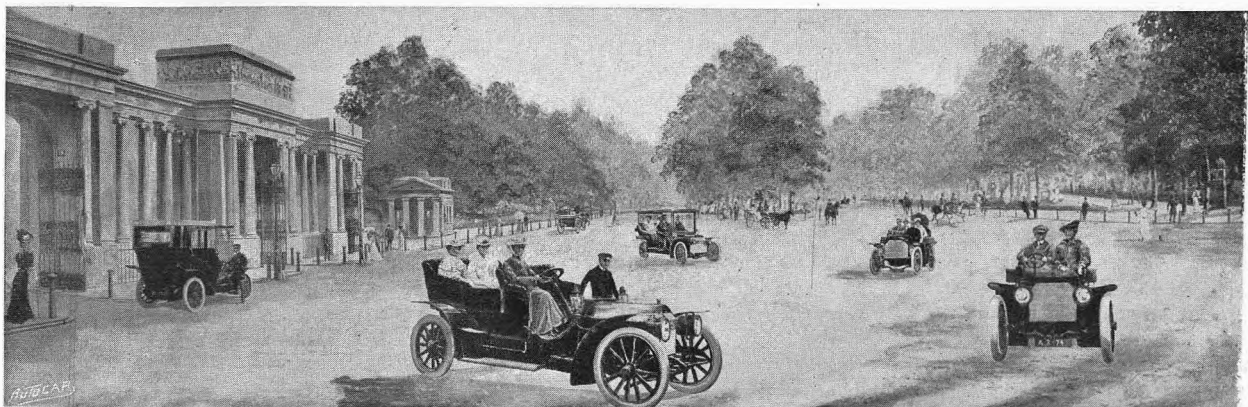
and is very heavy, weighing no less than 240 lbs. The frame is covered with ordinary muslin of good quality. No effort has been made to construct it particularly light; on the contrary, great care has been taken to make it very strong, so that it could support shocks when coming to earth. The apparatus is fitted with runners, like a sledge, and extending far enough to protect the screws when coming to the ground.

"The complete apparatus, with the engine, weighs 925 lbs. The operator is extended horizontally on his stomach, and as near as possible to the frame. Contrary to what might be thought, the fact is proved that a weight suspended lower than the centre of gravity has a tendency to rock the machine; in consequence, all the weight is gathered together as much as possible in a common plane, just as a bird when flying draws its feet up to its body.

"Mr. Orville Wright said that the final trial on October 5th was made, and they covered twenty-four and a quarter miles, and had to stop because the petrol was exhausted. On that day, the elder brother, Wilbur Wright, was directing the machine. He weighed 145 lbs., and the apparatus was carrying 50 lbs. of ballast attached to the front. The speed attained was a mile a minute, at twenty yards from the earth. It was only at the turnings that the height was slightly increased. He also said that he had been a four-mile circuit so close to the earth that he was not more than 10ft. away."

Then follows long conversations which the interviewer had with witnesses, one of whom occupied a house opposite the field where the trials had been held. This witness remembers seeing the trials, particularly those on October 5th. So did the farmer in whose field the trials took place. He says: "I was at work and saw the machine, which continued to go round and round, and I thought it would never stop." He said that it had been in the air for an hour.

Long circumstantial accounts have been given in the French papers by their representatives on the spot. Some of them absolutely shake one's faith in the whole performance; others strengthen it. Though a great deal might be written as to these reports, we really do not think they would advance the actual knowledge of the matter further. At the moment, we express neither belief nor disbelief. What we want to see, and what we shall very soon see if the whole thing is *bonâ-fide*, is a public demonstration of the Wright machine before credible witnesses. The conquest of the air is no small matter, and it will not be believed till it has been proved.

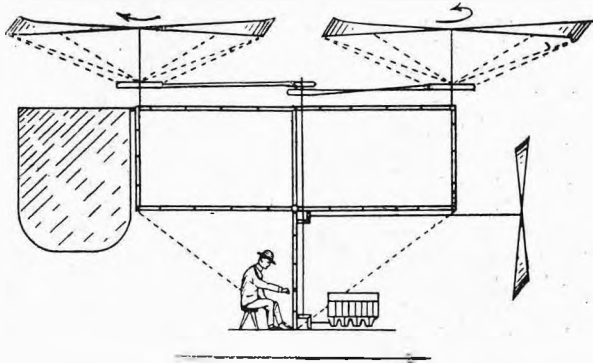


A fac-simile of one of the paintings on the Du Cros-Mercedes stand at the last show at Olympia.

*Flying: A Record of Aerial Navigation.*

**THE LATEST SANTOS-DUMONT FLYING MACHINE.**

It is reported that Santos-Dumont is constructing a flying machine heavier than air, with which he hopes to win the prize of 50,000 francs (£2,000) offered by MM. Deutsch and Archdeacon, and to be awarded by the Aero Club of France. The prize is to go to the first apparatus heavier than air which will fly a kilometre in circuit clear of the ground. If the fact that



A sketch affording a rough idea of the latest Santos-Dumont flying machine. The propeller is at the right hand side in the illustration, while the rudder is on the left. The total length is 41ft., height 49½ft.

the Wright aeroplane has already flown, and can again fly, thirty-nine kilometres, then the Deutsch-Archdeacon course is a mere bagatelle to it. M. Archdeacon has seen the plans for M. Santos-Dumont's machine, which he calls the "Helicoptère," and apparently does not think much of its chances of success, but in an interview he gave his interlocutor the following figures:

Total weight of the Helicoptère	...	352 lbs.
Levasseur motor, 24 h.p.	...	77 lbs.
Two sustaining helical screws, 19ft.		
8in. diameter	...	39.6 lbs.
Santos-Dumont	...	118.8 lbs.

The three last named items deducted from the first leaves but 117.6 lbs. for all the rest of the necessary apparatus—the frame of the machine, the propelling screw, the gear, belts, pulleys, and two transmission shafts. M. Archdeacon declares that it is impossible to include such parts within the avoirdupois mentioned, but estimates that the least weight that could be encompassed might be made up as follows:

Sustaining screws	...	39.6 lbs.
Levasseur motor	...	77.0 lbs.
Motor accessories, accumulators, tank, coil, etc.	...	33.0 lbs.
Frame, steel wires, etc.	...	110.0 lbs.
Transmission shafts, gearing, clutch, belts, etc.	...	88.0 lbs.
		<hr/>
		347.6 lbs.
Santos-Dumont	...	118.8 lbs.
		<hr/>
		466.4 lbs.

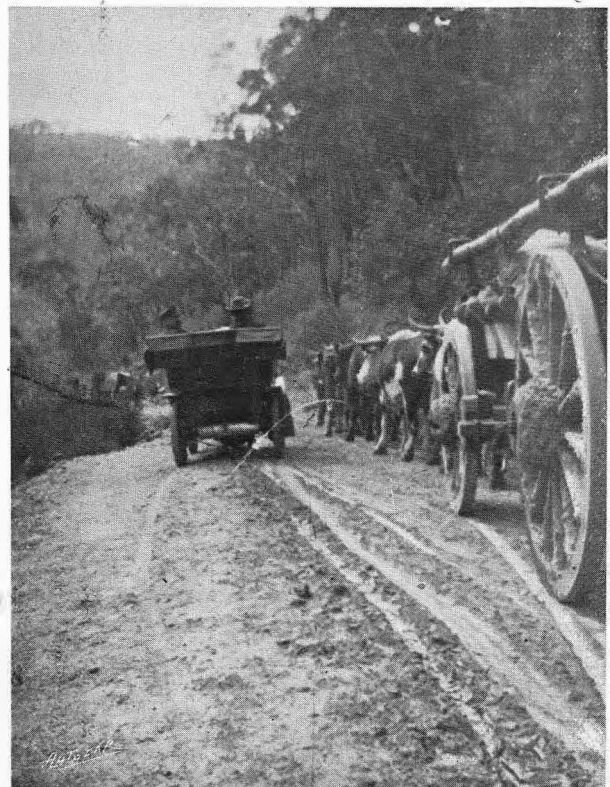
M. Archdeacon considers that the motor can only exert 18 h.p. useful power in lifting and sustaining, and that with a lifting power of 10 kilos. (22 lbs. per horse-power) Santos-Dumont is 70½ lbs. short in lifting power at least, and therefore his machine can never leave the ground. Moreover, M. Archdeacon is by no means impressed with the practicability of the lifting sustaining screws. We must say we agree with him, as it would appear from the rough sketch we reproduce that if the engine fails there is nothing to save the machine from dropping like a plummet to earth.

We may add that the frame is made of bamboo, and the cage in which the aeronaut sits is also of wickerwork, and sufficiently roomy to enable the navigator to place himself in any position necessary for the perfect balance of the apparatus. The machine complete is 41ft. long and 19½ft. high.

The transmission from the motor to the screws is by means of belts, the pulleys being built up like bicycle wheels, and keyed in a horizontal position on the screwshafts. One of the belts is open and the other crossed, so that the ascending and sustaining screws revolve in opposite directions, and the aeronaut is provided with a clutch pedal which allows the propelling screw to be revolved or left stationary as desired. The whole of the bamboo framework is braced together with piano wire. Although this apparatus has not yet been flown, the intrepid inventor has made a trial with an old pattern motor of 9 h.p. and one screw, and has succeeded with this power in lifting a dead weight of 198 lbs. He is therefore led to believe that with two screws and a motor of 18 h.p. double the weight would be lifted, viz., 396 lbs.

**THE AERO CLUB PRIZE.**

Sir David Salomons, Bart., has offered to the Aero Club, of which he is a life member, a valuable prize for the first mechanically-propelled aeroplane constructed in this country which succeeds in flying a given distance and returning to the point of departure. The rules and conditions of the award are now being settled by the committee. The Aero Club has recently enrolled quite a number of new members.



Modern and ancient forms of transport. A competing car passing an ox-wagon in the recent Australian Reliability Trials.

## CONTINENTAL NOTES AND NEWS.

### The Circuit European.

Under this title, the Automobile Club of France is organising a trial of reliability and a demonstration of uniformity of speed. The contest is to be an international one, and the Automobile Club of France proposes to organise the trial in co-operation with the national clubs of other countries, as the jury which will decide the official classification and deal with all disqualifications and disputes will be an international one, and the number of representatives of each country will be in proportion to the number of vehicles engaged. The course will extend over about 5,000 kilometres (3,107 miles), and the distance will be covered in fourteen or fifteen stages, from 300 to 400 kilometres (186 to 248 miles) in length. Possibly exhibitions will be organised in some of the more important centres. Leaving Paris, the following route will be taken: Marseilles, Turin, Milan, Vienna, Prague, Dresden, Berlin, Hanover, Cologne, and back to Paris again. The cars will be under constant observation, and adjustments and replenishments must be done in the running time.

A translation of the regulations of the contest appeared in last week's issue of the *Automobile Club Journal*, attention being drawn to the translation by an editorial note, presumably for the benefit of English competitors who contemplate entering cars in one or more of the four classes. This being so, it would be imagined that some care would be taken by those responsible for the publication of the translation in the *Journal*, and that the gross errors which are made in several places might—if they were not indicated—prove disastrous for any manufacturer who prepared a car for the competition on the figures given in the *Journal*. We say nothing about the looseness of the translation—the use of the words “reliability” and “uniformity of speed” for “endurance” and “reliability,” the word “place” for “space,” “entries” for “declaration,” etc.—because, after all, these freedoms

are only likely to cause a little confusion, but this cannot be said of the errors found in particularising piston areas, strokes, and speeds. We notice also that, luckily, there has been no attempt to turn weight in kilogrammes per square centimetre into lbs. per square inch of sectional area of cylinders. What errors would have resulted therefrom we hardly dare to think.

In Class I., for vehicles showing a mean speed of 18.63 miles per hour, it is set out that the piston area must not exceed 86.59 cm. (39.09in.)—that is to say, for a single cylinder motor maximum bore of 105 mm. Of course, square should have been written in, but that does not pardon the error of making 86.59 square cm. = 39.09in., when the correct answer is 13.42 square inches. The minimum weight to be carried must total 3.30 kilogs. = 7.26 lbs. per square cm., which is equivalent to 46.84 lbs. per square inch of piston area—a result which the translator has not taken the trouble to work out for either class.

In Class II., the total piston area must not exceed 226.19 square cm., which is equal to 35.05 square inches, and not 89.05, as given in the *Club Journal*. The minimum weight to be carried in this class is 41.87 lbs. per square inch of piston area.

In Class III., the total piston area is given as 346.36 square cm., and this is rendered by the *C.J.* as 57.609in. The correct figures are 53.69 square inches, which shows the club arithmetician to be getting distinctly warmer. By this time he had evidently thrown the lineal constant overboard, and had happened upon the necessary .155, but had yet to learn how to multiply by it correctly. Minimum weight to be carried, 33.35 lbs. per square inch cylinder area.

In Class IV., he is nearer than before, having only gone astray in a small matter of decimals. The piston area is given as 530.92 cm. = 82.689in., whereas it should be 82.29 square inches. The excess of .399 square inch would give a French committee all the ground they would want to rule an English-built car



Some of the competitors in the Australian Reliability Trials after their arrival in Sydney. It should be noted that they are all white men, but the thick coating of dust on their faces gives many of them the appearance of niggers.

*Continental Notes and News.*

out of the competition. In connection with this class, a careless blunder has been made in turning 45 kilometres into miles. It is rendered 38 in lieu of 28 miles per hour. Minimum weight to be carried, 30.517 lbs. per square inch of cylinder area.

We should strongly advise any manufacturer contemplating the construction of a car or cars for this competition to write to the Automobile Club of France for the "Projet de Règlement, Concours International d'Endurance pour Véhicules Automobiles," and have all the dimensions carefully resolved if the work is to be done in English measure.

**The Krieger Electric Searchlight.**

Readers of *The Autocar* who visited the Paris Show in December will doubtless remember seeing the searchlight that was erected in the Champs-Élysées. This was the Krieger electric searchlight, and a Monsieur E. Cuénod has since towed it on a gun-carriage by motor car to Caux Palace, a spot situated 1,000 metres above the Lake of Geneva between Montreux and Chillon. Monsieur Cuénod was accompanied by several military



The Motogodille in choppy water. This is an ordinary type of craft with the motor mounted over the rudder.

officers and others interested, who witnessed an illumination of the country and signalling operations, the light being visible over a radius of thirty miles. It is interesting to note that the searchlight and the gun-carriage on which it was mounted weighed 29½ cwts., while the motor car which towed it and the dynamo for generating the current weighed over 39 cwts.

**A French Change-speed Gear.**

An inventor from Lyons is responsible for what one of the French daily papers describes as a revolution in change speed gears. Judging by the description, the different speeds are transmitted from the motorshaft to the cardan-shaft by a sliding bolt, on which keys are machined. This shaft or sliding bolt picks up one or other of the pinions inside the gear box according to the speed desired, the pinions being separated one from the other by means of ball bearings running in a V groove. The pinions of the motorshaft, of the sliding-shaft, and the cardan are continually in mesh, and by

means of special arrangements there is a dead point between each speed, so that the driver can pass from one speed to the other and from reverse to third if necessary without taking the clutch out. He can also stop on the second speed and start again on either of the three speeds without coming back to the first. The inventor's name is M. Crypet, Lyons, and any further particulars can be obtained from G. Lambert, 16, Rue de Gramont, Paris.

**The Brescia Circuit.**

The new Brescia circuit will only cross the railway in one place. Contrary to the Auvergne, no bridge will be constructed over the line, and the motor cars will pass underneath the railway on planks laid over a brook which passes under the rails by means of a tunnel.

**Suggested Courses for the Great French Race.**

The French press are every day wrestling with the claims of a fresh circuit course for the speed race which it is alleged that the French manufacturers have forced upon the Automobile Club of France. One of the proposals to take the stage is a course suggested by the Mayor of Rambouillet, in the department of Seine et Oise. The latest proposal is a route which, starting from Rambouillet, passes through Ablis, St. Arnoult Dourdan, Dourdan Limours, and back to Rambouillet—a distance of forty miles odd, but which can be lengthened by twenty miles if the course is continued through Chevreuse, Le Mesnil, St. Denis, and Dampierre, and return to Rambouillet. No level crossings are encountered throughout, and no controls will be necessary.

**Théry's Movements.**

It may interest our readers to learn that Théry, having left the Richard-Brasier firm, has grouped around him draughtsmen, engineers, and capitalists, and is to manufacture the Théry car, the plans of which are already far advanced, and it will be put on the market early this season. Théry proposes to make Gordon-Bennett cars.

**Spring Wheel Competition.**

Our contemporary *L'Auto* is about to promote a spring or elastic wheel competition, and a meeting of the makers of these wheels has already been held in connection with the scheme. The competition will not take place, however, unless the Automobile Club de France drops the contest for the Cover cup. The date of the trials will be fixed somewhere between the 15th of March and 15th of April next. The minimum weight of the cars loaded is to be 1 ton 9 cwts. 1 qr. 24 lbs. The distance to be covered is 1,863 miles, divided into ten sections of 186 miles each. An average speed of 18¼ miles an hour is to be maintained, the maximum power to be equal to a motor of three and a half litres capacity—.7 gallon.

## FROM NICE NORTHWARDS.

A four months' stay on the Riviera had wearied us of its glare and glitter, and with the approach of May the more reposeful North beckoned us. From Nice to Fréjus was decided on, and we had a perfect day, cloudless, with lovely views over the Esterels. Here we heard the first cuckoo of the season, and were surprised and delighted with the number and variety of the birds to be seen and heard. Nearing Fréjus, the ordinarily quiet De Dion began to make alarming sounds, which proved to be due to the exhaust tube of the front cylinder having cracked. A local blacksmith, however, was found, who repaired it in time for us to resume our journey next morning to St. Maximin. *En route*, an outer cover burst, and was replaced by the spare Continental. We were then close to a small village, where it was a comfort to find that we could buy a Dunlop to replace the spare tyre.

At St. Maximin, where we stopped for the night, we were joined by a party of friends on a Darracq, going the same way as ourselves. The next day, on our way to Sisteron, we left the Route Nationale, and took a by-road across a low range of hills into the valley of the Durance. This road, though narrow, and in parts with a bad surface, amply repaid us by its beauty. Instead of crossing the river to the Route Nationale, we kept to the by-road as far as Les Mées, and our choice was fully justified. At Les Mées, a picturesque village nestling under red rocks, worn into fantastic shapes, we had to leave our by-road and take the Route Nationale on the right bank as far as Sisteron.

### The High Alps.

On the fourth we left the more or less level country, and began our climb into the Hautes Alpes at Gap. A stiff ascent of 1,500 feet brought us to the Col Bayard, where we stopped to admire the glorious view of the snows. Laffrey was the rendezvous.

On the 6th we went forward amid lovely Savoy scenery, through Chambéry and Aix-les-Bains, both motors behaving well, and leaving us free to enjoy the beauty of the scenery through which we passed. Of all the provinces of France, I can imagine none more charming than those of Isère and Savoy. This day's drive took us to Annecy, a picturesque mediæval-looking town, with the most lovely of lakes.

### Inhospitable Switzerland.

The 7th took us out of old-world France into work-a-day Switzerland, where even beauty is made the most of commercially. As it was Sunday, there was some difficulty about getting a *passavant* at Allongier. We, however, got it a little further on at the Pont de la Caille. We entered Switzerland by Geneva, and once in Swiss territory you cannot help noticing the change in the attitude of the people towards the motor. Placards at every two or three kilometres warn the motorist of the pains and penalties to which he renders himself liable. These range from a fine of five francs to "Sequestration," but whether of the vehicle or its

driver is not made clear. All Switzerland, with innumerable babies, was afoot on the road, so it behoved us to drive at a snail-like pace till at length we arrived at Morges, a pleasant restful little place on the north bank of the Lake of Geneva to the west of Lausanne.

Bad weather detained us for over a fortnight in Switzerland, and it was not without misgivings that on the morning of the 25th May we started for Solothurne. Swiss roads are execrable, and their charms are not enhanced by their being under repair. Starting from Montreux, it was not until we got well past Vevey and had turned north towards Moudon that we could put on top speed. A few miles further on, Avenches was reached, the ancient capital of the Helvetii, but now only a small town.

### A Change in Manners.

At Morat a marked change appears both in the architecture of the houses and in the manners of the people. Instead of the indifference, tempered with boorishness, which is the attitude of the Southern Swiss to motorists, the people greet you with a pleasant nod and smile, and the small boys, instead of surlily hurling abuse at you as you pass, doff their caps and bid you "Gut Tag."

Aarberg is the quaintest little town imaginable, approached by a funny old-fashioned covered bridge. Later in the afternoon we arrived at Solothurne, our stopping place for the night, and the oldest town on this side of the Alps, after Trèves. Next day, *en route* for the Black Forest, our route, though not good, ran through pleasant country, as we followed the course of the Aare, a river, in its willow-fringed banks and grey

green current, not unlike the Thames. We ran past the foot of the Wüfelsberg, on the top of which are the ruins of the Habsburg.

### The Fatherland.

At Coblenz we crossed the Rhine in a ferry, and entered Germany. Of all countries, the Fatherland is the kindest in its reception of motors. Here there was no tiresome douane to be gone through with the usual deposit, varying, as the case may be, from one and a half to some hundreds of francs. A customs official courteously informed us that there was nothing to pay. At Waldshut we entered the beautiful Black Forest, with its wonderfully kept roads. The route followed the course of the Schlucht, a pretty little stream running through a valley, which narrows every now and then to beautiful gorges. Our day's journey ended in the most remote and peaceful spot in all the Black Forest, Schluchsee, which made a centre from which to explore the district. The courtesy, the hearty welcome, and the deep inbred piety of the people, strike a pleasant note.

### The Bavarian Tyrol

Leaving Schluchsee, a run south and east through hilly country brought us across the border to



Eibsee in the Bavarian Tyrol.

*From Nice Northwards.*

Switzerland again, On our way to the Bavarian Tyrol we stopped at Neuhausen to see the magnificent Falls of the Rhine. Next day we continued our journey eastward, and after re-crossing the German frontier at Thuringen, ran through Lingen and round the arm of Lake Constance to Uberlingen.



A Bavarian clock tower.

We were not sorry to leave the flat country round the lake next day, on our way to Ravensburg, a quaint place surrounded by vine-clad heights once subject to the Guelphs. On Sunday, leaving Ravensburg, we took the Wangen-Isny route, and entered Bavaria, where we noticed a marked inferiority in the roads, which up to this had been excellent. Some of the gradients, too, were alarming. At Kempton we got into the watershed of the Danube, and ran

across a high plateau which lies between the Lech and the Wurtach.

Schongau we found so inviting that we remained there the next day. Black beer is drunk here at every hour of the day, but we never saw anybody the worse for it. Good-tempered and aimable, the Bavarians came up to all we had heard of them. It was on the next day that we were to experience the most delightful run of the tour. Our route lay *via* Pessingberg and Wertheim. Onward we went through rich and ever-changing pasturelands, alternating with pine woods, the not too-distant snow-topped Alps framing the beautiful picture. And at Eibsee, a lake which lies embosomed in the heart of the Bavarian Tyrol, with the Zug Spitze, 10,000 feet high, towering over it, we found the ideal, though temporary, term to our wanderings. Here at length we were in the veritable Arcadia, and here we lingered until the end of June.



The Zug Spitze.

MRS. F. ASHBROOKE-CRUMP.

## INCOMPETENT INSTRUCTORS.

We were interested the other day in watching the method adopted by a person who was supposed to instruct would-be motor car drivers in the art of attending to machines which they hoped to have under their control in the near future. We are afraid that the instruction which these young people received from the instructor would not be of much use to them, and it seemed to us a pity that hard earned or badly spared money should go into the pockets of some of the principals of these motoring schools, for certain it is that the benefits derived from the expenditure of this money would really be infinitesimal. To mention several points out of the many which struck us as proving the incapability of the instructor, we may say that the car on which the instruction run was to be given was placed out in the street, and the instructor stood by giving orders to some half a dozen men under his charge. In the first place, the vehicle was an extremely old pattern one which possessed features quite different from those fitted to present day cars, so that instruction on this particular vehicle would not greatly help the instructed in the proper care and management of a modern up-to-date car.

The petrol tank required filling with petrol, and two cans of petrol were brought out and one of the men proceeded to empty this into the petrol tank. Meanwhile the instructor was standing puffing vigorously away at a pipe with the bowl not six inches away from the filling orifice! The petrol was being spilled all

over the place, and it required no effort of imagination to understand that a serious fire was only averted by absolutely undeserved luck. The very first principle which an instructor should instil into the minds of his students is to avoid any needless risk as they would the plague, and we should say that this particular instructor was totally incapable and unworthy of his post.

One of the students noticed that the right-hand chain sprocket was loose, and drew the instructor's attention to this. The method adopted by this so-called teacher to cope with the problem was to seize a hand hammer and vigorously tap the sprocket four or five times close to the boss. He left it at that. The way to have done the job was to have taken out the split pin of the nut securing the wheel and to have given the nut about half a turn to tighten up the sprocket on its tapered shaft, but probably this was a little too much trouble, as it entailed using a pair of pliers and a spanner; the hammer came handier.

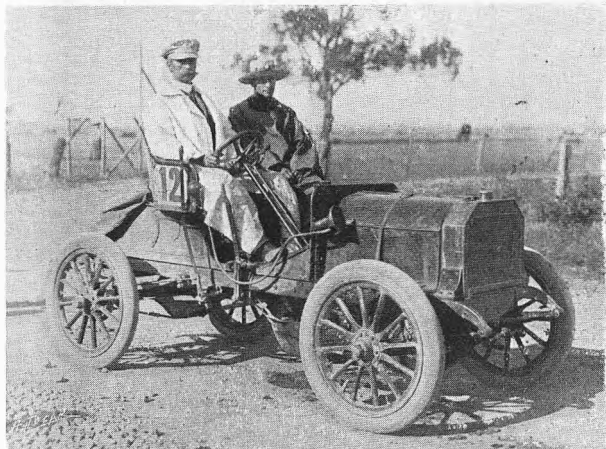
After filling the tank the party were taken aboard the car, and the instructor proceeded to demonstrate his skill (?) in handling the vehicle. The first-speed gear was put in mesh with a tremendous jar and the clutch let in in such a manner that the front wheels of the car were lifted no less than six inches from the ground. When students are instructed in this manner it is a bad omen for the successful running of the cars which later will pass under their control.

The 40 h.p. Fiat car presented to Lord and Lady Willoughby de Eresby on the occasion of their recent marriage was burnt on Thursday last week. The car was being used in Lord Willoughby's electoral campaign, and the petrol was being drawn off in readiness for the repair of a leak. The vapour got to a small lamp on the ground, some four feet from the car, which was

in a coach-house at Halton Holgate, near Spilsby, and an explosion occurred, followed by a big blaze. The coach-house and car were soon in flames, and the body of the car and the wheels were quickly consumed. The chauffeur, who tried hard to extinguish the flames, was, however, very severely burnt, and had to be taken to the Spilsby Cottage Hospital.

## OCCASIONAL GOSSIP. -By the Autocrat.

I would address herewith a fervent appeal to those automobile owners who do not drive their own cars, but sit cloaked in comfort within the shelter of a landaulet or limousine body, more or less unconscious of what is going on without as they are driven along. What I



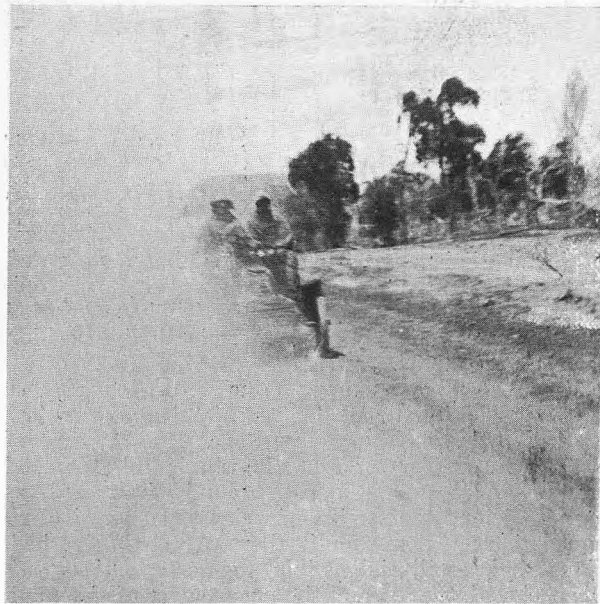
An Australian-built car. The 8 h.p. two-cylinder Tarrant, which, driven by Mr. H. Tarrant, made such a fine performance in the Australian Reliability trials.

would ask these owners to bear in mind is the annoyance and damage caused to pedestrians on the sideways when cars are driven fast over sloshy roads close to the kerbs. The big tyres usually fitted to these cars smash into the puddles of liquid mud, and squelch the filth in copious streams over anyone or anything within a wide radius, so that the garments of any decently attired woman are smirched out of all recognition. It is hopeless to appeal to the paid driver in this matter; he has no compunction whatsoever—indeed, at times he appears to take delight in this irritating practice. It is his master who should, and must, act, and who when he perceives the state of the suburban roads to be such that ladies cannot walk upon the footpaths without being smothered with road filth by cars running at high speeds should insist that the speed of the car be reduced to a point at which the mud is not thrown in a fierce cascade from underneath the wheels. Great offenders in this regard are the members of the various sporting clubs such as the Ranelagh, the New Polo Club, and Hurlingham, who are driven down to these places for polo or golf. The dwellers in Hammer-smith, Barnes, and Putney make continual complaint as to this scandal, which those actually responsible should be eager to abate.

x x x x

I have been wondering why it is that some of the French makers should have apparently admitted the validity of the Renault patent and arranged to pay royalties upon it to Renault. If they have taken this action, and if it is followed by the other makers of gear-driven cars in France, it will result, I suppose, in what is practically an admission of the fact that so far as France is concerned the Renault is a master patent for all gear-driven cars. What I want to know is how is it that it is a master patent, and is it really a master patent, or is it a matter of arrangement? In America, so far as I understand affairs, there is a patent called the Seldon, which is claimed to be a master patent,

but which some of the makers could upset if they liked. Instead of upsetting it, however, the American makers have formed a sort of society, and have established the patent so that it is a master patent in America, and no one can make a car who has not a royalty from the society or makers who own the Seldon patent. This means that the Society of American Motor Car Makers can practically shut out new comers, because they hold a master patent which makes it impossible to build a car in the U.S. unless the builder has an authorisation and pays a royalty. Is France going to do something similar to this? No one who visited the French Show last month could fail to be struck with the number of new makers of cars and of engines and all parts of cars. Are the French makers getting frightened, and thinking it is time they put a stop to their ranks being further increased? If the existing ones make common cause and establish the Renault patent as a master patent they can practically shut out new comers by refusing to grant them a license, and then they would only be able to make chain-driven cars. Not only so, they would be able to prevent the importation of gear-driven cars, though, considering their tariff, one would scarcely have imagined that this would give them very much trouble, particularly as they seem to be able to have the tariff increased whenever they want it—that is to say, if motor car importations into France assumed serious dimensions the French manufacturers would, taking a line through the past, have little difficulty in persuading the authorities to increase the tariff to a figure which was practically prohibitive just the same as it is in America, where one has to pay forty-five per cent. on the value of a car. Many rich Americans pay this rather than use the native productions, but, of course, it is out of the



The Australian Reliability Trials. Dust on the way.

question for any but rich people. Anyway, whatever may be the position in France with regard to the gear-driven car, it is satisfactory to note that in this country there is no master patent either real or fictitious.

## THE WELLER LIGHT ENGAGE GEAR.

The many striking and interesting points which attracted much attention to the Weller car when shown at the Crystal Palace in 1903 were all the work, or at least proceeded from the fertile brain of Mr. Weller, who is responsible for the neatly-conceived and simple form of noiseless gear engagement now under consideration.

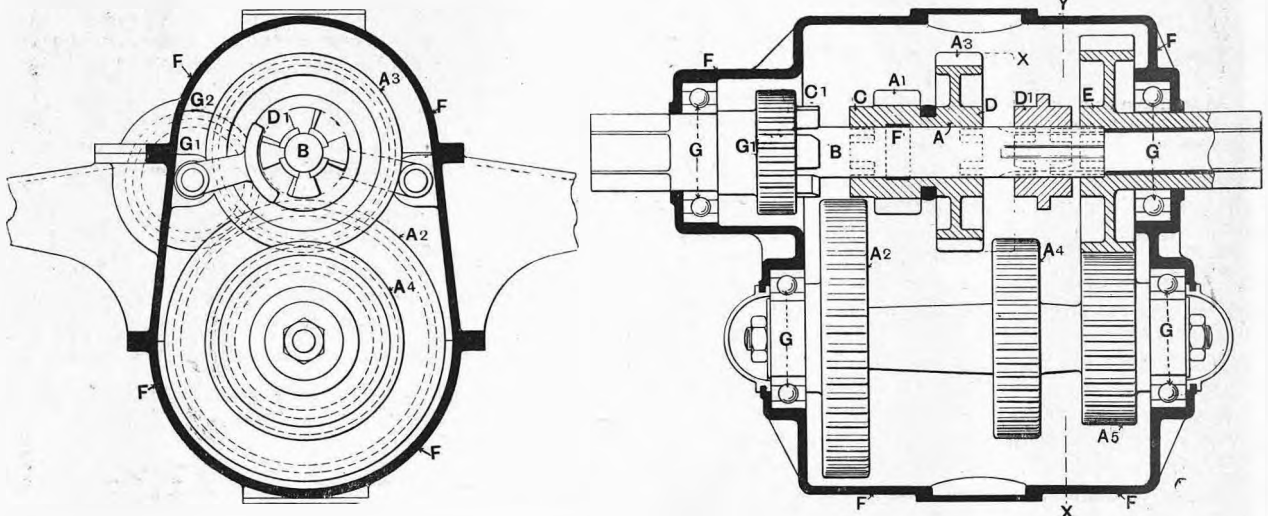
A very cursory examination of the sectional drawings will show that the light engage gear is a combination of two well-known gear box features, namely, the sliding sleeve (or *train baladeur*, as our friends across the Channel call it) and the all-mesh principle, in which any pair of toothed wheels always in engagement are locked up to their respective shafts by means of sliding dog clutches.

In connection with the device under review, it is claimed that it possesses the advantages of both and the objections of neither systems.

As in the sliding sleeve or Panhard system, the gear trains which are not transmitting power are disengaged when in a neutral position, thus affording the

number of parts as an ordinary Panhard gear, and should be cheaper to make, since the cost of the clutches is more than compensated by the use of a round shaft and round gear sleeves, while the toothed wheels, being protected against careless usage, need not be so heavy for any given horse-power. In many cases, indeed, the wheels may be formed solid on their shafts, thus reducing the number of parts, as well as the ultimate cost, since they cannot be damaged in changing speed.

Figs. 1 and 2 are a vertical and horizontal section of a three-speed Weller light engage gear box, in which A is the first and second speed sliding sleeve carrying the first and second driven pinion  $A_1 A_2$ , freely mounted on the round drivingshaft B. On the ends of the sleeve A are formed the clutches C and D adapted to engage with the clutches  $C_1$  and  $D_1$  solid with the shaft B. The clutch  $D_1$  is double-sided, and is mounted on the fluted end of the shaft B, being adapted to slide into engagement with clutch E. locking the first and third motionshafts together, and



Figs. 1 and 2.—The Weller easy-change speed gear.

A, first and second speed sliding sleeve  
 A<sub>1</sub>, first speed driving pinion  
 A<sub>2</sub>, first speed driven toothed wheel  
 A<sub>3</sub>, second speed driving pinion  
 A<sub>4</sub>, second speed driven wheel

A<sub>5</sub>, intermediate driving wheel  
 B, primary gear shaft  
 C, first speed driven clutch  
 C<sub>1</sub>, first speed and reverse driving clutch  
 D, first and second speed driven clutch

D<sub>1</sub>, second and third speed driving clutch  
 E, third speed direct driven clutch  
 F, gear box  
 G, ball bearings  
 G<sub>1</sub>, reverse pinion

maximum efficiency and quietude, minimum wear and tear, and the greatest possible simplicity and reliability—indeed, all the qualities which have enabled the Panhard form of gear to maintain its position ahead of all others.

As the second well-known principle of dog clutches is combined with the Weller gear, it therefore enjoys through their agency the advantages of great ease of engagement and durability. The wheels to be engaged are freely mounted upon a round shaft, and, as examination of the section will show, can receive no application of power until they are half meshed. Hence it is totally impossible to damage the teeth when changing gear, and the engagement of the tooth wheels is extremely easy. This protection of the teeth from grinding and tearing, which so often ensues when the gear is carelessly or ill-timedly changed, ensures sweetness and quietness of running, and long life to the toothed wheels, in addition to the great ease of manipulation.

It will be remarked that the gear has the same

giving a direct through drive. The dotted line X shows the second speed wheel  $A_3$  about to take up the load when the direct drive clutch  $D_1$  is in its neutral position. This arrangement of the drawing clearly shows the safety of the gear teeth at the moment of the engagement of the clutches D and  $D_1$ , which communicates the power from shaft to wheel. F is a friction clip ring, which ensures that sleeve A will rotate with the shaft B when sleeve A is in its neutral position. The friction of this clip is but slight, and its presence is not essential. It is merely fitted in order that the wear between the shaft and the sleeve may remain absolutely *nil*, since the only movement between them is at the moment of engagement of the first and second speeds.  $G_1$  is the reverse pinion, which engages with the first speed wheel  $A_2$  through an intermediate pinion  $G_2$  (fig. 2) mounted on a hollow shaft  $G_1$ , through which the gear-changing rod controlling  $D_1$  passes.

The gear is made by Autocar and Accessories, Ltd., 158, Norwood Road, West Norwood, S.E.

# 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 or the firms they represent may be expunged, and the initials of the writers substituted.

Letters of a personal nature will be withheld.

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

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

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

### A WARNING TRIANGLE.

[10370].—As a regular reader, I thought you would be interested to know that the Motor Union kindly presented me with a warning triangle, which I wanted put in a suitable spot here (Moreton-in-Marsh, Glos.), which is very dangerous on account of an infant school being near, and out of sight. The Great Western Railway, however, have written to say that I must pay 5s. annually for its erection on their bank. As it is not a private affair of mine, but in the interest of the public good, I think this is monstrous. They sent me, also, a long agreement to sign, with a plan as to its position. I may say the local body has allowed me to erect it, so I shall not trouble the company, nor pay 5s. per annum.

EWART WEST.

### POLICE STOP WATCHES.

[10371].—As a keen amateur student of mechanics generally, I have for a long time been aware of a fact in connection with modern low-priced foreign watches, such as those with which, I believe, the "hedgehog" is furnished, the importance of which to motorists has, however, only just struck me.

Most men time their watches by the large hands only, but they take it for granted that the seconds hand makes exactly sixty revolutions to one minute as shown by the hand, and policemen are not likely to be an exception to this rule. The assumption is quite correct in the case of good watches, but is altogether wrong as regards the great majority of the cheap Swiss watches of the present day. In these machines the seconds hands are an utter fraud, revolving without any reference to the minute hands. In some instances they make their circuit in less than a minute, and in others they take considerably more. It is easy to see how, in the latter case, a speed of, say, eighteen miles an hour may be registered as anything over twenty, for it is by the seconds hand only that times over short distances can be taken. Thus, many an innocent man has been heavily fined on the evidence of these false witnesses, and motorists who are charged with driving at excessive speed will do well to demand that the "stop watches" which are put forward in support of the indictments be subjected to suitable tests.

H. J. W.

### TO LAY DUST.

[10372].—In venturing to encroach on your valuable space, I can only hope that the importance of the subject on which these lines bear will serve as my excuse. The subject of preventing cars from raising dust is worthy of the greatest consideration on the part of all connected with motoring. We have very little data on this subject, as the trials made by the A.C. were chiefly directed towards body design. Now I believe the following data may be of use, as bearing on the action of the dust raised by the wheels and draught:

- (a) When dust rises vertically and spirally, if the spiral or helical action be broken it cannot ascend far, say two or three feet.
- (b) Draught dust takes an elongated spiral form, and progresses in a parallel direction to the ground.

I have the results of some trials of an anti-dust apparatus before me, which may be of interest. I will first describe the apparatus.

It takes the form of a small shoe or guard, which is fixed near where the wheel touches the ground, and embraces the tyre. It has a vertical height of about eight inches. This is fitted to both back wheels. Behind this shoe is a three-spray jet, composed of an air box and three nipples. Water enters the air box by gravity, and is there met by air from a rotary blower worked by the motor, which gives air at 8lbs. per square inch, which atomises the water into very fine particles, enabling it to combine with the dust to really form a species of fog. Better results have been found to be obtained by this

method than by merely allowing the water to fall by gravity. Similar shoes are fitted to the front wheels, only without any spray. The draught dust is stopped by baffle plates fixed across the car, reaching to within a few inches of the ground. By this combination quite fifty per cent. of the dust raised by the trial car—a 10 h.p. Daimler—was stopped. I am in no way interested in this invention, but merely quote it as the only example of its kind that I know. Of course the fitting of such an apparatus adds a little complication, but this will not, I think, be seriously grudged by anyone who really has the good of motoring at heart.

I hope that others of your readers will send their ideas, giving useful data where possible, and I venture to think that a really useful and profitable discussion will result. The sooner motorists as a body realise that nine-tenths of the animosity shown by the public is because of cars' dust-raising propensities, the sooner shall we be able, by our united efforts, to arrive at some satisfactory means of preventing it. And the sooner we discuss this the better, as the summer, and the dust, will soon be with us.

W. ADYE.

### PUMP V. NATURAL CIRCULATION.

[10373].—Your contributor "Owen John," in your issue of December 23rd, invites a discussion on the relative merits of pump-cooled engines and those without pumps, and complains of expense and annoyance from "burst pipes, congested radiators, and leaky joints."

In my experience, natural circulation (*i.e.*, without pumps) fulfils all necessary requirements. In my first car I had a pump, and more than once had trouble, but with my last two cars—a 16-20 and 24-30 h.p. Richard-Brasier, both of which are fitted with natural circulation—there has been no trouble—no "burst pipes, congested radiators, or leaky joints." Indeed, there has been, I think, a minimum of expense with both cars. As I sold the former car last summer, I cannot tell what it amounts to now, but it was very little then; while my bill for repairs to the 24-30 h.p., which I have had running since May last, and which has now covered 6,334 miles, has just been paid by me, and amounts to only £1 15s. 3d. So far from having had any trouble or expense connected with the water circulation, I find that not only is there none, but also that only about a tumblerful of water per week is used. With this system the engines get comfortably hot, giving, of course, better results then, but they do not over-heat, and one can always see, if desired, that the water is circulating by feeling the difference in heat of the upper and lower pipes to and from the radiator.

E. WHITE.

### PRICES OF MOTORS IN NEW ZEALAND.

[10374].—The figures given here are authentic, and taken from documents relating to an 8 h.p. car recently imported by a cycle agent here. They are compared with figures now prevailing, owing to appointment of a sole agent in Wellington.

Wellington agent's price ... ..	£325
English retail price ... ..	200
Increased cost ... ..	£125

Charges on the car, packed regardless of space, were as under:

	£	s.	d.
Case ... ..	4	10	0
Sundry charges and freight ... ..	30	12	4
Duty on English retail price ... ..	44	0	0
	£79	2	4

This gives cost of car, bought retail and shipped direct to Blenheim, as £279 2s. 4d., or, roughly, a saving on agent's price of £45. Owing to peculiarities in freight, £6 10s. would be added if not shipped direct, but reshipped under new bill at Wellington—through agent—making total cost £331 10s. ! The duty is calculated on the English retail cost, so it pays better to import privately and avoid agents.

A 6 h.p. car is priced by them at £190! Here again, by avoiding the agent, a saving of about £40 would be effected. Thus the agents would get their trade discount and

*Correspondence.*

still charge more than anybody can import the car for himself. Do they take us for fools, or are the makers blind to their own interests?

The cycle agent here was prepared to indent cars for about same money as we could buy retail, but he lost the sale of several cars, as we have no intention of paying such a foolish price. We would, of course, put up our money with the order.

This explains why American cars, in spite of the poor material and workmanship, sell as four to one more than all other makes. The cost over English price is invariably (in spite of a thirty per cent. duty) far nearer than any other cars—£225 to £150 for Oldsmobiles, £260 to £200 7 h.p. Oldsmobiles. I am quite aware that the agents get a far higher discount from American makers than from English.

What I want to point out is this. Why have a sole agent who fixes the price at an absurd figure when almost all cycle or motor people here for cash down will import a car for you at the same price as you can do it for yourself?

There are sole agents for all the leading makes in New Zealand, but, unless American cars, they are not advertised in any way, and I have had to apply to the factory in England to find out their existence. I sent an enquiry home for certain cars, asking what price the firm would sell six 6 h.p. cars for. I received a reply saying that I must do business with the sole agent in Dunedin, and he would write. That is twelve months ago, but the agent never wrote or bothered further about the matter. It seems to me the English makers do not want to sell cars, as if they did they would give equal rights to all the local centres, which, owing to the peculiarities of New Zealand, are totally isolated from one another, as I pointed out in my first letter.

I carry a stock of all ordinary spares on my car, and if I can buy castings, etc., in Australia it is cheaper to do so than deal in New Zealand, where the sole agent business means the sole right to charge ridiculous prices. I have imported nearly all the spares I want from England with great benefit to my pocket. To give you one instance. I got quotations for a new chain from agents, price 8s. per foot. I sent home and bought a very much better make of chain, paying (landed cost), 2s. 9d. per foot only. I could go on *ad nauseam* with similar instances.

If I know that I can buy my larger spares and castings in Sydney I need not bother about any New Zealand agent, as the freight I pay is the same for 1,100 miles as for seventy, and the prices are about fifty per cent. better, even when duty is paid. I hope that in future the English makers will not appoint any sole agent in New Zealand, but have a central depot for large spares in Australia, and furnish us with a numbered catalogue for ordering purposes.

A correspondent is sure to point out that the English houses give very small discounts. That may be so, but that merely places the private individual in a more favourable position as against the trade, so what is the use of trying to make big profits this end, as it curtails the sales enormously and lets in American rubbish? Why not indent cars as I suggest? It means no capital outlay, and would lead to a far larger business in the long run.

The moment a car reaches the port in New Zealand mentioned on the bill of lading it is fair game for exorbitant freights. I have paid in freight and insurance from a local port as much as would nearly pay the freight from England to that self-same port; hence to compel all cars to pass through agent's port is to load them at once with extra freight charges, and if the agents never see the car, and it comes direct to the purchaser, what do they do to earn their money?

A. FOSTER.

## AN ALL-BRITISH SHOW.

[10375.]—I do not think that Mr. Chas. Newton can be connected with the motor trade, or he would not even suggest a show for all-British motor vehicles only. It would be the most troublesome matter imaginable to the whole industry. The Olympia Show has already entered into severe competition with the Paris one, with the result that the Continental makers—having found that the holding of the Olympia Show before Paris resulted in a very serious loss of business to the firms showing only at the latter show—now advocate the holding of the Paris Show of 1906 in October, and it seems likely that the Olympia may also be advanced again so as to still be in front of the Paris one.

If in addition to the above competition there is also rivalry between two English shows both trying to be the first in the field, we may arrive at the time when the show of, say, 1909 models will be held in November, 1907.

There is another and, I think, more serious point of view in the interest of British manufacturers. If British-made cars are as good as, or better than, the foreign, why take steps to prevent the foreigner competing on even terms? If on his merits the British manufacturer ousts the foreigner, his victory will be overwhelming, but, on the other hand, if it is through show or any other preferential juggling there will be many well-informed motorists who will retain opinions of their own.

Now to speak in the interest of the buyers (public). Is their patriotism so strong that motives of self-interest do not intrude? And is it not the best value, irrespective of country of origin, that is the main quest? After all, are not the interests of the trade best served by free and healthy competition?

I cannot think that a restricted show would be welcomed either by the motor trade in general or the private users of motor vehicles.

ERNEST H. ARNOTT.

## RACING FOR THE IMPROVEMENT OF CARS.

[10376.]—In reply to Mr. Harris [letter No. 10332], I must, in the first place, point out that I do not deny that a considerable amount of information has been got by racing cars. The question, however, is not whether some information has been got, but whether it is in proportion to the money spent to get it, and whether in the future we shall get more.

My own opinion is that, whatever benefits may result from trials of speed between cars of the ordinary type built for ordinary use and of proved durability, none results in racing machines built purely for speed and quite different from the ordinary touring car. This is certainly the experience in other trades where we can actually see the results. In ships, trials of speed in ordinary running have no doubt led to improvements. Racing in the sense used of motor racing has led to little, if any. The fastest racing steamer in the world is the *Arrow*, built by Mosher. If Mr. Harris is right in his views as to racing being the only way of improving machinery, Mosher must be able to build the best passenger steamers afloat, and, in fact, the *Arrow* herself ought to be better suited for the purpose than anything else. As a matter of fact, all the most successful steamers are made by people who make a speciality of the particular class they belong to, and do not spend their time making racing boats.

As to the cars themselves, I take it that the most successful racing car there is at present is the racing Darracq exhibited at Olympia. This car is a very special one in many of its features, and if the racing sorts out the best car we must accept this as being in every way the best for steady hard use. If we have to modify it in any way to produce the best touring car, we must admit that the racing has *not* produced the best. Now Darracq himself modifies it in his touring cars, so that they are an entirely different design in engine, frame, change-speed gear, wheels, etc.

Further, if racing is the best way to perfect a machine, we must suppose that the motor car (of the racing pattern) is not only superior to other cars, but also to other machines not "perfected" by racing. Now, most classes of machinery run six days a week, nine hours a day, and are expected to do so without breaking down and wanting very great repairs, and to last, say, twenty years without wanting important parts renewed. Steamers twenty years old are still running non-stop runs of 3,000 miles at about twenty miles an hour average speed. Locomotives twenty years old are running as well as ever. I think it is quite clear that the racing motor car cannot do this, and that, in fact, the pleasure motor car of any kind has not got to this stage yet. Now these results have been got simply by people spending their whole time remedying every defect that appeared in daily work, and I do not see why, if motor car manufacturers do the same, they cannot get the same results.

When the motor gets to anything like this state of reliability and durability there is no doubt it will entirely take the place of horses on the road, except among a very few people who ride or drive for pleasure. As to the question of difference in construction for standing the greatest strain for short periods and long periods, it is perfectly well known that steels which show the best tests for short times do not show the best for long. In order to get the reliability which has been attained in steamers, as mentioned above, steels which only show moderate strengths on short test are always used. In some cases iron is used, although it shows lower strength still on short test.

As to methods of construction, the only motors that have been put to really long continued use are the lorries, which are some of them run all day and every day. Anyone going down a London street can see that those in actual successful use are

not built on the lines of the successful racing cars, and are not built by racing car builders.

As to the points mentioned by Mr. Harris, I would point out that it is often assumed that had it not been for racing no improvements would have been made. Experience with other machinery shows that this is not so. In fact, the development in several cases has been as remarkable as in that of motor cars. Further, in many cases improvements are claimed as the result of racing which are not really due to it, and in some cases have been actually delayed by the racing. An instance of this is the sloping wheel. This was adopted in traction engines years ago. On the other hand, the leading racing cars adopted a nearly vertical wheel spindle, and kept this in fashion for a time, in spite of the fact that one non-racing firm at least (Daimlers) used more sloping ones.

In order that an improvement can fairly be claimed for racing, it must be shown—

- (1) That it was not used previously to being adopted on a racing car;
- (2) That it would not have been used had it not been for the racing.

The latter is, of course, a difficult point to prove, as it is impossible to know what improvements a man who spent his whole time thinking of points in his touring cars would think of. Still, one may guess.

As to the points Mr. Harris names, the rake of steering wheel, I have shown, was rather delayed than introduced by the racing.

The advantages of long wheelbase were known long before car racing, and, as a matter of fact, the Darracq racing car has not got a very long wheelbase. It has no "spring checks," and its springs are obviously not so easy as many of the touring cars.

Ease of control is a thing that would, naturally, have a great deal of attention from construction of touring cars. Probably the easiest clutch to handle is the Hele-Shaw, but Mr. Hele-Shaw is, I believe, not a racing motorist.

Brakes are a point I always thought at fault on the older pattern of cars, but was told that as these were racers I was a fool to think they were not right. Had it not been for racing it would have been natural to put them in larger and more durable. As it is, the touring cars now often have much larger brakes than the racing, so the latter has not been the cause of the former.

Gate control was used on touring cars before it was successful in a race. It is not used on the majority of the successful 1905 racing cars, and therefore is not introduced by them.

The front axle was placed well in front of the engine by Gurney in 1827, and many other people, including in more modern times Lanchester in England and the Locomobile and other cars in America.

Low-tension ignition had largely superseded high tension for internal combustion engines before it was used in successful racing cars. In fact, it has been fairly universal in the States for marine and stationary engines for years. These, of course, have to be made to go without stopping in the way that many even of the racing cars do. It was also adopted by Lanchester in cars before it was used in racing cars. In fact, it is largely the fact that high tension was pushed by the earlier racing cars that kept it in use so long.

The very low car may be the result of racing, but it is certainly the cause of a great deal of the prejudice against motors. On many English roads a fairly high car can usually be driven round corners faster with safety than a very low one, as one can see further. I fancy, also, that the Lanchester cars were lower than the racing cars when they were first brought out.

As to live and dead axle, the whole matter is too long to discuss in this letter, but the statement that it "can never be of such strong construction as the ordinary side chain" needs a little explanation, in view of the fact that it is almost always used for loads of over five tons per axle, and has been for twenty years.

In conclusion, I would point out that if racing is the only means of perfecting a car it must be a necessary consequence that the winners of the car races are the only ones who can build a successful touring car. This position is rather difficult to prove. At this rate, among the failures would be Mercedes, Panhard, Peugeot, Renault, Argyll, Daimler, etc., etc. This is, of course, what the makers of the winning cars would like us to believe, and so it is natural they should extol the racing. The fact that several of the firms that have not gone in for racing are doing very well commercially shows that people do not now have implicit faith in them. The one thing that racing did in the early days of cars was to increase their speed. This has, no doubt, in moderation, been a very good thing,

### Correspondence.

but there is no doubt that now there are plenty of cars on the market which are amply fast enough for anything.

Every new trade in its infancy requires special advertisement, and this is what the racing has really been. Also, in every new trade we have to put up with many imperfections. That there has been enormous progress in remedying these is evident, and no one would grudge the credit of them to their originations less than I. At the same time, I think we should consider that the motor industry is getting out of its infantile stage, and that we should begin to expect a motor car to do much what other machines do. I think, also, that the trade ought to have got beyond patting themselves on the back about the "perfection" of cars, but that it is time we took it for granted that no machine is perfect, and discussed possible improvements and actual failures a good deal more. If you take up a locomotive paper or a marine engineering paper you will find there is nothing of the former and a great deal of the latter, and that it is quite admitted that both machines are far from perfect, even though their results are splendid, judged from an outsider's point of view.

F. STRICKLAND.

[10377].—The letter of Mr. F. H. Harris [No. 10332] is of great interest to those who are considering the future development of the motor touring car. Speed on ordinary roads must be the greatest strain a car can be put to. Therefore, developing high speeds with a weight limit must improve the design of all cars; the faster the speed the greater the test, consequently the greater the chance of improvement. There is, therefore, more useful knowledge to be obtained by specially constructed racing cars contesting at high speeds than in the Tourist Trophy Race for touring cars at moderate speeds on a basis of petrol consumption, the cost of petrol being a comparatively insignificant point to take into consideration where the wear on tyres and the working parts of the car are of so much greater importance in the cost of running a car, and silence, ease of control, flexibility, and vibration are each as important as the consumption of petrol in a touring car. In fact, if one considers the rules of the Tourist Trophy and the results that are likely to accrue from that race, they do not appear likely to bring about such useful results as would be obtained by the use of racing cars. At the same time I am greatly in favour of the Tourist Trophy Competition being continued, as any competition which induces manufacturers to think out designs for the improvement of any particular part of their car, with a view of minimising running expenses and increased proficiency, must be good, provided that in developing that one particular point others of equal, if not more, importance are not lost sight of. I cannot overlook the fact that the present Tourist Trophy Rules are conducive to a motor being constructed to win the race with a large single-cylinder engine, or a motor with increased vibration, multiplicity of gears, lack of silence, and probable loss of flexibility. Whereas, were it not for the construction of racing cars, it is probable that the leading foreign firms would not even yet have realised that the principle of using six cylinders is correct for obtaining the best results and the most proficient engine. It is only due to the success of the six-cylinder Napier for racing that all the large foreign firms are now experimenting with and constructing motors on this principle, which not only practically does away with the necessity of multiplicity of gears, but is conducive to silence, flexibility, lack of vibration, and less wear on tyres and working parts, whilst at the same time it does not increase the quantity of petrol required.

As regards the use of the live axle, I think Mr. Harris is rather mistaken, and has possibly lost sight of the fact that a very large number of racing cars are now fitted with the live axle. As long ago as 1902 the idea was introduced in the Napier racing car, which, owing to the live axle proving stronger and better able to stand the severe strains of racing, won the Gordon-Bennett Race, and that since then the Ardennes Race, 1904 and 1905, Dourdan, Florida, Portmar-nock, Blackpool, Chateau Thierry, Gaillon, and other most important international races have been won on live axle cars, and that the world's record for speed is at present held by a live axle eight-cylinder Darracq, which points to the fact that the live axle is both as efficient and strong in construction, if properly designed, as a chain drive car. F. BELL.

### FUEL ALLOWANCE IN TOURIST TROPHY RACE.

[10378].—I am the owner of a petrol car, and also the holder of a few shares in a petrol car manufacturing company, but in spite of this I regret extremely to see that the "petrol ring" has succeeded in extinguishing the ray of hope, fair play, and sportsmanlike treatment which the A.C.G.B.I. for

*Correspondence.*

a few days held out to the makers of other than petrol vehicles. The Tourist Trophy Race was, I take it, inaugurated for the purpose of demonstrating the best car for touring purposes irrespective of its means of propulsion, and how is this object to be fulfilled if all save petrol cars are barred? It is the cost of the fuel which interests the ordinary motorist, and I maintain that a value basis is the only fair way of determining the fuel allowance. The A.C.G.B.I. has decided that the allowance shall be one gallon of petrol for every twenty-five miles, and I earnestly appeal to it, in the interest of fair play and sportsmanlike conduct, so to modify the rules as to allow an equivalent value of any other fuel to be used. I fail to see what objection there could be to regulating the allowance by some such rule as the following: The fuel allowance shall be one gallon of petrol for every twenty-five miles, or any other fuel of equal monetary value chosen by a competitor. The equivalent value to be determined by the prices current on, say, the 1st June next in the Liverpool or London market. J. E. LONGFIELD.

[10379].—In reference to the continued letters of disapprobation on the steam car grievance, please allow me to make a few remarks.

I cannot but think that the committee in the first place should have limited the race to petrol cars, and have offered a cup for steam cars to be run at the same time and on the same course, upon a basis which would presumably give about the same speed. The knowledge so obtained would be then more than a mere guesswork handicap upon which to base mixed races, if the petrol consumption test be still in vogue in 1907.

Your correspondent Mr. Sheppee [letter 10339] seems to have quite failed to see the nature of a handicap and its undesirability here, and is easily satisfied if he considers that petrol cars are afraid of steamers. I am afraid most people do not see it in the same light. It would be most interesting if Mr. Sheppee would suggest the conditions upon which horses should be allowed to participate, as they are evidently feared even more than steam cars.

Would it not be better to adopt the very simple method of petrol classification adopted within the last month by the French, viz., cylinder area? Such classification involves none of the uncertainties of road surface due to dust or mud, neither does it exclude heavy oil or alcohol. There is no chance of fraudulently hidden tanks, devised at the "Hall of Mystery," such as was, I believe, hinted last summer. But on the side of its disadvantages we are told something about too great engine speed—just as if the consumption test did not suggest any abnormalities. Let us examine this a little. We are simply dogmatising that the high speed engine is unpracticable and bad, and consequently we won't give it a chance. I see that the six-cylinder Napier develops its normal power at 1,500 and goes higher; yet your correspondence is occupied in exalting it to the heavens at the present time.

Returning to the main point, such an area classification would enable us to compare our results with those abroad. For I certainly think that we shall be alone in our glorious classification, and no country will be envious enough to adopt it. France has had her trials and has deliberately chosen a basis of h.p. (for the bore is practically proportionate to h.p.) Such an idea is essentially simple, easily understood, and moreover the results are comparable to the lay mind. Our basis is such as would appeal to an astronomer or a person who records day by day the temperature or barometric pressure. The ordinary person would never dream of talking about gallons per mile of mud, or other equivalent term. Simple horse-power, however untheoretically calculated, means much more to the average person, and would be at least as correct as the system upon which the 24 h.p. Fiat or 35 h.p. Daimler are calculated. Has not the assumption of high speed revolution been somewhat hastily snatched at, as it is generally conceded that quick revolution is, beyond a certain point, inversely proportional to the stroke, and hence cubic capacity? I believe that I shall not be contradicted if I say that a fast rate of revolution gives a more constant torque, and will at any rate save our tyres, which are certainly our most extensive item of cost at present. *Apropos* of this last point, which has the greatest strain on the tyres, a six-cylinder going up a hill at 300 revolutions per minute on top gear or a four-cylinder at the same pace at 450 revolutions on the second of three gears (probably somewhat throttled)?

This question I think is quite fair when the great flexibility of the six-cylinder is in question as regards the tyre bill.

I think I ought to say that I am neither the owner of a steam car nor the manufacturer of a petrol car. C. R. C. P.

## SPRING WHEELS.

[10380].—I would like to point out to Mr. Clifford Hallé that my letter appearing in your last week's number was one sent to you some time ago, and I had no intention of renewing the correspondence on the above subject. A.V.R.

## CANDIDATES AT THE ELECTION.

[10381].—I understand the Halifax Automobile Club has approached all the candidates for Parliament in its district and elicited their views as to motor car legislation on all the points suggested by the Automobile Club G.B. and I. and Motor Union. Now, sir, I feel sure if all the clubs of this country did the same without any loss of time it would carry great weight, and the views of each candidate who is returned could be sent to headquarters for future reference. AC817.

## SIX V. FOUR-CYLINDER CARS.

[10382].—The four-cylinder car can be made as silent as any six-cylinder (if I am wrong I shall be corrected, but I think I can demonstrate the truth of my statement), and power for power can be made practically as flexible.

It will, I think, be conceded that from 15 to 25 h.p. is powerful enough for this country, and that such a car is economical in upkeep. I should, therefore, be willing to match my 16-20 h.p. Sunbeam car against any six-cylinder car of equal piston displacement per minute over a distance of, say, 1,000 miles, the points to be adjudicated upon being silence, hill-climbing on top gear, flexibility on top gear in traffic, freedom from side-slip, wear on tyres, and general reliability.

FREDERIC EASTMEAD.

[We have omitted the first portion of this letter, as it referred to a matter now of very limited public interest.—Ed.]

## FRENCH AND BRITISH CARS.

[10383].—Respecting British *v.* foreign cars, I would like to say a few more words on this subject, since my letter [10325] seems to have given rise to varying comments.

I am accused by "E.St.C.D." of being "little English" because I favour a French car, but he wishes me luck with same.

In thanking him I can only express the hope of being able to return the compliment one day—in passing "E.St.C.D." on his presumably British car.

Mr. O. Barnfather, in concluding his letter, cites this unconvincing argument, "That the foreigner is not the equal of the Englishman is proved by a well known firm who are pushing the six-cylinder car. Twelve months ago the number of foreigners in their shops by far outnumbered the English, but this year finds not one of the foreigners left."

Now I, for one, would be pleased to know if this is intended to infer (1) were the aforesaid foreigners after teaching the firm the trade dismissed, or (2) is this firm now employing less skilled labour? Will Mr. O. Barnfather explain?

CHAIN DRIVE.

## SUMMARY OF CORRESPONDENCE.

**YOUTHS FOR MOTOR DRIVERS.** The Rev. C. Wadham Lyne, of 39, Holland Road, Kensington, W., writes that he is able to recommend from time to time youths of respectable parentage and good character between the ages of 14 and 16 who would be willing to start at a nominal salary in workshops, where they could be grounded in the practical details of motor management and driving.

**TESTS RELATING TO BEARING LUBRICATION.** On December 30th we published a short article on some lubrication tests which were made by Messrs. Willans and Robinson. In this article it was stated that the firm made motor car engines. They wish us to say they do not make them but that they did make them. This may be regarded as a distinction without a difference, but the matter is of some importance to Messrs. Willans and Robinson, because they are now supplying castings and making other parts of motor cars for various manufacturers of these vehicles, and they evidently do not wish to be regarded as rivals by their clients. They add, "There is one other point we should like to emphasise, and that is that the whole idea of our experiments, which Mr. Walford explains, was to show the pressure distribution of the lubricant when grooves of the forms illustrated are used."

## A RENEWABLE TYRE TREAD.

Tyres and tyre troubles are even now so much the subject of discussion amongst all automobilists that interest is bound to be felt in any attempt to ameliorate and improve the condition and comfort of pneumatic tyre users.

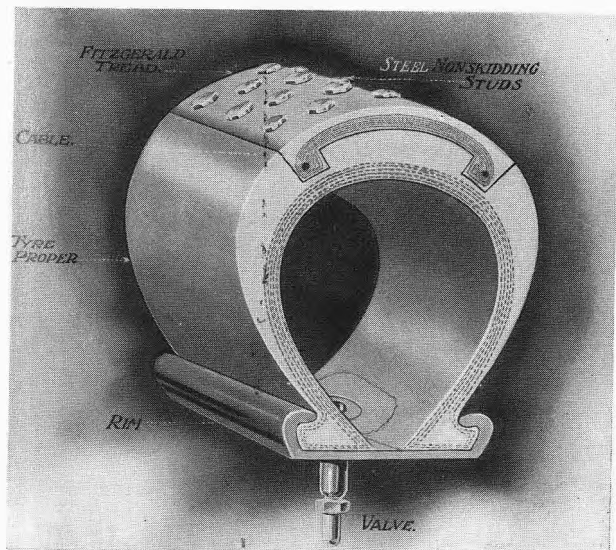


Fig. 1.—Section of the Fitzgerald tyre and tread.

In the beginning of the week we had submitted to us for inspection a specimen of the new Fitzgerald tyre and tread, which we understand is to be placed on the market by a recently incorporated company, and which, if it fulfils the promises made for it, should not only prove a boon to motorists, but should have a successful future before it. The note of economy, a great consideration in the matter of tyre use, is struck by making the tyre in two parts instead of in one. It differs from the standard type only in having its outer surface specially formed to take the counterpart which forms the actual wearing surface or tread. This latter is detachable, and it is claimed that when worn out can be replaced by another in a few minutes by the motorist or the man on the road or in the stable, and what is undoubtedly a great feature without subjecting the original portion of the tyre to the process of revulcanisation, which, it is well known, exercises a bad effect on the original fabric, and does not at all events improve the previously vulcanised rubber. In the Fitzgerald tyre, the tread or wearing part being replaced by the user, no expense is incurred for retreading beyond the cost of the tread itself, and it is claimed that such a tread will outlast six treads affixed to tyres in the usual way. We must admit that these claims appeal to us, but as it is not our custom to pronounce without practical demonstration and proof we should prefer to criticise a tyre and tread which had been in constant use in all weathers for some three or four thousand miles. Presuming that the Fitzgerald tread is all that is claimed for it by its inventor, it certainly appears to possess advantages over the leather cover non-skids at present in use by reason of the fact that a large amount of resiliency is reserved to the tyre, and not deadened by wrappings of more or less unresponsive leather. For front wheels the added tread would be made without metal studs. The presence of the Fitzgerald tread should prove an added protection against

punctures, as any puncturing agent would need to perforate the layer of fabric upon which the tread itself is built up. We are assured that the most strenuous experiments have proved that the tread itself cannot be wrenched from its position by tramlines, side-slips, violent application of the brakes, etc., nor will the Fitzgerald tread detach itself from the cover proper should the tyre become suddenly deflated. The squared ridges carrying the flexible wires are in such case nipped between the outer and central portions of the cover, and do not, we understand, allow the latter to escape from their embrace.

Fig. 2 shows the general appearance of the tyre complete on the right and with its tread removed on the left, the detached tread lying coiled up in the foreground. This tread when carried as a spare can be folded up into less space than that occupied by two inner tubes, and can be conveniently stowed away in a boot or tool drawer.

Fig. 1—a complete section of the tyre—is sufficiently explanatory without much description. The cover proper will, of course, be built up in the best possible manner, and the tread forming an endless band, having its thickened edges or beads strengthened in their centres by wire cables, and the whole fits into corresponding recesses in the tyre. These recesses are slightly smaller than the thickened edges of the tread, thus causing the rubber forming their outer sides to be slightly under compression against its edges when in position, thus forming a neat joint, which is so placed as to be clear of road contact.

We are assured that after a very severe trial of some hundreds of miles of the roughest treatment there was absolutely no "creep" whatever visible between the tread and the tyre proper, and this with a load of seventy stone on 810 x 90 mm. tyres fitted to a 15 h.p. Darracq.

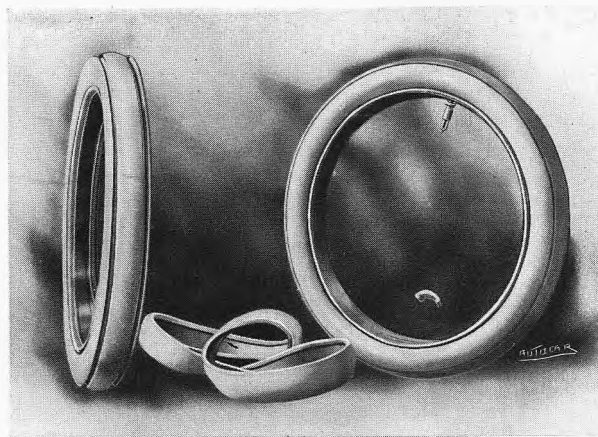


Fig. 2.—The tyre with the tread detached and complete.

A company has been incorporated to acquire the British and foreign rights and to manufacture the tyre in England. Those of our readers requiring further information should apply to the secretary at the offices of the company, 192, Goldhawk Road, W.

Works have just been completed in America for the manufacture of Berliet cars in all sizes, after the French designs. Probably the French factory would have sufficed but for the 45 per cent. tariff.

## THE 20 H.P. BRITISH-BUILT TALBOT CAR.

This smart, most carefully designed, and scrupulously constructed car is lock, stock, and barrel the outcome of the splendidly equipped Talbot works at Barlby Road, Ladbroke Grove, North Kensington. With M. Clément's well-known Bayard design as a basis, Mr. Chas. Garrard, the works manager, has improved thereon both in design of detail, material, and method of manipulation to a degree, only recognisable to the full when both cars are compared part by part. The chassis of this English-built car will be illustrated here shortly by interesting diagrams of the details, by which the above statements will be made evident to any who know both the cars.

The engine, the last organ to which the English staff turned their attention, is now all-British, and exhibits many instances in detail which point to the close consideration of the occasional failures and weaknesses experienced in the past. Take for instance the introduction of the expansion rings in the exhaust pipe between the cylinders—an introduction brought about by the fact that Mr. Garrard found by careful tests that

the prolongation of the exhaust pipe at that locality caused the end cylinders to be thrust nearly 3 mm. out of the perpendicular. The engine cylinders are 100 mm. bore and 120 mm. stroke. The plate clutch made on Weston lines, with improvements in design and material, gives the greatest satisfaction, the reasons therefor being demonstrable when we come to give the section of the clutch itself. Then there is a further improvement in the joint between the ends of the clutch and gearshafts—a great improvement in comparison with the old split collar secured by four bolts. The new connection is a refined form of Oldham joint so constructed that, should anything occur to put the shafts out of line, the joint will accommodate itself perfectly to any distortion of the alignment which might possibly occur under extreme circumstances.

In the gear box itself there are still further improvements, particularly with respect to the squared shaft and the bearing lubrication. We hope to be able to illustrate the many interesting features of this British-built car in the next issue of *The Autocar*.

## THE RENAULT PATENT IN FRANCE.

It is announced that the majority of the French automobile manufacturers have admitted the validity of the Renault patent. They have agreed that it is a master patent for a change speed gear with direct drive on the top speed by means of universally-jointed shafts. This decision has been arrived at by a committee of manufacturers, who were appointed to go into the matter after Renault had won his test action. The owners of the patent have agreed to claim no back royalties. Even for the current year they will make considerable allowances, because it is said that they recognise, as the prices are fixed and contracts signed, the makers cannot increase them without loss to themselves, so it is evident that the purchaser will have to pay the royalty which the Renault people will receive.

It is certainly somewhat extraordinary that a powerful body of motor manufacturers like those of France should have knuckled under to the Renault claims without making a better fight, because the law expenses which would be entailed would be very small when divided up among them. We presume that they recognise that if they made a fight and lost, Messrs. Renault would not deal with them so lightly in the way of royalties, but from what we are able to see it appears to us that the reason they have climbed down so gracefully is because they want to restrict the development of the industry in France. It is evident that the French industry is likely to suffer from over-production, especially if many more new firms are started.

Now if the existing firms can establish a sort of ring by means of the Renault patent it is thought they may be able to keep out new comers, who would not be granted a license, and who therefore would not be able to make gear-driven cars in France. Those in the charmed circle have their licenses, but no more would be admitted, or, at any rate, only under conditions which would prevent their competition from becoming obnoxious.

It may be urged that this action would not prevent the manufacture of chain-driven cars by new makers. This is quite true, but the chain-driven car is not the type which the new maker usually wants to turn out. Further than that, there is no question that the majority of cars made, of the low-powered and medium types, will be of the gear-driven pattern.

It is thought by some that the French action has been taken to shut out foreign competition, but we do not incline to this opinion ourselves, because France is a protected country, and directly the importation of any article which France could make herself became at all serious, the tariff would be put up to so high a figure that the foreign maker would be hopelessly handicapped. If therefore the tame acceptance of the Renault claims is due to any other cause than that which appears on the surface, it is unquestionably brought about by a desire to apply a sort of safety brake to the industry, which is expanding perhaps too rapidly for the comfort of those already in it.

## THE QUADRANT CROSS-ROLLER GEAR.

This most ingenious and interesting change speed gear, which we illustrated and described in our issue of October 28th (page 512), and which was exhibited at the Stanley Show, will be fresh in the memory of our readers. A few days since we were afforded by Mr. Priest the opportunity of testing it upon the road. The tests to which this gear has been put cannot be regarded as altogether fair ones when compared with the conditions enjoyed by the ordinary spur gears of the everyday order. The Quadrant gear on the trial car is fixed to the frame, and is without any arrangement for constant lubrication; consequently everything

is against it, as there is nothing to deaden its note or to keep it properly lubricated. Even under these conditions it ran with very great sweetness and with an absolutely constant note, and the trial was sufficient to make us wish for a second one when the gear will be having what, for want of a better term, we may call fair play. It is intended, now that it has been tested under the severe conditions we have named, to place the gear in a gear box with its own bearings, so that it will no longer be fixed to a more or less yielding frame, and will also be properly and constantly lubricated.

# ELEMENTARY LESSONS ON MOTOR CARS.

## A SERIES OF LECTURES DELIVERED TO THE LADIES' A.C.

Noted by Miss K. D'ESTERRE-HUGHES, Secretary. (Continued from page 28.)

### Petrol.

All good automobilists should be able to test their petrol and ascertain whether it be good or bad. This can be done with a densimeter. A densimeter or hydrometer is an instrument that looks something like the clinical thermometer used by doctors. If the densimeter sinks when placed in a tube full of petrol to .680 the petrol is good, and the lower it sinks the better the petrol. When the engine is difficult to start the petrol should be tested, as it may perhaps be the cause of trouble in starting.

There will never be water in the carburetter if the petrol always be put in the tank by means of a funnel. There should be a fine gauze screen at the top of every petrol funnel, through which petrol will at once pass. If, however, there should be any water in the petrol, the former will remain for a few seconds on the top of the screen. Petrol produces a very heavy gas not at all like the ordinary coal gas with which balloons are filled. Petrol fumes, being dense, do not rise, but descend. For this reason when filling a petrol tank placed at the back of the car one should always be careful to see that the tail lamp is first extinguished, because as a rule the tank filler is placed above the lamp.

### Some Causes of Trouble.

The everyday petrol engine may play many little pranks. Sometimes it is the automatic inlet valve to which we have to attend. There are still many engines fitted with these automatic inlet valves, though, as said in a former lesson, the mechanically operated valve is becoming every day more popular. Should the engine be running very slowly we should look at the spring of the inlet valve—it may be weak, and working sluggishly. The valve is sucked open by the piston, but, owing to the weak spring, it does not shut quickly, and the consequence is that as the piston returns on its compression stroke it forces some of the gas back into the carburetter. A great loss of power follows this defect. Sometimes the mechanically operated valve works stiff in its guide, and if the spring be not so strong it will close slowly. The first thing to do is to put a quantity of petrol in the cylinder and turn the engine round by hand. If this does not cure the stiffness, smoothen the stem with emery paper, for if the stem work easily the valve will open and close properly.

### Valves.

To grind in a valve we should cover the valve seating with very fine emery powder and oil, and then take a screwdriver, and with it give the valve half a dozen *half* turns. Next lift the valve, replace it on its seating, then repeat with the screwdriver until the seating show a perfectly clean surface. We should never grind in a valve by turning the screwdriver round and round, for if we do the result is likely to be a non-gas-tight joint, the reason for this being that by turning the screwdriver round and round we are liable to make many little rings on the valve, and the gas is thus able to pass. This grinding-in process is only necessary when a valve is not gas-tight, and is therefore making the compression weak through leakage past the valve.

### Cleaning the Engine.

After a long tour it is well to give the engine a couple

of charges from the paraffin oil pump. If put away at night without this being done the old oil will get very sticky, and the engine will be most difficult to start next day. Many engines are now fitted with these paraffin oil pumps. At the same time it is well to remember that paraffin oil is not an altogether ideal remedy. Therefore, if we be wise, we only use paraffin oil when absolutely necessary.

### Engine Running Hot.

There are many reasons for the complaint "an engine running hot." The first, perhaps, is that the water circulation is not working properly. Cars are generally fitted with a manometer, and the driver can at once see whether the pump be working or not. As little grease as possible should be used on a pump—only enough, in fact, to ensure its free and easy working. If there be much grease about the pump it will find its way to the water, and with it flow to the radiators. This is especially harmful when the car is fitted with honeycomb radiators, as the greasy water soon manages to stop up the waterways. The cure is a fairly strong solution of caustic potash and water. This mixture should be put in the water tank, and after having been circulated through the radiators left for twelve hours. The mixture should be drained away, and clean water put into the radiator.

There are still other causes for an overheated engine. Poor lubrication is one of them. An engine may be badly lubricated through having either too much or too little oil. If there is not enough oil it will get very hot and seize—that is to say, the piston will expand and cling to the sides of the cylinder. Here paraffin oil is most efficacious. Some should at once be poured on to the top of the piston. Naturally, the car must stand still until the oil has cleared the piston and stopped the seizing. This takes as a rule about half an hour.

### Freezing of Cooling Water.

Practically the only non-freezing mixture—that is, a mixture that will prevent the water freezing—is a good proportion of glycerine mixed with the cooling water. The exact amount depends upon the quantity of water carried, but on an average if one-third glycerine is put to two-thirds water the tank need not be emptied at night unless exceptionally cold. As a matter of fact, though, it is as well to let the water run off every night during the winter months.

### Air Lock.

Another source of trouble is the very dangerous air lock—dangerous, that is, because it, too, will make the engine hot, and because it means considerable delay. An air lock is really a cushion of air between two lots of water. The chauffeur may, perhaps, have filled up the water tank, and then, thinking that he had not put in enough water, pour in more, and thus easily introduce a layer of air between the water. If an air lock be suspected the tank should be emptied and then refilled. It is just as well to let the engine run slowly when the tank is being filled after an air lock. This also causes the pump to properly mix the warm and cold water.

(To be continued.)

## DETAILS OF CARS AT THE SHOWS.

Last week we published some tabulated details of the cars in the shows. One or two slight errors crept in, and as we wish the record to be accurate we point them out.

The Maudslay brakes are both of the internal expanding type, the radiator is a special gilled type, the axles are forged steel, and as the car was not mentioned among those which had the gear wheels enclosed it should be added to that list.

The other items are not mistakes, but might possibly be misunderstood. Rover brakes are not mentioned at all, because the article only professed to deal with the features which were more or less of a standard character, so it is well to point out that the Rover not only has a pedal brake acting on the back wheels, but also a

most powerful brake through the engine, because this, by the depression of a pedal, ceases to drive, and becomes an air compressor, giving a much more powerful retarding effect, though at the same time extraordinarily sweet in action, than can be obtained by the ordinary throttling.

The last matter is in connection with the Lanchester. In this it was stated that there were twelve gear wheels. Whilst this is an accurate statement, it should be pointed out that the Lanchester was not treated under any other heading, so that what might appear at first sight a bad feature was given, and no other. We mention the matter because we should be sorry to seem to do an injustice to what is one of the most successful deviations from the conventional type of car which is made.

## THE CRYSTAL PALACE SHOW.

This show will take place between 26th inst. and February 3rd, the date having been chosen for the suggested reason that with the advent of the New Year the purchasing public are likely to place their orders for cars for the coming spring. It is suggested that in many cases orders are not placed in England until prospective buyers have inspected, or have read about (in the columns of *The Autocar*), the latest and best efforts of the continental makers. There is no doubt that the Crystal Palace is an excellent building for the purposes of exhibition—the air is good and sweet, the place is clean, the light excellent, both by day and night, and all exhibits can be examined in comfort, as the entire building is comfortably warmed.

Practical tests in the Palace Grounds will be a feature of the show, while in close proximity to the grounds are some of the steepest hills in the South of England,

which are particularly free from vehicular traffic.

A motor boat section with eleven firms showing new craft and accessories will attract marine motorists, particularly as the large lake in the grounds, 300 yards in length, will be available for trials. Messrs. Lyons and Co. being the caterers, visitors to the Palace can depend upon lunching or dining well and in comfort. It is to be hoped that some adequate garage accommodation for visitors proceeding by car to Sydenham will be provided this year. Should low temperatures prevail, it is not comforting to leave one's car for hours in the open, or even in the tents hitherto provided. The space which was devoted to the storage of the cars taking part in the first of the trials held from the Palace would make a very good and convenient garage, as it is easily approached from the top of Anlerley Hill.

## THE MIDDLETON HUB TRIAL.

The Automobile Club have certified that a set of Middleton pneumatic hub wheels (fitted to and used on a 16-20 h.p. Florentia car) completed a distance of 4,000 miles under ordinary touring conditions, and under the continuous observation of officials appointed by the club.

After the completion of the trial a short trial run was made by Colonel Holden and Mr. W. Worby Beaumont. The wheels were then removed, taken to pieces, and examined by them for wear and general condition. These were as follows: The side plates and connecting driving studs were in good order, the wear of the faces being practically nil. The studs were not worn, but the rubber sheathing which had been put upon them had been ground to powder.

The pneumatic tube supporting the discs showed no wear.

The nuts on the ends of the connecting driving studs were screwed down on to the side plates with intervening Thackeray spring washers, which seem to have been satisfactory.

Of the pneumatic tubes, three were replaced during the trial, and one lasted throughout the trial; its condition justifies the expectation that its mileage might have been considerably extended before failure. Of the three tubes which failed, one had been run six and a half miles deflated (on the 1st December, 1905) and was then replaced. This tube does not appear to have been worn through, and at the time of the examination still held air put into it after removal. The main body of the material of the tube was, however, separated in a circular mid-section line, except as to the interior rubber lining, and this was apparently due to mechanical pressure in the working of the wheel. In other respects this tube might be roughly described as half worn out. The other two tubes, whose failure is reported, failed from what may be termed disintegration, resulting from the combined effects of internal pressure, the bearing upon the edges of the inner supporting discs, the relative motion of the wheel ring and hub plates, and the alternating compression and release of the vertical walls of the tube as the wheel rotates under load.

The fact that a wheel may be run with a deflated tube is one

of interest to the user, especially as it appears that the tube is not damaged by running a few miles in that condition, and that the fact that it is deflated is not readily detected by those riding in the car. This points to the importance of the part played by the solid rubber tyre in connection with this device, and leads to the suggestion that the true way to test the efficacy of the pneumatic hub would be to try it with iron tyres.

The diameter of the wheels over the tyres was 34in., and the weight of the wheels was as follows: Back wheels with sprocket, 185 lbs.; front wheels, 176 lbs.

The trial may, as a consequence of the bad condition of the roads, be considered to have been unusually severe, both for the pneumatic hubs and the car.

The trial lasted from November 21st to December 22nd.

*Number of miles run, per wheel, without involuntary stops.*

Near front.	Near rear.	Off front.	Off rear.
1143	2054 $\frac{3}{4}$	899 $\frac{3}{4}$	899 $\frac{3}{4}$
246	134 $\frac{3}{4}$	13	
	99		
2616	507 $\frac{1}{2}$	3092 $\frac{1}{4}$	3105 $\frac{1}{4}$ end of trial
4005	4005	4005	4005

*Petrol consumption: 287 gallons 3 quarts: 13.9183 m.p.g.*

Repairs and adjustments carried out on the road.—Two hub-tubes pumped up. One of these tubes found to be leaking at valve; new tube replaced. The valve of this new one also proved to be defective, and another one was inserted. New tube inserted in near side steering wheel hub on two occasions. Near rear tyre repaired. Wire cut out.

Adjustments made in the motor house.—Near side steering wheel hub tube pumped up. Near side rear tyre repaired. Wire working out.

## SOME QUERIES AND REPLIES.

We are always pleased to reply to queries, even if they be of an elementary and untechnical description, under this heading. Only a selection of those which are of general interest will be published. Where a reply is desired direct by post, a stamped and addressed envelope should be enclosed. In cases where querists ask for the opinions or experience of others, our readers are invited to reply. When advice concerning different makes of cars is sought, each vehicle should be given an identifying number. Letters should be addressed, The Editor, *The Autocar*, Coventry.

## QUERIES.

## No. 254.—Experiences of Silencer Wanted.

WILL any owner of a 6 h.p. Wolseley or Siddeley car, who has had Sharpe's Universal silencer fitted, kindly relate his experience and state whether the silencer has rendered the car more silent and smoother in running?—CHARLES ORMEROD, M.D.

## No. 255.—Repairers Abroad.

WILL any reader of *The Autocar* kindly give enquirer information of the prospects of a capable, energetic motor repairer and agent (combining carriage work) in California? which would be the best town for such work, and would a young man with, say, £400 or £500 stand a better chance of making money there than in England? Opinions of gentlemen who have travelled or lived in that country would be extremely acceptable.—ENQUIRER.

## No. 256.—Stanley Steam Car.

I AM wanting to buy a small car to seat two, and occasionally four, cheap to run, and fairly speedy. I am limited to about £200, and my choice has fallen on a Stanley steam car. But before actually purchasing, I should be very pleased to get any owner's first hand opinions on the following points: (1.) Average mileage per gallon of (a) fuel, (b) water. (2.) Name and price of cheapest brand of fuel that can be successfully used. (3.) Average speed over give and take roads. (4.) How long does it take to actually get under way from moment of lighting hand torch? (5.) What parts are likely to give trouble? I should also much appreciate any particulars as to yearly expense of running and upkeep, with mileage. I should look after and drive car myself, and am capable of, and have facilities for doing own repairs.—STEAM.

## No. 257.—The Arrol-Johnston Car.

WOULD any of your readers who are owners of the old dogcart type, or the new Arrol-Johnston car, give me their experience of how this engine does its work? I have been greatly interested in the descriptions and illustrations appearing lately in *The Autocar*, and as I am thinking of changing my car this year, I should feel obliged to users of above for their experiences, and any other information they can let me have. In particular, kindly say if there is any undue wear and tear in the piston rocking lever joints. Is the low tension system of ignition satisfactory? Is high tension magneto or the accumulator and coil more reliable? Is the automatic inlet valve satisfactory at both low and high speeds? The makers profess to run the engine at from 200 to 1,200 revolutions, which is a large range for automatic inlet valves. As a small tyre up-keep bill is a great consideration, I shall be glad to know if solid tyres on back wheels are a success on rough roads, for comfort and upkeep, at speeds of twenty-five to thirty miles.—SAM MONROE.

## No. 258.—The Albion Car.

MAY I seek, through your columns, information on the following points: My car is a 16 h.p. Albion, geared to 26 m.p.h., solid tyres on back wheels. I have as headlights Salsbury-Dietz paraffin lamps, with 7in. compound duplex lenses, and find them quite inadequate, although excellent of their kind. I think of replacing them by Polkey paraffin headlights, but have also thought of introducing into the present headlights burners supplied from a separate acetylene generator. Can any of your readers speak as to the Polkey headlights, or as to the possibility of the conversion I

suggest? I should also be glad to hear if any owners of Albion cars have the same difficulty in getting in and out of their first speed gears, which I experience. I am a careful driver, and left quite unworn the gear teeth of a Wolseley car that I drove for two years, but the first and reverse gear wheels of my Albion are badly worn after 4,000 miles. As for the running of the car, well, I wish I had the gentleman who told you recently that solid tyres could not do more than 15 m.p.h. (with safety), on my Albion at a steady average of 20 m.p.h. in this hilly country. I blow up my front tyres once a month or so, and run over sharp stones with a light heart. As for repairs, running or otherwise, there have been none!—W. N. DREW.

## REPLIES.

## No. 250.—Pre-ignition.

The fault which H.M.S. complains of is probably located in the contact breaker, which he should go over very carefully.—108, Renfrewshire.

## No. 248.—Spare Porcelains.

We have run four Pognon plugs over nine months, and have never had a cracked porcelain or other trouble. To our knowledge they are not guaranteed, but the porcelains and washers can be obtained through any motor dealer.—THE TURTLE MOTOR DEPT., Crown Hill, Croydon, S.E.

## No. 238.—Vulcan Odometer.

I have had one of these instruments in use for the last nine months, during which time it has registered some 1,500 miles with perfect accuracy, and there appears to be no reason why it should not be satisfactory for an indefinite period owing to the simplicity of its construction. With regard to the fixing, this can be carried out by any operator, whilst I believe the makers themselves fit it to the hub cap for some small charge.—H. G. PRATT.

## No. 242.—Non-skid Bands.

We can assure your correspondent that, so far from our non-skid bands throwing up a great deal of dust, by ventilating the contact with the road they go a very long way towards preventing the dust nuisance. This will be readily understood when it is remembered they prevent the suction between the pneumatic tyre and the road surface. Your correspondent need have no fear of undue heating if he will only see that the instructions are carefully carried out. If he will be kind enough to apply to us direct we shall be happy to refer him to several users of our bands, who will be able to reassure him.—R. AND J. PULLMAN, LTD.

## No. 245.—Choosing of Motor Goggles.

The goggles "Shortsighted" should get are the Mirowitch goggles, which he can get from the United Motor Industries, of 45, Poland Street, W., who can fit any glass to them he requires. I have worn these goggles even over my own spectacles, and find them comfortable, but he can get them fitted with special lenses if he wants. The price, I

think, is 21s. They are scientifically constructed with pneumatic buffers round the rim to fit the face, and an inlet pipe for cold air and an outlet pipe for hot air—they cannot steam, and are quite nice to look at when worn.—S. J. WATSON.

## No. 251.—Car for Hilly District.

I reside in a district all but as hilly as North Devon, and my brother-in-law and myself have driven over 22,000 miles in it during the last two years, and we can both speak from experience as to the suitability of Wolseley cars for this work, whilst they are the only cars which I know from experience will successfully stand solid tyres on all wheels. I do not, of course, mean it to be inferred that other cars will not stand solids, simply that my experience does not extend to them. My brother-in-law is just taking delivery of an 8 h.p. solid-tyred Wolseley car, and a friend of mine expects another of the same make on solids in a few days. If "D" will communicate with me I shall be happy to give him the results of our experience with these cars.—J. S. V. BICKFORD.

I think that the car I have used for the last two and a half years would suit your Anglo-Indian subscriber. It is a 9 h.p. James and Browne, giving up to 12 h.p. on the brake. For two years I ran it on solid tyres (rear wheels only), and I understand that there are cars of the same make running entirely on solid tyres, but having a good deal of running on somewhat rough causeway. I recently fitted pneumatics all over, as I found solids under such circumstances uncomfortable—not so much bodily as mentally, as the bumping hurt me (mentally) more than it hurt the car (physically). I have never had the slightest trouble with tyres, either solid or pneumatic, and I have never failed to bring the car home with me. I have carried a rope for horse traction purposes, but have never had to requisition that quadruped. My sole instruction was received on my four days' journey while taking the car home, and I have managed it since with the assistance of an intelligent groom. It is a good hill-climber, the lowest speed being so low that I have never the least compunction in stopping and restarting on any hill with full load. There are four speeds—an advantage in a hilly country. The top speed is twenty-five miles per hour. As to safety, I have never yet met with the slightest accident.—HILLS.

As a resident in North Devon, and having devoted the best part of the last three years in trying to discover the precise car "D" requires, I am obviously the proper person to reply to his query. At the very lowest estimate there are 40,000 people in the British Isles alone with similar requirements, but so far no serious attempt has been made to produce a low speed, simple, moderately-priced car with solid tyres. Makers know their own business best, and de-

vote their attention to six-cylinder racers. After hovering for these three years and taking every expert's advice, I have at last ordered a—but what is the use of mentioning the name when every car is the best? I don't know when I shall get delivery. I rather hope never, as ever since I placed my order I have been wishing I had ordered one or other of the 101 bests. As to solid tyres, they are out of the question. My man wants £85 extra for Sirdars, £65 for De Nevers, £40 for Middleton's, and about £180 for De Cadignan wheels. Makers won't give them a chance; they know that the speed craze will conquer, no matter what vows the purchaser makes that he will never drive over twenty miles an hour. They know that in three weeks he will be getting all he can out of his car, and that solids will knock it to pieces and they will get the blame. No, the car he and I want is the speedier off than ever, especially if the further limit is to be abolished.—F. W. B.

#### No. 240.—Change of Engine.

I had a 6 h.p. De Dion car in 1904, and considered that the body was altogether too heavy for the engine, or otherwise that the high gear was too high. At all events, I used to have to take the low speed very frequently indeed. I accordingly changed the 6 h.p. engine for an 8 h.p. De Dion engine. On the whole, the result was satisfactory, as the car was able to take practically all hills on the high speed, and by means of the throttle it could be prevented from racing under any circumstances. The car, however, could have done with a still higher gear with the 8 h.p. engine. I, however, had the car only for a few months with the change, because I then went in for a 12 h.p. Darracq, so that I am unable to inform your correspondent how the car was likely to last under the increased burden of the engine, and I do not know what became of it after it passed out of my hands. I have not the figures before me as to what the cost was, but my recollection is that the change cost me upwards of £20 after credit for the 6 h.p. engine which I sold.—JAMES O'CONNOR.

#### No. 239.—Beeston Humber Car.

I have much pleasure in giving my experience with a 16-20 h.p. Beeston Humber purchased in August, and which has now carried me about 3,400 miles without an involuntary stoppage. It is remarkably silent on top gear, and as you rarely have to use the lower gears, the slightly increased noise is quite negligible. I consider it to be one of the most reliable cars on the market, as, having two separate ignitions, you have no fear of any trouble in this respect, I am quite sure that a more comfortable car cannot be obtained, as the body is well sprung, and the tonneau very roomy; in fact, I brought seven people from a party the other evening. The fuel consumption is about one gallon in twenty miles, and I may say that I have not yet spent one penny in repairs. The engine generally starts at the first turn, either with the accumulator or magneto ignition.—A. F. HOUFTON.

I see in your columns enquiries are asked by one for the opinion of users of the 16-20 h.p. Beeston Humber car. I am writing to state as a user that I

have found the car most reliable, and I rely on it entirely for short or long journeys. It is very silent on top gear, and I should have no hesitation in recommending it, as my experience of it—six months continual running—has given me every satisfaction.—F. W. SHEPHERD HEYWOOD.

I have had a Beeston Humber since August, and have toured all over Wales, the South of England, etc.—in all over 5,000 miles, and may say I am thoroughly pleased with the car. As to reliability my only stop was caused by a broken belt, pump, and one day the car refused to run on the magneto. It turned out the coil was defective, which Messrs. Humber replaced free of charge. I should regard it as a very silent car, but not a dead silent one. The carriage work and finish are all that can be desired. The petrol consumption is about fourteen to fifteen miles per gallon, and its highest speed a few miles over forty per hour, although it runs best at twenty-five to thirty miles. Its best point is its hill-climbing capacity, as nearly all hills can be taken on top gear. The only fault I have to find is its small lock, which has, I believe, now been improved.—H. A.

Since delivery of a 16-20 h.p. Beeston Humber on 4th August last I have driven 3,200 miles. As I had no previous experience the car was subjected to frequent unfair strains, which it bore without any breakdown. The country I have run over is very hilly, many of the gradients extremely steep, but on these it has never faltered. A car which can run on top speed all the way from Ballater to Stonehaven by the Slug Road, as my car did last August, is undoubtedly a fine climber. For reliability it would be hard to beat. Friends who have driven with me have frequently praised its silence in running. It is as comfortable as an easy chair. So long as the roads were good my average consumption of petrol approximated one gallon to fifteen miles. With the mud in October results were not so good. Since fitting the new carburetter supplied by the company the results have again improved. Occasionally, when the engine is cold, there is a little difficulty in starting, more owing to want of knack than to any fault in the engine. In a long day from start to finish under ordinary conditions the car averages a speed of 22½ miles per hour. My experience of the car has been extremely satisfactory, and the treatment I have received from the Humber Co. has been more than courteous.—T. H. SMITH.

I have driven one of these cars for the last six months, and during that time, in spite of the vile weather, and still viler roads to be met with in Wales, there has not been any adjustment necessary, and for sweet running on the level, power in hill-climbing, and ease of manipulation, I have yet to meet with the car to beat it, and I have driven and handled most makes. I have found Messrs. Humber to be particularly willing to replace—and with the least possible delay—any defective or worn parts in other powered cars of theirs that I have had charge of, and from what I hear of owners of the 16 h.p. they maintain the same liberal attitude, in direct contradiction to that taken up by so many continental makers. As regards petrol

consumption, with the new carburetter—this varies from fifteen to nineteen miles to the gallon (Pratt's A), and my impression is that by fitting a larger choke tube still better results might be obtained, anyway I mean to try it. I may state here that I have no interest in Messrs. Humber, either directly or indirectly, but I see no reason why so many people should boom the foreigner when we can do as well, and perhaps better, at home. As to the clutch, Mr. E. G. Tew should try the effect of some Collan oil, or good castor oil on his clutch; if this does not have sufficient result the tension springs can be easily adjusted. For my own part I have found this clutch particularly sweet, and driving as I do on the clutch in traffic, nothing is more likely to make it fierce.—WILLIAM PADDON.

The following is my experience with my 16-20 h.p. Humber, which I purchased on 1st September last, and have now driven it considerably over 3,000 miles. It is very silent on its top gear, and there are few hills in this district that cause me to change, so that the little difference made in the noise is hardly worth mentioning. It is particularly reliable in every way, and one of the most comfortable bodies built. I find that the consumption of petrol runs out about 17½ miles to the gallon. I have never had occasion to spend anything on repairs. I keep a correct diary of the expenditure, and find that up to the present, petrol included, it has cost me about £8. I think that few motorists should expect better results.—R. L. JONES (Mansfield).

#### QUERY AND REPLY.

##### The Engine as a Brake.

THE letters relative to braking with the engine have been of great interest, but there is one point that I should feel greatly obliged by your making clearer. My car has clutch and brakes independent of each other, and it has always been impressed on me never under any circumstances to put on the brakes without first disengaging the clutch. Assuming, however, that I am descending a hill on the engine with throttle closed, is there any reason why the brakes should not be used in conjunction with the engine, and without disengaging the clutch? For instance, if I want to pull up under such circumstances, why should not engine and brakes be all worked to the same end?—NOVICE.

When you are compelled to make a sudden stop you should put down the clutch pedal when applying the brake, as it puts a strain on the engine if you do not simultaneously close the throttle, and there is not usually time to do this when an emergency stop has to be made—such as when a child rushes across the road unexpectedly. In such a case as this the throttle would be open, and consequently there would practically be a tug of war between the engine and the brakes; one would be trying to drive the car, and the other trying to stop it. On the other hand, when descending hills with the throttle closed there is no reason whatever why the brakes should not be used in conjunction with the engine without disengaging the clutch. No doubt you will observe the difference. In the case of the sudden stop the engine is propelling, and in the second case it is already being used as a brake when you supplement its efforts of retardation by the pedal or side brakes, or both.

## Flashes.

An old-fashioned Nottingham cow who objects to modern ways made a furious attack on a motor car at Trent Bridge recently. She was worsted, and after a sorrowful look at the disappearing vehicle, committed suicide in a fit of despair by jumping over the parapet of a bridge with a forty feet drop.



A six-cylinder 40 h.p. Napier, built for Mr. F. J. Cullinan. This car is intended for use in South Africa, and several deviations have, therefore, been made from the English standard. The wheels are 40in. in diameter, and the springs are placed well above the axles, which are of special shape, thus giving no less than 2in. from the engine cover to the ground. On account of the frequent necessity to cross deep spruets, etc., the exhaust outlet is placed very high up. The body is built chiefly of aluminium, and carries five passengers.

The Kaiser has consented to become patron of the German Automobile Club, which he has authorised to be known as the Imperial Automobile Club.

\* \* \*

Non-skid bands that will stand the wear and tear of a powerful Spyker car over some 3,000 miles of wearing roads can have no better recommendation to automobilists. The non-skid bands in question are Pullman's, made by Messrs. R. and J. Pullman, Ltd., of Godalming, and the distance is vouched for by a Smith's speedometer.

\* \* \*

Mr. Fletcher Moulton, who made so clever a speech at the annual dinner of the Motor Union last November, has been appointed a Lord Justice of Appeal. He is admittedly the greatest authority on patent law, and, moreover, is a man of science. We are glad that his abilities have been recognised, and that he has gone to the Court of Appeal, but for the sake of patent litigants we wish he had been made a judge instead, and that it had been decided that he should adjudicate always in patent actions. This would have been a very great service to justice, because it is most difficult for the average judge, however gifted a lawyer he may be, to grasp the niceties of mechanical and scientific patents upon which he may have to adjudicate. There is no doubt that in the past many injustices have been done to inventors and infringers alike through the inability of the presiding judge to understand the engineering problems placed before him, and it is really desirable that such cases should only be tried by a trained engineer and scientist.

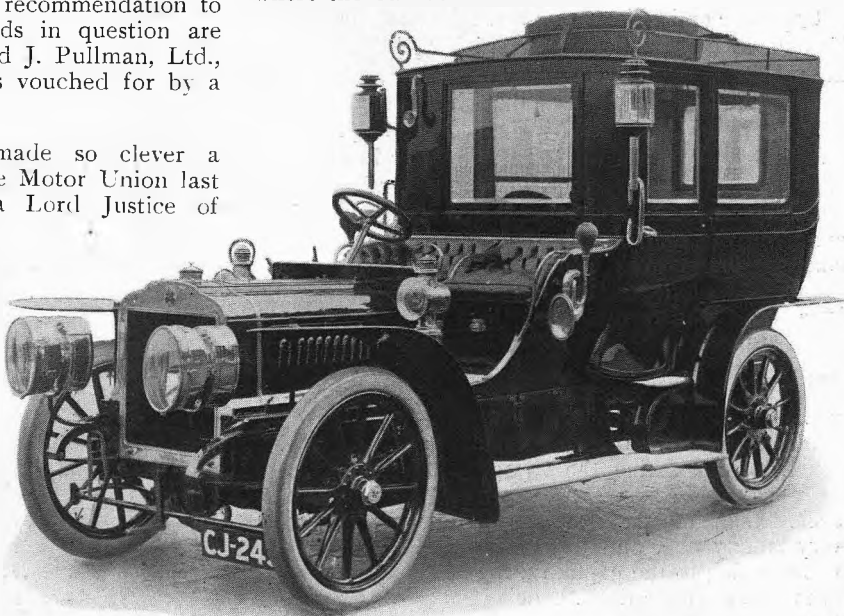
The gazebo—a vantage point from which our grandfathers watched the mail coaches from their grounds—is being revived by the popularity of motoring. By the way, according to *The Strand*, goggles were handed down to us from coaching days.

\* \* \*

In our report last week of the Australian reliability trial, we hinted at the bad state of the roads and the severity of the test to which the cars were subjected in consequence. The fact of stiff gradients being met with was also noted, but we are afraid that no adequate idea of the real nature of the hills encountered could be conveyed by mere description. In the instructions issued to competitors, the routes and sections of the roads are given, and we should imagine that some of the hills as pictorially represented would be enough to appal any but the stoutest heart, particularly towards the end of the tour. Thus between Goulburn and Sydney, ascents of 2,650, 2,600, and 1,325 feet respectively are shown, and many of those which are not particularly high are terribly steep.

\* \* \*

"The motor car as a matrimonial agent," says a lady correspondent, "seems a very good idea, and I have been told it has worked very well in several cases where the ballroom has failed."



A splendidly-appointed 40 h.p. Richard-Brasier limousine which was recently delivered to Mrs. A. M. Foster, of Brockhampton Court, Ross-on-Wye. The body was built by Messrs. C. and J. Jones, Hereford, and is undoubtedly a fine piece of work. It is capable of seating nine persons.

A number of foreign chauffeurs are endeavouring to gain sympathy and private employment by relating tearful tales of how licenses to drive public motor vehicles have been refused to them by the authorities because they are not British subjects. Three years' residence and a good character are requisites for a license.

*Flashes.*

Complaints are reaching us of something very like the sharpest of sharp practice on the part of a prominent French firm whose cars are at present in considerable demand. It is suggested from more than one quarter that purchasers who have ordered cars and paid deposits are being refused delivery at the promised

Another six-cylinder car has made its appearance in America, made by the Ford Motor Co., who have up to the present specialised in opposed motors.

\* \* \*

M. Gustave Rives, the director of the Paris Show, has been approached with regard to the advancement of the date of his exhibition this year, and has made reply that, owing to the booked engagements of the Grand Palais, it is impossible to vary the date of the French display. There is a suggestion that the French Government should be moved on the question, so important does it appear to the French trade. If any alteration is made, we trust the Society of Motor Manufacturers and Traders will be able still to keep a lead.

\* \* \*

The Sunbeam Motor Car Co., Ltd., write the British Empire Motor Trades' Alliance to the effect that they are of opinion that heavy and trade vehicles should be eliminated from future

Olympia shows, and should have a separate show of their own. Pleasure boats and cars only should, in their opinion, be shown together. Motors used for other purposes should be shown with the heavy and trade vehicles. They think that something should be done in order that British makers of pleasure cars may have a good opportunity of exhibiting their products at the next show.

\* \* \*

For good taste and effect the interior of the huge Argylls' London depot in Newman Street, Oxford Street, outvies anything of its kind in London. The decoration, fittings, and embellishments, while being exquisite in every way, are exactly suited to the establishment and its purposes. The car floors, while being carefully studied as to scheme, do not by their scheme distract the eye from the contemplation of the main feature, the cars themselves, while forming a perfect base and setting for their presentment.



The Australian Reliability Trials. J. W. Moffat (10 h.p. De Dion) coming down the Blue Mountains.

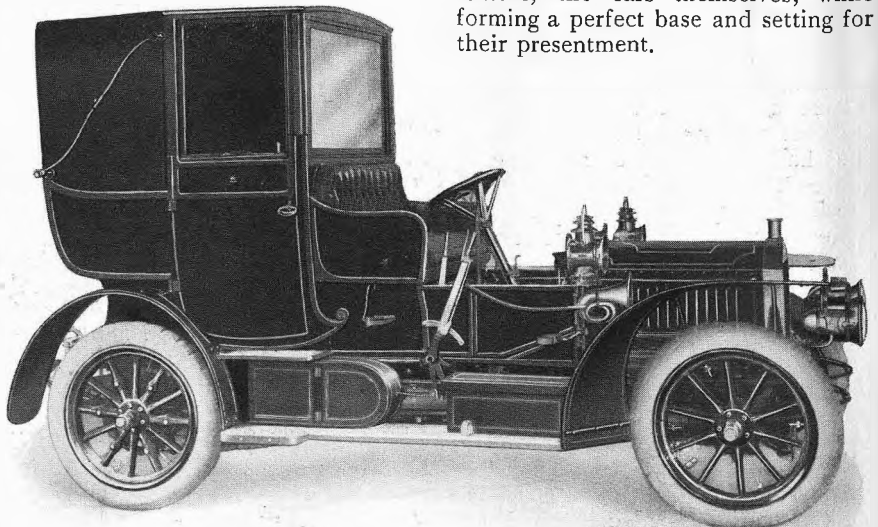
dates unless a premium over and above the price originally agreed is paid. We should be glad to hear from anyone who is experiencing this kind of treatment in order that we may possess accurate information upon which to base advice, for which we are asked by every post.

\* \* \*

Up to the end of last year, Mr. Eastmead had driven his new 16 h.p. Sunbeam car, which he has christened the "Witch," just over 4,000 miles, or, to be exact, 4,056 miles. He tells us that he has found the behaviour of his non-slipping Dunlop tyres most refreshing. Three of the four have never been off the wheels, and his tyre records for the 4,000 miles are one puncture and two pumpings. Considering the loose metal on the road at this time of the year, and the constant heavy work which the "Witch" undertakes, the record is a most satisfactory one in every respect.

\* \* \*

Lancia, the crack Italian F.I.A.T. driver, arrived in New York *en route* for Florida on the 8th inst., but during the voyage sustained a somewhat serious accident. The passage was a very stormy one, and just as he was chatting to the captain a big sea swept over the deck, knocked the crack chauffeur flying along the deck, rendering him unconscious for a short time, and cutting him so badly that nine cuts had to be sewn up by the ship's doctor. He spent the remainder of the voyage in hospital, but was well on the way to complete recovery when he landed in New York. He leaves next week for Florida.



The Hon. J. W. Lowther, the Speaker of the House of Commons, has lately acquired the 18 h.p. Napier illustrated above. The body was built by H. J. Mulliner, Brook Street, W.

# MOTOR CAR RADIATORS OR COOLERS.\*

## Types of Coolers.

The necessity for coolers arises from the fact that air-cooling becomes impracticable with any but small cylinders, even with forced draught. Water jacketing had to be adopted and means found to cool the water efficiently. The following divisions embrace almost every known type of cooler:

1. In which a tube or tubes carry the water and air circulates outside: (a) Coil radiator, with or without gills or fins consisting of one or more tubes, the tubes either flat, round, or irregular section; (b) a top and bottom or two side water tanks or main pipes between which tubes pass.

2. In which tubes form the air passages and water circulates around them: (a) The honeycomb (various types); (b) tubular (tube plate back and front).

3. Diaphragm, in which a plate increases the length of travel of the water.

4. Series of plates connected to distributing and collecting boxes (water tanks) at each end.

5. Series of plates interconnected by a system of washers. Example: The Fouché and Lanchester radiators.

6. *Rotary*. Driven either mechanically or by means of the water pressure.

## Gilled Tube Radiators.

The gilled tube radiator in its various forms is, on the whole, the most generally used at the present time. At first it had the field almost to itself, the designers of cars being apparently too busy rectifying mechanical faults to bother about radiators. There was really no reason why they should do so, the coiled gilled tube as then used being a most efficient cooler. Independent water tanks were general. Down to 1901-2 there was little change. The advent of the Mercedes radiator (honeycomb) caused many manufacturers to discard the gilled tube in its favour. The gilled tube radiator is now almost always surrounded by a case; in France it is called a *Cloisonné* radiator. In some cases wire is wound round instead of gills, as in the Kitchen and Clarkson radiators; in others a strip of metal, first corrugated, is wound on the tubes. Another form is that in which the gills themselves form the tubes, the collar of one being slipped into the next, and the whole dipped in solder.

Loyal's multi-tubular radiator consists of a number of small tubes in a row with large gills passing over the whole series. Smaller or flattened tubes have greater efficiency, because there is no appreciable core of water in the tube.

Radiators have been made with hollow gills and also fitted with deflecting diaphragms to spread the water over the whole surface. The author made a condenser on this principle some three years back, and undoubtedly the type is efficient, but it is a very old idea; in fact, it may be said in passing that heat transference apparatus has been almost done to death as far as really new ideas are concerned.

The methods of attaching the gills vary. The following are the most usual: (1) Tinning the tube and gills and subsequently sweating them together; (2) soldering on without tinning previously; (3) relying on mere contact of the collars; (4) introducing the collar of one gill into the next, forming thus a wedge contact (Proctor's patent, undoubtedly a very neat method); (5) making the gills continuous, so that they are mutually supporting. (It is found that sufficient contact is secured to enable solder to be dispensed with.)

The usual allowance of gilled tube per horse-power is about three square feet surface with a fan and twice that amount without. The gill surface should be at least four times but not more than six times the tube surface, as the receptive is far in excess of the emissive capacity of the tube under the conditions in which radiators work. The Begbie-Audin radiator is the old Loyal type, but with flattened tubes. The Aster radiator has flattened tubes with the gills right across the radiator, and notched out to give the appearance of a Loyal. Another form similar to the above is the Rolls-Royce radiator, with about  $\frac{1}{4}$  in. vertical tubes and horizontal plates not notched out. Other firms have adopted this form of construction.

Another flattened tube construction is the Albany radiator, in which the gills are not placed over the tubes but between them. The space between the tubes should be at least four times the water space, which should not be more than  $\frac{1}{16}$  in. and as low as  $\frac{1}{32}$  in. The Burdon radiator has V tubes, vertical, with the edges set to the front. Means are provided for introducing a draught to the back of the V, which precaution is quite necessary. The Daimler cooler is very efficient

and distinctive. It is a vertical gilled tube radiator with aluminium removable top and bottom boxes, and was originally made with horizontal tubes and end boxes with baffles. The vertical form assists natural circulation. The Siddeley radiator struck the author as being well thought out. The tubes are  $\frac{3}{8}$  in., and pass horizontally across the radiator, being connected by small U bends. This is undoubtedly a most efficient radiator. The Brotherhood radiator has  $\frac{3}{8}$  in. tubes vertically arranged with continuous aluminium gills. This is also most efficient. The Apprin tube is corrugated circumferentially, and is the same as was used by the author's firm for other heat-exchange apparatus. It can only be utilised effectively in a vertical position, and does not appear to be superior to ordinary gilled tube.

## Volatile Liquid System.

A radiator has recently been constructed which depends upon an old principle, viz., utilising the latent heat of a very volatile liquid, such as ether, to transfer the heat of the water to the cooling tubes. There is no top water tank; the tubes are screwed into and partly immersed in a bottom water tank and are sealed, and the air exhausted after being partly filled with the volatile spirit. The spirit is evaporated by the water and condensed by the air-cooled tubes. It is obvious that a good quantity of heat passes along each tube from the tank and is dissipated by the gills, and the author thinks this is the principal cause of the efficiency of the apparatus.

## Coils. Vertical Tubes.

The Rothwell car, using thermo-syphon circulation, has a radiator consisting of top and bottom tanks connected by small coils about  $\frac{3}{8}$  in. over and of  $\frac{1}{4}$  in. copper pipe—a similar construction to Kircaldy's Compactum condenser. Undoubtedly this would be most efficient, but the coils appeared to be too closely packed; in fact, looking at the front of the radiator one wondered how the air passed through at all. But the shape of the coils undoubtedly reduces the friction of the air in its passage.

Devices for breaking up the core of water in vertical tube radiators are only to a small extent used. They include: (1) Knotted wire; (2) a twisted piece of metal; (3) an internal displacement tube with wire wound on, leaving an annular concentric space; (4) a Field tube, Wheeler condenser style (the water passes down the inner tube and then up the annulus); (5) an inner tube through which air passes; this is undoubtedly the most practical.

## Honeycomb or Cellular.

The honeycomb or cellular radiator is size for size most efficient; in fact, sometimes too efficient. As it was originally made the tubes were fitted into tube plates, but afterwards other methods were introduced, i.e., separating the tubes by a wire mesh, expanding the ends, fluting them in the centre, etc. A "block" of tubes is assembled and dipped in a solder bath, the casing being afterwards added. The usual sizes of tubes are  $\frac{1}{4}$  in. sq.,  $\frac{3}{8}$  in. sq., and equivalent sizes in other shapes—triangular, hexagonal, etc. The water either passes between the tubes vertically or is made to travel in a zigzag or sinuous path by baffles. Square tubes are placed diagonally, horizontally, or dodged. The former is the best. The water spaces are irregular in some forms, but the average varies from  $\frac{1}{32}$  in. to  $\frac{1}{16}$  in., generally the former. A fan is fitted behind the radiator or in the engine flywheel, usually the former. It was at first commonly fixed to the radiator by a bolt passing through, but is now usually attached to a bracket on the engine. Driving is by a belt or chain. Chain driving is preferable. Fans are almost all of two types, of which the first largely predominates—propeller and centrifugal—and answers the same purpose to an extent as the old water tank. When a belt-driven fan is used, overheating may often be traced to slipping. At the moment a honeycomb radiator, generally speaking, helps to sell a car. Thus imitation honeycombs are much in evidence. There is no doubt that the gills of finned tube radiators do lose shape. The author has designed a grid which exactly simulates the honeycomb appearance, and which is fixed on the gilled tube. Another form is a manipulation of the gills themselves and addition of strips to give the same result, and was to be seen at the recent Olympia Show. The thickness of honeycomb tubes varies from 0.006 in. to 0.012 in. They have to be made of best brass; both solid and Triblet drawn qualities are used. Copper "shells" have been drawn, but are not very satisfactory, and are expensive. The thickness of honeycomb tubes within the limits specified has very little effect on efficiency.

(To be continued.)

\* A paper read on Monday, January 8th, 1906, before the Institution of Mechanical Engineers (Graduates' Association) by Mr. F. Edgar Bennett, graduate, of London. Abridged.)



The Mysore Challenge Cup, to be competed for in the trials promoted by the Motor Union of Western India, and which take place from January 15th to the 18th.

## CLUB DOINGS.

### CLUB FIXTURES.

- Jan. 15th.—Scottish A.C. (Western Section). Lecture by Professor A. Barr on Horse-power of Motors.  
 ,, 18th.—British Motor Boat Club. Lecture, "Screw Propellers," by Mr. Ramsey-Smith.  
 ,, 26th.—Notts A.C. Annual dinner.  
 ,, 31st.—Cardiff Motor Club. Annual meeting.  
 Feb. 19th.—Scottish A.C. (Western Section). Annual dinner.

### Northamptonshire A.C.

A meeting of the committee of the Northants A.C. was held on January 2nd for the purpose of electing a president, vice-presidents, other officers, and members, also to adjust rules and to complete the organisation of the club. The Rt. Hon. Lord Lilford was elected president. Mr. Sidney F. Harris was elected hon. sec. Four vice-presidents and a strong committee were also elected. The election of the other officers of the club was held over till another meeting. Rules were adopted and other business transacted. Mr. W. Rees Jeffreys kindly attended in an advisory capacity, and was accorded a hearty vote of thanks, as was also the chairman for presiding.

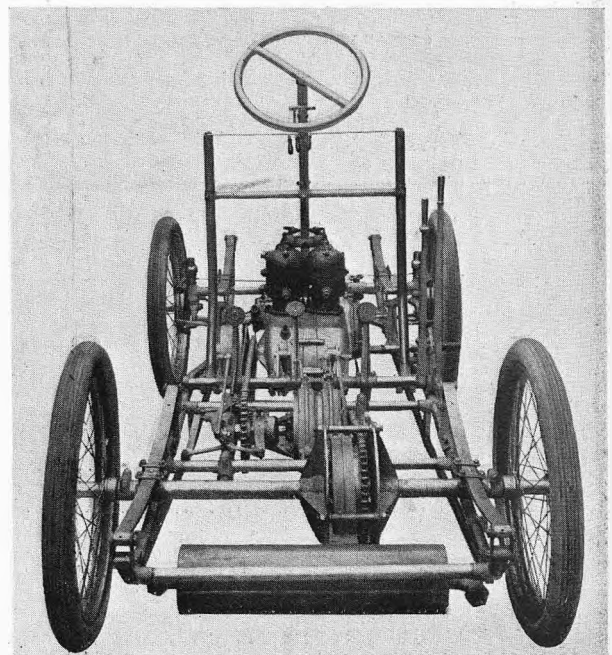
### Motor Yacht Club.

We have been favoured by the secretary, Mr. W. Morris, with an advance proof of an article for the *Automobile Club Journal* on the work of this club during the period of its existence since June last. The first event of importance was the reliability trial in Southampton Water on August 2nd and 3rd. In regard to this it is stated that, "Perhaps the most welcome feature, so far as the actual competitors were concerned, was the refunding of fifty per cent. (the maximum amount returnable) of the entry fees, and this in face of the fact that some of the expenses were exceedingly heavy, and greatly appreciated by many of the entrants. The gold and silver medals which were awarded were specially designed for the club by the very eminent artist, E. Fuchs, and were universally admired by those who were fortunate enough to secure them." The events of the racing season are reviewed, and in regard to the Cowes Meeting on August 11th, it is stated that at this meeting a new method of starting marine racing was adopted, viz., that the boat with the longest handicap

should start first from the scratch boat, and so on, according to the various time allowances, so that the vessel which first passed the line was the actual winner. As this mode of starting was of an experimental nature, many and varied opinions have been expressed as to its adaptability for motor boat racing. The writer, however, expresses a doubt as to whether this system will become popular, unless owners will take sufficient trouble to arrive in proper time at the venue to receive their instructions and time of starting. The acquisition of a floating club house in the ex-Admiralty yacht *Enchantress* is noted, and it is explained that this vessel, which is over 1,000 tons register, is eminently suited for the purpose, having sleeping accommodation for upwards of thirty members, beside saloon accommodation. Her engines having been removed, there is ample room for making a large saloon, 80ft. by 26ft. by 20ft., for the purpose of a dining or ball room. With these delightful social facilities it is expected that there will be a large increase in the membership of the club for the ensuing season. An excellent season's racing has already been arranged.

## THE 5,000 MILES HUMBER TRIAL.

Half the full distance of the trial has been successfully accomplished, and by the time these lines appear 3,000 miles will, it is hoped, have been accomplished, and the fourth lap being entered upon. The car is still running splendidly, and has required no attention beyond the ordinary cleaning up each night. The Dunlop tyres are standing up excellently. The weather last week was against Mr. R. M. Wright, who is driving, and very bad roads were again encountered. During Saturday's gale 114 miles were accomplished. A specimen day's running was that of Thursday, when the run was Lincoln to Doncaster, Retford, Newark, Nottingham, Kimberley, Awworth, Ilkeston, Heanor, Langley Mill, Ripley, Derby, Nottingham, and Lincoln—188 miles.



In *The Autocar* of December 30th last, we published a short article on back spring hangers which has brought from Phoenix Motors Ltd., Caledonian Road, N., the photograph of the chassis of their Quad-car, illustrated above. From this it will be seen that the frame is carried on the springs in the manner suggested, inasmuch as the strains on the shackle pins are evenly distributed. This method of springing was adopted in one of the earliest Wolseley racing cars, and later by Renault, who also constructed a racing car on the same lines.