THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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THE AUTOCAR.

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Notes.

Dust Displacement.

It has been proposed that the Automobile Club should organise, in connection with the 1903 reliability runs, a trial of cars with the view of making comparisons as to the volume of dust raised. This is a trial which it is extremely difficult to conduct fairly, and this is to a large extent the opinion which the club has formed concerning the matter, though endeavours will be made to arrive at satisfactory methods of conducting comparative tests. Undoubtedly, a series of trials with seven or eight cars for the purpose of thoroughly investigating the question would be of great interest, and possibly add to the sum of knowledge upon the subject; though at the moment it is pretty generally recognised that a very low-built car, any serious deviation from truth in the tyres or wheels, a bent frame which causes the wheels to drag, very large tyres and an exhaust which beats upon the ground are all causes which add to the raising of dust, but it is equally certain that a car which possesses none of these particular features will also raise a great deal of dust. If a small car is taken which possesses one or more of the dust-raising properties, it may, in an extreme case, make almost as much dust as a large car, but speaking of the average, there is no doubt whatever that the larger and faster the car the greater will be the dust cloud. If we equalise the speeds, and imagine a 10 cwt. car and one of 18 cwt. or 20 cwt. running at the same speed over the same road, the advantage will still be all in favour of the lighter vehicle, as it will stir up much less dust. There appears a tendency in some quarters to infer that the small machines are worse than the large ones. This, unfortunately, is not the case. Moreover, we have to remember that the vast majority of large cars are driven at much higher rates, and in nineteen cases out of twenty it is these which excite so much disgust among all other road users, not excluding the drivers of medium-size cars driven at a moderate speed. In some respects, these suffer more than any other users of the road, as they may be running at five-eighths the speed of the fast car which overtakes and passes them, and the consequence is they remain in its dust very much longer than slower-moving traffic. In fact, it is a common thing to see the owners of the lower-paced vehicles slackening down to walking speed for a quarter of a mile after being passed by one of the dust-lifting monsters so as to get out of its track as soon as possible.

The Next Problem.

In any case, now the problem of side-slip appears to have been solved in a practical manner, that of dust lifting should next occupy the attention of ingenious minds. We believe that at least two-thirds of the opposition of country authorities to motors is due to the clouds of dust raised by the fast-driven vehicles. It would not only be considerably more comfortable for the occupants of the car, particularly those at the back, who are apt to get a good share of the dust cloud, but it would be a relief to all considerate automobilists—that is to

say, all who are worthy of the name of gentlemen - to know that they were not making things unpleasant for other users of the road. The best remedy, and the one which will eventually, we hope, be applied, will unquestionably be to the road itself. When the disgusting and unscientific methods of mending high-roads with dirt are finally dropped, a very great difference will be made. There is, of course, also more than a possibility that some system like that being tried by Mr. Hooley will be adopted, which will give us waterproof and remarkably durable road surfaces at no more cost than those at present in vogue, and possibly at even a lower cost in the long run. The difference of subsoil must always have an important bearing upon the dustiness or muddiness of the road, but if all road authorities were to study carefully the question in the way that some of the scientific road engineers like Mr. Hooley go to work, we should not find the remarkable discrepancies which now occur in adjoining districts. In one the roads are hard and firm and scarcely any dust is apparent, but as soon as we pass a boundary stone we find ourselves running on sand, and raising a very sirocco in our train, and, what is worse, exciting prejudice against the automobile, when in reality it is the slipshod method of the local road repairing authority which is to blame.

An Example from Scotland.

A motor car driver, employed at Paisley, was charged in Dumfries Sheriff Court last Saturday with having driven a car between Thornhill and Sanquhar at a rate exceeding twelve miles an hour. Police evidence was given to the effect that a car covered twelve miles and one hundred and fifty yards in thirty-three minutes, and that a high rate of speed was maintained right on to Kilmarnock. Various constables along the route swore positively to the identity of the accused as the occupant of the car, as did also a rabbit trapper to whom he gave a lift before reaching Thornhill; but accused himself denied on oath that he had been in that district at all, alleging that on the date mentioned he drove by way of Dalry, Troon, and Dundonald to Kilmarnock. Sheriff Campion, considering it impossible that all the witnesses could have been mistaken, found the charge proved, but observed that no person had been incommoded. In the case of a person rushing through the streets of a town with a car, or passing people in such a way as to incommode them, he should say that even the maximum penalty under the Act was sufficient; but when it was a broad, country road, with only open hedges on each side, he thought it was rather an excess of zeal to bring up such cases at all. He therefore dismissed accused with a warning. A North British correspondent, in commenting on the above, tells us that he is convinced that the foolish prosecution of motorists is carried on to a far less extent in Scotland than in England. He has owned and driven cars in Scotland for over four years, and has never had the slightest friction with the police, though he has more often than not exceeded the legal limit on the straight, open stretches of country road; but here is the point—he always takes care to go very moderately through villages and towns and to slow down when meeting traffic. He finds, as do all considerate owners, that this has a wonderful effect not only in disarming opposition, but also in making converts.

Objectionable Methods.

We have received copies of correspondence between the Beaufort Motor Co. and a client to whom they sold a car, and an intervening third party (an agent), which throw a light on the practices which are, unfortunately, indulged in by a few isolated motor agents, and which bring great discredit upon their business, besides more or less shaking the faith of private buyers in the methods of the motor industry as a whole. To summarise the correspondence, it is only necessary to say that a 12 h.p. Beaufort car was bought from the Baker Street establishment of the company by a gentleman who resides in the provinces. Shortly afterwards no less than three local agents applied to the Beaufort Co. for commission, each one maintaining that he had effected the sale. The Beaufort Co. then made enquiries from the buyer of the car, and investigated

A sign of the times. The yard at the White Lion Hotel, Cobham, Surrey, at lunch time on a recent Sunday.

the matter thoroughly. They were assured by their client that not only had the agents in question had nothing whatever to do with the sale of the car, but, further than that, he did not even know the names of two of them, while the third applicant had endeavoured to his utmost to persuade him to buy some other make of vehicle. This is, unfortunately, only one instance. Another very similar case has been laid before us by the same firm, who, on sending the letter to their client, received it back with the short comment, "It is absolutely false." We also have further evidence in our possession from other sources showing that similar practices are attempted by certain agents, who appear to regard every motor firm as legitimate prey, and to be determined that no machine shall be introduced into their district unless they can obtain some small commission on its sale. At the same time, there is another side to the question which we would be the last to ignore, as we have known certain instances in which an agent has taken a great deal of trouble with a possible purchaser, giving him drives upon a car and doing his best to point out its merits, and, what is more, has thoroughly convinced his potential client of the good points of the car, so much so that without further ado the would-be owner has gone straight to the makers and bought a similar vehicle. Of course, in this case, the agent is quite entitled to some acknowledgment, but his claims are not looked at very favourably unless he is pretty well known to the manufacturer, as two or three bogus requests of the kind may have been dealt with in the previous week or two; and, consequently, the manufacturer is apt to regard all the agents as unscrupulous. At the same time, it is a very good guide for the manufacturer if he knows that the man claiming to have effected a sale is the owner of one of his carriages, and as a rule he has little difficulty in verifying his claims. Still, it is scarcely remarkable that some firms have determined to deal direct with the public, only making exception in the case of a few thoroughly sound and established firms in whose honour they can place personal reliance.

THE LOUET CHANGE-SPEED GEAR.

A somewhat unique method of changing the speeds is adopted on the Louet autocar, a vehicle of French construction. Instead of the gear wheels sliding into engagement with the respective wheels sidewise, as is more usual, they engage directly upon the face of the teeth in the following manner: A gear wheel B is driven by the motor, and above it is a second gear wheel C, which is mounted upon the countershaft, both wheel centres being on the same vertical centre line. The gear wheel C is not in the same plane as D, being to one side of it, as shown by the plan (fig. 2). The change speed gear wheels D, E, F, and G and the reversing pinions H are carried in a frame sliding lengthwise in the gear box A, being actuated by the usual side lever. In the top of the gear box is a pawl J, which falls into a notch cut in the frame, locking the gears in position until it is desired to change to another gear. The change speed gears have each two gear wheels of different diameters, excepting F, which is a plain gear wheel double the width of the others. The first speed is obtained by the driving wheel B gearing into the small wheel of D, the larger of which engages with the driven wheel C. The second and fourth gears E and G operate in exactly the same manner, but the third speed wheel F slides directly in between B and C, so that the ratio here is the same as if B were engaging directly with C. The reverse is given by sliding the pinions H into mesh with B and C. The Louet, it will be remembered, is driven by a three-cylinder engine.

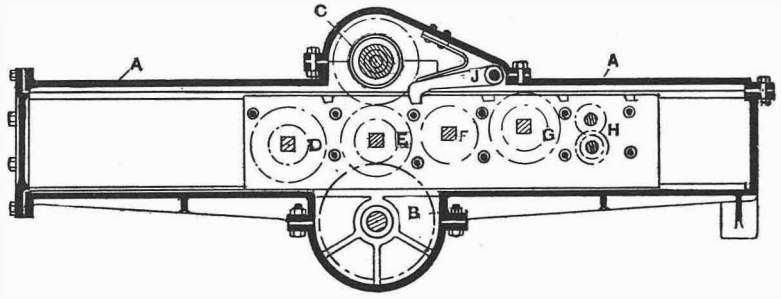


Fig. 1.—Elevation of the gear.

A A, gear box.
B, clutchshaft gear wheel.
C, driving gear wheel on countershaft.
D, first speed change wheels.
E, second speed change wheels.
F, third speed change wheels.
G, fourth speed change wheels.
H, reversing change wheels

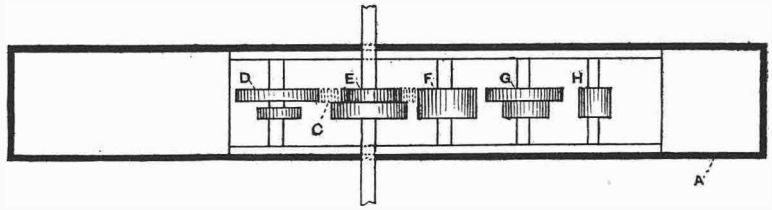


Fig. 2.—Plan of the gear. Reference letters are the same as in fig. 1

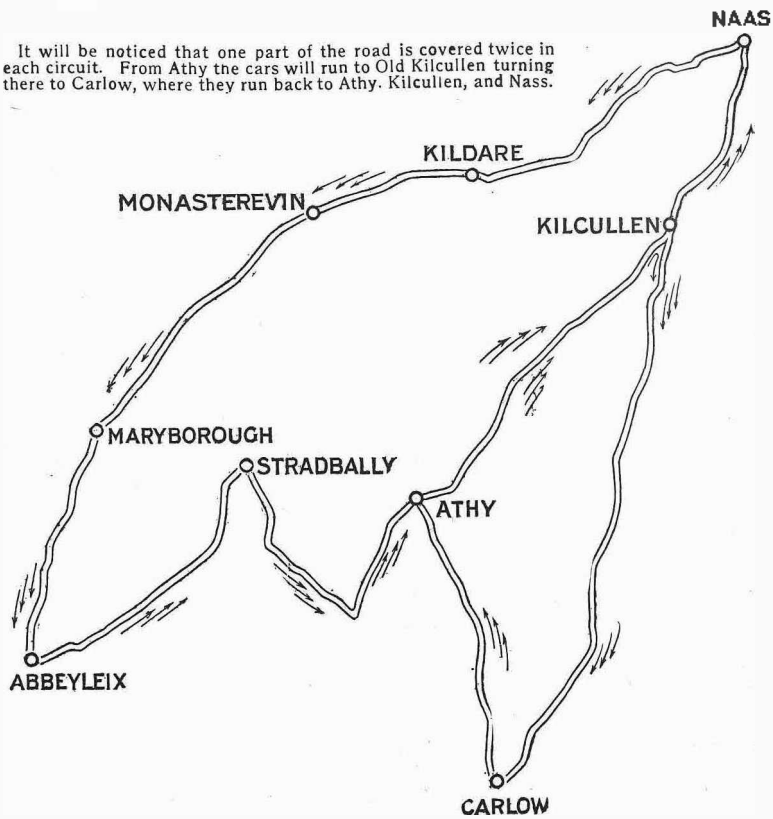
The Electric Ignition Co., of Birmingham, are putting some excellent and carefully-made insulated cable, both for low and high tension currents, upon the market. In the two samples of high tension wire sent us the cable is splendidly insulated. It is contained first within a jacket of indiarubber, which is surrounded again by a ring over $\frac{1}{16}$in. thick of grey vulcanised rubber, outside of which comes another jacket of indiarubber. The diameter of the larger of the high tension cable is $\frac{5}{8}$in., and of the smaller $\frac{1}{2}$in. Either will carry thousands of volts without leakage, and the car owner who has his ignition system wired up with these high and low tension wires should never be troubled with shorts. E.I.C. cable and E.I.C. sparking plugs are a fine combination.

THE PROPOSED GORDON-BENNETT COURSE.

LAST week we announced that Count Zobrowski, Messrs. Edge, Jarrott, and C. Johnson, assisted by Mr. R. J. Mecredy and other Irish automobilists, had, after a great number of tours of exploration, settled upon a course in Ireland as suitable for the Gordon-Bennett race. Mr. R. J. Mecredy, at great personal inconvenience to himself, has been good enough to send us a map and a brief general description of the selected course. There is probably no man breathing who knows the Irish roads so intimately as does Mr. Mecredy. Now that the course is selected it only remains for Parliament to grant the Automobile Club's request for a special bill to legalise the contest, though it would appear that the Irish authorities are almost unanimously in favour of the race, and will oppose it in no way, but in fairness to the competitors the club is determined to have no doubts on this score.

The suggested route starts from the little town of Naas, in the Co. Kildare, situate 20¼ miles from Dublin. It then runs south-west over a wide and good but rather winding road to Newbridge (6½ miles). From Newbridge the road continues wide to the Curragh. From this it is narrow, but dead straight, into the town of Kildare (12 miles). From Kildare to Monasterevan (18½ miles) the road is straight and good, but rather narrow. From Monasterevan to Maryborough (31¼ miles) the road is straight and wide, and the surface good. From Maryborough to Abbeyleix (41 miles) the same applies. At Abbeyleix the course turns north-east through Ballyrowan to Stradbally (52½ miles) over a comparatively straight and good road. From Stradbally it turns south-east. For about three miles the road is wide and good. For three miles after that it is rather narrow. Here there is a sharp turn to the left, and the village of Ballylinan is passed through, and so into Athy (66½ miles). This stretch of road is wide and straight, but the surface is rough on account of the heavy traffic between Athy and Castlecomer. From Athy to the fork near Old Kilcullen (78 miles) is the best stretch on the entire route. Except for one curve at Ardskull, it is dead straight, and the surface is excellent. At Old Kilcullen the cars will have to wheel sharp to the right, and follow the main Carlow road through Timolin and Castledermot into the outskirts of the town of Carlow (99 miles). This road is comparatively straight, and the surface is fair, and in most places there is room for two cars to pass. Just on the outskirts of Carlow the road bends sharply to the right, and runs in a north-west direction, opposite the river Barrow, into the town of Athy (111 miles). It is a pretty good level road. From Athy to Old Kilcullen the excellent 11½ miles stretch of road already described will be passed over again, thence a sharp double curve leads over the Liffey at Kilcullen, and the course follows a fairly good road into the town of Naas, thus completing the 131 miles circuit.

The whole of the course abounds with convenient places from which the race can be viewed, and it will be quite possible to watch the contest on different roads where there are convenient short cuts. It will be seen from the map that many such cuts should be possible.



It will be noticed that one part of the road is covered twice in each circuit. From Athy the cars will run to Old Kilcullen turning there to Carlow, where they run back to Athy. Kilcullen, and Nass.

	Miles.
Naas to Kildare...	12
Kildare to Monasterevan, 6½ ...	18½
Monasterevan to Maryborough, 12¾ ...	31¼
Maryborough to Abbeyleix, 9¾ ...	41
Abbeyleix to Stradbally, 11½	52½
Stradbally to Athy, 14	66½

	Miles.
Athy to Kilcullen, 11½	78
Kilcullen to Carlow 21	99
Carlow to Athy, 12	111
Athy to Kilcullen, 11½	122½
Kilcullen to Naas, 8½	131

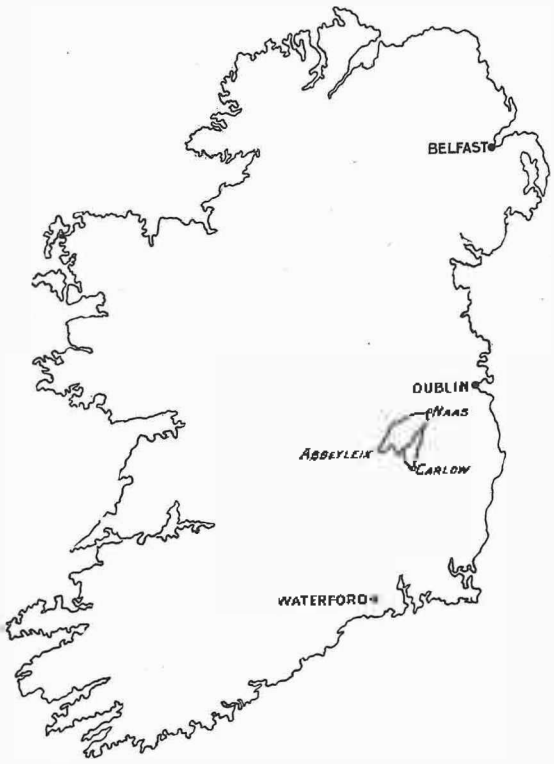
An Ulster branch of the Irish Motor Cycle Union was formed at Belfast on the 9th inst., a meeting being called at Hicks's Hotel for this purpose. Lieut. Young occupied the chair, and Mr. J. C. Percy ably set forth the objects of the union. A provisional committee was then formed, Mr. R. G. Wilkinson being the honorary secretary *pro tem.*

USEFUL HINTS AND TIPS.

There are many men, who, though good mechanics, have no idea as to the care required in washing a carriage body. Carriage varnish is a very delicate substance, and should be treated with extreme care. It is not generally known that it is susceptible to light and heat, both of which have a softening and dulling effect upon its surface. It should be carefully noted, therefore, that the house in which the car is stored is not subject to any strong rays of light striking through its windows directly on to the carriage. The house should also be dry and well ventilated. In any case, it is always best to keep the car covered with a large sheet when it is stabled.

× × × ×

A newly-varnished car should stand for at least a week before being taken into regular use. This is in order to allow the varnish to set properly. Frequent washing with clean cold water and careful drying with chamois leather and exposure to fresh air in the shade will both harden and brighten the finish. On no account allow mud to remain long enough upon a newly-varnished carriage to dry. If this is done, stains are bound to follow, and when once they have set into the varnish nothing will remove them. In washing a carriage, plenty of water should be poured carefully over the parts; it is always a mistake to use a swift flowing hose jet. It is really better to use a large sponge, well saturating it and squeezing it over the panels of the car body, when the water in running off will carry the mud with it. Never allow water to dry on the carriage, as this is very liable to stain, almost as much so as mud. Hot water and soap should never be applied to any varnished or light-coloured painted surfaces.



Sketch map showing the relative position of the cup course to the remainder of the country. See the opposite page for larger map of course and general description.

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Enamelled leather wings, hoods, or aprons should always be washed with weak soap and water, after which they should be carefully dried off and then polished with a chamois leather. On no account use oil, as so many people are apt to do, as this has a softening effect on the enamel, which in time causes it to deteriorate and lose its polish.

× × × ×

Owners of cars having a direct drive by propeller-shaft with universal joints should take particular care to see that these joints are kept well cleaned during the muddy weather which is prevailing at the time of writing. It often happens that if these joints are not covered over with a leather casing, as they should be, mud and dirt find their way in, and we have heard of cases where they have absolutely choked up either one or the other of the joints, thus preventing their free movement. When this occurs, there is a big strain upon the gearing, which if not immediately attended to will result probably in its becoming stripped.

× × × ×

If any difficulty is experienced with the carburetter during the raw weather which we are having just now, this will probably be remedied by bringing it closer up to the engine. In cases where it is placed at some distance away and low down, a draught of a heavily-laden moist atmosphere is drawn into the carburetter, and on its passage to the cylinder becomes dried to some extent, and thus gets rid of the moisture contained in the air. This moisture, in the form of water, drops to the bottom of the carburetter, and in a short time accumulates sufficiently to interfere seriously with its working. If the petrol supply tank can be raised to a position high enough to feed the spirit by gravity to the carburetter, a great advantage will be gained by shortening the pipe so as to bring the carburetter nearer to the heads of the cylinder, where, by the heat given off, the air becomes drier and more capable of taking up the spirit than a damp atmosphere. In making any conversion of this description, it is always well to have all necessary curves made as broad as possible, avoiding all short bends, whereby the induction power of the motor is decreased, thus considerably affecting the power of the carburetter when of the jet spray type.

× × × ×

It frequently happens that a lot of squeaking and grinding arising from a car is due to the fact that the springs are very dry—that is to say, the grease between the leaves of the springs having become dried up or pressed out, the leaves themselves are bearing harshly upon one another. A simple way of remedying this is to jack up the car body and to open the springs slightly by means of a screw-driver, and working in some gear box grease by the aid of a thin-bladed knife. The superfluous grease which will be pressed out of the springs upon lowering the body should be immediately removed, otherwise it will be apt to collect dust and work in between the leaves, thus causing an objectionable grinding noise.

THE STANLEY MOTOR SHOW.

THIS exhibition was opened at the Earl's Court Exhibition Buildings, S.W., on January 16th, and closes to-day, January 24th. The cars are staged in two buildings—the Ducal Hall, a large apartment with a sort of transept, making it T shaped in plan, and the Queen's Palace on the opposite side of the grounds, a still larger oblong building. It is the first attempt of the Stanley Club to hold a show devoted entirely to motor and kindred exhibits, though the club has had very long experience in the promotion of shows, as it has held annually and successfully a cycle show for the last twenty-six years, and with one or two exceptions the success of this exhibition has grown from year to year, the last one, in November, being one of the finest cycle exhibitions held within recent years. As will be seen from our report, the first show is not large, but it is none the less a most interesting exhibition, and one which does every credit to Mr. Lamb, the secretary, and his committee. The arctic weather of the three opening days made the lot of the exhibitors, and even of the visitors, a chilly one, but fortunately a more genial temperature has prevailed since.

THE INAUGURAL LUNCHEON.

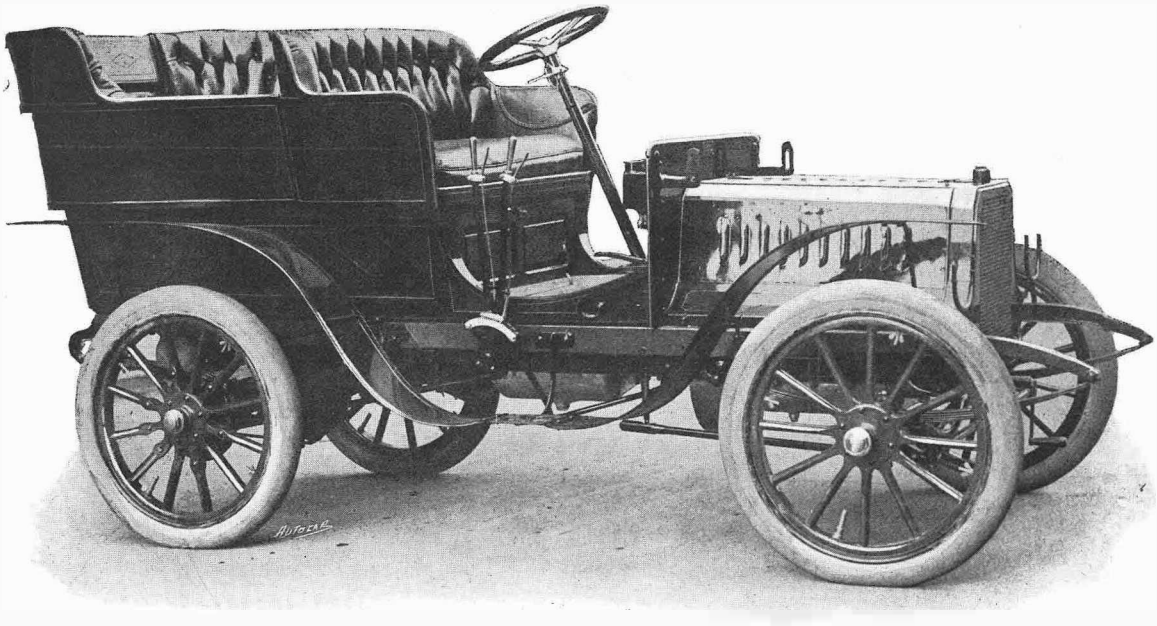
Following the opening ceremony of the exhibition, performed by Sir Albert K. Rollit, M.P. (S. Islington), on Thursday of last week, some 200 guests, chiefly representative of the automobile world, attended an opening invitation luncheon, held in the grill room adjoining the Ducal Hall. An excellent luncheon was followed by a telling speech by Sir Albert K. Rollit, who proposed the toast of "The Stanley Automobile Exhibition." He greatly interested his audience by recounting some of the experiences of his recent tour through the United States and Canada, and, in referring to the Stanley Club, he said he remembered years ago he had given them the motto of "On, Stanley, on," and to-day they saw the club not only successful in their cycle exhibition, but in their first attempt at organising a motor exhibition—a great deal of which success he attributed to the secretary, Mr. E. A. Lamb, whom he would be excused for alluding to as the "autocarat" of the luncheon table. (Laughter.) These exhibitions served not only the purpose of benefiting trade out educating the public, and the buying public, in the wonders of automobilism and the advance made in mechanical science. Man must recognise that to-day everything was tending to labour and time-saving appliances, which, if we were to go with the times, we must adopt at every possible opportunity—in fact, from what he had seen in America of machines practically human in their work, and infinitely more accurate, it was not above the imagination to figure out the last of the human working race being strangled by the automatic man. Water power was the power that was giving America and Canada many advantages, and if they had seen, as he had, the enormous power generated by Niagara and transformed into electricity sufficient to light towns and for miles around to drive machinery of thousands of horse power, it would send their thoughts in the direction as to why we allowed to run to waste such sources of water power as we have at our command in this country; for although we may not have Niagaras, we must recognise that we have to compete with this cheap production of power. In going through the Stanley Automobile Exhibition, while observing that in the lighter forms of vehicle we were in some cases behind the foreigner, he was glad to note that England excelled in vehicles for heavier traction, and he really believed that we could still hold our own, and get back what we had lost by adopting more scientific methods of education. In America and Canada the higher forms of education were scientific, and consequently they did not in those countries depend on the abilities of the few; but could rely on the abilities of the whole nation. Parliament here interferes too much with industry. It strangled the electric light, and it is to be blamed that we are not at the head of automobilism to-day. We had in this country fairly practical automobiles a century ago, and we had enactments harshly enforced from mere prejudicial opposition such as opposed the first railways. Now that we had an Act *allowing* automobiles on the road (they were not there by the common right), we had to suffer from prejudice, and the attention of the police armed with ancient watches. It was wonderful the faith a police-constable had in his own watch, and he remembered the story of a policeman who used to time the sun, and on occasions was heard to remark, "If the sun ain't over that hill in half a minute she'll be late." He thought police evidence might be summed up in a little formula: P.C. plus £ s. d., equals P.C. square. (Laughter.) There was no doubt that despite opposition the motor industry was bringing about a social revolution, and to the attractions of automobilism he attributed the fact that even the House of Commons now sat late on Wednesday and rose early on Friday. (Laughter.) In conclusion, he wished the Stanley Club every success in its new venture. Mr. Robt. Todd replied, and expressed the thanks of the club for the support already received, and the intention to make it an annual fixture, the date for next year's show having already been fixed. Other toasts were "The Visitors," proposed by Colonel Savile, and responded to by Mr. Wm. Whiteley, and Mr. G. E. Elliot, the Mayor of Islington; "The Chairman," proposed by Mr. Vernon Pugh, was responded to by Mr. Robt. Todd.

THE EXHIBITS.—THE DUCAL HALL.

THE BRITISH AUTOMOBILE COMMERCIAL SYNDICATE, LTD., 97 and 98, Long Acre, W.C. Six "Clément-Talbot" and three "Panhard-Levassor" cars are well staged on this stand. Attention may be drawn to the beautifully-finished chassis of the four-cylinder 20 b.h.p. 1903 "Clément," parts of which we are able to illustrate in connection with this report. The frame is carried on four 810 mm. by 90 mm. wheels through long semi-elliptical springs fore and aft. The frame is in cambered channeled steel, with distance-pieces of the same section and segmental angle plates. Wooden bearers are mounted on the upper side of the steel frame to take the body. The underframe carries the engine and gear box, and is of similar but lighter section than the upper frame, and strikes us as one of the stiffest, lightest, and best designed underframes we have yet come across. The dimensions of the 16 b.h.p. and 20 b.h.p. four-cylinder motors are 75 mm. by 120 mm. and 85 mm. by 120 mm. respectively. The cylinders are cast in pairs and set as closely together as possible upon

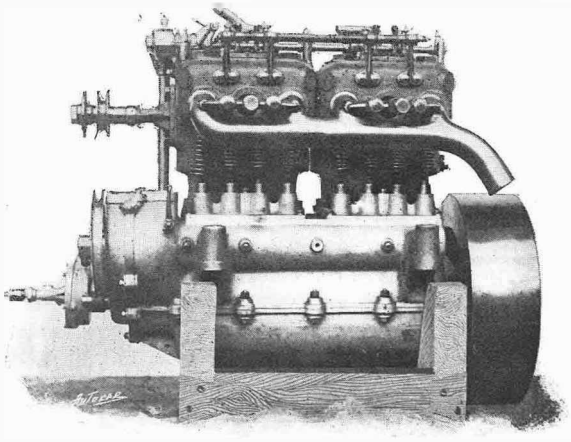
the base chamber. The crankshaft is one forging, and is carried in three bearings, one at each end of the crank chamber, and the other in the centre. There is no water joint to the water jacket on either pair of cylinders. The crank chamber is in aluminium, and upon the removal of six nuts the crankshaft, together with the piston, can be got at easily.

minium cap, runs in oil, and acts upon the inlet to the engine and the air port of the carburetter, and also closes the petrol jet when the engine runs beyond its normal speed. On the projecting end of the half-time shaft is a belt pulley, from which is driven the cooler fan, running on a spindle immediately behind a cellular type of cooler mounted in



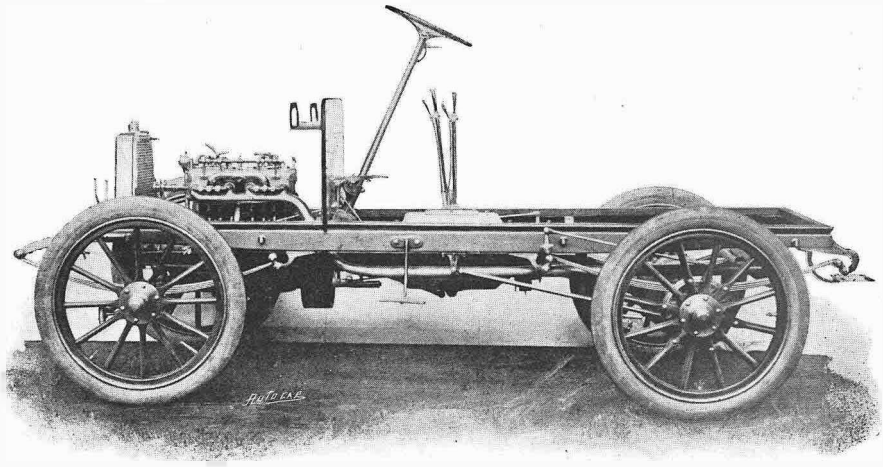
The 20 h.p. four-cylinder Clement.

One layshaft on the left-hand side of the engine serves to operate both the induction and exhaust valves. This shaft, together with the gearing actuating the governors, ignition bevel gear, and pump gear, are all enclosed in portions of the crank chamber which form oil baths for the same. Two inspection openings are found on the right-hand side of the crank chamber. Each is sufficiently large to allow the passage of the hand in order to test the nuts and bolts of the big ends, and to examine the quantity of the oil in the case. The governor, which can be easily got at by the detachment of two nuts and the removal of a small alu-



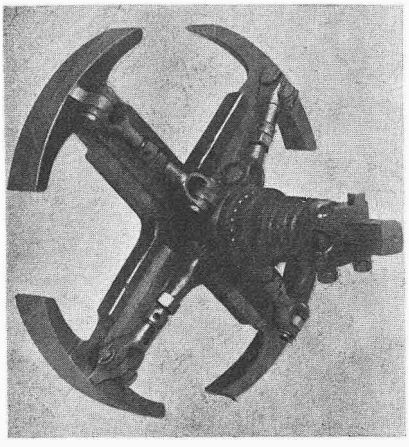
The Clement 20 h.p. engine, showing inlet and exhaust valves operated by the single shaft.

front of the bonnet. These arrangements can be fairly well discerned from the accompanying illustration of the four-cylinder engine. The charges in the cylinder are ignited by a spark from a rotary magneto driven by a friction wheel off the periphery of the flywheel in some cases and by spur gearing in others. The shaft for breaking contact runs horizontally over the top of the cylinders, and is rotated by a vertical shaft placed directly in front of the engines, deriving its motion from bevel gearing through the half-time shaft. The ignition and sparking apparatus is all set upon one plate, and the spark can be worked and tested by moving the plate and operating the same by hand, very much after the manner in which one tests an ordinary sparking plug. The carburetter is of simple form, and has air inlet and petrol feed controlled by the governor, as we have already mentioned. The cellular cooler set in front of the motor bonnet, as shown in the chassis elevation and plan, contains all the water necessary for cooling. Forced draught is maintained through the cells of the cooler by means ot the rapidly rotating fan already referred to. The water circulation is maintained by a centrifugal pump, gear-driven off the motorshaft, the gearing running in oil, and not more than 18in. of water tubing are employed to make the connections. Lubrication is provided by means of a sight feed lubricator connected with the water circulation, the oil being forced through the tubes by the pressure of the water beneath it. It will be seen that lubrication is thus arrested by the stoppage of the engine.



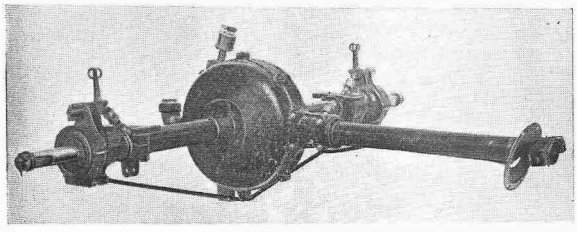
Elevation of the 20 h.p. Clement chassis.

The "Clément" clutch has now been entirely remodelled, the cone form being superseded. The overhanging flange of the flywheel is turned up parallel, and the segmental arms of the clutch are concentric therewith. These concentric arms slide in guides on a collar loose on the clutchshaft, and are held up to their work by a clutch spring placed in the usual position and bearing on the segmental metal arms by means of jointed adjustable thrust rods. The construction of this clutch can be easily conceived by reference to the illustration. The change speed gear is enclosed in an aluminium gear box, and fitted in the two-cylinder cars with three speeds forward and reverse, and in the four-cylinder



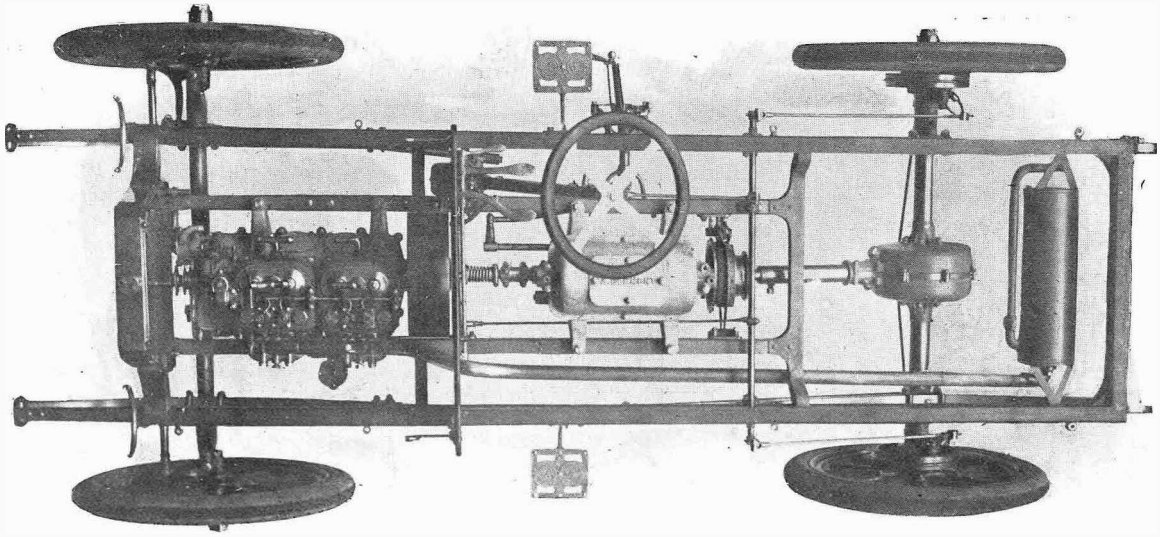
The new Clement expanding clutch.

cars with four speeds forward and reverse. It differs from the "Clément" gears hitherto shown in this country in the fact that the engine drives direct on to the live axle on the top speed. The propeller-shaft is very short, and has a universal ball joint immediately in the rear of the gear box. The shaft runs in a phosphor bronze bearing contained in a sleeve for nearly the whole of its length. The differential gear box and axle sleeves are very



The Clement back axle.

strongly formed, and altogether the construction of the present "Clément" will remove all suggestions of their being too lightly built. The lubrication of the crankshaft bearings and back axle is provided by a single pressure feed "Stauffer" box placed on the dashboard. The silencer is now placed at the rear of the gears, and formed of inner and outer chambers. The engine exhausts first



Plan of the 20 h.p. Clement chassis.

into the inner box, then into the outside box, and then into the atmosphere. It will be seen that the "Clément" car has been considerably improved and modified for the present year, and we feel sure that it will be examined with the greatest possible interest by visitors to this show. The body work of the vehicles staged is of excellent finish and taking appearance. We would draw special attention to the light delivery van and the 11 h.p., car, with handsome and convertible brougham body.

BURBERRY'S, 30 and 31, Haymarket, S.W., have a nice exhibit of their well-known motoring garments. The "Burberry" gaberdine is now made with a special wind-proof double fly front, by which this well-known weatherproof motor coat is considerably improved.

THE COVENTRY CHAIN CO., LTD., Coventry, exhibit a selection of chains of all pitches from ½in. up to a 3in. chain made for the War Office. In this particular chain every rivet is drilled, so that oil can be injected through the hollow rivet, and find its way thence to the inside of the roller. Specimens of the 1½in. pitch by $\frac{9}{16}$in. wide chain used on the King's Daimler are also shown. Cranked links to enable an odd link to be inserted are shown machined from the solid, so that absolute pitch is maintained, even though an odd link be used. We should add that the pen steel liners are no longer used on any of the chains, the bushes being made from the solid. A very good clutch for motor bicycles, with 1⅝in. bore for screwing on the hub, is also shown.

THE DURYEA CO., Coventry. Seven handsome machines are staged here, three of which are new types for this firm. The "Duryea" with the brougham body, very handsomely finished in black, and of novel design for this form of vehicle, will attract attention. The lines thereof are well displayed in our illustration. It has ample accommodation within for four passengers—one on the front seat—and, of course, is driven entirely from within the body. Another type of "Duryea" shown for the first time is the phaeton-bodied car with folding front seat. The ordinary English taste is also catered for in a neatly-designed tonneau body car. The engine and driving gear of the "Duryea" car have already been referred to upon several occasions in our columns, and are now fairly well understood by automobilists who follow modern mechanical systems, so that it is not necessary for us to describe the method by which these uniquely-designed vehicles are driven and controlled. We may add we notice a considerable improvement in body design and finish. Goodyear tyres are fitted to all the cars, and the good repute they have already gained with many of their users is bringing them rapidly into favour with English automobilists, who seem much interested in this stand.

THE FURRIERS' ALLIANCE, LTD., 16, Old Bond Street, W. A good variety of fur clothing of all kinds, not only of coats, but of footmuffs, caps, and wraps of all sorts, is shown.

THE GRAPHOLINE MFG. CO., LTD., Upper Thames Street, E.C., have a good display of motor clothing in furs and leathers. They also have the well-known "One Minute" tyre removers, which take the form of levers, which are put under the cover and hooked round the spokes. They are more useful for wired

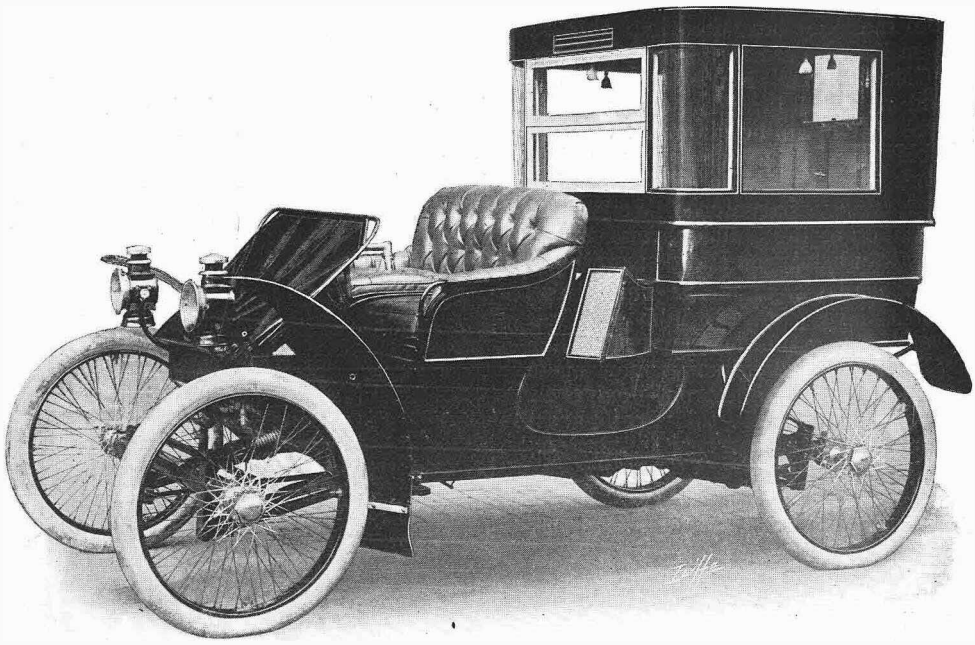
The Duryea brougham.

tyres than for the thickened-edge type now predominant.

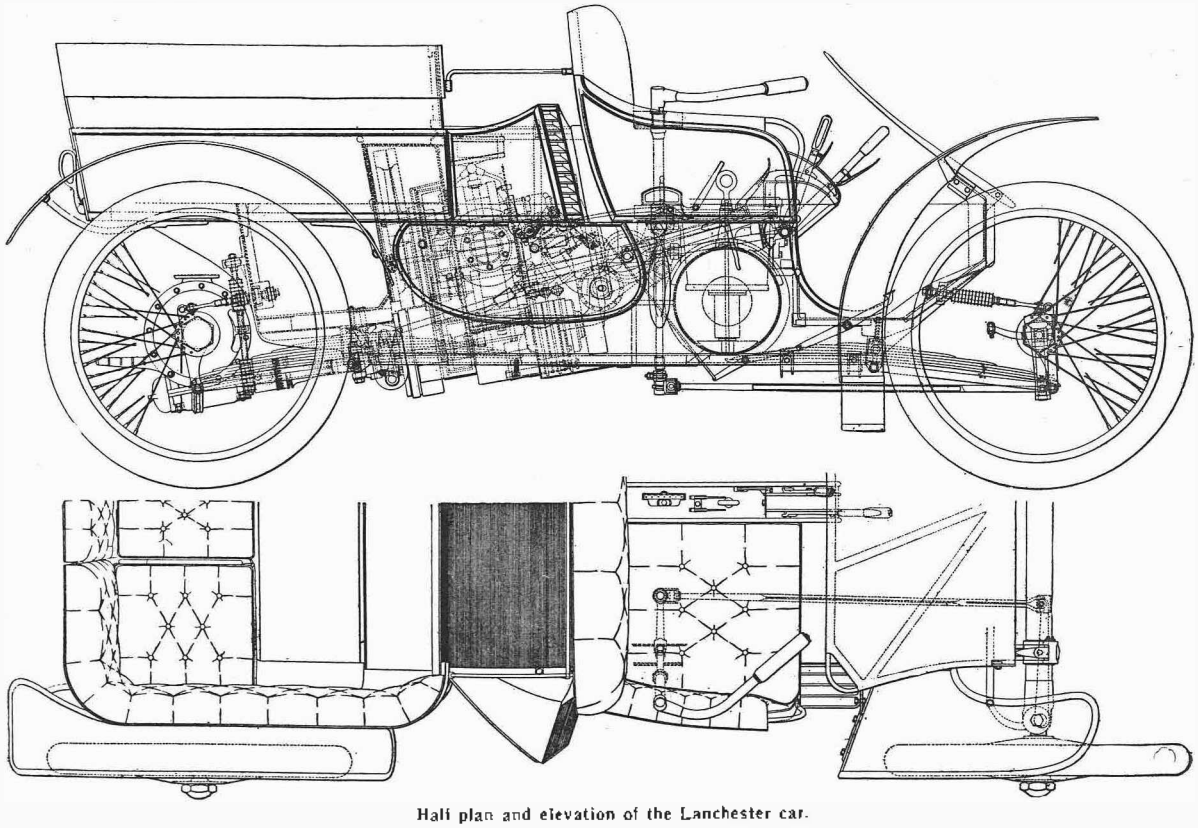
THE HOUK AUTOMOBILE CO., LTD., 7, Snow Hill, E.C. Four smartly-finished examples of the well-known "Prescott" steam cars are shown here. These vehicles have already been described and illustrated in detail in our columns, so that no necessity exists for enlarging upon them in this report. An interesting example of the transverse tube burner with superheater, formed of two concentric circles of tube set in the burner boxes, is shown upon the centre of the stand. The fact that the two-seated car is quickly converted into a four-seated vehicle by means of a concealed seat carried under the dashboard is a feature which will attract the attention of those who make a study of steam car design.

THE ISOMETRIC LENS CO., Crystal Palace, S.E. Those in want of cycling and motor goggles should visit this firm's stand, where a large variety of these useful articles are to be found suitable for either ladies or gentlemen.

THE LANCHESTER ENGINE CO., LTD., Montgomery Street, Birmingham. Ten of the unique "Lanchester" cars occupy the stand which runs the whole length of the hall. Conspicuous among them is a facsimile of one of the War Office cars finished in khaki, while some of the vehicles are fitted with a detachable brougham top, which fits on to the ordinary tonneau with great ease, and can be removed without affecting in any way the neat appearance of the body. The double-hooded car which we illustrated in our issue of Nov. 1st, 1902, page 444, attracts great attention owing to the thorough manner in which it enables the occupants of the tonneau to protect themselves either from dust or wet. It will be remembered that the hood is hinged in the middle and can be slung either forward to keep off wind or wet, or backward, half open, as a dust hood. The chassis which is shown—we believe this is the first time that the Lanchester Company have put a stripped car into an exhibition—is exceedingly interesting, as it enables an intelligent study to be made of the unique system. In the first place, the position of the engine should be noted. It is across the car with the cylinders opposing each other and working with two connecting rods to each piston on to separate cranks connected together by toothed gearing. The result is that the angularity of the thrust from the crank pin to

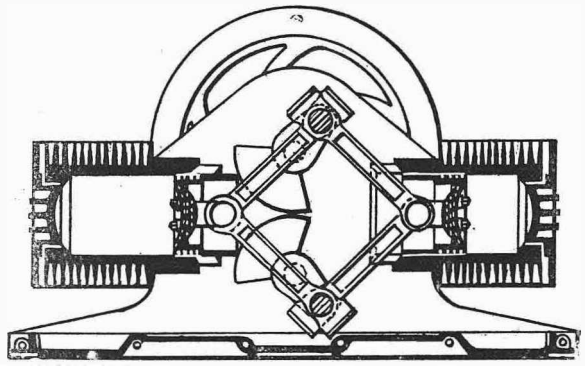


The Lanchester car with brougham removable top.



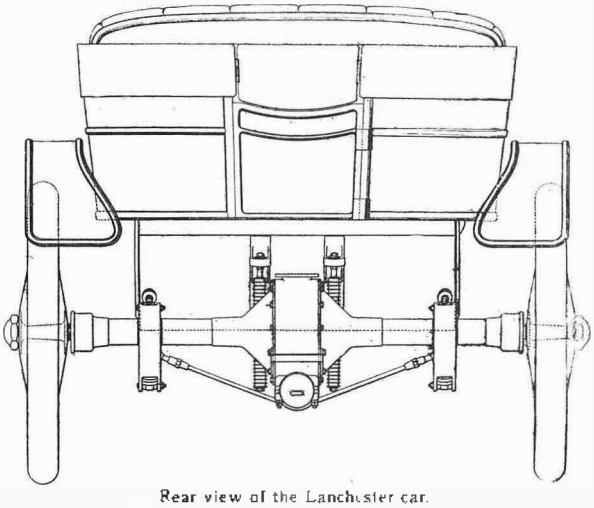
Half plan and elevation of the Lanchester car.

the walls of the cylinder through the connecting rod is balanced so that the running of the engine is remarkably smooth. In the ordinary way, an engine with opposite cylinders is very smooth in operation, but with the obliquity of the thrust balanced by the Lanchester method it is possible to obtain a motor which runs with such remarkable smoothness that it very nearly approximates to the electric motor, and it will be observed from the sectional illustration which we give that the cranks are fitted with balance weights, so that the rotating as well as the reciprocating parts and the angular thrust of the engine are all of them compensated. Air-cooling is employed, the cylinders being flanged and the draught induced by high speed fans. The ignition plugs, like every other part of the engine, are unique. Instead of the ordinary slow operation of unscrewing a plug and then screwing it in again, a breach joint similar to that employed in gun construction enables one to remove the plug by the mere movement of a small lever, which is permanently affixed to it. Not only so, but the distance between the sparking points can be adjusted instantly by the edge of a coin, so that the whole of the operation of plug detachment and adjustment is effected without tools of any sort, and in less time than it takes to write. Only one valve is under working pressure, as the inlet or feeding valve operates outside the compression chamber, and the only orifice to the cylinder is the port, which serves both for inlet and outlet. The governor is on the inlet, but it can be controlled by hand and either cylinder cut out of operation by a small lever at the driver's side. In starting, the same lever which partly releases compression also sets the spark back, so that there is no fear of back-fire. The



Sectional diagram of the Lanchester motor.

engine abounds in special features, to which we hope to return on some future occasion, as it is worthy of a special article to itself, and for this we must reserve a description of the magneto ignition, which is quite away from the standard types. Two positive speeds and reverse are given by means of Crypto or epicyclic gearing, and the drive is taken through a universally-jointed shaft to a worm which drives a worm wheel encircling the balance gear of the back axle. Roller bearings are employed to all wheels, and the system of springing can be gathered from the general view we give. It will be seen that the leaf springs are anchored at one end and are free at the other, sliding on a roller under the axle. Undue strain is taken from these springs by means of hinged distance bars which run underneath each spring, while lateral stability is provided by rods, the action of which is controlled by rubber washers. This springing provides remarkable flexibility, and a car can be taken over an obstacle two feet high. This, of course, is merely to show



Rear view of the Lanchester car.

the flexibility; but it is certainly striking to see it in this position with all four wheels in contact with the ground, or, we should say, the three wheels in contact with the ground and the fourth wheel on the obstacle. Lubrication is provided from a central lubricator, which serves every part with the exception of the wheels, which have separate lubricators, and the worm and balance gear box, which is filled with a thick lubricant. Those who have not mastered the Lanchester system should do so at this exhibition.

THE LONDON MOTOR GARAGE CO., LTD., 81, Page Street, Westminster, S.W. In general design, the 15 h.p. four-cylinder "Pipe" shown here follows Panhard practice. The cylinders are cast in pairs, and the cranks are set at 90°. The valves are extremely accessible, and can be removed two at a time by the unscrewing of a single bolt. The governor acts on the throttle, and a hand throttle is also fitted. The particular vehicle is fitted with one of Rothschild's bodies, and presents a fine, smart appearance. It should be remembered that this make, which was exhibited for the first time in the recent Paris show, was awarded a gold medal. The "Magnet" is another car shown here on general Panhard lines, but at a lower price than "La Pipe." On the same stand one of the little "Oldsmobile" cars will be found. A facsimile of this machine is running outside the exhibition, and its remarkably silent running is generally and most favourably commented on.

JOSEPH LUCAS, LTD., Great King Street, Birmingham. It is impossible in the space at our disposal adequately to deal with the innumerable "motoralities" shown at this stand; but whatever the automobilist's heart can desire in the shape of lamps, cycle horns, lubricators, or the hundred and one special articles which the care and conduct of the autocar require, can be found here. The "Wells-Lucas" lubricants, which have earned so excellent a name for themselves in the hands of drivers, are shown put up in their various packages.

The "King of the Road" acetylene head lamps, made in two sizes, are worth attention. The visitor to the show can spend a very pleasant half hour in inspecting the interesting and thoroughly well-constructed exhibits shown here.

THE MOTOR MFG. CO., LTD., Coventry. This is another imposing exhibit. Perhaps the most striking vehicle is a large 20 h.p. four-cylinder car with high back tonneau, built to the order of a South African millionaire. Several specimens of the two-cylinder 10 h.p. and four-cylinder 12 h.p. "M.M.C." cars are also shown; and last, but by no means least, a chassis of the 8 h.p. single-cylinder, which, with the exception of certain detail improvements, is precisely the same as the vehicle which won the gold medal in the last reliability trials. Among the improvements in this design may be mentioned that the wheelbase has been lengthened to six feet. The tyres are now 85 mm. by 700 mm., instead of the former 65 mm. A sight feed lubricator is fitted on the dash in place of the hand pump. The chains are somewhat stronger, 1¼in. pitch being used. Inclined wheel steering of the worm and segment irreversible type is now fitted, and the silencer has been considerably enlarged. The 8 h.p. engine gives this power on the brake at 1,450 revolutions per minute, and the bore of the cylinder is 100 mm. and the stroke 130 mm. We should add that all the two and four-cylinder cars are fitted with both electric and tube ignition, and are governed on the induction. Every pattern is fitted with the "Iden" patent change-speed gear, in which the toothed wheels are always in mesh. A hollow shaft with feathers is employed, the key or feather locking any particular gear into operation being actuated by a single lever.

THE MOTOR TRACTION CO., LTD., 27, Walnut Tree Walk, Kensington, S.E. Four "Salisbury" and two "Germain" cars are exhibited here. The "Salisbury" cars, which are the latest to be offered by this company, are of 10 h.p. and 7 h.p. types, and are fitted with Buchet, Monarch, or Aster engines to order. The drive is of the usual type by friction clutch, Panhard change-speed gear, and live axle. The "Germain" cars have already been illustrated and described in our columns, so far as their mechanical design is concerned, and there is no need to reiterate the same here. With regard to the vehicles shown, it may be said that special attention has been given to bodywork and finish. Considerable taste is evinced in the painting and upholstering of each car, and the vehicles are sold with lamp, horns, and all necessary fittings at an inclusive price.

THE NORTH BRITISH RUBBER TYRE CO., LTD., Castle Mills, Edinburgh. The new "Clincher-Michelin" motor tyre, which is the tyre made by the great firm of Michelin for the North British Rubber Co., is shown here in several sizes. We would draw special attention to the new rapid detachable valve and mushroom attachments. It requires but one or two turns of the butterfly nut to make it fast, and it can be detached by simply drawing the butterfly nut from the rim, without screwing at all. The operation of the well-known "Michelin" nail and thorn extractor is shown in action on a mounted tyre by the side of the stand. The valve and mushroom attachments referred to will shortly be illustrated and described in detail in our columns. To do so here would be impossible without sketches.

THE PETROL MOTOR POWER CO., Singer Street, E.C., show an American car—the "Peerless"—built on European lines; that is to say, the two-cylinder engine is placed in front under a bonnet; the cooler is vertically fixed before the engine; and the governing is on the induction, the control of the governor lever being obtained by a pneumatic buffer or piston working inside the small cylinder. The change speed gear is of the sliding type, giving four speeds and reverse, the drive being direct to live axle on the top speed.

D. SHEPPERD, 200, Regent Street, W., shows specialities in motor and cycling spectacles.

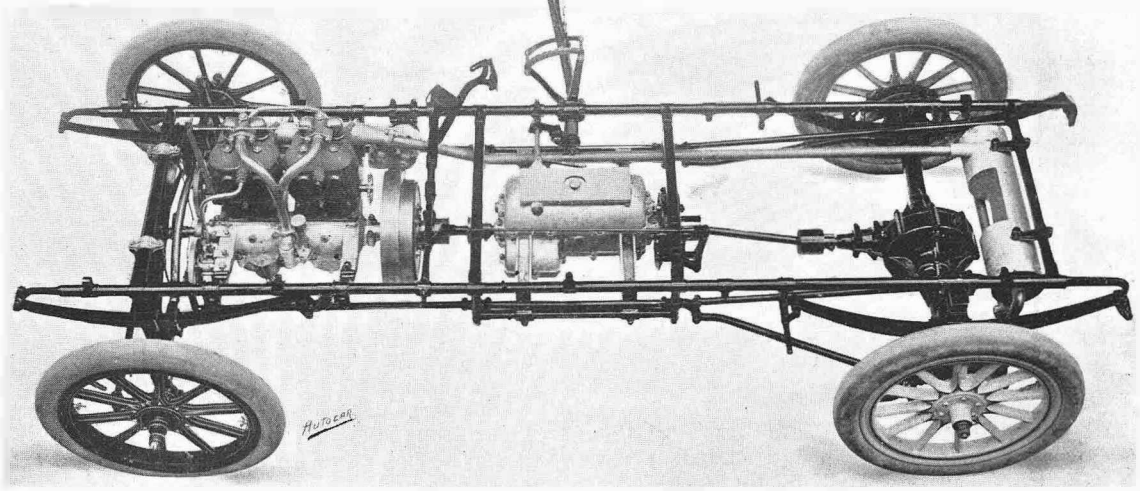
SHIPPEY BROS., LTD., 13 and 14, King Street, Cheapside, E.C., show a large assortment of the well-known "Diamond" tyres for various weights of vehicles, also one set of 34in. × 4in. non-skidding "Diamond" tyres with the herring-bone tread. The exhibits on this stand are of a very varied character, including American artillery wheels, cushion tyres, "Maison Talbot" tyres, and "Milwaukee" steam engines, American steam car sundries, "Gordon" primary batteries, the "Morrow" and "New Departure" hubs, and sundry electrical accessories.

STEINER AND CO., 142, Houndsditch, E.C. This firm have a good display of horns, lamps, and other motor accessories. A special novelty is a combined horn and lamp, the lamp being formed in the bell of the horn, while the sound from the reed issues by a concentric passage round the lens. This combination can be fixed to a steering wheel, and should be very useful for night driving.

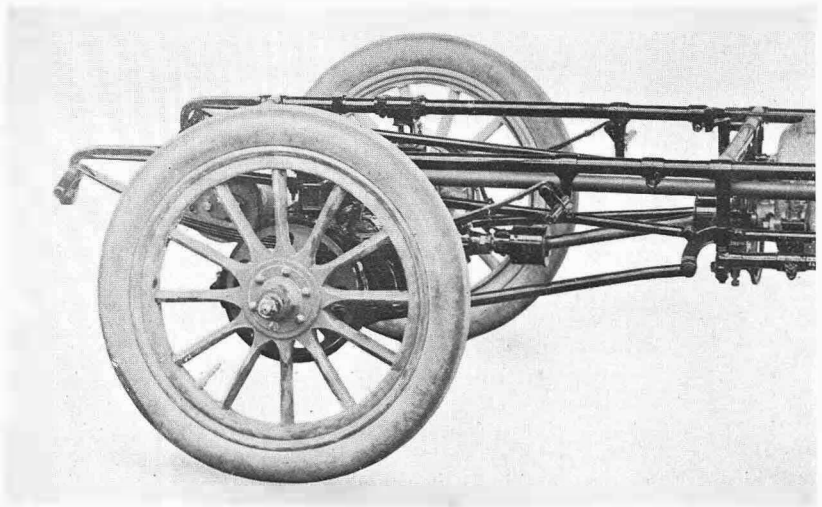
STERN BROS., 57, Gracechurch Street, E.C. The well-known "Sternoline" lubricators and the improved "Sternoline" automatic lubricator, together with sight feed lubricators and various types of the many excellent lubricating agents supplied by this house, are shown here. In addition to lubricants, Messrs. Stern Bros. have samples of the excellent "Rusticide" and "Ferrubicide," for preventing rust and dust respectively; also metal polishes and other automobile necessaries of this description.

THE VELOX MOTOR CO., LTD., Parkside, Coventry. This firm make their *début* with examples of the four-cylinder 12 h.p. standard car. For the purpose of description, we shall confine our attention to the chassis, as any type of carriage body may be fitted. The "Velox" motor four-cylinders are cast in pairs, and have a bore of 3½in. and stroke of 4in., which, with the crankshaft running at 900 revolutions per minute, develop 16 h.p. on the brake. The speed, however, may be accelerated up to 1,500 revolutions per minute without causing any undue vibration; at the higher speed, the power is, of course, considerably increased. At present automatic inlet valves are employed, but we understand that the firm are considering the matter of fitting the mechanically-operated type. A centrifugal governor controls the admission of gas to the cylinders through two throttle valves, each placed in a branch of the main induction pipe. A Daimler pattern float feed carburetter supplies gas to the

engine, and the ignition is of the usual high tension electric system. Water-cooling is assured by a gear-driven slow speed positive pump, the radiators being composed of a nest of vertically-placed Clarkson tubes headed into the receiving tank. The engine is attached directly to the frame, no underframe being employed. Lugs are clamped on to the frame, and to these the attaching arms, which are cast on the crank chamber, are bolted. Personally, we are inclined to prefer the arms attached directly to the frame rather than to the lugs, which are already clamped to the frame. The clutch is of the usual conical type contained within the flywheel, and is provided with a universally-jointed shaft to the change speed gear. The gear box is of aluminium, and is attached to a cradle depending from the main frame. This cradle performs a double duty, as it serves to brace up the main frame on the girder principle, as well as to carry the gear box. This construction is plainly shown in the photo-reproduction of the chassis plan. The change-speed gear gives four forward speeds and one reverse, all being operated by a single side lever. The gearing itself calls for no particular attention, it being on the usual sliding or Panhard type now so largely used. From the speed change gear the power is transmitted to the rear-driving axle by a propeller-shaft and bevel gear, which surround the differential. The whole of the axle and gearing are well enclosed to render them oil-tight and dustproof One of the principal features of the car is to be found in this section of the transmission. On the rear end of the secondary-shaft is a spring-driving device, by means of which the power is delivered to the propeller-shaft through a series of spiral springs which serve to take all excessive shocks off the gearing. Around this spring drive box is the countershaft band brake, which is so constructed as to close in on the drum equally all round the periphery. The majority of such brakes are rigidly fixed at the point of hinging, so that as the band closes upon the drum, it gets its grip upon the closing-in side first, failing to touch it upon its opposite side, but tending to pull the brake drum and shaft towards it. By placing the hinge of the band upon a swinging lever, the Velox Company overcome this difficulty, and obtain the full frictional contact of the band upon the drum. The method of construction is clearly shown by the accompanying illustration. The framework is of tubular construction throughout, with the exception of two forward tie rods. Built upon the girder principle, it gives a very rigid frame without adding to the weight. The side members are connected by four cross members, from the middle two of which four vertical members depend, these being connected by tubes parallel to the main frame. It is to these tubes that the gear box is clamped. From the front vertical tubes solid tie rods run up to the forward cross member, while from the opposite tubes

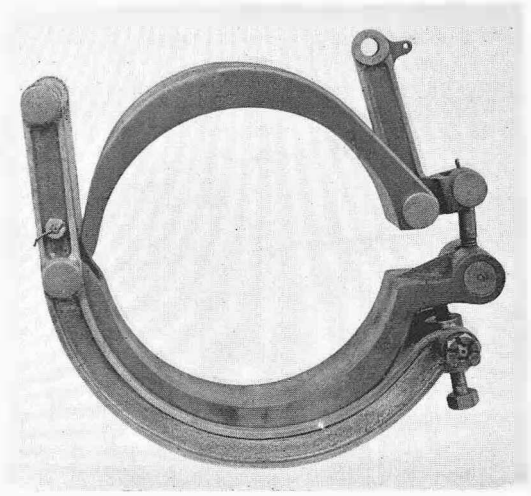


The Velox 12 h.p. four-cylindered chassis.



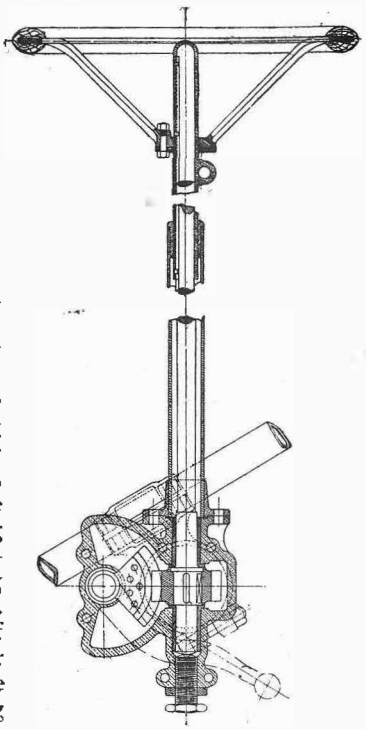
A view of the rear part of the Velox chassis.

tubular stays run to the rear cross member. The most interesting part of the construction is found in the rearward part of the frame, together with the method of springing and anchoring the rear axle, which is shown on the opposite page. It will be



The Velox countershaft band brake.

noticed that the back springs are linked to the frame at both ends instead of being anchored at one end, as is more usual. Fixed to the frame are two guide boxes in which guides attached to either end of the axle work. These guides prevent any degree of longitudinal movement to the axle, while they allow a considerable latitude for lateral movement of the frame. At the bottom of the guides are substantial rubber blocks upon which the guide boxes can sit when the springs are under heavy loads and running under adverse highway conditions. As a further stay to the back axle, tie rods run from a bracket on the rear vertical tubes to lugs beneath it, but only come into play at extremes in either direction. The springs shown in the illustration allow for the necessary play due to the vertical movement of either axle or frame. This arrangement is one of the particular features of the "Velox" vehicle, and one which is well worth studying, although not confined to this particular make alone. Referring back to the illustration of the rear frame, it will be noticed that a forked arm projects rearwards from the back axle. To this arm the band of the brake is attached by a bolt and nut, by means of which the band may be adjusted to the drum; further, when it is necessary to remove the band, it only requires the removal of the bolt to detach the whole. The wheels are of the usual artillery type. Contrary to the usual practice, the bend of the front axle is upwards and over the starting-shaft instead of under. This is to obtain greater clearance between it and the road surface. Another interesting detail is the steering gear and wheel. The gear is attached to the side members of the frame by means of a casing which is bored to receive a barrel turned on the gear box. It is thus possible to adjust the steering column to any angle to suit the driver, and being so adjusted it may be clamped in position, suitable provision being made for shortening or lengthening the connecting rod. The wheel itself is adjustable for height on the column, this being done in a similar manner to the adjustment of the handle-bar on an ordinary bicycle. The convenience of the driver is further considered in the pedals, the plates of which are also adjustable to any convenient angle through a simple quadrant and pinching bolt. As we before said, the car may be fitted with any body, and we consider the price asked for it quite reasonable.



The Velox adjustable steering wheel.

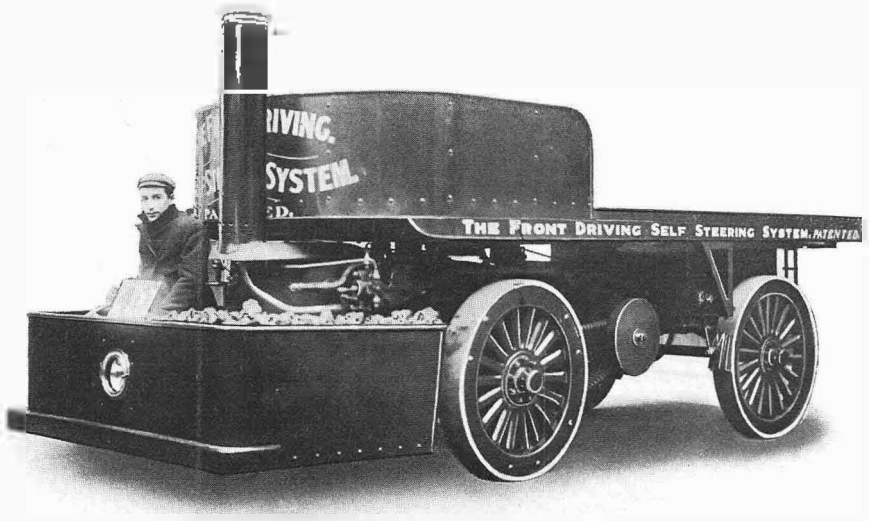
THE QUEEN'S PALACE.

ARGENT ARCHER, 195a, Kensington High Street, W., shows samples of his photographic work, with motor cars as subjects. Needless to say, the work is of the highest class, and shows true artistic treatment.

C. R. BASE, 309 and 310, High Holborn, W.C., has a good display of special motor clothing in tweeds, leather, Meltons, and furs, for ladies' and gentlemen's use. A selection of travelling rugs and other element-defying adjuncts are also shown.

L. A. BECKETT, 33, Marchmont Street, Russell Square, W.C. This firm exhibits for the first time in any English show a car on the Mathieu system. The novelty in this system is the change speed gear. This is of the sliding type, giving three speeds forward and reverse, with single lever, without having to go through any other gear when changing from one to the other. The whole operation is very simple and complete, being a single movement of the lever backwards or forwards, with, in the case of the second, third, and reverse speeds, an outward push. With the lever in the central or neutral position, a simple forward movement brings in the first speed gear. The second speed is obtained by bringing the lever directly back to its opposite limit. The top speed is obtained by bringing it back to its neutral point, giving it an outward thrust and carrying it forward; and the reverse is by getting on to the neutral notch, thrusting the lever outward, and pulling it back. The motive power is supplied by a single-cylinder engine with a bore of 110 mm. and a stroke of 130 mm. The carburetter is of the float feed type, the mixture being regulated by adjusting th-

petrol supply through a variable nipple, the air remaining constant. The usual water-cooling system is employed, the Loyal radiators being carried below the frame in front. Power is transmitted to the change speed gear through the usual conical friction clutch, thence by a propeller-shaft with universal joint to the bevel gear on the back axle. The universal joint on the propeller-shaft is provided with a series of indiarubber buffers, which serve to take up all driving shocks. The live axle runs in ball bearings of special design. The peculiarity of this is that the double row of balls run upon a central ball formed on the axle. This allows any side play in the bearing without the possibility of chipping in thin places, such as naturally occurs with the usual type of ball race. This bearing is also fitted in the change speed gear. Another feature which we should mention in connection with the throttle governing is the governor itself. This is of a new design, consisting of a number of heavy balls in a cage; as this cage revolves, centrifugal force causes the balls to fly outward from the cage and act upon a sliding sleeve on the shaft. This sleeve is, of course, in connection with a lever operating the throttle valve. Still another feature is the steering gear. This consists of a double threaded shaft working in suitable nuts in the top and bottom of the steering column, so that the motion is communicated to the steering wheels by a screw action, which causes the wheel to rise and fall in accordance with the movement given the steering wheels. We may say that this type of steering is perfectly adjustable by means of the top internally-threaded sleeve. The framework carrying the mechanism is tubular, as is also the underframe carrying the engine and gearing. The whole runs upon usual artillery pattern wheels. A complete car is shown on the stand, and its outward appearance does not materially differ from the usual design of autocar.



The Brightmore five ton lorry tractor.

BLERIOT LAMPS, 54, Long Acre, W.C., exhibit their justly celebrated make of motor lamps, including types of head and side lights. These are very well known, and need not be described here, as no substantial alterations have been made in their construction. The lamps shown take the usual form, both with circular and oval front glasses. The latest lamp has a big head light, above which is mounted a smaller lamp. This latter may be used simply as a warning light when there is sufficient light to drive by at night without using a big lamp, and on dark nights the latter would be brought into use, and the smaller one discarded.

BLOCK AND CO., 59, Lillie Road, S.W., show a preparation called "Rustoff," a name which is self-explanatory.

A. W. BRIGHTMORE, Egham Hill, Egham, Surrey. On this stand is seen a five-ton steam lorry on a somewhat new principle, for which the exhibitor holds English and foreign patent rights. It comprises a well-built steam tractor which may be applied to any van body sufficiently heavy and substantial in build to transport loads by the tractor. This consists of a vertical type of boiler placed under the forecarriage, the engine with its gearing being encased and hung in an iron girder frame. The drive is taken from the countershaft through Hans Renold side chains to the front steering wheels. The driver operates the tractor from a seat placed on the right-hand side of the boiler, so that he is below the level of the platform, and has the whole control of the machine directly under his hand, including the stoking of the boiler, which is fed from the side bunkers carrying the necessary fuel, the latter consisting of ordinary gas coke. The balance of the tractor appears to be about equal, as the boiler and its tender are forward of the front driving axle, the engine and the gear being in the rear of it. The water tank is carried directly over the back axle, and is coupled up to a direct-driven steam pump feeding the boiler through a flexible tube.

THE BRITISH GERMAIN MOTOR CAR CO., LTD., Hanover Court, Hanover Square, W., have a nice exhibit of half a dozen "Germain" cars, varying from 7½ h.p. to 20 h.p.; also a 7½ h.p. "Staughton" car and 7½ h.p. "Staughton" chassis. The "Staughton" car is driven by a single-cylinder water-cooled engine governed on the induction, driving through ordinary friction cone and change speed gear, giving three speeds and reverse by propeller-shaft to bevel gear in differential box on live axle. The brakes fitted to the driving wheels are of the internal compensated expansion type, having very wide flanges and being undoubtedly very powerful in application. Although this vehicle does not offer any special features in design, yet we particularly commend it to the attention of our readers, by reason of the care and thought that have been given to all special points where strength and good fitting are necessary. Lubrication

of all wearing points in particular has had special attention. All journals are on ball bearings, and road wheels may be had either artillery or of the cycle-built type. The finished car carries a neat twin-seated body, finished in green and yellow. The "Germain" cars, so far as their driving mechanism is concerned, have been dealt with so lately that we do not propose to detail them here; but the body design and finish of the vehicles shown deserve some attention, particularly the Limousine body. It has several special fitments worthy of notice. The front seat is made to hinge forward, so that the ample petrol tank below is easy to get at and remove for repair, if necessary. The fittings within the Limousine are most luxurious, and altogether this is a very well-designed and noble-looking vehicle. The "Germain" cars are now fitted with special form of carburetter, which will shortly be described in our columns.

BROWN BROS., LTD., Great Eastern Street, W. This firm only came into the exhibition at the last moment, and do not appear in the catalogue. They are showing a new 8 h.p. car with a two-cylinder vertical engine of the Daimler type which is governed on the inlet. The car is gear-driven, having three speeds and reverse actuated by a single lever. The framework is strongly constructed of channel steel, and supported on substantial axles and springs, the back frame being hung on two side and one transverse springs. The wheels are of the artillery type, 28in. in diameter, and shod with Clipper-Michelin tyres. The wheelbase is 7ft. 3in. and gauge 4ft. 3in. The usual brakes are supplied, and the rest of the arrangements are on general lines. The body shown is a nice-looking and roomy tonneau, the whole being of good design closely following the Panhard type.

THE BURLINGTON CARRIAGE CO., LTD., 316 and 317, Oxford Street, W. The exhibit here is one which attracts considerable attention, it being the splendidly-finished example of the 16 h.p. "De Dietrich" chassis which was exhibited at the late Paris exhibition, and was fully dealt with in our report of that show. Those automobilists who failed to visit the Salon should take this opportunity of examining this fine specimen of automobile construction. A 16 h.p. trial car is running in the exhibition grounds.

THE CENTURY TANNING CO., Wrexham. On this stand are shown various sizes and weights of green hide tanned belting for cars and cycles.

J. AND C. COOPER, 64, Long Acre, W.C. This stand consists of a large baize-covered board, upon which are some framed designs for cars of various makes and descriptions, from the heavy lorry, through the light delivery van, down to the simple two-seated voiturette on the lines of the quadricycle.

CRAWLEY, NEUMANN, AND RABEN, 6, the Facade, Villiers Street, W. This firm make a speciality of motor goggles, spectacles, and eyeglasses, adapting these to the wearer's sight.

ALFRED DUNHILL, 145 and 147, Euston Road, N.W. As may be expected, this firm have a very extensive range of motor clothing of all descriptions, and in addition show cleaning materials and car covers in great variety. In the smaller articles they have some special motoring caps in cloth and leather, and their well-known driving gloves in a variety of styles and colours. Some very useful things in the way of waterproof hold-alls, in which a lot of stuff can be stowed away in a small compass, are also exhibited, together with a selection of lamps, horns, rubber foot mats, and other motor sundries. The particularly large selection of motor clothing shown here prevents our noting it in detail, but we can strongly recommend a visit to this stand to all practical automobilists.

THE ELEPHANT CHEMICAL CO., Neate Street, S.E. A variety of motor oils and motor greases put up in various sizes and convenient forms are shown. Also a special make of calcium carbide which is put up in a handy form. These motor oils and greases are, we believe, so well known to motorists that we need not express any opinion on them here.

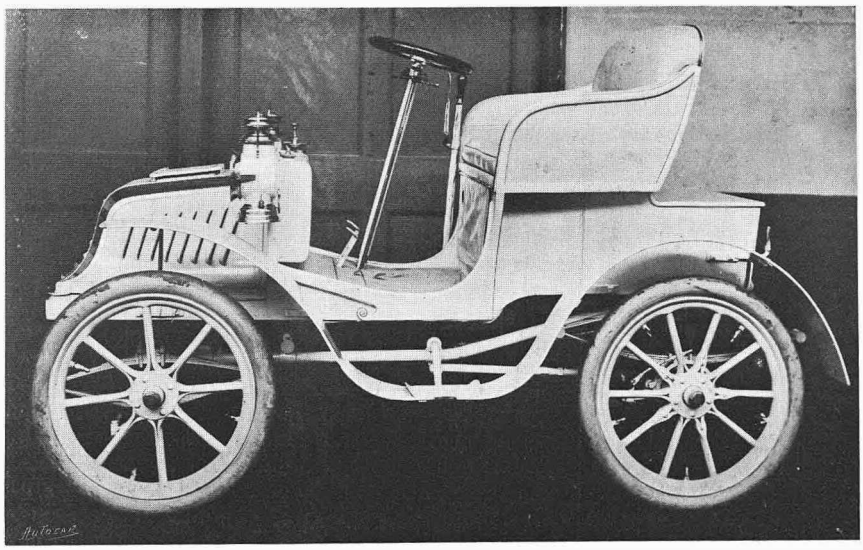
THE ENGLISH MOTOR CO., 3, Hanover Court, Hanover Square, W.C. An interesting two-seated car, known as the "Oilmobile," is shown on this stand. In general appearance it is not dissimilar to the American-made Oldsmobile, and in its construction follows somewhat upon the lines of the latter-mentioned car. It is propelled by a 5 h.p. motor with horizontal cylinder and a particularly large flywheel. The carburetter is of the simple spray type, supplying mixture to the engine through an automatic induction valve; a simple throttle valve is fitted, this being operated by a small pedal on the footboard. The ignition is on the usual high tension system, with trembler coil. The transmission gear is by epicyclic gearing, giving two speeds and reverse, actuated by a small lever conveniently placed at the right of the driver. From the countershaft the drive is conveyed to a live back axle by a single chain. The usual braking power is fitted to the car, and the action of applying the principal band brake releases the gear which is at the moment in operation, this preventing any undue strains which may possibly be thrown upon the gearing. The water-cooling is on the thermo-syphon principle, the radiators being placed flat beneath the floor-board, thus acting in a measure as a foot-warmer. The carriage runs on steel-built wheels—that is, the hubs, spokes, and rims are entirely built up from steel—and the steering is of the tiller type so general on this class of car. It is stated that twenty-five miles an hour can be attained on this machine, and that forty miles have been run on one gallon of petrol. Although the machine is shown with Dunlop tyres, it is, nevertheless, insufficiently equipped for English use, inasmuch as it is lacking in mudguards.

EVART-HALL, LTD., 15, Savile Row, W. Here we have four nice examples of the well-known Oldsmobile car—three with the American type of skeleton hood which makes the doctor's car, and one with single phaeton body. "Diamond" tyres and the detachable "Savile" mudguards are also shown.

THE FLEUSS PATENT AUTOMATIC BOILER FEED AND MOTOR CAR SYNDICATE, LTD., 15, Bury Street, St. Mary Axe, E.C. At this stand may be inspected a model of the patent automatic boiler feed made by this company, by which the water in the boilers of steam cars is maintained automatically at a con-

stant level. The regulator, which is fitted close to the boiler, is of cylindrical form, and contains a concentric chamber in which a double plunger is given a perpendicular movement by a rockingshaft from a crank on the engineshaft. This rockingshaft also actuates the ordinary force pump. The water is delivered by the latter into the upper portion of the regulator, and is carried down into the lower section by means of the upper part of the pump plunger. When the water level in the boiler has risen above the lower edge of the pump gland, no more water can pass to the boiler, but is delivered back to the tank by the upward stroke of the lower half of the twin plunger from the relief valve connected with the delivery pipe. This fitting deserves attention, and we hope to be able to produce a comprehensible diagram which will clearly show the working thereof at an early date. A car is shown on the stand from which the hand feed regulator has been entirely removed and the Fleuss regulator fitted in place of it. The latter has now been working most satisfactorily for over a thousand miles.

FRISWELL, LTD., 48, Holborn Viaduct, London, E.C. Here is seen an extensive show of "Peugeot" cars. These are the 12 h.p. four-cylinder car, the 8 h.p. two-cylinder car, and the well-known "Baby Peugeot." The first of these is a replica of the machine which attracted so much attention at the last Paris Salon. The engine is a four-cylinder vertical one, placed in front, having mechanically-operated inlet and exhaust valves opposite each other, and interchangeable. The ignition is either by magneto machine or on the usual high tension principle with accumulator and coil. In one case both systems are mounted together. The forced system of water-cooling is employed, with honeycomb radiator placed in front. The change-speed gear gives four forward and one reverse speeds. As this car was fully dealt with in our Paris show number, it is unnecessary to give any further details here. The 8 h.p. car is of the usual standard type with two-cylinder vertical engine in front. The high tension system of ignition is used in the model shown, and the governor is of the ordinary centrifugal type acting upon a throttle valve. The latter is also controllable by a small lever mounted upon the steering column. The water-circulating system on the one car is with the ordinary radiators placed below the level of the frame in front. The second type is shown with the honeycomb radiator mounted as in the 12 h.p. model. In this car there are three speeds forward and reverse, the top speed driving direct on to the countershaft, thence by chains to the back wheels in the usual manner. As far as the bodywork is concerned, both cars are fitted with tonneau bodies with canopy tops and removable glass fronts. A specially fine display is made of the "Baby Peugeot," which is shown finished in various styles, all of them being very attractive; and we must say for a light two-seated car this vehicle strongly impresses us. It has been greatly improved, the price being somewhat increased in consequence. The principal addition to the earlier type is the three-speed gear and reverse. This speed-change gear is a very neat piece of work, the mainshaft being run in ball bearings, and having an intermediate-shaft at the end carrying a brake drum, this being connected to the propeller-shaft through the universal joint. Of course, the new gear drives direct on the top speed. The second improvement is the fitting of artillery wheels, which have reinforced voiturette tyres, instead of the light tyre previously used. The control of the car is very nicely arranged, the speed-change lever being mounted on the right-hand side of the steering column, the mixture and sparking advance levers being on the left-hand side. The clutch and brake pedal are also conveniently situated, and are easily operated, thus making it an ideal car for ladies' use.



The 1903 Baby Peugeot. This is the same car that was shown in the Paris Exhibition.

HAYNES AND SON, LTD., 17, Goswell Road, Aldersgate, E.C. This is a new firm in the motor industry, and it is showing light German-made cars in which moderate price is the chief characteristic. The motors are two-cylinder, vertically placed, giving 5 h.p. These are placed beneath the seat of the car forward of the back axle, and drive by means of a simple sliding type of gear on to a bevel wheel on the live axle. Water-cooling is by positive throw pump and the usual radiators. One thing we particularly noticed about this was that every provision has been made for draining the system, to prevent damage by frost during the winter. Lubrication has been well attended to, an oil tank supplying all the main bearings through a single drip which distributes the lubricant equally to all of them. The carburetter is the well-known Longuemare. One of the machines shown has a very light two-seated body mounted upon wire

wheels, another having the same body with artillery wheels (we may say here that there is no difference in the price of these two models), and a third machine with a light platform, suitable for a tradesman's delivery van. A fourth vehicle has a 5½ h.p. motor, which is placed in front of the car beneath the usual bonnet. Its details are the same as those in the smaller car, except that it drives through a propeller-shaft on to a gear box attached directly to the back axle containing the three-speed gear and reverse, and has a spider seat. A low selling price seems to be the chief aim in the production of these cars.

J. W. LOVEGROVE AND CO., 175, Piccadilly, W. The "Drimosit" rug, which we illustrated and described in detail in our issue of last week, can be seen at this stand in various materials and linings. The Lovegrove "Ideal" motor coat in leather and various cloths, specially lined, is also shown, while the Lovegrove "Ideal" all weather coat in leather and cloth, with what may be termed a drop curtain at the back, most effectively protecting the back of the neck and ears from wet and cold, can also be seen. Indeed, this stand is well worth a lengthy visit from every automobilist who contemplates fitting himself up with up-to-date automobile garments, for Mr. Lovegrove has devoted much attention and ingenuity to the efficient designing of garments calculated to effectively resist cold, wind, and rain. A large assortment of motor accessories is also shown, but the exhibit is so varied that it is impossible to deal with it in detail in a report of this description. The only way to appreciate the contents of the stand is to examine them.

MEREDITH-JONES AND SONS, LTD., Wrexham, show samples of leathers suitable for motor clothing and the upholstering of carriage bodies.

MILDE AND CO., 34, Victoria Street, London. A new electric car is shown on this stand, and the "Milde" patented motor is employed to provide propulsive power. This motor is of the four armature type driving direct from a small pinion at the ends of the shaft on to two internally-toothed wheels connected to the road driving wheels. The accumulator plant consists of eighty-eight cells weighing 700 kilogs., having a capacity of 102 ampère hours. This is sufficient to run it at a speed of from twelve to eighteen miles per hour. When not using the current from the cells for driving purposes, the motor acts as a generator to recuperate the cells, *i.e.*, when the controller is brought back on descending a long hill the motor is for the time being converted into a dynamo, which recharg s the cells and acts as an electric brake; thus the capacity of the vehicle is materially increased, enabling it to cover longer distances irrespective of charging stations. The car itself, which is of the brougham type, is of handsome appearance, and should prove a serviceable vehicle.

DAVID MOSELEY AND SONS, LTD., Ardwick, Manchester. A variety of rubber goods, consisting chiefly of inner tubes of various sizes and weights, in grey and red rubber, are exhibited by this firm. The other rubber goods of particular interest to motorists are special patching rubbers and footboard mats, of which there is a good variety in form and pattern. The firm also show samples of black and vulcanised fibre, which should be of interest to manufacturers. Light covers suitable for motor cycles and light cars are included in the exhibit. As this firm have a very high standing as manufacturers of rubber goods, the stand is well worth a visit.

THE MOTOR CAR CO., LTD., 168, Shaftesbury Avenue, W. On this stand is shown a standard 20 h.p. "Decauville." The car has been mentioned so frequently and described so fully in our pages that it is unnecessary to go into details here. We may say, however, that the latest ignition is used, *i.e.*, with the dynamo placed at the back of the dashboard and driving from the crankshaft by a belt. This charges the accumulators while the engine is in motion, thus supplying the current as it is used up.

THE MOTOR HIRING CO., Savile Row, W. This company were listed to show three "Passy-Thellier" cars, but at the time of our visit these had not materialised.

THE NEW AUTOMOBILE CO., Cambridge Circus, W.C. The new 6½ h.p. "Rochet" is shown for the first time. This is one of the gold medal cars of the Paris exhibition. It is a smart little vehicle with double-scolloped seats and pointed toolbox at the back. The change-speed gear is of the sliding type, giving three speeds forward and reverse, and driving thence through universally-jointed shaft and bevel gear to live back axle. The standard pattern "Rochets" in the larger sizes are the 11 h.p. two-cylinder and the 16 h.p. four-cylinder. These are fitted with change-speed gear of the modified Panhard type, but the excellent and well-tried epicyclic gear with interlocking clutch, making it impossible for the gear to be changed till the engine has been thrown out of drive, is retained and supplied when wished, the sliding toothed gear being introduced to meet popular demand. Specimens of 6 h.p. and 10 h.p. "Miesse" steam cars are also shown. The improvements include automatic lubrication and a throttle valve, the latter enabling the engine to be controlled entirely by pedal. The generator has been further improved, the joints being made by screw coupling and then welded, the tubes being butted or thickened at the joints. We understand that these generators are now guaranteed for two years. The three-cylinder single-acting engine is retained and the burners are unaltered. To do justice to this unique system requires more space than we have at our command at the moment, but we hope to describe the "Miesse" in detail ere long.

THE NUGGET POLISH CO., LTD., Kennington Oval, London, S.E. On this stand is shown a variety of the well-known "Nugget" polishes. The black and brown leather polishes are most useful adjuncts to the motor cleaning outfit, as besides being perfect polishing mediums, they are also good waterproofing substances and leather preservatives. From regular use we can speak highly of the black leather polish, which we prefer to all others.

NURNBERGER MOTORFAHRZEUGE-FABRIK "UNION" G.m.b.H., in Nurnberg 90. One of the most curious cars in the show is to be seen on this stand. It is fitted with a single-cylinder vertical motor placed transversely, having at its rear end a large

disc and at its forward end a smaller flywheel. This disc drives on to a leather-faced friction wheel placed on a transverse countershaft, this latter driving in turn through chains to a rear live axle. Mounted upon the steering column is a small hand wheel and a chain wheel, which by means of a chain operates a shaft parallel to the countershaft; this, through a screw thread and yoke, causes the friction wheel to travel towards or away from the centre of the driving disc according to the speed required. The necessary pressure of the disc upon the friction wheel is obtained by means of a lever placed transversely in front of the engine and bearing through a thrust collar upon the crankshaft, the latter being free to move endwise and be brought into driving contact with the pulley. The system has been simplified since it was shown in the National Show last November.

THE PAGE MFG. CO., 100, St. John Street, West Smithfield, E.C., show a preparation in liquid and paste for metal and enamel polishing purposes and a powder for cleaning plated parts.

C. R. RADCLIFFE, 44, Devonshire Chambers, 17, Bishopsgate Street Without. A vehicle known as the "United States Long-distance Autocar" is staged here, being the first machine of this make to arrive in this country. The vehicle is propelled by a single-cylinder horizontal engine placed beneath the seat—5in. bore by 7in. stroke, running at 700 revolutions per minute. The inlet valve is mechanically worked. There is a water jacket to the cylinder, but no signs of a tank or radiators. Electric ignition is employed, and this appears to be of a hybrid character, as it has a low tension pattern sparking plug in connection with a huge battery of some type, and a small coil. The speed variation is by epicyclic gears, which, we presume from their arrangement, give two speeds forward and a reverse. Unlike many American cars, this vehicle is fitted with wheel steering.

THE RUCKER PNEUMATIC TYRE CO., 165, Fenchurch Street, E.C. The "Rucker" tyre and inner tube, about which there has been some discussion during the past few weeks, was shown for the first time on this stand. The firm's method of treating inner tubes to prevent them bursting in the event of a gash being made in the outer cover is very ingenious. They wind loosely round the tube a strong double thread. The inner thread is of soft material, and wound tightly around this is a very strong thinner thread. In the ordinary course of events, the thread does not bear directly upon the tyre, only coming into actual use in the event of a gash occurring in the cover. What happens then is that the tube, in its endeavour to blow through the hole in the tyre, causes the thinner thread to snap, thus releasing the inner cord, which forms a special fabric, preventing the tube bursting. Existing tubes can be treated with this thread, thus giving them all the qualities of a specially-made "Rucker" tube. The tubes are wound with the thread, and over that is laid a protecting film of pure rubber, which is vulcanised by a chemical process. It is really one of the most interesting things in tyre practice which has appeared for some time past, and is specially worth the attention of all practical automobilists. The firm also show a special tread attached to a Dunlop tyre. This has a flat contact surface with the road, and is sufficiently thick to make it non-puncturable. By its peculiar method of construction a great deal of flexibility is obtained, thus retaining, as far as possible, the advantages of a light tyre with those of a thicker one. A new Dunlop tyre fitted with the tread was shown on the stand. In this case, the tread was affixed to the tyre, and the side walls thinned by removing the outer layers of rubber, so that it assumed the appearance of an open-side cycle tyre, the idea, of course, being to obtain a thick wearing tread and a thin side wall to give the tyre resiliency. We certainly see nothing against this principle, as the strength of the tyre lies in the fabric and not in the outer cover of rubber; therefore it cannot be said that the removal of the rubber from the outside has any adverse effect on the tyre in this respect.

SHIPPEY BROS., LTD., 13 and 14, King Street, Cheapside, E.C. Although four electric cars are mentioned in the catalogue as being exhibited, the only stand we could identify as No. 3a exhibited but one example of a 6 h.p. Canadian-built five-passenger family brougham, of very handsome appearance and finish, and fitted with Stills's duplex electric motor, driven by a current from forty "Ideal" storage batteries. The vehicle has central lever steering, Shippey's combined volt and amperemeter and electric lamps, brakes actuated by foot and hand, and many modern improvements. On another stand, numbered 19, was shown a Canadian doctor's electric phaeton. To all appearance, no alterations have taken place in its construction during the past twelve months or so, and its outward design remains unchanged. As to any unseen alterations which may possibly have been made, we are unable to gather information, as at the time of our visit no one was in attendance at the stand.

THE SPEEDWELL MOTOR AND ENGINEERING CO., LTD., 50, Albert Gate, S.W. Examples of the 6 h.p., 12 h.p., 20 h.p., and 40 h.p. "Gardner-Serpollet" cars are found here, fitted with well-designed tonneau and double phaeton bodies. The pick of the stand is the chassis of the 40 h.p. "Gardner-Serpollet" car which was shown on the Serpollet stand at the Paris exhibition, and was fully described in our report of that show. It is only necessary here to again draw attention to the Stevenson link control of the water and oil feed in place of the series of stepped cams, the new 40 h.p. engine, and the change made in the shape of the generator, which is now rectangular instead of square, by means of which twenty instead of sixteen burners are now available. We hope to go more definitely into the construction of these well-designed vehicles from line drawings, which have been promised us for reproduction. One of the 6 h.p. cars is fitted with an opening and closing brougham body, making an extremely comfortable and convenient vehicle for country, night, and station work. At the end of the stand we have the first 20 h.p. "Serpollet" to arrive in England, which was driven from Paris by road. This car is fitted with an extremely comfortable and well-upholstered double phaeton body, the rear seat giving ample accommodation for three passengers. This well-known car has been so fully dealt with in our recent

issues that we do not dwell further upon it in this report. Within a case upon the stand is shown an interesting collection of the various special parts of "Serpollet" mechanism. Altogether, the stand is one which should not be missed by automobilists interested in steam propulsion.

EDWARD TOMLYN, 69 and 71, Weston Street, Bermondsey, S.E., exhibits leathers for clothing and upholstering.

USINES PRUNEL, 24, Mortimer Street, W. Four types of "Prunel" cars are shown—the 9 h.p. single-cylinder, 10 h.p. and 12 h.p. two-cylinder cars, and a four-cylinder 24 h.p. The design of this is on conventional lines, the drive in all cases being through friction clutch, ordinary sliding change-speed gear, and thence by balance-geared countershaft and outside chains to rear wheels. The standard type of engine fitted is either the Aster or Herald. No material changes have been made in the design, but the prices of some of the models are certainly very attractive.

THE VICTORIA CARRIAGE WORKS, LTD., Long Acre, W.C. The "Toledo" steam car is built on the usual light steam carriage lines. Its special feature is the water tube boiler, which was illustrated and described in *The Autocar* of Nov. 15th, page 492. It will be remembered that in this device the boiler is of the pot variety, the water tubes running from the bottom of the water ring up into the steam space. These tubes are of a spiral form, and present a very effective heating surface, giving a remarkably violent circulation. The fire space, it will be understood, is practically filled with these water tubes. The engine has the big ends and cranks enclosed; but the eccentrics and link motion are exposed. Piston valves are employed. The steering is of the hinged bath chair type. An electric phaeton is also exhibited on this stand.

WADDINGTON AND SONS, 30, Newport Road, Middlesbrough. "Waddington" cars of 6½ h.p., 9 h.p., and 10 h.p., with two-cylinder motors, are on view on this stand. The 6½ h.p. autocar is similar to that made for H.R.H. the Nawab of Surat. It is driven by a De Dion motor of 105 mm. bore and 110 mm. stroke, through friction clutch and three-speed gear box, propeller-shaft, and live axle in the usual way. Petrol and water tanks are placed under the driver's seat, and the whole control is by levers at the driver's right hand; an air and mixture lever are set on the steering standard wheel, and worm steering is fitted. This car is nicely finished in cream, lined with gold. The 9 h.p. "Waddington" car is driven by a De Dion engine through three-speed gear box, etc. It carries a well-finished, comfortable tonneau body, by Lamplugh, of Paris. The 10 h.p car has a two-cylinder governed engine, with gear box giving four speeds and reverse. The gear wheels in this car are always in mesh, and the drive is actuated by a gear striking lever on the right-hand side of the driver. A nice range of motor lamps and accessories is shown at one end of the stand. A special feature of this accessory exhibit is the "Waddington" sparking plug—an extremely good-looking plug of the De Dion type—which is offered at a remarkably low price. A neat electric hand inspection lamp is shown.

THE DUNLOP NON-SLIPPING TREAD.

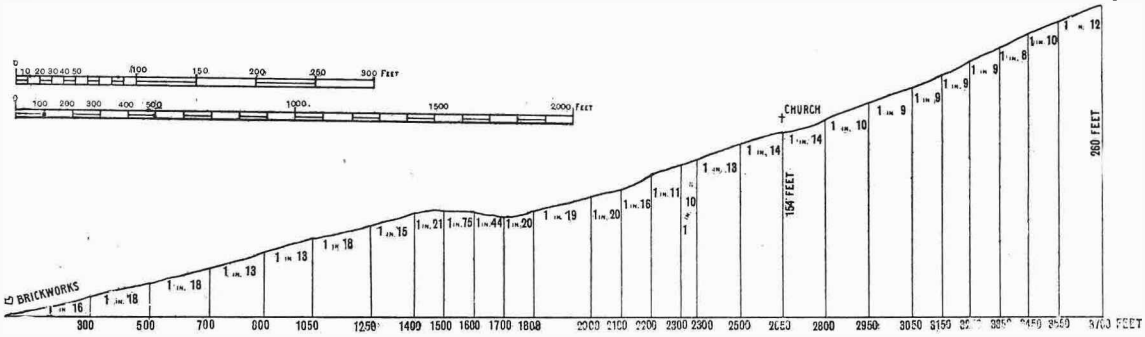
On Wednesday last week, at the invitation of Mr. Arthur DuCros, we embarked upon his 15 h.p. Panhard, in order that the remarkable efficacy of this new non-slipping tread might, in the interests of our readers, be demonstrated to us. All who are aware of the condition of the streets of the West End during last week will realise that to find one's self aboard a 15 h.p. car, approaching a narrow asphalted corner at something considerably over the legal limit, with the road surfaces as they then were, is enough to try the nerves of most automobilists. We will frankly admit that as Mr. Arthur DuCros swung his vehicle in and out of the traffic of Waterloo Place, Pall Mall, and Regent Street, swirled corners as closely as they could be taken, and at intervals jammed down both pedal and side brakes so hard that the back wheels were locked and slid for some few yards, we were conscious of a feeling of nervousness stealing over us. But this sensation passed with the early moments of the trial, for moments only were necessary to show conclusively that the Dunlop Pneumatic Tyre Co. have lit upon a simple form of tread which comes as near as needs be to a perfect form of non-slipper, even on that most treacherous of all substances, grease-skimmed asphalt—to say nothing of wood and macadam. Cyclists who can recall Edwards's non-slipping tread will best realise the design of the new Dunlop tread when we say that it is a form of inverted Edwards's tread. That is to say, transverse segmental grooves are formed all round the tread, the grooves being about ⅝in. to ¾in. wide and 1¾in. pitch. The tread carrying these grooves is made up with the cover, but is of special rubber. From the track left on the road surface by the wheels when curve taking, or when locked by the brakes, it is evident that the edges of the segmental grooves clear the grease away before them and find holding surface beneath. There is no doubt whatever of this, and the vehicle in which we rode—and which was put through evolutions that with smooth tyres would have caused it to dance a tarantella across Regent's Circus—showed no signs of sideslip under the worst circumstances. Mr. Arthur DuCros informed us that he had driven a pair of these covers over 2,000 miles, and they had not shown much wear. Treads formed with the non-slipping device, and held to the ordinary tyre they protected by inextensible wires in their edges *à la* Welch patent, were attached to the steering wheels, and the Dunlop Company contemplate putting such non-slipping treads upon the market. Car owners who wish to drive over treacherously greasy surfaces in safety will then be able to have these treads placed upon their tyres at will. This can be done easily by deflating the tyre, slipping cover into position, and re-inflating. We hope to give a photographic illustration of this simple and efficient device in our next issue.

Lowne's crank log. If this should meet the eye of the maker of this distance recorder, whose address we have lost, we should like to have same without delay at 3, St. Bride Street, Ludgate Circus, E.C.

PARBOLD HILL.

In response to the requests of several correspondents, we now have pleasure in giving the gradients of Parbold Hill, near Ormskirk. These levels, we may say, have been specially taken for *The Autocar* by Mr. H. Rimmer, architect and surveyor of Ormskirk.

Parbold Hill is situated about four miles from Ormskirk, and is on the Wrightington-Wigan road. It is undoubtedly the steepest long rise in the district, but the surface is very good, and the hill therefore forms an admirable testing ground for autocars. As will be seen by the levels, the hill in its steepest part has a rise of one in eight, and when



we say that it is not infrequently ridden by cyclists (we are told that a lady cyclist who resides at Wigan has several times been seen to ride from the bottom to the top of the hill) it will be plainly apparent that the surface must be much better than is usually met with on long slopes of this description.

Liverpudlians bound for Parbold could travel *viâ* Ormskirk, Burscough Junction, and Newburgh, which is a run of about seventeen miles. Parbold is four miles from Ormskirk, and Burscough Junction is about midway between those places. Another way, and a pleasanter, is *viâ* Ormskirk, Westhead, Lathom, and Newburgh. This road is rather more winding, however, but as it is plentifully supplied with direction-posts, little difficulty need be experienced in keeping to the right way.

The best road from St. Helens to Parbold is by way of Rainford, Lathom, and Newburgh. Between Rainford and Ormskirk, and about four miles from the last-named town, there is a direction-post on the right, pointing to Skelmersdale and Lathom. The first turning on the left, on the Skelmersdale road, is the one that should be taken. Other turnings on this road lead to Parbold, but the ways are not so pleasant nor so easy to find as the one recommended.

From the summit of Parbold Hill to Standish and Wigan is a direct and fast run—downhill most of the way. The road goes over a fine expanse of water at Wrightington—a very pleasant spot—and is excellently surfaced as far as Standish.

Should the autocarist, after vanquishing Parbold, be desirous of putting his car at another neighbouring rise or two, he will find a couple of long and steep hills in the vicinities of Upholland and Billinge. The hill near Upholland is a very trying incline, chiefly on account of its bad surface (large and badly-worn setts) rather than its steepness. It may be reached by taking the first turning on the right on the Parbold-Wrightington road. The way then lies through Appley Bridge, Roby Mill, and Upholland (bad surface and hilly nearly all the way), the hill referred to being between the last-named place and Pimbo.

It is but a short run from here to Billinge, between which place and St. Helens is a very steep hill at a little place named Moss Bank. If the ride has been continued from Parbold to Wigan, then the Moss Bank Hill could be sampled on the way from the last-named place to Billinge and St. Helens, and the hill near Upholland could be taken on the return journey from St. Helens to Parbold, which should be made *viâ* Crank. From Wigan to Billinge is very good going once the town setts are left behind.

Motor omnibus services are proposed for eight towns in New Zealand.

* * *

Such is fame! Sergeant Jarrett, the constable who is rather well known on the Portsmouth Road, owing to his attention to motorists, is actually the subject of a parody on some lines of Kipling's in the last issue of the *Sunday Times*.

* * *

Recently the Peerless car was referred to as being constructed by Messrs. Coxeter and Sons, Ltd., of Abingdon-on-Thames. This is incorrect, and the word "supplied" should have been used instead of "constructed." In fairness to Messrs. Coxeter, we should add that the mistake was our own—not theirs.

In his new sketch, Mr. G. Grossmith fits the time with a taking song, entitled "Oh, dear, what can the motor be?"

* * *

The book of the Duryea power carriages is a very interesting description of the Duryea cars, in which the special features of the machine are very clearly described, and illustrated with line drawings, which show the details well. The book is particularly good, as the Duryea car is not of a standard type, and consequently it should be thoroughly described and the reasons for its deviation from standard given; and these are set forth quite as plainly as the details of construction. It is a really useful booklet.

CONTINENTAL NOTES AND NEWS.

The Growth of Automobilism.

The present year is likely to see the autocar take a very strong position in countries which have hitherto stood aloof from the movement. An encouraging sign of the times is the formation of clubs for the development of automobilism in Portugal, Spain, and elsewhere, all of them being promoted by distinguished members of the aristocracy and placed under the patronage of royalty. The fact that such influences should be at work in fostering an interest in the new vehicle shows how people who are concerned for a country's welfare regard the autocar as an instrument of national prosperity. Its value lies not only in the opening it affords for building up a new industry, since it is hardly likely that many of these countries will be in a position for a long while to come to construct suitable vehicles for themselves, but the autocar is destined to become a source of economy to those who use it, and whether for public or private transport, any economy in time and money necessarily means an increase of national wealth. Public interest in automobilism will be stimulated this year by the carrying out of trials and races in Portugal, Spain, and Italy, to say nothing of the usual programme of events in Austria and Germany, and on the top of this we have the Paris-Madrid race and the Gordon-Bennett cup competition, which will awaken a far wider international enthusiasm now that the movement is spreading to all parts of Europe. Apart from the influence of the clubs, automobilism is also being served by the progress of the industrial vehicle, which is perhaps making more headway on the Continent than is generally supposed, simply because the public are not usually so well informed upon the feats of the waggon, lorry, and omnibus as they are upon the doings of the great racing machines, which are more calculated to strike the popular imagination. And yet the waggon and omnibus are not without their uses for the development of automobilism generally, as is clear from what is taking place just now in Switzerland. Automobilists who visit Helvetia do not usually come away from that country with feelings of regret, except it may be for the money they have left in the hands of the police for infringing some of the numerous byelaws or driving on roads which are prohibited to autocars. There is probably no country in Europe where prohibition is carried to such an extent, the reasons given being that the presence of autocars on the mountain roads may prove a danger to the horses which are at present exclusively employed for transport. Fortunately, some of the Swiss authorities have come to see that the autocar may, after all, replace the horse with great advantage, and at Berne some trials are shortly to be carried out with automobiles for the postal transport on the mountain roads. A single trial should be quite sufficient to convince the authorities of the superiority of the autocar for mountain climbing, as we can testify from experience that there is nothing more tedious and more expensive than horse traction on these routes. A horse cannot climb a mountain road at more than two or two and a half miles an hour, while an autocar will carry twice the load at five miles an hour. If horse traction is suppressed for the public services, the authorities will no doubt remove the irritating regulations and restrictions which, at the present time, drive automobilists away from the country, and Switzerland will become what it ought to be—a popular touring ground. In Servia, also, the Government has been impressed by the value of the autocar since the visit of the automobilists on the occasion of the Paris-Vienna race last year, and a French engineer has been engaged to report upon the advisability of establishing public services of motor vehicles. It is not yet known what the nature of this report is likely to be. One of the strongest factors in the progress of automobilism is undoubtedly the prominence being given to alcohol, for when the Governments see that the automobile is not only capable of cheapening transport, but will come to the assistance of the agricultural industry at the same time, the last objections against the motor vehicle will fall to the ground. It will thus be seen that the way is being prepared for a very rapid expansion of the autocar trade this year, and there is every promise that the results for manufacturers will be of a highly satisfactory character.

The gold cup awarded by the French Minister of Agriculture to Messrs. Chenard and Walcker for their car which won the consumption trials last year. In the first essay in February some doubt was expressed by critics as to the correctness of the results, as they were the lowest ever recorded in the official test, but in the second trial, four months later, the first results were more than verified, as the car (weighing 23½ cwt.) covered 453 miles on a very small fraction over 12¾ gallons, approximately half that of the other cars of similar weight. It may be of interest to give the wording engraved upon the bowl, which is as follows: "Epreuve de Consommation Véhicules Pesant plus de 650 Kilogrammes."

The French Circuit.

We stated last week that a circuit race would probably be organised in France this year on the lines of the Ardennes Circuit, and it appears that such an event has already been fixed by the Chambre Syndicale de l'Automobile, who propose to run it off on July 19th. The course will be selected in the French Ardennes, where it is hoped to find a circular route of a sufficient length to make up the total distance of 310 miles, with two or three laps at the most, without neutralisations. The Chambre Syndicale will do their best to avoid the inconveniences of the Belgian Ardennes course, where, it will be remembered, competitors complained that they had constantly to pass each other, and some of the turnings were, moreover, of a very sharp and dangerous character. The promoters

are pretty sure of getting the necessary permission, as they have decided to run off the event with alcohol, and under these circumstances it is scarcely possible that the Government will refuse its sanction. Another interesting feature about the French circuit is that the classification proposed by the Chambre Syndicale according to the cylinder cube will be employed for the first time. We expressed the opinion last week that there would be some difficulty in adopting this classification, owing to the great variety of cylinder dimensions; but the idea of the makers is evidently that in each class of vehicles the motor will have the same cube, and will run at the same normal speed, while it is also possible that the vehicles will be required to have the same gear. The matter, however, will not be settled until the new classification has been reported upon by M. Max Richard and M. Gobron, who are respectively for and against the system, but if employed on the lines indicated it cannot fail to be extremely interesting as a test of autocar efficiency.

The Cup Race in Belgium.

The French are, naturally, taking a keen interest in the efforts of the A.C.G.B. and I. to find a suitable course for the Gordon-Bennett cup contest. So far they have been withholding any criticism which might have been considered as a little beyond their sphere, and if they have abstained from appreciations it is largely because they hoped that the organisers would finally be obliged to run off the race in France. The selection of Ireland could not have raised any objections if the roads were sufficiently good to allow of the cars travelling at their maximum speed. This is a point to which the French attach a very great importance, for as their vehicles are constructed to run at high speeds on good roads, they fear that they would be placed at a great disadvantage in the event of their being required to run on a course where mere speed may perhaps be of less importance in deciding the issue than the more solid qualities of strength and resistance. As the French makers are extremely anxious to get the cup back, they would naturally prefer to see the race decided on French roads, where they would have a considerable advantage over their foreign competitors. While the delegates of the British club were investigating the Irish roads, and appeared to experience a great difficulty in mapping out a sufficiently long course, the French took it for granted that the organisers would have to profit from the superior advantages offered by France, and they have even gone to the extent of suggesting a route which will allow of the Gordon-Bennett cup contest being run off at the same time as the Paris-Madrid race. Advices from England then pointed out that Ireland might after all overcome the difficulty of providing a sufficiently long course, whereupon some of the Paris newspapers have begun to protest somewhat strongly on the ground of the inferiority of the Irish roads, which they claim will not allow of the vehicles travelling safely at high speeds. Now the matter has taken another turn, for the A.C.G.B. and I. have just informed the Belgian Automobile Club that, owing to the difficulty of organising the contest in the British Isles, they may be desirous of running off the race in Belgium, either at the time of the Ardennes Circuit or at any other period fixed by the Belgian club. A meeting of the club was held in Brussels on Monday, when they decided to do what they could to assist the British club in organising the Gordon-Bennett cup contest in Belgium, and negotiations are to be carried out to this effect as soon as possible. It is therefore extremely likely that the great international competition will take place in the Belgian Ardennes, where there would seem to be little difficulty in mapping out a circular course over excellent roads. In fact, all through the Ardennes the roads are good, and are favourable to high speeds, quite as much so as in France, and the selection of Belgium will put an end to the friction which might otherwise be caused by the vehicles of one country obtaining an advantage over another. The action of the A.C.G.B. and I. is fair and sportsmanlike, and should give satisfaction to all the competitors concerned.

We understand that the new Reading steam cars will be fitted with two-cylinder slide valve engines in place of the four-cylinder single-acting rotary valve now employed. The vehicles will be fitted with Klinger gauge, steam air compressor, syphon, forced draught, the box front which is now so often a feature of steam cars, and wood wheels. The makers are also placing a steam tonneau on the market built on the lines of a petrol car. This will have wheel steering, and the 10 h.p. two-cylinder slide valve engine placed immediately under the footboard, while the 20in. boiler will be right in the front under what would be the motor bonnet of a petrol car. The reverse is by pedal, and the transmission is by chain from engine to a balance-geared countershaft, and thence by outside chains to rear wheels. This machine will also have wood wheels and 3½in. detachable tyres, steam and air pumps, and other detail improvements. It will be quite a petrol car in appearance. Another steam car which is being turned out on similar lines is the White, and this may easily be mistaken for a petrol car. It has a wheelbase of 6ft. 8in., and 4in. tyres. The engine is of 10 h.p. nominal, and the boiler is of the semi-flash type associated with the White car as known on this side. It is stated that its makers are anxious to enter it to represent the States in the Gordon-Bennett cup, but we should imagine some more powerful vehicle is referred to.

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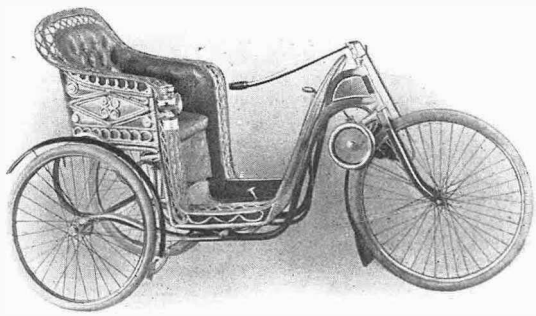


The Dickinson morette. This little machine is made either in the form illustrated for one person, with a 1½ h.p. engine, or in a somewhat larger size for two persons, with a 2½ h.p. engine. Some further details of it were given in *The Autocar* of January 10th, page 45.

Correspondence.

MOTOR CYCLE TRIALS.

[2778.]—I note in your issue of last week that at the recent meeting of the Automobile Club Motor Cycle Advisory Committee the suggestion that a "tourist's class" be included in the forthcoming trials of motor cycles was strongly deprecated by all the members of the trade present. Comments are scarcely necessary, and so we must be denied the privilege of seeing Mr. Edward Kennard sitting under his upset bicycle, and the lens of the photographer, without spilling a drop of petrol (see photo. in the club *Journal*), or riding at top speed without hand assistance. Is it envy or sheer incompetence on the part of the makers that would deprive us, who are motor cyclists, of such inspiring sights? Or is it that the makers of England are afraid to compete with the tourists of the world? I await a reply, and also the discussion of the motor cycle committee of the Automobile Club, which I humbly submit had better decide at once whether they are going to back the trade or motor cycling—two very different things.

A MOTOR BICYCLIST.

PROVINCIAL SHOWS.

[2779.]—I venture to think that your contributor in criticising the value of shows outside London has overlooked the fact that improvements are possible as compared with fast results. Responsible district agents will support local exhibitions, and make them both attractive and a success. It is not suggested that manufacturers should bear the additional burden. This company alone will exhibit, as may be gathered from your advertisement pages, a larger number of motor carriages than have been seen before at any complete Liverpool show, which fact, I am convinced, is typical of the course the trade must follow, viz., to entrust their provincial interests to those who have the competence and facilities to serve country buyers promptly and with the best only.

E. SHRAPNELL SMITH,
General manager and secretary
Liverpool. For the ROAD CARRYING CO., LTD.

A RACING MAN'S VIEW OF THE PARIS EXHIBITION.

[2780.]—As foreshadowed, the storm has burst, but from *one* cloud! The curious coincidence of Messrs. Bidlake, Edge, Jarrott, and Stocks's letters, not overlapping one another, though almost looking like a combined effort, saves the indulgent reader from suffering reiteration, but will make a reply over *one* signature appear long, no matter how briefly put.

In Mr. Jarrott's letter, I am afraid my friend gives me too much credit, and while it is true that Birmingham brains have astonished the world, by the way, they have succeeded in materially advancing British and Imperial interests in recent years. I am a mere Scotchman, and it would appear that native cautiousness is now being construed into scepticism, though when one finds that there is not yet one all-British motor firm issuing a public balance-sheet which shows a profit, one may be pardoned for having been over cautious, as probably I have been. However, I have no longer any doubts, and firmly believe that the motor industry will in a few years rank amongst the most important industrial undertakings of the country.

It is presumed that I probably cannot understand Mr. Jarrott when he writes: "In certain types of cars where a necessity has arisen for a certain design, I would not and do not suggest that certain apparent complications are necessary to obtain satisfactory running results, but at the same time to endeavour to build all carriages on the same lines without understanding why would be foolish." I don't, for the paragraph repeated here, complete as printed, seems to me a string of words without meaning.

"Conclusions" come to by Mr. Jarrott are just as indefinite in his last letter as in his first, and there is a conspicuous, most conspicuous, want of definite statement, unless it be to advise the home makers to do nothing. Some excuse is evidently thought necessary for this want of definite statement, and it is explained that it is withheld because it would educate me. It is not difficult to estimate the strength of the position—"I know, but won't tell because others will then know."

There is now, apparently, a really unfortunate misconception of my first letter, in that the impression has been created that in some way or other there is a wish to disparage Mr. Jarrott's racing abilities.

Nothing was further from my thoughts. I have had the pleasure of Mr. Jarrott's personal acquaintance for a considerable time, and am sure that no one has ever met a better sportsman, or a more fearless or skilful driver, and it is a matter of the greatest possible congratulation to all at home that we have a gentleman of Mr. Jarrott's conspicuous abilities, willing to come forward and represent the home country in the Gordon-Bennett and other races, at great personal expense, and at risk to his life and limbs. Nothing one could say or write could add to the universal esteem in which Mr. Jarrott is held as a sportsman by all those with whom he has ever come into personal contact.

The remaining portions of Mr. Jarrott's letter are mere platitudes, but fortunately they bring us back to the main issue raised by his writings, as they repeat that his impressions of the Paris exhibition are that home makers have nothing to learn, and are admonished to "do nothing" as a result of what was to be seen at the show referred to.

The letter of Mr. Bidlake—a model of clear, concise, and definite statement—neatly summarises my first letter, as, on analysis, being capable of being "boiled down into the suggestion that British manufacturers ought to be copyists." I will gladly go along that road as far as the proper turning with Mr. Bidlake. It is notorious that the Daimler Company were supplied with the drawings of the Cannstatt-Daimler cars, and paid for them, that they refused to use them, and that as a consequence they lost ground, so that the present directors have had an enormous leeway to make up in getting the present Daimler cars into their high state of efficiency, and putting them into the position they now so happily hold of being in every way a credit to home industries. Originate by all means, but ask to-day, anyone who knows, what is the best thing a firm embarking in the motor trade can do, and one will certainly be told, "Take the best French car and copy it, at any rate to start with."

In this letter we find some well-reasoned queries on the technical points raised in this direction:

(1) The objection that the *chassis embouti* presents difficulties in fitting various styles of bodies is not borne out by facts except in the case of special cars to seat, say, seven or more people, as widely different varieties of bodies are at present fitted on exactly the same under-carriage. As to whether in the event of any accident the *embouti* frame would be more costly to repair, it all depends upon the accident. One can see that in the case of a smash-up affecting the whole length of the frame there would be no great difference, whether a car was made up with this frame or the older type, as both would have to be entirely dissembled, though in an accident affecting only the extension arm holding the front spring, the old style would be more cheaply repaired than the exact Mercedes type of frame. There are, however, such things as *embouti* frames with detachable extensions for the front springs, and when I use the term "*chassis embouti*" I do not necessarily confine myself to one exact type of frame, but mean to convey a frame made up of U channel steel as in contra-distinction to the old L angle iron and wood.

(2) Mechanically-operated inlet valves may have, as is contended, some greater tendency to wear than the suction-operated inlet valves, but all the parts can be so made as to show after very long use indeed almost imperceptible wear, and I think that the point raised is a negligible factor, and would not amount in the long run to any such differences as may be found in the working of suction-operated valves due to loss of temper in the springs intended to close them.

(3) In regard to the radiator, no argument in my previous letter has been answered by Mr Bidlake except that he says "that to carry less water is not necessarily an increase in efficiency." Agreed, up to the point of cooling the cylinders, but surely less weight, dispensing with a tank and all the pipes to and from, tend to increase the efficiency of the motor car as a whole.

In Mr. Stocks's letter I have an opportunity of acknowledging his many kind suggestions and great help, but though it can hardly be a matter of public interest, my friend seems to have forgotten that my company had a con-

siderable financial load to carry which somewhat militated against the adoption of a recommendation to indulge in the sprints he would have had them make. Anyway, time settles most matters of this kind, and had they followed the advice he writes of and rushed into the manufacture of motor tricycles and quadricycles to the extent he advised, it is now clear that the results to my company would have been disastrous, perhaps irretrievably disastrous. As to the accusation of being "behind the times," I have yet to hear of any would-be purchaser of an "Ariel" tricycle or quadricycle who had to go without because he could not get one (at the time Mr. Stocks mentions).

The most unkind thing one can do to a politician whom one wishes to heckle is to adopt the favourite dodge of raking up past speeches or past policies, and hurling them at the head of the unfortunate individual; and with this analogy I will frankly say that my friend Mr. Stocks was right and I was wrong, and his history of the motor bicycle delay is sufficiently accurate. I thought that what has happened in France with regard to the motor bicycle would happen here, but it is now evident that motor bicycles have taken the fancy of the general public in this country. Some time has been lost, but my friend will be glad to know that the number of Ariel motor bicycles sent out by the company last year placed them among the first six largest motor bicycle manufacturing firms in the kingdom, and every effort will be made to make up the leeway (if any) lost by over-caution at the start—a deliberate policy which time has not yet shown to have been a mistaken one.

In Mr. Edge's letter some most valuable information is given, and while he joins Mr. Jarrott in his advice to British makers "to do nothing" with the three improvements mentioned in this discussion, he makes a very definite statement that the Mercedes makers have eliminated, (1st) the honeycomb radiator, (2nd) *chassis embouti*, (3rd) mechanically-operated inlet valves, and, writing as a professed friend of the home trade, he clinches his argument by imparting this information. *Now, if time shows that the information he gives the home makers is correct*, then he will have conferred a very great service on the trade by preventing us, or some of us, from adopting these improvements—improvements which have now apparently been bettered—and in his advice he is supported by Mr. Stocks, who also urges us to give further deliberation to these matters before coming to a decision.

The drives Mr. Edge draws attention to are gratefully acknowledged, and arouse pleasant memories of his good-fellowship, and I must also not omit to remember the loan which he gave me in the early days of a lamp ignition Beeston tricycle. In these drives, Mr. Edge gave me a good example of my contention that it is not absolutely essential to be a skilful or fast driver to know something of motor cars, as he invariably took care that I should never be given at any time an opportunity to drive even one yard.

The choice sneer hurled at my head of the "English motor car builder's prophet" will not do me any harm. In a discussion of this sort, it is better to have it conducted in good temper and fairness on both sides, and Mr. Edge's allusion to "motor measles" is perhaps rather unfortunate, for the comparison which he has thought well to make may cause Mr. Jarrott to exclaim, "Save me from my friends!" The businesses which are alluded to as having been "conducted successfully" are presumably De Dion and Panhard and Levassor; it is generally understood that they were both successful before the period alluded to, and if I am expected to go back further than this period, to have it synchronise with my "motor measles" stage, then I fear that the word "successful" will have to find a substitute in some other word, certainly "honourably," if Mr. Edge likes, but hardly "successful." It would have been a good thing for many thousands of shareholders in English companies if over-caution, or, as Mr. Edge styles it, "motor measles," had been a little more prevalent. I have very great pleasure, indeed, in making the *amende honorable* Mr. Edge desires me to make in regard to the water-cooling of that grand car, the Napier. My statement was based upon general observation, and so far as the particular car mentioned by him is concerned, I was out on one in November last—in fact, on the car's maiden trip. This car is, I believe, the most powerful, as it is certainly one of the most expensive offered to the public, and in that car the water required renewing about every 150 miles! No harm can possibly arise from the exact statement which I made regarding the capacity of radiators, which referred to radiators "*ordinarily fitted*," more especially since Mr. Edge has now stated that the distance I gave is less than can be attained on some few of the cars of the make he mentions.

In conclusion, I submit that no shadow of an argument has yet been advanced to show that my contention that there were "real advances to be seen at the Paris Exhibition" is incorrect, and if there is much to learn (to "copy" if the word be preferable), then can there be justification for anyone—particularly those mainly interested in the exploitation of foreign cars—writing to the papers with the idea of inducing home makers to stand still?

CHAS. SANGSTER.

MOTOR CARS FOR THE MIDDLE-AGED.

[2781.]—I am one of the thousands who want just what is described in your note of last week. That is to say, I need a petrol car that will go silently and smoothly at a moderate speed, which will climb steepish hills readily with a full load, and which has no complicated mechanism to get out of order. I know of no such petrol car at the present time. So far as my experience goes, even the best of the new cars only run silently and smoothly at paces which I do not wish as a rule to travel. The steam cars, on the other hand, I am told by my friends who have tried them both here and in America, will do what I require, but only for a very short time. Then they begin to get out of order, and become a perfect nuisance. I am sure the first maker of petrol cars who can meet the very reasonable requirements which you enumerate will make his fortune. Motor cars are still a luxury, and they will, in my opinion, continue to be so, until middle-aged men and women of fair means can purchase a car which will serve them at least as well and as cheaply as a good horse and vehicle. This ought not to be difficult to provide, for one has a good deal of trouble at times with horses and carriages.

AN ELDERLY MAN.

AN UNIQUE EXPERIENCE.

[2782.]—As a constant reader and subscriber to your interesting journal, I think the following episode may prove of interest to your readers, especially as it is so unique.

Last Saturday afternoon, January 17th, I started off with a friend on a 40 h.p. Panhard for Cobham, Surrey, the afternoon being perfect, and the roads dry and very dusty. I arrived at Cobham, and had tea, and upon going out to get ready for our return journey, found that it was raining heavily, and, moreover, freezing at the same time. I waited some little time in the hope that the rain would cease, but, after finding that it did not do so, started for London. The road was slightly slippery at that hour, 6.30 p.m., and I proceeded with caution, but finding that I did not slip much, increased my pace a little. Having traversed the Cobham Fair Mile, I descended a hill and up another, when, upon descending the next steep hill, I turned completely round three times, and the front of the car stopped right upon the bank, very quietly, and with the car completely across the road. I got off the car, and immediately fell down, and noticed when I got up again that the car was gradually slipping sideways down the hill. I then reversed, and when I let in the clutch the car commenced to slide down the hill broadside, and there we were, unable to move on a steep hill, not even able to start up the engine, because the vibration made the car slide. After waiting an hour, and only seeing two cyclists, we had the luck to find a man with a cart, who helped us to push the car to the wrong side of the road, with the tonneau against the opposite bank, and we three actually pushed the front of the car into the gutter, showing how slippery it was, the roads being completely covered with a layer of ice an eighth of an inch thick. Having got into the gutter on our wrong side my friend just pushed the car very slowly down the hill with no engine working. The next hill took us exactly twenty minutes to ascend, and another was descended with the motor not working, and the last hill into Esher took us over half an hour, the wheels flying round at a tremendous pace, and the car moving about six feet in four minutes. At last I called out to my friend to place one of the rugs under the off-side wheels; he did so, and the flying wheel sent the rug back quite ten yards. At last

we arrived at Esher, and decided to place the car at the Bear Hotel, which stands slightly higher than the main road. To get there, however, was another question, and, after cutting very many circles, and waltzing about in the middle of the road, with the old forty roaring like a bull, we got some rope and tied round the back wheels, and at last crawled into the yard, having taken three and a half hours to get from Cobham to Esher, a distance of, I think, three and a half miles. Hundreds of people came round at Esher, and many laughed so much at our capers that they fell down. I think that this is an unique experience, and I shall not forget for many a day the car sliding gradually down the hill like a sleigh, and we quite powerless to assist it had it once got away.

JOHN D. HILL.

[We suffered in a somewhat similar way ourselves last year, and we also recounted the adventures in different parts of the country of Mr. Mark Mayhew and Mr. Sturmey, but we do not think the roads were so treacherous as they were last week; in any case, we had no record of such complicated involuntary evolutions as those performed by Mr. Hill's car.—ED.]

SPARKING PLUG EXPERIMENTS.

[2783.]—With reference to Mr. A. J. Wilson's article in your paper of January 17th, it may interest Mr. Wilson and your readers—most of whom, as autocarists, have some knowledge of electrical appliances—to learn that the so-called Panhard discovery of an extra or external spark gap in sparking plugs is more an adaptation of already known methods than an out-and-out new discovery.

In Röntgen ray work, a large induction coil is used by the majority of workers to produce a spark capable of jumping six to twelve inches in the air. This spark is used to actuate a "Crookes tube" or "vacuum tube." Briefly, this tube—the source of the rays—is of glass with two platinum terminals sealed into either end, and exhausted of air. The resistance to the passage of the secondary current from the coil across the gap between the terminals inside the tube is very great. Under certain conditions, this high resistance of the tube may almost render it impossible to work it when the limit of power possessed by the coil has been reached.

If now a spark gap is interposed outside the tube at any accessible part of the secondary circuit, it will be found that the coil will be equal to the task and X rays generated. For reasons which need not be gone into, this method is not applicable to all tubes; but the fact remains that by giving the coil heavier work to do, viz., forcing its spark across two gaps, it does it better than across one. While this spark gap No. 2 is in use, a marked change can be detected by the car in the working of the interrupter employed with the coil. The beats become slower and the discharge heavier. Owing to the secondary not being able to discharge itself readily, the duration of the inductive effect in the coil is prolonged, and the magnetism of the coil brought nearer to saturation. This of itself will increase the sparking power, and reacts on the flow of the primary current, and so slows the rate of vibration of the interrupter; this slowness also tends to increase the sparking length of the coil.

This method of making a coil do heavy work by giving it apparently more to do has been in use by me for many years, and was also used, as I ascertained, by workers in England and abroad. Messrs. Yeates, of Dublin, constructed a coil for me six years ago with such a gap apparatus attached. Numbers of instrument makers constructed small glass tubes with fixed platinum points having a spark gap between them for this purpose; but such do not always fulfil the requirements, for, as in Mr. Wilson's experiments, the gap must be capable of adjustment.

In Mr. Wilson's experiments, when the sparking power is thus increased, sparks will pass across the points of the plug, and also perhaps over the sooty surface; but the latter effect might be outshone by the first-mentioned flash, and the resistance of the sooty track may be such that, while it will permit of a leakage, it cannot take a heavy rush of current, which will consequently flow through the next most convenient channel.

In common, I am sure, with all your readers, I felt the greatest pleasure in reading Mr. Wilson's article. Such a practical study of one of the small worries that beset us on the road is the only way to eliminate them.

RICHARD LANE JOYNT, F.R.C.S.

[2784.]—The method recently discovered by Panhard's workmen of obviating the ignition difficulties due to foul sparking plugs is of great interest to all motorists, and is, I think, susceptible of a much simpler explanation than your valued contributor, Mr. A. J. Wilson, believes. Indeed, if my view is correct, it is a matter for surprise that so simple and valuable a suggestion comes as the result of accidental observation rather than deliberate experiment.

Briefly, the explanation appears to be as follows: The production of a high pressure, or potential, at the terminals of the secondary of an induction coil depends essentially on the secondary being on open circuit at the moment when the trembler interrupts the primary current. The "soot bridge," which produces a low ohmic resistance in the plug, results in a partial short circuiting of the secondary. Under these circumstances the production of a high electromotive force at the terminals is impossible. The current, small as it may be, which leaks across the plug the moment the magnetic flux begins to vary, enormously retards its decrease; and high pressure depends, of course, entirely on rapid demagnetisation. Put it in another way. It may be said that the energy of discharge is dissipated almost wholly in the high-resistance secondary wire itself, instead of externally. Introduce the auxiliary air gap into the circuit, and the whole condition changes. The secondary is now on open circuit, and demagnetisation is rapid and effectual. A high pressure of many thousands of volts is generated, and a disruptive discharge takes place in the circuit. Under these circumstances, the partial short circuiting of the spark gap on the plug is comparatively immaterial. High pressure oscillatory discharges take short cuts, and care little for mere ohmic resistance. It is well known, for example, that a lightning discharge will traverse many feet of air rather than go round a longer metallic path of infinitely smaller resistance. The surgings in the circuit will inevitably produce a spark between the wires, even though the "soot bridge" may be there as an alternative path.

As regards the effect on the battery, the more rapid exhaustion anticipated by Mr. Wilson will not be found to occur in practice. If the additional spark gap necessitated the use of a larger coil, more current would, of course, be required; but Mr. Wilson's own experiments show that this is unnecessary. The additional gap cannot in any way increase the current supplied to the primary of the coil, for it must be remembered that it is only when the primary circuit is *broken* by the trembler that the secondary discharge takes place. No such drawback will, therefore, detract from the usefulness of this interesting discovery.

H. C. HAYCRAFT, B.Sc., A.I.E.E.

[Mr. W. A. Turpin, the works manager of Messrs. Panhard and Levassor's English agency, also writes on this subject, stating that he can fully testify to the advantages gained by the interruption of the high-tension current before it passes through the ignition plug. He sends us a specimen of a small device which his firm fix to the plugs. It is merely a block of vulcanite, with a hole in the centre, fitted with a screw at each end. By the use of this device he finds that the trouble due to liberal lubrication which used invariably to be experienced in testing new engines is entirely obviated; in fact, the attachment has been found so valuable that Messrs. Panhard and Levassor are arranging to supply it at a nominal charge.—ED.]

THE NUMBERING NUISANCE.

[2785.]—It seems to me that we are on the eve of a great danger with regard to the Scott-Montagu Bill. I should like to add my protest to the many that have already appeared, and to emphatically declare that those motorists who are advocating the affixing of numbers or other conspicuous marks of identification upon private motor cars are not only digging their own graves, but sealing the doom of the industry as well.

Automobilists are sufficiently persecuted as it is, and the industry is sufficiently crippled by opposition on every

side, without arming the police and all evil-minded persons with a weapon so powerful that motoring will become an absolute impossibility. This may seem an exaggerated statement, but several of my friends have given up their motor cars already, simply because they cannot stand being perpetually pestered by the police every time they go out for a run, and heavily fined by motorphobe magistrates on the evidence of perjuring policemen. It is not very pleasant to be continually treated as a criminal just because one persists in using a motor car, to be insulted and jeered at by the police on the road, and to be bullied and sneered at by the magistrates on the bench.

Leaving aside all the other hostile interests, in no other country are the railway interests and the horse interests so powerful, each of which think they see a deadly rival in the horseless road vehicle, and it behoves us to be more than careful of what is done—whether by those in our ranks or those in the camps of the enemy. Any mistaken movement just now may be fatal. Horseless vehicles were once driven off the roads and totally abolished, in spite of our being such a wonderfully free people; and history has a nasty habit of repeating itself at most unexpected moments.

Just because a hundred cars or so can be collected for a run, it is a great mistake for us to become exalted by this pleasant little assembly, to imagine we are many, and to think that nothing can arrest the triumphal march of the motor. Let us not lull ourselves into any idea of false security, or imagine that we are in a bomb-proof house, or forget the great number of those that are against us. When all is said and done, we are few—precious few—while those against us are not to be numbered.

The motorist can hardly imagine the millions of men in these islands who would like to scalp every motor car that exists, mutilate it, and dance a joyous war dance over its remains. LEOPOLD CANNING.

PARAFFIN BURNER FOR STEAM CARS.

[2786.]—Mr. E. Mouey's letter in your issue of the week before last claims an answer from one who has been using a Locomobile with the Clarkson burner and all his other improvements since July, 1901.

On October 5th and 19th of that year *The Autocar* has letters of mine on the subject of the Clarkson burner, detailing my experience of its use. All that I then said I now re-assert, but since then have ran a burner, including vaporising coil, 900 miles without repairs of any kind, and when last summer I sent it to be overhauled it was acting perfectly, though I knew from inspection that some parts which were exposed to the fiercest heat had suffered, and would ere long affect the steam-raising power. A few shillings expenditure, however, renewed the nickel rings and vaporising coil, and the burner was and now is as good as ever!

In order to be seriously impressed by the statements and suggestions which Mr. Mouey makes, I should at any rate want to know who fitted the Clarkson burners to the Locomobiles spoken of, and whether Mr. Mouey himself is qualified to undertake "tinkering and adjusting of valves, etc."? For, like other good mechanisms, if improperly applied or adjusted, I doubt not that it too becomes "a very tricky contrivance." From such a communication, in which suggestions so largely make up for ascertained and understood facts, I gladly turn to my own experience of now more than 2,500 miles with the Clarkson burner, during which I have only had two renewals of those parts which suffer the most. That experience decided me to see the new 12 h.p. Chelmsford car of the Clarkson Syndicate, and I therefore went out in it twice, covering altogether over 100 miles. One of the journeys was to Maidstone and back during the first week of last December. We had very strong east winds all the time, and after reaching Farningham snow lay on the ground 4in. to 5in. deep. The car was purposely put to severe tests, notably on Wrotham Hill. These it sustained without a sign of strain or difficulty, and accomplished the journey with such ease and comfort and warmth to the travellers, and with so little need of attention, except to steering, that I gave the best proof I could of my confidence in it (burner and all!) by ordering a chassis for myself. I should say that this performance was in spite of the fact that the car had then run over 3,000 miles without repair or even overhauling. The latter it has since had, and I was informed that the burner, including vaporising coil, was found in good condition, and the machinery running all the better for its constant use. T. FARMER HALL.

THE AUTOMOBILE COMMERCIAL SYNDICATE'S DINNER.

On Monday evening last the above firm entertained their agents and friends to dinner at the Hotel Cecil. In the regretted absence of the Right Hon. Lord Shrewsbury and Talbot, K.G., who was prevented from taking the chair by a severe chill contracted at what his lordship described as the "al fresco" Exhibition, that position was occupied by the managing director, Mr. D. Weigel, who certainly did not fail to entertain his lordship's guests right royally. The dinner menu was one that did the Hotel Cecil credit, and was thoroughly enjoyed by all present. The chair was supported by Messrs. W. M. Appleton (Bristol Motor Co.), Albert House (Bradford Motor Co.), Dan Albone (Biggleswade Motor Co.), F. W. S. Clark (H. A. Clark and Co., Leicester), J. Atkinson (North of England Motor Co., Leeds), Frank Wellington, Harry J. Swindley (*The Autocar*), T. S. Bailey (Stafford and Eccleshall Motor Co.), C. R. Garrard (the new works manager of the building English Clement-Talbot Works), Chas. Cordingley, G. H. Cox (Southsea Motor Co.), G. E. Bedwell (Cambridge Autocar Co.), H. Carver, F. H. Passmore, and others. The vice-chair was occupied by Capt. B. Corbett, late 1st Life Guards, who is about to join the British Autocar Syndicate. Mr. Weigel, in giving "Success to the Automobile Industry and Trade," apologised for and explained the absence of Lord Shrewsbury by reading a letter from his chairman, and went on to welcome his guests and to sketch the system upon which the syndicate had dealt and proposed to deal with their agents, and which appeared to be most favourably received by those present. He also gave an interesting sketch of the various large interests of the concern, and coupled with the toast the name of Mr. Albert House, who briefly and suitably replied. Lord Shrewsbury's rapid return to health was enthusiastically drunk and accorded musical honours, a telegram being immediately despatched to him to that effect. Mr. Garrard, in giving the health of M. Adolphe Clement, gave a brief description of that brilliant man's career, lectured his audience on the efficacy of the metric system, and gave an interesting description of the scheme of the new Clement-Talbot Works. A cable was despatched to M. Clement at the Waldorf-Astoria Hotel, New York. The health of the Chairman of the evening was given by Mr. Cordingley, and seconded by Mr. Harry J. Swindley, who indulged the company with a few reminiscences of Mr. Weigel's boxing, cycling, and automobile careers. Mr. Weigel replied deprecatingly, and shortly afterwards the company parted, after a most enjoyable and instructive evening.

THE SOCIETY OF MOTOR MANUFACTURERS AND TRADERS.

The second of the series of dinners given by the Society of Motor Manufacturers and Traders during the winter season was held at the Hotel Cecil on Wednesday, the 14th inst.

The subject of the discussion following the dinner was "The Paris Automobile Salon, 1902." Messrs. Chas. Jarrott, Burford, J. E. Thornycroft, Buckea, W. E. Hall, Clarkson, Nadall, Peckham, Chambers, Arthur Brampton, and D'Esterre (Rolls and Co.), amongst others, gave the meeting the benefit of their opinions, and made various suggestions of great interest to the entire automobile industry.

The Chairman (Mr. Frederick R. Simms) called particular attention to the splendid results obtained in Paris by there being but one great automobile show each year—a state of affairs which this society is doing its best to bring about in this country.

Flashes.

According to the latest computation, there are 6,000 autocars in France, half of which have been constructed to hold at least three persons each. Paris alone is responsible for 1,200 cars.

* * *

On the occasion of their forthcoming visit to the Duke and Duchess of Devonshire at Chatsworth, the King and Queen will visit Matlock, and orders have been given by the Derbyshire County Council for the main road to Matlock to be rolled and cleared to allow of their Majesties motoring.

* * *

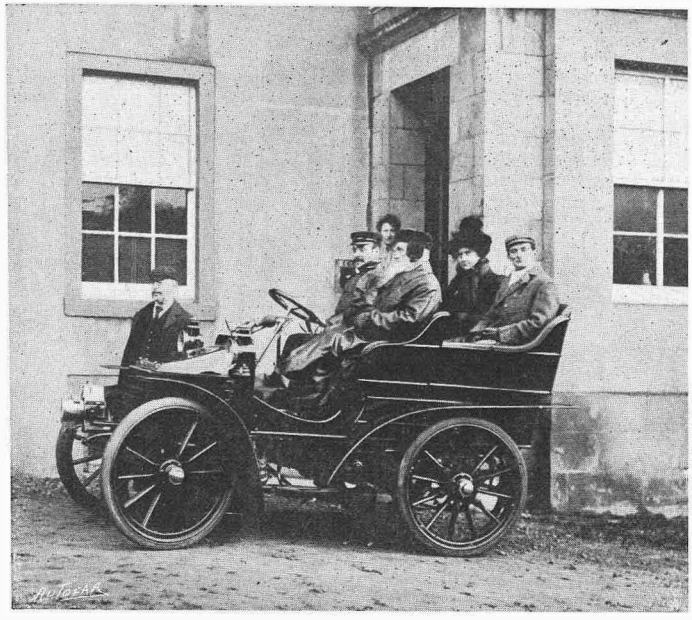
Messrs. C. S. Rolls and Co. are making a specialfty of all sorts of chemical fire extinguishers, which are suitable for putting out fires caused by petrol or paraffin. They throw a powerful jet some 40ft. for from five to eight minutes, according to size. Of course, the great point about them is that they are chemical. That is to say, everyone knows that water is no use to extinguish a petrol fire, but, of course, a chemical fire engine produces a vapour in which no flame can live.

* * *

The motor car question again came under consideration at the last meeting of the West Riding County Council, which body had before it the Norfolk County Council's resolution demanding a registered number on the back of every car, and the Automobile Club's recommendation to the County Councils' Association suggesting a fourteen miles limit in the populated districts and no limit in the open country, and protesting against the numbering proposal. The Chairman (Mr. C. J. Milnes-Gaskell) indulged in some of his usual anti-motor statements; and, upon his motion, the Norfolk County Council's resolution was carried.

* * *

Some very handy heaters have been introduced by the Automotor Accessories Co., of Southampton Row, W.C. These are made in all shapes, and are given their preliminary heat by immersion in boiling water. Some are made as foot-stools, and others in the form of little cylindrical grips. The smaller sizes are very handy for ladies to use in their muffs. Of course, the great advantage of them is that there is no possible danger from fire.



Our illustration shows Dr. Blair, of Jedburgh, on his 10 h.p. Wolseley, which he recently purchased from the New Rossleigh Motor Co., of Edinburgh. Dr. Blair was one of the first members of his profession to appreciate the advantages of a motor car to country medical men, and for three years before he bought the Wolseley he used every day a little Benz car. He is a great enthusiast and we believe one of the founder members of the Scottish Automobile Club, whilst he is also a member of the committee of the Eastern Section of the club.

The Irish invention for the prevention of side-slip to which we referred last week has, we understand, been placed in the hands of Mr. W. R. McTaggart, of 102, Grafton Street, Dublin.

* * *

M. Tampier, who is officially inspecting the Paris-Madrid course for the big event of the French motor world for 1903, is using one of the new little 6 h.p. De Dions which we illustrated and described on December 27th last.

* * *

We have received a new illustrated catalogue from Messrs. Hoare and Sons of their special motor clothing, garments to which we have often referred in terms of approbation from lengthy use of them. We see they have now produced a very smart idea in liveries for motor servants. The man can wear a short reefer coat, which is so arranged that a rug attachment can be instantly buttoned to it, and the garment at once becomes a long top-coat. This attachment can also be used as a rug. We understand it has been adopted by the Viceroy of Ireland for his motor servants.

* * *

With reference to the fitting of band brakes to the rear wheels of light steam cars, Messrs. Bennett and Carlisle, the motor car dealers and repairers of Deansgate, Manchester, inform us they have been fitting these for some two years with satisfactory results. They guarantee them to hold the car on any hill without assistance from the differential brake or engine reversing gear.

* * *

The car upon which Mr. C. D. Rose toured the constitutency which he now represents was an 8 h.p. Argyll, which was sold to him by Mr. W. P. Warren Smith from the Farman establishment at 100, Long Acre. That both candidates for the representation of Newmarket should canvass the borough in automobiles is curious and interesting, and demonstrates their general utility.

* * *

We are asked by the Clipper Pneumatic Tyre Co. to state that their agreement with the Dunlop Pneumatic Tyre Co. permits them to sell tyres manufactured by Messrs. Michelin in this country provided they are branded, "Clipper tyres, made by license of the Dunlop Company."

The Ellis self-starter, which we illustrated and described last week, will, we understand, be exhibited at the Crystal Palace on one of Mr. Cole's Belle cars.

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Vive le sport! Five Parisian policemen have passed an examination as motorists, and will be supplied with fast cars to arrest drivers who travel at a dangerous speed.

* * *

The Paris Fire Brigade has been provided with two electric motor fire engines, which are claimed to be the most powerful ones in the world. They have a maximum speed of sixty miles an hour.

* * *

We lately came across a most interesting description of the first motor car to make its appearance in Rhodesia. This was a 6½ h.p. Gladiator, which had been imported by Mr. C. Duly. The writer of the description—a member of the staff of the Rhodesian paper in which it appeared, and who made a longish trial trip in the car under notice—is convinced that the automobile has come to stay in Rhodesia.

* * *

An exciting incident occurred at the Stanley Show in the Earl's Court grounds. One of the Evart-Hall motor cycles side-slipped round a sharp, loose corner, and a heavy steam car coming up behind could not stop. It ran clean over the cycle, crushing it considerably, but smashing nothing. It also passed over the rider's legs, but, luckily, did not hurt him much. This track appeared to be altogether too loose and too sharp in the bends for motor cycles—in fact, we wonder there were not more accidents both with them and the cars, as some of the drivers were exceedingly reckless, though one could not help admiring their smartness and address. The looseness of the ground and the sharpness of the corners played some considerable havoc with the tyres of most of the vehicles.

* * *

In reference to our remarks on silent cars in our last issue, Mr. S. F. Edge points out that the Napier is not one of those cars which, while running quietly on high speeds, are not so pleasant at low rates. In this we entirely coincide—in fact, in pointing out in our article that there were fast, powerful machines which were also comfortable in every way at slow speeds, we were bearing in mind, without any attempt to make a complete mental list, the 24 h.p. Napier, 40 h.p. Mercedes, and 24 h.p. Clement. There are, we are glad to say, a number of others, but we mention these as specimens, while as an instance of a lower-powered machine, there is the 12 h.p. Humber and, still smaller, the Oldsmobile.

As thoroughly competent repairers of either steam or petrol cars, a correspondent recommends the Cremorne Motor Manufacturing Co., of Lots Road, Chelsea, S.W.

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Quite a "seasonable" aspect is given to the Park by the number of smart autocars that are driven through it daily. Lady Essex invariably causes a small sensation as she dashes along in her new car, which is believed to be the only one of its kind in London.

* * *

Visitors to the Earl's Court Exhibition have been much impressed by the remarkably silent running of the new 20 h.p. four-cylinder Clément which has been found in the grounds most days. When the car is standing and the engine running, there is no vibration, and no more noise than would be made by a small clock. The silencer, too, is thoroughly adequate, and the exhaust is scarcely more than a heavy breath. The machine is an excellent example of the remarkable manner in which the French have tackled the question of reducing noise, as up to this season it must be admitted that the French cars were often far from quiet, though many of them were admirable vehicles in other respects.

The Milnes-Daimler motor telescopic tower supplied to the Bradford City Tramways for the repairing of the overhead trolley wires. On this vehicle all tools and other requisites are carried, and breakdowns can be attended to very much more speedily than with the old horse-drawn apparatus.

The Wilkinson Tyre and Tread Co., the makers of the Wilkinson non-slipping cover, are removing from their old place in Princess Street, Huddersfield, to larger premises at Chapel Hill Mill, as they find they have insufficient room for their manufactures at Princess Street.

* * *

Dr. Stephenson, of Blackburn, tells us that on January 10th he forwarded a cheque for £23 18s. 6d. to the owner of the motor car which was destroyed last summer by fire. Both he and the owner of the car thank all subscribers through the medium of *The Autocar*. The only subscription not directly acknowledged is a guinea from "C.M.R.," of Birkenhead, whose address is not known.

* * *

The Maison Tabot have, we are informed, been appointed sole representatives for the Michelin tyre in London by the North British Rubber Company, who are introducing Clincher-Michelin tyres. Some very large premises will be opened in the centre of London for this branch of the business, which will be supervised by Mr. D. M. Weigel. It is proposed to hold a very large stock, so that there will never be any difficulty or delay in obtaining tyres of any sizes.

* * *

The Peerless car—not the American, but the British Peerless—which we illustrated a fortnight since, is, we are informed by the Automobile Supply Co., of 56, Broad Street, Birmingham, made by Mr. Thomas Chatwin, a well-known tool manufacturer, of Birmingham. It is not an 8 h.p. car, but gives 6⅜ h.p. on the brake. The cylinder is 3¾in. bore by 4½in. stroke. The gear does not give direct drive on the top speed, but is of the ordinary Panhard type. The later cars have engines with a bore of 4¼in. and stroke of 4¾in., which actually give 8 h.p. on the brake. Further, the Automobile Supply Co. inform us that the car we illustrated was the actual chassis they exhibited at the Agricultural Hall last year.

* * *

One of the Lanchester cars running in the grounds at Earl's Court had a novelty of a very practical character. It will be remembered that the wind board of the Lanchester is hinged, and that when the occupants of the front seats have taken up their position they pull the wind guard back to a stop, so that it is sloped sharply backwards and protects them from all the worst of the weather, and, to a large extent, takes the place of a rug, while as the guard is hinged freely it is perfectly easy to push it forward when moving out of the car. The back part of the front mudguards is connected with the hinged wind guard, and each mudguard has an inside insertion. The result is that when the wind guard is pulled backward the hinged mudguards are raised and the footboard is shut in at each side by the extensions from the wings. This makes the footboard extremely snug, keeping cold cross draughts off the feet, and, of course, entirely protecting it from mud or splashes from the front wheels. Further than that, when the wind guard is swung forward to dismount, the mudguards drop out of the way, and a dismount can be made without a moment's delay, as there is no side door to open or to climb over.

We note with pleasure from *Le Vélo* that a Thornycroft steam lorry has been entered in the French Criterium de Consommation to be held 19th February, 1903.

* * *

Messrs. G. T. Riches and Co. tell us they are introducing a device known as the auto-trembler, by means of which any non-trembling coil can be converted in five minutes to a high speed trembling coil.

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The letter which appeared last week on the numbering proposals was contributed by Mr. Robert E. Phillips, the well-known member of the Automobile Club—not by Mr. R. D. Phillips, as stated by a printer's error.

* * *

At the recent Birmingham Municipal Bye-election, the Traffic Automobile Manufacturing Co. had two cars running for eleven hours without stopping the motors. They were on the first or second speed all the time they were running, and often carried a load of eight or nine persons.

* * *

From the *Dumfries and Galloway Courier and Herald* we gather that a trial was given on Saturday last over the heavy rising grounds in the neighbourhood of the first motor car built in Dumfries. This is the work of Mr. A. C. Penman, coachbuilder, of the burgh, and is fitted with a 10 h.p. Albion Motor Co.'s engine, which is capable of developing twenty miles an hour. The trials more than reached anticipations. The car, which is a variation of the tonneau with cane panels all round, and nicely upholstered, will be on view at the Crystal Palace Show.

* * *

With regard to metal contact breaker plates, the Traffic Automobile Mfg. Co., of Birmingham, write us that they always make a point of destroying them and substituting fibre plates, as they consider the metal plates treacherous, owing to the fact that they short circuit, the ebonite bushes of the metal plates not being a sufficiently positive insulation. They say they have found them work well in some instances for a certain time, but sooner or later oil percolates through the bushes, and a short circuit occurs, which may take a very long time to find, particularly as shorts in this part are not easy to diagnose.

* * *

Automobilism and love of antiquarian research do not always go hand in hand, but still there are many autocarists to whom relics of the past appeal. Tourists in the North Midlands should not omit to visit the ruins of Newark Castle, which are exceedingly interesting and of great historical importance. Visitors are shown the room in which King John died, some very gruesome dungeons, and an underground chapel, with a ceiling of fine Norman architecture. Then, again, a few miles from Nottingham, but right off the beaten track, is Colwick Church, which adjoins Colwick Hall, the ancietn seat of the Muster family, but which is now merely a resort of trippers and visitors to Nottingham racecourse. In Colwick Church will be found the tomb of "Little" Sir John Byron, and in the grounds of the hall is a tree under which Lord Byron composed many of his best-known works, he at one time being a frequent visitor to Colwick.

MOTOR RACING: SPORTING AND EDUCATIONAL.*

BY CHARLES JARROTT.

Paris-Berlin, in June, 1901, was the next big event, and was again won by the conquering Fournier, covering 1,106 kiloms. in 16h. 33m. This race, in which I myself took part, was, I should think, one of the best that has ever been held—a stern chase from start to finish—and the accidents and troubles *en route* greatly enhanced the uncertainty of any individual man finishing.

The Circuit du Nord alcohol race held last year, won by Maurice Farman (to whom I finished second), comprised a distance of 865 kiloms., which was covered by Farman in 11h. 55m. The roads were atrocious. It rained on both days, and the highest speed was out of the question; but it enabled the Minister of Agriculture to prove that alcohol could be used most satisfactorily for motors.

Paris-Vienna, the four days' scramble in which some of us participated, is so painfully impressed on my own memory that I would if I could pass it by; but the fact that it was won by a carriage in the light car class is worthy of note, as, for the first time, the big powerful cars were beaten by a car of lighter construction and a less powerful motor, the winning carriage weighing under 650 kilogs.; and Louis Renault, in his defeat of the big racing cars, proved very conclusively that the race does not necessarily go to the *fastest* car, and that reliability scores where speed cannot be relied upon.

Of course, the great and interesting point about this race lay in the fact that the Gordon-Bennett race was run over the same course and at the same time, with such a glorious result. Personally, I shall never forget my elation when I saw the great hope of France—Fournier—out of the race on the first day, Girardot having already finished his effort soon after the start, leaving de Knyff the sole champion for France. With Edge in slight trouble, but still going well, England's hopes at the end of the first day were much brighter than at the beginning.

The run through Switzerland neutralised on the second day evidently did the 70 h.p. car, driven by de Knyff, no good; and on the third day, when coming down the Arlberg, I saw de Knyff out of it, and realised that Edge in front had only to finish to win the race, my feelings can be better imagined than described. I eventually caught Edge up at a level crossing soon afterwards, and informed him that France was finished with, and that he had only to finish to win the cup for this club, and we indulged in the best handshake I ever had in my life.

The Ardennes Circuit.

The Circuit des Ardennes (512 kiloms.), run four weeks later, was won by myself in 5h. 53m., giving an average speed of fifty-four miles an hour. This was the first race run in the form of a circuit, as competitors had to cover the fifty-three miles course six times without any neutralisation and without any allowances for filling up with petrol, water, etc. The course was fair, the dust was very bad, but the 70 h.p. Panhard, which had previously given me so much trouble in the Paris-Vienna, carried me through splendidly. The race itself was very interesting from a spectator's point of view, as there was only a difference of twelve seconds on the last turn between myself and Gabriel on a Mors.

In regard to this race, it was also interesting to note the fact that for the first time in the history of motor racing, a recorded speed of over a mile a minute was obtained, as Baron Pierre de Crawhez, who started first, covered over sixty miles in the first hour. Whether his subsequent smash was owing to the increased risks he ran in the attempt to maintain this pace right through, I do not know, but he did not finish.

I am certain that racing of this description is the most interesting from a spectator's point of view, and has no disadvantages from a competitor's point of view, as a much better course can be selected; and much less inconvenience is caused to the country at large.

Dealing, however, with the technical side of the subject, I do not think it can be doubted for one moment but that the rapid evolution which has taken place in the automobile industry has been owing chiefly to the French racing programme arranged year by year. Instead of the unstable short wheelbase cars, which we might have been using even to the present day, the increase of speed attendant upon the fitting of more powerful engines made originally by the manufacturers solely with the idea of winning races, made the building of much more stable cars an immediate necessity; and the comfortable touring cars we are using at the present day owe their inception to the racing cars of two or three years ago.

Of course, I am aware that some of the big racing cars, as we know them at the present time, could hardly under any circumstances be utilised for touring purposes pure and simple; yet there are cars which have been designed for racing which, while having that remarkable turn of speed necessary for a car to be termed "a racing car" at the present time, are nevertheless of such flexible construction that they might be termed "absolutely ideal touring carriages." Again, the use of aluminium, which enters so much into the construction of the modern automobile, would undoubtedly in course of time have been adopted; but I doubt very much whether it would have been taken up so quickly had it not been for the fact that the leading manufacturers, in endeavouring to secure the maximum of power with the minimum of weight in order to secure the best results on their racing cars, recognised the value of aluminium in this direction.

How quickly the public have seized on one year's type of racing carriage and turned it into the following year's touring car has been to me a matter of astonishment.

Paris-Bordeaux.

In 1899, when the 12 h.p. Panhard was first used in the Paris-Bordeaux race—I have already mentioned what powerful cars they seemed to us to be—no doubt some of us remember the story told in the French press of a man standing at the foot of the hill at Versailles who fell down dead with excitement when he saw Charron coming down the hill at a most fearful speed; yet the following year 12 h.p. Panhards were running about the country for touring purposes; and at the present time a man wanting a touring carriage would, if his pocket allowed him so to do, order something more powerful. The same remarks may apply to the 16 h.p. and 24 h.p. cars used as racing models one year; they were the touring cars of the next.

It was only when we started to decrease the weight of our cars that our tyre difficulties became somewhat less troublesome. I have heard it said that tyres to-day are much better than they were before, and that we use stronger tyres. Possibly we do; but there *was* a day when to drive out on a car fitted with pneumatic tyres was to make it more than a certainty that one would be repairing one or all of them before one could get back again. Our cars were heavier, our tyres were lighter, and it was from racing models we learned our lesson so quickly.

Of course, we know perfectly well that the English manufacturer is rather inclined to allow his foreign brethren to do the racing, and then, when certain results have been obtained, make use of the knowledge so gained. But this always entails our being at least twelve months behind in England; and although twelve months may not seem a very long time, nevertheless the importance of keeping right up to date must be apparent to all of us.

The question of expense is a serious matter, and it is not *everything*. The possibility of bad luck may make an experiment of this description not only risky, but even disastrous to the manufacturer. Knowing as I know the difficulties one has to contend with in entering cars and getting them through a big race, I think the greatest credit reflects on Mr. Edge and Mr. Austin in entering cars for the Continental races last year.

I have already said what bad luck may do. I saw the bad luck experienced by the Napier on the first representation of this club in the Gordon-Bennett race, Paris-Bordeaux, but I do not think there can be any doubt that in the 50 h.p. car driven by Mr. Edge, England had a car with a big margin over other competitors in actual speed. Yet, nothing daunted, with a perseverance which all of us admired, another car was built; and the combination of a good car, and the combination of the

*Excerpts from a paper read before the A.C.G.B. & I. on Friday, January 16th. The first portion dealing with the earlier races is omitted.

fortuitous circumstances which we have heard Mr. Edge mention, with the combination of a plucky driver, were sufficient to make this club the holder of the cup, which we are going to make so hard a fight to retain this year; and when I say we are going to make so hard a fight, I mean, gentlemen, that we are *all* going to make a fight to retain it. The race has to be held in *Ireland*, and we have every one of us to do everything we can in bringing personal influence to bear upon the obtaining of the necessary permission. The course is there, and *the race has got to be run there*, or we shall have lost the finest opportunity of expressing that grand old English policy of "what we have we'll hold" that ever nation had. It will be a terrible struggle to get that cup again if France or Germany take it back across the Channel.

There is much to be learnt, there is much knowledge to be gained, and many things to be known before one can hope to *win* a race. With a hundred competitors it can readily be realised that there is very little to be given away to anyone if one has the faintest idea of finishing in the first place. The only means of gaining this knowledge is in actual racing.

I shall never forget my first Paris-Bordeaux race on a motor tricycle. Although reasonably fit, having done a lot of riding previously, I was to all intents and purposes five hours from the start as complete a physical wreck as anyone could be. The philosophy borne of experience which comes to one taking part in a race was not mine, and the consequent strain in seeing in every little trouble I experienced disaster to myself told on me tremendously. Of course, riding a motor tricycle partook of a physical effort; but nevertheless many of my troubles would not have been had I known more about racing. For instance, I started with goggles of a most primitive and ineffective description; my clothing was suitable for the early morning when it was bitterly cold, but was not conducive to active pedalling uphill when the sun came out. Lack of knowledge of procedure was most trying, and when ninety kilometres from the finish, the rain came down in torrents and I had short-circuiting troubles, I remember getting off and lying down in the road, finished to the world and thankful that, so far as I was concerned, the race was over.

Paris-Berlin.

Paris-Berlin the year before last saw me mounted for the first time on a big racing car, and here again I learnt much. I started off on the first day of that race from Paris to Aix-la-Chapelle quite convinced that the right procedure was to drive what I call "red," and the escapes we had in the first hundred kilometres were marvellous. My little dash eventually ended in taking a right-angle turn so fast as to throw out my mechanician; and it was only after he had implored me practically on his hands and knees to think of his neck that I steadied down.

This race was educational to me, because I realised that the best I could hope to do was to finish in a decent position. Nine punctures were not sufficient to make me lose heart, and we plodded on doing our best, deriving considerable encouragement from the knowledge that other competitors were having *their* stoppages at various places, and were going through *their* troubles in like manner; and it was after the finish of the race that I realised that the Chevalier Réne de Knyff's advice to me at the start, namely, "to get there," was the right advice to take.

Probably the most exciting race I have had was the Ministerial alcohol race—the Circuit du Nord—in the early part of last year, when I found the driving I had done on my light car at Nice, and my journeys over the Alps, where the roads were very bad, stood me in splendid service, and I felt quite fit, even though it was a race in two days of rain over the greasiest *pavé* I have ever experienced. It may have been caution, it may have been recklessness, that enabled me to finish second; but however reckless one might feel, the sight of a car smashed up at the side of the road through having failed to take a corner was sufficient check on any hare-brained wish one might have to keep on the top speed, and take everything in full flight.

I had another example of this in the Paris-Vienna race. The 70 h.p. Panhard I was driving was of a lighter construction than any of the other Panhards in the race, and I knew that no liberties could be taken with it. I had had the opportunity of running over the road the day before the start, and I had made up my mind that nothing would induce me to go until I got to Provins—ninety kilometres from Paris—where the road improved. It was hard to follow out this policy when one was caught up by two or three other cars which had started after, but which had taken the risks of negotiating the bad road at top speed. Nevertheless, in spite of this, I finished third at Belfort, seven minutes after de Knyff, who made an average of fifty-six miles an hour. My care was somewhat wasted, as the Swiss and Austrian roads played havoc with my car. Win I could not, but I could not bear it to be said that I failed to get my car through.

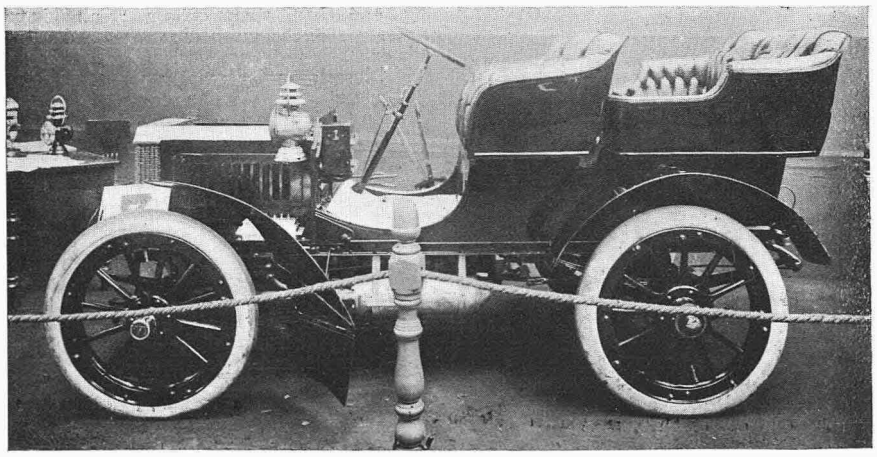
My entry on the racecourse at Vienna must have been somewhat dramatic, as I do not think anyone expected me to finish; and had I failed to start on the last day, no one would have been surprised. When I arrived at the Prater, in Vienna, with my governor broken, my throttle gone, no exhaust box, running on the low gear, unable to change speed through the impossibility of taking out my cone, regulating my speed by the ignition, the frame of my car practically in half, no cap, no coat, no goggles—in fact with nothing, I must have presented a picture ludicrous to a degree, but indicative in a measure of the effort I had made to get my car through.

Of the Circuit des Ardennes I need say little; the event is still fresh in your minds. With my car going splendidly, a straightaway course, no stoppages, no towns, nothing to bother one, merely to drive and keep driving, I was able to win my first race on Continental soil. I took greater pleasure in the winning when I realised that other cars better than my own were competing against me, and that by the taking all legitimate risks and a few illegitimate ones, I was able to win.

As some of my personal experiences in this race may interest you, I may be forgiven for digressing a little.

My experiences the night *before* the race, when I found myself in Bastogne without a bed, were disconcerting, and brought home to me in a very forcible manner how many difficulties the racing man, competing on foreign soil, has to contend with.

Here again the philosophy I had gained in my Continental experiences assisted me, because I am perfectly certain that it was only through the extraordinary sight I must have presented that made one of the villagers come up to me, and eventually offer me a bed in his own house. It must certainly have struck him as being peculiar to see me at nine o'clock at night sitting in the middle of



The Peerless car (see page 86).