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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"THE AUTOCAR" SUBSCRIPTION RATES.

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Notes.

The Show.

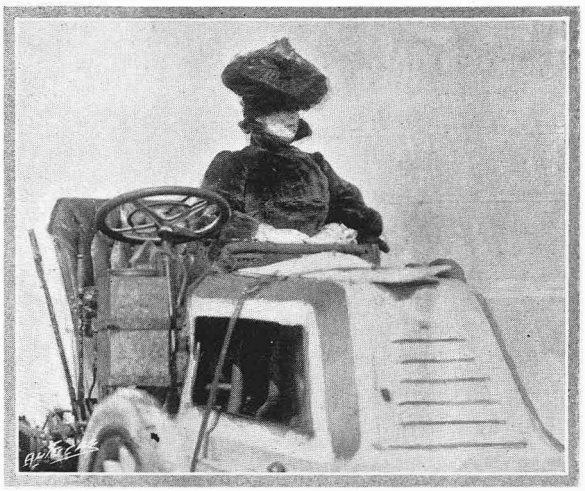
On Wednesday last the most representative and altogether the best motor car show which has ever been held in Great Britain closed. Already arrangements are well in advance for next year's exhibition, the date of which is fixed for February 10th to 18th, it being the opinion of the majority of the exhibitors that eight days are sufficient for the show instead of eleven, as this year. In order to give more space, the size of the stands will be cut down, no firm being allowed to have a greater area than 800 square feet. What this means will be best understood when we say that the maximum area of the largest stands this year was 1,400 square feet. So that next year's exhibition, unless the number of large exhibitors is considerably greater than it was this year, will be more compact, and there will be no necessity for the overflow exhibits in the corridor by which visitors reach the Palace from the Low Level Station. This will undoubtedly be an improvement. The show this year really occupied too great an area. The average visitor would have been better pleased if he could have seen it all without quite such a long promenade. Besides this, we are very doubtful as to the advisability of very large stands. When a large number of cars are shown in one exhibit the visitor is apt to get bewildered, and it seems to us that it would be better in many cases if one machine of a type were shown. For instance, if a firm were making, say, a voiturette, a two-cylinder car, and a four-cylinder vehicle, it would be better to show one of each type, or, at the outside, a fourth machine with some special body, and a chassis or two. It would be easy to show the alternative designs for bodies on the other cars by means of enlarged photographs or drawings. Another point which would facilitate examination of the machines would be that each should be neatly marked. For instance, it is quite difficult, even for the most expert visitor, to know whether a certain car is a 12 h.p. or a 15 h.p., and it is only by direct enquiry that he can find out this. The tyre people are more enterprising. The visitor sees at a glance with what tyres the machines are fitted, being informed of the fact by means of a neat little card attached to the wheels of the vehicles; but this is all he can glean unless he enquires of the stand attendants, who may be fully occupied with other visitors at the moment.

Interested Visitors.

We have no official figures as to the actual number of visitors to the show, but the impression seems to be that they were not more numerous than last year, though, as the show was open three days longer, this, of course, means a considerably larger total attendance. However, without going into this, as we do not profess to estimate the numbers—it would only be guesswork—it seems to us there is no doubt whatever that the people who attended the show really wanted to see motor vehicles, and that a very fair percentage of them went with the intention of purchasing. There was a time when people visited the show merely because motors were such a decided novelty, but now comparatively few who are not really interested, either as users or as prospective users, will take the trouble to journey to Sydenham. It is just as well that this is so, as we do not think very much good accrues to anyone from the visits of those who are not genuinely interested in the motor. Such people only get in the way of those who are interested. This used to be the case, and was to some extent on the occasion of the recent show, particularly on Saturday afternoons, when the usual crowd of aimless wanderers roamed about the place without looking at the exhibits at all.

The Future of the Show.

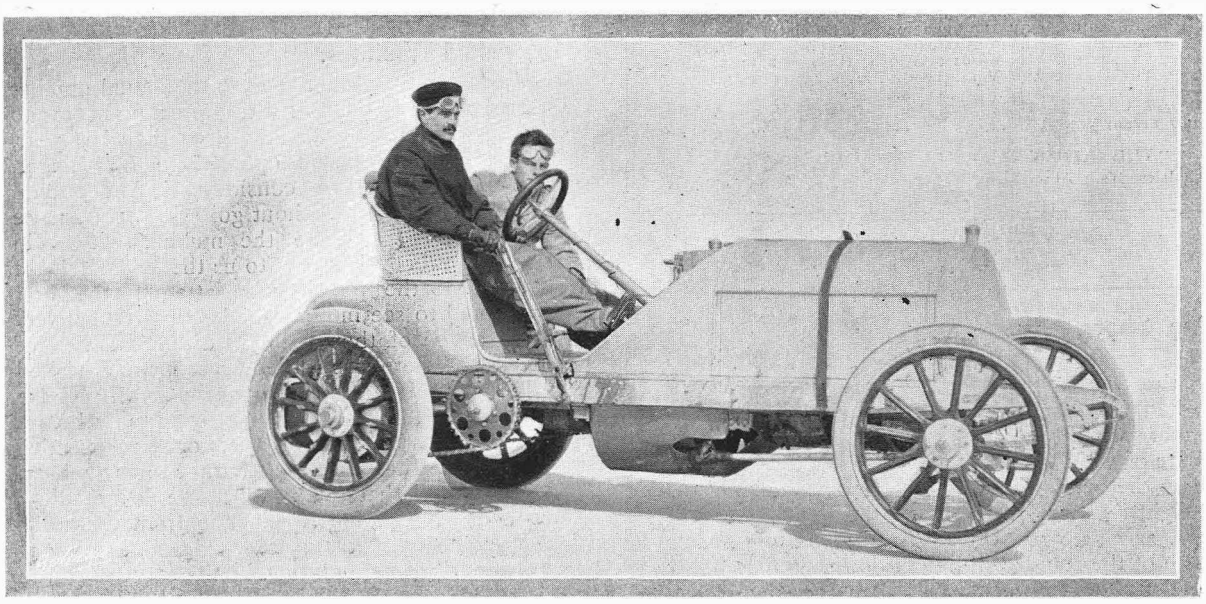
To return to the future of the show at the Crystal Palace, there seems to be no doubt whatever as to this, but the question of one show only instead of two appears farther from settlement than ever, not only on account of the club's action in bestowing its patronage upon the less important exhibition, but also because of certain internal difficulties set up by the exhibitors themselves, or perhaps we should say forced upon the exhibitors by circumstances. To put the question briefly, the difficulty is this. Some of the Crystal Palace supporters have signed a bond agreeing not to exhibit at any other show, and for this they are admitted to the first ballot for places. A new bond was prepared, which was retrospective in action, and which would have prevented all makers who had decided to exhibit at the Agricultural Hall show next month from doing so unless they were prepared to pay a penalty of £250. This they all refused to do, and the matter appears to have been compromised at the moment by the new bond being dated March 26th—the last day of the Agricultural Hall show. While this will satisfy the firms showing next month, it does not meet the approval of those who have loyally stuck to the Crystal Palace show through thick and thin, and who have denied themselves the publicity of the Agricultural Hall because they believed so thoroughly that one show, and one show only, was all that was necessary for the benefit of the pastime and industry. However, it is to be hoped, under the circumstances, that the two opposing factions will be able to come to a definite understanding. If they do not, we may look upon two shows as a certainty for some years to come. It has already been proposed that the Crystal Palace show shall be held earlier and be devoted solely to makers, and that the Agricultural Hall show should take place in the spring and be restricted to agents, but there appears little possibility of this plan being adopted.



THE FLORIDA BEACH RACES. Mrs. Vanderbilt watching her husband race from his old 60 h.p. Mors.

The Club Committee.

To-day we publish important letters in which distinctly opposite views are given as to the composition of the future club committee. While we would be the first to protest against the interests of the motor business being too strongly represented, it would be even more unsatisfactory for the direction of a society of encouragement to be left entirely to members who had no monetary stake in the industry, and who might in many cases concern themselves about unimportant matters rather than the consolidation of the movement as a whole. The club has made many mistakes, but its worst errors in policy have been sanctioned by members who were not connected with the motor industry, while it has been saved from more than one serious blunder by the practical men on the committee.



THE FLORIDA BEACH RACES. Mr. W. K. Vanderbilt, jun., on his 90 h.p. Mercedes at Ormond Beach Tournament, Jan. 27th to Feb. 1st, referred to in *The Autocar* of last week. The following are the records claimed for this car on the occasion named: One mile in 39s.; five miles in 3m. 31⅘s.; ten miles in 6m. 50s.; twenty miles in 17m. 2s.; thirty miles in 24m. 11s.; forty miles in 33m. 52⅘s.; fifty miles in 40m. 49⅘s.

USEFUL HINTS AND TIPS.

Lubricating the Clutch.

Cases of trouble with the clutch and the first speed gearing have at various times come under our notice, and difficulty has been experienced in locating the cause of the trouble. Every clutch is provided, or should be, with means of lubricating the boss where it revolves on the shaft when withdrawn from engagement with its opposite half, which is very frequently the flywheel of the motor. Want of lubrication causes the moving portion of the clutch to revolve rapidly, and, in fact, to transmit power when it should not—that is, when the clutch is out of action and the gear is still running. The result of this driving by the clutch when disengaged is that one member of the change-speed gear is revolving at a higher rate of speed than the opposite member with which it has to engage. In order to ensure the minimum of ease when changing speeds, the gear wheels should approximately be running at an even speed, otherwise a harsh grating sound follows, the result of which is that the edges of the gear wheels become severely chipped, and are generally reduced to a bad condition. If one gives the slight attention necessary for the lubrication of the clutch, all such difficulties will disappear, and no further trouble will be experienced in changing down to the low gear, and the shrieking and grinding which previously accompanied such changing down will become non-existent.

Protecting Universal Joints.

Particular attention should be given during wet and muddy weather to the universal joints which are employed on cars with gear transmission by propeller-shafts. If such joints are unprotected, there is every possibility of liquid mud being splashed over the joints and finding its way therein. So long as the gear is moving, there is little fear of accident occurring through jamming, though, of course, such liquid mud can do a great deal of harm while being churned about in these joints, inasmuch as it very frequently must contain hard, gritty substances which act as an abrasive on the articulating surfaces of the joints. The real trouble lies in allowing the mud to dry in the joints during a period of inactivity of the car. A very simple and effective method of protecting the joints, and one which is carried out by many manufacturers, is to encase the whole of the joints in a soft, pliable leather covering, this being stitched over the joints in such a manner as to allow ample room for the greatest possible freedom of movement without tearing the leather. If one contemplates enclosing joints of this kind in such a casing, the parts—provided the car has had some wear—should first be taken down and thoroughly cleaned with paraffin, then wiped dry, and filled as full as possible with good motor grease before the leather covering is placed over the joint. In some cases, and for some reasons, it may not be possible so to enclose these joints, and where such is the case it is an excellent plan occasionally—in fact, very frequently—during wet weather to inject paraffin into the joints by means of a syringe, and after allowing the superfluous oil to drain away to inject by similar means a quantity of good heavy-bodied lubricating oil.

The Force on the Starting Handle.

Many of our readers will know from bitter experience the result of a backfire on a single-cylinder engine. Although the force is known to be great, its magnitude will hardly be appreciated without going into cold figures. A motoring friend of ours has taken the dimensions of a well-known engine, and, assuming a given cylinder pressure, has calculated that the force at the starting-handle when a backfire occurs is equal to no less than half a ton. A tip which will be very useful to possessors of single-cylinder engined cars, and equally to those having multi-cylinder cars, is the method of holding the starting-handle which has been adopted by the friend to whom we refer. Instead of grasping the handle in the usual way—with the fingers underneath and the thumb over—the thumb is turned so as to lie parallel with the starting-handle, and the four fingers are hooked underneath the handle. If sufficient flexion is allowed to the muscles of the fingers, it will be found that when a backfire occurs the handle will simply straighten the fingers out and leave the hand without the slightest danger to the operator. In fact, we are told that an engine has been purposely started up with the ignition well advanced, in order to demonstrate the safety of this method of manipulating the starting-handle. At the same time, the adoption of this method should not lead motorists into careless habits, which they may possibly have overcome by reason of their concern for their own personal safety. They must remember that the strain of a backfire still affects the engine, though it has been removed from themselves.

Examination of Tyres.

At this time of the year, when one may reasonably look forward to the coming of spring, it is a commendable practice to remove the tyres from wheels and to subject them to a thorough examination. Any cuts which may be found should be cleaned out with naphtha, and filled in with rubber solution, which should be allowed plenty of time to set before the edges of the cut are closed together. Special attention should be given to the fabric. If any dark patches are to be seen, they indicate that damp has penetrated through some cut in the rubber casing, not necessarily opposite the mark on the fabric, but probably very near to it. This puncture should be sought for very carefully, for it may be only a small one, and it should be closed up, while the damp should be extracted from the fabric by placing it in a moderately warm atmosphere and allowing it to remain there for some time. If the tyre is in such a condition, either as to its fabric or its rubber casing, that to attempt a home repair would be out of the question, the opportunity would be a favourable one for sending it to the works for necessary repairs. When replacing the tyre, French chalk should be liberally used, though care should be taken not to be too lavish in this direction, for this reason—that if too much is used the chalk has a habit of forming itself into hard lumps, which adhere to the fabric, and the friction of the inner tube upon these lumps, smooth though they be, will eventually thin down the walls of the tube to such an extent as to make its bursting a very probable event.

NOTABLE CAR FEATURES AT THE SHOW.

A BRIEF SUMMARY OF SOME OF THE MAIN MECHANICAL FEATURES OF THE CARS EXHIBITED AT THE CRYSTAL PALACE SHOW. NO ATTEMPT IS MADE TO GO INTO MINUTE DETAIL, THE IDEA BEING RATHER TO INDICATE BROADLY THE CONSTRUCTIONAL TENDENCIES OF THE TIME.

In *The Autocar* of February 13th the main features of the show as a whole were pointed out, and the tendencies of motor car construction, as exemplified by the machines exhibited.

Now that the show is over and everyone interested, who was not absolutely prevented, has been, and seen, and admired, it may be of interest to mention a little more in detail the most noteworthy car features of a most noteworthy exhibition.

The Engine. Turning first to engine construction, we find three-cylinder engines well to the fore, whilst at least three representative manufacturers staged six-cylinder engines. The observer could not help being struck by the marked tendency in multi-cylinder engine construction to cast the cylinders separately, and so obtain more uniform cooling and expansion than when cast in pairs, besides facilitating and reducing the expense of repairs.

The automatic inlet valve, at any rate on engines of more than two cylinders, has, in most representative makes, given place to the mechanical inlet (usually constructed to give a variable lift), whilst in many cases the inlet and exhaust valves are made interchangeable.

Ignition. Magneto ignition, brought within the last year to such a high state of perfection, has been adopted by several important makers, to the complete exclusion of the accumulator system, which had been employed until now. At the same time the accumulator system is very far from being dropped, as many reliable constructors, while believing that the magneto is the ignition of the future, do not consider that it has reached such a stage of development as to warrant their adoption of it. Then there is another section of designers who fit the magneto, but provide high-tension ignition as a standby. We do not regard this as altogether good practice, as it induces complication. It appears to us the magneto should be sufficiently good to stand alone. If it is not it is best to stick to the accumulators for the time being.

Carburation. The automatic carburetter was, as expected, numerously represented, but one had to look in vain, except in the case of one public service vehicle, for any device for the carburation of heavy oils. In the vast majority of cases the automaticity consisted in supplying extra air through ports, which were uncovered by the stronger suction of the engine as the speed advanced. In other words, the effect aimed at is much the same as if an extra air inlet automatically opened in the induction pipe, when the speed of the engine demanded more air on account of the fixed air inlet being too small for high speeds. In other cases the extra air was supplied by the action of the governor, which, as the speed went up, opened the air ports wider and wider. In only one case was an automatic carburetter found which adjusted the air and petrol throughout for all speeds of the engine, instead of leaving the petrol supply to be controlled entirely by the strength of the engine suction. One or two other devices claimed to do this, but we can scarcely say that the claims were justified, with the one exception mentioned, as no provision was made for instantly regulating the jet. On the other hand, the system which provides for two or more carburetters coming into action one by one as required, except for its complication, has much to recommend it, as each jet and mixing chamber, with its orifices complete, can be proportioned correctly for the work of the moment. It may be urged it has the objection which applies to ordinary change-speed gears. That is to say, instead of being gradually progressive it comes into action in steps. At the same time, taking practice and not theory as the guide, it must be confessed that the objection raised can scarcely be said to hold good from results, as the engines so fed run with remarkable smoothness at all speeds, and do not appear to suffer frim the sudden transition; this, of course, being brought about by the fact that the supply, whether received from one or both carburetters, is still controlled by the throttle.

Circulation. As regards the cooling system, we noted a distinct inclination to use "natural" (thermo-syphon) instead of pump circulation, or, where the pump was retained, to contrive the circulation so that in the event of its failure a continuous, though less effectual, stream could be maintained on the thermo-syphon plan. Not only so, but the thermo-syphon is now to be found combined with the induced draught of the fan, so that the efficiency of the cooler is not seriously reduced when the car is standing still, and no natural current is passing through the radiator.

The tubular cooler was conspicuously prevalent, though, as pointed out in *The Autocar* of February 13th, "the flanged radiator stack is very far from being banished, and many manufacturers prefer it to the tubular or honeycomb type."

Transmission. This remains very much as it was a year ago, with the important exception that direct drive on top speed was very generally shown, whilst two English cars were exhibited using the worm drive. Another tendency which could not be missed was the fact that larger and heavier cars are now gear-driven throughout than was the case a year ago. It is also notable that in many cases the top or fourth speed is more moderate than was formerly the case, and this, combined with the greater elasticity of the engine of to-day, enables cars which have quite a respectable turn of speed on the level to ascend many inclines, without the necessity for changing down to a lower gear.

The internal type of clutch was fairly well *en evidence*, and a growing and praiseworthy tendency was noticeable to construct the foot brake to work independently of the clutch pedal, and so give the driver a third brake—*i.e.*, the engine—should occasion arise. One maker even showed a simple arrangement whereby the brake and clutch pedal could be disconnected at will. The metal-to-

metal clutch is also gaining ground. There was a conspicuous exponent of this system at least who had not previously shown a car so exhibited, while the three or four firms who made a feature of metal-to-metal clutches a year ago had all adhered to them, so that there seems to be no doubt that the metal-to-metal oilproof clutch is gaining ground.

The Frame. Pressed steel frames were very numerously represented, but some of the most experienced makers still use the wood frame with steel flitch plate. A year ago it was prophesied that the tubular frame would die, but it has not died. In fact it is in at least as wide use this year as it was last, more than one of the very best makers retaining this pattern of frame, as it appears to us they are fully justified in doing. It is light, strong, and smart-looking, and those constructors who have trained men thoroughly acquainted with the building of light tubular frames should be commended rather than blamed for adhering to this system of frame-building.

Wheelbase was, without exception, considerably longer than last year.

Tyres. We cannot help noticing with dissatisfaction that many of the cars shown were fitted with tyres of insufficient size, and bound sooner or later, therefore, to give trouble and dissatisfaction to purchasers, for it should not be forgotten that much of the unreliability of the pneumatic tyre is eliminated if, with considerate driving, a sufficiently large size is used. We were pleased to note that one firm boldly announced that they had no recent improvements to show. Their cars were already reliable, and their endeavour was to bring the totality —*i.e.*, the tyres and cars together—up to the same standard of reliability by fitting very much larger tyres than were usually regarded as necessary for the weights and speeds of the vehicles in question. It is certainly significant of the dissatisfaction which many users experience with pneumatic tyres that there was even one firm of exhibitors showing cars designed exclusively for use with solid tyres, whilst several makes of car were to be seen built for use with solids if desired.

The Runabout. With the advent of the light petrol-driven runabout the light steam car has become almost obsolete, and was not represented at the show. All the steamers shown were of the four-seated type, and two of the systems were thoroughly tried, and not only thoroughly tried, but thoroughly proved both for reliability and fuel and water endurance. Steam cars which can be driven one hundred miles without replenishment, and still longer distances if the owner likes to have specially large tanks fitted, can be regarded as thoroughly worthy exponents of steam, and at once remove the old reproach to steam that as compared with petrol it was not practical, as such short distances could be covered without a compulsory water stop.

Protection of the mechanism from mud and dust, by means of a metal shield extending underneath the car throughout its length, is a very great improvement which was fitted to a large number of cars. Dirt is potential trouble, and to prevent its accumulation on the mechanism of a car is to prolong the life of that mechanism. At the same time, some of these under protections will be a source of no little trouble at intervals. They are not easily detachable, and there is no provision made for getting such dirt as may find its way into them out again. There should be some sort of draining system adopted, and at the lowest level of the cover there should be a trap or door which could be opened so that the dirt could be easily removed. The leather aprons fitted under some cars, while better than nothing, do not add to the appearance of the vehicle, especially when they have been in use for a short time.

Finally, it may be said that with the ease of control which has come with the advent of the hand throttle, automatic carburation, and increased elasticity of engine, the demand for high-powered cars, as instanced by the number on show, must be distinctly large. Generally, the impression left by a visit to the Palace is that cars tend to become differentiated into three classes —(*a*) A rapidly increasing class with four or more cylinders of relatively high horse-power; (*b*) cars with three cylinders, including a rapidly waning class of two-cylinder cars; (*c*) small single-cylinder runabouts.

THE FLORIDA BEACH RACES. Preparing to go for a record.

THE NEW 12 H.P. JAMES AND BROWNE.

Some Details of the Engine Design.

We give herewith a diagram of the new 12 h.p. James and Browne engine, designed specially for landaulettes and similar vehicles, with a view to obtaining a perfectly flexible and vibrationless motor. This, as can be seen by reference to fig. 1, is a four-cylinder engine, with cylinders of 3½in. bore and 4½in. stroke. It is arranged on similar lines to the firm's 18 h.p. motor, and has proved itself so flexible that the car to which it is fitted can be driven on the top speed in traffic without withdrawing the clutch. Also, when the engine picks up after slowing down almost to a stand, the front of the car is not lifted up with every impulse of the engine, this being due to the horizontal position of the cylinders, and to the driving impulse being given in the direction of the progress of the vehicle. The diagram (fig. 1) has been particularly drawn to show the James and Browne system of lubrication, which is unique for its special feature of maintaining a partial vacuum in the crank chambers by means of the pumping action of the pistons themselves. The effect of this provision is that the pressure feeding the oil increases with the speed of the motor, while the near approach to perfect vacuum prevents the oil from reaching the combustion chambers of the cylinders with all the well-known attendant bad effects.

The cylinder oil is fed to the cylinders on their upper surfaces by the orifices shown in the drawing, the feed being in such a position that at the end of the outward stroke the last piston ring is still on the explosion side of the oil orifice. The oil for the countershaft is fed directly to the bearings, the brasses being so grooved as to convey all the oil in the direction of the crank pins. A hollow boss is formed on the crank web, and this web, surrounding the end of the bearing brass, collects all the oil flowing from the latter. From this boss, or collector, a hole is drilled to the crank pin, and all the oil so collected is thrown up this lead by centrifugal force, thus ensuring perfect and constant lubrication to this important member. In the base of the crank case is fitted a non-return valve with a flat seat enclosed as protection from grit, this valve being held in position by a light spring. Therefore, when the piston advances towards the crankshaft, the air in the crank chamber is expelled therefrom through the valve, conveying with it the oil, but when the piston has reached the end of its outward travel the valve closes automatically, the return of the piston causing a partial vacuum in the crank chamber, thereby permitting the external pressure of the atmosphere to force the oil on to both piston and bearings. It will be observed that to achieve this end each crank rotates in its own crank chamber, and, of course, has its own automatic air outlet valve.

Fig. 2 is an enlarged diagram of a crank, crank chamber, and air valve.

Fig. 3 is a section of one of the new James and

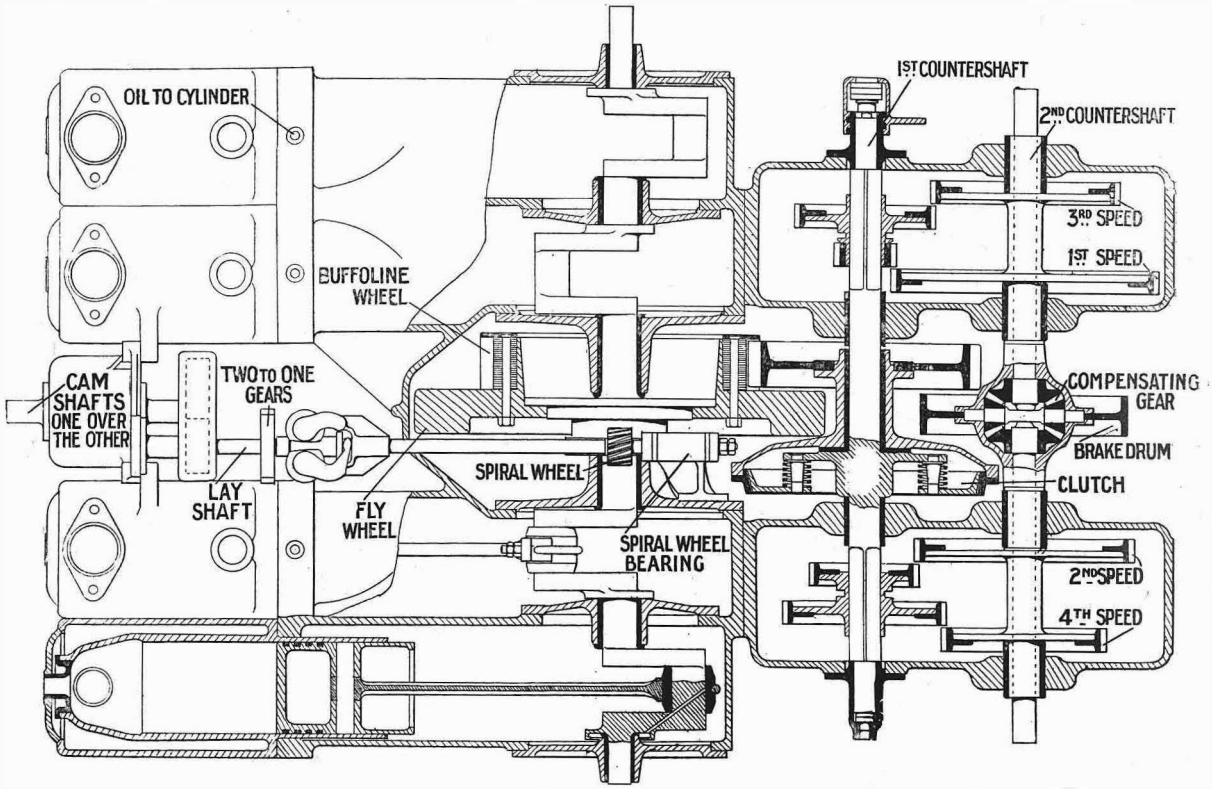


Fig. 1. Part sectional plan of the 12 h.p. James and Browne engine and transmission gear

Browne exhaust and induction valves, the operating mechanism of which is somewhat on the lines of that employed in their older pattern cars. It consists of a layshaft set at right angles to the crankshaft, with its axis parallel to the cylinder centres, but above the plane of the latter. On the crankshaft, overhanging one main bearing of the engine (see fig. 1), is a hard steel spirally-toothed wheel, which serves to drive a hard phosphor-bronze companion wheel keyed on the layshaft, which rotates thereby at the same speed as the crankshaft. Between the ends of the two inner cylinders is bolted the valve gear box, which contains two camshafts, driven by a train

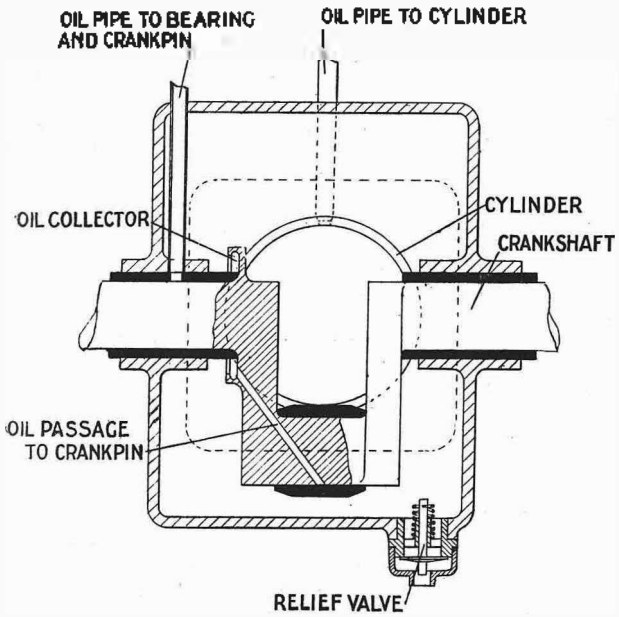


Fig. 2.—Section of crankshaft showing oil ways.

of wheels from the before-mentioned layshaft at half engine speed. These camshafts are parallel to the layshaft, midway between the cylinders, and placed one above the other. The lower one is in the same plane as the cylinder centres, and operates the exhaust valves, the upper controlling the inlets and the commutator.

The exhaust valves are opened by a bell crank lever, and the valve stems are made in two parts, called the valve stem and extension (see fig. 3). The extension is tubular, is slotted, and swaged at one part, as shown, in order that the hammer end of the bell crank lever can strike the end of the valve stem. The valve stem and extension are connected together by the long pointed cotter shown. The lower end of the extension is made with a cross-head, on to which the valve spring is secured. As the bell crank lever strikes the lower end of the valve stem within the swaged portion of the hollow extension, and the spring is coupled to the extension, the cotter is always retained safely in its position by the pull of the spring.

To withdraw the valve for any purpose, all that is required to be done is to screw the extractor on to its head, take the pressure of the spring on one hand, and withdraw the cotter with the other. The valve can then be withdrawn, without any necessity for detaching the spring or any other part, as the extension is held in position by the end of the bell crank lever. The valve can then be ground in with all the gear in position.

To replace the valve, all that is necessary is to insert the taper end of the cotter in the stem, a part of which will be visible through the corresponding slot in the extension, and with the pressure of the spring being taken by the hand, as before, the cotter will be found to go home quite easily until the valve stem rests in its notch.

The whole of this simple but most ingenious valve gear—upon the conception and perfection of which we must offer Mr. F. Leigh Martineau our congratulations—has been designed to be identical

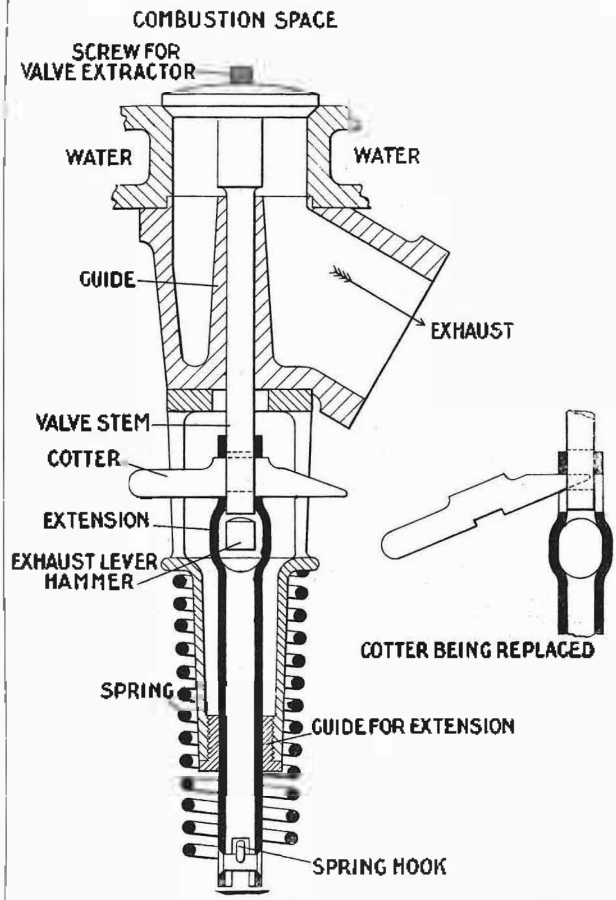


Fig. 3.—Section of exhaust valve showing the new spring attachment.

(except for the number of parts) either with ordinary automatic or mechanically-operated valves. To illustrate this, the 18 h.p. engine shown at the Crystal Palace was fitted with two of its cylinders having automatic and two mechanically-operated inlet valves.

There will probably be running during next summer a service of motor omnibuses in the Lake District. One of the principal proprietors of the horse-drawn coaches which at present traverse the twenty miles of roadway between Windermere and Keswick and one or two hotel proprietors are interested in the scheme, so that it seems to partake of the quality of real earnestness. The time scheduled for the journey to be made was only a little over half that occupied by horses, and the fares proposed are one penny per mile, against fourpence under the old *regime*.

OCCASIONAL GOSSIP. By the Autocrat.

A few weeks ago there was some talk of an Institution of Motor Car Engineers being formed, but I have heard no more of it lately. I rather wonder that nothing has come of it, as I think such an institution is wanted. I should not be eligible for membership, so I can speak impartially. I might possibly creep in as an associate if the rules were not too stringent, but that would be the height of my ambition.

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Some of my friends pooh-pooh the idea of this Institute of Motor Engineers. They say there is an Institute of Mechanical Engineers, the Electrical Engineers, and I do not know how many other learned societies, and they ask me what is the use of starting any more. My reply to this is, did you hear Captain Longridge's paper, or, rather, the discussion which followed it, at the Institute of Mechanical Engineers in the autumn of 1902? If you did, you would see at once how much, or how little, most of the members of that institution—assuming them to be represented by the gentlemen who took part in the discussion—knew about the subject. Here and there a bright remark was made and something was learned, but I must say the ordinary average motor club, which discusses some little paper read by a member, talks much sounder motor sense than did most of the members of the Institute of Mechanical Engineers when they discussed Captain Longridge's paper the year before last. There is something else to remember, too. This paper was read nearly eighteen months ago, and neither the subject of high-speed internal combustion engines nor any other matter of special interest or value to the motor engineer has been contributed since. Therefore, if the Institute of Mechanical Engineers is sufficient for the motor engineer it can only be said his wants are very small. He must know more than I give him credit for, as I can only assume he knows all there is to be known about carburetters, about ignition, about bearings, about gears, and the hundred and one other things which most automobilists think are still open to improvement.

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I have always been a great believer in the three-cylinder engine, because it has seemed to me that this is the minimum number of cylinders by which a smooth running motor can be secured, but I have a confession to make. I have only had the opportunity of trying three or four cars driven by three-cylinder engines, and I have not been altogether prepossessed. I mean that the three-cylinder engines do not seem to me to be much better than some two-cylinder engines I have driven behind, and certainly not equal to a good four-cylinder engine. In fact, unless it can be shown that the three-cylinder engine is practically as smooth running as the best four-cylinder engine, it seems to me it will be wise to drop it and stick either to two or four. The general idea was that the three-cylinder engine would be considerably more than a halfway house between the two and four-cylinder types. It was, in fact, to give most of the advantages of four-cylinders without the complication or expense. I still have personal hopes that this will be done, but, as I have said, up to now I have not been on the car which indicates that it has been accomplished. What I should like to see, personally, would be one of the quietest and smoothest running four-cylinder engines rebuilt as a three. Take the existing four-cylinder engine, give it a new three-throw crank, and rob it of one of its cylinders, and see what can be got from it. Of course, I know that there would be a drop of twenty-five per cent. in the power, but that is not the point that interests me. Plenty of power can be got from a three-cylinder motor, that is only a question of the cylinders being large enough, but I want to be satisfied that it is to all intents and purposes as smooth running as the best four-cylinder engines.

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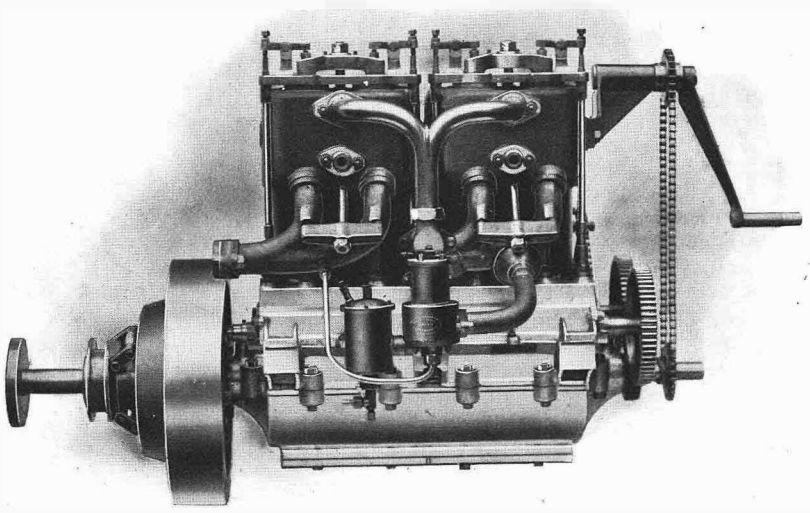
When talking with a friend the other day about the possibilities of the British eliminating trials for the Gordon-Bennett race being held in the Isle of Man, he expressed a hope that while the club ambassador (Mr. Orde) was visiting the island, with the idea of approaching the authorities on the subject, he would spend money freely. My friend's opinion of the matter is that if the Manxmen are only impressed with the idea that motorists are open-handed men with plenty of money to spend, the Gordon-Bennett eliminating trials will be welcomed by them as a most desirable event. I am inclined to think there is something in this suggestion, and can only hope that the club committee has authorised their secretary to appear before the Manxmen in royal state, for, after all, they are more or less an island of hotel and lodging-house keepers. In fact, I suppose their staple industry can be described as catering for visitors. There is no doubt whatever that the trials would bring a very large number of visitors, and of a far better class than usually frequent the island, and if the event could be fixed to take place either between Easter and Whitsuntide or a little after Whitsuntide, it would appeal still more to the business instincts of the islanders, as they would know that these periods would be ones in which, in the ordinary course of things, they would not be overrun by visitors, so I hope it will be made very clear to them that the race would be a good thing for their pockets. Mr. Orde is seen at his best in negotiations of this sort, and I have little doubt from his conduct of the Irish negotiations last year that he will acquit himself well in the Isle of Man.

THE THAMES VALLEY FLOODS. A scene in Staines taken early last week by Mr. T. Bernard Percy, to whom we are indebted for the original photograph.

PETROL ENGINES FOR COMMERCIAL CARS.

We recently had an opportunity of inspecting a four-cylinder engine designed and built by Messrs. Johnson, Hurley, and Martin, of Coventry, for use on a private railway motor lorry. The four cylinders are cast in pairs, and are provided with ample water-jackets, the fair way in these being assured by having a detachable aluminium head to the water-jackets. This is a construction which is now being very largely used, as it admits of better castings being obtained, and enables manufacturers to assure themselves that the waterways in the jacket are not restricted by any projections which may possibly be formed in the process of casting. Such projections, of course, would restrict the free flowing of the cooling water, and would contribute to overheating to a very considerable extent. Each of the cylinders has a bore and stroke of 4¾in., and running at a speed of 800 revolutions per minute 30 b.h.p. is developed. The crankshaft cranks are set at 180°, the two two inner pistons having an opposite movement to that of the outer ones. That is to say, while the two end pistons are at the top of their stroke, the two centre ones are at the bottom of their stroke. The crankshaft is made in one piece, and is provided with a large diameter boss, to which the flywheel is bolted. The crank chamber is of aluminium, and is provided with suitable brackets for attachment to the frame. Mechanically-operated inlet valves are used, these being placed over the exhaust valves, and are interchangeable therewith. They are actuated by means of lifting rods and tappets operated from a second camshaft, which also actuates the exhaust valves. A second camshaft is provided for the operation of the magneto machine and the sparking plug tappet actuating cams, where the low-tension system of ignition is employed. The gaseous mixture is supplied to the cylinders by a single Longuemare carburetter, the throttle valve being interposed between the carburetter and the inlet valves, so that when governing each and every cylinder obtains an equal charge. On the engine that we examined, the exhaust gases were ejected into an exhaust box, and were led thence to the silencer by a large diameter pipe. A variation of this fitting is made by the provision of branch pipes with double exhaust pipes to the silencer. The illustration given depicts a similar engine made for fitting to launches. This, as will be seen, is fitted with starting gear, which is absent in this form on the lorry engine. Otherwise the motors are precisely similar. With regard to the details, one point should be mentioned, and that is the fitting of a hardened screw step to the ends of the valve plunger, so that the distance between the valve plunger and the valve stem may always be kept certain and constant. The distance necessary, of course, is very small—so small, in fact, that, after regrinding the valves once or twice, it is possible for the valve stem to rest on the lifter, thus preventing the exhaust valve closing to its seat properly, this, of course, resulting in loss of compression and power. The bottom of the crank chamber is detachable for inspection purposes.



Right-hand side view of the Johnson, Hurley, and Martin engine.

A Scottish correspondent sends us cuttings of reports of two horse accidents, which illustrate the necessity for what we have often insisted upon, namely, identification plates for horse-drawn vehicles no less than for motor cars, and an age limit for drivers of horses. The first cutting reports in twelve lines the fact of a running down case at Helensburgh, in which the driver of a van knocked down a woman, and "drove off without offering help or drawing attention to the accident." The second cutting, equally brief, describes how a van horse at Glasgow broke away from a boy who was left in charge, and did a lot of damage, including serious injury to a recruiting sergeant who tried to stop it. Commenting upon this cutting, our correspondent remarks: "Under the new Motor Car Act, it is made illegal for anyone under seventeen years of age to drive a motor car, and yet the law allows an animal which is in the highest degree dangerous when frightened or excited to be left in charge of boys and children who have not the power to control it. Only about a year ago, whilst on my way to St. Andrew's with my car, I overtook a heavy Clydedale horse under the sole charge of a boy who was certainly not more than ten years of age. This child was mounted on the horse's back, and trotting alongside were two little girls of about seven and eight. As it happened, the horse took no notice of my car. Had the animal turned restive, I tremble to think of what would have happened to those three children. Had either of these accidents been caused by a motor car, what a howl would have gone up, and what large type would have been used for a heading. As they were horse accidents, the paragraphs were just put in a corner."

THE NEW BURLINGTON CAR.

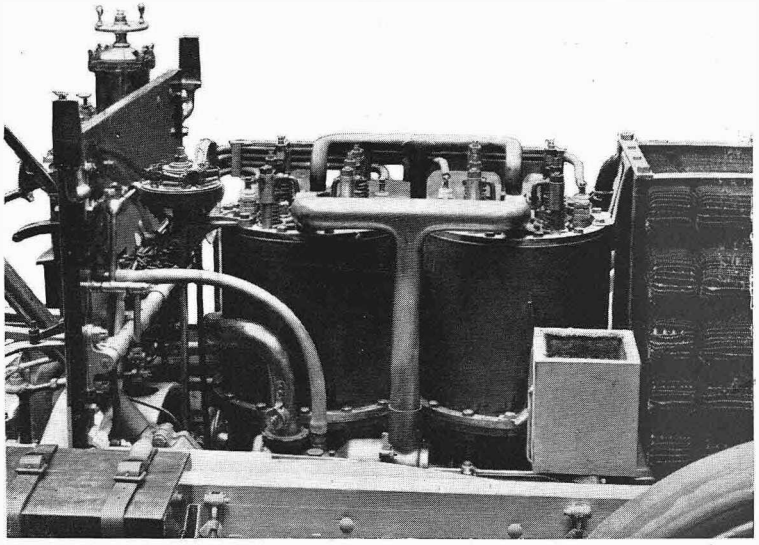
A CAR CONTAINING SOME NOVEL FEATURES, PROMINENTLY AMONG WHICH ARE THE CYLINDER WATER JACKETS, WHICH ENTIRELY SURROUND THE VALVE MECHANISM; AN AUTOMATIC CARBURETTER IS FITTED, AND HIGH TENSION IGNITION IS EMPLOYED. THE CHANGE SPEED GEAR IS OF THE SLIDING TYPE, GIVING FOUR SPEEDS FORWARD AND A REVERSE. THE FRAME IS OF ARMOURED WOOD.

Late on the first Monday night of the show week the Burlington Carriage Co. staged a chassis of the new Burlington car—a four-cylinder 24-28 h.p. vehicle—in which the construction of the engine is the most remarkable feature. The cylinders are in pairs, each pair being placed within copper drums, as shown by the accompanying illustrations. The guides for the valve rod tappets are cast in the form of columns between the top and bottom flanges of the drum. All the valves are mechanically actuated.

The valve boxes are formed in the upper flange of the cylinder casting, both exhaust and inlet valve spindles having to be depressed in order to open the valves, the valve tappets being in the form of a swivel arm screwed to the upper end of the valve opening rod by a nut and washer. There is therefore no rocking whatever in this arrangement, the end of the tappet being provided with a striking nut capable of exact attachment for the proper depression of the valve.

The engine shown is fitted with high-tension ignition, the sparking plugs being set in the crowns of the combustion chambers, where the compression taps are also placed. The lower flanges of the cylinder drums are bolted to a corresponding flange cast on the crank chamber. What may be termed the barrel of the drum is formed of a sheathing of thin copper, which forms the water jacket. It will therefore be seen that a very large quantity of water circulates about the cylinders and the valve chambers, and that efficient cooling must result.

The commutator, which is of a somewhat novel design, is driven off the right-hand half-time shaft by bevel gearing, and is brought up above the level of the cylinder heads in a very convenient position.



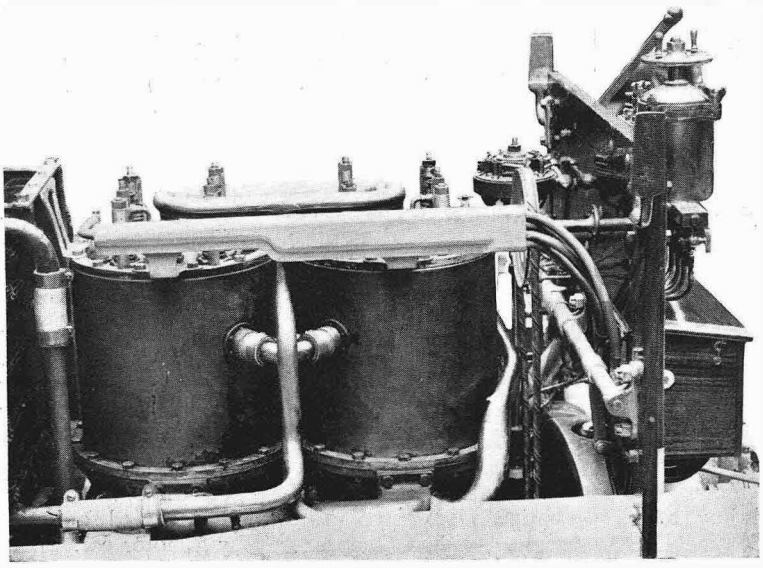
Right-hand view of the new Burlington four-cylinder engine. The commutator is seen above the head and in rear of the cylinders in a horizontal position. The box at the right-hand side of the picture carries the acetylene generator for the lamps

The carburetter is provided with a piston valve control connected to the governor, the accelerator pedal, and a hand lever attached to the dash-board.

Both hot air and cold air inlets to the carburetter are controlled by radial valves.

It should be noted that in addition to the ordinary delivery and return pipes to the water jackets of the cylinders the latter are connected to each other by a pipe seen on the left-hand side of the engine.

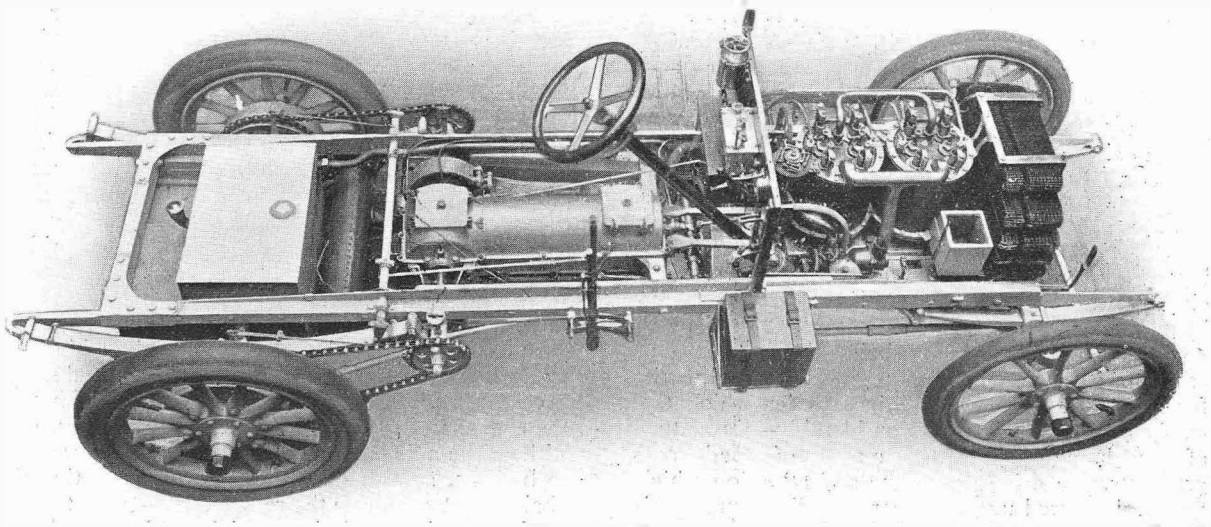
The stroke and bore of this engine are 140 mm. by 130 mm. The drive passes from the engine to a gear box of somewhat unusual length, in which is a train of gears affording four speeds and reverse, and thence by bevel gear to the countershaft, from which chains convey it to the road wheels. The frame of this car is of the armoured wood type, and carries the crank chamber and gear box by means of two angle steel members running from the fore part of the frame to the outer countershaft bearings.



Left-hand view of the Burlington four-cylinder engine, showing the supplementary connection to the water-jackets

A metal apron of suitable shape protects the engine, flywheel, and clutch from dirt and mud.

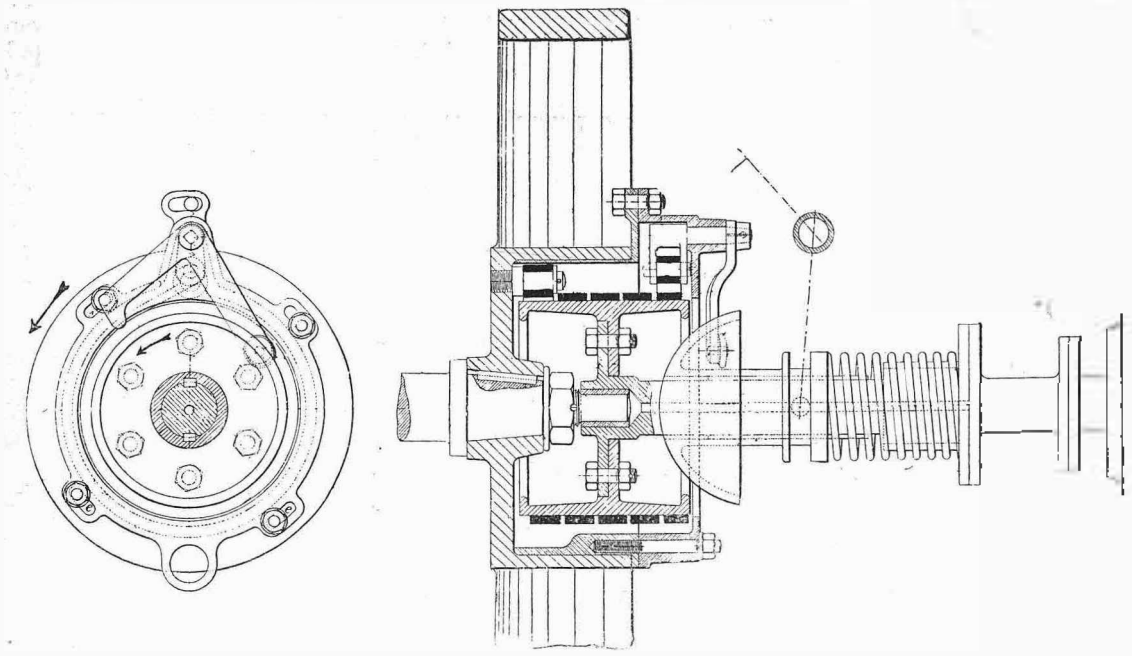
We were unable to draw attention to this most interesting car in our last issue, but those of our readers whose curiosity is awakened by this description and the illustrations which accompany it may inspect this machine—which is the output of Messrs. De Dietrich and Co., of Niederbronn—at the Burlington Carriage Co.'s establishment, 315-317, Oxford Street, London, W.



Chassis of the Burlington 24-28 h.p. car. This view shows the length of the gear-box, and also the heads of the cylinders

THE 1904 MERCEDES CLUTCH.

The accompanying drawing discloses the details of the new Mercedes clutch, which differs very much from the previous pattern. A drum is mounted upon the clutchshaft, the end of which has a thimble bearing, in which the crankshaft rotates when not driving the car.



End elevation and section of the Mercedes clutch.

Anchored inside the flywheel boss is a spiral spring, shown in solid black section, the opposite end being attached to a movable arm also carried on the flywheel. Loosely mounted on the clutchshaft is a half sphere, upon which the spring arm rests or rotates as the case may be. This is kept up to its work by means of a spiral spring seen behind the clutch disengaging collar. The clutching spring is given just sufficient tension to enable it to clear itself from the clutch drum when disengaged by the withdrawal of the half sphere, the introduction of which causes the clutch spring to wind itself up on the drum and so drive the car. This clutch should be smooth in action and simple in operation.

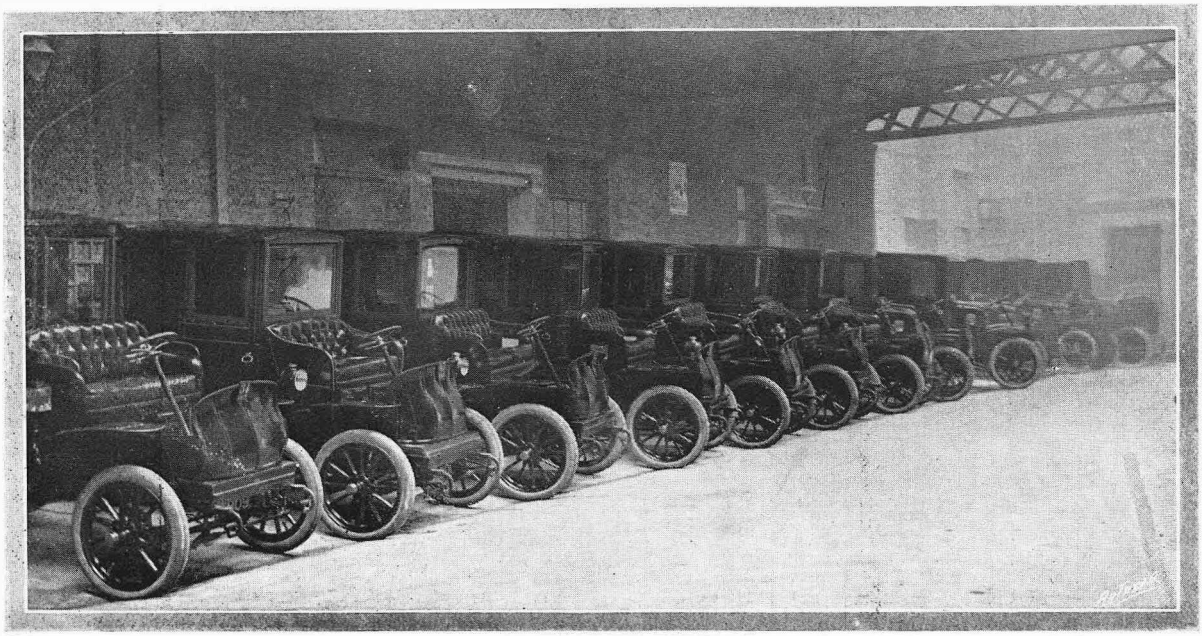
VOITURETTES AT THE CRYSTAL PALACE SHOW.

By the Roving Critic with a Limited Purse.

The editor has been good enough to ask me to write a few notes on the voiturettes which were exhibited at the recently closed automobile show. Altogether I found over thirty firms who were showing that class of machine in which I am interested, and some of them were showing several types or variations of their machines. My object was to discover, if possible, the best vehicle for a man with a distinctly moderate income, so those which over-ran my price limit of £225 did not receive any serious consideration.

I have said that my object was to discover the best machine within my price limit, but even with eight years' experience of cars on the road, preceded by a similar period spent in engineering shops, I could not now single out as being the *best* any one car from among so many of practically equal merit, for this reason: The conditions under which the car is to be used vary very considerably—the nature of the home district, the matter of roads and gradients, the driver, the time and attention which can be bestowed upon the car, standing out prominently. The car which is designed to be used as a runabout within a reasonable distance limit and at a moderate speed is not suited to the requirements of a man who rushes to his car on Saturday afternoons, throws in a couple of kit bags, seats a friend beside him, and starts out with the intention of covering over a hundred miles or more, at an average speed of twenty miles an hour, doing double the distance next day, wet or fine. Cleaning operations frequently occupy the major portion of the following week, these being done in instalments. The car which would serve admirably for the former purpose for years would be reduced to a travelling (?) scrap-heap in a few months of severe touring on the instalment plan. What impressed me most was the Belsize Junior—a voiturette which was exhibited for the first time. This is practically a reduced form of the more expensive designs of motor cars, though many simplifications have been made in order to produce the machine at a low price. A pressed steel frame is employed, and this adds wonderfully to the finished appearance of the car, and, of course, gives it strength with lightness. The method of attaching the spring ends to sliding brackets permits the springs to exert their influence and make easy riding for the passengers. The placing of the engine transversely gives a power transmission in one plane, thereby adding to its efficiency, for it must be plain, even to the uninitiated, that there must be a big drop in efficiency when power has to be transmitted round a corner, as is the case with bevel gear. Whether the engine will run quietly, smoothly, and keep cool without the aid of a fan behind the radiators remains to be seen, as also does the effect of mounting the chain countershaft on the radius rods— to me the one weak point in the design, which, without a doubt, the makers will alter before delivering cars. The body work is excellently carried out, and ample luggage room is provided. What I like in particular is the steering gear, and the control levers mounted on the steering wheel. The steering gear is of the multi-thread screw and nut type—the only one of its kind I noticed on a car costing £175. The Belsize Junior is certainly a voiturette worth watching.

With my modest price limit I hardly looked for multi-cylinder engined cars, yet two makers were to be found showing such vehicles, these being the Pick Motor Co., of Stamford, and the Vulcan Motor Co.,



THE HORSE SUPERSEDED A stud of electric carriages which have replaced horses in one of the largest jobbing establishments in Curzon Street, W. The coachmen have been retained, and after a short course of instruction have proved themselves very capable motor drivers for the most part. We hope to see in the near future mechanical traction replace the horse in cities, which will then be far healthier and cleaner than they are now

of Southport and Bolton. The former firm adopt the horizontal cylinder position, placing the cylinders fore and aft the crankshaft. The friction clutch has a fibre faced male member, which is stated to give absolute satisfaction, and this should be so with slight angled but fairly wide contact faces. One point which struck me as being somewhat original, not to say daring, in a degree, was the fixing of the time of firing with the high tension ignition. This has its advantages as well as its disadvantages. Prominently among the former is the inability of the driver to illuse the engine by advancing the ignition too far when running slow; while, on the other hand, there is no opportunity afforded for economical running beyond the use of the throttle valve, which has its uses limited, as very poor results would be obtained by a light charge ignited comparatively late. I must confess to partiality of "whacking up the engine" on a light charge ignited early, as the engine runs cooler. For the rest of the car the work is sound if rough in places, but detail finish never yet helped to get a lame car home any more than it played its part in a breakdown—that is, such finish as I refer to.

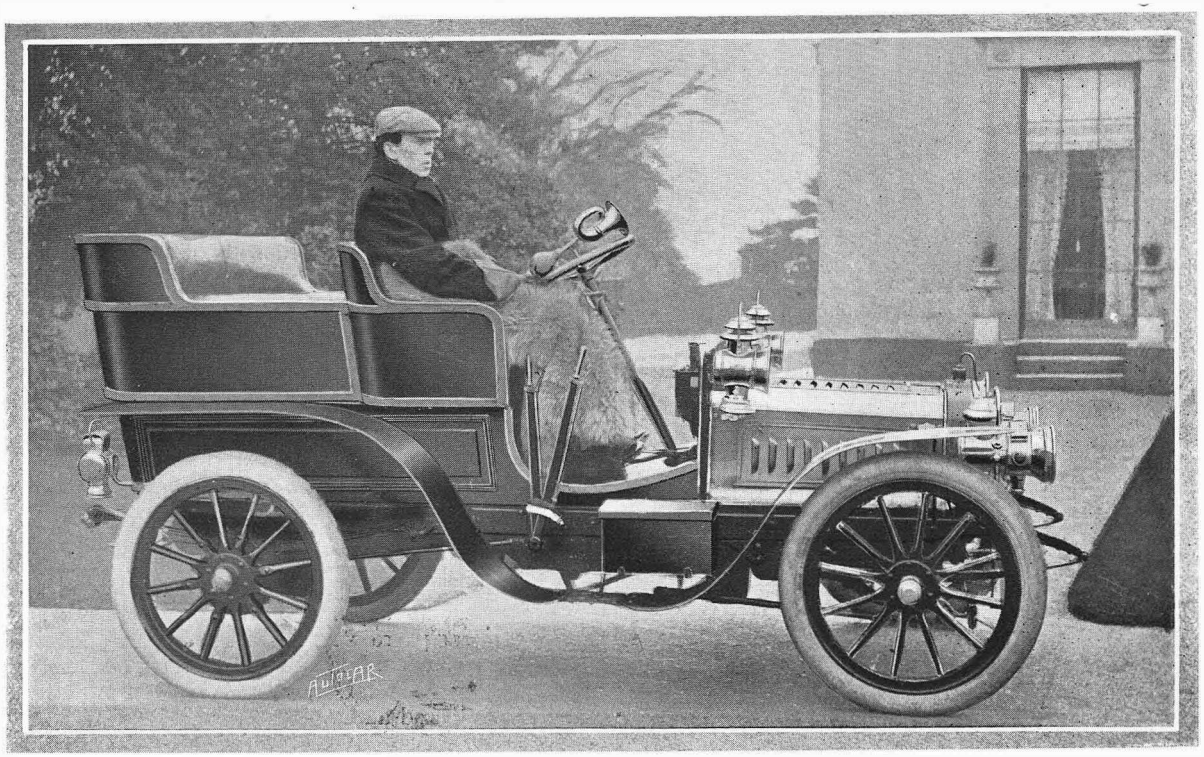
The Vulcan car has its two-cylinder engine in a vertical position with its crankshaft in the longitudinal plane, as is generally usual; the exhaust valves are placed on one side of the cylinders, and the inlet valves on the other. A governor actuating a throttle valve is mounted on the inlet valve camshaft, while the water circulating pump is attached to the crank chamber in front, and is driven by the exhaust valve camshaft. It is a well-designed engine, which gives evidence of good work. As a whole, this car is certainly worth trying by those desiring a light two-cylinder engined machine of moderate power.

As a sporting machine, the single-seated Eagle took my fancy beyond anything which I saw in the show, large or small. Towards the end of the week, when I paid my visit, I noticed that several orders had been placed for machines of this class, and among the purchasers was a lady—Miss Margaret Regan, of Manchester. I certainly envy the plucky lady her mount. Fitted with a 4½ h.p. water-cooled engine and two speeds, this lively little machine is, I am told, capable of doing up to thirty-eight miles per hour.

While on this stand I noticed several of the Eagle tandems fitted with variously powered engines. I have at different times and in different parts of the country met these machines upon the road, and they have always been travelling well, though I cannot say that they exactly suit my own taste. The light car exhibited is much more to my fancy.

The Beaufort 9 h.p. voiturette was the only machine of this type fitted with magneto ignition which came under my notice. In this the Bergmann ignition is fitted. The engine has mechanically operated valves, is governed, and has a gear-driven pump. The whole of the car is substantially built, and distinctly good value for the 210 guineas asked for it. One commendable feature that I noticed in this car was the carburetter. The petrol enters the float feed chamber at the top, rises through a gauze strainer, and then falls through a central orifice to the float chamber, whence it passes to the spraying nozzle. The spray is controlled by a needle valve carrying an index on the top of the carburetter, by which the amount of petrol may be regulated.

(To be continued.)



THE THIRD OF ITS TYPE. From time to time we have announced the great satisfaction which some particular make of car has afforded its owner, and have also given illustrations of such cars. The 14 h.p. Talbot car depicted above is the third of its type which has become the property of Mr. B. Walmsley, of Bowden, thus showing how satisfactory has been this make of car in his hands.

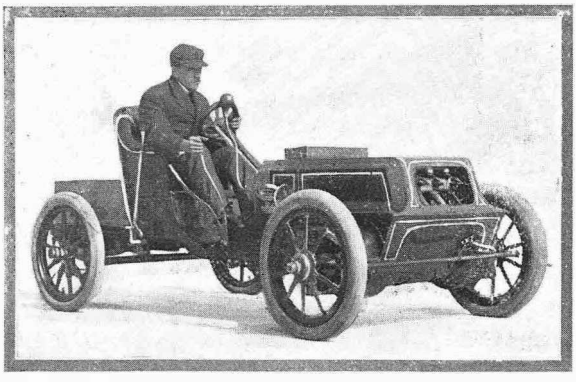
CONTINENTAL NOTES AND NEWS.

The Gordon-Bennett Course.

The Automobile Club of Germany has just modified part of the itinerary of the Taunus route, over which the Gordon-Bennett cup race is to be run. It is the worst part of the course, that which stretches from Dornholzhausen to the Saalburg. This was formerly a narrow road with numerous curves, and rather dangerous; in the new route a wide road leads to Homburg, similar to that leading from Homburg to the Saalburg. This modification increases the course by a few kilometres, and it is well-known that the course was slightly inferior to the reglementary distance, and this slight modification had to be granted by a special vote. It is now very probable that in this manner the standard 550 kilometres of the Gordon-Bennett cup race are thus re-established; in fact, this is the distance over which the cup is always disputed. In 1900, on the course Paris-Lyons, there were the reglementary 550 kilometres. In 1901, on the course Paris-Bordeaux, there were exactly 552 kilometres. The first difficulty arose in 1902, on account of the neutralisation of Switzerland, and then on account of the moral impossibility to finish the race in the open field; it was, therefore necessary to push on to Innsbruck. At the meeting of the International Committee the English delegates entered a protest on this subject, and, curiously enough, it was just this modification, proposed by France and opposed by England, that helped Edge to carry the day; in fact, had the Gordon-Bennett cup race only been run over the 600 reglementary kilometres in that year René de Knyff would have won, but he broke his differential at the 615th kilometre—17 kilometres before the finishing point. Last year, as everybody knows, the cup race was run in Ireland according to its standard programme, which will probably also be adhered to this year.

French Activity.

The French competitors who are taking part in the race are making active preparations. Out of ten of the competing makes there will be eight heavy ones. The light cars will be represented by Georges-Richard-Brazier and Darracq, their weight will be slightly increased over the standard weight of light cars, but it will not exceed 750 kilos. The English and German Darracqs will be constructed on exactly the same model as the French Darracqs. At the present moment, twelve racing cars are being constructed by the Darracq firm for the cup race—six of these (of which three are reserve cars) will be for France, and six for the two other countries; these will be entirely constructed in the country of origin.



THE FLORIDA BEACH RACES. Walter Christie's 30 h.p. front wheel-driven Christie car.

Most of the French competing firms have already constructed their motors, and put them on the testing bench. Some have even gone further, and Mors has actually some cars on the road, which, of course, gives them a great advantage, as the *mise au point* of the racing car is the most difficult and important function connected with its success.

All the French petrol cars have four cylinders, and the firm of Panhard and Levassor have abandoned chains in favour of the live axle, in order to economise weight. Darracq, of course, is using live axles in all his cars, but all the other competitors are sticking to chains. Magneto ignition will be almost universal, although Darracqs will, it is said, stick to the older form.

The most powerful motor will no doubt be the Gobron-Brillie with its double pistons, whose combined stroke equals a little more than 220 millimetres. The most powerful four-cylinder motor will be the Mors, with 180 mm. stroke by 180 mm. bore. Serpollet had intended to use a compound engine; but, after protracted trials, the idea had to be given up on account of the increase of weight necessitated, and he will, therefore, use this year cars with six single acting high pressure cylinders.

Gobron-Brillie will use alcohol at ninety per cent. carburation for his racing cars.

The Representation of Germany.

In Germany, the Cannstatt Daimler Motoren Gesellschaft has been chosen to represent the country with two Mercedes cars. This firm will not take part in the eliminatory trials, but they have constructed six special racing cars, of which four have cast-iron cylinders and two steel cylinders, and before the race takes place the Cannstatt firm will have made complete and exhaustive trials of these two different kinds of cylinders, and according to the result of these trials they will choose for the Gordon-Bennett cup race cars of either of the old make or of the new.

In spite of all that has been said on this subject, the drivers for the German cars have not yet been definitely decided on. However, it is likely that they will be Jenatzy and Werner.

In the German eliminatory trials, which will be held about a month before the race, in order to choose the third car to represent Germany in the Gordon-Bennett cup race, the firms of Benz and Opel Darracq are the most serious competitors. The Benz have already chosen their drivers as follows: Mme. du Gast, Mr. Terry (an American millionaire), and an employee of the Benz firm.

French Eliminatory Trials.

For the French eliminatory trials, the racing commission of the A.C.F. has definitely adopted, subject to the authorisation of the Minister of the Interior.

the second circuit of the French Ardennes, the route of which is as folows: Boulzicourt, Poix, Les Crêtes de Lannoy, Faissaut, Rethel, Pauvres, Vouziers, Le Chesne, Tannay, Chemery, Donchéry, Flize, and back to Boulzicourt—about 126 kilometres in all.

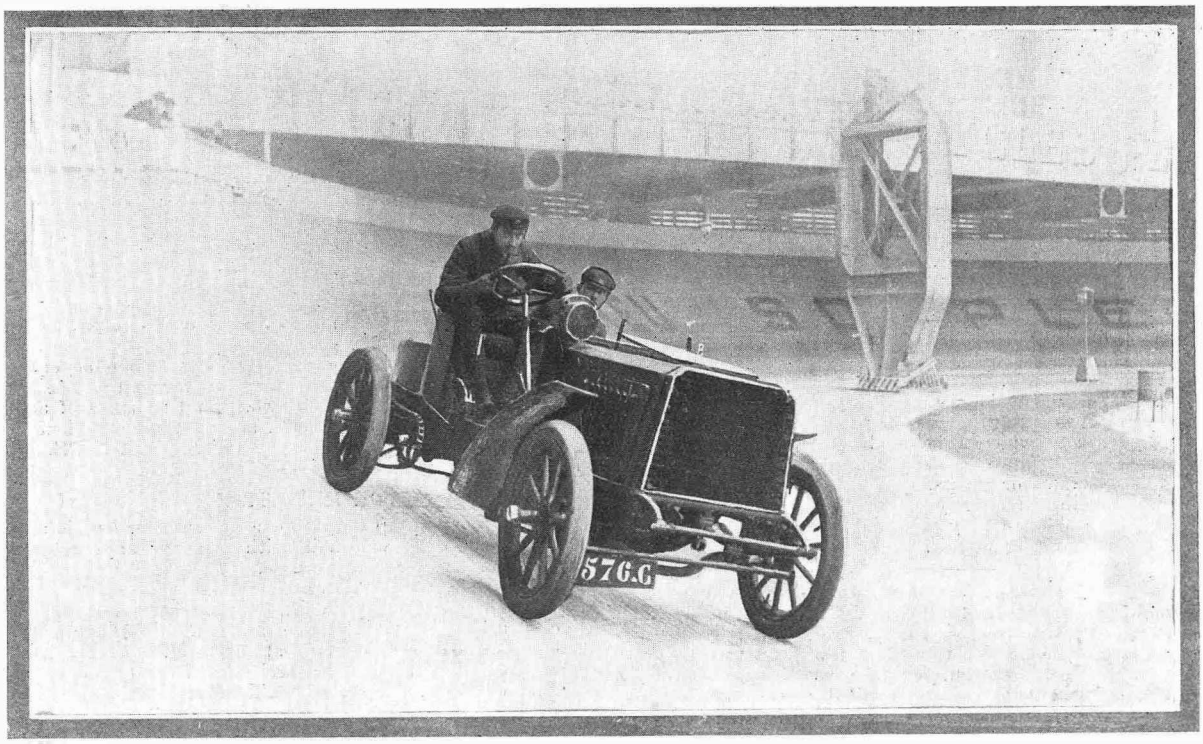
The greater part of the route is rather wide, except, perhaps, from Flize to Boulzicourt, where, however, it is very little frequented. From Boulzicourt to Poix the route is level, and there are hardly any valleys. From Poix to the Crêtes de Lannoy there is a very long and very steep hill, then the road is slightly uneven to Rethel. The whole part of this route, with the exception of a slight turn near Poix, in order to avoid two level crossings, is the ancient route Paris-Berlin. From Rethel to Vouziers the road leads through the Champagne country, and is very fine and very straight, and sufficiently wide; but there is the danger of skidding in rainy weather, because the soil is of clay and holds water. From Vouziers to Chesnes the road is fine, wide, and straight, with some hills, and from Chesnes to Tannay there is a straight flat line of five kilometres. From Tannay to Chemery and Donchéry the route is a little narrower, and rather uneven, but still sufficient; here we are in the Argonne country. From Donchéry, or, rather, from the crossroad of Bellevue to Flize and Boulzicourt, the route is wide and flat, except in its last part. In short, it is a fine road, but much less difficult than that of the Taunus, where the racing cars may be and will be much more numerous. It is certain that nowhere are there found hills like those of the surroundings of Weilburg, of Koenigstein, of Kirchberg, and of the Saalburg. From this point of view, the second Belgian circuit, with the hills of St. Hubert de Martelange et de Habay-la-Neuve, approaches much nearer to the German course over which the Gordon-Bennett race will be run than any other circuit for the eliminatory trials.

This Year's Continental Events.

The first trial of the year in France will be the consumption trial of *L'Auto*, which this year is based for the first time on a programme similar to that of the reliability trials in England. Indeed, whilst during the previous years the cars were simply classed according to the smallest consumption, this year consumption is only one of the elements, and if a competitor desires to carry off a prize, the conditions imposed are that the car at the same time consumes very little, carries a great amount of weight, and attains a certain speed uphill and on the level. Certainly, this programme is more complete, and, though it is not a trial of endurance like the English trials, it will nevertheless contribute to emphasise the principal qualities of a car.

Several other trials are said to have been contemplated by *Le Monde Sportif*, amongst others, a competition *à la vitrine*, in which only such cars should take part as had been chosen by the commissaries in the windows of the showrooms of the manufacturers. There was also the question of an endurance competition for electric cars on country roads, which had been the subject of so many discussions; but it seems to us that to-day the electric car is entirely a town vehicle.

All the above projects seem, however, to have been abandoned, as we have not heard any more about them, and the time is approaching when they should have been carried out.



INDOOR MOTOR RACING. Tavenaux on the 100 h.p. Gobron-Brillie car on which he covered 333 m. = 364·16 yds. in 15⅘s. at the Winter Velodrome. He is shown flying round one of the four highly-banked curves of the circuit.

CORRESPONDENCE.

EDITORIAL NOTICES.

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

Letters of a personal nature will be withheld

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

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

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

INCOMPETENT EXPERTS.

[3544.]—I have read Mr. Robert E. Phillips's letter No. 3532 in *The Autocar* of February 13th, and am pleased with the stand he takes regarding incompetent experts. There is a great deal of good common sense in his remarks, and I for one would be very glad to join the list of the proposed profession of auto vets. When Mr. Phillips tenders us his further promised remarks, it would be a great boon to many would-be auto vets. if he would give us an idea how, say, ten such men would be able to get a living in any particular town without an agency or some other branch of trade to help him out, what fees he would propose charging both for advice and supervision, and how he proposes making one's self known to be infallible in knowledge, beyond the interested friend who owns a car of a certain make and the various authorised agents of makers. The latter can not be despised altogether, for most of them—even assuming that they are not engineers—can claim to be business men, and unless the purchaser leaves the question of choice and purchase entirely with the auto vet., his position would not be a very enviable one, for the tongue and wit of the average business man of this class are apt to run riot with anyone in semi-authority.

Personally, I fail to see what one can do better than to secure the agency in the district he is in for the makes he believes to be the best and take his chance of getting his commission from the makers in the usual way, together with the offchance of being called in as an adviser occasionally.

THOMAS PARKER, JUN.

[3545.]—I quite agree with the remarks made by Mr. Phillips in his letter (3532) to you published in *The Autocar* of February 13th, and, speaking as a motor vet., find the only difficulty is my personal objection to advertising.

Being a consulting engineer with fifteen years' experience in Westminster, an owner and driver of motor cars, member of the Automobile Club, and well up in all latest types of cars, expenses of running and upkeep, I find myself in a position to undertake work such as Mr. Phillips suggests. I have no interest in any make or agency, but at present can only come into touch with would-be owners by personal introductions, as I do not consider it compatible with my profession to advertise.

Perhaps you could arrange a list of men like myself to be available in case of enquiries?

I find that practically all the motor experts who advertise their undoubted capabilities are more or less interested in agency work, probably because it pays so much better than "consulting," which I have always understood to mean absolute independence of any connection with direct dealings with makers or agents.

This letter being practically an advertisement, I trust you will excuse the necessity of biding my light under a bushel, and subscribing myself,

AUTO VET.

[3546.]—I have read with pleasure the letters of your correspondents, Mr. R. E. Phillips and "B.O.H.," and as one who is competent to give sound, practical advice in motor matters, I should like to make a few remarks.

I have a college education, eighteen years' total engineering experience, and I have studied motor vehicles since the passing of the Act. I have many times considered the advisability of starting as an expert adviser to owners and prospective purchasers of automobiles, but it seems, however, that work would be scarce, as the average man dislikes paying a fee for sound advice, and generally gets taken in by the salesman, who possibly, I may even say generally, knows nothing beyond the price of the car which he sells.

During my managership of a motor firm, where I both sold new cars and did an extensive repairing business, I had many experiences which gave me an idea as to how matters stand in this respect, and I give you one herewith.

A customer of my firm thought of buying a second-hand — — car, and he came to me, informing me of his intention, and asking me what my fee would be to go with him and give him advice as to its condition. I asked £2 2s., out of which my rail fare would have been nearly £1, and my man asked me to be in readiness to undertake the work.

I heard nothing further, however, until I had a message to the effect that my client had bought the car and brought it down by rail.

I was requested to call and see it, and was then informed that it would only travel on first speed except on a dead level. I made a thorough examination of the car, took it out, and then sent, on request, an estimate for putting it in thorough repair.

The work, which cost my customer nearly £30, was charged reasonably, and included all new brasses to the engine, reboring the cylinders, and fitting new pistons and rings. This brought the car to much above the market value, whereas if I had seen it previously my customer would never have been allowed to purchase it.

If the "motor vet." becomes an accomplished fact, I should be glad to place my name and experience before *The Autocar* for investigation, and I feel that I could be of great use in many ways. For instance, I could teach a purchaser the driving, electrical, and mechanical details of his car, instruct his man, etc., etc. The candid and straightforward man ought to have many supporters.

I meet many motor men, and every driver and botcher has a card to offer with the inscription "motor expert" upon it.

Mr. Edge says good mechanics and drivers are scarce. I agree with him, but I know that they exist, for I have met them.

With regard to this question, I have a complaint to make. All firms get men constantly calling upon them asking for work—fitters and drivers. I myself have always made a point of having a chat with every caller whenever convenient, and I have taken the names and addresses of likely men.

Most men who seek work, and who go into motor depots to obtain it, generally interview one of the delightful personages known as "salesmen," of whom I have before spoken, and these men having no knowledge of motor matters cannot discriminate between good and bad, and consequently all are treated alike, and this is hard upon the good men.

Respecting chauffeurs, a razor stropper on a Panhard and a coachman on a Mercedes are equally good for the repairer and bad for the car. It surprises me beyond measure to think that a man can go so far as to place a valuable and beautiful piece of work in the hands of an inexperienced man. It is wrong, as doubtless experience will teach.

W. S., A.M.I.M.E.

TYRE INFLATION.

[3547.]—To pump up a tyre on a hot summer day is no joke, and motorists will hail with pleasure any motor-driven appliance for this purpose.

The Pompeesi which Messrs. Jarrott and Letts are introducing is simplicity itself, but is the principle of directly utilising the explosive force in the cylinder a correct one? It strikes me that, even allowing for the cooling effect of the coiled steel tube from cylinder to pressure chamber, the gases would enter the air tube at a very high temperature. I have always understood that extremes of heat or cold were most injurious to tyres. Perhaps some of your readers better up on the subject than I am will give me the benefit of their opinion.

W. M. INGLIS

THE AUTOMOBILE CLUB.

[3548.]—As one of the founders of the Automobile Club, I have followed with concern, but not with surprise, the rising flood of criticism and discontent anent the recent conduct of the club's affairs throughout the automobile press, and especially the well-founded protest against the influence of the club being exploited for the purpose of commercial gain and in unfair competition with genuine commercial ventures. When I was engaged with Mr. Simms in framing the original constitutions of the club our chief aim was to so draft them as to preclude the possibility of the club being conducted, or being accused of being conducted, for profit. It will be within the remembrance of many that the club's first departure from this vital principle occurred two years ago, when the committee, strangely enough with the support of its three journalistic members, resolved to run its own garage for cars.

At that time I and my friends who a few months before had, with the approval of the committee, at a considerable outlay established at Westminster the first London garage confined to members of the club, were coolly informed, practically without notice and entirely without compensation, that the club intended in future to run its own garage and did not require mine any further.

It is true the committee accorded me, forsooth, a vote of thanks as a set off to the loss of several hundreds of pounds which I had been induced by the club to risk when neither the club nor anyone else had been prepared to make the plunge.

I ventured to predict to the journalistic members of the committee that the next flight of the club into the realms of trade would take the direction of journalism, and in the event I am not sorry to see that the pressure of the *Club Journal* is being more and more realised by the journalistic toes of the automobile press.

Thus out of evil comes good, and a watchful press, smarting from unfair competition, is the more alert to expose such flagrant slips as the recent bartering of the club's patronage for a monetary consideration, and to criticise the constantly recurring instances of ineptitude on the part of the committee and the *Club Journal*. Such criticism should have the effect of bestirring the members if they wish to avert betimes the ignominious fall of the Automobile Club from its former high estate, to see to it that an entirely new committee is elected, and one recruited as far as possible from members who have "no fish of their own to fry."

I can with the more consistency lay stress on this latter essential to good club government, inasmuch as two years ago, when I deemed my own growing commercial interests in automobiles liable to become antagonistic to the general interests of the club, I asked in a letter to the chairman that I should not be put in nomination for re-election to the committee of that year.

Further, I think, sir, it is time the members sought to take advantage of the new energy and ability which surely cannot be far to seek amongst the 2,500 odd members of this hitherto prosperous club, and allow the forty or fifty gentlemen who during the last six years have devoted so much of their valuable time (many of them disinterestedly) to the direction of the club's affairs to be free at length to give some time to their own affairs.

I have sometimes thought that some of the present committee have been so long dazzled with the effulgence of of their exalted position that they were becoming unconscious of the very existence of the mere members. At any rate their recent achievements tend to show that something has impared the clearness and perspicuity of their mental vision, and a rest in the cool shadows of ordinary membership should restore their tired faculties and enable them as onlookers to see a little more of the game.

But if my fellow members see the need for reform and don't mean to let the coming election be captured by the present party in power, they must take time by the forelock and be prepared with a complete list of capable candidates without delay, and, as a beginning, I suggest that those gentlemen who have the qualifications and leisure to devote themselves to the affairs of the club committee should at once send their names to some member who is willing to organise the campaign for infusing new life and sound policy into the club, and I suggest the Hon. Arthur Stanley, who has shown he has the true interests of the club and the automobile movement at heart.

If it be asked why I address this letter to the general automobile press instead of to the *Club Journal*, I can only plead that my own experience has been that under the present management, while the *Club Journal* is open to advertisement or otherwise, the criticism and grievances of its own members are not readily admitted until they have been subjected to judicious editing.

C. HARRINGTON MOORE.

[3549.]—I have addressed the enclosed letter to the chairman of the Automobile Club, and shall be obliged if you will be good enough to publish it.

The matter is, in my opinion, of too vital importance in the interest of the future development of automobilism as a pastime, sport, and industrial undertaking, for the benefit and welfare of the British manufacturers to be passed over lightly by the press.

I trust, therefore, that you will give the matter your due consideration. SHREWSBURY AND TALBOT.

[COPY.]

12a, George Street, Hanover Square.
February 19th, 1904.

To the Chairman, Automobile Club, 119, Piccadilly, W.

Dear Sir,—It is my intention to propose at the next general meeting of the club on the 10th March next, the following resolutions:

(1.) That no member of the Automobile Club in the trade, or journalist connected with an automobile journal, be eligible for membership of the committee of the Automobile Club of Great Britain and Ireland, and that the meaning of "member of the trade" be settled by the committee of the club.

(2.) That the committee of the Automobile Club of Great Britain and Ireland shall have power to appoint sub-committees who shall deal with the matters in which the trade may be interested, such as racing, trials, administration, finance, and Parliamentary questions.

As in all matters connected with any sport or pastime, it is the recognised axiom that those who direct such matters should not be interested in any prejudicial manner in such sport or pastime, I have long been of the opinion that any member who may be so described should be excluded from the managing body of the Automobile Club.

For this reason I have not allowed myself to be put in nomination as a member of that committee.

Among the members of the existing committee there have been many members connected with the trade, and probably this in a rising industry may have been a matter of necessity, and so far I may say that the non-trade element of the Automobile Club has been able to prevent any serious action being taken against the general interests of automobilism, but now the time has come when the circumstances of the case enable matters to be placed upon a different basis.

My friend, Mr. John Scott Montagu, has proposed for nomination a new committee of the Automobile Club, among the members of which my name is included, but I observe that, instead of the trade influence on that committee being lessened, it would be largely increased, giving an absolute majority to the members of the trade.

If such a committee were elected, the whole of the automobile movement would be placed in the hands of interested parties.

The importance of this question is not solely confined to motorists, inasmuch as the general public are very largely affected, because of the use to which motors are put, and it is therefore imperative that an impartial authority should be deputed to safeguard the interests in Great Britain and Ireland of those interested in the industry, pastime, and sport, as well as those of the general public.

By adopting my proposal, the Automobile Club would be administered and be looked up to in the same manner as the Jockey Club, the Marylebone Cricket Club, the Grand National Hunt, and other kindred associations.

As this matter is of such immediate and public importance, with your permission, I will send it to the press.

Yours truly,

THE EARL OF SHREWSBURY AND TALBOT.

LORD SHREWSBURY'S LETTER.

[3550.]—I have had an opportunity of perusing a copy of the letter which has been sent by Lord Shrewsbury to the chairman of the Automobile Club. Lord Shrewsbury, for some reason or other, has arrived at the conclusion

that the Automobile Club cannot continue to be managed with fairness by a committee on which there are representatives of the trade. May I record my opinion that, during the five and a half years in which I had the honour of serving as secretary to the Automobile Club, I do not think that there was one occasion on which the members of the trade who were serving on the committee endeavoured to make use of their seat on the committee to further their trade interests. Lord Shrewsbury would do well to go a step further and to indicate what form of interest is to preclude a man from serving on a committee of the club? Is the club to be deprived of the services on its committee of such eminent gentlemen as Sir John Thornycroft, F.R.S., Mr. John Scott Montagu, M.P., Mr. Arthur Stanley, M.P., Mr. Paris Singer, who is responsible for one-third of the rent of the club house, and others?

Will Lord Shrewsbury suggest the names of fifty gentlemen absolutely unconnected with the trade or journals who are capable of and willing to give the necessary time to carry out the work which has hitherto been done by the club committee and the executive committee?

Does the fact that a man is financially interested in breeding and selling horses preclude him from becoming a steward of the Jockey Club?

Does the fact that a man is administrating a company which manufactures engines preclude him from serving on the Council of the Institute of Mechanical Engineers?

If there had been a better trade representation present at the meeting of the club committee at which it is alleged that the name and patronage of the club were accorded to the Agricultural Hall Exhibition, might not the authorities have been sufficiently well advised to prevent them from giving, as they have given, the patronage of the club to an exhibition at which the principal foreign and British manufacturers are precluded from exhibiting?

Is it constitutional or just that, in an institution which was founded for the greater part with the moneys, brains, and energies of gentlemen who had, or who have since had, financial interest in automobile businesses, all those who have any financial interest whatever in an automobile undertaking should not be represented by some of their number on the principal committee of the club?

Is there not a danger that, if Lord Shrewsbury carries his proposal, leading amateurs and all the trade members of the club may withdraw from the club, form a society of encouragement, and at their first meeting pass a resolution that they do not recognise the club and will not exhibit or take part in any exhibition or trial held under its organisation?

I am inclined to think that Mr. Scott Montagu's suggestion, that presidents and vice-presidents of the club should not be in any way financially interested in the industry, and that they, with the chairman and vice-chairmen of the club, should form a supreme council, is a very happy one. In the event of the chairman of the club committee, or the club committee, or of one-tenth of the members of the club, considering that the club is being conducted in the interests of one particular section, the supreme council will be asked to give its decision, which will be final and binding on all parties concerned. If this supreme council consisted of such men as the Duke of Sutherland, Lord Stanley, Lord Dudley, Lord Onslow, and others of undoubted standing, Lord Shrewsbury and his friends would be quite satisfied, I am sure, with any decision arrived at by it. Lord Shrewsbury was, at one time, a very warm supporter of the Automobile Club. I shall always remember with pleasure the time at which he induced many of his friends to become members of it, with a view to supporting the club's legislative campaign. I hope that now he may see his way to withdraw what appears to me to be an unconstitutional and dangerous proposal, and to adopt Mr. Scott Montagu's proposition as to a supreme council.

In conclusion, I should like to point out that the cry has been raised that the rebellion against those who are primarily responsible for the humiliating position in which the club now finds itself in connection with exhibitions is an attempt by the trade and the automobile journals to secure the control of the club. I hope that no member will be misled by this electioneering cry. They would do well to bear in mind that the cry is raised by those who are responsible for the exhibition fiasco; that the reform party are anxious to deprive these gentlemen of the opportunity of repeating such a fiasco; and that there has been no attack on the club, but only upon the seats on the committee of those gentlemen who brought about the disaster. Although most of them are personal friends of mine, who have worked loyally, strenuously, and gratuitously to build up the prestige of the club, I look upon the action they have taken with reference to the exhibition question as having wrecked their former work, and that a new committee is necessary to re-elevate the club to the proud position which it held a few months ago.

C. JOHNSON.

ANTI-FREEZING MIXTURE FOR RADIATORS.

[3551.]—I have found a mixture of one-third glycerine (brown commercial) added to the water quite satisfactory, and has no effect on the metal with which it comes in contact. This mixture does not freeze when put in a test tube and exposed to frost of 14° on the grass. I have given this a trial for two winters. The car used was a 7½ h.p. Wolseley.

J. HANCOCK STEEL.

NON-SKIDS.

[3552.]—It would be of great service to beginners if your readers would kindly state their experience with the different devices shown at the Crystal Palace. I rather like the Grose or Sampson bands, or the Wilkinson treads. We are told that the tyre is the only troublesome part of the modern car, so that any really good article to prevent punctures and skidding cannot be too widely known.

NOVICE.

ENGLISH AND FRENCH CYLINDER PRACTICE.

[3553.] In examining the descriptions of various cars exhibited at the Paris Salon, which were published in *The Autocar* show reports, I noticed that the general tendency of the French manufacturers was to have the cylinders of the motors cast separately, and the required number bolted up.

Now, I see that most of the leading English manufacturers exhibiting at the Crystal Palace Show have the cylinders cast in pairs in the larger cars.

The separately cast cylinders in the Talbot cars are, perhaps, an introduction from France by Mons. Clément. Why is there this great difference in construction? Is it that the English manufacturers have not caught up to the French yet? Some of the advantages of separate cylinders appear to me to be: (*a*) The unequal expansion of large masses of metal is greatly reduced. (*b*) More efficient cooling, due to a greater surface per cylinder being exposed. (*c*) Any number of cylinders can be bolted up, giving ample variation of horse-power for one maker, while with twin cast cylinders separate patterns have to be used for the single and three-cylindered cars. (*d*) The twin-cylinders require special boring machines to enable both to be bored at once, while with separate cylinders it is practically all repetition work. (*e*) The castings are not so complicated, and the expense of "scrapping" a faulty casting is less.

On the other hand: (*a*) There is less facing up of surfaces and bolting together, with its attendant risk of the cylinders being out of alignment. (*b*) The number of castings for the same sized motor is less.

Probably it is only a question of machining, but perhaps some of the gentlemen who are connected with the leading English manufacturers, such as Messrs. Edge, Clément, Austin, etc., will state their views in the discussion and enlighten

AN AMATEUR.

CHAUFFEURS.

[3554.]—I have read with interest the correspondence in your columns relating to the failings and virtues of chauffeurs and the demand for unbiased and reliable advice as to the purchase of cars and cause and remedy of breakdown, and as my experience appears to be common with that of others, I think it may be no abuse of your columns to insert it.

On all sides one sees and hears that the motor industry is rapidly developing, and it is frequently stated that there is a demand for reliable chauffeurs and consultants. I have not served in a trade workshop, but as a commercial man I have run my own car and have never experienced serious difficulty in tracing the cause of temporary breakdowns, such as appear to nonplus many of your correspondents. Moreover, I am a practical amateur mechanic and have made a careful study through your columns.

manufacturers' specifications, etc., of all the leading makes and improvements.

With a view to entering the trade, I applied to a leading firm who were offering a course of tuition, and, assured by them that with my experience I should have no difficulty in obtaining employment, I took a short course of lessons with them to formally qualify for a place on their register, after which they complimented me on my ability and awarded me a first-class certificate. That was two months ago, but the situation, or any suggestion of it, is yet to come. If there really is a demand, surely through the instrumentality of your estimable journal or some equally authorised source a register could be formed on which, after a practical and theoretical test, reliable and experienced men could be enrolled for the benefit of owners and genuine chauffeurs and consultants alike. S.B.

[3555.]—Referring to a letter in your issue of January 30th by "A Bas les Chauffeurs," I am pleased to note that it has raised the ire of some of your readers.

I am a chauffeur, and would offer your correspondent a suggestion upon which to act when next he wants a man.

I would first remind him that there are two kinds of chauffeurs—the genuine article and the cheap and nasty sort.

If his funds permit, let him obtain the former, but if not it will pay him better to do the work himself, as the latter will, like all shoddy goods, prove a continual source of trouble. Let him get a man—not necessarily a "razor stropper"—examine him, personally if possible, upon every part of the mechanism, and then test him in driving, and if found satisfactory investigate his personal character.

But let him bear in mind that he will never obtain a satisfactory chauffeur, as some suppose is possible, for £1 or 30s. per week, willing to clean boots and knives (razors excepted), attend to the garden, and so forth. Should the situation be a permanent one, I venture to think a young married man, and preferably an old cyclist, is more likely to give entire satisfaction than a single one, provided, of course, that his mechanical knowledge is good enough to justify his engagement.

Gentlemen's servants may be taught to drive through a bit of straight country and to clean the motor, but they lack the brains for machinery and electrical details.

The following sound advice is given in the "Badminton Volume" on "Motoring":

"A prime difficulty of the establishment of a motor car is the chauffeur or engineer. The perfect motor servant should be a combination of gentleman and engineer. He is a new type of man, and will require the wages of other engineers. I do not think that a competent, cool-headed, skilful, well-mannered engineer will ever be obtainable for 30s. a week." NOT A 30s. MAN

[3556.]—After reading the various letters *re* the above, I fail to see the reason of "A Bas les Chauffeurs" and "Owner" screaming in print over the abilities of their menial razor strappers. We all know the average intellect of "John the son of Giles," who is generally chosen for a place by the amount of servility he displays when applying for same. "Owner" is quite right in saying this article should not be sent to the works, as he only picks up bad ways, etc. I would suggest that "Owner" keeps his tame monstrosity in the glass house (a democratic atmosphere would be fatal). Certainly "if he is keen on the job" and went to an industrial centre he might lose some of that precious servility which employers of the type of "A Bas les Chauffeurs" and "Owner" love so well.

He might possibly find out if he went to London, for instance, that he could get 8s. per day driving a 'bus, or as a cabman rather more. Even the road sweepers of some parishes are paid better.

As "Owner" says, "if he is keen on the job" he would find that it pays much better to drive any conveyance rather than a "private" carriage for his late employer without having to sell his employer's forage, blacking, etc., to make a living wage. In other words, he might develop into the resemblance of a man, and resent being ordered about "in a hurry," which "Owner" appears to think is his proper vocation in life.

What a picture to see "Owner" "on the hurrying" of his free British razor stropper. Does he advance the spark or apply his boot when he wants to accelerate him? If these stroppers are worth anything, why don't the railway companies employ a few at a £1 or so a week to drive their engines instead of paying the independent driver from 50s. to £4 per week? It might make "Owner's" dividends go up a bit. I maintain that the skill and judgment required in handling a locomotive are less than that required to drive an automobile as it should be driven, and I have driven both. Bah! enough of these tin gods. They should employ Chinese *à la* South Africa, who would fall down and worship them as required. Having done upwards of eighteen years at various engineering works, I often find the ex-coachman or valet driver who has "taken" a course and got "certificated" thinks he knows more than half-a-dozen poor mechanics like myself put together. It is inexperienced men like these who cause those terrible accidents now and then.

I would suggest that "Owner's" make-sure drivers have at least two or three years driving experience behind them before allowing them out on a decent powered car to endanger the lives of "Owner" and family. A few shillings extra per week is a good investment in the right man ensuring safety with the minimum of wear and tear. Give your man a chance. Remember that he was not raised on the "reverence your pastors and masters," etc., doctrine. When you know him you may find you have a live man, which is better than a worsted one.

To my fellow drivers I would say, do your business fearlessly and well, study your car and also your employer, and if he is a good one you cannot do too much for him. Plenty of owners of the right sort prefer a thoroughly experienced man, as is proved by those owners "in the know" giving the ex-jarvey, etc., a wide berth.

I am not ashamed of my name appearing.

GEORGE STONE.

MIESSE STEAM CAR.

[3557.]—I shall be obliged if any user of the 10 h.p. Miesse having the new pilot light and combined petrol and paraffin burner will state the shortest time possible to raise 300 lbs. steam, starting all cold. ENQUIRER.

PLUG PROTECTION.

[3558.]—Under this heading I quite sympathise with Mr. W. N. Drew, as on very wet roads, going through "water splashes" and in heavy rain, the car has stopped through one or both plugs getting wet. My experience of mud has been it makes no difference, as the porcelains may be coated and the car run all right. The only remedy, and an inconvenient one, on a dirty day is to get out and clean the plugs—the work of two minutes.

J. W. HANCOCK STEIL.

[3559.]—In reply to W. N. Drew's enquiry *re* wet getting on sparking plugs of Wolseley car, may I say I have suffered from the same trouble, though I always use the ordinary Wolseley engine guard. I got the Lacre Motor Car Co. to make an extension of the guard, which buckles to the old guard and is fastened to the underside of the frame under the radiator by two thumb nuts. This has completely cured the trouble. I drove from Birmingham to London, *via* Warwick, the other day, through floods as much as fifteen inches deep, and never had a misfire.

FRED. L. HUNTER.

CAR NUMBERS.

[3560.]—As a medical practitioner who has driven a motor for professional visiting during the last twelve months, I wish to remark on the new numbering regulations for identification of cars.

My car is well known in my district to police and all, and I seldom drive out of my district as touring cars do. Is it not possible that a man who uses a car for professional purposes within a residential area of three or four miles, and in a case like a doctor, where appearances go for so much, should be spared the indignity of having his car disfigured and labelled like a public cab? As a matter of fact, the cabs in my district are not numbered.

Surely some saving clause might be allowed, such as the condition that a doctor's car used for visiting his patients within a regular and defined area shall be exempt from labelling, *except* when going out of their customary area.

I would suggest that the local borough or urban district council be empowered to meet such cases. Doubtless other medical men using cars feel as I do, and I may safely say had the numbering regulations been in force when I was considering the purchase of a car for professional purposes

I should have decided against a motor. The placarding of a doctor's private conveyance will deter many from purchasing, and thus a very considerable amount of support will be withheld from the popularisation and industry of light runabout motors.

BURTON ROBINSON, M.B.

SUMMARY OF CORRESPONDENCE.

BRITISH CARS. Mr. S. F. Edge writes as follows: "The recent automobile exhibition held at the Crystal Palace was in some points very disheartening to the genuine British manufacturer, as so many cars, masquerading under honest British names, were made up almost wholly on the Continent or of Continental parts. I think the time has come when every genuine British manufacturer should ask the Automobile Club, or some honest body, to hall mark British goods, so that those posing as British manufacture may be put into their proper place. There was one car in particular, the so-called manufacturers of which have been recently triumphantly heralded throughout the whole press as a firm of standing, who would be of great assistance in holding up the prestige of Britain. I fail to see it, when they showed a vehicle made up to a very large extent abroad.' Our correspondent adds that every part of the Napier is British built, and he is therefore anxious that credit for British built vehicles should remain with genuine British builders.

THE CROSSLEY CAR. We have received a letter from Messrs. Jarrott and Letts dealing with the rumour which has been circulated to the effect that the Crossley car and engine was not made by Messrs. Crossley, but was imported from the Continent. Our correspondents forward us a letter from Messrs. Crossley, Ltd., as follows: "We are surprised to hear that there has been any doubt as to our having manufactured the engine shown on the Crossley car. Will you kindly accept this note as a warranty that every bit of the engine was made by us; also the carburetter and the regulators, and all the finished parts shown on our show boards. We also fitted the engines in the cars and assembled the parts purchased by Mr. Critchley from the best-known makers. It is our intention to lay ourselves out to make the gear and chassis generally, except, perhaps, the frames." This is perfectly satisfactory as far as it goes. As stated in *The Autocar*, we ourselves saw the engine and all its parts in process of manufacture. No secret was made of the fact that the gear and framework of the specimen car we were shown were not made in the Crossley factory. On the other hand, we were shown the preparations which were being made for enlarging the factory so that every part of the vehicle save, perhaps, the springs and frames, should be made therein. We were also informed confidentially the amount —many thousands of pounds—which Messrs. Crossleys proposed to spend in the necessary buildings and their internal equipment. As the matter stands, it may be summarised as follows: The specimen car which we inspected had an engine and the parts appertaining to it built in the Crossley factory. Every part of the vehicle was from English designs, but the rest of the car was not made in the Crossley works, though the vehicles which will be supplied to the public are all to be made by Crossley. This is a subject in which we should not have dealt in the ordinary way, but we feel it due to our readers that we should do so, as we need hardly say that we never knowingly refer to any machine as being of British origin unless it is actually made in this country. On the other hand, so long as we are satisfied as to the *bonâ-fides* of a manufacturer and the quality of his material and workmanship, we do not attempt to ascertain whether every part of the car has been made in his works or to his designs and under the supervision of his examiners in another factory. Points of this sort do not interest the user, nor do they affect the practical value of the car. On the other hand, we think it quite time that British manufacturers should decide to let it be plainly known that their cars are of home origin.

In reply to Mr. G. F. Squire's letter, it is pointed out that the petrol supply is automatically regulated by a special screw form device which restricts the passage of the spirit to a certain degree when the suctional force is increased by the higher velocity of the engine when there is any tendency to race.

H.B.—Will this correspondent send his address—not necessarily for publication otherwise his letter cannot be inserted.

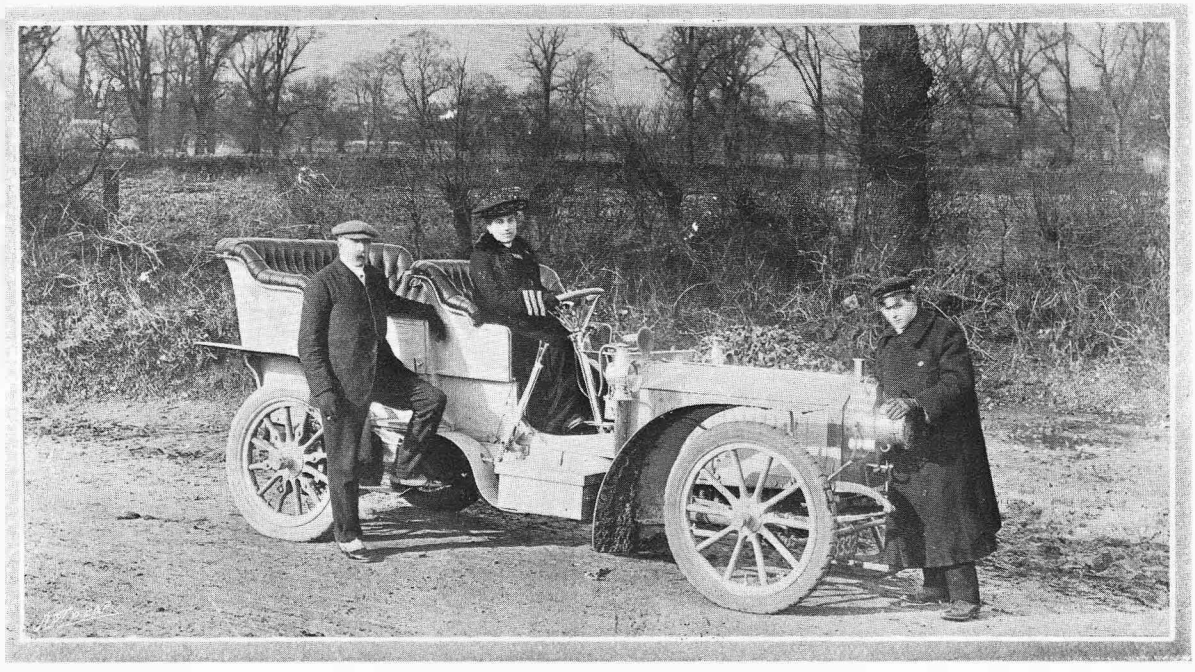


Photo. *By Russell and Sons.*

Mr. Edward Kennard's new 18-30 h.p. Napier touring car. The engine has six cylinders, which ensure absolute freedom from vibration and noiseless running. Only one coil is employed for ignition purposes, the sparking of each cylinder being perfectly regular. The inlet valves are mechanically operated by six cams cut out of a solid bar of steel. The transmission is a direct or bevelled drive, enabling the car to travel at any speed from four to fifty miles an hour on the top gear, the velocity being under absolute control by a throttle lever in the steering wheel. The radiators are of an improved honeycomb pattern. The Napier carburetter, as is well-known possesses a hydraulic air regulator which is simple in action. The brakes are on the internal expanding system. The wheels are shod with Palmer tyres and the car complete—which the proud owner has named Charles III.—weighs 17 cwt.

Flashes.

Mr. Wilfrid Maybery and his brother, Mr. C. Maybery, left Llanelly (Carmarthen) on Sunday, February 14th. at six a.m., in their car, and made a non-stop run to London, arriving in the Metropolis at 6.5 p.m., covering 219 miles in twelve hours. It is said that this is the first non-stop run from Llanelly to London that has yet been made. We were not informed of the make of the car.

* * *

Major Theophilus G. Drapp, one of the engineers in charge of the Yellowstone Park in the United States, has made a report to his Government on the "extraordinary facilities" for steam motor cars in the park. There are several thousand geysers in the Yellowstone Valley which emit steam in large quantities at an average pressure of 140 lbs. to the square inch. "If Providence had placed the geysers with the sole idea that they should be employed to fill up automobiles with steam it could not have located them any better," says Major Drapp officially. "A steam automobile can replenish its boilers every few miles at the geysers, and run thousands of miles without burning an ounce of gasoline." The above suggestion seems very plausible from a superficial point of view, but there are one or two obstacles in the way of its practical adoption, which the gallant major appears to have overlooked. Chief among these is the factor of the condensation of the steam in its passage from the geysers to the autocar boilers.

* * *

On March 10th, after the annual meeting of the A.C.G.B. and I., papers will be read on "Continental Touring."

* * *

Messrs. Coxeter and Sons, Ltd., on March 1st (Tuesday next) will open their new motor works and garage at Pembroke Street, St. Clement's, Oxford. Facilities will be here provided for repairs; there will also be space for the storage of fifty cars, private lock-ups, etc.

"THE AUTOCAR" DIARY.

Feb. 27.—Midland A.C. Paper, "Wire Wheels Tyred." By Mr. F. W. Lanchester. Smoking Concert.
,, 29.—Entries close for A.C.G.B. I. Side-slip Trials (noon).
,, 29.—Scottish A.C. (W. Section). Discussion, "The Cost, Upkeep, and Care of an Autocar."
Mar. 1.—Paris Rome Touring Car Run, Entries close.
,, 3.—Junior Institution of Engineers. Paper, "Storage Batteries." By Mr. G. C. Allingham.
,, 3.—A.C.G.B.I. Paper, "Valves and Valve Mechanism of Internal Combustion Engines." By Mr. R. E. Phillips (9.0).
,, 3.—*L'Auto* Fuel Consumption Trials.
,, 4. Manchester A.C. Annual Dinner.
,, 7.—Manchester Motor Show opens.
,, 7.—Scottish A.C. Paper, "Medical Aspect of Motoring." By Prof. H. Galt.
,, 10.—A.C.G.B.I. Annual Meeting, 5.0.
,, 10.—A.C.G.B.I. Paper, "On Continental Touring." By Messrs. R. H. Fuller and J. Pennell.
,, 11. Nottingham and District A.C. Annual Dinner.
,, 12.—Midland A.C. General Meeting and Dinner.
,, 13-20.—Cannes Automobile Week.
,, 14-19.—Boston U.S.A. Autocar Show.
,, 19.—Hertfordshire A.C. Opening Run.
,, 19-26.—Motor Car Show, Agricultural Hall.
,, 22.—Motor Union Annual Meeting (5.0), Agricultural Hall.
June 17.—Gordon-Bennett Cup Race.

The South Wales and Mon. A.C. are making arrangements to have a club garage at Cardiff, where members will be able to store their cars at any time.

* * *

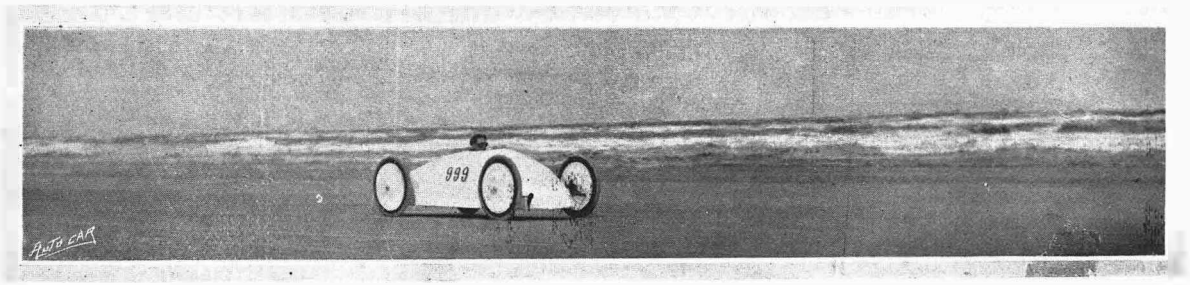
Recently the S.W. and Mon. A.C. communicated with Mr. Solomon Andrews, the lessee of the road between Cardiff and Penarth, and asked him to reduce the toll for motor cars. The club's case received every consideration, and the welcome intelligence has been made known that in future a reduced toll will be charged.

* * *

It must not be imagined that the daily press confines its humour on mechanical subjects entirely to the motor car. Only a few days since there there was a tale about the locomotives on the railway to Vladivostok, in which it was stated that an epidemic was prevailing among the locomotives. These machines were dying like flies; a large number were borne to the grave every month, and many of those which would run could only run forward, the reverse function having become atrophied. Atrophy of the reverse function is a complaint which is perhaps commoner among motor cars than locomotives—in fact, there are some vehicles in which the necessary organs for reverse have never been developed, though according to the laws of nature—or, should we say, the Local Government Board—the weight of the cars is such as to make such organs necessary.

* * *

A German chauffeur caused quite a diversion at Cardiff last week. He drove a car at great speed through one of the busiest thoroughfares, whilst the car swayed and zigzagged from side to side. He soon cleared the road of traffic. Eventually a constable signalled to him to stop, and this he did in a precipitate manner by running into the hedge. Charged with being drunk whilst driving his car, defendant, whose name is Pfabigan, was fined 40s. and costs, or a month in default. This certainly cannot be regarded as an excessive punishment for so dangerous an offence, nor are such escapades calculated to ingratiate motorists with the local authorities.



THE FLORIDA BEACH RACES. Baker's Electric Car

Colonel Crompton on behalf of the Automobile Club, and Lord Russell and Mr. Rees-Jeffreys on behalf of the Roads Improvement Association, have been invited to give evidence before the Royal Commission on London Traffic, and their evidence will be taken to-day (Friday), February 26th.

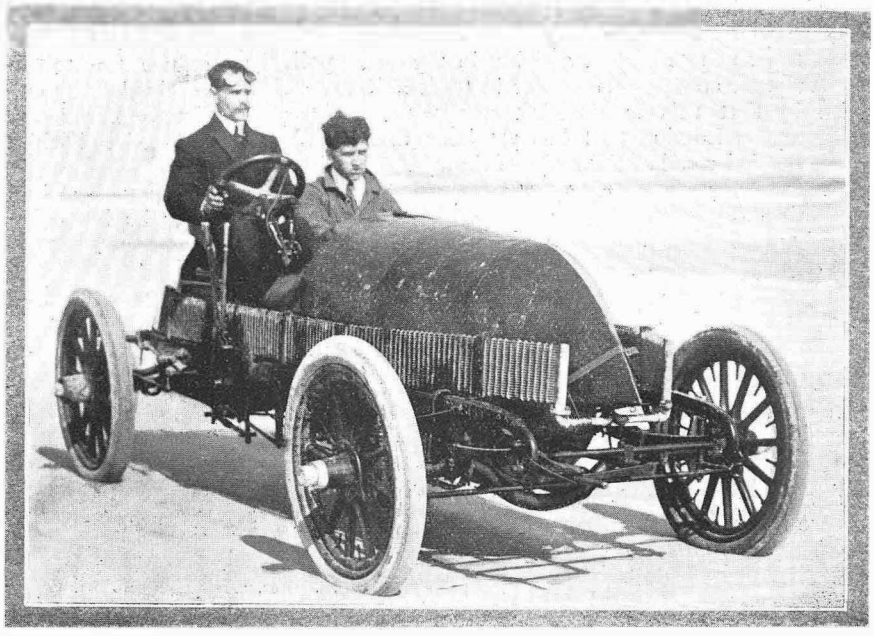
* * *

Last Saturday, Mr. S. F. Edge was sufficiently recovered to leave for a short rest at Madeira. Oddly enough, as he was driving to the boat he was passed by a string of three or four cars in which were several of his friends, who were driving over to the Crystal Palace Show. They saluted him in passing, wishing him *bon voyage* and a speedy return in full health. It is certainly hard luck that his indisposition should have prevented him from taking any active part in the show for which he had worked so hard, and which, from a very small beginning two years back, has developed into the leading motor exhibition of Great Britain.

* * *

The Midland Railway Co. have just issued a handy little volume of some 160 pages containing a list of agricultural and other shows, cattle and sheep fairs, racing, cricket, and other sporting fixtures for 1904, besides much miscellaneous information with regard to various kinds of traffic carried by the company. Nevertheless we are bound to say that the work would be far more complete if the charges for the conveyance of motor cars and motor cycles by rail on the M.R. system had been included.

Messrs. John E. Gibbs and Co., engineers, Thomas Street, York, inform us that they have well-fitted works and garage for thirty cars, besides facilities for undertaking repairs.



THE FLORIDA BEACH RACES. Jos. Tracy on a Peerless car. The Peerless is a 70 h.p. vehicle. It was driven by Tracy in the twenty miles handicap (all classes), his time for that distance being 31m. 53⅘s.

A fine new garage has just been opened at Cardiff by the Motor Garage Co. Their premises, situated right in the centre of the town—Queen Street—are admirably adapted for the storage and repairs of motors.

* * *

Mr. D. Mackenzie, for the Motor Van and Waggon Users' Association, gave evidence before the Departmental Committee on motor cars.

* * *

After a hearing extending over three days, a case was decided on Friday last week in the King's Bench Division before Mr. Justice Wills and a special jury, in which the Motor Mfg. Co., Ltd., were sued by Mr. Wethered, of Malden, for damages arising out of an alleged breach of warranty. The plaintiff bought a 10 h.p. M.M.C. car for £395, but it did not work satisfactorily. He asked the company to take it back, which, however, they declined to do, alleging that the breakdown was due to unskilful treatment and neglect. The jury, while finding that there was no fraud on the part of the defendants, as had been alleged against them by plaintiff, awarded the plaintiff £300 damages. A stay of execution was granted pending an appeal.

THE FLORIDA BEACH RACES. Walter Christie was one of the competitors in the ten miles invitation race (open to gentlemen drivers) which was won by Vanderbilt in 6m 50s. Christie's car was a 30 h.p. Christie, and his time was 9m. 35s. for the ten miles. Christie also drove in the twenty mile handicap (all classes). The picture shows him in his new car (named after himself) leaving for a run from the Ormond Beach track.

His Royal Highness the Prince of Wales has ordered one of the new Daimler cars. It will have the new silent engine, and the body from his present 22 h.p. will be transferred to it, while the old car will be fitted with a big waggonette body, to be used as a beaters' vehicle.

* * *

Messrs. A. Darracq and Co., Ltd., of 483, Oxford Street, W., inform us that they were obliged to exhibit a notice early during the recent Crystal Palace Show to the effect that they were unable to take any more orders for their 9 h.p. twin-cylinder car, the output of the year having been completely sold.

* * *

On Thursday last week, in the King's Bench Division of the High Court of Justice, Mr. Justice Buckley had before him an action brought by Charles Fuller Garland against Julian Humphries for £500 damages for alleged breach of contract for sale by the defendant to plaintiff of an 18 h.p. Mercedes motor car. It was stated that defendant, who did not appear, admitted that he entered into a French contract with the plaintiff to procure delivery to him of an 18 h.p. Mercedes, 1903 model, at £1,050, and that £350 was paid on account of such price, but no time was fixed for delivery, and a reasonable time had not elapsed. The plaintiff was an American. When the time came for delivery of the car Mr. Garland was unable to obtain it or the money. After hearing evidence, His Lordship gave judgment for the amount claimed.

* * *

A correspondent complains of the conduct of a man on horseback, who in the neighbourhood of Leatherhead causes annoyance to motorists by systematically signalling them to stop, and then pouring forth a volley of foul abuse. On one occasion this objectionable person succeeded in getting a man fined.

Ease before Elegance. An American automobilist in racing attire.

* * *

Baron de Barreto, of Sennowe Park, Ryburgh, Norfolk, has been summoned for "driving his motor car (No. AH-9) without a light at 9.30 on the evening of February 11th within the metropolitan area." It would appear, however, that the over-zealous police have made a serious mistake, for Baron de Barreto informs us that he has written to the Inspector in Chief at New Scotland Yard emphatically denying the charge for the following reasons: "He was not in London on February 11th, neither were any of his drivers, nor is he possessed of a car in London; and, further, none of his cars have ever been in London." He offers to furnish further evidence if this explanation is not satisfactory. This is clearly a case of a constable misreading the number displayed on a car. How the case terminated we are not informed.

It is not very long ago that various local councils in Monmouthshire complained that autocarists often failed to give audible warning of their approach, and prosecutions followed. Naturally, motorists when in Monmouthshire grew wary and made their approach audible. The authorities now appear to have had enough audible warning, for at the next meeting of the County Council, Mr. A. Jones will move: "That a byelaw be framed to suppress the nuisance and annoyance caused to the public by the unnecessary use of horns and other instruments by parties travelling by vehicles and motor cars throughout the county." Between these two extremes the lot of autocarists in Monmouthshire is not a happy one, especially as speed restrictions are also proposed.

* * *

A controversy has lately been proceeding as to who was the first person in Wales to successfully adopt horseless traction. The first patent for the employment of the expansive power of steam "to propel wheel carriages" was granted to Trevethick and Vivyan, and in 1804 a successful demonstration took place near Merthyr. Long before this, however, in 1782, a Welshman named Oliver Evans in the inventive atmosphere of America conceived the project of employing steam as a locomotive power on land. He obtained the exclusive right to make and use steam waggons in the State of Maryland in 1787, fifteen years before Trevethick. Singularly enough, the year that Trevethick's puffing monster caused excitement at Merthyr, Evans figured with his in the streets of Philadelphia.

* * *

Elsewhere we refer to the satisfaction which the Taff Vale Co. have obtained from their railway motor vehicle. We can only say that if they build a lighter railway car and drive all eight wheels instead of one pair only, they will obtain considerably greater economy than that which has been effected up to the present. The railway motor cars have been a sort of hybrid, with a very strong flavour of the electric tram and the locomotive superintendent's engine and saloon. This vehicle, we may say for the benefit of those who are not up in railway matters, is a railway locomotive and railway carriage combined, in which certain high officials of the railway make periodical trips of inspection. However, we have no doubt that the railway car will eventually become a far lighter vehicle than it is at present, though it will not, and need not, be—in fact, it certainly should not be—so light as an autocar.

The 60 h.p. Spyker car which drives with all four wheels. The car was to be seen on the stand of the Elsworth Automobile Co., of Bradford.

SOME QUERIES AND REPLIES.

We are always pleased to reply to queries, even if they be of an elementary and untechnical description under this heading. Only a selection of those which are of general interest will be published, though all will be answered direct through the post, for which purpose a stamped and addressed envelope should be enclosed

When advice concerning different makes of cars is sought, each vehicle should be given an identifying number

Letters should be addressed The Editor, "The Autocar," Coventry.

SURFACE CARBURETTERS.

I have often wondered why the surface carburetter of the wick type is not more used than it seems to be? So far as I know, the only car which has such a carburetter fitted is the Lanchester, and I am told by friends that this answers admirably and never gives trouble. Perhaps you would be good enough to enlighten me on the subject?—W. S. WILSON.

The heavier s.g. petrol which is now being sold to the public is largely responsible for the disappearance of the surface carburetter, as with it in its most simple form starting difficulties were experienced. Personally, we still believe that a perfectly satisfactory apparatus could be devised which would be economical in petrol and give better all round results than many of the spray carburetters. The new conditions of far greater engine flexibility than was the case with the older engines employing surface carburetters would have to be very carefully considered.

THE POSITION OF COOLERS.

Would you be good enough to tell me whether there is any good reason for the carrying of the radiator below the frame in front? Some cars carry the radiator above the frame in front of the bonnet, but others have it low down as a sort of apron. In my opinion it looks very ugly low down, and I want to know whether there is any advantage in carrying it in this way?—BONNET.

There is no advantage in carrying the radiator beneath the front frame, except that the engine is more accessible on account of there being nothing in front of the bonnet. In other respects it is preferable to have the stack placed above the frame and to fill up the space which would be occupied by the front of the bonnet, as the water is brought higher and a certain proportion of it at any rate is carried above the engine, so that the cooling system is not quite so dependent upon the proper running of the pump as when it is low down.

GEAR CHANGING.

Might I trouble you to say whether, when changing gears, or rather speeds, it is advisable to let the clutch in as slowly or as quickly as possible, and why? H.R.B.

When changing down, *i.e.*, when putting in a lower gear uphill, it is best to let the clutch in at once, otherwise the car slows and more shock is put upon the engine and transmission generally than if the clutch is let in smartly. When changing up, however, it is best to let the clutch in gently, so that slight slipping occurs, particularly if you should put the gear up a little too soon before the car is going at about its fastest on the gear off which you are changing. You will see the conditions are reversed. When climbing the car is going slowly, and if time is lost in the change it gets slower still, so that the load on the engine is heavier and altogether more of a dead load. However, it is always advisable to have the foot ready, so that you can allow very slight slipping if the engine begins to thump directly the lower gear is put in. This is not likely to occur in the ordinary way. When changing up, the aim is to increase the speed of the car as easily as possible, and therefore a slight slipping of the clutch is correct, as it allows this to be done. The matter is largely a question of sympathy between the motor and the man. Directly one feels any sort of labouring on the part of the engine, one should prepare in the case of hill-climbing to put in the lower gear, or if one has just changed on to a higher gear, to depress the clutch just sufficiently to relieve the load without allowing the engine to race at all. The clutch that will not permit of this is either wrongly designed or in want of adjustment.

EXTERNAL SPARK GAP.

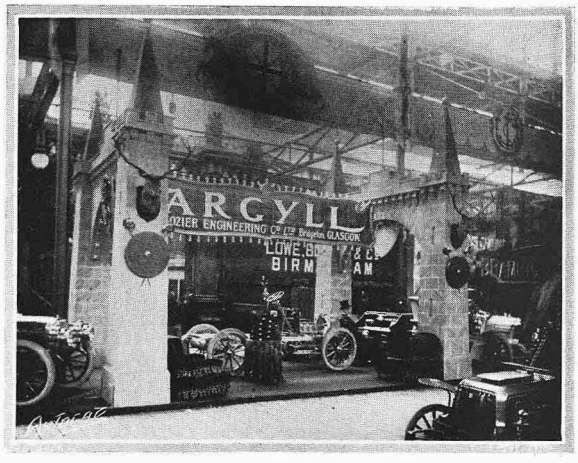
Is the external spark gap injurious to a coil? For the past ten months I have been using one on a motor tricycle with a De Dion contact breaker and coil. The latter broke down suddenly the other day, and on testing it the defect was found to be in the secondary winding. An exactly similar occurrence happened to a friend a short time ago. In neither case had the coil ever been used in connection with more than four volts (two cells of accumulator).—H-295.

The external spark gap certainly is more likely to injure a coil than when the coil is used without one. Owing to the action which takes place an increased electro-motive force is produced between the windings of the high tension circuit, and as the insulation is arranged to suit normal conditions, more risk is involved of damaging the insulation. If a wipe contact were fitted to the half-speed shaft, and a high speed trembler coil were used, there would be a very efficient spark produced and practically no adjustment required.

THROTTLE GOVERNING.

I recently purchased a car, the engine of which is controlled by a governor working on disc valve placed in the induction pipe. At present the running of the engine is extremely erratic, as the governor seems to come into action suddenly and cuts off the mixture from the engine when it, of course, slows down and the valve is again opened. Could you give me any information as to the adjustment of the governor?—S.J.S.

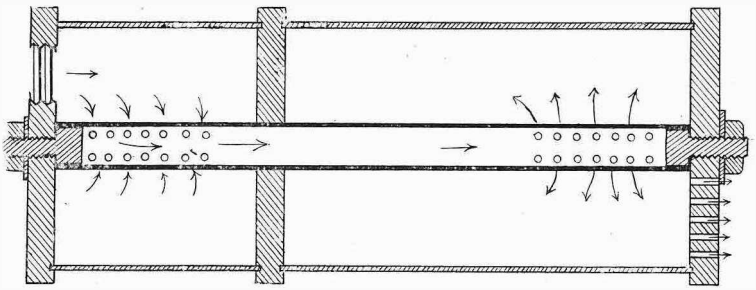
The most likely cause of the trouble is that the governor weights are not sufficiently heavy to exert the force necessary to overcome the strength of the governor spring. The result is that the throttle valve is held nearly full open until such time as the weights have attained, by a high velocity, sufficient power to compress the spring, which, when the force is applied, shuts up comparatively suddenly, thus allowing the valve to close. The fitting of a lighter and more flexible spring in place of the present one will overcome this difficulty. The smooth running of the engine may further be secured by drilling a small hole through the butterfly valve in the induction pipe. As a general rule this should be about $\frac{1}{16}$in. in diameter, which is big enough to allow sufficient mixture to pass the valve to keep the engine running smoothly.



A part of the Argyll stand, showing double portcullis towers which are frequently to be seen on old Scottish castles.

AN EFFECTIVE SILENCER.

What is claimed to be an improved form of silencer has been brought out by Messrs. Coxeter and Sons, of Abingdon-on-Thames. The sectional illustration of the silencer given herewith shows it to consist of two different-sized chambers connected by a central pipe. The exhaust pipe is led into the end of the smaller chamber, where the exhaust gases are passed from the engine. A certain amount of expansion is allowed them here, after which they escape through a large number of holes drilled in the central tube. Passing through this, they escape through a larger number of holes into the bigger expansion chamber, whence they pass through a number of small holes in the opposite end of the silencer. The particular feature of this piece of apparatus is the ease with which it may be taken apart and reassembled. The central tube is plugged at both ends, and a screwed stud is inserted therein. These screwed studs—one at each end—pass through central holes in the end plates of the silencer, which are provided with a channel to receive the ends of the tubes from which the body is constructed. The central plate is permanently attached to the tube, and is also provided with grooves wherein the body of the silencer rests. Thus the removal of the two nuts shown liberates the larger and the smaller expansion chambers, when the silencer is reduced to its component parts. This apparatus is made in sizes varying from those suitable for motor cycle engines to those suitable for the largest powered car engines.



Longitudinal section of the Coxeter silencer.

MOTOR TRAFFIC DEVELOPMENT.

In connection with the higher commercial education scheme of the London Chamber of Commerce, a lecture was delivered at the London Institution, Finsbury Circus, on February 9th on "The Development of Motor Traffic and its Connection with Commerce," by the Hon. C. S. Rolls. After a brief historical retrospect, Mr. Rolls went on to speak of the light pleasure car, the popularity of which was so great that manufacturers had only recently been able to keep pace with the demand. What the public really required was a small car that would do a speed of twenty miles per hour on the level and that could be bought at about £100. For passenger vehicles for public service the field was practically unlimited. The advantage of motor omnibuses over tramcars was that each car could accommodate itself to the existing traffic instead of forcing all other vehicles off its path. Smooth road surfaces would be possible without the necessity of railways on public streets, added to which there would only be one-sixth of the capital expenditure with corresponding benefits to the ratepayers. There was a still greater field for this type for connecting large towns together and for acting as feeders to railways. There was a great future before the light tradesman's delivery van, and he noted with pleasure that the Automobile Club was organising a trial at the end of the year. The class which Mr. Rolls considered as of the greatest commercial importance was the heavy goods lorry designed to carry from three to seven tons or up to ten tons with trailer. He expected during the present century a development in this direction of a character which would rival in importance the introduction and perfection of the railway. A well-known firm of brewers in Birmingham had come to the conclusion after twenty-nine months experience that a fair estimate of the advantage of the motor lorry over horse drays was £200 per annum. A motor lorry should succeed where its mileage was not less than 175 per week, with an average load throughout of three tons, or a combined ton mileage of approximately 500, and at an average rate of not less than 4½d. per ton mile, including collection and delivery. Returning empty should be avoided as much as possible, if even by combination with other traders. The raising of the tare limit permitted by law was expected very shortly, and this would enable makers to build more substantial, reliable, and durable machines. Of the three commonest modes of propulsion, steam was the most suitable for heavy haulage, the internal combustion or petrol motor was best for light vehicles, while electricity was a luxury limited to town use until a light accumulator was discovered having a greater capacity than at present possible. The substitution of mechanical for horse transport would benefit the whole community in many ways, and chiefly in the direction of national prosperity, social and commercial convenience and economy, and streets would become more sanitary. With the 100,000 miles of roads at disposal in this country there could be little doubt that the general adoption of motor traffic would prove the right thing in the public interests, contributing not only to the prosperity of the manufacturing classes, but extending a helping hand to all.

RAILWAY AND MOTOR CARS.

The Taff Vale Railway Co.'s Experience.

The shareholders of the Taff Vale Railway Company spent some time at their last half-yearly meeting in discussing the importance of having a service of motor cars to run on their lines. Mr. R. S. Vassel, the chairman, stated that the motor car service on railway lines was a new departure, and doubtless the shareholders would like to hear their experience. Powers had been taken to electrify the railway, but the directors found, on going closely into the question, that if motor cars with separate power were to be introduced, electricity was not in it with steam, the prime cost being very much higher and also the cost of working and maintenance. They had, therefore, tried the experiment with steam, and the car between Penarth and Cardiff had proved an unqualified success. Passenger traffic had greatly increased. As regards cost of working, they found that the car consumed much less coal—about one-third the quantity used by an ordinary locomotive; that it attained full speed in 40s. from starting; and that it easily negotiated the stiff gradients. The cost of running was 6d. as against 1s. 6d. per mile, and, of course, the wear and tear of the line were much less. The directors were so convinced of the desirability of extending the use of these cars that they proposed to obtain six more for use on the different branches. The order for the new cars has been placed with the Bristol Waggon and Carriage Works Co., Ltd., and the Avonside Engine Co., both of Bristol. The cars will be duplicates of the one designed by the Taff Vale Railway Company's locomotive superintendent, Mr. T. Hurry Riches, and will be ready for the summer traffic.

SHOW ITEMS.

In our report of the Langdon-Davies' exhibit we referred to change-speed gear under the firm's name. In order to remove any doubt as to the type of the gear, we may say that it is the Soames gear to which we referred.

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In our description of the Grappler Tyre stand last week, we referred to this tyre as being manufactured by the Hyde Rubber Co. This is not the case. The Hyde Rubber Co. are the agents for the sale of the Grappler tyre, but the tyre itself is manufactured in accordance with the special Grappler tyre process in a factory and by machinery rented and owned by the Grappler Tyre Syndicate. We regret that we should have caused a wrongful impression in this respect.

* * * *

We are advised that the speed indicator exhibited by Mr. C. J. Paffard is that invented by Dr. Winter, and is known by his name, Mr. Paffard being the manufacturer.

* * * *

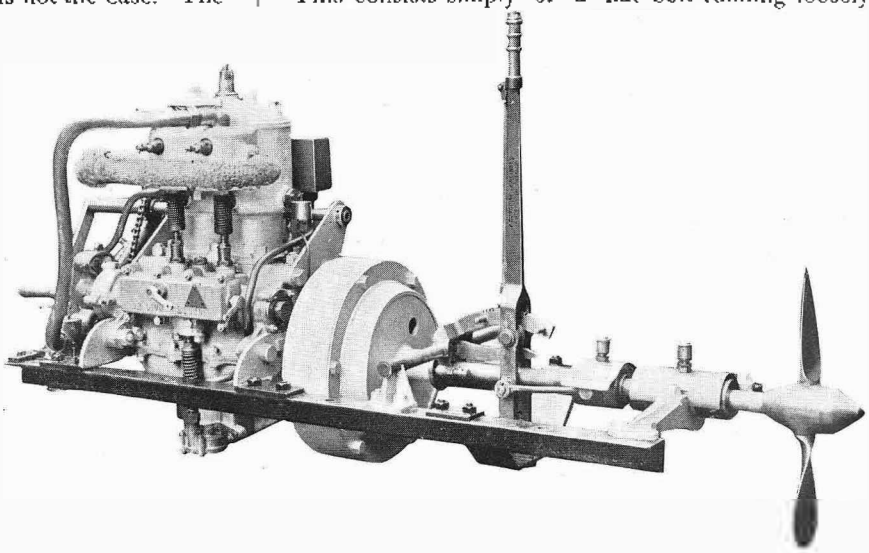
We made a short trial of the new Standard car, with its two-cylinder engine of 5in. bore and 3in. stroke. From the way it climbed hills it evidently has a large reserve of power.

* * * *

At the United Motor Industries' stand there were shown samples and sections of the Double Arched tyre—a solid rubber tyre with a smaller stiffened arch formed in the base where the tyre is laid upon the rim. This rubber tyre is held in position by lip flanges bolted to the wheel felloes, and is retained so securely that no creeping can take place. It is claimed that the tyre wears soft down to the lowest point, the inner arch having the effect of preventing the hardening of the tyre which takes place very frequently in solid rubber tyres, owing to the hammering of the road.

AT THE AUTOMOBILE SHOW. A view in the North Tower Gardens at the Crystal Palace. A large crowd was always to be found around the trial cars.

Another car which gave us the impression of good power was the new 10 h.p. Pick. With a full load, several of the worst pitches about the Palace were tackled at quite a reasonable pace. There are several excellent features in the design of the Pick, two being specially noticeable—the accurate balance of the motor and the power of the brakes fitted. Another point of interest is the Pick chain protector. This consists simply of a flat belt running loosely outside the chain, and held on sidewise by ⊔ shaped steel riders. This protector effectually prevents any mud from reaching the chain, and, in addition, serves as a base for and retains the grease.



A 12 h.p. two-cylinder De Dion engine adapted for launch work. A reversing propeller is fitted, and a permanently attached starting handle is provided.

* * * *

In connection with the Langdon-Davies change-speed gearing described last week, there is an improved form of friction clutch running in oil, on the Weston principle. When observing the action of this clutch on the trial car, the driver allowed the car to slow right down when running on the top speed, by disengaging the clutch. On the pedal being suddenly released, not the slightest jar or even labouring on the part of the motor could be observed, the car resuming its former velocity gradually, though quickly. We intend to illustrate and describe this clutch fully in an early issue.

* * * *

When we tried the new Crossley car we were not surprised to find the rotary distributing valve, of which we gave a general non-technical description in our issue of February 13th, was not fitted. As we stated at the time, we felt sure that this valve was not required, the combination of the carburetter, the governor, and the hand throttle being quite sufficient to provide the engine with a correct mixture, and the necessary volume of it at all speeds. Experience has shown we were right, and we mention the matter now to explain why it was we devoted so little attention to the rotary cut off valve. We regarded it as an interesting but wholly unnecessary supplement to the mercurial carburetter, and, therefore, dealt with it summarily.

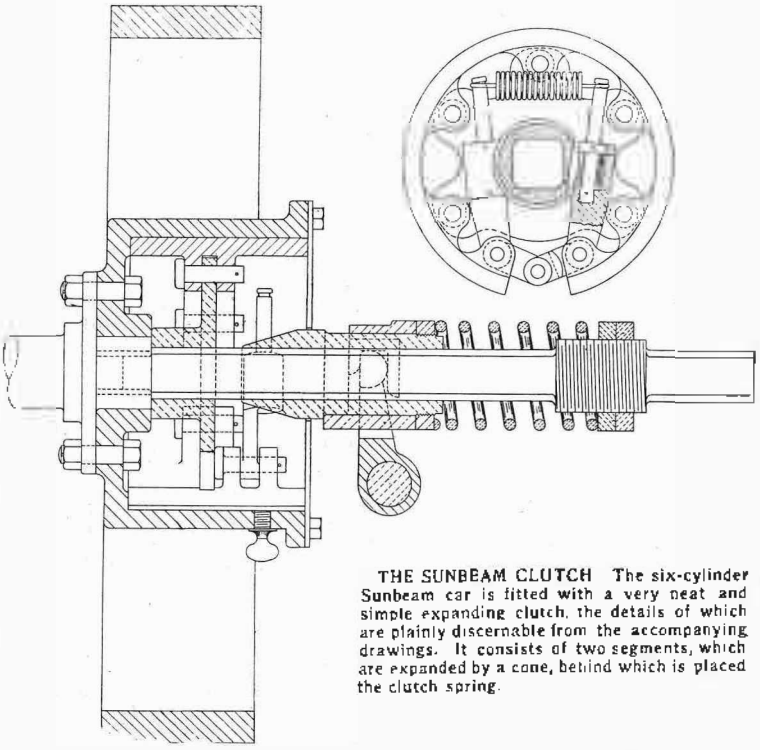
The Crystal Palace grounds and the environs constitute an ideal testing course for cars, many of the hills in the neighbourhood having the abnormal grade of one in five and a half. One of these hills, known as Jasper Road, actually has the gradient mentioned, and not a few drivers of trial cars have carefully avoided it. The new James and Browne 18 h.p. car, however, made a most creditable performance on this hill, for, with four people up (averaging eleven stones each), Mr. Martineau drove the car to the steepest portion of the grade, then stopped on the brake, and restarted again with the greatest ease. Undoubtedly the special qualities of the clutch fitted to this car have something to do with this.

* * * *

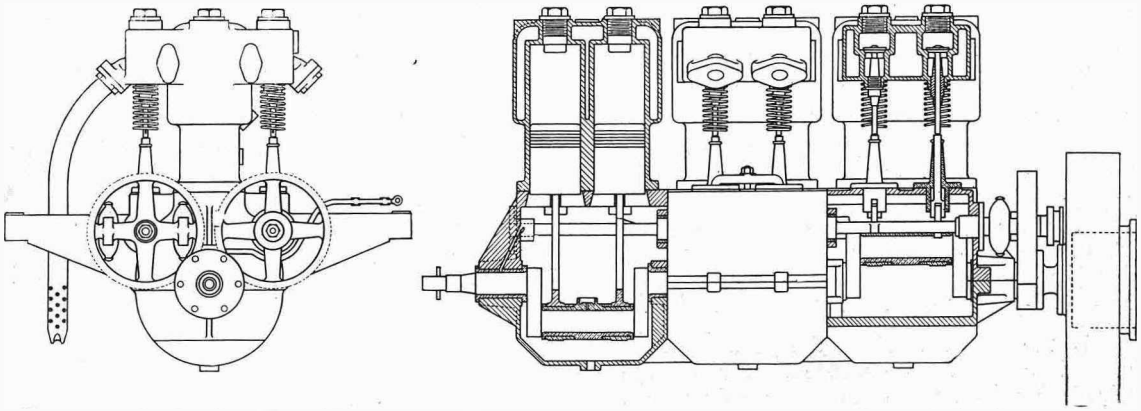
A machine that fairly "romps" up hills, to use a common if not a literary expression, is the 16 h.p. F.I.A.T. A circuit of the Palace on this car and hill-climbing tests at almost all of the more severe of the inclines strikingly demonstrated the power developed by the engine, whilst the manner in which the car picks up speed when the accelerator is brought into action is excellent. The F.I.A.T. method of controlling the spark advance solely by the engine speed probably accounts for this, inasmuch as the moment of ignition is always correct, automatically adjusting itself accurately to the speed of the engine, this being completely independent of the driver, and reducing both the risk of damage to the engine and of poor results when the car is in the hands of an indifferent driver.

* * * *

On the last day but one of the Palace Show we were afforded a welcome opportunity of taking a short trial run on the Crossley car, with Mr. Charles Jarrott at the wheel. To say that we were greatly impressed by the running of this car on all its speeds is to express our approval mildly. Whether running slow, fast, or with the engine raced, the motor is absolutely unfelt by the occupants of the vehicle, while upon its second speed the car will crawl at from two and a half to three miles per hour smoothly and sweetly and without any gear sensation whatever. With regard to its hill-climbing abilities we may say at once that the car took the accepted Crystal Palace hill trial—namely, the ascent of Jasper Road—without the slightest falter, the engine running cleanly and sweetly all the way up. There is no doubt whatever that the Crossley cars, so long as they are turned out to equal in every respect the car we had the pleasure of testing on Tuesday this week, will take a place in the very first rank of automobiles. We expected good results and found them. Messrs. Jarrott and Letts, we think, are to be congratulated upon the machine they now have to place before the public, for in our experience with all sorts and conditions of self-propelled vehicles we may say at once that with none have we had a more gratifying experience than with this new car.



THE SUNBEAM CLUTCH. The six-cylinder Sunbeam car is fitted with a very neat and simple expanding clutch, the details of which are plainly discernable from the accompanying drawings. It consists of two segments, which are expanded by a cone, behind which is placed the clutch spring.



THE SIX-CYLINDER SUNBEAM MOTOR. End elevation and part longitudinal section of the Sunbeam petrol engine which Messrs. J. Marston and Co., of Wolverhampton are fitting to the new model Sunbeam car. In this the most notable feature is perhaps the employment of a three-throw crankshaft, the cranks being, of course, set at 120°. Attention must also be called to the thorough cooling of the cylinders, the water entirely surrounding these—an important point.

THE COST OF CARS AT THE CRYSTAL PALACE SHOW.

REVISED GENERAL STATISTICS. CLASSIFICATION OF PRICES AND SEATS.

By H. Hewitt Griffin.

"Motors for men of moderate means" has been a catchline for discussion in many quarters, and so much attention is given to the subject that, commissioned by *The Autocar*, I made a second tour of inspection of the great show at the Crystal Palace to ascertain exactly how far the exhibitors were meeting the evident want of a low-priced car, with seats for two or three. Only autocars for personal use were counted. Of these there were 422 cars, shown by 101 exhibitors. Occasion was also taken to check the previous enumeration, more especially as regards late arrivals. These increased the previous total by sixteen vehicles. The revised table shows:

Light and heavy cars	218
Cars with detachable covers	74
With permanent covers	48
Voiturettes	74
Racing cars	1
Motorettes, etc.	14
Omnibuses	9
Lorries and vans	24
Tractors	15
Chassis	97
Grand total in Exhibition	577

Method of Propulsion.		Driving Gear.	
Petrol	525	Chain	323
Electricity	17	Propeller	231
Steam	33	Electric	17
Petroleum	2	Gear	5
		Belt	1
Total	577	Total	577

Classification of Cost.

With prices varying from £73 10s. to £1,550, there is a wide margin, but the eight classes into which I have divided the "cost" ought to cover all reasonable requirements:

I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Not over £100.	£100 to £150	£150 to £200	£200 to £350	£350 to £500	£500 to £700	£700 to £1,000	Over £1,000
7	38	43	68	85	99	67	15
Per cent. of the whole 1·657	9·005	10·190	16·114	20·142	23·460	15·877	3·555

Only complete cars, for passengers, in addition to the three "singles," were counted. The apparent discrepancy between 577 and 422 can be worked out thus:

Grand total of all exhibits		577
Chassis	97	
Lorries, vans, etc.	23	
Tractors for heavy vehicles	15	
Tandem type and other "Not cars" including cars "Not for Sale"	20	155
Total		422

There is a certain type of motor vehicle which is neither a cycle nor a car, such as the Century and Eagle tandems, and other kindred vehicles. These, though appearing under motorettes (which would include the "Cosi-car" attachment) in the general statistics published last week, and revised this, have been left out of the present particulars.

In very many cases, guineas are asked instead of pounds, but cars on the border line are nearly always included in the £ class. Even the generous limit of £1,000 is considerably exceeded. Six of the high-priced cars total up to £8,100—average, £1,350. A glance at the table of the I. to VIII. classification shows that out of the 422 cars, 85 (20.142 per cent.) cost between £350 and £500. This makes (with those at a lower price) 241 (or 57.109 per cent.) at or below £500; while of the 422 cars, 266 (or 63.031 per cent.) cost over £350, and 181 (42.891 per cent.) cost over £500. The show was thus a rich man's paradise rather than a poor man's delight.

Total Value of the Exhibition

I find the figures work out between £260,000 and £270,000, which must be far and away the most valuable collection ever brought within the Crystal Palace.

The Seating Accommodation.

Note of this was also made in each car, in four classes, as explained by the following table:

Cars with one seat, 3. Per cent. ·711.	Cars with two seats, 85. Per cent., 20·142.	Cars with three seats, 11. Per cent., 2·607.	Cars with four seats & over, 323 Per cent., 76·540

Over threequarters of all the cars are for four or more persons, and only one-fifth for two—a very striking proof, emphasising the price question, of the little attention paid to the lower-priced cars. Another fact these figures bring out is the very small number of cars fitted with three seats. It is a great additional attraction to a buyer if the body is so constructed that the rear portion is adaptable in three ways: (1) Closed up for ordinary travelling; (2) a platform for luggage, etc.; or (3) a spider (detachable) seat for a young or light passenger. The cost would not be a tithe of its value as a talking point in effecting sales. At the same time it is a mistake to overload any car, particularly a small light one, and if a third seat is provided there is always the risk that the occupant may weigh anything up to 14 st.

THE FLORIDA BEACH RACES. Mr. W. K. Vanderbilt after his record. An amusing incident on the third day was the tossing of a coin by Mr. Vanderbilt and a photographer to see whether the American sportsman should pose for his picture. The photographer won the toss, and Mr. Vanderbilt made his first pose for a snap shot.

THE WORKING OF THE NEW ACT.

Applications for the Ten Mile Speed Limit.

In addition to the boroughs mentioned in *The Autocar* of February 6th, the following have now applied to the Local Government Board for the ten miles speed limit to be placed upon autocars passing along all roads in their respective districts: Blackpool, Newport, Mossley, Stockport, and Chepping Wycombe. In addition to these Newbury has applied for the ten miles limit for all roads except the following: Oxford Road from Donnington Square northwards to the borough boundary; the Bath Road from the caution board, Speen Hill, westward to the borough boundary; Enborne Road from the Grammar School westward to the borough boundary; Andover Road from Buckingham Road southwards to the borough boundary; Newtown Road from Porchester Road southwards to the borough boundary; and London Road from the railway bridge eastwards to the borough boundary. The time has expired for lodging objections in all these cases. Stockport has, in deference to representations from local automobilists, decided to suspend its application for six months, at the end of which period, let us hope, it will be withdrawn.

Numbers on Motor Cycles.

This question has been fully dealt with in the pages of *The Motor Cycle*, but as motorists are often asked for advice in regard to the same matter, we refer to it here.

A point upon which considerable doubt appears to exist is as to whether it is necessary to have a number plate fixed both to the front and rear of a motor cycle. It is assumed for some reason or other that if the front number plate be so fixed as to show the number on both sides the necessity for a rear plate is done away with. Mr. F. A. Bullock, secretary of the Cycle and Motor Trades' Association, wrote to the Local Government Board pointing out that some difference of opinion had arisen as to whether it was necessary where a plate having duplicate faces was placed in the front of a motor cycle to have in addition a plate at the back of the cycle, and asking for an authoritative statement on the subject.

In reply the Local Government Board said: "Under Article VIII. of the regulations a motor cycle, like any other motor car, must carry a plate at the back as well as in front, whether the front plate has a duplicate face or not."

The Newport Application.

The Gloucestershire Automobile Club, on receiving a communication from the South Wales and Monmouthshire A.C. in reference to the proposed imposition of the ten miles speed limit in the borough of Newport, Mon., sent to the Local Government Board a protest in which they stated: "The club do not think that the corporation in question can have grasped the immense power which the police have under the Motor Car Act of 1903 in preventing furious driving, nor the protection afforded to the public by Section 1 of the Act, or they would not have troubled to resort to a measure which they dare not apply to tramcars or any other mode of travelling upon the highway." A large number of individual members of the club also wrote to the Local Government Board in opposition to the application.

Cardiff.

The endeavour of certain persons to prohibit the driving of motor cars in certain Cardiff streets has ended in utter failure, thanks to the reports of the Borough Engineer and the Chief Constable. These gentlemen have reported that such a step is not necessary, and the report has been adopted.

South Wales.

After taking legal advice, the Electricity and Tramway's Committee of the Newport Corporation has decided to take out licenses for the drivers and conductors of the electric cars. The Watch Committee has asked the Local Government Board to make regulations restricting the speed of motor cars within the borough to ten miles an hour.

The Pontypool District Council, on being asked by the Monmouthshire County Council for information respecting the highways in the district, replied "that all the by-roads in the district are dangerous to motor car traffic."

The Barry (Cardiff) Public Works' Committee consider that cars should not exceed ten miles an hour on any of their highways, and that they should be prohibited on all roads and bridges under sixteen feet in breadth, and on those with a gradient of one in ten and a half or steeper.

The Newport County Borough Council, in considering the appeal of the South Wales Automobile Club not to restrict the speed of cars to ten miles an hour in the streets of the county borough, decided not to accede to the club's petition. Some of the gentlemen who voted in the minority called attention to the fact that the corporation's electric tramcars exceeded the ten miles an hour speed limit which it was sought to impose on motor cars.

Stockport.

We are informed that in the matter of the application of the Watch Committee of the Borough of Stockport to the Local Government Board for the ten miles limit to be imposed within that town, further proceedings have been deferred for six months. As soon as it was known that the Town Council had applied for the speed limit, Messrs. H. Hollingdrake and W. Brownsword called a meeting of the local automobilists to discuss the situation, and a deputation was appointed to wait upon the Watch Committee to ask them to withdraw the application. The Watch Committee gave a favourable hearing to the views of the deputation, and the matter was again brought before the council, with the result above stated, in order to give the new Act a fair trial. In justice to the Watch Committee, it should be stated that their application in the first instance was made without their being made fully acquainted with the provisions of the new Act, and also against the wish of the Chief Constable. The result of the action of the Stockport automobilists should encourage those in other parts of the country to persevere in their opposition to similar applications.

JARRETT'S UNDOING.

On Saturday last the persecuting zeal of the renowned Sergeant Jarrett, of Ripley, received a rude check. For years past this active officer of police has been a terror to automobilists passing through the quiet Surrey village where he holds sway. When he has credited motorists with speeds of which they never dreamed their cars were capable, his word has been implicitly taken by all too confiding benches of magistrates. But a case which proved the contrary occurred before the Woking magistrates. It was a charge against Mr. S. R. Sibley, of Richmond, of having covered a measured 176 yards in 14⅔s., twenty-five miles per hour, according to the time taken by Jarrett. Jarrett, snugly ensconced beneath the porch of the newly-built Police Station at Ripley would perceive cars passing between two trees, and behind a hedge at the distance of the hypothenuse of a right-angled triangle, the base of which measured one-tenth of a mile, he would then start his watch and stop it as the vehicle cut the perpendicular line of the same figure later. A signalled officer stopped the car later. Photographs of Jarrett's scene of operations were produced in court, and by the aid of these and Mr. Staplee Firth's smart and penetrating cross-examination, together with his contention that a second witness was obligatory under the Act, Mr. Staplee Firth was successful in inducing the Bench to dismiss the summons, although costs were refused. No evidence whatsoever was called for the defence, although Mr. Messenger, surveyor, and Mr. Harry J. Swindley *(The Autocar)*, honorary official timekeeper A.C.G.B. and I., were present to give expert testimony as to the fallacious method of timing adopted. It should be noted that the Motor Union instructed Mr. Firth, and will make a substantial contribution towards Mr. Sibley's costs. Jarrett will have to revise his methods in future.

THE ORMOND BEACH CARNIVAL.

We are enabled to give a few more illustrations of the Ormond-Daytona Beach automobile carnival, briefly noticed in *The Autocar* of last week. The records made were of so startling a character that even the Americans themselves seem a little incredulous as to the reality of the speeds attained. The great sensation of the event was, of course, W. K. Vanderbilt's mile in 39s. There is also some mention of an "unrecorded mile" in 35s., which Vanderbilt says he did, and which, though not officially timed, is accepted by some. "The next thing in order," says one writer in an American contemporary, "of course, is to see how our friends across the water will regard the affair. It will surprise me if they don't treat it as they have the knack of doing most items of news from America—speak of it diplomatically as unimpeachable, at the same time blandly requesting someone to pass the salt. The only thing that will save it from instantaneous incredulity is the fact that foreign machines gathered in all the records—or, I should say, all but one." The fact that the American cars were so soundly beaten, while supporting the *bonâ-fides* of the records, also points a moral, and that is, that American-built cars have not yet reached the same point of efficiency that cars of other nations have reached. Besides that of Vanderbilt's, another world's record was made by H. L. Bowden of fifteen miles in 10m. 18s. The mile championship of the American Automobile Association on the second day was won by Barney Oldfield on his 120 h.p. eight-cylinder Winton car (which he called the "Winton Bullet"); time, 46⅖s. His machine, however, broke down later, and he was unable to participate in the other races, thus causing no little disappointment to the spectators.

AN IMPROVED SPEEDOMETER.

An improved form of the Jones Speedometer is being sold by Messrs. Markt and Co., of 20, Chapel Street, Milton Street, E.C., an illustration of which is given herewith. The improvement consists in the drive now being made positive, by the employment of gear instead of friction drive. For given diameters of wheels, a different ratio of gear wheel is supplied, so that the previous narrow limit of error is still further reduced. As with the majority of speed meters, the drive is by a flexible shaft contained within a flexible tube, this driving from one of the steering wheels. Personally, we do not see why the drive should not be taken from the rear driving wheels, when the bevel form of transmission is employed, as it appears to us that it would not be a difficult matter to attach the driving gear wheel of the instrument to the brake drum or other convenient part of one of the rear road wheels. By this method the great flexion on the driving shaft would be avoided, thus contributing to an increased life of the mechanism to no small extent.

CLUB DOINGS.

Yorkshire A.C. Huddersfield Centre.

The Huddersfield Centre of the Yorkshire Automobile Club has been inaugurated under the chairmanship of Mr. J. Crowther, who has also been elected a vice-president of the Y.A.C., and the honorary secretary is Mr. Gordon Learoyd. The centre is entirely self-governing, and is affiliated to the A.C.G.B. and I. and Motor Union through the Y.A.C. The members of this centre have all the benefits of the Y.A.C., and by this means it is intended to make a powerful and live organisation in the "broad county." Already about fifty members have been enrolled.

South Wales and Monmouthshire A.C.

A largely attended meeting of the South Wales and Monmouthshire A.C., which has on its roll practically every motorist in the southern part of the Principality, was held at Cardiff last week. Mr. Godfrey S. Clark, of Talygarw, presided. Attention was called to the proposal of the Newport Corporation to restrict the speed within the borough of Newport to ten miles an hour. "We, together with motor cyclists and cyclists, must be up and doing," stated one gentleman, and the hall rang with applause, which spoke emphatically of the determination of those present. It was pointed out that these restrictions would have a very serious bearing on motorists in Wales and the West of England, because of their having to pass through Newport in order to enter or leave South Wales. Glamorgan and Cardiff have placed no limit. It was conclusively shown that accidents in South Wales due to motorists are extremely rare and insignificant.

Hertfordshire A.C.

As a result of the action of one of the members of this club, red tail lights are now carried by the L. and N.W. Railway Co.'s horse-drawn lorries running between Berkhampstead and Chesham, which during the past winter have many times narrowly missed causing accident.

The Conference of Automobile Clubs.

In our report of the conference of provincial automobile clubs with the A.C.G.B.I. last week (p. 229), it should have been stated that scheme No. 1, before being adopted, was amended by the deletion of the words describing the general council of the club as the final court of appeal for the affiliated clubs and the Motor Union. The Chairman of the meeting stated, in reply to Mr. Robert Todd, "that the council of the club had no power over the general committee of the Motor Union, which acted independently and as it thought best."

REVIEW.

"The Grant and Validity of British Patents for Inventions." By James Roberts, M.A., LL.B., 1903. (John Murray, London. 25s. nett.)

It is not often that one turns to a law book with actual pleasure, but we must confess to having studied this one with a distinctly pleasurable feeling. The work has been written for, and from the point of view of, the inventor. That has been the author's object according to the preface, and we think that he has carried it out most successfully. At the same time he does not aim at discouraging the inventor from obtaining professional assistance; quite the contrary. His idea is rather to educate the inventor so as to be able to take an intellectual interest in, and get a knowledge of, his subject from the legal point of view. Attention is called to the very large proportion of patents that are invalid (principally by reason of want of novelty), and the great loss arising therefrom: where the want of novelty is not ascertained the inventor continues to pay renewal fees where he would not do so if he were aware of his true position. If the patent is upset, the costs, of course, will be greater, being costs in an action. The work takes into consideration the new Act, and the new procedure shortly to be brought into operation thereunder. This is necessarily treated more or less theoretically, as what the actual details of practice may be remain to be seen. The author lays great stress upon claims; and rightly so. In our opinion, this important part is never dealt with in works on patents as it should be. Given such and such a class of invention, the authors should state what form the claims should take, giving actual illustrations. The present writer goes some distance in this direction by giving particular cases with their claims, and stating what happened to them; but this is rather approaching the matter from the opposite point of view. The work is divided into three principal parts. The first and last are what one is accustomed to find in books of the kind; thus, Part I. is devoted to General Principles, including some history and general procedure. Part III. is concerned with the Statutes and Rules. Part II. is something of a novelty, and the best feature of the work in our opinion. It is devoted to abstracts of leading cases, with notes. This part is certainly very well done, and the author must have taken an immense amount of trouble over it. Indeed, he confesses that he has studied all the cases in which the validity of patents has been called into question. From these he has selected the leading cases, and has appended notes showing their bearing upon one another. The cases are dealt with very fully, and, though it seems almost a shock to conventionalities, he has dared to introduce reproductions of the drawings! In some introductory remarks to this part (II.), the author calls attention to the danger of forming too general deductions from any particular case. The decision in each case depends so largely on the facts, that, unless one is fully acquainted with these facts, it is not safe to apply what may appear to be its general principle too closely to other cases. The work concludes with an Appendix on Disconformity and an ample Index. In this connection, we may remark that the Table of Contents gives as to Part II. the names of the cases and the points they turned on. It would, perhaps, have been more convenient if these had been classified according to subject matter rather than arranged in order of date. Two points we should have liked to have seen do not appear to have been included. One is some definite information on the question, if a provisional specification be refiled within the nine months and the original application be abandoned, whether user during the first period of nine months would invalidate the patent granted upon the second application. In the Rules it would have been a convenience to some to find a specimen drawing executed according to Patent Office requirements. Possibly, however, this was omitted in accordance with the author's principle of rather putting the inventor in a position to properly instruct his patent agent than to do the work himself. To anyone having to deal much with patents we can offer no better advice than they should invest in a copy of this work.

The 6½ h.p. Cadillac climbed the hill known as Crystal Palace Park Road with eight passengers on board—double its proper load The hill referred to is the long one approached by running down the grounds from the north tower and then turning sharply to the left at the bottom gate Competitors in the 1,000 miles trials know the hill very well. They descended it on all occasions when they went south or east from the Crystal Palace on their daily runs, as it is the main road from the Palace Parade to Beckenham. It is a fine wide road, and sometimes when three or four cars were making trial spins up it last week it looked as though a hill-climbing competition was in progress. It is whispered that appearances did not belie the fact.

ROAD REPORTS.

The main road from Halifax to Manchester is in a very bad state, and has been so for the last eighteen months. The trams on this road are very dangerous in places. Two lines are laid on a road so narrow that when two trams are side by side there is no room for any other vehicle in the road. The roads in Rochdale will soon be in a chaotic state, as the trams are about to be converted from steam to electric, and all tourists should cut Rochdale out of their programme for the rest of the year.—H. BRIGHT.

I beg to notify you of the following road conditions in Mid-Cornwall: First.—Main road between Truro and Bodmin. Bridge at Laveddon washed away by floods last November. No repair of bridge yet started. Temporary road over fields; fair surface, but very dangerous turns at junction of main road with temporary road. Second.—One mile east of Lanlnet two patches of loose stones extending whole width of road, unrolled, and in highly dangerous state for cars, etc., at night when I passed over this spot on the 11th inst.—C.E.A.

The road from Southwater Station to Shipley Gate has been relaid with granite in two lines, so that it is impossible to get off them. This occurs for about a mile. The road through Billingshurst village to Pulborough is in a very rough condition, and has had flints dropped in patches, unrolled.

New Patents.

This department is conducted by Mr. G. Douglas Leechman, consulting engineer and registered patent agent, 18, Hertford Street, Coventry 32, York Street, Dublin; and 9, Exchange Chambers, New Street, Birmingham; from whom any further information respecting patents, designs, and trade marks may be obtained

The following specifications were printed and published on the 18th February, 1904. All notices of opposition to the grant of patents on the several applications should be filed not later than the 3rd April, 1904:

1903.

1,924.—C. F. G. Low. Variable gear with expanding pulleys.
2,162.—Sir O. J. Lodge and A. M. Lodge. Electric ignition apparatus.
2,181.—E. Midgley. Chains and attachment for same to tyres to prevent side-slip.
2,514.—J. L. Heward. Hollow tyre composed of a spring steel coil.
2,634.—E. C. P. Sadler. Non-slipping tyre with chain let into tread.
5,008.—E. S. Bond. Motor cycle frame, driving gear, etc.
6,407.—Sir J. I. Thornycroft. Automatic spray carburetter.
6,759.—H. Smith and B. F. Wright. Combined brake lever and switch.
6,794.—H. Brough. Liquid fuel burners for steam cars.
7,234.—H. S. Halford. Flat spiral spring wheel.
8,811. Brown and May, Limited, and E. F. Falconer. Combined exhaust valve and ignition tubes.
18,098.—G. W. Day. Sliding attachment for semi-elliptic springs.
22,134.—G. Brown. Hand and steering-wheel cover.
23,161.—R. N. Fliess. Electric means for heating steering wheels.
26,261.—C. Bailly. Mechanism for varying time of ignition by magneto.
28,166.—W. H. Whetley (Ford Motor Company). Flexible shaft and live axle drive for cars.

On two days of the show, seventy two trial runs were made by the two Oldsmobiles which Messrs. Chas. Jarrott and Letts, Ltd., had running in the Crystal Palace grounds for the delectation of show visitors, and we hear that a large number of these machines have been sold. Another exhibitor, Mr. J. E. Hutton, informed us that during the first day of the motor exhibition his firm took instructions for cars and engines totalling 380 h.p.

LIGHT DELIVERY VANS.

Cost of Running.

The White Steam Car Co. send us some details which are likely to prove interesting to those contemplating the service of a delivery van. The van from which the particulars were obtained was built for Messrs. Liberty and Co., the well-known art drapers, of Regent Street, London, W. Its dimensions are as follows: Length, over all, 10ft. 8in.; width, over all, 5ft. 2in.; height, 7ft. 2in.; weight, unladen, 16 to 17 cwts.; carrying capacity, 9 cwts.

This van has been running for two months over wet and heavy roads, the route followed day by day taking in the hilliest part of Hampstead. During the Christmas rush and the January sales its average course was nearly fifty miles a day, and each trip included a large number of stops, frequently many of these being made on steep gradients. The figures given below show the cost of running the van for the whole period, but, as will be noticed, the figures include fuel and oil only, no sums being set down for spare parts, wages, depreciation, stable rent, cleaning, etc.

Week ending		Fuel.	Lubricating Oil.	Engine Oil.	Total.
1903.		£ s. d.	s. d.	s. d.	£ s. d.
December	10th ...	15 0	1 0	1 0	17 0
"	17th ...	17 6	1 0	1 0	19 6
"	24th ...	1 1 3	1 0	1 0	1 3 3
"	31st ...	11 10	1 0	1 0	13 10
1904.					
January	7th ...	17 6	1 0	1 0	19 6
"	14th ...	16 10	1 0	1 0	18 10
"	21st ...	15 7	1 0	1 0	17 7
"	28th ...	16 3	1 0	1 0	18 3
		£6 11 9	8 0	8 0	£7 7 9
Average cost per week	...	16 6	1 0	1 0	18 6

What is claimed as a puncture-proof band has recently been brought out by the County Chemical Co., of Excelsior Works, Birmingham. The band consists of two strips of special leather of a very tough but flexible character. This we have proved to our satisfaction on a sample section, which offered a very strong resistance to a fairly sharp instrument. One of the above-mentioned strips of leather is solutioned to the fabric of the tyre, while the second strip is loosely sewn to the former. In action, it is claimed that any puncturing substance which should work its way through the cover is prevented from entering the tube, finding lodgment between the two strips of leather. These should give extra strength to the cover.

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