

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 423.] VOL. XI. SATURDAY, NOVEMBER 28TH, 1903. [PRICE 3D.

THE AUTOCAR.

(Published Weekly.)

EDITORIAL OFFICES:

COVENTRY.

PUBLISHING OFFICES:

3, ST. BRIDE STREET, LONDON E.C., ENGLAND.

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"THE AUTOCAR" SUBSCRIPTION RATES.

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

Notes.

The Size of the Numbers.

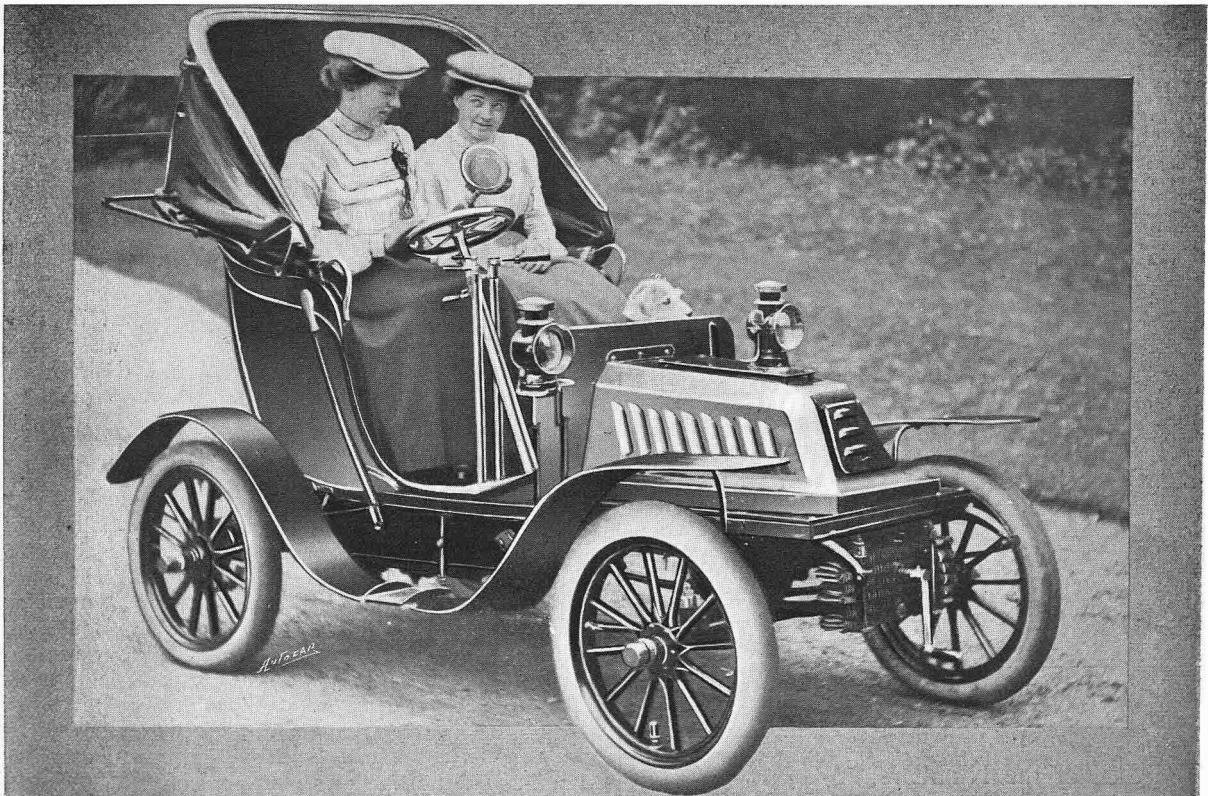
When the new Motor Car Act, which comes into force on January 1st next, was passed, many points of vital concern were left to the Local Government Board to deal with by means of regulations which they were empowered to make. We need hardly say that the chief features of the Act were the increase of the speed limit from twelve to twenty miles an hour, the imposition of registered numbers, and licenses for driving. In another column to-day we publish a synopsis of the regulations, and it will be seen that the size of the district index letters and the numbers has been very considerably reduced from those originally proposed. Not only so, but

the one or two index letters and the car number can be placed in a row if desired, so that a long narrow plate may be employed instead of one more nearly square. This will be a great convenience in many instances, particularly for the front number. Only the back number need be illuminated at night, and so long as it is plainly illuminated, it is left to the automobilist to adopt such means as he sees fit to secure that end. The regulations now issued deal only with the registration, numbering, and the driving licences, though in the memorandum which accompanies them, sent to County and County Borough Councils, in which the Act and regulations are expounded for the benefit of those who will administer them, other matters are referred to. Incidentally, it is made plain that only roads of an altogether exceptional character will be closed to automobile traffic, and further, that the 16ft. which refers to highways upon which the Act permits local authorities to forbid motor traffic, with the consent of the Local Government Board, does not mean the width of the metal surface, but the width between the fences, or other boundaries of the road. It is also made clear that in the opinion of the Local Government Board the prevention of reckless or negligent driving is the main purport of the speed limit and the numbering clauses. A further series of regulations dealing with minor matters will be issued by the Local Government Board shortly, and we would earnestly suggest to the authorities the desirability of the removal of the red tail light rule. Now that the back number is to be illuminated, this red tail light is absolutely unnecessary, and although it is easy to make a lamp which shall illuminate the number plate and also show a red light backwards, it is simpler to construct a lamp which shall have the one duty of illuminating the plate. We think it should also be made clear that if the user elects to have a lamp which provides a transparent number plate in place of the ordinary lens, that should be taken as equivalent to a back number by day as well as by night, provided that it is properly legible at both times. There is no difficulty whatever in making such a transparency, and it would be much less offensive to many users if they could carry a number on the back lamp instead of upon the car itself. There can be no objection whatever to this practice so long as proper provision is made for securing the lamp to the car in such a way that it cannot be removed; in fact, there is no reason why it should not be locked on and sealed by the County or County Borough officials. Taken as they stand, the regulations interpret the requirements of the Act in a liberal spirit, though the numbers are larger than necessary, and if the local governing authorities charged with their administration carry them out in the same broad-minded manner there will be very little, if any, annoyance caused to those who use their cars in a reasonable way.

A Motor Engineers' Institute.

For a long time past we have felt that a Society or Institute of Motor Engineers would be of benefit to the industry. It has been asserted by some that the Institution of Mechanical Engineers provides all that is necessary in this respect, but we think that those best qualified to judge of the requirements of motor car design and construction will, after careful consideration, agree with us that this is not so. Far be it from us to speak disparagingly of the Institution of Mechanical Engineers, or any other engineering society, but in these days of specialisation it is necessary that an entirely new industry presenting so many problems which are not, and which cannot be, dealt with in any institution which devotes itself to the whole realm of mechanical engineering, should be specially provided for. The subjects taken up by the Institution of Mechanical Engineers are so numerous that it is only possible to give attention once or twice in the course of a session to any one subject, and as there are at the present time many much larger—though perhaps not more important—branches of engineer-

ing than that which concerns the design and manufacture of motor cars, it seems to us that the requirements of motor engineers will not be adequately met till they have a society of their own. Without instancing the older established branches of engineering which have their separate societies, many of the members of which own allegiance to the greater body—the Institution of Mechanical Engineers—we have only to cite the Cycle Engineers' Institute as a recent example of specialisation. This institution has done excellent work, not alone for the cycle industry but to some extent for the motor industry as well, several papers having been read before it dealing with autocar and motor cycle subjects. These papers were read in the most notable instances by prominent and successful designers of motor cars. The Cycle Engineers' Institute is now well established, and has a substantial monetary balance, and motor engineers would be able to profit materially by the experience gained by becoming members. We do not suggest that the Motor Engineers' Institute should become a branch of the Cycle Engineers' Institute,



AUTOMOBILISM FOR LADIES. It is not now so rare an event as was formerly the case to see ladies driving alone, or, at all events, without male assistance. Many women still refrain from taking to automobilism because of their erroneous idea that motors are not manageable by them, but we fancy more are successfully taking to automobilism than the general public is aware of. This is particularly the case in country houses, where a motor is a great convenience, but if the ladies are not able to drive—and by that we mean do all that is necessary, including minor adjustments, starting, etc.—the capability of the car or cars is materially limited, for the usual drivers are not always at liberty. Then many ladies do not care to have to take out a mechanic, but prefer to be able to manage for themselves, and they do it very well too. One who has successfully driven her car for some time is Miss E. C. Neville, of Wellingore Hall, which is situated between Lincoln and Grantham. Miss Neville commenced with her father's 7 h.p. Panhard car, and can start and entirely control it herself. Her trips are by no means short; respectable journeys are taken. The demand for this car by so many members of the household resulted in one of the new 6 h.p. two-seated De Dion cars being purchased, and this Miss Neville has for her own use. The car is fitted with a hood, and has a spare seat at the back. It has been driven by Miss Neville on many long journeys, her sisters or her mother usually accompanying her. The only absolute stop with the Panhard was when a water pipe had broken, and she had to telegraph for a repairer, and on another occasion there was a stop owing to the batteries on the same car giving out, and the fuse wire breaking at the same time. Since the first day of driving the De Dion, when the trembler broke, she has never had a stop, and she speaks very highly of the car. Miss Neville is indeed a most capable automobilist, and another living proof of the fact that ladies can gracefully and successfully manage autocars.

though the two societies, working as they would on parallel lines, would be mutually helpful, and would also have some features in common. Seeing that several of the most active members of the Cycle Engineers' Institute are prominent in the motor industry, it might be desirable to enlarge the scope of the C.E.I., and alter its title so as to embrace the new industry. On the other hand, certain of the motor engineers might possibly object to being associated with cycle engineers, but we should imagine that the time has gone by for such an attitude to be maintained. There was a time when a good many manufacturers of cycles were not in the proper sense of the term engineers, but nowadays there is no chance for the cycle manufacturer who is not either a competent engineer himself or does not employ thoroughly well-trained engineers to carry on that business. In fact, despite the rule of thumb practice, which for many years dominated the manufacture of cycles, there is no getting away from the fact that this branch of light engineering has made a very distinct mark in the mechanical engineering world. The possibilities of the pitch chain were never fully realised until the

cycle had shown what could be done with a really accurately made chain and properly cut wheels; while the ball bearing, the wire wheel, and the remarkably light though strong tubular structures composing the cycle frame, all emanated from the same quarter. Last, but by no means least, really high-class machine tools for the production of the most accurate repetition work were common in the cycle industry years before the majority of other engineers had got away from more or less antiquated tackle. If an amalgamation with the Cycle Engineers' Institute be not possible, the other alternatives are that a separate institution of motor engineers should be founded; or, again, that an Institute of Motor Engineers should be formed as a branch of the Automobile Club. There are points in favour of any one of these three courses, but we are inclined to believe that the object in view would be best attained by joining forces in some way with the Cycle Engineers' Institute, and that to enlarge the scope of that organisation so as to embrace more fully than it does at present, the subject of motor engineering would provide the best solution of the problem.

USEFUL HINTS AND TIPS.

For Straining Petrol.

Writing from Boston, Mass., U.S.A., a correspondent sends a good tip for the straining of petrol before putting it into the tank, which was prompted by a hint and tip which was given in *The Autocar* of October 10th (p. 449). He says: "I have found the best quality (jewellers') chamois skin makes a most excellent medium for straining petrol. It stops dirt, fluff, and water, so far as my limited experience shows, and if the opening of the funnel is eight inches in diameter, so that a good-sized piece of skin may be used, it does not materially delay the filling of the tank."

Recharging Accumulators.

As a general rule it may safely be stated that five and twenty per cent. of ignition troubles are due to the bad handling of the accumulator in recharging. Until very recent years the accumulator was not really thoroughly understood as to its principles and management, even by many electricians whose experience was well up to the average. There were, of course, experts on the subject to be found here and there, and these chiefly graduated in connection with electric lighting plants where accumulators or storage batteries, as they are more generally termed, were used. Now that the number of accumulators which are in daily use has largely increased, it has become imperative that electricians should study, and become more familiar with the principles of accumulators and the methods of handling them, particularly in the direction of recharging. This being so, there is, generally speaking, but little trouble experienced in getting one's accumulators recharged; but there are many who profess to have, and who might be reasonably supposed to possess, the knowledge necessary for the recharging of accumulators, who are very care-

less in the handling of them. This is often found to be the case where it would be least expected. For instance, many people say they are having trouble with their accumulators, and if asked the question, "Are your accumulators properly charged?" they very frequently answer, "Oh, yes, I always get mine recharged at the central station." This is to their minds a sufficient guarantee for the correct charging of their batteries. Now, a central station man is usually an engineer first and an electrician afterwards, his sole duties being to keep his machinery and his dynamos running. As to the theory and principles of electricity, his ideas very frequently are extremely crude. This remark, of course, does not refer to the heads of the stations, but rather to their subordinates, and it is into their hands that accumulators sent to a station to be charged are committed. They very frequently spoil plates by using too high a pressure—for the central station man, as a rule, deals in currents of thousands of volts, not in units—and even supposing that the current from the central station is 220 volts, though it is often higher, being reduced for lighting purposes by transformers, there is great difficulty in reducing the current to the six or ten volts necessary for recharging purposes. Taken as a general rule, it may be safely assumed that the best man to handle autocar accumulators is the smaller electrician, that is, a man who fits up houses with electric light, and has sufficient knowledge to reduce a current by inserting the necessary resistances in the circuit to recharge an accumulator at its proper rate. An instance was brought to our notice of a motor repairer who undertook the recharging of accumulators, who had cut his current down to such an extent that he was only charging at the rate of half an ampère instead of the two and a half necessary.

THE SIZE OF THE NUMBERS FINALLY SETTLED.

A Synopsis of the Regulations of the Local Government Board.

THE LOCAL GOVERNMENT BOARD HAVE ISSUED THE FIRST OF A SERIES OF ORDERS WHICH THEY TERM THE MOTOR CAR (REGISTRATION AND LICENSING) ORDER, 1903, BEARING DATE THE 19TH DAY OF NOVEMBER, 1903. THE ORDER DEALS SOLELY WITH THE REGISTRATION OF CARS (WHICH INCLUDES NUMBERING) AND THE LICENSING OF DRIVERS.

UNDER the Light Locomotives Act of 1896 certain general regulations as to the use and construction of light locomotives, and the conditions under which they may be used were issued on the 9th day of November, 1896. The Local Government Board now state that, as the result of the passing of the Motor Car Act, 1903, and of the experience gained since 1896, some of the regulations contained in the Order of November 9th, 1896, need amendment; and, in consequence, the Local Government Board will issue an order rescinding these and prescribe others.

It may be mentioned that the term motor cycle is not defined in the Act, and the Local Government Board have no authority to define it, but they understand that, though the term might sometimes properly apply to other vehicles, it would be generally treated as limited to motor cars designed to travel on not more than three wheels, and weighing,

unladen, not more than three hundredweights.

The Board contemplate that Councils will usually assign consecutive numbers to cars registered with them. They think, however, that for purposes of ready identification it is not desirable that numbers consisting of more than three figures should be assigned, and they will be prepared, if desired, to assign a fresh index mark to any Council who may require to start a fresh series of numbers under a new mark.

The (Licensing and Registration) Order now issued consists of twenty-two articles, and they are considerably modified from the draft of the Order which the Local Government Board recently sent out to certain of the automobile associations.

The important point about the regulations is that motor cars must carry a number "fore and aft," to use a nautical phrase. Only the number carried at the rear of the car requires lighting at night.

REGISTRATION OF MOTOR CARS.

ART. I. (THE OFFICIAL REGISTER) requires County Councils and County Boroughs to establish and keep a register of motor cars in the form set out in the schedule. Each County or County Borough has its own distinguishing mark, and may keep the register in two parts—one for motor cars and the other for motor cycles.

ART. II. THE REGISTRATION FEE.—Owners of cars or cycles desiring to register them shall furnish the necessary particulars set out in the form of registration. The fees (20s. for a car and 5s. for a motor cycle) shall be paid before the car can be registered.

ART. III. ASSIGNMENT OF NUMBER.—On receipt of such application, the Council shall assign a separate number to the car, register it, and furnish the owner with a copy of the entries in the register.

ART. IV. CHANGE OF OWNERSHIP.—When the ownership of a car changes, or is about to change, notice of the change or intended change shall be given by the old or new owner to the registering Council, and an application made either—

- (a) To cancel the registration, or
- (b) Continue the existing registration under the new ownership

If application (a) is only made, the existing registration is cancelled. If applications (a) and (b) are made, the new owner shall furnish the necessary particulars as to ownership, and on receipt of the fees—5s. in the case of a motor car (reduced by the Local Government Board from 10s. as it appears in the Act) and 1s. in the case of a motor cycle—the registering Council shall cause the necessary alterations to be made in the register, and furnish the owner with a copy of the altered entries in the register.

ART. V. CHANGES OF THE REGISTER.—Any change (other than a change of ownership) which affects the accuracy of any particulars in the register, may be registered free, and the owner furnished free with a copy of the amended entry.

ART. VI. CANCELLING.—If the registering Council are satisfied that a registered motor car has been destroyed, broken up, or permanently removed from the United Kingdom, or registered with another authority, or if the owner of a registered car requests them to cancel the registration (and no application is made to continue the existing

registration), they shall cancel the entries in the register, and if they think fit assign the registered number to any other motor car, whether belonging to the same or any other owner.

The Identification Plates.

ART. VII. THE PLATES.—The mark to be carried by a registered car (Sec. 2, 1903 Act) shall consist of two plates, which must conform with the lettering, numbering, and otherwise, with the provisions set out in the Fourth Schedule to the Order. Designs painted or otherwise shown upon the motor car may, if it is desired, be used instead of plates, and any reference to plates shall be construed to include a reference to such designs, and any reference to the fixing of plates to include a reference to the painting or other delineation of the designs.

Each plate must be rectangular, and bear upon it the index mark of the Council, and the separate number assigned to the car. Alternative designs are given:



The plates may be, at the option of the owner, either of the shapes shown, or one of one shape and one of the other.

The ground of the plate must be black, and the letters and figures white.

The Size of the Letters and Figures.

Letters and figures must be $\frac{3}{16}$ in. high, every part being $\frac{1}{16}$ in. broad, and the total width of the space taken by every letter or figure (except in the case of the letter I and the figure 1) must be $\frac{1}{4}$ in.

The spaces between the letters and figures must be $\frac{1}{16}$ in., the margin between the nearest part of any letter or figure and the top and bottom of the plate at least $\frac{1}{16}$ in., and between the sides of the plate $\frac{1}{16}$ in.

In No. 1 design the space between the upper and lower line must be $\frac{3}{16}$ in. In No. 2 design between the letters and figures $\frac{1}{16}$ in.

This means approximately that with two identification letters and three figures beneath them the plate will be

10in. wide by 8½in. deep. If the letters be placed in a line with the figures it will mean a plate 17½in. wide by 4½in. deep. (Of course, when one letter only (as is the case in some districts) and less than three figures are used, the plate will be proportionately smaller, the dimensions we give being the extreme.)

In case of the plates for motor tricycles or motor bicycles of a weight, unladen, not exceeding three hundredweights, each of the dimensions mentioned above must be halved, and the shape of the plate need not be rectangular so long as the minimum margin between any letter or figure and the top, bottom, or sides of the plate is preserved.

It may be interesting at this point to compare the English sizes with those of France, which are as follow:

FRONT PLATE.		
Width of front plate	100 mm.	= 4in.
Height of letters	75 "	= 3in.
Thickness of letters	12 "	= ½in.
Width of letters	45 "	= 1½in.
Spacing	30 "	= 1¼in.
BACK PLATE.		
Height	120 mm.	= 4½in.
Height of letters	100 "	= 4in.
Thickness of letters	15 "	= ½in.
Width of letters	60 "	= 2½in.
Space between letters	35 "	= 1½in.

The Position of the Plates.

ART. VIII. POSITION OF PLATES.—The plates forming the identification mark shall be fixed one on the front and one on the back of the car in an upright position, so that the inscription on them shall be upright and easily distinguishable from in front or behind, as the case may be.

In the case of a motor tricycle or motor bicycle of a weight not exceeding three hundredweights, unladen, alternate provision is made for the front plate being such that the inscription is visible on either side of the vehicle instead of from in front.

The plates forming the identification mark shall be fixed on the motor car in the position indicated in the particulars given on the application for the registration of the car, or subsequently furnished to the registering Council, or, if that Council are not satisfied with the position so indicated, in such a position as they direct.

So long as the provisions of this Order are complied with, different identification plates may be used on a motor car by day and night or on different occasions.

ART. IX. TRAILER NUMBERS.—When another vehicle is attached to a motor car either in front or behind, the front or back plate must be fixed, as the case requires on the vehicle attached.

ART. X. OFFICIALLY-SUPPLIED PLATES.—The registering Councils may, if the owner so desires, supply the identification mark on the car and make a charge for it.

Illuminating the Back Plate

ART. XI. ILLUMINATION OF NUMBER.—Whenever between the period between one hour after sunset and one hour before sunrise any car is used on the highway, a lamp shall be kept burning on the car, so contrived as to illuminate by means of reflection, transparency, or otherwise, and render easily distinguishable every letter or figure on the identification plate fixed on the back of the motor car, or of any vehicle attached to the back of the motor car, as the case may be. In the case of a motor tricycle or bicycle, either the front or back plate may be illuminated.

ART. XII. (MANUFACTURERS' PLATES) makes provision as to the general identification mark to be issued to manufacturers.

(a) It must consist of two plates bearing the index mark of the Council and some other distinguishing letter or letters, and each having placed thereon or annexed thereto some distinguishing number; and

(b) The colouring of the plate shall be different from the ordinary identification mark (white lettering on a red ground is suggested by the L.G.B.).

(c) The letter and numbering of the plate shall, so far as possible, be similar to the ordinary identification mark.

The manufacturer or dealer is required to keep a record of the distinguishing number placed on the car on each occasion on which the mark is issued, and of the name

and address of the person then driving the car, and this record is to be open for inspection by the Council, or by any superior officer of police or duly authorised constable.

If the general identification mark is issued at the same time on more than one car, the distinguishing number placed on, or annexed to, the plates must be different on each motor car.

The provisions of this Order which relate to the fixing and illumination of identification plates shall apply to the plates forming the general identification mark as they apply to the plates forming the ordinary identification mark.

The Council have to keep a register of any general identification marks assigned to manufacturers or dealers, which will contain certain prescribed particulars.

ART. XIII. INSPECTION OF REGISTER.—The register of motor cars is not to be open for public inspection, except to Inland Revenue officers. Police officers and registering authorities can have copies of the register relating to any specified entries free, whilst any other person who has reasonable cause for requiring a copy of an entry shall be supplied with same on payment of a fee of one shilling.

LICENSING OF DRIVERS.

ART. XIV. APPLICATION FOR DRIVING LICENSE.—A person desiring to obtain the grant or renewal of a license to drive a car or motor cycle shall apply to the Council of the County or County Borough in which he resides, in the forms A or B in the Fifth Schedule to the Order. The fee of 5s. must be paid before the applicant is entitled to receive the license or renewal.

Applications may be received and dealt with at any time within one month before the date on which the grant or renewal is to take effect.

ART. XV. LICENSES AND RENEWALS.—The license and renewal shall be in the form set out in the Sixth Schedule to the Order, or to the like effect.

ART. XVI. GRANTING LICENSES.—Any registering County Council or County Borough shall grant a license to a person (not disqualified) residing out of the United Kingdom.

ART. XVII. (DUPLICATE OF LICENSE) provides for the issuing, on payment of a fee of one shilling, of a duplicate license, with a copy of any endorsements thereon, where the license or any renewal thereof has been lost or defaced.

ART. XVIII. OFFICIAL REGISTERS.—The registering County shall keep a register in the form (or to the like effect) set out in the Seventh Schedule to the Order.

ART. XIX. (RECORD OF CONVICTIONS) provides that the registering Council shall, upon application being made to them by the police or any other licensing authority, forthwith provide them, free of charge, with a copy of the particulars in their registers of licenses relating to any license granted by them.

Upon receiving from any Court particulars of any conviction against one of their licensees, and the Order of the Court, the Council shall cause a copy of such particulars and Order to be sent to the police authority for the area in which the holder of the license resides.

Supplemental.

ART. XX. provides that the Clerk of the Council or other officer authorised by the Council is empowered to perform the duties for carrying this Order into effect.

ART. XXI. provides that the Order shall apply to a public highway or roadway to which the public are granted access.

The expression "motor car," unless the contrary appears, includes motor cycle.

ART. XXII.—This Order may be cited as the Motor Car (Registration and Licensing) Order, 1903.

The registering Councils may now proceed to establish registers, and on receipt of applications will register cars under the Act. The registration will not take effect until the first day of January, 1904, but the process of application and of assigning numbers and entering particulars in the register may be carried out before that time. There is nothing in the regulations to prevent applications for registration being forwarded to the Council through a third party.

The penalty for a breach of these regulations is a fine not exceeding £10 (Section 7 of the 1896 Act).

MOTOR CARS IN THE CYCLE SHOWS.

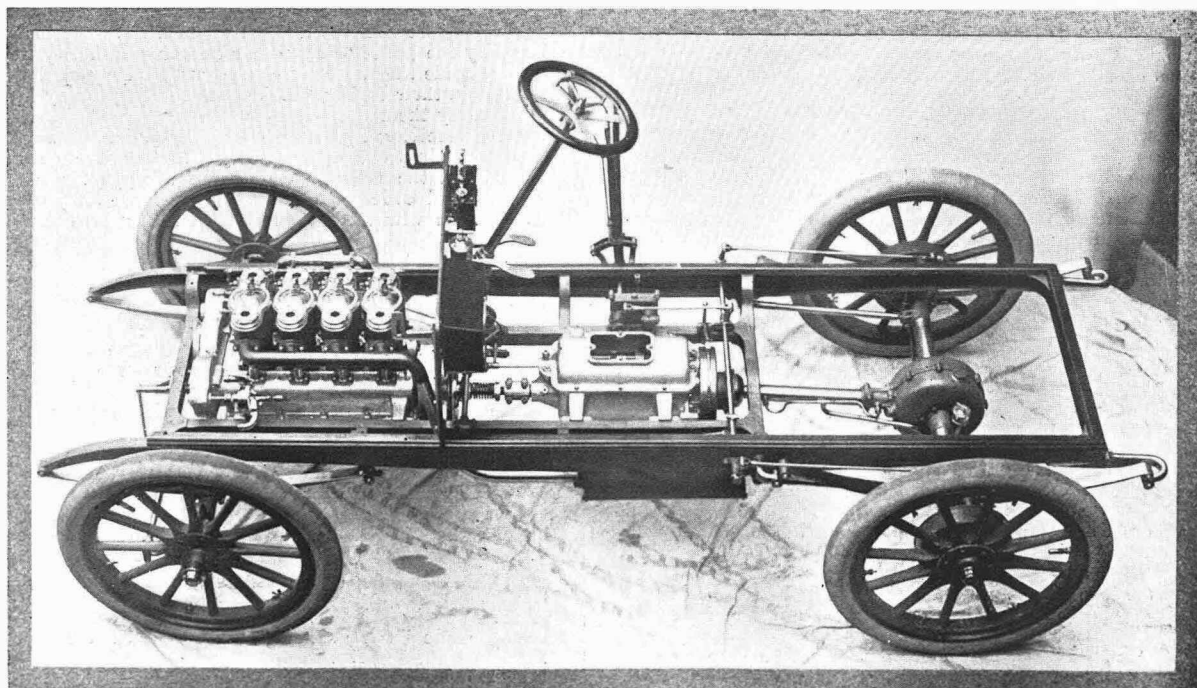
MOTOR CARS ARE FOUND BOTH IN THE STANLEY SHOW AT THE AGRICULTURAL HALL AND IN THE NATIONAL SHOW AT THE CRYSTAL PALACE. THE NATIONAL HAS BY FAR THE LARGER NUMBER OF CARS. MOTOR CYCLES ARE VERY NUMEROUS IN BOTH SHOWS, PARTICULARLY IN THE STANLEY. THESE ARE ILLUSTRATED AND DESCRIBED IN DETAIL IN "THE MOTOR CYCLE" OF LAST WEDNESDAY.

THE NATIONAL SHOW.

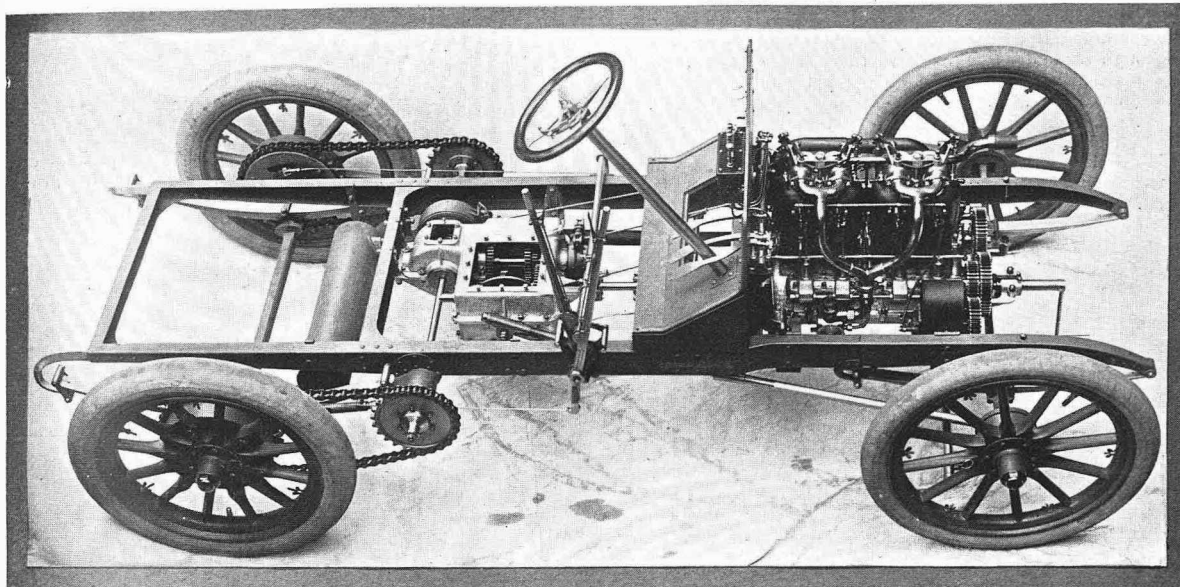
New Talbot Cars.

As we foreshadowed in our issue of last week, certain of the new Talbot cars are exhibited by the British Automobile Commercial Syndicate, for the first time in this country or abroad. It is not remarkable, therefore, that considerable attention is directed to the very smartly-finished chassis which are found on this stand. Taking first the 9-11 h.p., we find that the engine consists of two single-cylinders, with induction valves on the right and exhaust valves on the left, so that, differing from the patterns of the present year, the engine has two half-time shafts. Magneto ignition is fitted, the armature being of the rotary type and driven off the right-hand camshaft, the breaking contacts being also actuated from the same shaft. The pump is of gun-metal casting, securely bolted to the upper side of one of the aluminium brackets of the crank chamber, and is driven by gearing from the left-hand camshaft. This pump is set level with the lower end of the cylinder. The governor is on the forward end of the left-hand camshaft, and controls an ordinary throttle valve above the jet chamber by suitable connections. This throttle, and also the position of the ignition, is controlled from two levers in the centre of the steering standard above the steering wheel, the movement of the ignition lever serving not only to vary the cams actuating the contact breakers, but to vary the position of the rotating armature in consonance therewith. All the connections, from steering standard to throttle and ignition, are made by steel rods, with ball-jointed connections at all angles, in the same manner as the steering gear. The foot brake now takes the form of internally expanding sections, taking effect on the interior periphery of a drum upon the rear end of the gear shaft and having a ratchet on its outside, which engages with a pawl as a sprag to hold the car backwards on down grades. The radiator fills in the forward part of the bonnet, and is made of closely nested flanged tubes,

encased. Needless to say, the frame is of stamped steel as usual, the only difference being that the spring hangers to the rear springs are set outside the line of the frame. As shown, this chassis exhibits a finish in detail which it is a pleasure to inspect. At the other end of the stand we find the magnificent chassis of the new 20 h.p., which, excepting one or two mechanical details, is practically a double of the one above described; that is to say, there are four cylinders in lieu of two set upon the aluminium crank chamber. A handsome cellular radiator closes the front of the bonnet, the bearing for the fan of which is set in the centre of the tubes instead of being carried from the front cylinder as heretofore. The train of gear in the gear box gives four speeds forward and one reverse. As we have already intimated, in every other detail the 20 h.p. is a big brother of the 9-11 h.p. We next come to the chassis of the 27 h.p. Talbot (Voiture de Luxe), which differs very considerably from those before described. It is driven by a four-cylinder engine, with mechanically actuated exhaust and inlet valves operated from one camshaft situated on the left-hand side of the engine. The inlet valves are placed in the top and centre of the combustion chamber, and are operated by tappet levers pivoted in a bracket forming part of the valve box cover. The speed of this engine is largely controlled by the capability of varying the lift of the exhaust valve, a tapered key being introduced in a slot between the rising rods and the exhaust rods of the induction valves. This key is attached to a rocking lever on a spindle, which is controlled by a lever set in the centre of the steering standard, the moving of which upon a rack operates the opening of the induction valves at will. The magneto set at the right of the engine is driven by fibre and gunmetal gearing from the end of the camshaft, which also operates the breaking contacts of the magneto ignition. This ignition can be advanced or retarded in a manner exactly similar to that described in the reference to the 9-11 h.p. Talbot. An ordinary form



The 20 h.p. Talbot chassis, showing the new valve position.



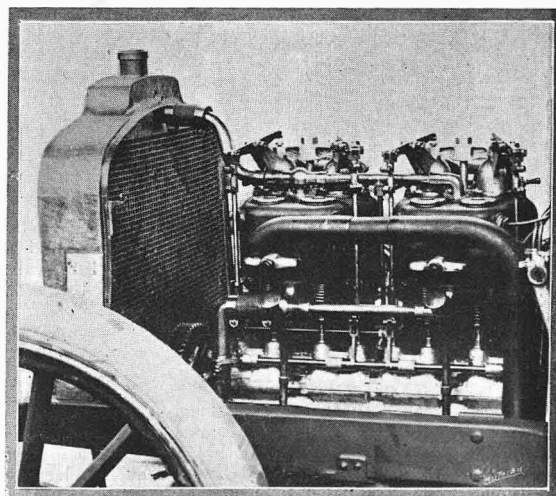
Russel & Sons, photos.

The 27 h.p. Talbot chassis (Voiture de Luxe),

Crystal Palace, S.E.

of dumb-bell governor, set within a toothed wheel at the end of the exhaust camshaft, controls the butterfly throttle valve in the induction pipe in the usual way. The pump is already in a position similar to that described. The engine is entirely enclosed by a suitable bonnet with cellular radiator front, through which a draught is induced by the pitched arms of the flywheel. Immediately in the rear of the latter is a simple form of the mechanical grip clutch, operated in the usual way from a clutch pedal. In the carburetter fitted to the 27 h.p. the jet and automatic valve are most rapidly got at by simply unscrewing a cap at the top of the mixing chamber. Upon reaching the gear box we find that a complete change has been made in the system of gearing within the gear box. A double cam is rotated by means of a ratchet and toothed wheel, this cam serving to bring the first, second, third, and fourth speed gear wheels into mesh successively, and, by means of a cam on its outer side, to bring the necessary toothed wheels for reversing into connection. The cam plate is formed with V-shaped depressions on its irregular periphery, into which a roller at the end of a spring-controlled lever enters and serves to keep the wheels driving at any particular speed in their proper position. The entry of this roller into the depressions in the edge of the cam is distinctly felt by the driver through his gear lever, so that gear-changing in the dark is with this arrangement a simple and certain matter. The road wheels are rotated from the countershaft by chain wheels and chains. The thrust bearings throughout the gear box are ball bearings. The ends of the countershaft are carried in extended bearings, the cases of which form part of the stamped steel frame. This casing encloses a plain bearing, to which is added a ball thrust bearing and a ball running bearing beneath the centre of the chain sprocket. A special feature in this gear is the method of brake application. There are three sets of brakes fitted. Two are band brakes, and those within the chain wheels on the driving wheels are expanding brakes, and are irreversible. The band brake on the countershaft and the expanding brakes in the chain wheel drums are connected with the clutch pedal, but the band brake on the forward exterior end of the secondary gearshaft is applicable by an extra pedal without any relation to the clutch. These brakes are applied by the pressure retained on a right and left nut square-threaded spindle which works in threads formed in the ends of the brake band lugs. They are adjustable by means of two saw-toothed discs set upon the square-threaded spindle. The radius disc is formed of deep H section tube, split and threaded at its forward end for rapid adjustment. The whole of the brake thrust by the setting of the brakes within the chain wheel drums is thrown upon the radius rods, and not upon the road wheel axle. The springs are carried upon the solid back axle by a segmentally-shaped block, which is carried in a segmental seat formed on the axle itself. This segmental or radial

block can move backwards or forwards in the axle seat referred to, which not only permits of chain adjustment without throwing stress upon the springs, but also takes up a large amount of road shock and vibration. The steering centres of the steering wheels are set in the centre and within the hubs of the steering wheels themselves, so that the latter turn absolutely upon the point. The front axle is of deep rectangular section with chamfered edges. Indeed, the comparison of this splendidly-constructed chassis with those of last year will convey to any visitor some idea of the immense strides which have been made in automobile construction. An interesting exhibit on the stand is the Talbot racing Voiture Légère which took part in the Gaillon hill-climb—a very fine example of the present-day speed machine.



The 27 h.p. Talbot engine, showing the inlet valve tappets.

A New Car.

On Stand 27 we find the Windora car exhibited for the first time in this country by Mr. S. A. Marples. This is a good looking and well finished 18 h.p. four-cylinder car, with mechanically-operated valves, and a special feature in the shape of a simple form of automatic carburetter, which increases the supply of air proportionately to the increased speed of the engine. The drive is through friction clutch, change speed gear, countershaft, and chains, in the usual way, there being three speeds forward and one reverse. A clutch brake is fitted to assist in changing

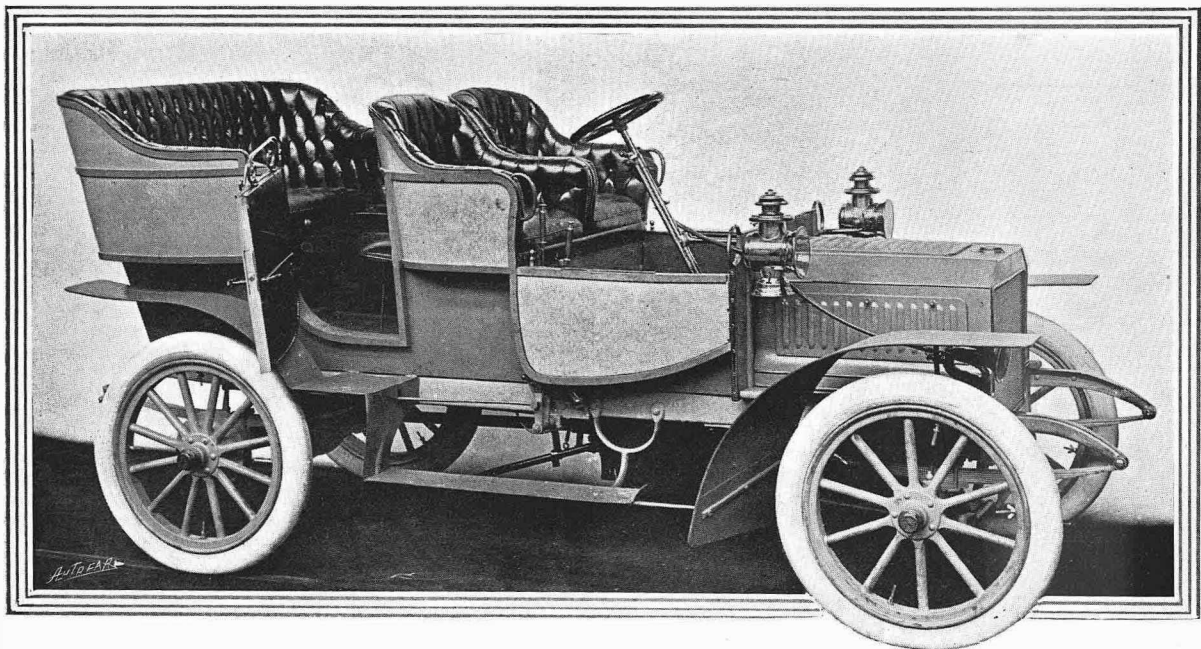
speed. The throttle valve is connected up to the foot brake pedal, so that the action of applying the brake on the countershaft automatically throttles the engine down. Although beyond these features this car does not present any particular novelties in design, yet so far as we are able to discern from a somewhat cursory examination, it appears to be a well constructed and well finished vehicle throughout. A very ingenious form of speed indicator may be seen attached to this vehicle. It takes the shape of a watch set in the centre of the steering wheel, which is connected up to the road wheels and registers the speed at which the car has traversed every other 200 yards at regular intervals. Mr. S. A. Marples is putting this upon the market for the first time. The body to be fitted to this car in 1904 is of the double phaeton type.

Beaufort Improvements.

Amongst the exhibits on the Beaufort stand one is struck by the new body, with convenient and well-arranged side entrance, for which there is so large a demand. We also notice a new form of cooler, in which flat perpendicular tubes are set parallel within the frame, after the manner

Durkopp Omnibuses and Broughams.

A fine example of a motor-driven public service vehicle is to be seen upon the stand of Durkopp and Co. This is attractively finished in white and blue, with ample canopy and protective side curtains, and is capable of accommodating twenty passengers, besides the driver and conductor. It is propelled by a three-cylinder Durkopp engine, driving through gear box, countershaft, and chains in the usual way. A number of these vehicles are now in course of despatch to the Argentine Republic for the purpose of public service. The three-cylinder Durkopp engines shown are now provided with commutator case, set in a most convenient and get-at-able position above the crank chamber, and are also remarkable for a specially-formed cam on the half-time shaft, by means of which the height and duration of the lift of the induction valves are controlled from the driver's seat. The low-bodied 10 h.p. brougham, which is also shown upon this stand, is really worth the attention of those who are on the look-out for a comfortable motor-propelled carriage for town use. We hope to describe and illustrate the Durkopp specialities in detail at an early date.



The new Beaufort car, showing the side doors giving access to the rear seats.

of the well-known cellular type. Sundry small detail improvements are also found embodied in the 12 h.p. Beaufort engine, such as a control of the mixture valve in the carburetter and additional air inlet from the dashboard. A 10 h.p. Beaufort tonneau, built to the order of Major Francis Cannon, 5th Battalion Royal Fusiliers, with body finished in light and dark natural woods, is shown. A striking feature of the stand is the 20 h.p. Beaufort, which occupies one end. Our attention was drawn to a detail improvement in the carburetter, by means of which the quantity of petrol delivered from the jet is controlled by a small lever set upon the dashboard. This engine is fitted both with magneto and high tension electrical ignitions, and arrangements are also being made to endow it with low tension electric ignition, employing magneto plugs. For the first time all the new Beaufort cars are shown with pressed steel frames. The new gear box fitted to the 12 h.p. Beaufort should be seen, as it is so designed that after the removal of the cover by the loosening of four thumbscrews, two end-filling pieces can, after unscrewing four set screws, be moved from the ends of the box, and the gearshafts with their bearings lifted clear without disturbing any other member, save disconnecting the universal joint at the end of the propeller-shaft nearest the rear bearing in the gear box. A most practical and convenient arrangement.

The British-built Duryea.

The leading feature of the Duryea stand is naturally the Duryea chassis, built by Messrs. Willans and Robinson, of Rugby. In this chassis the three-cylinder engine is set nearly horizontally in the centre of the frame, the breaches of the cylinders to the rear. Although the general lines of the American Duryea have been followed, yet we find in this chassis several notable improvements. The crank chamber is now in aluminium, the induction valves are mechanically-operated, and the water jackets to the cylinders are carried down very much further than before. The Dawson-Duryea ignition is employed, high-tension sparking plugs being inserted in the cylinders. By means of a governor carried in the magneto, the sparking is adjusted to the speed of the engine, but this governor is not controllable by the driver. The chassis itself is formed of straight channelled steel, with ash insertion. The rear axle is of nickel steel, and has mounted upon it three band brakes, two acting directly upon the road wheels, and one through the differential. The change gear is controlled by means of two levers actuated by the left hand, one giving the high and low speed and the other brake and reverse. The distance rods from steering standard to steering axle are ball-jointed, and allow one end or other of the axle to rise without throwing stress upon the frame or joints.

Sunbeams.

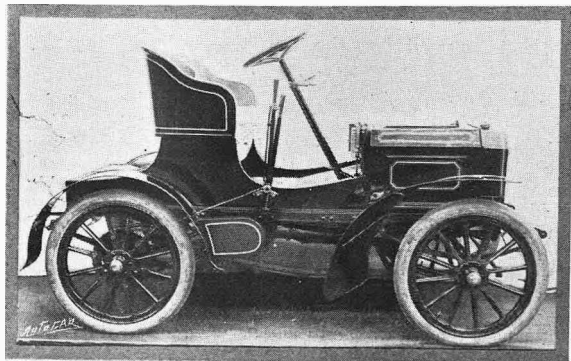
The special point in connection with the two handsome Sunbeam cars exhibited by Messrs. John Marston, Ltd., is the Sunbeam chain case, which promises to do as much for motor chains as it has done for the chains of cycles. The construction and method of fitting of this chain case was lately described in our columns, and does not now need recapitulation. We do not remark that any novel feature has been introduced into the detail of these cars since last commented upon. It is impossible, however, to leave the stand without mentioning the brilliant finish of the vehicles, as well as their most comfortable design.

De Dietrich Details.

In the new four-cylinder 12 h.p. De Dietrich, which is shown by the Burlington Carriage Co., Ltd., *en chassis*, we observe a notable improvement in the scheme of water circulation. The radiator is formed of four lines of flanged tube, through which the pump delivers the water at once, so that it travels much more rapidly through the radiator. The cool water from the lower part thereto, we notice, is delivered immediately to the water jacket, round the valve boxes, and so on through the cylinder jackets to the tank in front of the dashboard. In this car the magneto ignition is controlled by a ratchet lever set in the centre of the steering column. A 16 h.p., with handsome tonneau body, is also shown, but this is similar to the 12 h.p. referred to. The brakes to the rear wheels are of the expanding segmental type, the brake arms fitting to the inner peripheries of the chain wheels. The contents of the silencer are delivered by a long pipe well clear of the rear of the car. The bodies on both the finished cars are particularly handsome and well designed, and are built by the exhibiting company.

The Little Star.

A novel feature on the Star Engineering Co.'s stand is the two-seated Little Star chassis, which is in wood stiffened with steel fitch plates, with the 6 h.p. De Dion type single-cylinder engine carried on a single iron underframe with a Mercedes type of motor bonnet, the front panel of which is filled in with tank and radiators. The drive is conveyed from the engine by means of a large diameter (12in.) friction clutch to Panhard type gear, in a gear box of ample dimensions beneath the footboard. The road wheels are rotated by chains off a countershaft, and all gearshafts are carried on ball bearings as well as the countershaft, which is fitted with a double row of ball bearings on each side, somewhat similar to those of a bicycle hub. The arrangement of gear gives three speeds forward and reverse, the drive being direct to the countershaft on top speed. The gear change is made by a side lever in the usual way, metal-to-metal compensated band brakes on the road driving wheels being also applied by side lever. The metal-to-metal band brake on the countershaft is applied by foot pedal in the ordinary manner, the clutch



The 6 h.p. Little Star.

being also similarly actuated. The throttle and sparking levers are conveniently set on the steering standard below the steering wheel. In order to ease the starting of the engine, a half compression lever is fitted, by which compression is released on the compression stroke. The pump for circulating the cooling water is friction driven off the flywheel in the Panhard manner. The exhaust pipe has

but two bends, and is attached to a large silencer, which must effectually silence the engine. Both the wheelbase and wheel gauge are ample, the former being no less than five feet six inches. The car shown must not be taken as a type of the finish in which these Little Stars will be sent out, as it has been got through hurriedly in order to have it upon the stand at this exhibition. Samples of the manner in which the cars will be turned out may be seen in the other vehicles upon the stand. An interesting feature of the exhibit is the 70 h.p. Star touring car, in which we find a transformation of the Star Gordon-Bennett racer into a vehicle perfectly suited for touring purposes. The mechanical details of this car have been already fully described and illustrated in our columns, but it is now provided with a throttle control from the steering wheel after the Mercedes pattern. It makes a very noble, looking vehicle, and should prove very comfortable and fast. A very handsome double bucket-seated Roi de Belge tonneau, built on the Star Company's patent system of perpendicular wood sections is also shown, and the whole exhibit is one that is worthy of the careful attention of the visitors to the show.

1904 Darracqs.

On the Darracq stand is found an example of the new 1904 15 h.p. four-cylinder Darracq, in which several features novel to the Darracq mechanism are introduced. The governor in this car now takes the form of a piston valve operating vertically at the junction of the two induction pipes. Simplification has been made in the radiator, and the automatic lubrication, effected by the pressure of the exhaust on the surface of the oil, is now placed inside the bonnet forward of the dashboard. The 20 h.p. chassis, which created so much remark at the Paris exhibition of last year, is also on view here. A well finished 24 h.p., 1903 pattern, is also shown. A special feature of this extensive exhibit is the brougham body fitted to the Darracq chassis. The bodies are by Messrs. Holland and Holland, and are the acme of comfort, elegance, and finish. All visitors to the show in search of a thoroughly comfortable vehicle for winter and town use should not fail to inspect these well executed carriages. A single coupé, also by the same firm, is beautifully finished in blue black, picked out white, and is a sample of carriage building of which the firm responsible may indeed be proud. It is fitted upon a 24 h.p. chassis, and by the forward canopy and form of curtains the occupants of the front seat, in addition to those at the rear of the vehicle, have efficient protection from the weather. Indeed, both the French and English bodies on this Stand are well worthy of inspection.

The De Cosmo Car.

One chassis and one finished 24 h.p. Wilkinson De Cosmo car are staged by the Cadogan Garage and Motor Co., Ltd. An examination of the chassis will show that a somewhat novel feature is introduced with regard to the fitting of the front springs. Swivels and shackles are fitted to both ends of these springs, a radius rod below the rear portion connecting the axle to the rear spring bracket. The steering centres are canted inwards, so that the line produced through these gives the connection at the point of tyre contact, so that in turning the wheels move on a point, which relieves them of a large amount of strain. The improved form of carburetter found on this engine should be examined. By simply unscrewing the top of the mixing chamber the jet is at once get-at-able, while in the top, unscrewed, is contained a leather diaphragm, which, in responding to the extra suction of the engine, allows a larger proportionate supply of air to the carburetter. This car is driven by universal shaft and live axle in the usual way, but the wheels run on bearings formed by the extension of the steel axle sleeve, and are rotated by the live axle by means of suitable square connections on the ends thereto.

Rex Cars for 1904.

On the Rex Motor Mfg. Co.'s stand we find exhibited for the first time the 9 h.p. Rexette priced at 240 guineas—a very smart-looking light car, driven by a single cylinder Rex engine through friction clutch, three-speed gear box, and Cardan shaft to live axle in the usual way. The bonnet is of the well-known Rex shape with flanged tube

radiator set in front, and tank in front of dashboard, the water circulations being maintained by a small pump, chain driven, off the engineshaft. The engine is governed on the inlet valve, the governor being controlled by a lever set on the steering standard. The gear changes by side lever in the ordinary manner, and the car is fitted with pedal brake on countershaft and irreversible band brakes to driving wheels, applied by side lever. Bucket seats are fitted to the front, and the whole car is tastefully finished and upholstered. The Rex Company here introduce to the motoring public their Simplex 12 h.p. chassis, in which they make several very interesting departures in construction from their usual patterns. The frame is of stamped steel throughout, and both the two-cylinder 4 in. by 4 in. engine and the gear box are carried directly on it, there being no underframe. The inlet and exhaust valves are set in the crown of the combustion chamber, the inlets being automatic and the exhausts actuated by tappet levers. Both valves are readily removable. All the toothed gearing for driving camshaft, pump, etc., is enclosed in an extension of the crank chamber. A governor actuates a piston throttle valve in the carburetter, and the position of this valve is capable of being set from a lever on the steering standard. A combination water tank and radiator fills in the front of the bonnet, a fan (belt driven off the engineshaft) inducing the necessary draught. The flywheels are enclosed within the crank chamber, and a 15 in. clutch serves to transmit the drive through a strongly-made double-jointed universal joint to the gear in the ample-sized gear box. The clutch can be removed and the top of the gear box taken off without disturbing any other part of the mechanism. In the gear-striking device the gear-striking fork moves horizontally. On the rearward projecting end of the primary gearshaft is fitted a powerful double-acting band brake actuated by a pedal on the footboard, and the drive passes to the live axle by propellershaft with two strongly-constructed universal joints. The rear springs are hung outside the frame, and the silencer is set across the back of the car. Both clutch and brake pedals are of the push-forward type, and have ample-sized serrated foot-rests. At the side of the chassis is a banquette-seated tonneau body mounted on a similar frame, beautifully finished in primrose yellow and green, and most handsomely upholstered in red-buttoned leather. The standard Rex dashboard is fitted. The carburetter, commutator, and pump are all set right to the front of the frame, and are attained in the simplest possible manner.

The Richardson Cars.

The two 12 h.p. Richardson cars, though presenting no special features of construction, are good examples of home manufacture (save for the engine, which is a two-cylinder Aster, 105 mm. x 130 mm.). The frame is of tube, and the engine drives through friction clutch, four-speed gear (nine, sixteen, twenty-five, and thirty-four), and universally-jointed propeller-shaft on to back live axle. The top speed is direct. The usual brakes are fitted to the rear road wheels, and applied by side lever in the usual way, but the pedal-applied brake is of the internal expanding drum type, set upon the bevel pinion spindle between the rearward universal joint of the propeller-shaft and the differential gear case. This is done to avoid passing any braking strain through the propelling gear. The wheelbase of both cars is 6 ft. 6 in., and the wheel gauge 4 ft. The cars, however, are particularly remarkable for their coach finish and upholstery, which are very much above the average. The standard tonneau car at 350 guineas is a very smart-looking vehicle indeed, and has mounted upon it a good-looking and cleverly designed hood, which, by the way, can be fitted to any car. The car which carries the Richardson tonneau de luxe is a most creditable vehicle, beautifully upholstered and finished. It has a simple, but for long journeys most comfortable, arrangement of the tonneau floor, the forward portion of the tonneau floor being so tilted up as to take the feet at a sitting angle—an excellent idea for long journeys. The specially finished car sells for twenty guineas extra, but both prices include Ducellier headlight, side and tail lamps, rubber mat to front and cocoanut fibre mat to tonneau, two sets of batteries, horn fixed on dashboard with tube and bulb, all tools, and all necessary spares. Both these cars travelled under their own power from Lincoln to London by road.

Baby Peugeot.

Three Baby Peugeots with colonial hoods in brown and waterproof canvas, and three with English hoods in leather, are shown by Friswell, Ltd. We notice that the upholstery and general finish of these cars have been very much improved. The seat is now separated, and retaining pads are formed on the forward part of the cushions. A neat and useful addition is a small pedal on the right-hand side of the dashboard, by which the lubricating pump can be actuated and a charge of oil sent to the crank chamber in the simplest manner. One of the Babies, finished in two blues, with hood and glass screen above the dashboard, and well-cut leather sides to the footboard, strikes us as an eminently comfortable little car for a medical man.

Vauxhall Light Cars.

The four Vauxhall cars exhibited by the Vauxhall Iron-works Co., Ltd., show considerable improvement in body finish, but their mechanical details have been so lately fully described in our columns that further reference for the moment is unnecessary. Two of the cars staged are fitted with light detachable canopy tops, which add very much to the appearance of the vehicles.

A Light Motor Van.

The General Motor Car Co., Ltd., show amongst their exhibits a 12 h.p. Aster-engined motor van, body in the rough, built to the special order of the G.P.O.; also an 18 h.p. Daimler with an interesting patent hood, which gives an almost rectangular section within, from the front, to the rear of the vehicle, and folds down out of the way behind the rear seat.

An Alcohol-driven Machine.

The Morette safety motor carriage by B. E. Dickson, Toledo Engineering Works, Birmingham, is a tricycle for seating two, with an alcohol engine carried on the front wheel forks, driving by leather belt off the engineshaft to overhead pulley, and from the shaft of this pulley to the front wheel by chain. The machine is lever steered, all the control being performed by means of levers and Bowden wire connections on the steering handle.

A Heavy Oil Engine.

Every visitor to the show who is interested in the solution of the heavy oil problem will be interested to examine the example of the Allsopp motor found on Stand 92. It is not possible to adequately describe this engine without proper drawings, but it is only necessary to say here that a small auxiliary cylinder is set up in connection with the cylinder proper, the piston of which, being suitably driven off the countershaft, draws within it a certain quantity of air and heavy oil, which is subsequently gasified by the compression stroke of the piston and the heat of the cylinder itself, which is exhaust jacketed. The heavy oil passes to the motor proper through induction valve in the usual way. We are assured that this engine will run at two hundred revolutions for any length of time without any condensation on the walls of the motor.

Accessories.

Amongst the accessories and other exhibits we find Mr. C. R. Base with many novelties in motor clothing. Messrs. Warsnop and Co., Ltd., of Halifax, show many types of acetylene and oil lamps of their own manufacture, which prove conclusively English makers are more than able to hold their own with those on the other side of the Channel. In view of the at one time expected illumination of the front lights, an acetylene headlight having a lens arranged to project a light on the number plate was shown. MM. J. Lacoste and Co. (Paris) have a nice exhibit of their ignition gear, with a neat commutator which is now fitted to many French cars, and this is shown in all its varieties. Messrs. Holding and Son have a very select and tasteful exhibit of motor clothing, in which are included all their specially-designed garments. All interested in ignition questions should inspect the new Lithanode accumulators on Stand 94. We learn from friends who have had them in use for some time that they have proved themselves eminently satisfactory.

The Samson Hutchinson anti-skidding and puncture-preventing bands are exhibited by the See Motor Car Supply Co., of 9, Hills Place, Oxford Circus, W., who supply these in all recognised sizes. A useful tool is the Quick-grip spanner, which is shown by Mr. A. G. Taylor.

THE STANLEY SHOW.

The Four-cylinder Elswick.

The Elswick four-cylinder 24 h.p. car, with mechanically-controlled valves and very handsome Roi de Belge body, finished in dark green, chocolate, and black, picked out white, and surmounted by a good-looking canopy, is a car that should have the attention of purchasers. The inlet valves of this engine are set in the crown of the combustion chamber, and are particularly accessible for inspection and replacement. The commutator, coil, and



The 24 h.p. Elswick exhibited by Mr. O. C. Selbach.

lubricator are conveniently set upon the dashboard. Air, gas, throttle, and ignition levers are placed below the steering wheel on the steering standard, and operate by means of Bowden wires. The car has three speeds forward and one reverse, and drives through the gears and Cardan shaft on to live axle in the usual way. Examples of the well-known 6 h.p. and 10 h.p. Regal are also staged.

The New Enfield Cars.

For the first time at any show, the Enfield Cycle Co. are exhibiting three cars—two 10 h.p. and one 6 h.p. The 10 h.p. car is made with a well-stayed tubular chassis. It is driven by a two-cylinder engine of 3½ in. bore and 5 in. stroke, carried by aluminium brackets extending through the crank chamber to a tubular underframe slung from transverse members of the frame proper. The engine drives through a gear giving three speeds forward and one reverse, driving directly on to a live axle on top speed by means of the usual Cardan shaft. A handsome cellular radiator is fitted in front of the bonnet, which is of Mercedes pattern, cooling being effected by a well-designed enclosed fan, belt-driven off the engine-shaft. Both exhaust and induction valves are mechanically actuated by one camshaft set on the left-hand side of the engine. The valves themselves are interchangeable, and most easily accessible from above. The silencer is of ample dimensions. The gears are changed by a side gear striking lever, and the rear wheel brakes, which are of the internally expanding order, are operated also by a side lever in the usual way. The air, vapour, and ignition levers are

conveniently set at the left of the steering standard and below the steering wheel. The car runs on artillery wheels of 30 in. diameter fitted with 3½ in. tyres, and carries a handsome, well-designed, and well-upholstered tonneau body. The 6 h.p. car is driven by a De Dion engine set beneath a closed bonnet, the front of which is filled in by a radiator of the flanged tube type. The drive is through a gear giving three speeds forward and reverse, and the tubular chassis will run on 28 in. cycle-built wheels shod with 2½ in. pneumatic tyres.

The 8 h.p. M.M.C. Car.

Although no fresh feature is presented by the M.M.C. 8 h.p. chassis shown in the Minor Hall, yet it is so fine an example of English car manufacture and show finish that we commend its inspection to all automobilists visiting the exhibition.

Mobile Light Cars.

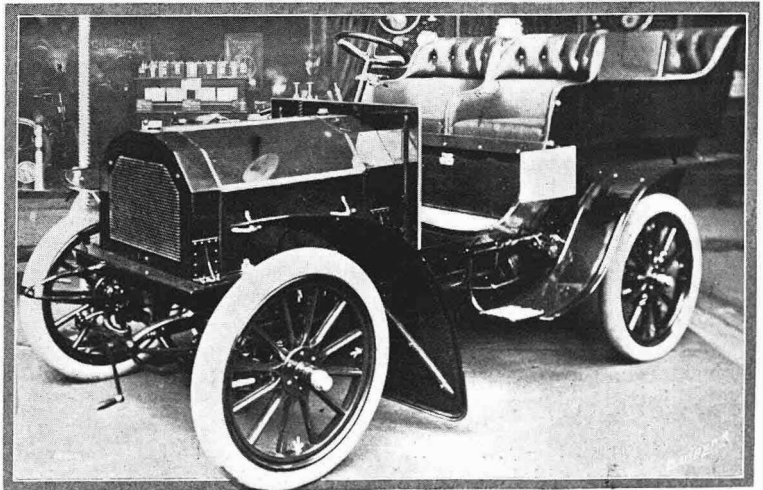
Two 6 h.p. Mobile voitures, propelled by genuine De Dion engines, are exhibited by Messrs. Lintine and Co. With three forward and one reverse speeds and direct drive on top, they are both smart-looking two-seated cars, while the 12 h.p. Mobile, driven by a two-cylinder Aster engine with three speeds and reverse, is also a good-looking vehicle. The bonnets of all three cars are of the Mercedes pattern; Cloisonnée nests of radiators fill in the front panel. The small cars have bucket seats and artillery wheels.

The Speedwell Light Car.

For the first time the Speedwell light car is shown in public on the stand of the Oxford Automobile Agency, and those interested in a smart, low-priced, well-made, two-seated small car should not fail to pay a visit to this exhibit. At 130 guineas the vehicle strikes us as being excellent value. The 6 h.p. De Dion engine is carried on a tubular frame, and the drive is through the change-speed gear and propeller-shaft to live axle in the usual way. The gear affords two speeds forward and one reverse, the speeds being controlled by a side lever as usual. Two well-upholstered bucket seats are fitted, and an ample platform for luggage is provided in the rear of the car. The front panel of the bonnet is filled up by a Loyal type radiator, and the bonnet itself with its brass angle finish makes a very smart appearance. The car must be said to be a very taking little vehicle. (Stand 56.)

A Two-cylindered Light Car.

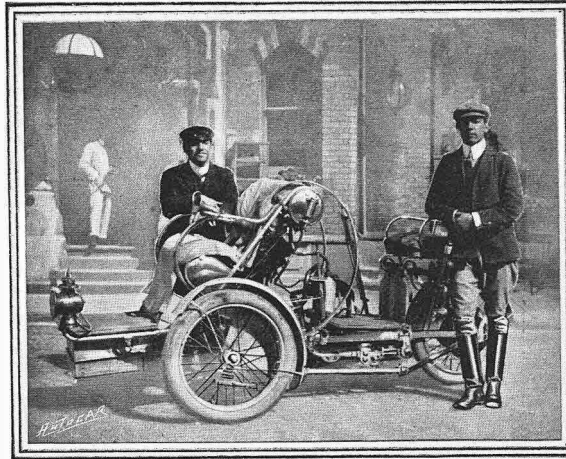
For the first time at any show there is exhibited by A. Rothschild a three-seated Lux car propelled by a double-cylinder 6 h.p. opposed engine set in the rear very much on the old Benz lines. The body is of the phaeton type with seat provided in front, and is fitted with a smart-looking hood.



The new 10 h.p. Royal Enfield four-seater car.

A SEVERE TEST.

Mr. Tom Terriss, the well-known actor, writes from the Green Room Club as follows: "Reading various and marvellous hill-climbing feats of late in the daily papers, both in this country and abroad, I thought it might be of interest to many of your readers, and not remiss, if I place on record the performance, this summer, of the smallest and lightest of voiturettes—a Century tandem. Touring from here to Land's End, with my brother and luggage, etc., we did the whole of the coast of Cornwall and Devonshire, not being balked by any hill whatsoever, the worst of any we encountered being the celebrated Porlock Hill. This hill. I might say, we took in particularly greasy weather, the roads being in a very bad way. From a standing start the little tandem took us up, baggage and all (a portmanteau on parcel carrier at back), with the exception that my brother was compelled to jump out and run alongside for about twenty yards; and had the road been in anything like a decent state, I feel certain even that would not have been necessary.



I did not think so highly of this performance at the time, until I commenced to hear from many quarters what a bogie Porlock was presumed to be. Touring in Cornwall and Devonshire is exceedingly pleasant, with one exception, the horses are so easily frightened, and one is compelled to stop, cut off the engine, and in many cases dismount and lead the animal past the machine. Perhaps this accounts for the rarity of cars generally in that district, for since leaving Somersetshire we only encountered one car absolutely travelling on the road in a distance of, say, about five hundred miles all told. The roads, too, are excellent on the whole, and we travelled without a puncture. For my part, I would prefer to have a tandem to the best light car on the market, it being so compact and handy. When I am acting I travel

to town every fine night without any inconvenience, and the journey home, after the gases and dusts of the theatre, is the finest tonic in the world." We agree. Motoring is, indeed, the world's finest tonic.

A PRIVATE RELIABILITY TRIAL.

I have read with considerable interest the letter in yours of the 21st inst. on the above subject, and the run detailed therein proves the reliability of the car tested, and is also a good test as to the reliability and endurance of the drivers.

I have made several fairly long runs on a Lanchester car which I did not think worth publishing, but there is one which I think may be of interest to your readers, especially as my average speed was good and my petrol consumption low, notwithstanding the fact that I had a fairly heavy load.

Below I give particulars of the run:

Coventry to Dunstable Town Hall and back, <i>via</i> Dunchurch, Daventry, Towcester, and Stony Stratford...	116 miles.
Coventry to Shrewsbury and back, <i>via</i> Stonebridge, Castle Bromwich, Brownhills, Gailey, Newport, and Wellington	127 miles.

Total 243 miles.

Time, 10h. 50m. = 22.1 miles per hour. Car, 10 h.p. air-cooled Lanchester.

	Cwts	Qrs.	Lbs
Weight of car	21	1	12
Four passengers and baggage...	6	3	2

Total 28 0 14

Petrol consumed (.701 specific gravity) 84 lbs. = 21.9 miles per gallon.

Weather wet, roads muddy, heavy, and greasy.

Complete non-stop run; engine or road wheels never stopped. I drove myself the whole way, and never once let go the steering tiller or moved from my seat.

Two of my passengers were very severe critics—one was a French gentleman, a motor car builder, who did not believe in the tiller steering, or the air cooling of the Lanchester. The other passenger was an English gentleman, the manager of a motor car works, and he did not believe in air-cooling, and also stated that the Lanchester car was very extravagant in petrol.

After the run both these gentlemen admitted that their objections to the air-cooling, the tiller steering, and the statements regarding the extravagance in the consumption of petrol were baseless.

The above run may be of interest to your readers, and seeing that I am a novice at driving, and have not had the experience of either Mr. Dixon or Mr. Millership, and that my car with load was some 3 cwts. heavier than theirs, and was of six less horsepower, and that the average speed was slightly better and the consumption of petrol considerably lower, it speaks volumes for the 10 h.p. Lanchester as regards reliability, speed, and economical running.

A VISITOR TO WARWICKSHIRE.

CONTINENTAL NOTES AND NEWS.

The Harmsworth International Race for Motor Boats.

We would particularly draw the attention of the Continental constructors to the fact that the date of entry for the Harmsworth international cup has been fixed for February 1st, 1904. Entries have to be made to the recognised clubs of the various countries engaging. The race will probably be held in the Solent in August, and the only qualification for the entry is that the boat shall not exceed 40ft. over all. Up to the present no entries have been sent in, and the Automobile Club of England have, with the consent of the owner and the 1903 winner and the donor of the cup, arranged to extend the date till next February. We beg that our Continental motor contemporaries will give particular prominence to the new date, as it will be a great disappointment to English sportsmen if some challenges are not sent in. It is hoped that the Harmsworth race will become the marine Gordon-Bennett, and this can only be brought about by the hearty co-operation of the Continental launch builders.

Count de Chasseloup-Laubat.

Among the little band of hard workers who gave themselves up almost entirely to the cause of automobilism at a time when few people had much faith in the future of the motor vehicle, no one occupied a more conspicuous place than Count Gaston de Chasseloup-Laubat. Coming of an aristocratic and highly distinguished family, and trained as an engineer, the Count threw himself heart and soul into the new movement. With Levassor and one or two others, he may, indeed, be said to have created the movement, and his at least was the spirit that pervaded the races and trials, which showed the public for the first time the possibilities of the autocar. He published several technical works on the automobile, and in 1895 organised the first race from Paris to Bordeaux and back which was won by Levassor. Two years later he took part in the race from Marseilles to Monte Carlo with a De Dion steam tractor, and won, and subsequently turned his attention to electricity, beating the kilometre record at Achères with a Jeantaud car, when he was the first to do more than ninety kilometres an hour on the road. He went thoroughly into every phase of automobilism. He had particular faith in the industrial vehicle. He was one of the organisers of the trials at Versailles, and did everything he could to advance this branch of automobilism. He was a man of restless energy, always at work, and yet he knew that his life was hanging by a thread. He organised Paris-Amsterdam, and helped to organise Paris-Berlin and Paris-Vienna, which he said would be his last race. While on the road completing arrangements for the Vienna contest his strength finally gave way. He tried to recover his health in Algeria, where he continued to occupy himself with automobilism, particularly in the way of opening up the Colony with public services, and then he vanished altogether from the little world of automobilism. A few days ago the news reached Paris that he had died near Cannes of the malady which had been gradually undermin-

ing him for several years previously. He was only thirty-seven years of age. The name of Count Gaston de Chasseloup-Laubat will always be remembered as an indefatigable pioneer, who contributed largely to making the automobile industry what it is at the present day.

The 1904 Programme.

In view of the inconvenience arising from the clashing of dates during the past season, when it happened on one occasion that several meetings in France, Belgium, and England were being held almost simultaneously, it is proposed to organise a conference on the occasion of the forthcoming Salon to draw up an international programme so that the success of meetings will not be jeopardised by the competition of others. Meanwhile, the sporting committee of the Automobile Club of Belgium have submitted the following dates for their 1904 programme: Ardennes Circuit in May, the automobile week at Namur in the second half of June, the Ostend and Spa meetings between June 10th and 20th, and the Spa automobile week between July 10th and 31st.

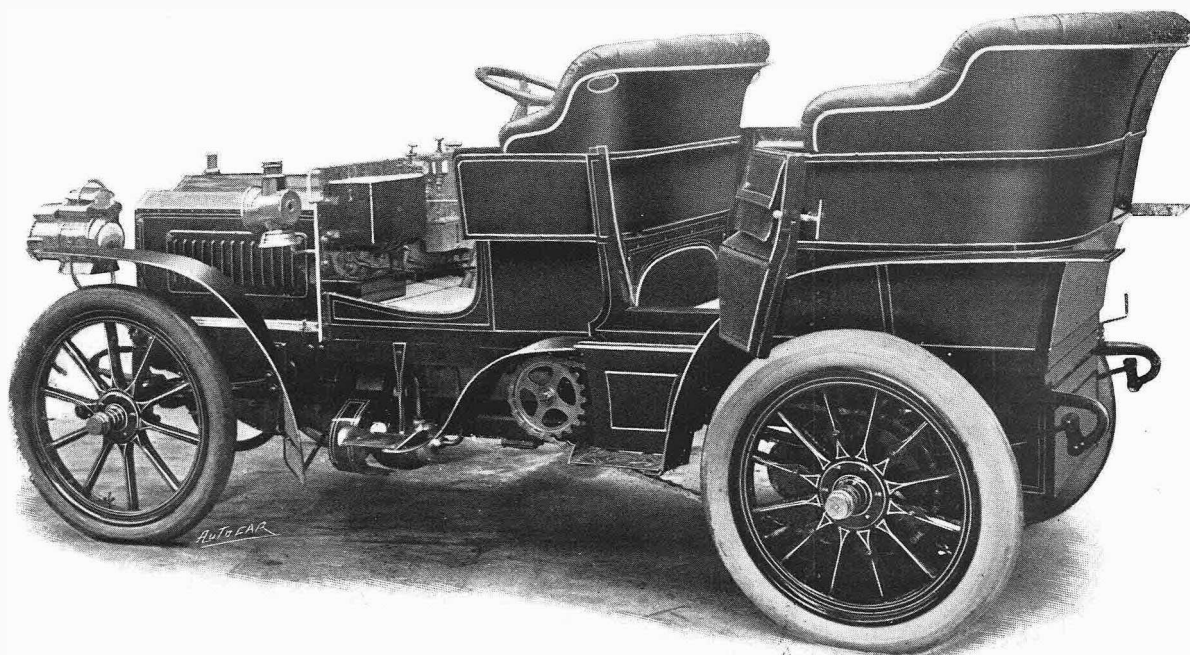
The Gordon-Bennett Cup Course.

The Homburg circuit is likely after all to be officially chosen for the Gordon-Bennett cup race. The sporting committee of the Automobile Club of Germany are in favour of the route, and nothing but an absolute impossibility to render it suitable for racing would have induced them to go against the wishes of the German Emperor, who practically sanctioned the contest on condition of its being held in the neighbourhood of Homburg. It is true that the course can hardly be considered an ideal one, but it is far from being so bad as has been represented. To make sure of giving satisfaction to the foreign competitors, the German sporting committee invited Chevalier René de Knyff to prospect the course. He went over it on Sunday last, during a heavy rain, when the route could hardly have presented its most attractive appearance. The road in parts is very undulating, and there are several long stretches allowing of the cars travelling at top speed without danger; but, on the other hand, the turnings are numerous, and three of them are regarded as highly dangerous unless care is taken to neutralise them, or, at least, clearly indicate them to the competitors. It is understood, moreover, that the road at these points is to be widened so as to smooth off the angle of the turnings. Much of the road passes through vast areas of forest. Chevalier René de Knyff seems to be of the opinion that the course is suitable for racing if certain precautions are carried out, and if, as is probable, he confirms the committee's selection, the Homburg course will be finally adopted. Starting from Saalburg, the course takes in no fewer than fifteen towns and villages, among them being Oberursel, Koningstein, Glashütten, Esch, Neuhof, Kirberg, Limburg, Obertiefenbach, Veilburg, Grafenwiesbach, Usingen, and Wehrheim. Each town will probably be neutralised, and will have to carry out its own police arrangements. These measures will be of an extremely severe character.

The French Cup Qualifying Race.

The sporting committee of the A.C.F. have just published the regulations for the qualifying race, which is to take place, if possible, a month before the date of the Gordon-Bennett cup event. The length of the course to be selected will not be less than 550 kilometres and not more than 600 kilometres. Nothing is said about the site of the race, but it is understood that the committee are thinking of running it over the Argonne circuit, in the east of France, and this course is to be prospected to see if it fulfils the necessary conditions. Failing permission to race in France, the committee have received a proposal to run off the event in Algeria, where the local Automobile Club is at present engaged in mapping out a number of courses. The chances, however, are so greatly in favour of the Government authorising a race, which is regarded as of such vital interest to the automobile industry, that it is hardly likely the committee will be under the necessity of accepting the Algerian offer. Each maker will be allowed to enter three cars, and for each vehicle he will have to pay an entrance fee of £200, which will go towards the expense of organising the race. If the total fees more than cover the expense, the balance will be divided equally among the competitors finishing the course within a given time. The cost of patrolling the course and carrying out such arrangements as will prevent the possibility of accident to the public will nevertheless be so great that it is by no means improbable even that a deficiency will have to be made good out of the club funds, the more so as few makers will be disposed to pay £600 for three vehicles unless they think they have a very good chance of getting into the cup race. The three first cars will be selected to

represent France in the cup competition. Until the day of the cup race the vehicles will be under the control of the sporting committee, and the makers will not be allowed to run them in any other event during this time. They must, moreover, keep a second car in reserve in case of accident. The order of starting in the qualifying race will be decided by lots, and the cars will be sent off at intervals of two minutes. Apart from the importance of this race, which, from a sporting point of view, will be of scarcely less interest than the cup competition itself, the fact of the Automobile Club venturing to promote it is striking evidence of the change which has come over the attitude of the public and the authorities with regard to automobile contests. After the Paris-Madrid disaster no one could have supposed that in less than a twelvemonth another great race would be organised. Speed events were then regarded as utterly doomed. But things have changed a great deal since that time, and makers find that it is absolutely necessary to raise the prestige of the French industry, which has been somewhat diminished by the success of foreign cars in the last two Gordon-Bennett cup races. At the same time, the Extra-Parliamentary Automobile Commission has been impressing upon the public and the authorities that, while racing is highly desirable for the development of the industry, it can be carried out with safety if properly organised, as was fully demonstrated at the Irish meeting, and it is believed that the forthcoming event will mark the beginning of another period of racing in France, very occasional though it may be, under conditions entirely different from the loose methods of organisation employed in the past.



A 24 H.P. NAPIER. Not long since side entrance for the back seats of a car was regarded as an impossible ideal without making a hopelessly clumsy vehicle. However, longer wheelbases have made the solution of the problem simple, and our illustration shows an example of this style of body as fitted to a large car. The upholstery is of a most luxurious type, and there is plenty of room in the back seats for three passengers, all facing forward. This particular car, which is of the latest type, has the new hydraulic regulator, and with its scarlet upholstery, green and black finish with fine white lines and nickel silver fittings, it makes an exceedingly smart and imposing vehicle.

Correspondence.

The Editor is not responsible for the opinions of his correspondents.

A CLUB CIRCULAR.

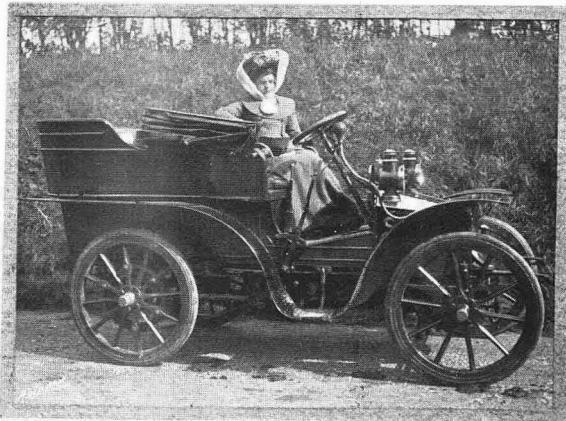
[3317.]—A circular has been issued by the Automobile Club, in which appears a paragraph stating as follows: "That in the *Club Journal* a manufacturer made a certain claim, and since which several companies have written denying the assertion of this particular manufacturer."

Might I suggest that had the powers that be taken care that such a trade puff as this did not appear in what is termed a "Club Journal," it would have been better for everybody connected.

D. M. WEIGEL.

TYRES.

[3318.]—I enclose photograph of my James and Browne 9 h.p. car which has run on solid tyres since June, 1902. The car weighs, with leather hood, 18½ cwt. It has run about 5,000 miles on these tyres, and they will easily do another 5,000. The engine and frame have not suffered in the least, and I have not lost a nut or had to replace anything except two small bolts in the side brakes which were not worn out but worn enough to rattle. The tyres are Challiner 2½ in., and I can average eighteen to twenty



miles per hour. Of course, I do not think any car would stand solid tyres, and I am sure cars with live axles would not, but we have three James and Browne cars in this district on them, and they are all most satisfactory.

As far as comfort is concerned, up to twenty-five miles per hour the passengers could not tell the difference between solids and pneumatics, and a friend of mine is often asleep in the tonneau. The driver feels a little more vibration through the steering wheel, but I have driven up to 150 miles a day without any fatigue from this cause. Of course the car has exceptionally good springs.

H. J. BATH.

[3319.]—My experience with tyres has been so curiously different from that of T.G. (3299) that it may be of some interest. My last car was of well-known French make, and fitted with pneumatic tyres. The latter were a constant source of worry and expense; and as to the car itself, the nuisance of every part being to metric measure, without mentioning other troubles, was sufficient to make me decide to have nothing to do with either one or the other in the future. I then bought a 10 h.p. Wolseley with solid tyres. This car has now been run over 5,000 miles—almost entirely over the roughest and hilliest roads in South Devon. The tyres have never given me a moment's trouble, and are the last things I ever think about. The front tyres are as good as new, and will certainly run as far again. The back tyres were originally the same—2 in. Challiner—but these wore down so much that at the end of the first 2,000 miles I replaced them with 2½ in. Sirdar. These stand much better, and are apparently little the worse after over 3,000 miles hard work. As to smoothness of running, my present car on solids certainly

runs far better than my old one on pneumatics, and many lady passengers have remarked to me on this point. This is correct for speeds up to about twenty-five miles per hour. Above this there is no doubt solids are very much rougher riding than pneumatics; and, moreover, the steering is apt to become somewhat tricky, owing to the front wheels hopping about. But so far I have not had a single failure of any kind in either wheels, tyres, springs, spring harness, steering-gear, or frame, and am so well satisfied that in the new and more powerful car the Wolseley Co. now have in hand for me I have specified for solids on the back wheels and pneumatics on the front. In conclusion, I can assure "A Practical Motorist" that the danger he imagines as to solids on front wheels is absolutely non-existent.

Of course, I quite admit that for racing or high-speed work pneumatics are a necessity, but for the average motorist who rarely exceeds thirty to thirty-five miles, my belief and experience go to show that solids are all that can be wanted; and, better still, the combination of solids on drivers and pneumatics on steerers.

Finally, I may add that solids side-slip quite as much as, if not more than, pneumatics.

WM. CROSS.

CAN THE LOCAL GOVERNMENT BOARD ENFORCE NUMBERS IN FRONT AND BEHIND?

[3320.]—There seems to me little doubt that they can, for Section 20-23 of the 1903 Act says, "This Act may be cited as the Motor Car Act, 1903, and the Locomotives on Highways Act, 1896, and this Act may be cited together as the Motor Car Acts, 1896 and 1903"—plainly showing that the two Acts must be taken and read as one.

Now although it might appear from Section 2 (2-4) and Section 7 (a) of the 1903 Act, read alone, that regulations are to be made by the L.G.B. in regard to one mark only, still on reading Section 6 (1) of the 1896 Act in conjunction with the former, it will be clearly seen that any deficiency in the new Act is fully provided for in the wording of this section of the old Act, which is as follows: "The Local Government Board may make regulations with respect to the use of light locomotives on highways, and their construction, and the conditions under which they may be used."

This section seems to me to provide the L.G.B. with every power they may require in regard to numbers, apart altogether from the new Act, and as the 1903 Act does not attempt to restrict the powers granted to the L.G.B. in the former Act, I fail to see how any legal objection can be taken to a L.G.B. regulation requiring two numbers.

LLEWELLYN S. DAVIES.

THE DARRACQ.

[3321.]—With regard to the alleged overheating of the 12 h.p. Darracq, we think it would be well for so-called experts to leave Darracqs alone as sent out by the makers.

If users of these cars and experts will but attend carefully to ordinary driving rules, and, instead of fiddling with the car and scratching holes in pipes, will just give the engine the right mixture, with not too much gas, and will drive the car with as little mixture as is necessary, they will have a cool car and still have a 12 h.p. Darracq instead of a Darracq-cum-Somebodyrother.

ARCHIBALD FORD.

HEAVY MOTOR TRAFFIC.

[3322.]—The discussion on Mr. Shrapnell Smith's paper on this important subject recorded in your valuable journal of the 21st inst. has elicited that driving or tractor wheels as now made are wanting in endurance.

This is no more than one would expect in wheels made on the fashion that has obtained for many years, yet I submit that not only the drivers but all wheels—if constructed of suitable material and of suitable design—would be made practically indestructible by ordinary wear, and the endurance of wheels now employed of every description would be materially increased, if they were fitted with rubber cushion hubs. This could readily be done while utilising the spokes, felloes, and tyres, and making them really stronger by the conversion.

It will doubtless be obvious to most of your intelligent readers that it is infinitely better to distribute the load on

a resilient material, such as rubber, than to waste material in any attempt to do without it, especially as it can be so arranged as to afford about 200 square inches of rubber bearing surface in each hub, such rubber being protected from injury.

Such wheels for a motor lorry to carry three tons are now ready for use. As to the loss of time referred to by Mr. Douglas Mackenzie, such loss might easily be considerably reduced if steady and reliable marine engineers were employed as drivers, as they are accustomed to keep their engines going for weeks on end without any breakdown, and know how to act in an emergency.

EDWIN N. HENWOOD.

22, Great St. Helens, London.

THE IDEAL FOUR-SEATED CAR.

[3324.]—We have read with the greatest interest Mr. F. A. Morgan's letter in last week's *Autocar* setting forth the requirements his ideal four-seated carriage would have to fulfil, namely, a reliable, silent vehicle, simple, so as to be able entirely to dispense with the services of a trained mechanic, the vehicle to be about 8ft. in length, and weighing about 8 cwt. We should like to explain why this ideal is almost impossible of attainment, and why, to quote Mr. Morgan's own words, "All the four-seated reliable cars are somewhat heavy, i.e., about 13 cwt."

The following vital points must of a necessity be considered when designing a car:

1. A sound design, in which the maximum of power is employed to advantage.
2. Perfect workmanship and the selection of the proper qualities and kinds of metals and materials best calculated to withstand the particular shocks and strains to which each individual organ is subjected.
3. Above all, gauges of sufficient margin to ensure long life, which is after all another name for "sustained reliability."

Let us, for the sake of argument, presume the first two conditions to be complied with. Now the designing of a motor car as turned out of the workshops of any firm of repute is not what many people would suppose, namely, the assembling of the various parts irrespective of what strains such parts are put to; on the contrary, every part is or should be theoretically worked out by means of recognised formulæ, which determine the gauges which suffice satisfactorily to withstand the strains to which each organ is put.

This margin we should call the margin of safety, and any cutting down of weight is done purely at the risk of the longevity of the machine.

An exaggerated instance of this is seen in the case of racing cars where longevity is of no account.

Seeing that the car is called upon to fulfil certain definite requirements (to transport four persons at a certain speed), the basis of the design is more or less fixed, hence the more or less unanimity in weights.

We really fail to see how real comfort can be obtained for four passengers in a car 8ft. over all without sacrificing the design; it was just on account of this restricted accommodation that the "Chambre Syndicale" persuaded all the leading manufacturers in France to adopt larger seating accommodation in four-seated cars.

In conclusion, we regret we cannot agree with Mr. Morgan that all four-seated reliable cars of 12 to 13 cwt. demand the services of a mechanic.

On the contrary, we know of a silent reliable car, with removable tonneau, irreversible steering, fitted with a two-cylinder motor, provided with M.O.V. automatic carburation, and even automatic ignition, which is far simpler to drive than many of the voiturettes on the market, around the steering column of which will be found a maze of levers and taps calculated to alarm the most courageous of drivers.

THE WESTON MOTOR SYNDICATE,

WALTER GUTMANN, manager.

HIGH VERSUS LOW-SPEED MOTORS.

[3325.]—I very much regret that there are not more automobiles fitted with multi-cylinder high-speed motors. In the automobile, where lightness and flexibility are so essential for a perfect machine, it would appear that the high-speed motor must be an ideal one for propelling it, this kind being so much more flexible, light, and compact than the slow-speed type. By high-speed motors

I mean those which normally run at about 1,500 revolutions per minute. Having four cylinders, they would not vibrate more than the slow-speed type running at 800 revolutions per minute, because the power of each impulse is not so strong and, consequently, would be felt less. The success of the Ariel car is greatly due to its high-speed motor, which even runs up to 2,000 per minute and sweetly at that, and is so small that it makes one marvel at it propelling so large a car so perfectly.

Now, our theorists will at once exclaim, "Oh, but a motor running at 2,000 or 1,500 per minute will have worn itself out by the time the season is over!" But their remarks are not borne out in actual practice, for there are plenty of little $3\frac{1}{2}$ h.p. De Dios still running well whose engines are practically as good as when they were new, save for having the brasses and piston rings renewed.

It would be interesting to hear what objections (if any) our leading makers have toward the high-speed motor.

E. P. BOWEN.

AN IMPROVED INDUCTION VALVE.

[3326.]—In reference to Mr. Robert E. Phillips's letter in your last issue, I cannot but hold that the quick and accurate closing of air valve is an important point. I was comparing the action of the semi-automatic valve with a fully automatic valve, which at some speeds closes with a chattering action on its seat. The merit of the semi-automatic valve lies in the combination of easy automatic opening with quicker and certain mechanically-controlled closing, and this, I pointed out, was invented by Professor Riedler.

In writing of the length of time the valves remain open, the terms "air" and "exhaust" evidently got transposed in my mind. Of course, the exhaust valve remains open longer than the air valve, as it is usual to open it well before end of working stroke and keep it open during return stroke.

The point I was illustrating, however, was clear enough, viz., that there is a difference in lengths of cams when two are used, and in making one cam serve both purposes allowance must be made in design in order to correctly time the valves, and this is no more difficult in the ordinary arrangement than in the type of valve which Mr. Phillips claims as his. It is common to both.

JAMES VIRTUE.

STEAM CARS.

[3327.]—Like Uloola, I am another prospective buyer. I have been informed on good authority that the White and Miesse steam cars are the best in the market.

Might I suggest to Uloola to get a descriptive catalogue (which contains full plan of the car) from the White Steam Car Co., and another from Turner's Motor Manufacturing Co. of the Miesse car; also to get the back numbers of *The Autocar* containing plan of same.

If Uloola does not understand machinery he could submit the plans to an engineer for explanation. Like Berkeley, in your issue of Oct. 17th, I "do not care to give 400 guineas for a car that will rattle itself to pieces in 4,000 or 5,000 miles."

The points I want information about regarding the above-named cars are as follow:

- (1.) Their durability; how long will they last?
- (2.) Cost of repairs to steam pipes, and length of life of same?

I note that S. R. Rhodes in the issue of Oct. 24th states: "The gears of my last car required renewing, and an application to the makers for the price of new gears resulted in a quotation over one-third in excess of the price subsequently quoted by another firm not motor manufacturers."

As this might also apply to repairs of steam pipes, etc., before buying a car I should certainly ask the firm to give their prices.

- (3.) Are the boiler tubes, steam pipes, joints, and their connections satisfactory? How are they rendered steam tight, and does the jolting of car give trouble in this case?

(4.) Does the presence of a boiler render the car hot from the heat of the steam? This especially applies to the White car, as the boiler is under the seat, whereas in the Miesse it is under the bonnet.

- (5.) In frosty weather would any trouble arise from the water freezing?

I note in the issue for Nov. 7th that Mr. Coleman (who I suppose is the representative of the White Steam Car Co.) thinks the letter of H. W. unfair when he suggested the danger of a car carrying a large quantity of petrol.

As a prospective buyer of a steam car, I think that thanks are due to H. W. for this criticism. In my opinion this question of danger is a serious one, and I hope to see some answers on this matter from users and not sellers of the car.

I remark that Mr. Coleman, though he objects to "Guert's" criticism, does not answer it; viz., "Supposing the car met with an accident, or by some means the petrol supply pipe from the tank to the burner was fractured at the tank side of the valve, what would be the consequence?" Finally, I hope to buy a car that, after a period of instruction and explanation of its entire mechanism, I can drive and manage myself. I look on a chauffeur as a great expense and nuisance in such a small affair as a motor car; his presence would destroy all privacy. But I am in no hurry, and follow with great interest the correspondence in *The Autocar*, as I want to get at the practical experience of the users of the White and Miesse cars, i.e., of those driven by owners not aided by a mechanic.

ROY.

[3328.]—Having noticed in the columns of *The Autocar* that many drivers of steam machines are now giving their opinions as to reliability and ease of driving, I wish to say a good word for the light American machine. I have a Toledo, which I procured in the U.S.A. two years ago, bringing it over here about fifteen months ago, and though it is only the standard pattern of small car, I have done several tours on it, having only quite recently made a most enjoyable trip in Wales of over 300 miles. The only mishaps were a few punctures caused by nails. How is it that one picks up such a number of nails on the road?

In your issue of Oct. 17th, H. S. H. writes about this particular car, and I quite endorse his statements, and even though the consumption of fuel is greater, the particular fuel used is a great deal cheaper than that used in a petrol car: I pay 11d. a gallon for what I use, and have also procured fuel which is satisfactory at 10d. a gallon.

I have only once or twice had trouble with the back-firing, and that was always in a very high wind, driving with it, and up hills, but by turning the burner down slightly the machine behaves itself.

I can leave the car almost as long as I wish standing with the pilot alight, though the steam drops a little, and it takes about two minutes to get it up again.

I understand that the makers are supplying a burner to use paraffin oil, and this should considerably reduce the cost of running.

R. A. B.

THE MOTOR GADABOUT.

[3329.]—Will you kindly allow me to make a few remarks about the design of small two-seated cars? I consider that they are all made too small throughout, including the carriage work. In them a big man both feels and looks uncomfortably big, and has not enough room in which to work the pedals. It is true that an increase in size means extra weight, but the advantage in comfort would be very great, and being a big man myself can speak from experience. The steering wheel should be capable of adjustment as to its height. As regards tyres, in two-seated cars, when economy is probably of great importance, solid tyres ought to be fitted, and the cars constructed to run on them.

The Wolseley Company inform me that their new 6 h.p. car, being a light car, will not be suitable for solid tyres. Now, considering that their other cars are, I cannot help feeling that this is a great mistake, and one which perhaps can be rectified before the 6 h.p. car is on the market.

CAPTAIN.

P.S.—What of the Roussel spring wheel?

WILFUL OBSTRUCTION.

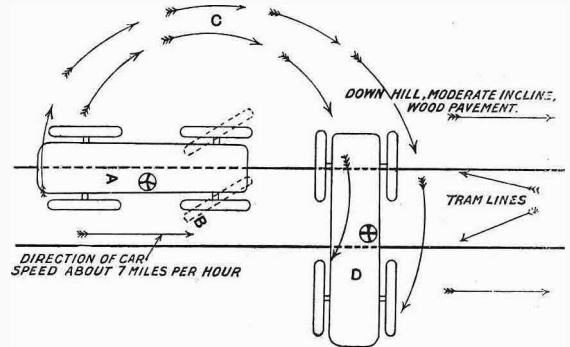
[3330.]—Your report of the case wherein I was fined at Marlborough Street Police Court for "wilful obstruction" is not quite accurate. I did not refuse to remove my car, because I was never requested to do so. I went into the witness box and swore that when I came out of De Dion's I found a constable there with his pocket book and pencil

ready in his hand. He did not ask me to move my car, but said that he was going to summon me for obstruction. He gave me no opportunity to move my car. My contention therefore is that I was not guilty of the offence alleged on the summons, viz., "wilful obstruction." It is because the magistrate stated that the precise number of minutes a car might stand by the kerbside was immaterial, and that it was not necessary that any person or thing should be proved to have been obstructed, that I decided to appeal, feeling that it is of vital importance to every motorist that an authoritative definition should be given of the phrase "wilful obstruction." "Obstruction" is no offence, but according to the Act under which I was summoned the obstruction must be "wilful."

A. J. WILSON.

SIDE-SLIPPING.

[3331.]—I enclose a diagram, which may interest you, illustrating the danger of side-slip. A is a plan view of the car travelling with two wheels between the tram rails. The pavement was wood blocks and greasy; a slight shower at the time. The car was running with the engine



A, car's original position
B, inclination of steering wheels
C, direction of skid
D, final position of car

out of gear—free-wheeling, in fact. The brakes were not applied at all, the steering wheels were turned—as shown in the dotted lines—at B to bring the car out of the tram-lines. The rear end of the car then began to swing round in the direction of the arrows, and the car never stopped until it arrived at the position shown at D, i.e., it swung round three-quarters of a revolution. There were two in the car, sitting in the front. There was a good deal of traffic, but the car, fortunately, missed everything. This has caused me to have a great dread of wood sets in wet weather.

R. T. BRANKSTONE.

[The only remedy is to fit efficient non-skids.—Ed.]

THE OLDSMOBILE.

[3332.]—We note with very much pleasure letters from Mr. F. H. Buckmaster and Mr. J. Brown with reference to the above, and not having the addresses of these gentlemen, we thought perhaps you would be good enough to allow us to ask them, through your columns, if they would kindly send us their addresses, so that we could post them full particulars of the new pattern Oldsmobile, which we have been selling for the last two months, and which has been giving such splendid satisfaction.

We note in Mr. Buckmaster's letter the trouble he had with the cylinder. This has entirely been done away with in the new cylinders which are fitted to the engine of the new type of car. Owing to the construction, it is impossible for the water to leak into the cylinder.

Mr. J. Brown will find that in the new cars every part is made heavier and stronger, and special attention has been given to the details. Where they were originally fitted with wire spokes and wire connections they are now fitted with wood artillery wheels, and proper connections have been made in every part of the car. In fact, we have dozens of letters from customers to whom we have sold the new type of Oldsmobile, and they all write saying the car gives splendid satisfaction.

CHARLES JARROTT AND LETTS, LTD.

[Owing to pressure on our space a number of letters are unavoidably withheld.—Ed.]

Flashes.

The Motor Cycle of Wednesday, the 25th—which, by the way, was on sale both at the Crystal Palace and the Agricultural Hall on Monday morning—is a most interesting number. It deals with all the new motor cycles, and illustrates the majority of them, over thirty pages being devoted to descriptions and illustrations of the motor cycle and kindred exhibits in the two shows.

* * *

One or two surprises have been provided by Messrs. Jarrott and Letts to the automobile world. We have just heard of another instance of their enterprise which will, we fancy, excite very considerable interest as soon as it is prudent for it to be made public.

* * *

A member of the Automobile Club and an engineer speaks highly of Mr. J. Hutton, of 98, King's Road, Camden Town. Our correspondent says that his repair work is excellent and his charges moderate, and as he has had some unfortunate experiences of bad work by so-called fitters, he very properly thinks it will be of interest to automobilists to know of a good workman.

Occurrences, which out of courtesy are termed accidents, are constantly happening, due to the uncontrollability of the horse, and which are comparatively ignored by the daily press, but which if they were occasioned by motor cars would be blazoned abroad, and characterised by some more serious epithet. We have no hesitation in saying that had the accident which happened at Hyde Park Corner the other day, resulting in serious injury to a lady and the death of a horse, been due to a collision with a motor car instead of with horse drawn vehicles, some harder things would have been said about it.

* * *

This week we publish a summary of the regulations under the Motor Car Act, by Mr. John A. Williamson, a well-known Northern solicitor and an authority on highway law. Both he and Earl Russell have done their best from time to time to make the new conditions, which will come into force on January 1st, clear to our readers. Many, however, have expressed a desire for a handbook which will give them the complete Act and regulations with explanatory notes. This has been carefully compiled by Mr. Williamson, and will be issued from *The Autocar* offices, 3, St. Bride Street, E.C., on Wednesday next, at the nominal price of 7d., post free. It has not been produced with the idea of making a profit, but merely to give the automobilist, in one handy little work, the complete law on the subject, which it does.

Mr. G. Bright Willis, of Moor Green, Birmingham, recently purchased a 10 h.p. Wolseley car, and he points out to us that his initial is not C.

* * *

In reference to the proposed postal C.O.D. system, it has been pointed out to the Postmaster-general that motorists in country places frequently require some part or accessory which is not obtainable in their district. They telegraph for what they want, but when their names are unknown delay of a most annoying character occurs. This would be entirely obviated if the goods could be handed over to a Government department with the full knowledge that either the money would be forthcoming or the goods would be returned.

* * *

The celebrated *Passe-Partout*, which began its ambitious tour round the world more than eighteen months ago, but never proceeded beyond the Russian capital, after many vicissitudes was, as many will remember, bought by Messrs. Friswell, Ltd. Mr. B. Harris, of Llangibby Castle, Monmouth, has now purchased the vehicle from them, and will use it as a station bus.

* * *

The Motor Union published on Wednesday this week a pamphlet containing (1) regulations as to registration and licensing, (2) the Acts of 1896 and 1903, (3) the Local Government Board memorandum explaining the Acts and the regulations, and (4) a list of the authorities under the Act to which application

must be made for registration and licences, and the addresses of their offices. Copies have been sent to members of the Motor Union post free. Non-members may obtain a copy of the publication by sending six penny stamps to the secretary to the Motor Union, 16, Down Street, Piccadilly, W.

* * *

The name of Brotherhood is very well known in the engineering world, but it will be information to many to hear that in connection with the old-established firm of Peter Brotherhood, Westminster Bridge, London, a motor car manufacturing company has been formed under the title of the Brotherhood Crocker Motors, Ltd. The car which is, broadly speaking, on simplified Mercedes lines, will be known as the Brotherhood-Crocker, and in addition to pleasure carriages, motor vehicles for commercial purposes will be built. Mr. Percy Richardson, who is so well-known in London automobile circles, having taken an active part in the movement practically from its commencement, is the general manager as well as a director of the new Brotherhood Co., the other members of the board being Earl Fitzwilliam, Mr. Stanley Brotherhood, and Mr. John Crocker. However, these matters are of comparatively small interest to the automobilist beside the vehicles themselves, and these we hope to deal with on an early occasion.

"THE AUTOCAR" DIARY.

Motor and Cycle Show at Crystal Palace closes Nov. 28.
 Nov. 28.—Balloon Chase by Autocars, Crystal Palace.
 Dec. 1.—Cheltenham and Gloucestershire A.C. Meeting.
 " 1.—Annual Dinner Auto Cycle Club.
 " 2.—A.C.G.B.I. Founder Members' Dinner.
 " 3.—A.C.G.B.I. Paper, "Les Combustibles Liquides employés dans les Moteurs de Voitures Automobiles, leur mélange avec l'air et leur inflammation," by M. Forester.
 " 4.—Annual Dinner, Yorkshire A.C., Leeds.
 " 7.—Scottish A.C. (W. Section). Annual Dinner, Glasgow.
 " 8.—Motor Volunteer Corps. Annual Dinner.
 " 8.—Yorkshire A.C. Paper, "The New Motor Act and its Effect on Motorists," by Mr. H. A. Jones.
 " 10 to 25.—Paris Salon (A.C. de France).
 " 10.—A.C.G.B.I. Sideslip Trials.
 " 11.—Annual Dinner Norfolk A. and Launch Club.
 " 31.—Entries close for 1904 Gordon-Bennett Race.
 Jan. 18.—Scottish A.C. (W. Section). Paper, "Reminiscences of the Road," by Mr. C. Jarrott.
 " 23-Feb. 4.—Brussels Salon.



THE AMERICAN TRIALS. The interesting reports of the American reliability trials, which were given in "The Autocar" of October 31st and November 14th, show the White steam cars to have done the best performance of any steam-propelled vehicle in the trials. One of the two cars which ran through from New York to Pittsburg is here depicted as it was dropping over the crest of a hill on the last stage of the journey.

The Grand Duke Michael of Russia has, we hear, ordered a motor car from Mr. W. A. Vincent, of Stoke-on-Trent, Hanley, Staffs.

* * *

We understand that the Lanchester Engine Co., Ltd., now have one of their new type water-cooled cars running in London, and trial runs on this car may be had on application to the company.

* * *

A firm of Bombay engineers, Messrs. Turner, Hoare, and Co., write us stating that, so far as their experience is concerned, there is no trouble whatever with carburettors during the monsoon. They say that they had Renault, Peugeot, and De Dion cars running in Bombay during the height of the monsoon, which was an exceedingly severe one, and they did not experience the least trouble through the extreme humidity of the atmosphere at this period.

* * *

The Grappler Pneumatic Motor Tyre Syndicate, Ltd., of 30, Bachelor's Walk, Dublin, advise us that they have purchased from the liquidator of the New Grappler Tyre Co., Ltd., all the patents, etc., in connection with the well-known Grappler motor tyres. The process by which this tyre is manufactured was invented and protected by Mr. S. J. Bartlett, for years works manager to the old company. This gentleman's services have now been obtained by the Syndicate, who will have sole right of the employment of his particular process. Arrangements have been made with the Hyde Rubber Works, Ltd., for the supply of all rubber, and a portion of that company's works have been leased for the further manufacture of the Grappler tyres. All the necessary plant and specially designed tools for the manufacture of the Grappler tyres have now been erected within these works, and the tyres are now being turned out under the personal supervision of Mr. Bartlett. The address of the sole agents of the Grappler Pneumatic Motor Tyre Syndicate, Ltd., is the Hyde Rubber Works, Ltd., Woodley, near Stockport.

The record recently made by the Hon. C. S. Rolls at Welbeck of one kilometre in $26\frac{2}{5}$ s., equalling 84.68 miles an hour, has been officially confirmed by the Automobile Club.

* * *

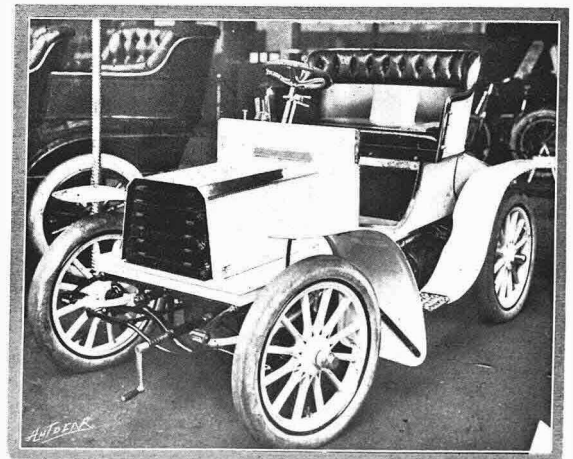
Our offspring *The Motor Cycle*, which deals wholly and solely with motor cycles, has surpassed itself this week by publishing a thirty-page article, profusely illustrated, in which all the new motor bicycles, tricycles, tandems, and sidecars, besides almost innumerable novel motor cycle accessories, are dealt with. When it is remembered that not so long ago *The Autocar* was able to cover both motor cycles and autocars without difficulty, the number of the power-propelled cycles described and illustrated in *The Motor Cycle* afford an excellent illustration of the growth of the demand for and the use of the lightest forms of automobiles.

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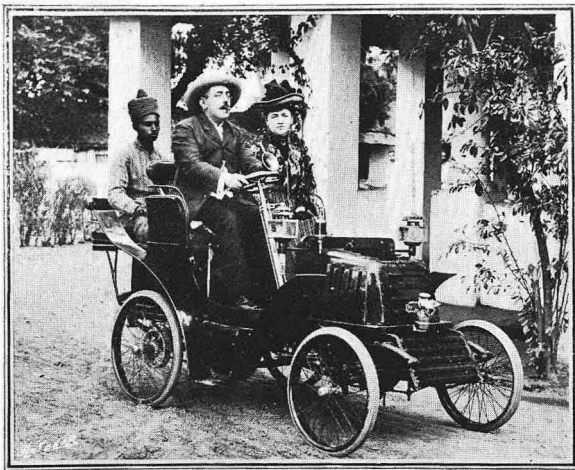
There is probably no make of car of which more spurious imitations are sold than the De Dion. All sorts of artifices are practised to endeavour to make a would-be purchaser imagine he is buying a genuine De Dion car, when, as a matter of fact, it is some sort of hybrid arrangement, the only real De Dion feature about it being the engine. A particularly glaring instance has been brought before us this week, in which the machine is described as the Populaire voiturette, 6 h.p. De Dion engine, the intention of the announcement apparently being to make the reader imagine that the car was a genuine De Dion Populaire throughout.

* * *

The motor passenger railway car recently tried by the Taff Vale Railway Company has been such an unqualified success that it is intended to have a number of these cars constructed. At present heavy trains are run on some of the branch lines for the convenience of few passengers. The motors will remove the need of this. Apparently, judging by the number of enquiries from other railway companies, the Taff Vale Railway Company's experiment is attracting great interest. At present the car is running between Penarth and Barry, and accomplishes the distance in fourteen minutes—several minutes quicker than an ordinary train.



The 6 h.p. Royal Enfield voiturette shown at the Stanley Cycle and Motor Show



AN ANGLO-INDIAN AUTOMOBILIST. Under this head we printed a very interesting communication on August 8th, from Mr. J. W. Hall, of Ahmedabad. It will be remembered that Mr. Hall is successfully using paraffin instead of spirit for his motors.

We are informed that the tyres fitted to the Clarkson motor omnibus, which has just commenced running at Torquay, are not of the make stated last week, but are known as the Turner endless solid rubber tyres.

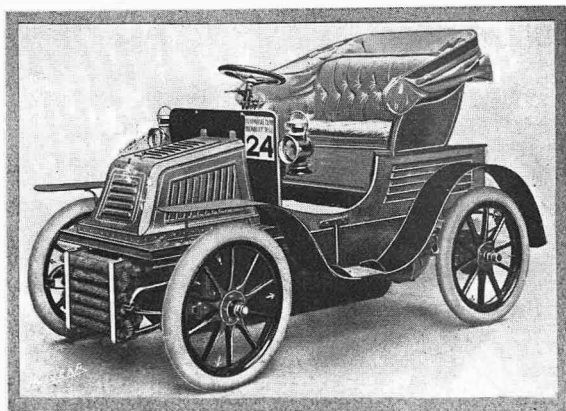
* * *

Automobilists who drive on trammed roads in all weathers should beware of a little *contretemps* which occurred to a medical motorist while driving down King Street, Hammersmith, in his 9-11 h.p. Talbot car one very greasy day last week. All who are condemned to issue from London by the Great Western Road have knowledge of the congestion caused in this thoroughfare by the passage therealong of Mr. Clifton Robinson's fourteen miles per hour fourteen-ton trams. But that by the way. Our friend was driving down this street with his near side front wheel running on the near side tram-line. To him there presently appeared a horse-drawn vehicle, for which in duty bound he was obliged to give way. He put his wheel hard down in order to move to the left, but, nevertheless, to his astonishment, his car still continued its progress upon the rails. At first he thought his steering gear had given way, but immediately afterwards realised that, although the road wheels had obeyed the rotation of the steering wheel, they had turned in the groove in which the tramrail was set, and, on account of the greasy mud with which the road was covered from side to side, had slid straight forward without deflecting the car from its original line of progression. He realised that there was nothing to do but to apply the brakes and hope for the best, and this he did, with the happy result that no collision with the approaching vehicle occurred. He was not quite so lucky with regard to what took place in his rear, however, as another car which was in close propinquity was obliged to select his tail lamp as a cushioning buffer. Luckily, the lamp was the only thing that suffered on either car. We have referred to this somewhat disconcerting incident at some length in order that our readers may realise another direful possibility of a tram-railed street.

If it is desired to witness the wonderful control of a Cadillac, a visit should be paid to the Anglo-American Motor Car Co.'s depot at 19 and 21, Heddon Street, Regent Street, when the urbane director, Mr. Packham, will not scruple to give a show with a Cadillac chassis, which is quite as remarkable as the performance of this excellent little car in the reliability trials. Standing on the ground beside the chassis, he will run the car backwards and forwards three yards by alternately throwing in the forward and reverse speeds without moving his foothold or letting go the gear lever. In addition to this demonstration of handiness, the ingenious mechanism of the Cadillac is always worthy of examination.

* * *

E. Failes Baker, who drove the winning Duryea in the Phoenix Park, Castlewellan, and Southport trials, met with a startling experience on Saturday which came very near to ending his career. An ascent—or attempted ascent—of the Aero Club was being made in the Palace grounds, and Baker found himself amongst the spectators, when the balloon became unmanageable in the strong wind then prevailing, and the bystanders were called upon to assist. Ever ready where work is wanted, he sprang forward with others and hung on to a rope. The balloon gave a violent plunge and everybody let go, but Baker—who does not believe in letting go a task he has once taken hold of—and the next instant he found himself high above the tree tops hanging on to the rope, with the crowd below yelling to him to stick to it. Never losing his presence of mind, in an instant he got his legs round the rope and prepared to hold on for all he was worth. Happily it was not long before the balloon got down again, and once within measurable distance of Mother Earth, Baker lost no time in getting there, and now says motor car racing is quite exciting enough for him, and he does not want any more ballooning—at any rate, of *that* sort.



THE 6 h.p. SWIFT. One of the small cars which performed extremely well in the recent 1,000 miles reliability trials of the Automobile Club was the 6 h.p. Swift, No. 24. It made five non-stop runs out of eight, two of the stops being occasioned by punctures, the only one due to mechanical derangement being required to change an inlet valve. Two passengers were taken up all the hills, and in the Bexhill speed test twenty-two miles an hour was made. In fact, it was one of the small cars which showed itself thoroughly fitted for a thousand miles reliability trial, and almost immediately after the trials concluded it was bought by Mr. F. W. Thompson, of Horwich.

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.

MAGNETIC CLUTCHES.

Will you please tell me how a magnetic clutch is made?

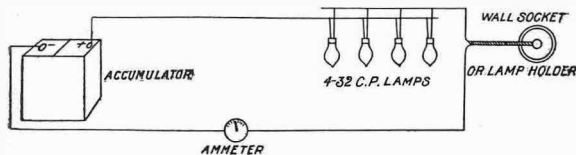
Has anybody used one in the form of a dynamo, say with the field magnet fixed to flywheel and the armature on the gear shaft? Are there any other clutches which will slip without wear? I have looked in some books at the Patent Office Library, but have not found anything.—F. WATTS.

Magnetic clutches are constructed by attaching to the flywheel of the engine a series of electro magnets—in other words, bars of soft iron or of sheet iron built up to the required thickness. Round these are wound several layers of well insulated copper wire. The passing of a current through this coil of wire converts the core of soft iron into a powerful magnet, thereby attracting to it any other metallic pieces constructed of steel or iron. It would not be possible to construct a clutch in the form of a dynamo with the field magnets fixed to the flywheel and the armature to the gear shaft, as both these parts rotate together at the same speed, and would, therefore, be inoperative. It is impossible for any clutch to slip without wear. The one upon which, we believe, there is the least possible amount of wear is that designed by Professor Hele-Shaw. This was illustrated in *The Autocar* of August 8th, 1903, p. 199.

CHARGING FROM A 220-VOLT CIRCUIT.

(1.) I have a thirty ampère hour accumulator, P. and R., two cells, 2.2 volts each. This I wish to be able to charge myself. We have the electric light laid on our premises, with a pressure of 220 volts. I have two sixteen candle power lamps, controlled by one switch. Will you please tell me how long it would take to charge it, using the two lights, and also how to find the negative pole with pole paper? (2.) What would you advise as a remedy for a slipping De Dion clutch? If I adjust it a quarter of a turn it seems too much, as with the clutch handle normal, and the engine running, it appears to sound as if it is grinding the gear wheels. Now if I slack it back to its previous position the clutch is always slipping on the second speed.—T. G.

Two and a half ampères, at least, are required to charge an accumulator. It will be necessary to use four 32 c.p. lamps placed in parallel, as shown in diagram herewith. The current, of course, must be a continuous one, as an alternating current is useless for charging purposes, owing to the rapid changing of the poles. The best method of arranging the circuit is shown in the diagram. A plug for inserting in lamp holder should be procured from a local electrician, and to this the usual length of flexible wire should be connected. One of these wires should be



cut down to about one-third the length of the opposite wire. The shorter wire should afterwards be arranged for the positive terminal. The insulator of the shorter wire should be bared in four places, and to each of these four places should be connected a short length of wire.

At the end of each is an ordinary lamp socket. The opposite wires from the lamp sockets should be attached in a similar manner to that of an independent wire (as shown in the diagram), which is connected to the positive terminal of the accumulator. Now as each of these four 32 c.p. lamps passes a current of .6 ampères, we get a total current of 2.4 volts. To charge the accumulator fully at this rate will take approximately sixteen hours. Less time is taken, of course, if there is already a current in the cells. A 16 c.p. lamp only passes a quarter ampère at 220 volts. Therefore if you arranged your two lamps in a similar method to that shown on the diagram, you would only get a total pressure of a little over half an ampère, which is insufficient to charge the accumulator. Using the pole finding paper, the positive pole turns the blue paper red, while the paper is unaffected by the negative pole. (2.) There is something which is not quite right in your method of adjusting the clutches. The change speed lever on the steering column should be placed in the free position. After the locking collar has been removed, the small plug in the end of the shaft should be turned round, so that the collar can again lock it in position. Before testing the car for adjustment, this locking collar should be placed in position. We think it probable that you have neglected to do this before testing the gear, the result of which has been that the adjustment of the clutch has slipped, so that it has made it fiercer than it should be.

PROTECTION OF CARS AGAINST FROST.

(1.) I keep my motor in a shed, not altogether frostproof, and as it is a considerable trouble running the water off from the tank, radiators, etc., every time after having used it, I am thinking in frosty weather of adding some glycerine to the water. Can you please let me know what proportion of glycerine I ought to add, so as to make the water quite frostproof? Will a common quality of glycerine do, and, also, is it in any way at all injurious to the tank or pipes? (2.) Can you suggest any better way to prevent the water freezing in cold weather? I presume petrol will not freeze under any circumstances? (3.) Are accumulators liable to be damaged at all by very frosty weather? I shall be very grateful for your opinion on these points, as with the winter coming on I am naturally anxious that my car shall not in any way get damaged by the frost.—G. H. P.

(1.) The best proportions of glycerine and water for a non-freezing mixture are one of glycerine and 2.5 of water, commerial glycerine being suitable. This, however, does not make the water quite frostproof. No damage whatever would be done to the tank or pipes by the use of such a mixture. Calcium chloride has frequently been mentioned as an anti-freezing mixture, but this has an injurious effect upon certain metals which form part of the majority of water-cooling systems. (2.) Undoubtedly the best method of warming a motor house is by fitting up hot water pipes, if this is at all possible. If one does not care to go to this expense, a gas or oil stove might be employed, this being put up from the floor on the bricks, and in such a position as to be as far away from petrol as possible. Petrol would not be affected by cold weather. (3.) Accumulators do not freeze readily owing to their being of an acidulous nature and not affected by frost to such a degree as the water-cooling system, so that if efficient protection is provided for the cooling system, the accumulators will also be benefited thereby.

MOTOR VEHICLES AT THE MANOEUVRES.

An interesting non-technical paper was read on the 19th inst. before the Automobile Club by Mr. Jas. F. Ochs, who by the light of his own and other people's experiences, gave a description and a criticism of the work done by the members of the Motor Volunteer Corps during the recent manoeuvres. Mr. Ochs opened by referring to the original request preferred by General Sir Redvers Buller to the Automobile Club for the use of a motor car in the cavalry manoeuvres of 1901, and told how upon this Mr. M. Mayhew later took steps to inaugurate a corps of motor volunteers, his success in this endeavour being notified by an announcement in the *London Gazette* of 3rd March last that the formation of the Motor Volunteer Corps had received Royal sanction. Accordingly a fully equipped force took part in the manoeuvres this year. Being attached specially to General Sir Archibald Hunter, the umpire-in-chief, Mr. Ochs was in a position to gain some knowledge, not only of the working of the motors of the Volunteer Corps, but also of those belonging to the War Office and those privately owned by officers.

Preliminary Practice.

Previous to the manoeuvres, in order to familiarise the members with the work they would be required to do, Colonel Mayhew organised a series of staff rides. The system was interesting, with an element of sport in it.

The headquarters of these staff rides were at Marlborough, and the manoeuvre area extended from Banbury in the north to Portsmouth in the south, and from Bath in the west to Windsor in the east, some 300 square miles. Each member of the corps was supplied with a special map of this area, and it was to obtain knowledge of the roads and by-roads that these staff rides were carried out. The rides were well attended.

The method was: Every two members were informed on their arrival of a particular town or village to which they should proceed on the following morning, and each would proceed to his destination by a different route, the higher powered car going by the longer route. The first car on arriving had to wait forty-five minutes for the arrival of the other car, and thereon to open a sealed envelope which gave it a second destination. It says much for those who set these routes that in very few instances did any car have to wait for the second car any appreciable time; in fact, in some instances it has been known that both cars arrived at their destination almost simultaneously, although perhaps there might have been a difference of ten or fifteen miles in the length of the route.

The second destination was the place to which all the cars would proceed, and late in the afternoon they would there find the commanding officer awaiting them. He did not remember a staff ride in which any of the cars failed to turn up at the second rendezvous.

Composition and Disposition of the Corps.

The *personnel* of the Motor Volunteer Corps consists of twenty-four officers and eighty-nine members, besides adjutant and permanent staff. The equipment of the corps consists of forty-three cars and thirty-one motor cycles, the cars having an aggregate h.p. of about 600—an average of 12 h.p. per car. They consist of: Three Cléments, one Gladiator, eight Panhards, five Napiers, one Gamage, one Prunel, two Peugeots, three De Dions, two Lanchesters, two Wolseleys, one Miesse, one Deauville, one New Orleans, two M.M.C., three Mors, one Georges-Richard, one Wilson and Pilcher, one Locomobile, two Renault, and one Argyll. They range from a 50 h.p. Wolseley to a 2½ h.p. De Dion.

The motor cycles numbered twenty-one, as follows: Two Cléments, three Ormondes, one Werner, one Dennis, one Singer, one Kerry, one Morris, three Referees, one Excelsior, one Lougouda, three Bats, and three Minervas. Average 2½ h.p. to 3 h.p.

These cars and cycles were allocated as follows:

Invading force (Marlborough district): Sir Evelyn Wood's force. Umpire, Lord Roberts. General directing manoeuvres, Duke of Connaught. Foreign attachés. Cars thirty-three. Motor cycles ten.

Cosham: Umpire, Lord Grenfell. Cars seven. Motor cycles five.

General Sir John French's defending force. Cars seven. Motor cycles five.

It will be observed that Marlborough had by far the largest number of cars and cycles, the idea being to keep cars and cycles in reserve in case of a breakdown of arrangements. On the inspection day after the manoeuvres, every car and cycle paraded, which spoke well for their efficiency, for this was a much more severe test of efficiency than any reliability trial.

Honours for the Motor Cars.

The first honours of the manoeuvres fell to the corps, and probably to Mr. Ochs, for it devolved upon him to convey to General French at Petersfield the declaration of war from Marlborough. The final honours also fell to the M.V.C., for at the final conference all cars of the corps were requisitioned to carry Lord Roberts, the Duke of Connaught, and other staff officers from the field. Otherwise, after a hard day's work, the staff officers would have had to ride on horseback perhaps thirty miles.

Cars were requisitioned about seven o'clock at the camps for the purpose of conveying umpires. On leaving camp the members of the Motor Car Corps would drive the umpires distances varying perhaps from ten to fifteen miles, to the foot, probably, of some hill. The officer would then leave the car, mount his horse, and ride up the hill.

A great many of the cars were put at the disposal of the foreign attachés. Fighting over for the day, the officers would be conveyed to their meeting place, generally on some hill indicated by a captive balloon, and it was not always easy to find a road.

The Real Work.

The real hard work of the Motor Volunteers was during the three days preceding the actual fighting, when the opposing forces were gradually approaching each other, moving each night to a different camp, and the staff officers greatly appreciated being able by the aid of the motors to visit the probable location of the camp in the evening, which in previous manoeuvres they had been utterly unable to do, so that when they did arrive in camp they knew exactly all about it, having been previously perhaps two or three times before the troops arrived. On the second day the southern corps, to which Mr. Ochs was attached, moved from Petersfield to Abingdon Park (16 miles), the troops leaving Petersfield about eight o'clock in the morning. He had driven backwards and forwards some three or four times before they arrived.

The trying part of the work was passing through miles and miles of transports or troops on the march, for a speed of four miles an hour could seldom be exceeded; but it was very remarkable how splendidly they observed the rules of the road. It was a pity that such discipline did not apply to all roads in this country.

The part taken by the motor cyclists could not be overpraised. The work of the Motor Corps was nothing to it. They were often up all night waiting for despatches. To quote one instance. A certain general's position was not exactly where it was supposed to have been at the close of the operations for the day, and at the last moment all other commanding officers in various camps had to be informed. The telegraph after ten o'clock was not in working order, and therefore six motor cyclists were sent to the other camps with new instructions. Except for these the operations of the following day might have been delayed many hours.

During the manoeuvres distances were comparatively small, but a crack driver, a member of the club, covered 750 miles in four days without breakdown.

An officer having grumbled at the slow speed of his motor car, the crack driver's car was requisitioned, and the way that car went round corners and down narrow lanes was awe-inspiring. In the evening that officer did not grumble about the pace his car travelled.

On the whole, officers knew very little as to what the cars could or could not do, but they showed great confidence in the drivers. The crack driver in question was told off to carry a certain officer, and greeted him thus: "I am told off to drive you, sir, to-day." The officer then, as was usual, complimented the motorist on the appearance of his car. They always did. This particular owner, having apparently all his military ardour aroused, and being evidently of a somewhat bloodthirsty nature,

replied, "Yes, this is the car that killed a man in the Paris-Madrid race." It was reported that that particular officer, who had been through many fights in South Africa, and had been very nearly gaining his V.C., really confessed to the mess in the evening that he had never had such a fit of the blue funks in his life as when he entered the tonneau of that car. The car ever after became famous as the "man-eater."

One cold night an order came from headquarters that Mr. Walter Long, the President of the Local Government Board, wished to be conveyed to some neighbouring camp. Their esteemed colonel thought the opportunity was a very good one for improving the occasion, and for showing Mr. Long how simple it was to drive a car in the dark at twenty miles an hour, and a little over. True, it was a very cold night, and Colonel Mayhew reports that he heard Mr. Walter Long's teeth chattering, no doubt from the cold!

Lessons from the Manœuvres.

To come to a few words as to the build of a car for manœuvres: It should stand high from the ground; for there were many obstacles met with which could not be steered round. The car should be of high power, able to run on low speed without weakening the engine, as it was often necessary to drive at four miles an hour for many miles in succession. The tonneau should be a roomy one, for commanding officers preferred to keep their staff with them in their own car rather than following in a second car, for fear of breakdown. If cars could be built narrower than at present it would be an advantage. The use of motors in manœuvres, apart from carrying of officers, etc., gave an enormous advantage. They might be used for conveying ammunition from the park to the front, and some of the heavier cars could go beyond. They were used in the manœuvres with searchlights, though not altogether with success. The War Office did not seem to have been able to obtain efficient drivers. He saw two of these searchlight cars attempting to charge a bank, going close up to it, putting in their first speed, and hoping to get up. For scouting purposes, if rivers had to be forded

cars could run along the bank and aid the engineers in their work. In keeping up communications they could be of immense use. If Mr. Marconi could perfect his invention, how useful a car fitted with it would be! It could follow the commanding officer from point to point, and then send back a second car so fitted to the rear, with a message which could be replied to by wireless telegraphy.

The most important rôle for the motor car would be in hospital work. Mr. Ochs had to carry an officer, who had broken his leg, to a station one day, and very pleased the officer was to be able to travel in a car rather than on the top of a transport waggon. Nurses could be conveyed to and from the field, and all necessary medicaments with them.

In a recent examination paper on topography, set by the military authorities, it was stated a car would be available for reconnoitring purposes—a proof, Mr. Ochs thought, that the military authorities in this country fully recognised their utility. Cars belonging to the War Office were used in manœuvres. General French had one. The last the lecturer saw of it was in a river. Tommy Atkins had taken it down there to wash it, and could not get it up again.

The organisation of the Volunteer Corps could be improved upon. The Motor Volunteers should have their own workshop on wheels, and a skilled engineer to attend to repairs.

Encomiums.

The attachés formed a very favourable impression of their usefulness. England was the first country to have organised a motor volunteer corps for service recognised in manœuvres.

Mr. Ochs repeated the words of Lord Roberts in his speech after the inspection at Marlborough, "Without your help I do not think that the manœuvres would have been possible." For those interested in automobilism he could not think of anything more delightful than being a member of the Motor Volunteer Corps. It just gave the element of interest that was sometimes wanted, for one felt that it was of some practical use, and was helping to remove prejudice and popularising automobilism.

HEAVY MOTOR TRAFFIC.* The Discussion.

(Concluded from page 642.)

Major Lindsay Lloyd endorsed what Mr. Burford had said with regard to the internal-combustion engine. Looking at it from the military point of view—of course, they must expect the War Office to be behind the times—but they had been looking into this question, and it had been borne in upon them that the internal-combustion engine was the engine of the future for military purposes. The main thing of importance to them was the power of the vehicle to move along a road without external assistance, and without wanting constant renewals of fuel supply, and without having to stop and have a drink at every pump. They wanted a vehicle which, on its natural working weight, could travel long distances without outside assistance, and he thought that was only to be found in the internal-combustion engine. The steam engine constantly required water supplies, for they had not yet got a satisfactory condensing engine. It was to the internal-combustion motor that they were looking as a vehicle which would carry goods, not over English roads in time of peace, but over roads in other countries of all kinds and conditions in time of war. There were some difficulties in connection with the use of petrol, but they hoped shortly to get an engine that would use ordinary petroleum which was obtainable in any country. For many reasons he considered heavy oil was the fuel they wanted to use, and in that respect he hoped progress would be made, and was glad to say was being made. A good deal had been said about tare weight. What they should consider was not the tare but the maximum weight carried on the axle, and, having got that, what was the size of the axle and road wheels and the width of tyres on which they were going to put it. All legislation should be directed towards obtaining that the total weight of the vehicle with all on board was only

so much and no more, and he hoped any committee which might be formed would work towards that end.

Mr. Wallace, in proposing a vote of thanks to Mr. Smith, said he must endorse what Major Lloyd had said. The crux of the problem was, as Major Lloyd had pointed out, not the tare, but the total weight carried on axle and tyres of road wheels. Any scientific committee considering the problem would inevitably come to that conclusion. However, what he had really wished to speak of was the legal decision of Mr. Justice Grantham, to which Mr. Burford had referred. He supported Mr. Burford in saying that the decision should be upset. It had never been, as far as he knew, a principle of law that a man's having an ugly face was any cause for his being cast in damages, nor did he think it should hold in this connection. Turning to the question of the suggested committee on heavy traffic, such a committee would certainly be formed, and at once. Indeed, the reason it had not been done before was that the work was being done so well by the Liverpool body, and since the question of tare was unsettled, other branches of the motor movement required more advancement in the first instance. He hoped soon to see evolved such an internal-combustion engine as Major Lloyd desired, capable of being driven by the unskilled driver Mr. Smith had mentioned. It was a great pleasure to him to propose a vote of thanks to Mr. Smith, and he hoped that in passing it they would show how much they appreciated the very valuable work he had done for the automobile movement, especially in the department of organisation. (Applause.)

Mr. W. Rees Jeffreys, in seconding the vote of thanks, said he was in a position to make an interesting announcement which he would like to preface by a few general remarks. Might he say that the club had never neglected the heavy traffic movement, and, as no doubt they would

*A Paper read before the A.C.G.B. & L., on November 5th, by Mr. E. Shrapnell Smith.

remember when the Motor Car Act was before the House of Commons, a proposal had been made to members that an attempt should be made to have it amended on the lines suggested by Major Lloyd. The Government could not be induced to grant such an amendment, and had only given greater powers to the Local Government Board. Since then the matter had not been neglected, and he, in conjunction with Mr. Arthur Stanley—who had taken a leading part in forwarding heavy traffic interests—had been pressing it upon the notice of the Local Government Board, with the result that he had that very afternoon received a letter from Mr. Stanley stating that the President of the Local Government Board had consented to the appointment of a Departmental Committee to enquire as to heavy motor traffic and the question of tare weight. That was a great step forward, and would, he hoped, lead to some solution. He had been more than ever impressed with the difficulties of the heavy traffic movement, as he had within the past day or two heard of a firm who had been fined in a North London Court for having a waggon in use over the present tare weight, and, having been threatened with a heavier penalty for a future offence, had laid up their experimental waggon to await an alteration of the law. That was not encouraging, and he thought he was only echoing the sentiments of the committee when he said he thought the club should take steps to safeguard the interests of heavy transport users. For some two months he had had a scheme ready cut-and-dried, and had only been awaiting the psychological moment to produce it. From what had been said he gathered that it was the desire of heavy transport users to join together for their common interests, and now that they had got the Departmental Committee that would be more than ever necessary. One of the chief difficulties met with by traction engine users had been the closing of whole districts by local authorities owing to the closing of bridges to such traffic, and they had had to band together and fight the county councils on that point. He was afraid that, owing to the powers given the county councils to close bridges by the new Act, heavy motor users would have to fight the bridges question all over again for themselves, and with the additional disadvantage that they would not have the protection of an appeal to the Local Government Board. He was sure he was speaking for the committee of the club, when he said they would only be too anxious to do everything possible to help the heavy traffic movement. It gave him great pleasure to second the vote of thanks.

The Chairman, in conveying the thanks of the meeting to Mr. Smith, said he was sure they were all greatly indebted to him for the very excellent paper he had given them.

The Reply to the Discussion.

Mr. Shrapnell Smith, in replying, thanked the members very much for the kind reception they had given him and for the very appreciative remarks that had been made, as well as for the courteous manner in which the points in the discussion had been raised. Might he, in replying on those points, group them under heads? First, as to roads, he quite agreed with what Sir John Thornycroft had said as to the need for proper foundation of them. In this connection he might say that as long as the petrol lorry was confined to two and a half tons it could beat steam, and as far as loads went would probably always be a little lighter. The internal combustion engine had not yet, however, reached a point where it could bowl out steam, though he hoped that would come. Still, they had to deal with motor traffic as it was; not as it would be when the paraffin carburettor came into use. When that day came he could assure Mr. Burford that steam users would not be laggards in making use of the petrol engine. He conceded to Mr. Burford that the petrol lorry was lighter, but he didn't believe there were more than about twenty of them in use in the country, as against 1,000 steam lorries. With regard to the present limitations of tare weight, he quite agreed with Mr. Mayhew that in order to have paying loads they wanted it increased, so that seven tons could be carried on motor vehicles. He had, too, been most interested in what Major Lloyd had said, and he might point out that the Liverpool Association in their report of the 1900 trials had recommended the adoption of total weight instead of the existing tare. The reason they in Liverpool had kept pegging away at tare was because they knew that if they got a four or five tons tare they would get wider wheels and heavier loads. As to the appointment of the Departmental Committee, it might have the happiest re-

sults if it acted promptly, and did not keep them too long to the present tare limits, and might lead to their being able to produce a motor vehicle internally efficient and externally non-destructive. Referring to the decision in the North London Court mentioned by Mr. Jeffreys, Mr. Smith said he thought the case should not have been lost, and if it could be re-opened by the Motor Union, and a reversal of the decision obtained, it would be a very great gain to the heavy traffic movement. As to some of the general points raised by Mr. Mayhew and other speakers, he would ask them to remember that things moved quickly in connection with automobilism, and a vehicle which was quite up to date two years ago would be quite out of date to-day. They had to move with the times, as they gained greater experience, and he was quite confident that the heavy motor vehicle of to-day was an incredible improvement on that of two years or even a year ago. For instance, they scarcely found now what had been seen at that time—a motor waggon in which the pump was geared with the road wheels. Boiler and pump troubles were indeed becoming things of once in nine months instead of being of daily occurrence.

Mr. Mayhew interrupted to explain that the vehicles he had referred to had been built not more than five months ago.

Proceeding, Mr. Smith said, all he could say was that makers turning out such vehicles could not compete, and would be run off the market in a year. As to wheels, he had seen a lot of trouble with road wheels through going, as drivers would at times, at twelve miles an hour with a full six or seven tons load. The great trouble with wheels was the working loose of the spokes, but he had recently seen one wheel which solved that by the casting of the naves and spokes in one piece. He entirely agreed with Mr. Mayhew and Mr. Mackenzie on the question of fuel and the necessity for screening it, but when it came to having two trailers, he could not agree with Mr. Mayhew, as he thought it eminently desirable they should keep themselves distinct from traction engine users, as if they grouped themselves with them they would be not unlikely to arouse opposition. The motor lorry was distinct from the traction engine in use as much as in type, though, of course, they could pick out conditions of traffic in which the small tractor with trailers, advocated by Mr. Mayhew, would pay better than the motor lorry. He could not go quite so far as Mr. Mackenzie on the question of working days, as many people got more than two hundred and forty, and the possible number was on the increase. As to management, he thought Mr. Mackenzie had argued rather from the particular in the case of the owner of a motor waggon for his own use to the general in the owner having a stud for hire, whose supervisory expenses were bound to be very considerable, and whose lorries went out on long-distance journeys under varying and uncertain conditions. Turning to the internal combustion engine, Major Lloyd had put his finger on the mark when he said it was the "thing of the future." He hoped it would be of the immediate future, and he was sure the present users of steam would not be backward in taking it up. He wished to thank Mr. Wallace for his appreciative remarks on affiliation and other little matters, and said that if to Mr. Rees Jeffreys or to the club he could render any help in connection with heavy motor traffic, his services were always at their disposal. In conclusion, he would like to propose a vote of thanks to Sir John Thornycroft for presiding. Sir John was a man of many engagements, and it was a great compliment both to himself and to the club to have him in the chair that night.

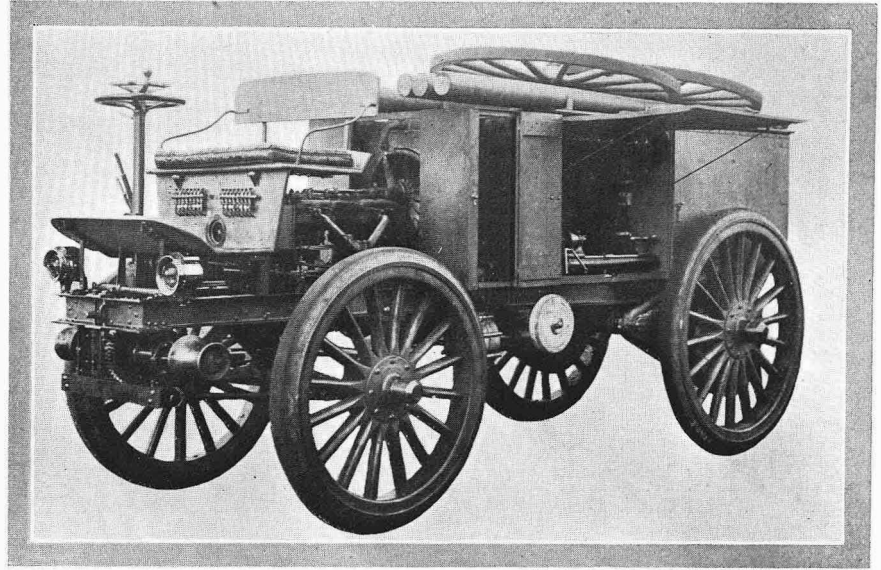
Sir John Thornycroft replied briefly, and the proceedings then terminated.

To-day, the 28th inst., two balloons will leave the Crystal Palace at one o'clock precisely, open to the members of the Aero and Automobile Clubs and Motor Volunteers. Prizes will be awarded to those automobilists who first succeed in a capture by touching the balloon car in its descent. Among those who will ascend to-day are Count Henry de la Vault, Miss Vera Butler, Mr. Frank Butler, Mr. C. F. Pollock, Hon. C. S. Rolls, Professor Huntingdon, and Captain Skeffington Smyth, D.S.O., Adjutant Motor Volunteer Corps.

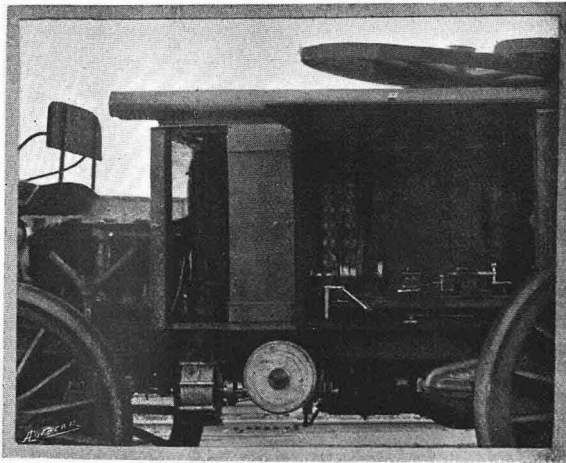
A MILITARY MOTOR WAGON.

An unique vehicle which underwent its trials at the hands of the United States Government is the subject of this description. The wagon, an illustration of which is given below, was constructed by the Long Distance Automobile Co., of Jersey City, N.J. The wagon was employed as a general utility van for the various craftsmen who accompany an army corps. The framework is constructed of channel steel, and is mounted upon four semi-elliptical springs. The motor has four cylinders, and develops 24 h.p., running at 800 revolutions per minute, which speed is capable of acceleration. The change-speed gear is of ordinary sliding type, and affords four speeds forward and one reverse, the high speed being about ten miles per hour. The chassis weighs just over two and a half tons complete. The box-like body contains fourteen compartments, in one of which is a small lathe, which is driven by an independent single-cylinder 5 h.p. motor. This motor also drives a small dynamo, which has an output capable of lighting

eight sixteen candle-power lamps. Two accumulators supply the ignition current. They are, of course, charged from the dynamo. The outfit comprises a portable forge, anvil, emery wheel, grindstones, blacksmithing department, two extra 50in. wheels for gun carriages (these are seen on the top



A view of the complete wagon. This shows the winch and winding drums, the propelling engine, and many other interesting details.



The auxiliary 5 h.p. engine, with the lathe and dynamo compartment.

of the body), six wagon poles, picks, shovels, lifting jacks, and a quantity of other small items necessary in field equipment. It will be seen that the doors are hinged at the top, and open upwards, and are carried on light supports, thus affording shelter to the men as they stand at their work. The lathe, which is shown more clearly in our smaller illustration, is mounted upon a movable bed, so that it can be withdrawn from the carriage so as to be more easily worked and yet remain perfectly steady. In the same compartment the dynamo and the electric ignition apparatus are carried. Across the front of the vehicle is fitted a winch with two winding drums. This is actuated directly from the propelling engine by means of a worm gear engaging with a worm wheel on the winch shaft. The wheels are shod with 5in. solid Fire Stone tyres. The wheelbase is 9ft. 2in., and the track 5ft. The total height is 7ft. 7½in., and the total length 15ft. Its weight complete is nearly five tons, and eighty gallons of petrol are required to run it a distance of 300 miles. It is the most complete wagon of its kind ever built.

The Newport (Mon.) County Council during the past twelve months has been electrically equipping the town tramway service. Much difference of opinion prevails among the councillors and citizens regarding whether it would be preferable to substitute a motor car service for the electric tramway which the borough is authorised by Parliament to make in the Stow Hill district. Stow Hill is an exceedingly stiff gradient. The district, however, is a

large residential one for the middle classes. The electricity and tramway committees so far have come to no final decision on the matter, but have authorised their manager, Mr. H. Collings-Bishop, to make enquiries on the suitability of an autocar service, and to pay visits to places where such services are being run. We hope they will bear in mind that the reliability of public service motor cars is now absolutely proved.

CLUB DOINGS.

The Automobile Movement.—A Conference convened by the A.C.G.B. and I.

The Automobile Club of Great Britain and Ireland has issued invitations to the various automobile clubs of the United Kingdom, inviting them to a conference to be held at 119, Piccadilly, to discuss the present position of the automobile movement and the manner in which the organised bodies of automobilists may best combine to advance it. The exact date of the conference has not yet been fixed, but it is proposed, if this should prove to be the most convenient date, to hold it during the third week in February, when the Crystal Palace motor show will bring many provincial automobilists to London. The various clubs have been asked to appoint two delegates each, and also to forward to the administrative secretary notice of any resolution or matter they may desire to have discussed at the conference.

Yorkshire A.C.

The fourth annual dinner of the Yorkshire A.C. promises to be a splendid success, the tickets being in great demand. The club room at the Great Northern Hotel, Leeds, is now in full swing, and may always be seen occupied by some of the club members. Mr. Herbert A. Jones, of Bradford, has promised to read a paper entitled "The New Motor Act and its Effect on Motorists," on Tuesday evening, December 8th. In illustration of his lecture he is arranging to have a large number of sample speedometers, new regulation lamps, etc., for inspection.

The Scottish A.C.

A combined list of office-bearers and members of the two sections of the Scottish A.C. has just been issued, from which it appears that the organisation has grown to very respectable proportions, under the presidency of the Right Hon. Sir J. H. A. Macdonald, K.C.B. There are eighteen vice-presidents, including the Duke of Argyll, the Duke of Sutherland, the Marquess of Tweeddale, the Marquess of Breadalbane, Lord Napier and Ettrick, Lord Saltoun, Lord Blythwood, the Earl of Dalkeith, etc.

Reading A.C. Annual Dinner.

Decidedly representative of the leading automobilists of the town and district was the company assembled at the annual dinner of the Reading Automobile Club, which took place at the headquarters in Friar Street on Friday evening last week. The president, Dr. J. Hopkins Walters, occupied the chair, and was supported by Drs. Truman, Deane, and Major, Messrs. Arthur Russell, A. E. Newton (hon. sec.), A. H. East, R. E. Rawstone, A. T. Cooper, Joyce, Pocock, Alexander, and J. Moniet. The President having given the usual loyal toasts, "Success to the Reading Automobile Club" was drunk at the invitation of Mr. R. Kenealey, and replied to by the Chairman and Mr. C. H. Dodd. Other toasts were "The Visitors," proposed by the Hon. Secretary, and replied to by Mr. Anthony New and Mr. Cooper; "The Officers of the Club," submitted by Dr. Truman and replied to by Mr. Newton (hon. sec.). The proposed federation scheme was discussed at some length. The club, it was stated, wished to rely on the borough council and county council for their assistance to further the objects of automobilism.

The Scottish A.C. (Western Section).

"The Ideal Touring Car."

At a meeting of the Scottish A.C. (Western Section) on Monday evening last at Glasgow, Mr. John M. Ross read a paper on "The Ideal Touring Car." His remarks were based largely on the necessities of an automobilist who looks after his car himself. He thought a touring car should be fitted with an engine capable of giving an average speed of twenty miles per hour on an ordinary give and take road, and which would climb hills at a good speed. This latter was more important than the ability to make high speeds on the level. It should also be able to climb any hill on its low gear, and capable of being driven slowly on the highest gear. Of tyres, he indicated a preference for pneumatics, and thought it necessary that every touring car, if used in all weathers, should carry some non-slipping device. In regard to the shape of touring bodies, he thought these should be tonneau, and the space under the seat should be reserved for luggage. The tonneau should be sufficiently long

for comfort, and locker accommodation should be provided below the seats. Facilities should be provided for carrying a reasonable amount of petrol, either in a spare tank or by fitting a removable box beneath the car to hold four or five tins. In the discussion, Mr. James Burns thought it was an advantage that a checking tendency should be placed upon speeds by the inability of cars to take hills at the same speed as level road. He was strongly of the view that solid tyres were, until a more perfect pneumatic had been invented, the more suitable for touring purposes. He related some personal experiences of six years' motoring without any mechanical assistance of any kind, and stated that, while he had suffered petty troubles, they could not be called serious, and he had formed the conclusion that break-downs of cars arose not from the fault of the cars, but from the lack of knowledge and experience of those in charge of them.

Affiliation and Federation.

Sir,—I have read with interest from time to time your remarks on this important topic, and think the advice you gave last week—to approach the A.C.G.B. and I.—was very sound. Perhaps there is too much dignity about the matter just at present, but on this question dignity may be left for the moment, and both sides step down and make an advance towards each other. If the prime movers in this proposed federation will but act on your advice, and show the club in what way the present affiliation is unsatisfactory, and if the club will meet the provincial clubs and "talk things over," we might have a single body instead of, as is now so probable, a regrettable parting of the ways. As founder and first secretary of the Lincolnshire Club—which, I am pleased to say, is a real success, and has done a lot of good in the county—I have taken a keen interest in the affiliation question, and got to know something about it. I do not think the 10s. 6d. per member is, as such, the stumbling block. The trouble is that the provincial clubs only pay, and cannot take part in the work. The half-guinea may be low enough payment per member, or far too much. It just depends on what is done. I know that serious discontent arose from the club not consulting its affiliated clubs in reference to the new Act, until it was too late to do anything. Will some member of the club enlighten us on the following points, which are, I think, those on which the split may occur:

Will the club state how many representatives—say per hundred or per fifty members—there may be on the club committee (or whatever it is that is to absorb the provincial clubs)?

What powers may the representatives have?

Will there be, say, four yearly general meetings of all the representatives?

Will a committee be formed to carry on the work, composed of members of the provincial clubs and nominees (a set proportion) of the club?

Will the provincial clubs act as centres and deal with all purely local matters?

Will the provincial clubs join with the club in all national matters, including such things as test cases?

Will the affiliated clubs become a body apart from the club (such as, say, taking the place, and name, of the Motor Union), and act in all but purely local matters with it?

Will the affiliated clubs be consulted on all matters affecting the movement generally?

I think that if these questions could be answered the members of some of the clubs at present affiliated might not be so anxious to break away, as at present seems to be the case. The action of the Manchester Club is highly significant, and an indication of the fact that affiliation at present simply consists of paying so much money. Whether the fee be a shilling or a guinea, the provincial clubs will not, as a whole, be willing to affiliate unless it is affiliation in fact, and not in name only. They are sturdy officers and good workers, and kick, not at paying, but at enforced inactivity. Cannot, then, your advice be taken, and the two (or is it three?) parties meet together and talk it over?

G. J. WILKINSON.

[The course which our correspondent suggests has been adopted by the convening of the conference referred to at the head of this page.—Ed.]

MOTOR CARS. By Alex. Govan.

On Saturday, the 14th inst., Mr. Alex Govan, the managing director of the Hozier Engineering Co., Ltd., makers of the Argyll car, read an interesting paper on "Motor Cars" before the Scientific Society of Glasgow. The meeting was very largely attended by engineers engaged in other branches than those touched upon in the paper. This being so, Mr. Govan had some difficulty in steering a middle course, so as not to weary those who were conversant with motor car practice, while at the same time bringing his remarks well within the compass of those whose knowledge of the subject was more limited.

At the outset, after briefly reviewing the history of self-propelled vehicles, the lecturer gave a lucid description of the method of producing petrol.

A large fire, said Mr. Govan, is kindled under a vat which contains thousands of gallons of petroleum. The first vapour that passes off is the petrol vapour. This is conducted through a worm surrounded by cold running water, where it is condensed, and afterwards runs into the washing tank. The washing process is to remove the impurities. Air is forced through a pipe at the bottom of the tank, and sulphuric acid is forced into the petrol at the top. This is allowed to go on until the petrol and sulphuric acid are thoroughly mixed, when the process is stopped. The sulphuric acid then falls to the bottom, taking with it the impurities. Any remaining sulphuric acid is removed by an alkali mixture, which in its turn is allowed to precipitate, when the petrol is considered ready for the market.

Should the process of distillation be hurried or the temperature raised too high, the spirit will contain a proportion of the heavier hydro-carbons, and should the spirit not be thoroughly washed it leaves a deposit of pitchy matter on the valves and sparking plugs, which may be the cause of much trouble to motorists. Temperature affects the gravity of petrol in the inverse ratio of two to one, that is to say, if the temperature is raised two degrees the gravity is lowered one point. It will be seen that during the winter months the gravity of petrol may be from ten to fifteen points heavier than during the warmest part of the year.

Carburetters.

Dealing with the parts in their natural sequence the carburetter was next described, and its principles broadly reviewed. The Krebs carburetter was described as being the first attempt to provide a variable air opening controlled by the speed of the engine. This device, Mr. Govan observed, permits the engine to be run quietly at a very slow speed, and ensures the maximum power being given off at any speed between the maximum and the minimum, owing to the fact that approximately the correct mixture of air and petrol is maintained. It would be observed that the success of the device depends to a large extent on the tension of the air inlet valve spring, and he would describe a method of absolutely fixing the air opening area for any speed. It is found when running at about 200 r.p.m. with a four-cylinder engine having 90 mm. bore and 120 mm. stroke, only a $\frac{3}{16}$ in. diameter air opening is required, and when running at 1,500 revolutions per minute, the air opening required is about $\frac{1}{2}$ in. Between these two points the air opening will enlarge in a direct ratio to the speed of the engine, so that this device has an auxiliary air opening which just begins to allow air to enter as the inlet valve on the pipe is opened. The correct amount of mixture for any speed can be fixed by suitably shaped ports when running maximum speed on engine described, the full air opening being $\frac{1}{2}$ in. diameter and ease of petrol jet .042. This shows a proportion of 27 to 1.

Ignition.

The high tension system of ignition was described as being the one which was more generally used. The coil, accumulator, and commutator were all dealt with. Magneto ignition was mentioned as being often fitted, but its chief objections were that the moving parts were so small that after a short period of running they gave considerable trouble.

The Engine.

The motor itself was next dealt with, and many interesting points were brought out. Mr. Govan strongly advocated the use of high speed engines—a point which appeared to have a disconcerting effect upon those of his audience whose ideas were bound down to the slow moving engine. To build high speed engines satisfactorily, said Mr. Govan, was merely a question of design, material, and workmanship, and it was pointed out that on the first introduction of the high speed engine protests were loud and long against even running at a thousand revolutions per minute by those who had been in the habit of running their engines at slower speeds. These latter had since increased those speeds, in many instances to a thousand r.p.m., while those who originally ran at that speed had gone as high as two thousand r.p.m. While dealing with speed, comparison was made between the piston speed of a locomotive engine travelling at sixty miles per hour and that of a petrol engine running at 1,500 r.p.m. Assuming the locomotive to have a 26in. stroke and a 6ft. driving wheel a calculation showed that the piston speed was no less than 1,213.3ft. per minute. A petrol engine having a 120 mm. stroke only made 1,180ft. per minute. So that the figures proved the piston speed of the high speed internal combustion engine to be 33.3ft. per minute slower than was the case in the modern locomotive. Perhaps we may be permitted to say that Mr. Govan took an extreme case in instancing a 6ft. driving wheeled locomotive, but in any case the comparison is favourable to the high speed motor. Still working on the same data Mr. Govan showed that the surface speed of the crankshaft bearings in the locomotive engine having a crankshaft of $\frac{6}{16}$ in. diameter was 467.46ft. per minute, while that of a petrol engine having $\frac{1}{16}$ in. nickel steel crankshaft running at 1,500 r.p.m. gave 441.25ft. per minute. So that the surface speed of the crankshaft bearings in high speed motors was 35.21ft. per minute slower than in the locomotive. It had often been noticed by the general public that there was apparently an excessive amount of vibration from an engine when the car was standing, this disappearing when the vehicle began to travel, and becoming practically non-existent at high speeds. The reason of this was very clearly shown. The lecturer pointed out that the weight of the vehicle acted in a similar manner to a flywheel which ran steadily at high speeds, thus tending towards steadying the car. When climbing hills on the low speed, however, this velocity was lost, and so an increased amount of vibration was again felt.

Bore and Stroke.

On the very debatable question of bore and stroke, Mr. Govan spoke as follows: Practice has proved that good results are obtained when the stroke is $\frac{1}{4}$ in. greater than the bore, and good results are obtained by making the length of the stroke even beyond this, the speed of the engine being maintained by opening the exhaust valve early. There is no exact data yet to show if there is any gain in making the stroke much longer than the proportion indicated. No doubt this proportion shows greater efficiency than when the bore and stroke are equal. As a general rule it may be taken that the longer the stroke in proportion to the bore, the earlier the exhaust valves must be opened, but as the stroke is increased within limits greater advantage can be taken of expansion.

If it is desired to run the engine up to 1,500 revolutions per minute, the exhaust valve should open when the connecting rod is at the angle of eighteen degrees from the perpendicular, and the fire would take place in the compression chamber in some cases as early as fifty degrees from the perpendicular.

A two-cylinder engine having a bore of 90 mm. and a stroke of 120 mm. will give 11 b.h.p. at 1,500 revolutions per minute, and taking the efficiency of the engine to be eighty per cent., being 15.751 h.p., this shows a mean pressure of 62 lbs. per square inch. The compression before ignition is 60 lbs. per square inch, which runs up to 150 sq. lbs. at the point of firing. The weight of the engine is 194 lbs., or 17.7 lbs. per horse-power.

(To be continued.)

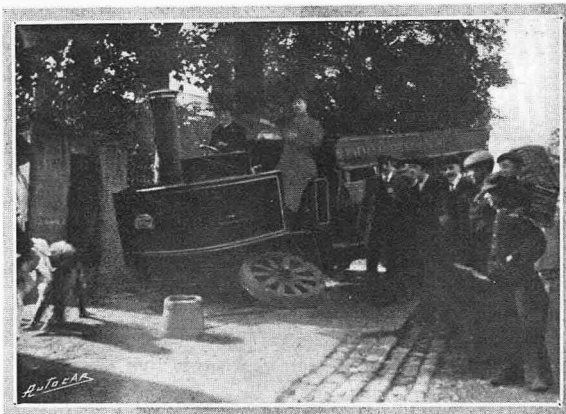
POLICE TRAPS.

Methods of Motor Catching.

A Kingston-on-Thames reader writes: "The following is the intelligent method of timing (?) motor cars in this district, as told to me, in confidence, by a constable who, in company with a sergeant, was recently "motor catching." The measured distance is two hundred yards; the men stand about two hundred and thirty yards from the starting point, the sergeant holding the watch. In order to make sure that the car has passed the mark and to give the driver a fair chance (!) they allow two seconds to elapse before starting the watch, which is stopped as the car reaches a point about thirty yards from where they are standing, which distance gives them time to refer to the watch and note the speed. With a flying start it would be possible to cover a considerable distance in that two seconds, thus showing the mileage per hour greater than it really is, even assuming it to be a truthful two seconds. Also I fail to see how the police can determine the exact moment at which the car passes an object whilst looking up the road a distance of two hundred and thirty yards. I say up the road, for I generally notice it is at the foot of a hill or slope that these traps are laid, but perhaps this is adjusted according to the requirements. I also understand that a constable always corroborates the statement of his superior officer. I happen to be a driver, although at present disengaged, but at the time I gleaned the above information I was just an ordinary cyclist, and I have warned many motorists on fine Sunday mornings."

We are advised of a police trap between Preston and Lytham, on the Preston side of the Lea Gate Inn.

A motorist has been trapped and fined for traveling beyond the legal limit on an unfrequented road at Bramber, near Steyning, West Sussex.



There have been some grossly exaggerated reports of the accident which occurred to a steam lorry at Forest Hill. Mr. W. Halcot Hingston, in sending us the photograph we reproduce above, tells us that the vehicle was coming down London Road, Forest Hill, a fairly steep decline when a pin in the steering gear broke, rendering the machine unmanageable. The vehicle ran into the kerb with considerable force, breaking the front axle and both the front wheels came off. Luckily, there was no traffic about, and no serious damage was done, but it shows how necessary it is that the steering of any motor vehicle, even a comparatively slow moving steam lorry, should be to all intents and purposes proof against failure. It does not matter how smart a driver may be, he is helpless if his steering fails.

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 19th of November, 1903. All notices of opposition to the grant of patents on the several applications should be filed not later than the 4th January, 1904.

- 1902.
- 23,165.—C. Jenatzy. Magnetic clutch.
 23,307.—R. Biggs. Hand shield to fix on the handle-bars of a motor bicycle.
 23,774.—F. W. Lanchester. Turbine to be operated by exhaust gases of motor.
 24,471.—E. F. Durrant. Double-acting explosion motor.
 25,409.—H. R. Greiner. Condenser of corrugated pipes.
 25,810.—A. Hopton. Attachments for ends of wires in tyres.
 25,951.—W. Balassa. Tyre composed of solid balls attached to rim.
 26,212.—E. H. Seddon. Pneumatic tyre and means of securing same.
 26,707.—T. G. Smith. Heating device for vaporisers.
 27,324.—F. W. Thomas. Skid block or sprag to be lowered on to the ground close to the wheel.
 27,628.—P. V. A. Thezard. A vent is placed opposite sparking-plug points to allow burnt gas to escape.
 27,803.—R. Wick. Expanding clutch.
 28,134.—H. Swiers. Coupling for attaching two motor vehicles together.
- 1903.
- 477.—F. W. Lanchester. Carburetter with a number of vertical wicks.
 1,278.—D. W. Combs. Attachment for heavy motor vehicles to assist their getting clear of gullies, swamps, etc.
 4,913.—F. H. Coleman. Swing cranks for motor cycles.
 8,286.—C. O. Hedstrom. Automatic carburetter with jet arranged in centre of float
 11,655.—F. Hardenbrook. Motor with exhaust valve controlled by variation of lift.
 16,576.—R. B. Price. Method of and machines for putting solid tyres on vehicle rims.
 17,098.—L. Azulay. Tyre with horse-hair cloth inserted between air tube and outer cover.
 17,341.—J. L. Parker. Rotary digger driven by a motor.
 17,398.—C. A. Bush. Autocar having transverse engine driving through crown and pinion gearing on to rear wheels.
 18,294.—F. E. Hall. Motor in which connecting rods thrust upon a tilting disc, a central extension of which works upon the motor crank pin.
 19,701.—W. P. Thompson (N. Pedersen).—Governor in which an increased delivery of a pump is caused to act on throttle valve.
 20,055.—F. W. Brampton. Wood wheels, the hub of which is expanded by an annular wedge of molten metal.
 20,502.—P. B. Schiller. Governing device arranged on motor crankshaft.

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