THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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THE AUTOCAR.

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"THE AUTOCAR" SUBSCRIPTION RATES.

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Notes.

Non-stop Runs.

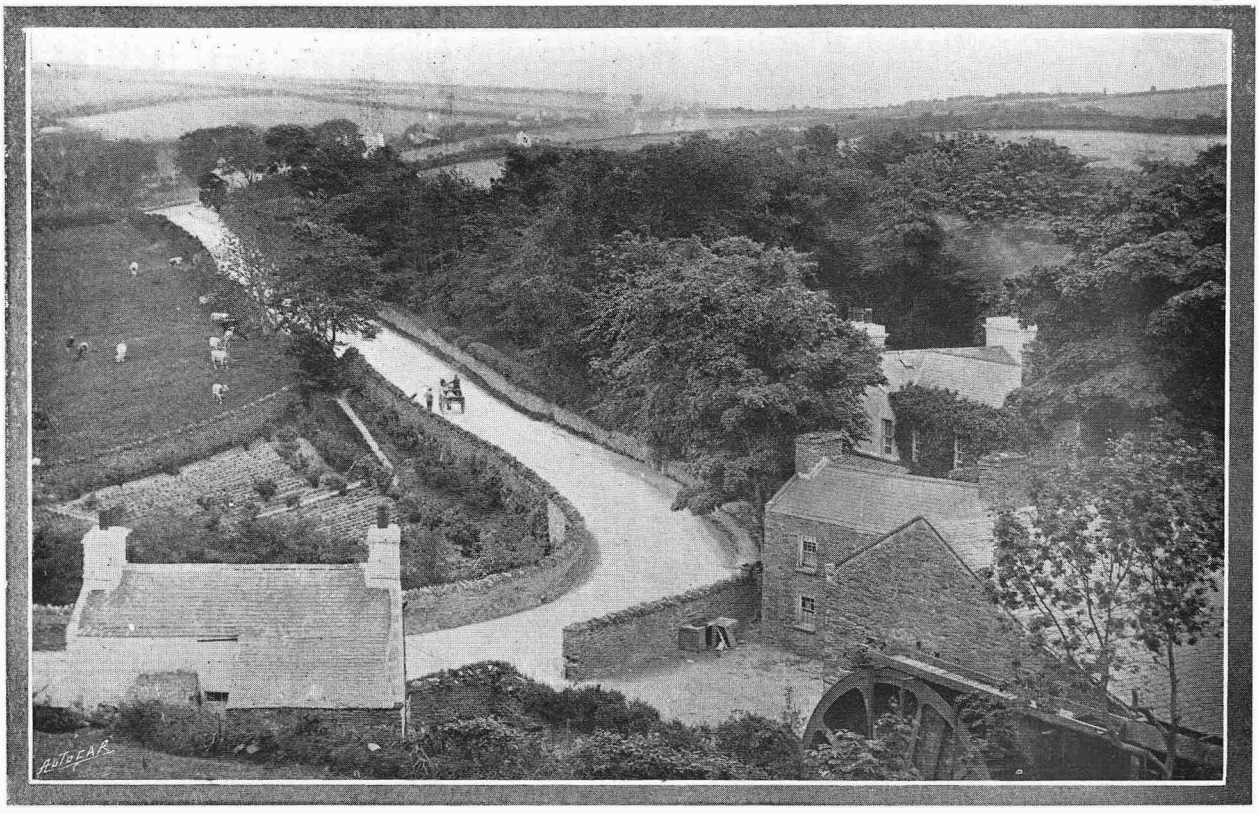
Judging by the way the year has opened, there is at least a possibility of long drives taken to demonstrate the reliability of a car being overdone. It is a very fine performance indeed to run four hundred or more miles without a single stop; but, good as it is, four hundred miles is only a small item in the life of a car, and we think it is quite undesirable that too many feats of this kind should be attempted. As there will be the Scottish Automobile Club's non-stop run from Glasgow to London in May, we should advise any who contemplate making a long non-stop run to reserve their energies for this occasion. In this trial a stop is compulsory at approximately half distance, and it is better that it should be so, for no good purpose is served by driving on for ten hours or so after a good thing has been overdone and when nature craves for rest and change. Two runs of two hundred miles each without a stop are, so far as the everyday user is concerned, as good as four hundred miles without a stop. Luckily, no car other than a thoroughly good one has hitherto accomplished the run from London to Glasgow or Edinburgh, or *vice versâ*, without a stop; but it is quite conceivable that the feat might be performed by a comparatively poor vehicle, the real difference between the good and the indifferent car not being apparent. That is to say, a good machine would be none the worse for the run, but a poor one would have appreciably shortened the period of its existence, though by dint of specially careful preparation beforehand and good driving throughout, it might have been run from capital to capital without a single stop.

The Cost of Repairs.

A matter to which those British makers who have not directed special attention should give very careful thought is the question of repairs. It would be expected that this work would be less costly in the case of a car of home origin than when the complete car was made abroad; and yet this is by no means always the case. This arises from a variety of causes. Among them may be mentioned the fact that where a car is home-made the owner nearly always sends it to the works for repair, and, it must be confessed, from the reports which we receive from owners that in some factories it would appear the repair department is not so well organised as it should be. On the other hand, if the car is made abroad, it is, in case of any important work being required, usually sent to the British agent, who in many cases has arranged special facilities for prompt and reasonable repair. He feels that he must do this if he is to compete with the home manufacturer. It often happens, therefore, that his repairs are not only more carefully carried out than those of the home maker, but that the prices charged are much more reasonable. Of course, it may be urged that many users treat their cars most unfairly, and are astounded at the high cost of the repairs which have been entailed entirely through their own violent usage and shameful neglect. This is perfectly true, and it applies to British and foreign cars equally. The point we wish to emphasise is this, that so far as the home manufacturer is concerned he has everything in his favour when it comes to the renewal and repair of a car, and he should never compare unfavourably with a foreign manufacturer in this respect. However, he sometimes does so, and as this is the case, it is a matter to which he would be well advised to direct his attention. In doing this he will not only benefit himself but relieve many private owners of a good deal of annoyance and delay, caused in the past merely by the fact that his repairs department is not systematically organised. Not only so, but the spread of automobilism will be hastened on, as there is no doubt whatever that many would-be purchasers are deterred from buying cars quite as much by what they hear of the running expense entailed by the cost of maintenance as by the first cost of the car itself. Many are willing enough to make the initial outlay, but they do not care to contemplate the high charges for renewals or repairs.

THE GORDON-BENNETT ELIMINATING TRIAL.

VIEWS ON THE PROPOSED ISLE OF MAN COURSE.



A sharp turn at the bottom of Baldrine Hill. The curves and gradients which the proposed Isle of Man course for the eliminating trials for the Gordon-Bennett cup contain are well depicted in the photographs here reproduced, and show the course to be an excellent one for the purpose of such a trial. Other views of the course are given in this issue.

A curve in the road at the Dhoon Hotel.

USEFUL HINTS AND TIPS.

How to Test Compression.

The testing of the compression is a somewhat difficult operation to obtain satisfactory results, as so many elements enter into the conditions. These we will touch on after describing how compression may be tested. The piston should be freed in the cylinder by injecting a small quantity of petrol, or for this purpose paraffin is possibly much superior, on account of its having some lubricating properties, as well as being a cleansing medium. The starting handle should be put into engagement, and should be revolved until resistance is felt on one upward stroke only. It is by the amount of resistance which is felt on the starting handle that the amount of compression in the engine may be judged. In order to obtain a correct idea of the amount of compression there is in the cylinder, a slow steady pull should be given to the starting handle —not a sharp quick jerk such as is necessary in the starting operation. In order to free the valves and to get the engine as nearly as possible into its free working condition, two or three sharp revolutions by means of the starting handle may be given to the engine, after which the compression stroke should be felt, and then a long steady pull on the handle taken, from which to judge the amount of compression. In doing this, the operator can steady himself by placing the left hand on the front part of the dumb iron, while with the right hand he grasps the starting handle. The amount of compression in the cylinder is judged by the length of time occupied in overcoming the resistance. Incidentally, the power of the operator is a factor which also enters into one's judgment. For a two, three, or four-cylinder engine, it is necessary that each cylinder should be tested independently. This is more easily done by inserting between the valve-lifter and the valve stem on the exhaust side two copper coins, which will give a sufficient lift to the valve to prevent any resistance from those cylinders which are not being tested beyond the normal frictional resistance. By this means each cylinder may be tested separately.

Another Method of Testing.

Another method is to remove the sparking plugs. This may possibly in many instances be a more simple operation than that previously described. We said before that many conditions entered into the judgment of the amount of compression, as usually tested, so that one might easily misjudge the length of time which elapses between the compression being felt and its release by depending merely on the physical strength of the operator. The latter is a very essential point. For what to a moderately muscled man may seem a high compression would to a man in good training be a mere nothing. So that, altogether, the testing of compression by these methods is at best very unsatisfactory.

Correct Testing.

The only satisfactory method of ascertaining the correct compression in the cylinder is to have an adapter made to fit into the sparking plug orifice, this attachment carrying a small pressure gauge such as is used for tyre inflation, the dial of which is marked up to 100 lbs. per square inch. This should be sufficiently high for most engines. The gauge itself should be screwed into the adapter, so that the extra amount of compression space obtained by the use of the device may be as little as possible. It only now remains for the gauge to be screwed into the cylinder, and then for the operator to watch the highest point to which the index registers, in order to obtain the exact amount of compression of the particular cylinder under test. This figure, of course, will not correctly indicate the amount of compression which will be present when the engine is actually working. In this case, it will be higher than that indicated. Incidentally, we may mention that suction may also be tested in a similar manner by the fitting of a gauge, the dial of which is marked below zero, and not above as with the compression indicator. No hard and fast line can be given as to the amount of compression which should be registered, for this varies with many engines according to the speed at which they run, and the diameters of their flywheels to a certain extent. The average compression, however, is about 75 lbs. to the square inch. The most satisfactory and practical way of finding out the condition of one's engine is to test the compression when the engine is in good going order, and to make a record of the compression and suction (if tested), and to use these as standards of comparison when the engine is out of order and needs attention, in the manner already indicated. Measures must then be taken, previously described, to restore the engine to its normal condition of working.

Grinding-in and Reseating the Valves.

In order to re-establish the compression when the valves are found to be defective, these should be re-seated by grinding with the aid of oil and flour emery. Great care should be exercised in carrying out this operation. At various times we have seen advice given to make a paste of flour emery and oil, to place this on the angular face of the valve, and then, replacing the valve stem in its guide, to commence grinding operations. Now, this treatment is altogether too severe, unless it be resorted to when a valve is in such a bad condition as almost to necessitate its being refaced in the lathe. A preferable manner is to lubricate the face of the valve, and then, dipping an oily finger into the flour emery, transfer as much of the abrasive material as adheres to the finger to the face of the valve. This provides quite sufficient emery to commence operations with. The valve should be turned on its seat—by the use of a screwdriver or a special tool provided by the makers—either with a circular or half-circular motion, light pressure being brought to bear upon it at the same time. At frequent intervals the valve should be lifted from its seat to prevent any hard particles which may possibly be in the emery causing rings to be cut on the face of the valve and its seat. It will always be found after lifting the valve that a new cut is on the emery, and this will gradually wear away until it appears to have lost its cutting edge, but the lifting of the valve will again prove that this is not the case. During the whole of the grinding-in operations, plenty of oil should be used, and when the condition of the valve face and its seat is perfect (this being indicated by a bright and equal surface extending over the whole face of the valve) the seat of the valve itself should be well washed with petrol, great care being taken that no particles of emery are washed into the cylinder. If this should happen, it is very possible that the piston and the cylinder will become badly cut by such emery, and the foundation will be laid of a lot of trouble, and there will be a permanent loss of power through bad compression.

(To be continued.)

THE 1904 GARDNER-SERPOLLET CARS.

Year by year M. Serpollet introduces improvements into his steam cars, and this year, wishing to keep at the head of the list, some interesting changes have been made in the car.

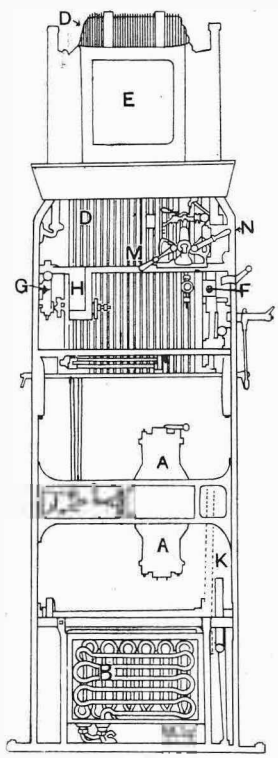
There are three special types for this year's production, namely, 40 h.p., 15 h.p., and 9 h.p., the last of which is the most novel. Here simplicity is the order of the day, and M. Serpollet has set to work to realise it to the full extent in this small vehicle.

To carry home this idea to his customers, the 9 h.p. chassis is called the "Simplex," and its chief recommendations are the facility with which it can be driven, the simplicity of its construction, and the economy in fuel required to drive it. All the mechanism, including the motor, is placed in the centre of the chassis, and the old mechanism for working the pumps has been abolished, as also have the pump camshafts and the levers belonging to them. In this manner the continual errors and difficulties of driving the car, and the bad results produced by allowing too much fuel to be supplied to the burners with its consequent smoke and reduction of power have disappeared, and have been replaced by the following simple contrivance which does away with all the difficulty mentioned above.

The petroleum feed pump being abolished, it is replaced by a constant air pressure of half a kilo per square centimetre, or about two and a half pounds per square inch applied in the petroleum tank. Before reaching the burner the petroleum passes through a distributing box—which is provided with a certain number of little holes. These little holes can be opened or closed at will by the driver by means of a slide which is moved as is necessary. When this slide is closed there only remains a very small opening, and this is the position of rest, with the burner only just alight. In the three other positions, that is to say, openings 1, 2, or 3, the petroleum is supplied at the rate of four, eight, or twelve litres an hour, and this supply of petroleum corresponds strictly with the power it is necessary to produce. In this manner it becomes impossible to waste the petroleum and to overcharge the burner.

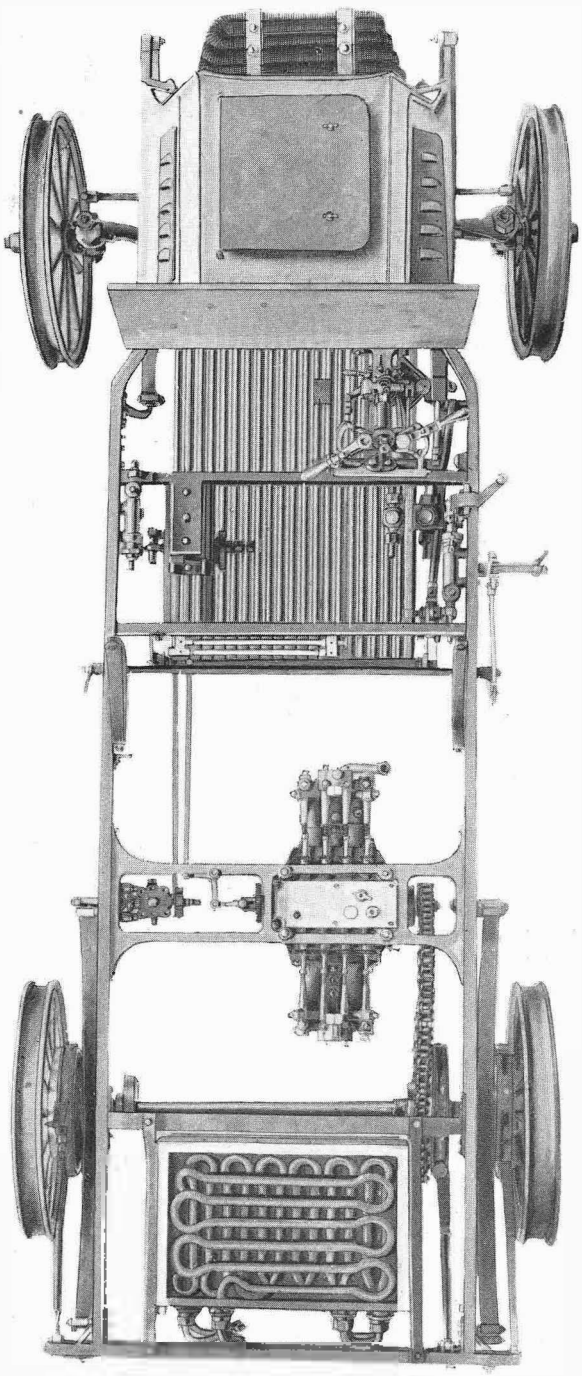
The pump, which, in the old Serpollet, supplied water to the boiler, being done away with, we shall see what arrangements are made to replace it.

Alongside the distributing chamber for the petroleum described above, there is a second distributing chamber for the water, and these two are worked by the same lever, and opened and closed together, so that a series of holes determine the quantity of water allowed to enter the boiler, and the surface of these holes is calculated in such a manner that it corresponds precisely with the quantity of petroleum received by the burner, and the consequence is that, the amount of water vaporised and the amount of petroleum required to vaporise that amount of water is mathematically proportional, both quantities being regulated by a single lever under the control of the driver. After having passed through the distributer,



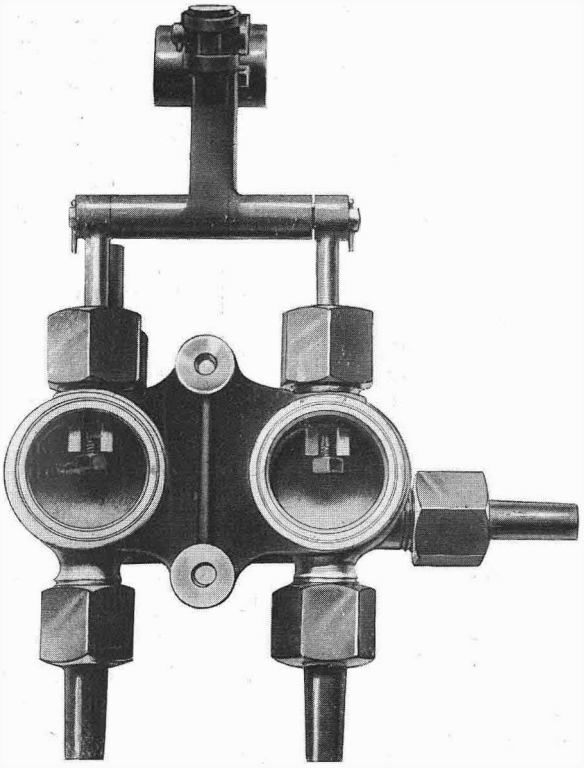
Key plan to the Serpollet-Simplex chassis.

A A, motor
B, steam generator
C, hand pump
D D, condenser tubes
E, water tank
F, oil and fuel distributer
G, water pump to generator
H, automatic lubricator
J, separator
K, driving chain
M, forward and reverse lever
N, lever controlling distribution valves



Plan of the Serpollet-Simplex car.

the water enters the cylinders of a pump which has a fixed stroke. This is always at work when the car is in motion, and is mechanically driven by an eccentric fixed on the back axle. All this pump has to do is simply to deliver to the boiler the water that it receives



The Serpollet-Simplex water and fuel regulator valves.

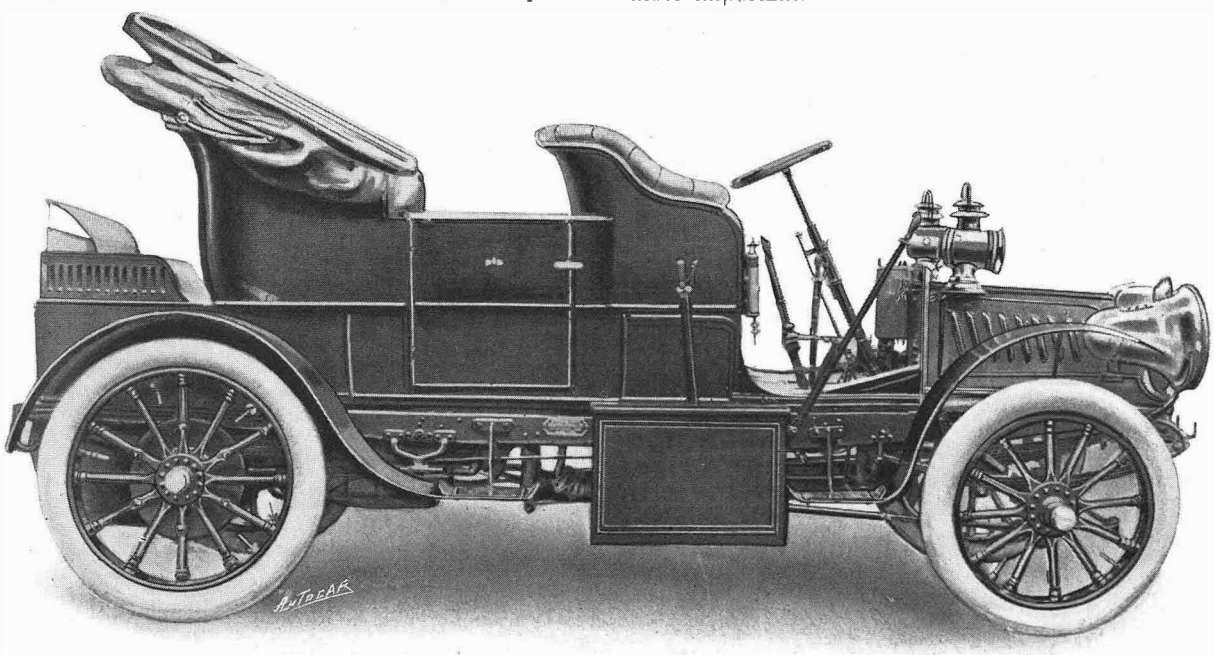
from the distributer, and it will thus be seen that there remains little or nothing for the driver to do. He hardly requires to think, and it is almost impossible for him to make an error, and he is not called upon to judge the comparative sufficiency or the insufficiency of his fuel and his water.

The supply of water and petroleum which is carried by these cars is calculated for a half day's run at the rate of twenty-five miles per hour. The Simplex can attain a speed on the level of thirty-eight miles per hour. The chassis is mounted on equal wheels, with 90 mm. tyres.

The 40 and 15 h.p. cars are made somewhat on the same model, but we will deal first with the 40 h.p. This has stamped steel frame, mounted on axles, with a width of 3ft. 6in. from wheel to wheel, and the length of the wheelbase can be from 6ft. 6in. to 6ft. 10in. The steering gear is irreversible, and the system of operating the pumps for the proportional supply of water and petroleum is worked by an eccentric, which furnishes a proportional supply of water and petroleum from zero right to the maximum by the simple moving of one lever, which operates a Stephenson link gear. The steam generator is short and wide, and thus reduces greatly the encumbrance of the back of the car. It is supplied with a light burner made of steel with forty jets, heating a very large surface, so that the production of steam is very rapid. There is a light condenser to which a radiator is attached, and which is placed under the bonnet in front of the car, and which condenses a large amount of steam.

The 15 h.p., as previously mentioned, is almost identical with the 40 h.p., and has the same chassis, the same steering gear, the same width, and wheelbase. It has the same bonnet, but the generator and all the parts at the back of the car are very much reduced in size and weight. The generator and burner are made on the same model as those of the 40 h.p., and both 40 h.p. and the 15 h.p. are provided with a little supplementary pump, which entirely does away with the hand pump, so disagreeable to work and so unsightly.

All lovers of steam will be pleased to see that M. Serpollet is determined to keep on improving his system. Each year has marked an advance, and the simplification of the working now accomplished is one of the most important.

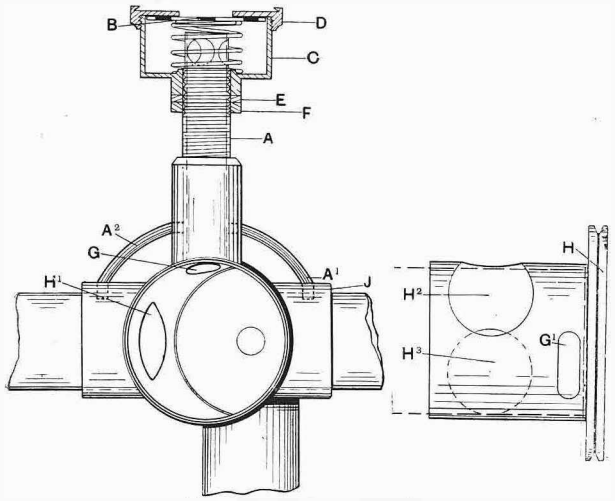


The 40 h.p. Serpollet-Simplex car, with a latest pattern body.

AIR VALVES FOR CARBURETTERS.

THE DOYLE VALVE.

This is a valve whereby the dilution or otherwise of the charges of explosive mixture drawn into the cylinders may be regulated. It is fitted to the motors of the Brush Co.'s cars, and, indeed, is an invention of their motor car expert. Mr. Doyle has been led to the design of this valve by the conviction that the high temperatures attained by portions of the induction pipes exert a considerable influence upon the density of the charge induced, and consequently upon the power of the motor. The action of this valve tends to keep the temperature of the mixture low. The valve also acts as an additional air valve, admitting air in proper proportion as the speed of the engine increases. When coasting with the engine throttled and clutch in, the valve can be caused to permit the passage of cold air to the cylinders by means of the bypasses, thus relieving the engine and scavenging the cylinders. The engine of the Brush car which ran in the thousand miles trials was fitted with one of these valves, and when the cylinders were dismounted for inspection the pistons and rings were found in a remarkably clean condition, and free from carbon deposit.



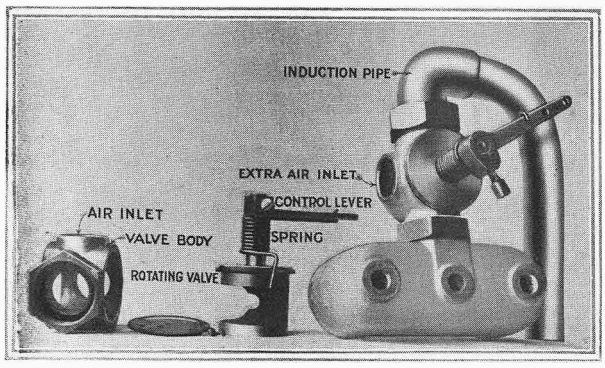
The Doyle carburetter valve.

A, valve body
A A², air by-pass
B flat valve
C, valve chamber
D, valve cap
E and F, lock-nuts for holding valve in adjustment
G G¹, air ports
H, hand throttle connection
H¹ H² H³, mixture ports

The accompanying diagram shows a Doyle valve in section, as fitted to the induction pipe of a 30 h.p. Brush motor. It is connected by the hollow stem A, upon the exterior of which a thread is turned for the purpose. The valve itself consists of a plate valve B contained within the cylindrical body C, and held up against the underside of the cover D by the light spring shown. The cover D is made with a central aperture normally closed by the plate B, which is of equal diameter to the inner dimension of the body C, but has its circumferential edge serrated to allow the passage of air. The strength of the spring holding up the valve plate B can be adjusted by rotating the body C on the valve column A. The valve is adjusted with the engine running, and the cap is locked in position when the best adjustment is obtained. It will be seen that with proper adjustment the valve B will open and admit air to the induction pipes proportionately to the engine piston speed, while when the hand throttle H is entirely closed the suction of the pistons will still open the valve B, and cold air will gain admittance to the cylinders *via* the bypasses A^1 A^2.

THE COOKE AIR VALVE.

Messrs. Cooke and Wade, of Cutlers' Hall, Sheffield, are making a fitment for the induction pipe of any car, the functions of which are to act as an "air regulator, economiser, and cooler." It is also claimed that this device acts as a pneumatic brake when the car is descending steep gradients. It consists essentially of a three-way cock, two openings of the cock being in the line of the induction pipe and the third at right angles to it. Thus with the tap in its normal position there is a clear passage through the induction pipe, but the auxiliary opening is quite closed. When in action, the cock gradually opens the third orifice, and so admits pure air to the induction pipe, thus correcting the mixture should this be too rich. The extreme position of the cock shuts off the induction pipe completely, and pure air only is drawn into the cylinders. In the application of this device, the lever attached to the cock is connected to the governor, which, as the speed of the engine increases, causes the extra air orifice to be opened, as before explained. In order to get the best effects in hill-climbing, an accelerator pedal action should be fitted in order that the engine may get a full mixture when climbing.



Details of the Cooke air valve.

It is interesting to note that the Gordon-Bennett Panhard cars are being made with live axles. In this respect they are certainly following 1902 Napier practice, as the 1902 Napier which won the Gordon-Bennett race was the first powerful racing car ever built with a gear drive throughout instead of chains for the last drive. Of course, Renault, who won the Paris-Vienna race, had the gear drive. He was not, however, in the 1,000 kilogs. or heavy category, but in the light car class, so that the honour belongs to England of first demonstrating that the gear drive could be satisfactorily used for cars of greater weight and much higher power and speed than had previously been possible. The Hotchkiss racing car, too, will have a direct drive.

SOME PRIVATE RELIABILITY TRIALS.

By Fred T. Jane.

I have been carrying out some private reliability trials with a M.M.C. car on those points which I contend affect private owners driving their own cars.

The car is a two-cylinder 10 h.p. (14.8 b.h.p.) M.M.C., 1904 "special model," with a 20 h.p. body, specially strengthened frame, and a variety of minor improvements on the 1903 10 h.p. M.M.C. I allowed four days to learn to run it, and then began my trials, the central idea being to run the car hard daily for a month. I attempted no lengthy non-stop runs; I am not lunatic enough to want to sacrifice meals for the sake of fancy records. I got the car for pleasure; so when I felt inclined to stop, I stopped.

Distance run in Thirty Days (approx.) 1,200 Miles.

Consumption.—Thirty-two gallons of petrol (Pratt's A), which gives an average of thirty-seven miles per gallon. I had the air full on all the time. My best record was Portsmouth to Guildford (forty-one miles) on, as near as I can calculate, one gallon only, for I was only able to put half of a two-gallon tin into the tank here. The car is extremely economical.

Speed.—I had 16-tooth sprockets to begin with. The car would only take the top speed with these, with a slight downhill on which to get into it. Speed was very high thus, but as the roads grew heavy I substituted 14-tooth sprockets, on which the most the car can do is about thirty-five, I think; but it is still too highly geared perhaps, as getting the car into top speed is rarely as easy as I would have it.

Hill-climbing.—With the 16-tooth sprockets the car did Liphook to Hindhead (the Huts) in 14m. 20s., four up (second speed). Portsdown Hill (one in seven) the car could not do on the second; with the 14-tooth sprockets it cannot do most of it on the second. I have found nothing that the car cannot get up on the first speed, even if stopped halfway up and started again, but it is a very slow climber on it with four up. I should never call the car a fast hill-climber unless rushed. "Rush" distance on the top speed is approximately a hundred yards.

Starting.—Always on first turn of handle when warm. I have had inlet holes bored on top of inlet valves to admit paraffin when the car is cold, and thus usually start it at once cold. Before that the car took from four to six turns in cold weather. No backfires experienced.

Plugs.—I had at first a great deal of trouble with De Dion plugs, which fractured the porcelain. On examination, I found this due to the plugs being screwed in too tightly. No trouble now. I have never had any bother from sooting, and have run five hundred miles without taking out either plug.

Water.—Very slight loss. About one and a half pints per week is used up. I have ordinary radiators. Pump once gave a little trouble from lack of grease, but was never touched again during the trials.

Commutator.—Has never given any trouble. It is inconveniently placed in front of car, but with a shield over it.

Engine.—No trouble at all. Moderately silent. Practically silent on the top speed.

Vibration.—On top speed car runs exceedingly smoothly. Slight vibration on lower speeds, but nothing to speak of. When standing, throttled down, the car shakes rather much, of course.

Valves (automatic).—Inlet valves stuck a bit at first. No trouble after. Exhaust untouched.

Trembler Coil.—No trouble.

Steering.—Extremely good.

Brakes.—Excellent. On applying side brake to slow the car when I suddenly detected police at the bottom, descending Guildford High Street, the car stopped dead. On a matter of urgency I have twice stopped the car dead when on top speed, going fast, using both brakes—once on a decline.* The car stopped in its own length (distance measured as a matter of curiosity). No damage to tyres from these stoppings.

Tyres (Clipper-Continentals, 810 × 90).—No punctures at all. One slight deflation (valve washer got loose) after 1,000 miles. Only two noticeable cuts (on driving wheels). Thirteen times I passed over "roads up"—flints uppermost. The car is extraordinarily light on its tyres, which I attribute to the large wheels.

Side-slip.—I have run quite eight hundred miles on wet and greasy roads—about eighty miles of these on wet tramlines. I have had one genuine skid, due to having to turn sharply to avoid a cart that stopped unexpectedly in front of me. I was on second speed. Car jumped across the road, but I easily kept it headed. Four minor skids at corners, two or three feet only (on top speed once). The car is not inclined to skid easily when empty behind, and always slow enough at it to enable me to correct the tendency with the steering wheel. I use no non-skid devices. The car has run on greasy tramlines each day. I attribute the non-skidding to the heavier body than usual, and good distribution of weights.

General.—I drove myself all the time. My *mécanicien* is a bicycle man, quite ignorant of cars, and I myself possess no mechanical knowledge beyond what I picked up recently. After the first hundred miles I got absolute control over the car, and will now take it anywhere or do anything with it. On the matter of control, I may add that my motor house being small, I have to drive in round a corner and stop two inches from a wall. As I have never touched that wall, though I now usually enter on the second speed, I imagine control must be as perfect as possible. At the end of the month, no repairs of any sort were needed. Beyond the boring of the holes to admit paraffin on the inlet valves, changing sprockets, and grinding inlet valves twice, none were effected during the runs.

This was nearly two months ago. I have kept these notes back to see whether my satisfaction remained the same after general use in really bad weather. I may say that it does. I have had no trouble beyond some worry with the valves, caused by a person who had ground them trying to "improve" the springs. I lost power over this, but I have never had a breakdown stop. Also, despite the fearful state of the roads, all up for remetalling, I have not had a single puncture, or even inflated the tyres. Nor, now that I know the car, do I experience any tendency to skid, which convinces me that the skid terror is caused chiefly by bad design, *i.e.*, weights not properly distributed.

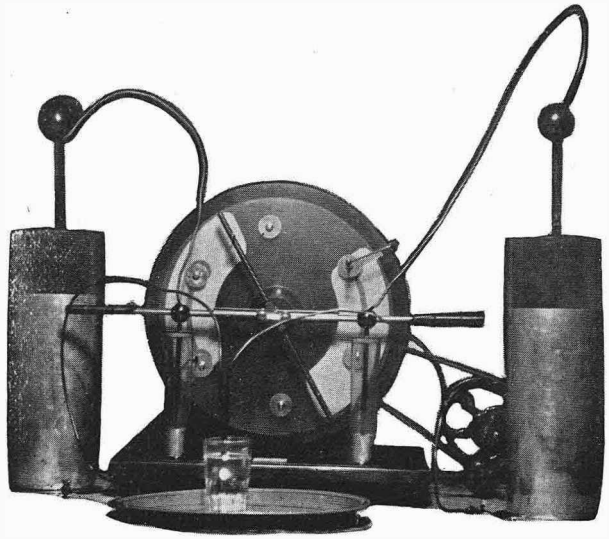
It is hardly necessary to say I have no financial interest in the Motor Manufacturing Co. I was persuaded into getting this particular make rather against my will by a local foreman of works, who had a tip depending on my not wishing I had got some other type a month after purchase. He got his tip all right.

*(1.) An unattended horse by the roadside suddenly walked across the road. (2.) Coming round a curve found a traction engine occupying all the road.

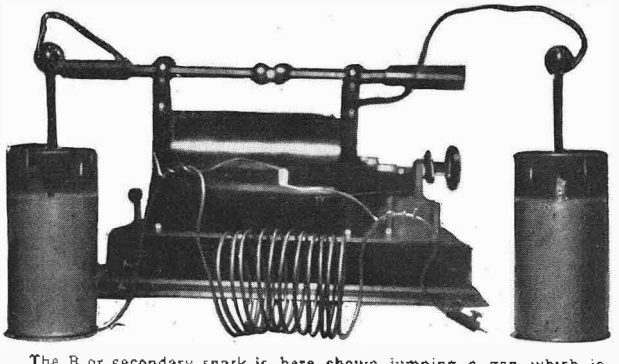
AN IMPROVED HIGH TENSION IGNITION.

SIR OLIVER LODGE, WHO IS ALWAYS IN THE VAN OF SCIENTIFIC PROGRESS, HAS EARLY REALISED THE FASCINATION OF MANY OF THE PROBLEMS CONNECTED WITH THE MOTOR AND ITS WORKING. ASSISTED BY HIS SON, MR. A. M. LODGE, AN ENTHUSIASTIC MOTORIST, HE HAS PERFECTED A COIL WHICH HAS MADE THE IGNITION MUCH LESS SENSITIVE TO EXTERNAL OR INTERNAL CAUSES OF DERANGEMENT.

The ignition of a motor car is of such vital importance that every precaution should be taken to ensure its acting reliably and with perfect certainty. Perfection is reached when the mixture can be regularly and instantaneously fired while at its maximum compression. At present, from various causes, the sparking in cylinders is at times capricious, one reason being the possible clogging of the sparking plug with carbon. Such clogging of the plug at least tends to enfeeble the sparking, and, though it may ignite the gas, it ignites it slowly, and consequently the engine does not give out its full power; whereas, if the gap in the plug should become completely bridged across with carbon, the coil



In this photograph the A or primary spark can be seen passing between the knobs of a Voos electrical machine, and the B sparking under water in the tumbler. This spark is so sudden that in disturbing the water it also breaks the glass.



The B or secondary spark is here shown jumping a gap which is short circuited by a coil of thick copper wire.

is short-circuited, and there is no spark at all.

Another cause of capricious sparking is through water getting on to the leads or splashing on to the plugs, and so providing a leak for the current.

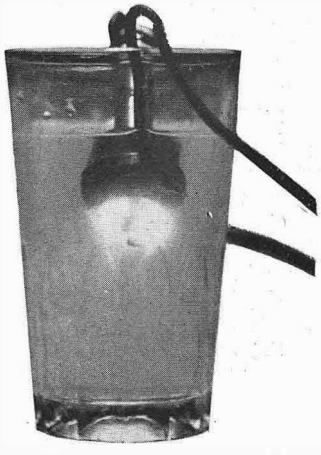
The following invention, making use of a discovery by Sir Oliver Lodge, and of which a description follows, entirely avoids these difficulties.

The coil has certain appendages inside its case, which effect the discharge in so sudden and impulsive a manner that no ordinary obstructions or short circuits can stop the spark. The gap may be plugged with carbon or even shorted with a loop of wire, and still the spark will occur where it is wanted with perfect regularity. In the ordinary coil there is a period of preparation during the charging up of the coil, in which leaks and other flaws have plenty of time to act; but by this invention no time is given for a leak to have any influence, consequently the wires leading to the cylinder need not be carefully insulated, and the spark will occur even under water.

This shows a plug sparking in air with most of the plug under water, and also clearly exhibits the brightness of the spark in the Lodge system.

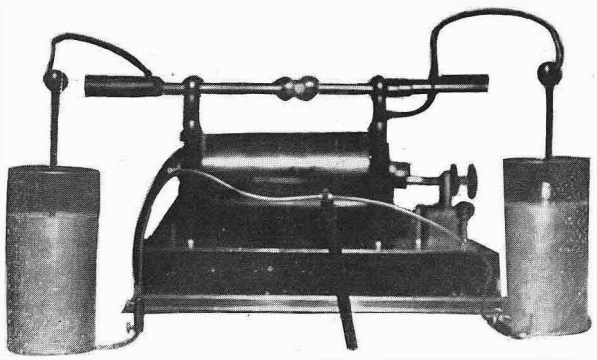
Some years ago Sir Oliver Lodge emphasised the fact that when a pair of Leyden jars were charged to a high electric pressure and a spark allowed to pass between one pair of coatings, a secondary or impulsive rush discharge was precipitated between the other coatings, giving a spark sometimes three or four times the length of the initial spark. This initial spark has been called the A spark and the other the B spark. He discovered that this B spark had the peculiar property of not being materially affected by bad insulation, and so was especially adapted for firing explosives in places where it was difficult to have good insulation, such as exploding a submarine mine or firing the charge of gas and air in an oil engine, etc. This discovery and the later one that a liquid resistance acts as a dielectric to a surging discharge, and as a leak to a charge, are embodied in the present patented coil.

The whole arrangement is made up in the ordinary box pattern, and the external connections are the same as with the ordinary coil. Inside the lid of the box there is an adjustable gap, at which the A spark passes, and which should be opened until the ordinary blue thin spark changes to a fat white flaming spark. As the two knobs of the spark gap represent the ends of



Here the gap of the sparking plug is under water, but this does not prevent the B spark.

the secondary winding, it will be seen that this part of a coil is isolated from the rest of the machinery, and that the coil spark can occur under full inspection and control whenever necessary. A special system of winding and insulating is employed in these coils, but as this only has to do with the manufacturing it need not be mentioned here. The connections are the same as with the ordinary coils. The action of the apparatus is as follows: When the contact-maker completes the primary circuit the Leyden jars are charged by the secondary through a special leak which is provided inside the box. They then discharge at the A spark, which is the adjustable gap, and precipitate an impulsive rush through the B gap, which is the sparking plug, irrespective of ordinary insulation, because of its extreme suddenness. The A and B sparks are not to be thought of as two gaps in the same circuit. The A gap completes the coil circuit. The Leyden jar flash at B is an extra, and occurs about the millionth of a second later.

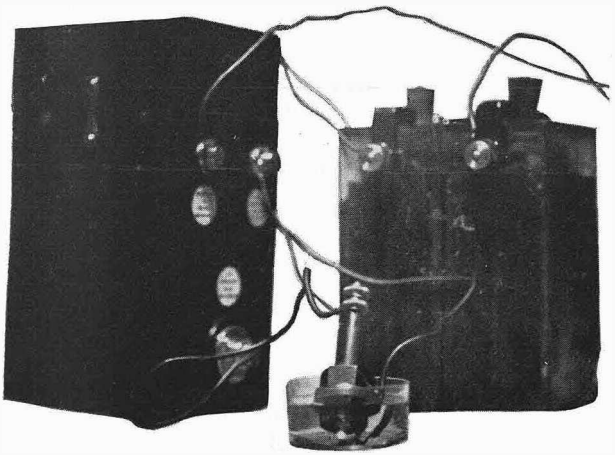


No. 5. In this photograph a stick of arc lamp carbon has been leant up against the spark gap, so as to make a good carbon short circuit. The white light at the end of each wire is the B spark.

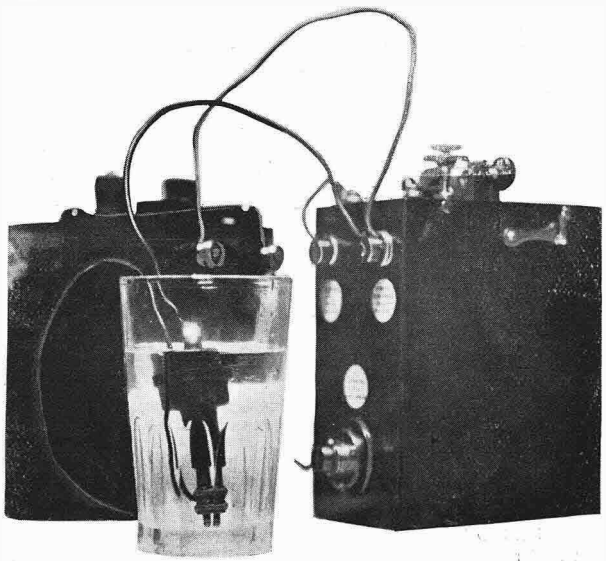
OCCASIONAL GOSSIP. By the Autocrat.

Mr. Claude Johnson, the ex-secretary of the Automobile Club, has an interesting article in the March number of the *Badminton Magazine of Sports and Pastimes*, entitled "Some Medium-priced Modern Motors." In it he raises a question which has never yet been explained, and that is, why the judges awarded the gold medal for dustlessness in the last 1,000 miles trials to the car which came out eleventh under this particular heading. I have always thought, and always shall think, that the marks awarded for dustlessness, absence of vibration, and lowness of cost, were misleading. In fact, the proper value of the trial results would never have been ascertained, but for the analyses which were published in these pages, from which what may be called doubtful or impracticable items were removed. I would not infer for a moment that dust, vibration, and noise are not evils which should be eliminated as far as possible, but the methods adopted to measure them were not practical. Those who gauged them did it conscientiously enough, and terribly hard work it was for them, but the senses of sight, hearing, and touch cannot gauge with sufficient accuracy as they must be guided by the sensations of the moment. For instance, after a very noisy car, the next one, which might be moderately quiet, would seem very quiet, quieter than it really was, simply because its predecessor was noisy, and so on.

By the time these words are read the annual meeting of the Automobile Club will be over. I have my own opinions as to what the result will be, but I have no intention of prophesying, as my prophecy cannot be read till the meeting is over. What I want to say now is this—I hope, however the contentious matters about which feeling has run so high may have been settled, the result will be for the benefit of the club we all wish to see strengthened. Both sides cannot have the victory, and I counsel the vanquished to take their defeat in good part, and to make up their minds to abide loyally by the wishes of the majority, although they may not be able to endorse them entirely. The club has been greatly weakened by the lack of judgment which has been shown in its policy during the past few months, but it will be still further weakened if internal dissensions are to continue, and nothing could be worse for the movement as a whole than a weakened representative body. There have always been differences, and sharp differences, in the opinions of the members of the committee, but these need not weaken the club; in fact, they should tend to strengthen it, so long as the holders of the opposite views content themselves with constitutional means of endeavouring to carry them out.



THE LODGE COIL. No. 6. This shows the invention arranged in practical shape for a motor bicycle, andemanufactured by the Electric Ignition Co., of Birmingham. The plug is here shown sparking with the gap under water.



THE LODGE COIL. No 7. Here the bicycle coil and accumulator are producing a spark with all the plug except the gap under water.

Occasional Gossip.

I really felt sorry for the members of the Automobile Club who did not take a very active interest in its working in the ordinary way. Last week they must have been fairly bewildered by the way they were bombarded with proxy forms. I received one from the club, another from Mr. Scott Montagu, and another from Lord Shrewsbury, and, strangely enough, my three all came by the same post. I am told that some wicked persons in the club signed all three and returned them to their respective senders. I was exceedingly surprised that the club proxy was made out in the names of three members of the Executive Committee. I hope this touting for proxies will be stopped before the next annual meeting, and, above all, that a section of the members of the Executive Committee will not again be allowed to set the example of proxy touting. It is not even as though they had asked for proxies on behalf of the Executive Committee; simply three members, Messrs. Roger Wallace, Mark Mayhew, and Col. R. E. Crompton, applied on Automobile Club paper for proxies in their own names, and in distinct opposition to, at any rate, a portion of the Executive Committee. Of course, it may be urged that at least one other member of the committee (Mr. Montagu) was doing the same thing, but he was doing it individually and not really or apparently by the authority of the club.

× × × ×

A writer in the *Bystander* wants to know how it is possible for a car to cost £2,000 when one can buy a single-cylinder engine for £20. He multiplies this by four for the engine, but is still in difficulties, as he wants to know what becomes of the £1,920. It is not quite clear from the way the question is worded whether the writer is aware that very few cars indeed cost £2,000, and that whether they cost that or a quarter of the sum depends entirely upon the choice of the buyer. Thoroughly serviceable and altogether satisfactory and delightfully running and comfortable cars can be bought from £300 upwards, but so long as one has enough money, and is willing to pay for all sorts of luxuries in the body-building line, there is scarcely any limit to the price that one may pay. A motor car is just like any other article. A thoroughly good and serviceable specimen can be obtained for a reasonable price, but there is what may be called the *edition de luxe*, or pedigree vehicle, for which fancy prices are asked and paid.

× × × ×

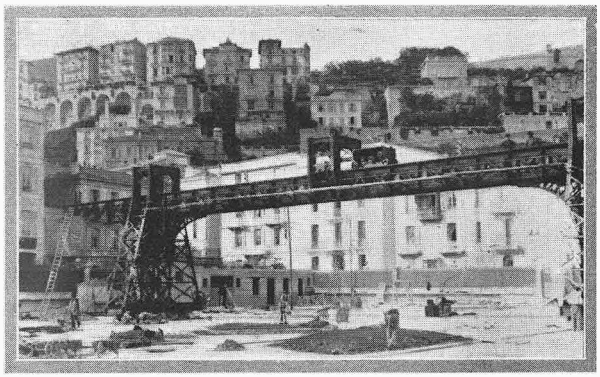
Having listened more than once to the conduct of motor cases by Mr. Staplee Firth, I am bound to say that he would do even better than he does if he did not gird the several benches before whom he pleads into protective sympathy for the prosecuting policeman. The constable does not enjoy himself when cross-examined (I had almost written bullied) by the A.C. solicitor; indeed, from observation, I am obliged to conclude that he looks on the searching interpellation as an earthly purgatory. But nevertheless, I am convinced—his late successes notwithstanding—Mr. Firth would do even better were the silken glove more completely to cover the iron hand.

AN AUTOCAR LIFE SAVER. The appliance in front is a life saving device for which Mr. Jane has taken out a patent. This particular shield has two lives to its credit. The dent on the right was made by contact with a drunken man, who lurched off the pavement across the car; the one on the left by a bicyclist scorching out of a side street. In both cases practically no harm was done. This is the car with which Mr. Jane conducted his private reliability trials, described on page 347.

CONTINENTAL NOTES AND NEWS.

Motor Launches at Monaco.

The greatest event of the early season will certainly be the exposition and the races of automobile boats of Monaco, which this year will replace the famous Nice week. This is simply reduced to a touring competition and a mile race on the Promenade des Anglais. There is also the De Caters cup to be competed for on the Turbie, but last year, as is well known, this was impossible, because Mr. Serpollet was nearly killed in a trial, having taken a turning too rapidly, and it is impossible to find in the Turbie 500 metres of straight



THE MONACO LAUNCH RACES. Another view of the motor launch exhibition buildings.

road. Besides, it is very improbable that, after the accidents of last year, an authorisation will be given for any trial to be run in the Turbie.

There remains, therefore, the automobile boat races at Monaco, which will take place during the first fortnight of April following the Exposition, to be opened on the 15th of March. The race will be very international, as out of eighty-two boats entered, of which thirty-seven are racing boats, there are two English, three Italian, four German, one Belgian, and three American.

The two English boats are the Napier, one being the winner of the Harmsworth cup at Cork; the second boat is the Napier Minor, which runs in the racing series of less than 40ft., and which will be steered by Edge. The Great Napier, which has already won in France the Gaston Menier cup at Trouville, is now known to be the property of M. Henri Deutsch de la Meurthe, the donor of the famous prize of 100,000 francs, won by Santos Dumont when he first rounded the Eiffel Tower in his famous airship.

The German boats are all, without exception, provided with Mercedes motors. They are in general 90 h.p. motors, and there will be seen the first motors of the Gordon-Bennett cup.

The Italian boats are from the F.I.A.T. works at Turin, a firm which has made a speciality of the construction of heavy motors.

The Belgian boat is from the Germain Co., and has a two-cycle motor. It will be steered by Baron Pierre de Crawhez, the winner of the last Circuit des Ardennes, and President of the Racing Commission of the A.C.B.

As regards the French boats, there will be many of different makes. Old firms like Panhard, Mors, Darracq, De Dietrich, Richard-Brazier, Serpollet, Peugeot; and new firms such as Delahaye, Ader, and Hotchkiss, whose racing boats will be steered by Henry Fournier, will be in evidence.

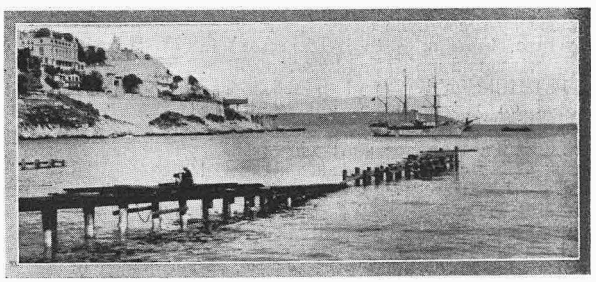
There will be quite a collection of champion chauffeurs to steer the boats, and it is certain that this will be an extraordinary week, for the Monaco races will be for motor boats what the great Cowes week is for sailing yachts.

We have already seen in Paris some of the boats in construction. One of the most remarkable as regards horse-power will certainly be the Dubonnet, of M. Marius Dubonnet, whose name is pretty well known. The Dubonnet possesses three screws and three screwshafts. The central shaft is worked by an 80 h.p. motor, and each sideshaft by a 40 h.p. motor. The boat is little more than twelve metres in length, and has an effective force of 160 h.p.

We cite also the yacht Marie, belonging to Messieurs Caze et Amblant, which possesses screws in bows and in the stern, so that the water is divided by the forward screw, while the after screw is driving the boat. It is said that this boat can attain more than seventy kilometres per hour. This is certainly somewhat exaggerated, but if it can only reach thirty knots it will be sure to obtain a big success.

The Monaco races for petrol launches will this year be unique of their kind, and of quite a special interest. For the first time in the history of motor boat races, the course is to be run over a distance of 250 kilometres for the 40ft. boats. Hitherto, 100 kilometres has been the greatest distance covered without a stop, whilst at Monaco there will be a six to eight hours non-stop run, which will bring out the qualities of endurance and reliability, just as the famous Circuit des Ardennes, run for the first time two years ago in Belgium, being a long non-stop, has become the criterion of endurance for racing automobiles.

The meeting will cover seven instead of eight days, and there will be an interruption in the meeting to allow the yacht races—such as the French cup, the Nice cup,



THE MONACO LAUNCH RACES. A view of the bay at Monaco.

and the King Edward VII. cup—to be run. It will be remembered that the King Edward VII. cup is for a race from Gibraltar to Cannes.

The new pragramme will be as follows:

First day.—Racers of less than 8 metres; cruisers of less than 6 metres 50.

Second day.—Racers of 8 to 12 metres; cruisers of 6.50 to 8 metres.

Third day.—Cruisers of 12 to 18 metres; steam boats; fishing boats.

Fourth day.—Racers of 12 to 18 metres; cruisers of 8 to 12 metres.

Fifth day.—Handicap racers (speed); handicap cruisers; cat-head boats.

Sixth day.—Handicap racers.

Seventh day.—Kilometre and knot.

Continental Notes and News.

L'Auto held last week, for the fourth time, its *criterium de consommation* for automobiles; but this year the competition was based on a new programme, in which the average speed of the car, although limited to the legal requirements of the country, became an element in the final result, into which also entered the hill-climbing capabilities of the car and its reliability. This is the first time that such a formula has been applied to a motor car trial in France.

The competition lasted over three days, the first being reserved to passenger vehicles whose chassis cost less than 12,000 francs. The second day was reserved to passenger vehicles whose chassis cost more than 12,000 francs, and the third day to industrial vehicles. The competition was also divided into the following classes:

1st Chassis costing under 5,000 francs.
2nd ,, between 5,000 and 8,000 frcs.
3rd ,, between 8,000 and 12,000 frcs.
4th ,, between 12,000 and 18,000 frcs.
5th ,, between 18,000 and 25,000 frcs.
6th ,, between 25,000 and 40,000 frcs.
7th ,, over 40,000 frcs.

The following were the general rules of the competition:

(1.) Passenger vehicles. The total consumption per ton. The marks awarded for the classification are equal to the number of litres consumed, divided by the total weight in tons and multiplied by ten.

(2.) The consumption per ton of useful load. The marks shall be equal to the number of litres consumed, divided by the useful weight in tons, and multiplied by ten.

(3.) Regularity and average speed. Each competitor doing the whole route (100 kilometres) in less than four hours, that is to say, at an average speed of twenty-five kilometres an hour, will not be penalised. Every vehicle doing less than twenty-five kilometres an hour shall be penalised in the following manner: The number of marks awarded equals the difference of the average obtained by the vehicle under the required average, the figures to be expressed in kilometres and multiplied by twenty-five.

(4.) Hill-climbing and speed. The speed on the Picardie hill shall be counted with a flying start on the way out, and a standing start on the way back. Any car having made on the hill an average speed of thirty kilometres shall not be penalised. For speeds below thirty kilometres the penalty shall be calculated with a coefficient of five in the outward journey and ten on the return journey.

The route to be covered by the passenger cars was from Suresnes to Corbeil and back, 62½ miles. The industrial vehicles had only to cover a distance of 37½ miles, that is to say, from Suresnes to Longjumeau and back.

An interesting experiment was made by Messrs. Chenier and Lion, with their old two-cylinder Peugeot, such as was seen in the English 1,000 miles trial in 1900, which on the first day worked successfully with shale oil.

On the second day it came out again, this time being worked with naphthaline balls. They had a big reservoir filled with these balls, which by means of a valve were allowed to fall into the inlet tube, where they were heated by the exhaust, and the naphthaline liquefied. The vehicle consumed six kilos of naphthaline balls for sixty kilometres.

French Fuel Consumption Trials.

RESULTS OF THE FIRST DAY'S TRIALS.

RESERVED TO PASSENGER CARS COSTING UP TO 1200 FRS.

MARKS AWARDED.

Competitor.	Total Ton.	Useful Ton.	Avge. Speed.	Hill-climbing. Flying Start.	Hill-climbing. Standing Start.	Total.
FIRST CATEGORY OF LESS THAN 5000 FRS. (PRICE OF CHASSIS).						
Peugeot	64	211	0	81	155	511
Peugeot	69.9	205	0	77.5	181	533.4
Fouillaron	91.3	299	0	67.5	136	593.8
Boyer	64.7	423	0	58.5	182	728.2
Bolide	132.9	464	0	90	192	878.9
Ph. Roy	154.4	633	0	49.5	115	951.9
SECOND CATEGORY OF 5000 TO 8000 FRS. (PRICE OF CHASSIS).						
Créanche	67.4	238.4	0	13	38	356.8
Chenard and Walcker	70.7	323	5	59.5	136	594.2
Créanche	105.6	382	0	54.5	78	620.1
Vivinus (Sonrel)	115	420	0	0	91	635
Vinot-Deguingand	92.4	531	0	0	54	677.4
Ariès	114.3	451.8	0	72.5	155	793.1
Boyer	97	556.5	0	63	126	842.5
THIRD CATEGORY OF 8000 TO 12000 FRS. (PRICE OF CHASSIS).						
Créanche	75	349	0	0	83	507
Ariès	72.9	283	0	41.5	120	517.4
Vinot-Deguingand	131	597	0	21.5	47	796.5

TABLE OF RUNNING AND FUEL CONSUMPTION.

Competitor.	Price of Chassis.	Weight Empty. Kilogs.	Useful Weight Carried. Kilogs	Average Kilogs. per 100 Kiloms.	Litres of Fuel Consumed.	Carburants.
Créanche	5000-8000	810	320	25 k.p.h.	7.630	petrol
Vivinus (Sonrel)	5000-8000	760	320	,,	12.000	,,
Fouillaron	less than 5000	695	305	,,	9.130	,,
Peugeot	,, ,,	610	265	,,	5.600	,,
Peugeot	,, ,,	511	264	,,	5.420	,,
Bolide	,, ,,	690	285	,,	12.000	,,
Créanche	8000-12000	1220	240	,,	9.770	,,
Chenard and Walcker	5000-8000	945	265	24k. 800m.	8.560	,,
Ariés	8000-12000	1042	360	25 k.p.h.	10.210	,,
Ariés	5000-8000	882	300	,,	13.550	,,
Vinot-Deguingand	5000-8000	1000	315	,,	11.330	,,
Boyer	less than 5000	665	120	,,	5.080	,,
Ph. Roy	,, ,,	680	220	,,	13.940	,,
Chenier-Lion (Peugeot two-cylinder)	5000-8000	929	239	18 k.p.h.	14.810	burning oil
Boyer	5000-8000	1335	283	25 k.p.h.	15.750	petrol
Vinot-Deguingand	8000-12000	1080	303	,,	18.100	,,
Créanche	5000-8000	753	285	,,	10.880	,,

RESULTS OF THE SECOND DAY'S TRIALS.

RESERVED TO PASSENGER CARS COSTING MORE THAN 12000 FRS.

MARKS AWARDED.

Competitor.	Total Ton.	Useful Ton.	Average Speed.	Hill-climbing. Flying Start.	Hill-climbing. Standing Start.	Total.
Peugeot (Renaux) 18 h.p. (12000 to 18000 frs.)	88	300	0	25	62.5	475.5
Automotrice (Gasté) 22 h.p. (18000 to 25000 frs.)	89	384	0	0	80	553

COMPARISON OF THE TWO PEUGEOT TYPES 1900 FOR PETROL AND FOR SHALE OIL.

Gaudin (Peugeot petrol)	98	540	5	92.5	105	840.5
Chenier-Lion (Peugeot shale oil)	106	579	100	77.5	175	1037.5

TABLE OF RUNNING AND FUEL CONSUMPTION.

Competitor	Price of Chassis.	Weight Empty.	Useful Weight Carried.	Average Kilogrammes per 100 Kilometers.	Litres of Fuel Consumed	Carburants.
Automotrice (Gasté)	18000-25000	1258	382	25 k.p.h.	14.700	petrol
Peugeot (Renaux)	15000-18000	1162	488		14.700	
Chenier-Lion (Peugeot two-cylinder)	hors série	935	210	22 k.p.h.	12.170	shale oil
Gaudin (Peugeot two-cylinder)	hors série	830	185	24k. 500m.	10 litres	petrol

TABLE OF COMPARISON OF PRICES ESTABLISHED BETWEEN ESSENCE AT 45 CENTIMES THE LITRE AND SHALE OIL AT 22 CENTIMES THE LITRE.

Peugeot	schale oil	kilometric ton	023 litre
Peugeot	essence	kilometric ton	044 litre

A four-seated Peugeot small car.

The Gordon-Bennett Race.

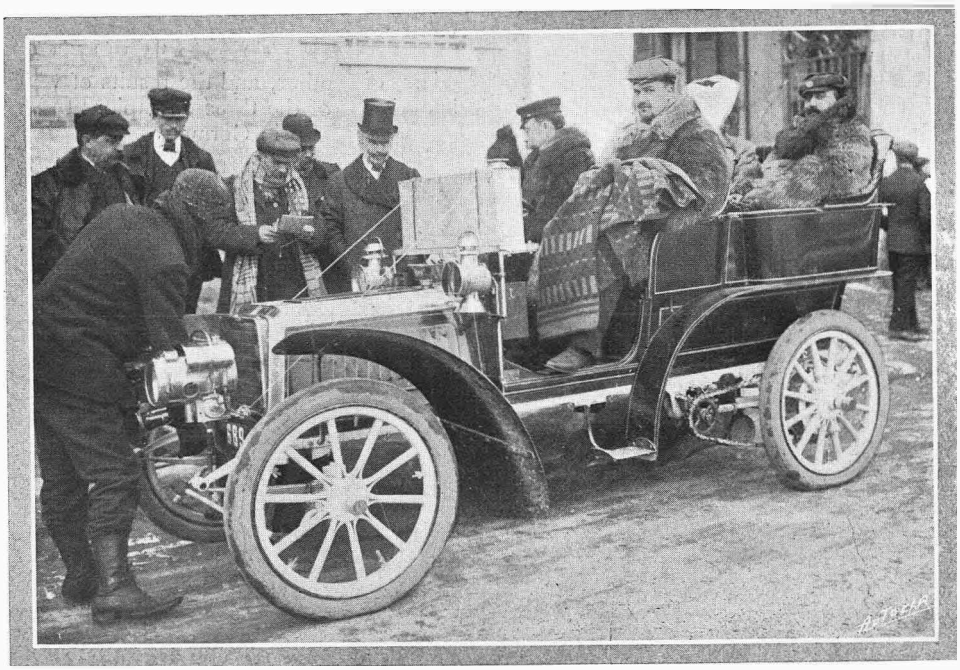
The first of March marked a red letter day in the annals of French automobilism. The Chamber of Deputies has unanimously voted that the authorisation to test the cars for the choice of the French team in the Gordon-Bennett cup race shall take place on the Circuit of the French Ardennes. The most sanguine did not look for such a triumph; and, above all, after Mr Combes, the Minister of the Interior and President of the Council, had given a flat refusal for the authorisation. What had happened in the meantime? We will go over the facts.

After having paid their unsuccessful visit to the Minister of the Interior, the sub-committee delegated by the Racing Committee of the A.C.F. decided that they would call the trade together, and consult them as to whether it was not advisable to bring the question before the Chamber of Deputies. But here everything was in an uncertain state. The difficult and dangerous point was that, should the Chamber uphold the decision of the Minister of the Interior and reject the request of the A.C.F., such action would endanger the possibility of running off the eliminatory trials in Belgium, for the Belgian authorities might consider it was a slight on the French Government to allow the trials to be run on Belgian soil after permission had been refused for them to be run on French soil. Here was the difficult and delicate question to be dealt with. At the meeting of the interested parties there were present: Mr. Emile Mors (representing the Mors Co.), Mr. Clément (representing the Bayard cars), Baron de Turkheim (the representative of De Dietrich and Turcat-Mery), Mr. Darracq (representing the Darracq firm), Mr. Léon Serpollet (of the Gardner-Serpollet Co.), Mr. Favarger (one of the managing directors of the Hotchkiss Co.), Messrs. Julien Cuenod and Brazier (representing Georges-Richard), and Mr. Gobron (representing the firm of Gobron-Brillié). There were also present the Marquis De Dion and Mr. Max Richard in their positions of president and vice-president of the Chambre Syndicale de l'Automobile. It was thought at this meeting that at least a week would be required to canvass the Chamber and get its decision, and in view of this delay the greater part of those present leant towards Mr. Gobron's idea, which was to abandon the scheme of holding the eliminatory trials in France, and to accept the offer of the Belgian Club to hold them on the Circuit des Ardennes. But the Marquis De Dion was not of this opinion, and being himself a deputy, he went to the Chamber the same day and forced the question before his colleagues, and Mr. Poulain, the deputy for the Ardennes, which department, of course, naturally desired that the race should be held in France, moved in the name of the industry and commerce of France that his colleagues should join him in requesting the Minister to authorise the race to be held in France. The Marquis De Dion, in a spirited discourse, backed up the proposition of Mr. Poulain, and, by a clever handling of the Chamber, obtained an immediate unanimous vote in favour of Mr. Poulain's proposition, and this is why it is now definitely decided that the French eliminatory trials shall be run on French soil on the new Circuit des Ardennes.

The Circuit of the Ardennes.

It is therefore, appropriate for us to give a description of the splendid road on which the struggle will take place, which will have such momentous results for the competing marks.

The French Circuit of the Ardennes is situated round the two valleys of the Meuse and the Aisne,



The Vinot et Deguingand car, a new comer into the automobile world so far as English automobilists are concerned.

Continental Notes and News.

that is to say, it crosses twice a line drawn between two watersheds, first of all at Crêtes de Poix, where the hill is negotiated by means of a series of bends, and

Filling the competitors' tanks with the official quantity of fuel.

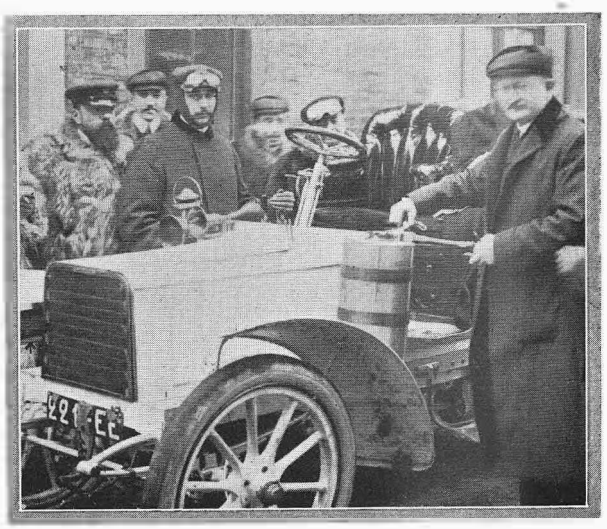
then again in the other direction between Vouziers and Chesne. The watershed is, however, only a series of low hills. There is only one which is difficult, and that is near Poix. The route follows for some distance the main road from Vouziers to Chesne and from Vaunay to Boulzicourt and Poix, this part of the road covering nearly half the circuit. Four times the railway line is crossed, but only once by a level crossing, and that is at Novy-Chevriers. This level crossing is close to the station, and will of course be neutralised. The railway again is crossed over a bridge at Fainault, and again at Rethel and Vouziers, each time in towns which will certainly be neutralised. The great advantage of the French Circuit des Ardennes is that the roads are very wide, the whole distance being more than wide enough for two cars to pass each other at full speed.

The portion of the road from Rethel to Vouziers, of which we give a photograph, has remarkable beauties.

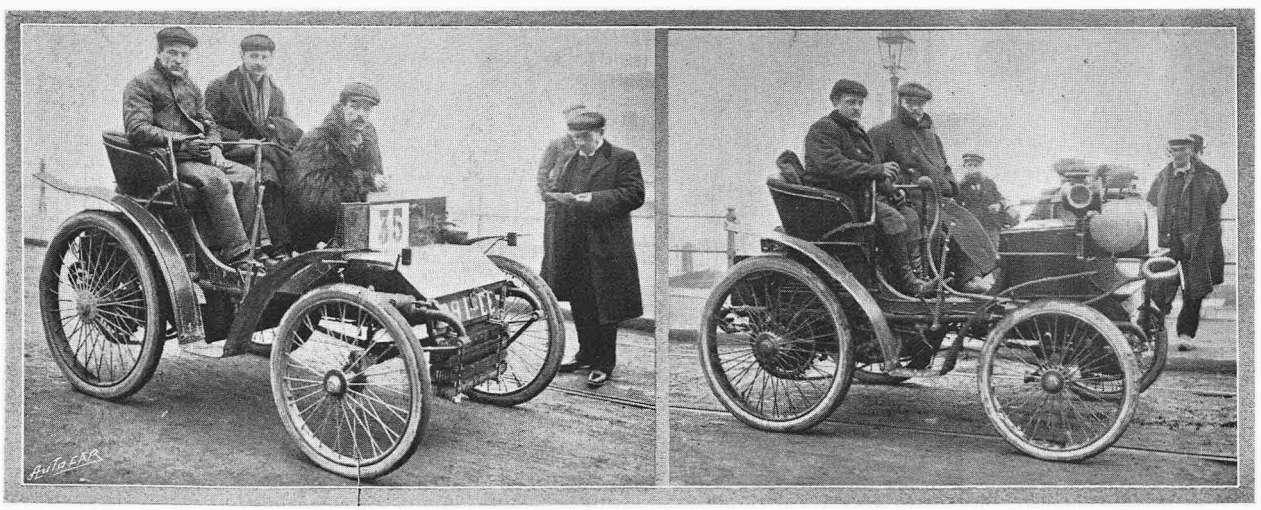
Generally speaking, the French Circuit des Ardennes, which is 125 kilometres in length, is quite difficult enough to be a good training ground for the Taunus in Germany, where the actual Gordon-Bennett cup race will be held, and as we have said above, it is quite wide enough for the French eliminatory trials to be held in all security and practicability.

There will only be eight neutralisations, namely, Poix, the level crossing at Novy, Rethel, Vouziers, Le Chesne, Chemery, Donchery, and Flize, and there remains the straight line of twenty kilometres from Rethel to Vouziers—a very hilly and very wide road with a splendid soil, which will admit of the highest speeds. However, the Circuit, from beginning to end, either at Poix, or from Chemery or Boulzicourt, is difficult enough to be able to establish definitely the master qualities of the car that should be chosen victor, from the points of view of speed, hill-climbing, clutch power, and brakes.

These are the main lines of the eliminatory trials, in which the best French cars will be pitted against each other, and the results of which will end in the choosing of the three champions to strive for the Gordon-Bennett cup in Germany.

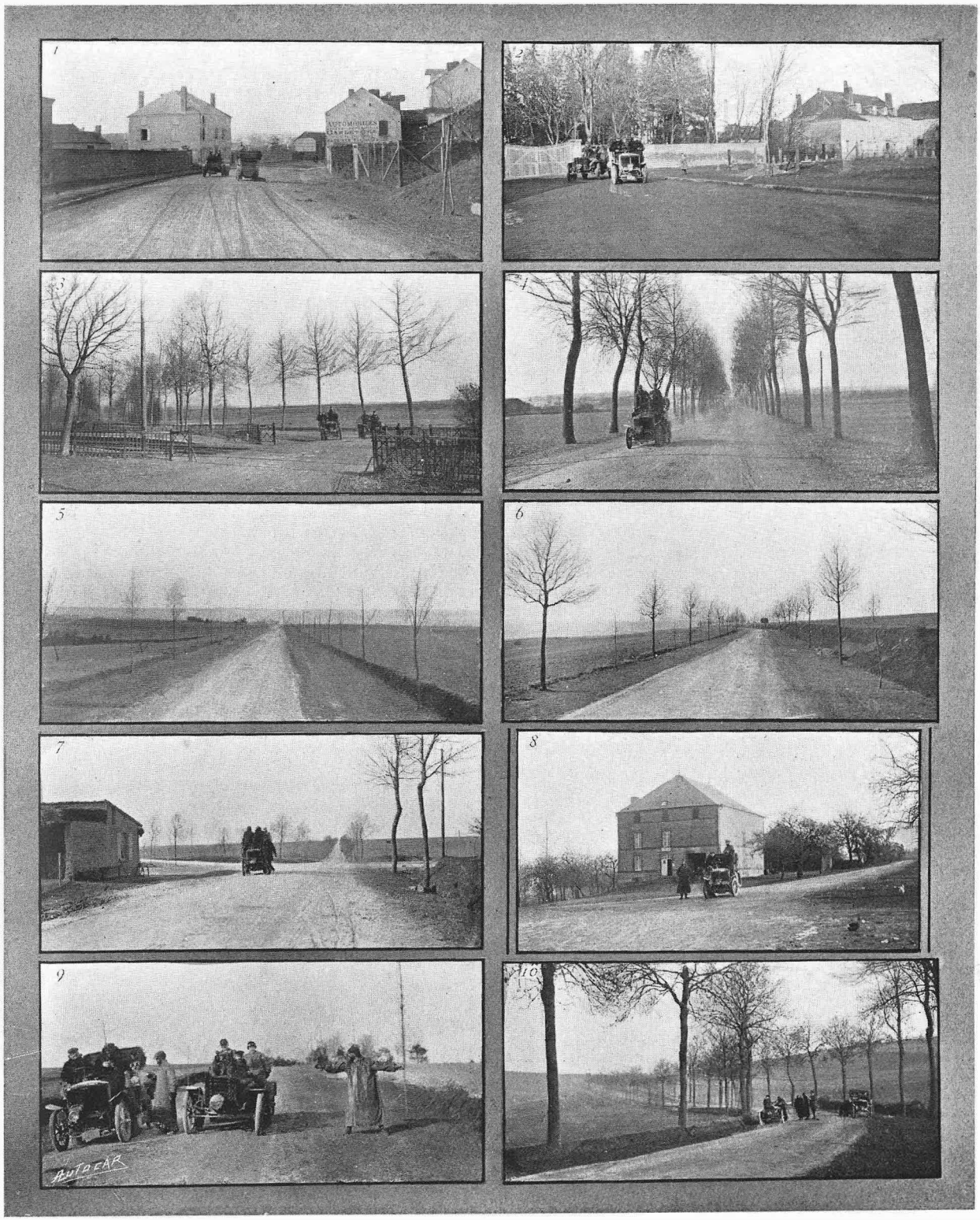


Officially sealing the tanks after being filled for the consumption trials



FUEL CONSUMPTION TRIALS. The old type Peugeot cars which competed in the trials running on shale oil one day and naphthaline balls on another day. This illustration is of great interest, as it depicts so graphically the advances made in autocar construction since 1900

THE FRENCH ARDENNES.
VIEWS OF THE FRENCH ELIMINATING TRIALS COURSE.



1. Entering the neutralisation at Rathel
2. The end ot the neutralisation at Rethel
3. Neutralised level crossing at Novy
4. A straight stretch of road, Rethel to Vouziers
5. A straight stretch of road before Vouziers
6. The road a little before Rethel
7. The cross roads between Chalons and Mazagran
8. The cross roads at Poix
9. The width of the road between Rethel and Vouziers
10. On the road from Boulzicourt to Poix

Continental Notes and News.

M. Gaudichart. M. Tampier. M. Audistere.

Some of the officials at the consumption trials. M. Tampier will be remembered as one of the official timekeepers in the last Gordon-Bennett race.

The Gordon-Bennett Cup.

The A.C.F. has definitely fixed the date of the eliminatory trials for the choice of the Gordon-Bennett cars for the 20th of May. The race will be held on the French Circuit des Ardennes, and there will be a ballot of the competing houses to choose the starting numbers of the first car of every make. The second and third cars of every make will be the same number as the first one with the addition of 10 and 20. Thus, the maker that wins No. 1 will have the numbers 1, 11, and 21 for his three cars. The weighing in will take place on Thursday, the 19th of May. Ladies are precluded from driving cars.

Colours of the Competitors.

All the colours for the different competing nations in the Gordon-Bennett cup race have now been definitely settled and accepted by the German Automobile Club. They will be as follows: France, blue; England, green; America, red; Belgium, yellow; Germany, white; Italy, black; Austria, black and yellow; Switzerland, red and yellow.

Cars and Drivers.

It is needless for us to point out what a struggle there will be in the French eliminatory trials, where there are twenty-nine competing cars, all made by well-known makers. Amongst the favourites must be classed the Gobron-Brillié 1904 car. This year the three cup cars, with slight exceptions, will be identical in construction with last year's model. That is to say, there will be four cylinders and eight pistons placed vertically. The bore and stroke, which a year ago were 140 and 120 respectively, have been increased this year, and the motor, which last year gave 100 h.p., will this year give about 120, and these sizes will allow the car on the fourth speed to be geared up to a speed of 150 kilometres an hour. A double clutch will allow for a rapid starting, and this will undoubtedly be one of the quickest cars. The drivers will be Rigolly and Duray and a gentleman driver who wishes for the present to remain anonymous, and who is known at present under the initials "A. B." The drivers of the Georges Richard-Brazier cars in the French eliminatory trials for the Gordon-Bennett Cup will be Théry, Stead, and Caillois.

Official Programme.

The following is the official programme for the week:

Thursday, June 16th.—Weighing-in of the competing cars, and in the evening there will be a reception for the drivers, given by the authorities of the Kurhaus of Homburg.

Friday, June 17th.—Gordon-Bennett race.

Saturday, June 18th.—An excursion over the cup course and a banquet at the Kurhaus of Homburg.

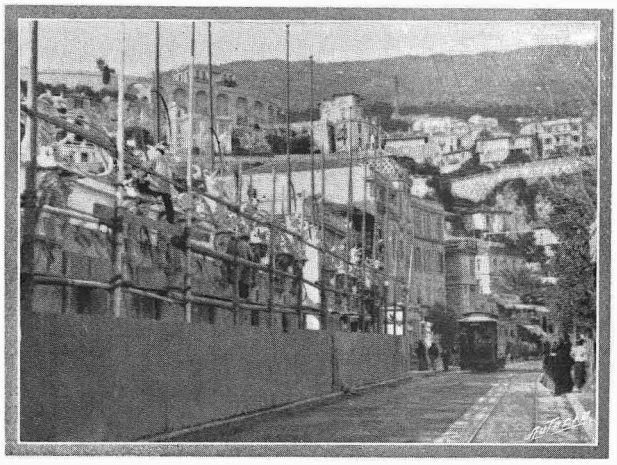
Sunday, June 19th.—Short automobile races and records on the Frankfort Autodrome.

Monday, June 20th.—International automobile congress at Homburg.

Tuesday, June 21st.—Battle of flowers and "Concours d'élégance."

The Nice Week.

On March 28th next the annual automobile meeting at Nice will begin. The meeting will be opened by a mile race for the first trial of the third Henri de Rothschild Cup, which is for cars between the weight of 650 and 1,000 kilogs., carrying two passengers side by side. The rules for this trial are the same as last year. If there should be the same winner three times running he will be owner of the cup. It is thus that Léon Serpollet holds the cup, which he won three years running. Serpollet did the mile in 29.19 seconds; that is to say, at the speed of 123 kilometres 294 metres per hour. The second trial for the second Rothschild Cup (reserved for cars above 650 kilogs. and less than 1,000 kilogs. in weight, with two passengers side by side) will then follow. The conditions are the same as for the preceding cup, which was won last year by Hieronymous in 31.76 seconds; that is to say, at the speed of 113 kilometres 328 metres an hour. The third event will be the Baron De Caters Cup, and will take place on Tuesday, March 29th, at two o'clock, on a kilometre of ten per cent. hill on the Corniche Road. This race is open to all vehicles without any condition of weight or classification. Each car will start by itself, and no car must be pushed. The competitor who has



THE MONACO LAUNCH RACES. The exhibition buildings, wherein will be shown motor launches of every description in the course of construction.

won twice running becomes owner of the cup. In 1902 Serpollet won the third annual trial in 59⅕s. The following year Rigolly won on the Laffrey Hill in 50⅕s. The mile race is open to five different categories of cars as recognised by the A.C.F., namely: First category—Cars weighing more than 650 and less than 1,000 kilogs. Second category—Cars weighing more than 400 and less than 650 kilogs. Third category—Cars weighing more than 250 and less than 400 kilogs. Fourth category—Vehicles weighing more than 50 and less than 250 kilogs. Fifth category—Vehicles weighing less than 50 kilogs.

The Death of Levegh.

The A.C.F. and the French racing chauffeurs in general are in mourning over the death of Alfred Velghe, who was an automobile sportsman running under the pseudonym of Levegh, and who has been suffering for some time from a chest disease down in the South of France, at Pau. Levegh has been ill for a long time, and has hardly been able to follow automobile events since 1901. He was originally a fervent bicycle racer, and soon became an adept with the automobile, and the sport owes much to him. Velghe never drove but one make of automobile, and he was until 1901 (when he was obliged to give it up) the unquestioned champion of the Mors. In 1899, in the "Tour de France," Levegh, on a 16 h.p. four-cylinder Mors, was the only Mors driver who arrived in Paris, and at the end of the same season he won, one after the other, the Paris-Ostend and the Bordeaux-Biarritz races, and he was classed second in Paris-Trouville and Paris-St. Malo. In 1900 Levegh was never beaten. He was first in the Paris-Toulouse race of 730 kilometres, and won all the Nice races, including the mile and the Turbie Hill, and then the race from Bordeaux to Perigueux and back. In 1901 Levegh was only able to run one race—that is to say, the Gordon-Bennett Cup, in which he was at the head as far as Poitiers, where he was obliged to stop, and this was the end of his glorious racing career. He was not only a good mechanician, but also an excellent driver. He was an artist of some talent, and holder of the "Prix de Rome," and he will be deeply regretted by his large circle of friends. He was the brother-in-law of Strom, the automobile tailor and inventor of the *parapluie du chauffeur*, and his family are interested in the sale of bric-à-brac and art curiosities.

The late M. Levegh on the 24 h.p. Mors, which he drove in the Paris-Toulouse race in 1900.

The Kilometre Race at Dourdan.

L'Auto announces that towards the end of June, between the Gordon-Bennett Cup and the Ostend week, it will hold an automobile race on the kilometre at Dourdan. Last year, in this competition, it will be remembered that Duray beat the record of the world for the kilometre.

GLASGOW TO LONDON RELIABILITY TRIALS.

Reverting to the rules and conditions for these trials, promoted by the Scottish A.C., and referred to last week, it may be stated that the entry fee is £10 10s., and entries must be lodged with Mr. R. J. Smith, 59, St. Vincent Street, Glasgow, not later than April 13th, though for fourteen days after this date entries will be received at double fees. The system of marking will be as follows:

There will be a maximum number of marks for the run, and one mark will be deducted for every minute or part of a minute during which the vehicle is at rest from the time of starting to the conclusion of the run. No deductions will be made for compulsory stops at Penrith, Leeds, and Stamford, stops for traffic or by order of the police, accidental detours, and stop by marshal or timekeeper prior to commencement of hill climb.

There also will be deducted, in addition, one mark for every minute in excess of the maximum time between each control, the time occupied by all stops and detours having first been added.

Arrival at the end of a stage in advance of the minimum time allowed will entail the loss of one mark for each minute or part thereof of such prior arrival, and in any case where the committee are satisfied that such arrival in advance of scheduled minimum time is due to deliberate intention on the part of the driver the vehicle will be disqualified. Marks so deducted are additional to deductions for any other purpose. Any vehicle arriving at a control in advance of minimum time shall be stopped—with the engine running—till time has expired, and if such control be the occasion of a compulsory stop, the time of the prior arrival shall be added to the period of the compulsory stop, and the order of restart regulated accordingly.

Certificates will be granted in respect of each vehicle completing the trial, and will state the total number of marks, the number gained, and (separately) the deductions for (1) stops, except those mentioned in rule 19, and for (2) tyre troubles; also the results of the hill-climbing test; the motive power, horse-power, and price, as stated by the manufacturer; number of passengers carried; weight, including passengers; and nature of tyres.

The club will award a non-stop gold medal in each class. No medal will be awarded except in the event of a non-stop run (compulsory stops being excluded), and full marks being consequently secured; and in the event of two or more vehicles in either class gaining full marks, the award of the medal will be made to the car making the best results in the hill-climbing test at Woodcock Hill, near Elstree. The following formula will be the basis of the marks given for the hill-climb:

$$\frac{(w \times 60 \times L) + (W \times h) + \left(\frac{W \times v^2}{2}\right)}{a \times n \times s \times \left(\frac{G}{D\pi}\right)}$$

EXPLANATION OF SYMBOLS.

w = Laden weight of car in tons.
L = Length of hill.
W = Laden weight of car in lbs.
h = Height of hill.
v = Velocity in feet per second.
a = Area of piston in square inches
n = Number of cylinder.
s = Stroke in inches.
G = Gear ratio or number of revolutions of engine for one revolution of road wheel on lowest gear.
D = Diameter of road wheel in feet.

The foregoing formula is not to apply to steam cars. If necessary a formula for these will be prepared.

Note.—Woodcock Hill forms part of the trial route, and the results, as determined on the basis of above formula, will only be used to determine medal awards, and then only in event of equality, as above explained.

CORRESPONDENCE.

EDITORIAL NOTICES.

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

Letters of a personal nature will be withheld

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

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

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

THE FUTURE OF THE AUTOMOBILE CLUB.

[3583.]—Several friends having written to me about my nomination on the Reform Committee, I desire to state, in order not to cause any misapprehension, that I was approached by the Hon. John Scott Montagu to stand for election on his proposed committee in my capacity as president of the Society of Motor Manufacturers and Traders. Personally, owing to the many claims upon my time, I have no desire or ambition to serve on the committee, although perhaps to some it might not appear unreasonable that the founder of a club, during whose three years vice-chairmanship the club was decidedly successful, might be the holder of some honorary office in the club.

With regard to the Reform Committee, although it is impossible to entirely agree with the personnel of any such large committee nominated by someone else, I believe the said committee, if elected, would do useful and safe work for the club.

I truly hope, for the prosperous future of the club, that Lord Shrewsbury's well-meant but unpractical resolution will not be carried, but that of Mr. Jarrott, who puts the truth in a nutshell. If the Automobile Club shall be reduced to a club of amateurs pure and simple, we can hardly expect any public body to continue to recognise it as a practical authority governing automobilism in this country. No matter which gentlemen happen to be elected on the new committee, a few more balance sheets as the present one, with a deficit of some £1,700, cannot fail to bring about what I ventured to predict some three years ago, viz.:

Firstly. The reconstruction of the Automobile Club into a high-class social and amateur club, with a high entrance and subscription fee, eliminating all elements socially ineligible, and dealing with all matters of automobilism as a sport and pastime.

Secondly. The Motor Union becoming the practical body, governing automobilism as a Society of Encouragement, and taking under its immediate care and protection at a moderate fee all motorists, of whom there will be millions in time to come.

Thirdly. The Society of Motor Manufacturers and Traders as a strong and consolidated body, dealing with all matters pertaining to trade questions.

FREDERICK R. SIMMS.

CHAUFFEURS.

[3584.]—Referring to a letter written by a professional mechanic named Mr. Stone under this head in your issue of February 27th, certain passages cannot fail to be of interest to car owners.

I would therefore propound the following query: Do owners pay their mechanics to carry out their instructions at their own convenience, or to conduct themselves as if on terms of equality with their masters? A man can still be a man, and yet, without any loss of dignity to himself, be respectful to his employer without making a "tin god" of him (to quote your correspondent's own phrase).

To take an instance which I myself saw only lately—a gentleman sitting in a private car with his mechanic leaning negligently against the dashboard speaking to him. I have never yet seen or heard of a footman adopting a similar familiar attitude when addressing his master.

The sooner—and I am sure all owners will agree with me in this—that mechanics realise their position and conduct themselves in a manner more befitting it the better it will be for all concerned.

Letters such as the one I refer to can only serve to prejudice owners in favour of the "razor stropper" as opposed to the professional mechanic. W. A.

[3585.]—Referring to the various letters *re* drivers which have appeared in your columns, as well as those of one of your contemporaries, it seems to me that those men who have learned the trade of a mechanic seem pleased to have the opportunity of sounding their own praise, as well as running down "so-called certified drivers," the latter without distinction. It pleased me very much indeed to read so manly a letter as the one from "S. B." [3554], who, in spite of all that had been said against it, acknowledged himself to hold a certificate.

I may say that I served six months in a repair shop of one of our leading manufacturers with the view to procure a driver's berth, and there had occasion to see that "Owner's" words are quite true. From the mechanics employed there a man cannot expect to learn anything but that which serves him to no purpose. When they were asked for an explanation as to the working of a part, I have invariably had the same answer, "I don't know."

I dare say that a good many driver-mechanics seem to have the idea that they must do their utmost to pooh-pooh letters as written by "Owner," but I maintain that they will not improve matters by writing such epistles as "George Stone." He does not seem to see that this "article and tame monstrosity" may, with some training, if of good intellect and, as "Owner" says, keen on the job, in a comparatively speaking short time, be quite as good, and perhaps a better, driver than George Stone, and, in any case, I hope, better mannered. Mechanics are all very well as long as they have to do repairs, etc., but, by what I have seen, ninety per cent. of those employed in a motor car factory would be quite as useless as drivers in private service as an uninitiated "razor stropper." They are told to do a certain job, and they do it more or less to the satisfaction of their foreman, but set them to find out why an engine has lost power or why it runs hot, etc., and you will soon find out whether they would make a good man to be entrusted with a car or not.

A. M.

NATURAL CIRCULATION V. PUMP.

[3586.]—I note Mr. Wheatland's letter in reference to the above in your last issue, and quite agree with him that the last word should have been said upon these two systems of water-cooling, and note his remarks in reference to the Renault improvements this year in this direction. Mr. Wheatland is evidently unaware that natural circulation was fitted by me to cars three and a half years ago, and has been working most satisfactorily on all the vehicles manufactured by the Stirling Motor Construction Co., of Edinburgh.

I shall be pleased to hear what Mr. Wheatland's reasons are for believing that this has not been generally recognised in the motor world. There is no doubt that better results and lower temperature of water are obtained without the pump, provided the radiator and its connections are properly designed, which, unfortunately, is not always the case.

ARTHUR J. DRAKE.

BRITISH AND FOREIGN CARS.

[3587.]—I have read with considerable interest your remarks in last week's issue on British and foreign cars, and seeing that this is a subject I have for a long time past felt very strongly on, I beg leave to offer a few comments.

I cannot agree with your assertion that "there are so few firms passing as British manufacturers who are really dealing in foreign made cars as to render them a negligible quantity." I submit, with a full knowledge of the importance of my assertion, that there are scarcely half a dozen firms worthy of mention who can really claim to be *bonâ-fide* English manufacturers. By this I mean that their productions are British built throughout.

I therefore think with Mr. Edge that it is quite time that H.M. Customs, the Automobile Club, and the automobile press instituted a campaign, so that the British buyer might know when purchasing a car whether it is totally or partly British or foreign built.

There are many firms who claim to build British cars who really only build the chassis and wisely fit a French engine of repute to complete the car. Now, seeing that the engine is not only the most vital part of the car, but that portion of it which requires the greatest amount of scientific and mechanical knowledge to build, I consider that no firm fitting an engine of foreign origin should be entitled to style its car as a British production.

You state that English buyers at present may be divided into two classes, *i.e.*, those who prefer foreign cars and those

who would rather buy the home made article. Might we not divide these into two categories, the expert who has "had some," these being those comprising the former class, and the patriotic novice who is paying for knowledge he is about to acquire. A. E. COHEN.

INCLINED VALVES.

[3588.]—When "doing" the show at the Crystal Palace I was particularly struck with the Daimler Company's latest practice of open and unprotected camshaft; also valves at an inclination of between ten and fifteen degrees to the vertical. Does this not seem to be going back to the days of the old Daimler V type engine with its inclined valves and exposed actuating mechanism?

Perhaps the Daimler Company will be good enough to put forward the advantages they doubtless claim for their latest type engine beyond, perhaps, a quicker exhaust at the ports and increased facility for camshaft detachment, of which the latter is hardly necessary? W. G. BELL.

SO-CALLED BRITISH CARS.

[3589.]—I quite agree with Mr. S. F. Edge in his well-timed remarks on so-called British-made cars. I myself with two friends (all three motor engineers) visited the recent exhibition at the Crystal Palace and noted particularly the various mixtures of Continental component parts hung together and branded British-made cars throughout. This is how innocent purchasers are gulled, and when the car has been run 500 miles or so its malleable properties have lived their life! Hence so many new motorists stating that Continental engineers still lead in the motor world. But England was their school and can now give them tuition.

I am in a position to confirm Mr. Edge's statement about the Napier being British built, as I have seen all the parts made at their works in London.

I am in no way connected, nor have I ever been, with the Napier Co. MAURICE CLARKE.

ENGLISH MOTOR CAR BUILDING.

[3590.]—With reference to the question of English motor car building and particularly the paper recently read before the Automobile Club, I think it is hardly fair for anyone to give lists of firms doing certain work unless they are complete and accurate. Mr. Austin has already said that the figures given for the Wolseley Co. were entirely wrong. Some of the others are also more than doubtful. Among firms building bodies, I see no mention of the Rex Co., of Coventry. They have built bodies for several years, and have done it in a most creditable manner. I know this from having possessed two of their cars, and have been over their works many times. There are also a number of other English firms of equal importance who are ignored in the same way, though they surely deserve a free advertisement as much as the few who were mentioned.
C. L. SCHWIND.

BRITISH MANUFACTURE.

[3591.]—In view of the controversy now going on concernin British and foreign cars, I made a careful inspection of the exhibits at the Crystal Palace Exhibition, giving my attention only to those cars sold under English names, and hence ostensibly of British manufacture. Of these the bodies in all cases appear to be of home construction, but in many cases, so far as the chassis is concerned, small items of fittings and accessories, such as coils, sparking plugs, lubricators, etc., are of continental make. Ignoring these minor details, and also ignoring the steam vehicles, which were all of British manufacture, I found them to be grouped as follows:

BRITISH ENGINES, FOREIGN CHASSIS. The Crossley.

FOREIGN ENGINES, BRITISH CHASSIS. Argyll, Century, Dennis, Eagle.

ALL BRITISH. Albion, Arrol-Johnston, Ariel, Albany, Achilles, Alldays, Belsize, Daimler, Duryea, Humber, James and Browne, Lanchester, Langdon-Davies, Lea and Francis, Ludgate, Marston, Maudslay, M.M.C., Napier, Pick, Rex, Ryde, Ryknield, Star, Siddeley, Standard, Swift, Thornycroft, Vauxhall, Wilson and Pilcher, and Wolseley.

All the rest appear to be British only in body. Should I be in error, or have omitted any from the list, I hope those most interested will point it out, for the matter is undoubtedly one of more than passing interest at the present time. Anyway, it will open the eyes of some to learn there are so many firms turning out "all British" cars, and, before leaving this subject, may I draw attention to a fact which hitherto appears to have escaped public attention—viz., that the official returns of the imports of foreign cars for January last, for the first time in the history of the trade, show a heavy decline over the corresponding month of the previous year. I take this as a very significant sign of the times, showing that we have now come to "the parting of the ways," and that henceforth we may expect to see the hitherto enormous foreign importation of cars into Great Britain steadily decline, whilst the exports of British vehicles will as steadily increase. HENRY STURMEY,
F.R.P.S., Hon.M.C.E.I.

NON-SLIPPING TREADS.

[3592.]—In answer to your correspondent of last week, my experience of Wilkinson treads is as follows: I sent a pair of new Michelin tyres to the firm to have the treads put on, and have since run about 900 miles on them. (They are on the back wheels of my car, a 16 h.p. Decauville.) I have never had a vestige of side-slip during all the wet weather there has been of late, nor have I had a puncture, though my front tyres have twice been pierced during this period. The small steel points at the side of the tread are but little worn, though in the centre they are worn smooth with the surface, and have in many cases disappeared altogether. I should imagine, though, that the weight of the car would force them out sufficiently when in contact with the ground to enable them to grip. At any rate there is little, if any, more tendency to side-slip than when they were new. The feeling of safety on a greasy road that they give is very delightful.

Of course, 900 miles is no great distance, but the fabric of the tread appears to be wearing very well, though it would be rash to prophesy how much more they may be good for. Of their efficacy hitherto I have the highest opinion, and if they remain effective for another 2,000 miles I shall always use them. SAFETY.

THE CASE FOR APPEAL.

[3593.]—Referring to your notice of the above in your issue of February 6th, I am greatly surprised that motorists generally have completely overlooked this matter, as I quite expected to see it generally taken up in all parts of the country. However, in fulfilment of my letter No. 3,528 of the 13th February issue, I have pleasure in handing you herewith a cheque for one guinea, and shall be glad if you will kindly forward same to M. Rollet. At the same time I am anxious to know if anything further can be done to bring the matter again before the public in a further issue of your paper. J. C. H.

THE ASCENT OF SNOWDON.

[3594.]—May I most respectfully ask Mr. Ducros, jun., whether he will answer me the question asked by Mr. Windham? Is the setting of the photograph due to the photographer who shaped the print and caused the left of it to be tilted upwards, throwing the telegraph post out of the perpendicular, and thus making the gradient appear much steeper than it really is? Or are we to assume that Mr. Ducros, jun., answered the question in your last issue when he wrote: "I have to say that Snowdon, with its telegraph posts, is still in the same position as when I attempted and failed to climb it," knowing as we do that the telegraph poles on Snowdon are perpendicular, thus proving the photograph misleading to the public. WELSHMAN.

18,500 MILES ON A BENZ.

[3595.]—On March 1st, 1901, I bought a twin-cylinder 6 h.p. Benz victoria, at a cost of £250, from Messrs. Hewetson's. At the end of the second year I had covered a distance of 12,500 miles, and my expenses were for that distance: Repairs, £10 13s. 10d.; petrol, lubricating oil, etc., £60; making a total of £70 13s. 10d., which is equal to 1¼d. per mile. My third year is now completed, and I have covered a further distance of 6,000 miles, my expenses being: Repairs, £34 3s. 4d.; petrol, lubricating oil, etc., £30; making the total expenditure for the year £64 3s. 4d. Adding these expenses to the two previous years, we have a total expenditure of £134 17s. 2d. for a distance of 18,500 miles, or about 1¾d. per mile.

The car is still running daily, and is to all practical purposes as good as new. The only difference I can notice is a slight loss of power on stiff hills. This last year has been trying to the chains and band brakes, owing to the excessive rain, the roads being often a sea of mud, and very bumpy.

I am now starting my fourth year, and am hoping for equally good results, a report of which I shall have pleasure in sending you next March. FRANK WHITELEY.

March 2nd, 1904.

Correspondence.

EXHAUST GASES AND SIREN.

[3596.]—It will interest your correspondent "Siren" to know that his suggestions, as laid down in letter 3,569, were carried out with great success on the 1903 Benz-Parsifal racing car. S. G. NASH.

HORNS.

[3597.]—"Siren's" suggestion as to utilising the exhaust gases is a good one, but I do not agree that the warning should be continuous. It must, as now, be turned on only as wanted. The note is the thing to be remedied first. Cannot makers of musical instruments suggest some alteration of the present horns, so as to make them sound like a bugle?

The "noise" of motors has always been one of the objections of our enemies, and I am sure that this subject is worth more than a passing thought, as the harsh coughs and grunts of some of the large horns are painful in the extreme.

TOOT.

SHOW ATTENDANCE.

[3598.]—"Autocrat's" reference to the Agricultural Hall Exhibition of last year, though doubtless well intentioned, does an injustice to the visitors. The "undesirable class" has certainly not been in evidence at the Agricultural Hall shows. We fail to believe that the exhibitors, who receive a number of tickets in proportion to the space they book, do not utilise these to their best personal advantage. As a matter of fact, the "shoals" to which "Autocrat" refers as being present on the Saturday evening at the last exhibition were absolutely non-existent. It was a very wet evening, and the attendance was slacker than it had been on any night during the week. CORDINGLEY AND CO.

[We have sent a proof of the above letter to "The Autocrat." He replies as follows: "Evidently Messrs. Cordingley's definition of the 'undesirable class' does not agree with my own. Accounting for one Saturday evening does not answer my remarks. I referred 'to almost every evening, and particularly on Saturday evenings.' The undesirables may pay to come in. This could easily be found out by ceasing to distribute free tickets by the thousand."]

INCOMPETENT EXPERTS.

[3599.] My time has been so fully occupied the last two weeks with matters pertaining to the Automobile Club and the coming election of the new club committee that I have been unable to give earlier attention to your correspondents who have addressed you on the above subject.

First, to reply to "R," whose letter of complaint instigated my letter published in your issue of the 13th ult. According to my view, the business of an autocar vet. should be purely consultative, in order that his opinion may be completely unbiased. It goes without saying that an agent who deals in cars or receives commissions on sales or introductions can make as much profit out of one deal as a professional man could probably make in the way of fees out of ten cases. For this reason the autocar vet. will—at least for some time to come—be a man who has some other profession or business, though if my idea of periodical examinations and reports catches on—as it is bound to when its advantages are fully recognised—there should be enough work to keep many autocar vets. employed in populous centres. This also answers one point raised by Thomas Parker, jun. What I do insist on is that an agent interested in the sale of any particular car or cars should not be accepted as an independent expert. I do not believe in "sitting on the fence"; be honest and get down on one side or the other, either into the "trade" field or the "professional" field. It rests with the users of cars to assist the man on the "fence" into his proper field.

I quite agree with "B. O. H." that the makers will probably welcome the advent of the autocar vet. If half the tales one hears respecting the way the trade are bled in the way of commissions by, in many cases, persons having no connection with the trade, this evil must be a serious one.

Most of your correspondents have touched on the crucial point—viz., how is a competent man to make himself known? Advertising is supposed to be unprofessional, but even if it were not so, or even were justifiable under the new circumstances, one would scarcely care to see one's advertisement classified amongst those who in most cases are traders first and experts afterwards.

"R" says that the man of ordinary intelligence who owns a car knows what he wants when it comes to buying one, and that he also knows, or ought to, all about the upkeep. The only inference to be drawn from these statements is that automobilists as a body are not men of ordinary intelligence, which I deny *in toto*. What I contend is that the average automobilist knows very little about his car, and even when he has reached that stage when he thinks he knows all about it, he has only reached that stage when "a little knowledge is dangerous." The real fact of the matter is that motor cars are now so reliable that they will run for a considerable length of time without giving the driver any trouble, with the result that one is apt to think that everything is going all right, whereas in a large majority of cases excessive wear and tear and often more serious damage is taking place quite unknown to the owner until the time comes when the mechanism gives out, and then comes the bill for overhauling and repairs, whereas if the car had been under the supervision of a practical engineer the proverbial stitch in time would have saved the nine. I am sure that if "R" will consult any of those gentlemen who are practising as autocar vets., and who have addressed you on this subject, he will at once be advised of a shop where he can send his car under the conditions he lays down.

ROBERT E. PHILLIPS,
M.I.Mech.E., Assoc.Inst.C.E.

AIR-COOLED ENGINES.

[3600.]—I see from the reports of the New York Motor Show that in America they build cars with one, two, and four-cylindered air cooled engines. Now I take it that these must work satisfactorily, otherwise they would not continue making them. How is it, then, that with the exception of the Lanchester (so far as I know) we make no large air-cooled engines?

If air-cooled engines are a success, a maker using them should surely be able to turn out a much cheaper and lighter car than if he used a water-cooled engine, and the purchaser would not be troubled with broken pumps, leaky joints, and frost-cracked radiators or water jackets.

Perhaps some of your readers have tried American air-cooled engines. If so, I should like very much to have their opinion. AIR-COOLED.

THE SECURITY OF NUMBERS.

[3601.]—We would ask the favour of space to utter a word of warning to car owners and the trade, that they should see that their numbers are so fixed that they cannot be tampered with. During the Crystal Palace Exhibition we were running a car around the Palace, and we garaged it, with a number of others, in a local livery stable. One day our driver had scarcely left the garage ere he was stopped by a policeman, and then found there was no number on the front of his car. As some half-dozen others found themselves in a similar predicament the occurrence could scarcely have been accidental. The sequel was a summons to appear at the Lambeth Police Court last week, and a fine of five shillings and costs. We therefore suggest that the numbers of private cars—which, when once registered, keep the same number "for all time"—be, wherever possible, *painted upon* the car itself, and not attached separately. With traders' and manufacturers' numbers, which are changed about from car to car, this is not of course possible, but it will be well for all to see that the numbers are so affixed that it will be impossible to remove them without considerable trouble, or much inconvenience and injustice to drivers may result. D. C.

SUNDAY TRIALS OF CARS.

[3602.]—I appreciate the letter by E. Robinson upon the above subject in *The Autocar* of March 5th. As workshop foreman of a repair works in the North of England, I get quite enough of motors for six days in every week, and desire to enter my protest against the apparent selfishness of the leisured class of motor owners and motor dealers who would necessarily rob me of my divine right to a rest on the Sunday. I have yet to learn that any permanent profit accrues from Sunday trading, but if other motor traders adopt a Continental Sunday in deference to the requirements of their customers I fear lest the spirit of competition should compel my employers unwillingly to request my attendance at business seven days per week. The keenness of competition I observed strikingly in evidence at the Crystal Palace Show, but there is no good reason why such competition should trespass upon the workers' day of rest *à la Française*.

W. E. CORCUTT.

Correspondence.

THE FRENCH SHOW.

[3603.]—"S.F.E.'s" remarks as regards the French Show are only what are expected from him, and the only thing to admire about him is his courage in making a suggestion which he could not uphold for five minutes, and which I candidly believe he has as little belief in as I have.

The suggestion that English manufacturers should not show in France is a little too rich. There have been up to the present moment three manufacturers showing in France. One was showing a type with an horizontal engine which was discarded by a few French manufacturers in the year 1900; the second—the firm of your correspondent—showed a car which was at least three years out of date, and who is this year manufacturing a car which has not in its design a single thing to recommend it as original or a new invention, or that is not in every point and detail an attempt to copy the French makers of 1903. There is not a single thing upon the car that the French have not used or discarded before he fitted it. If "S.F.E." can mention a single thing upon his car that is new, or that would give any help to French manufacturers to perfect their manufactures, I should be pleased if he would name it. In fact, "S.F.E.," not six months ago, wrote letters in your correspondence columns running down most of the articles he is now fitting. As regards the third manufacturer who exhibited at the French Automobile Show, he gave a genuine and interesting display as far as it went, and as he has not claimed anything special, or suggested that he went over with the object of teaching Frenchmen, there is no need to treat his silence with anything else but the courtesy it deserves, and I would suggest that "S.F.E." took a lesson in courtesy from this same firm. D.M.W.

A DANGEROUS PRACTICE.

[3604.]—I recently saw an innovation on a car novel to me at any rate. Across the back of a covered car (Limousine, I think) a row of iron spikes 1½in. to 2in. long, painted white, had been nailed. Presumably, the object was to prevent small boys having a cheap ride, but as the car had a side entrance I could see no foothold for them. As a motorist, I venture to protest against this device. Anyone who drives a car in crowded thoroughfares knows the necessity of occasionally stopping dead, not to mention occasionally driving on the reverse. The consequences for an unfortunate cyclist or horse might be terrible. X.

TRIALS OF CARS.

[3605.] The letter of Mr. E. Robinson in your issue of the 5th has my warmest sympathy, and he deserves the heartiest thanks for bringing the matter forward in such a manly and Christian manner. Now the question of Sunday traffic has been raised in connection with the motor industry, I should like to plead for those who, like myself, are engaged in it at a watering place, where there is a great tendency to take no notice of Sunday being a day of rest. During the summer months especially, we are engaged for long hours from Monday morning until Saturday night, and are willing to oblige motorists at all times, day or night, and therefore feel we should be allowed one day's rest, putting on one side for the moment the religious question.

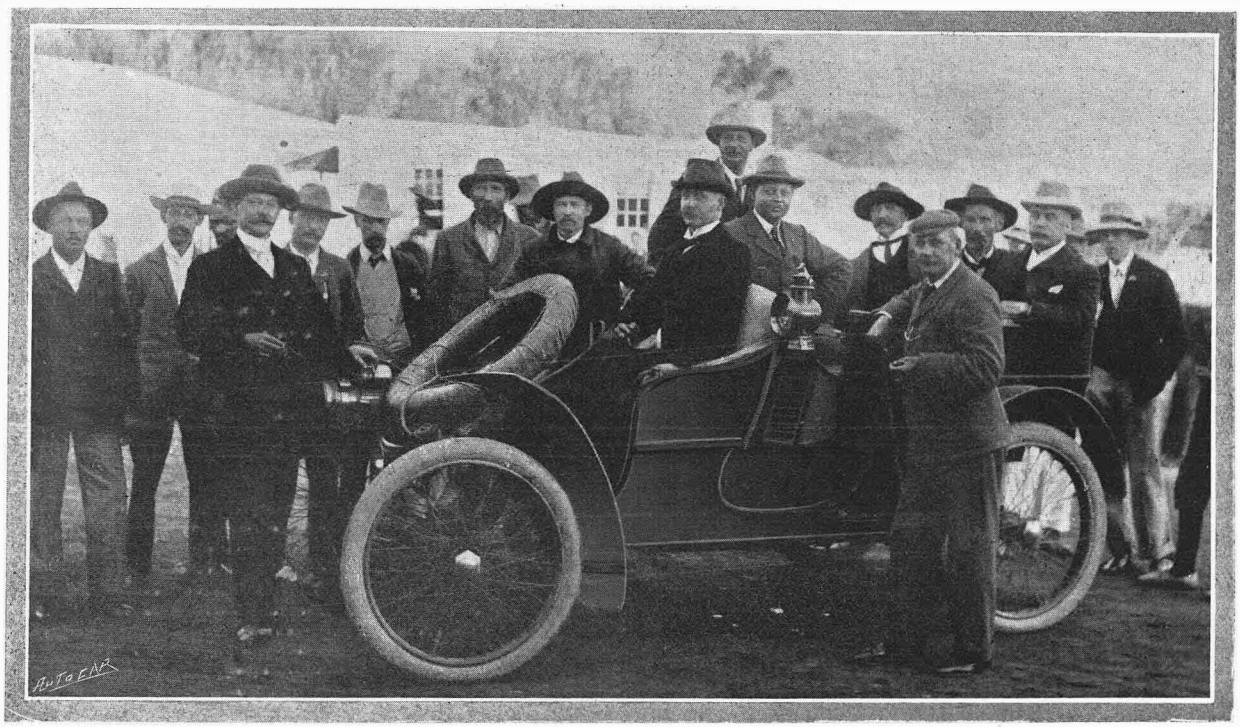
In most cases we recognise it is simply want of thought, and we hope that this summer car owners will as far as possible obtain what they require on Saturday evenings, and thus allow a little rest to those who have the right of the worker to a day of rest, and also a duty to Him who has ordained the Sabbath. SUSSEX.

SUMMARY OF CORRESPONDENCE.

AUTOMATIC CARBURETTERS. In reply to "Correct Mixture," we recommend the new carburetter made by the Rover Cycle Co., of Coventry, which gives a correct mixture at any speed.

TYRES AND THE SHOW. The Maison-Talbot inform us that there were 980 wheels fitted with Michelin tyres at the Crystal Palace Show, and that the statements which have been made to the effect that there were more of another make are therefore incorrect.

TYRE INFLATION. The questions asked by F. J. Tompson as to the action of the products of petrol combustion upon tyres in the Pompeesi tyre inflator were anticipated and answered last week by the letter [3562] published from Messrs. Charles Jarrott and Letts, Ltd.



A LANCHESTER CAR IN SOUTH AFRICA. We have previously noticed some of the exploits of Lanchester cars in South Africa and their adaptability to the topographical conditions which prevail there. Particulars are to hand of one of these cars having made a trip between Johannesburg and Bloemfontein. The car is the property of the Rudge-Whitworth Cycle Co. (agents for the Lanchester cars), whose manager at Bloemfontein (Mr. Earley) informs us that it was intended to drive the car on *viâ* Kimberley to Capetown. If this trip is successfully accomplished it will form one of the best runs yet accomplished on this make of car. Before leaving Bloemfontein the car was tested on Naval Hill, which is noted for the severity of its gradient, and the surface of which had been rent and torn by torrential rains. The car, however, travelled over sluits, boulders, sand, and bog, quite pleasantly, most of the time at the rate of twenty-five miles an hour, sometimes getting on to its top speed of forty miles. The illustration depicts a Lanchester car engaged in electioneering work in South Africa.

Flashes.

Lord Hastings has purchased the handsome-looking 28 h.p. Gladiator which was shown at the Crystal Palace, and which was illustrated in our show report.

* * *

The Clarkson steam motor 'bus which has been purchased by the Eastbourne Corporation for public service purposes has commenced duty by making alternate journeys between Victoria Place and the Tally Ho and between Victoria Place and the Cemetery.

* * *

Those interested in the Georges-Richard cars may remember that the 20 h.p. car had a stop booked against it on Westerham Hill in the thousand miles reliability trials. This it seems was a mistake. The observer, apparently, was not acquainted with Westerham, and booked a stop which occurred on a hill previous to Westerham as taking place on the test hill itself.

* * *

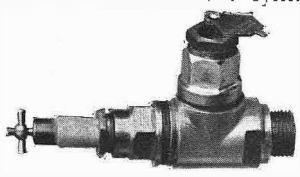
The ordinary reporter's ideas of the working of an internal combustion engine are proverbially crude, but we do not remember having seen a case in which ideas were so mixed up as in the mind of a reporter who, in his report of the Edinburgh motor show, spoke of a six cylinder Napier fitted with "a new hydraulic contrivance for the regulation of the pressure of air, for the mixture of the water, and petrol for the engine."

* * *

By commandeering a motor car, a Metropolitan policeman effected the arrest of a man charged with uttering a counterfeit half-crown. The man galloped off in a trap, but, jumping on a motor car which was passing, the constable caught him up after a hot chase for a mile.

* * *

A sparking plug adapter, having a transparent window in a side inspection chamber, has been devised and patented by Mr. E. B. Milburn, of Northumberland Works, Wilts. It consists of a T-piece, one arm of which screws into the cylinder, and into the other end of this arm an ordinary sparking plug is screwed. The remaining opening from the T-piece is closed by a thick glass window held between two packing washers with a gland nut. The external face of this nut has a small swing door on it, which effectually prevents any moisture from settling on the glass and causing breakage. This adapter suffers, unfortunately, from the common defect of the glass sooting up and becoming opaque. Owing to the fact, however, that the adapter removes the glass rather further from the combustion chamber than usual, it is probable that the sooting would be less. There is also the advantage of the sparking plug and inspection adapter being interchangeable.



"THE AUTOCAR" DIARY.

Mar. 11. Nottingham and District A.C. Annual Dinner.
" 12.—Midland A.C. General Meeting.
" 12.—Manchester Motor Show closes.
" 13-20.—Cannes Automobile Week.
" 14-19.—Boston, U.S.A. Autocar Show.
" 15-16.—A.C. America Commercial Vehicle Trials.
" 16.—Entries close Vienna Alcohol Motor Exhibition.
" 17.—A. C. G. B. I. Paper, "The Use of the Highway." By Mr Moresby White.
" 17.- Paris Rome Touring Trials commence.
" 19-26.—Motor Car Show, Agricultural Hall.
" 19-27. Frankfort on-Main Autocar Show.
" 20-26.—Nice Week. (Consumption Trials 22nd and 23rd.)
" 21-26.—Washington U.S.A. Motor Show.
" 22.—Motor Union Annual Meeting (5 0), Agricultural Hall.
" 22.—Manchester A.C. Paper, "My Experiences with a 60 h.p. Mercedes." By Mr. Higginbotham.
" 22-27.—Trials of Electrical Vehicles, Paris.
" 24.—A. C. G. B. I. Paper, "Alcohol as a Motive Power." By Dr. W. R. Ormondy.
" 26.—Sheffield A.C. Run to Retford.
" 30.—Cheltenham A.C. Lecture by Mr. J. W. Roebuck.
A.C.G.B.I. Side slip Trials. Beginning of April.
Gordon-Bennett Eliminating Trials April or May.
May 19-20.—Glasgow to London Reliability Trial (entries close April 13.)
June 17.- Gordon-Bennett Cup Race.

The Ivel agricultural motor has been awarded a gold medal at the Cairo agricultural exhibition.

* * *

It will no doubt be useful to motorists in the Glasgow district to know that Messrs. David Carlaw and Sons, a firm of mechanical engineers in Finnieston Street, are specialising on motor car repairs and alterations. They have storage for fifty cars, so that it should be a convenience to many.

* * *

The Motor Car Co. point out to us that their 10 h.p. Decauville still holds the London to Edinburgh record, as in June, 1902, this car was run in 20h. 40m. from capital to capital without a stop of the engine or the road wheels. This performance was vouched for by an independent observer (Mr. F. T. Bidlake), and up to the present it has never been equalled.

* * *

An amusing narrative appears in *The Indian Sporting Times*, entitled "My First Motor Car," apparently written by an Indian military officer on leave of absence in Great Britain. Amongst other experiences is one in which, on being unable to obtain petrol as expected from a service of motor 'buses at Dunbar, owing to the service being discontinued, he, "in desperation, went to all the chemists' shops in the town, and bought up all the inflammable fluids they had, including naphtha, benzol, benzine, and other fluids, varying in colour from bad beer to fine gin. The few drops of petrol remaining assisted in starting the engine" (remarks the writer), "and by keeping her on the go we managed to get along. But, oh! the odour we left on the trail!"

* * *

What happened when a horse met a motor car driven by a doctor was described at Shoreditch County Court. "A man was riding the horse," said the doctor, "but he lost control of it, and the animal plunged about, and finally sat on the front of the car. The front was bent in and the wings broken by its weight." "Possibly it felt ill and wanted to consult you," suggested the defending solicitor. The doctor was awarded £10 damages.

* * *

Messrs. Deasy and Co., owing to the increase of business, will shortly be moving from 217, Piccadilly, to 10, Brompton Road, Albert Gate, where larger and more commodious premises have been secured.

* * *

The London Power Omnibus Co. have bought from Stirling's Motor Construction Co. (1903), Ltd., Granton Harbour, Edinburgh, eight omnibuses with which to begin their service. The vehicles will be run on the road between Brondesbury Station and Marble Arch, where the passengers will be deposited at the station of the Central London Railway. The intention is to give a frequent service of six omnibuses to this point without wasting time plunging into the congested traffic of Oxford Street.

We are informed that His Majesty the King's 28 h.p. Mercedes car was delivered at Buckingham Palace a few days ago.

* * *

Some of our readers may be interested to know that the Motor Mart, Ltd., 145-147, Euston Road, N.W., recently installed a complete charging plant for electric motor cars.

* * *

At the meeting of the Junior Institution of Engineers on March 4th, a paper was read by Mr. G. C. Allingham, entitled "Notes on Electric Accumulators." Speaking of motor car and other portable cells, the author said the usual practice was to employ light pasted plates, which had a very short life, but which are made as cheaply as possible, and simply scraped and replaced by new ones as soon as they begin to give trouble. The extreme importance of the chemical purity of the materials, not only of those used in the manufacture of the plates, but also of the acid, and even of the water used for filling up, was insisted upon.

* * *

It is satisfactory to note that the recent agitation by Mr. E. J. Coles and others against strewing the roads of the Metropolitan boroughs with chippings of flint is likely to be successful. The Town Clerk of Marylebone has informed Mr. Coles that the question of the kind of ballast to be used in ballasting roadways in that borough is now under the consideration of the Works Committee of the borough council.

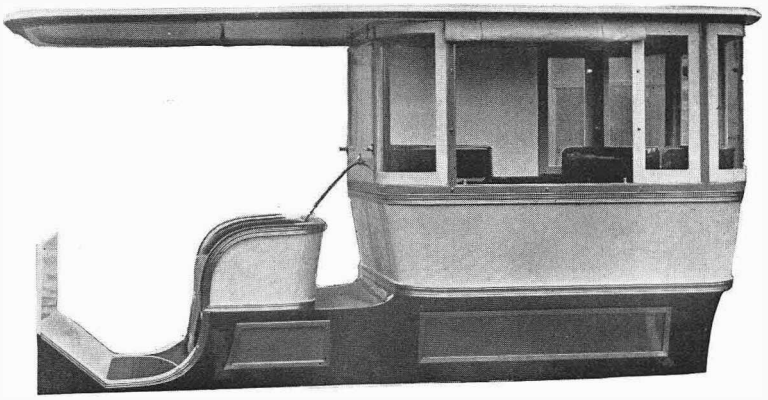
* * *

The Hotchkiss car (which was one of the new and striking features of the Paris Salon last December) will be shown at the Agricultural Hall next week by Messrs. Mann and Overtons, Ltd. It will be its first appearance in this country, so that no little interest will be taken in it. We understand that during the show one will be available for trial.

* * *

A very interesting race for motor boats will take place on August 8th between Calais or Boulogne and Dover. The race—an International one—will be for the Récopé Cup. This cup has been presented by Comte Récopé, the vice-president of the Yachting Division of the Automobile Club de France. The entries close on June 30th to the French club, 6, Place de la Concorde, Paris. The French Minister of Marine has promised to convoy the racing boats by torpedo boats in French waters, and our own Automobile Club is taking steps to obtain Admiralty sanction on this side of the Channel. The club is also seeking the co-operation of the railway companies, municipalities, and yacht clubs, so that, all being well, the 8th of August should see a combined fête of automobilism and motor racing which will not be soon forgotten, as there is no doubt that a large number of automobilists will drive down from town and elsewhere to see the boats come in. There is no question of a good French entry, and we hope that the British makers will also be strongly in evidence. The French Automobile Club is thoroughly alive to the importance of the internal combustion launch to the naval authorities, and it feels strongly that the race should take place under the direct patronage of both the English and French naval departments.

The extreme ease with which a Lanchester car can be driven across country, thanks to its unique springing, is occasionally a wee bit too tempting, as was discovered by Mr. Claude Browne and his party (consisting of Mrs. Claude and Ronald Browne, Mr. Harry J. Swindley, and the mechanic) when returning from Woking on Saturday last. Between New and Old Woking the road forks, one road going to the right to Stoke and Guildford and the other to Ripley. By error, the right-hand road was taken, and when the mistake was discovered Mr. Browne essayed to drive across a rough triangular piece of ground forming the fork. In so doing the car wheels got into ruts, which presently, getting deeper and deeper, caused the differential gear box to ground upon the mound between, so that the car came to a dead stop, while the wheels spun furiously in the wet and slush. To extricate the car was quite a feat of civil engineering. The ruts had to be widened and cleared away in order that plank runners might be laid for the wheels to rotate upon, and it was necessary to drive a heading beneath the differential gear box in order to allow it to come away. A couple of the horny-handed and numerous boys, however, soon made shift to effect the work, and the Lanchester was presently backed out of its dry dock.



THE GERMAN EMPEROR'S CAR BODY. This illustration depicts the body built for the German Emperor's car by Messrs. Hooper & Co., 54, St. James Street, W. It follows the general lines of that fitted to King Edward VII.'s car by the same firm; this similarity being the result of a drive which the Emperor William took in his royal uncle's car soon after it was finished. The ends and bends of the passenger portion of the car are glazed. The straight portion across the front seat can be slid up under the roof. The sides between the glass bends may be closed in with curtains at will. The canopy and glazed portions of the superstructure are removable. The double tonneau is luxuriously seated to accommodate six, and the body is finished in the German royal colours. The upholstery is in plain red leather, this being the only feature in which the car differs from King Edward's, which is buttoned. The window frames are painted ivory white. One large electrolier is set on the canopy.

* * *

Mr. Mervyn O'Gorman's "Motor Pocket Book," which we hope to review in an early issue, is really a most useful work, and one which, with the "Dictionary of Motoring," will enable recruits to automobilism to bring themselves right up to date.

A LOST CAR.

Mr. A. C. Payne, Rosenau, 89, North Side, Clapham Common, S.W., writes: "Car A-2140, derelict, was taken into custody this morning (Monday) after being left outside my house from six o'clock till ten. No owner to be found. It was about 10 h.p. M.M.C. It had not come far, and petrol tank was full. My own opinion was that it had been stolen, and that the batteries had run out. The owner may see this, if the police have not already found him."

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 indentifying number.

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

INSPECTION PIT DIMENSIONS.

Can you give me the proper dimensions for an inspection pit? —H. G. R.

The inspection pit dimensions should be 3ft. 6in. wide by about 4ft. 6in. deep, and sufficiently long to enable the operator to have ready access to all parts of the car from the front of the engine to the rear live axle. If, however, space does not permit of the pit being made of sufficient length to do this, it might be made about 4ft. 6in. long, and the car pushed into the position required to reach those parts which need attention. The pit should be lined with bricks or boards; the former preferably, and these should be blue on account of their damp resisting qualities. The pit should be well drained, particular attention being paid to this point. A gutter formed round the edge of the pit and led away to the nearest drain trap will prevent a lot of moisture running into the pit itself. A ledge should be formed along the upper edge of the pit, into which stout boards at least 1½in. thick can be fitted over the top of the pit so as to complete the floor space when the pit is not in use.

CRACKED WATER JACKETS.

Through carelessness the recent frost has made a small crack in the water jacket of my 9 h.p. De Dion engine. The engine itself is unaffected, but the water escapes slowly from the jacket. Can anything be done?—C. K.

A small crack in the water jacket of an engine is a rather more difficult matter to deal with than one which is of larger dimensions. For in the latter case one can easily repair the fracture by means of what is known in the engineering world as a "rust joint." This is made by filling the crack with fine iron filings damped with a solution of sal ammoniac. This causes the surface of the fracture to oxidise, and with this the fine iron filings would set in sufficiently hard to repair the fracture. In the present instance if the above treatment cannot, by reason of the narrowness of the fracture, be carried out, the repair will be more satisfactorily executed by simply soldering the fracture with hard tinman's solder. The surface of the jacket along the fracture should be filed bright and clean, and some acid soldering fluid run over the joint, if possible allowing it to run in through the crack, for which purpose it would be advisable to form a V-shaped channel along the crack by means of the edge of a file. The jacket should be well warmed by the aid of a tinman's blow lamp, and hard solder run into the fracture. If the blowpipe is employed great care should be taken that the petrol tank and the carburetter are completely emptied, and that no inflammable fumes arising from petrol are about the car. Otherwise damage may possibly result.

A GOVERNOR QUERY.

Will any of your readers who have run the new type 12-14 h.p. governed Clément-Talbot give their experiences? It seems to me that in cases such as this, where the governor is fitted as a "fool-proof" apparatus merely to prevent the engine racing at excessive speeds, the car must on all ordinary ones be running with the throttle full open with a corresponding increase of petrol consumption. In the car under my notice ten to twelve miles per gallon was the best done—of course, a quite impossible rate. Surely in all such cases there should be some hand appliance for "setting" the governor at will, and then working the accelerator to meet the road requirements?—C.W.

The butterfly throttle in the induction pipe immediately over the jet is fitted with a strong spring, which when the accelerator pedal is allowed to lift to its fullest extent entirely closes the induction pipe save for a small hole made through the centre of the throttle, which permits mixture sufficient to pass to keep the engine running slowly declutched. Even when well sparked up, the action of the spring on the throttle valve is so quick that no racing results when changing speed. The large consumption of petrol referred to by our correspondent may be due to the fact that he always has his hot water jacket in operation. We find that this is only requisite in very cold and damp weather, but if allowed to operate when the weather is comparatively dry a considerable increase in petrol consumption is the result.

OPENING CELLULOID ACCUMULATORS.

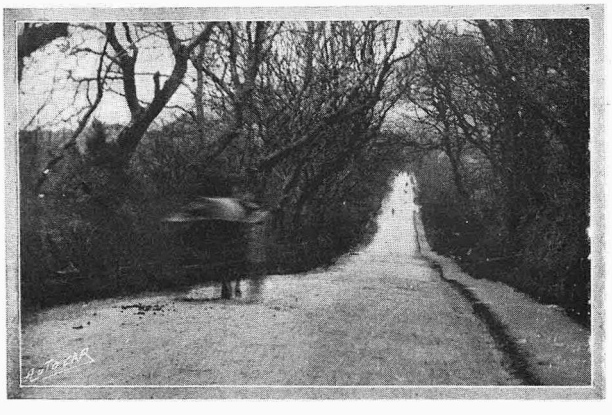
Could you inform me how to open and seal up a celluloid accumulator? I have one in which the plates have dropped.—E. R. WEBBER.

You will be well advised not to attempt to open the accumulator, but rather to return it to the makers, or send it to an electrician who undertakes the repairing of accumulators, to have the necessary repairs executed. If, however, you are particularly anxious to do the work yourself, the top of the accumulator will have to be detached by dissolving the celluloid cement at the cap joints by the aid of acetone. This is a solvent of celluloid, and should therefore be handled very carefully, the liquid being applied only between the joint, so that it will attack the cement only and touch the sides of the cap as little as possible. Liquid celluloid will have to be employed to re-seal the case. The same liquid is useful for fixing small strips of sheet celluloid to cells which have become cracked; also for stopping leaks.

THE RESISTANCE OF A COIL.

Would you be good enough to let me know the usual resistance of the winding of induction coils for motor cars? The primaries of my new coil balance 0.45 ohm, and the secondaries 495w. The former seems rather low. Would you advise putting external resistance in the primary circuit?—P.

The resistance of the windings of your coil are about normal. Working from a four-volt accumulator, your primary would pass from eight to ten ampères on closed circuit, which is rather high, but not at all unusual. The current taken under working conditions depends very much on the adjustment of the trembler, but would probably be about two ampères. In all probability, a small external resistance would not materially affect the spark, and would decrease the maximum current. You might try a yard of No. 14 Climax high-resistance wire. This has a resistance of about a quarter ohm per yard. If this is made up as a coil, it should be doubled over at the centre and wound double. The current then flows up the coil one way and back the other, which prevents it from having any self-inductive effect.



THE BRITISH ELIMINATORY TRIALS. A stretch of road near St. John's, on the proposed Manx course.

VALVES AND VALVE MECHANISM OF INTERNAL COMBUSTION ENGINES.*

In opening his paper, Mr. Phillips suggested that if any apology therefor was necessary the recent controversy touching the merits and demerits of automatic valves supplied it. To achieve brevity the author's remarks were entirely confined to valves and mechanism of internal combustion engines of the four-cycle type.

Present Practice.

In the modern petrol engine it was the universal practice to open the exhaust positively and to close it by a spring. At first the induction valve was opened atmospherically or automatically, and was closed by a spring, but the latest tendency was to open these valves in the same manner as the exhausts. To judge by some manufacturers' remarks, this was only done to meet the public demand rather than to obtain any advantage. Mr. Phillips then proceeded to describe the construction of both automatic and mechanically-operated valves, their positions in the cylinders, and the means of actuation, going on to say that where there was room to place the valves side by side without undue decrease of valves or increase of length of engine, he thought this was the best arrangement. Failing this, the induction valve above the exhaust was to be preferred. He by no means approved of placing the valves on opposite sides of the cylinders, as, apart from extra parts necessary, the consequent irregular shape and enlarged area of the cooling surface of the combustion chamber must be detrimental to consumption and to general efficiency. After pointing out that with atmospheric valves the springs were light and with mechanically-operated valves heavy, and the method of lifting or opening the latter, Mr. Phillips emphasised the important part played by the spring in connection with the automatic valve. It must be light enough to permit the valve to open as soon as possible in the charging stroke, but not so light that the valve should be sluggish or irregular in closing. Increase of the strength of the spring increased the lag and the tendency to vibratory movement or fluttering, and a compromise as regards the strength of spring was necessary. Further, the automatic valve was liable to "stick up." Many attempts had been made to improve the automatic valve. Mr. Phillips cited the valve with weak and strong spring by Mr. E. Estcourt, the annular inlet valve of Mr. Montague Napier, and the double spring valve of Messrs. Pidgeon and Bradley which improved as to opening was in no way superior to the ordinary valve as regards closing—rather otherwise—and while it got over the sticking-up difficulty, it accentuated rather than decreased the greatest defect of the atmospheric valve—viz., the dependence on a spring for efficient action. To compare the automatic valve with the mechanically-operated valve it was necessary to fix a standard. What are the essentials for an ideal induction valve?

(1.) Positive and instantaneous opening immediately pressure in cylinder falls to that in induction pipe; positive closing at end of suction stroke at all speeds to ensure greatest valume of charge in cylinder.

(2.) Inability to become impaired or disarranged.

(3.) Automatic adjustment of time of opening according to speed.

(4.) Inability to "stick up" on seating.

(5.) Absence of vibratory motion, consequently diminution in wear, and absence of noise.

Dealing first with opening and closing. Atmospheric valve only opened after piston had completed such part of suction stroke as was necessary to create vacuum in cylinder sufficient to overcome strength of spring, consequently a full charge of gas was never drawn into the cylinder. Also owing to lightness of spring, valve does not return positively at end of suction stroke, so that percentage of gas was discharged back through the valve, resulting in loss of quantity, compression, and power. Loss of compression in the cylinder increased lag of valve at opening. The time of opening also varied with pressure of exhaust gases remaining in the cylinder at end of exhaust stroke. A mechanically-actuated valve presented no such variations; its action was positive, but owing to the varying pressure of the exhaust gases in the cylinder at end of the exhaust stroke the valve must be set to close some time later than the dead centre to avoid opening before the pressure of the exhaust gases had fallen to atmospheric pressure, otherwise they would blow back into the induction pipe and reduce volume of incoming charge. Consequently, whether opening at dead centre or later, a full charge could never be drawn into the cylinder with engine running at high speed. Though the mechanically-actuated valve was advantageous its action was by no means perfect.

With regard to wear and tear. The perfect action of the automatic valve depending upon its spring—the weak point of which was its delicacy—any variation therein impaired the efficiency of the valve. Cotters and washers acted on by the springs were subject to wear, and occasional breakage through the continuous hammering. A mechanically-actuated valve suffered much less from this hammering, the only serious wear taking place in the operating mechanism. Wear in the strikers or lifters meant so much lost motion, involving lag at opening and lead at closing.

Valve Adjustment.

In the matter of adjustment, there was considerable difficulty in adjusting strength of automatic valve spring, even with single-cylinder engine, and this difficulty was hugely increased with multi-cylinder engines. The same difficulty arose with mechanically-actuated valves in adjustment of strikers to obtain similar period of opening all valves, but as this adjustment was much simpler than that of the springs of automatic valves, consequently there was an advantage under this head.

"Sticking up" could not take place with mechanically-operated valves. Then with regard to vibratory action and noise. All automatic valves chattered more or less on account of the sucking action of piston. This diminished the intaken charge, and caused wear to cotters and washers by subjecting them to considerable hammering. With mechanically-actuated valves this vibratory action was entirely absent.

Therefore the mechanically-actuated valve approached most nearly to theoretical perfection, but neither it nor the atmospheric wholly reached the ideal standard, as neither opened at the theoretically correct time at all speeds, and both required adjustment to preserve their efficiency. If the valves and operating mechanism were properly designed the construction of exhaust valves left little to be desired. Any improvement would probably lie in the direction of water-cooling, or varying the time of closing according to the speed of the engine, and of obtaining a quicker opening or closing so as to obtain longest possible period of complete opening. Water-cooling the valves had not yet been successfully employed in petrol engines for automobiles.

Mr. Phillips then referred to experiments carried out by Mr. Mervyn O'Gorman, in order to obtain more rapid opening and closing of an exhaust valve. A supplemental spring, arranged to throw the valve wide open immediately upon lifting, was made use of. Mr. Phillips then went on to describe an induction valve of his own design, which, he claimed, fulfilled all the "essentials he had laid down." Its special feature he termed auto-mechanical. It was retained on its seat during whole of compression, and working part of exhaust stroke by a spring, and during latter part of exhaust stroke by pressure of exhaust gases in the cylinder alone, so that it was free to open automatically, either by gravity or by the spring, immediately upon the pressure in the cylinder equalling that in induction pipe, so that it always opened at the correct moment at all speeds. The spring was strong enough to ensure positive closing, and its pressure was removed so as to free it before the end of exhaust stroke, and was restored to close the valve at the end of suction stroke by mechanical means, preferably from cam on half-time shaft. The time of removal of spring pressure was immaterial within certain limits so long as it was in advance of the time of opening. This mechanism had been tried thoroughly on his Rochet-Schneider car, and no alteration or adjustment had been made after the valve had been placed in position. The valve requires no adjustment either in first instance or subsequently. As the original atmospheric valve could be replaced at will, he had made frequent running comparisons between the two valves, and had no doubt as to the increased power afforded by the auto-mechanical valve, and in this he was supported by many qualified to form an opinion. Lack of opportunity had prevented brake tests, but he hoped before long to make public the results of such a test.

(To be continued.)

*Excerpts from a paper read before the members of the Automobile Club by Mr. R. E. Phillips, M.I.M.E., A.M.I.C.E., etc.

SOME DETAIL DIMENSIONS OF PETROL ENGINES.

Compiled by Mr. R. E. Phillips, M.I.M.E., etc.

THE leading dimensions and other data given in the following tables are extracted from a very comprehensive list, which was incorporated in a paper on "Valves and Valve Mechanism," read before the members of the Automobile Club, by Mr. R. E. Phillips. The tables were compiled with the object of showing the results of employing different sizes of valves and giving them different lifts, and to obtain some definite comparisons between the automatic and mechanically operated inlet valve. The results obtained will be of very great value to automobile engineers in general, while to the practical automobilist, even a cursory comparison of some of the leading particulars and dimensions, such as the number of cylinders, their bore, stroke, number of revolutions per minute, and horse-power, will provide much food for useful thought. In his paper, Mr. Phillips has treated with such a large number of engines that consideration of space precludes our dealing with the whole. We have, therefore, extracted those engines which are well known and in general use, or contain any distinctive dimensions or features departing from current practice. We have also arranged all the engines of any one make under their distinctive heading for the purpose of ready comparison. In the case of the Aster engines—of which some particularly interesting figures are given—the names of the cars to which these engines are fitted are given.

The most striking difference in the tables is found in the 12 h.p. Aster engines, one of which has four cylinders and the other two; both have the same stroke, though the one has a larger bore than the other, and their normal speeds are identical. As there is a great deal of interest being taken in the question of multi-cylinder engined cars at present it would be most instructive to have some definite records of the two engines running both on the test bench and upon the roads for purposes of comparison.

In order to appreciate the figures given in Mr. Phillips's tables it will be necessary to follow very carefully our completed report of the author's paper, though, as we have already stated, there are many detail figures which a large proportion of our readers will now be able to follow readily with advantage to their knowledge of petrol motors.

On the preceding page we publish the first part of our report upon Mr. Phillips's paper.

		Ariel.		Aster.						Daimler.		De Dion.	
				(Gladiator	(Clement)	(Clement)	(Clement)	(Gladiator	(Gladiator				
Horse-power		15	18	6½	9	10	12	12	14	18	28	6	8
Number of cylinders		4	4	1	2	4	4	2	4	4	4	1	1
Diameter of cylinders		3.5	3.5	3.46	3.46	3.30	3.46	4.13	3.46	3.74	4.33	3.54	3.93
Stroke		3.75	4	4.33	5.51	4.72	5.11	5.11	5.11	5.11	5.9	4.33	4.72
Revolutions per minute		1400	1400	1400	1200	1000	1000	1200	1200	800	750	1700	1600
Volume swept by piston (cubic inches)		36.07	38.48	40.7	51.79	40.35	48.03	68.42	48.03	56.10	86.84	42.6	57.25
Piston speed in feet per minute	Mean	875	933	1010	1102	786	851	1022	1022	681	737	1226	1258
	Maximum	1374	1466	1587	1731	1235	1337	1606	1606	1070	1158	1926	1976
Type of admission valve		M	M	A	M	M	M	A	M	M	M	A	A
Diameter of admission valve		1.25	1.31	1.14	1.18	1.18	1.18	1.96	1.18	1.25	1.37	1.29	1.45
Lift of admission valve		.218	.218	.118	.236	.236	.236	.196	.275	.27	.275	.118	.157
Area of charge inlet port (maximum)		.854	.895	.422	.873	.873	.873	1.20	1.01	1.05	1.18	.477	.714
Charge velocity through inlet valve in feet per second	Mean	164	167	376	198	128	153	190	158	118	152	422	356
	Maximum	257	262	590	311	201	240	298	248	185	238	663	559
Area of induction pipe		.833	.882	.817	1.93	1.38	1.93	1.74	1.74	1.38	1.56	.528	.817
Charge velocity through induction pipe in feet per second	Mean	168	170										
	Maximum	264	267										
Diameter of exhaust valve		1.25	1.31	1.18	1.18	1.18	1.18	1.65	1.18	1.25	1.37	1.25	1.37
Lift of exhaust valve		.218	.218	.236	.236	.236	.236	.315	.275	.27	.275	.196	.196
Area of exhaust port (maximum)		.854	.895	.873	.873	.873	.873	1.63	1.01	1.05	1.18	.768	.842
Exhaust velocity through exhaust valve in feet per second	Mean	164	167	189	198	128	153	140	158	118	152	261	302
	Maximum	257	262	297	311	201	240	220	248	185	238	410	486
Area of exhaust pipe		.833	.882	1.09	1.93	1.38	1.93	2.68	3.01	1.38	1.56	.58	1.56
Velocity through exhaust pipe in feet per second	Mean	168	170									346	
	Maximum	264	267									543	

		De Dion.		Fiat.		James and Browne.			Maudslay.		Mercedes.		Standard.
Horse-power		10	12	16	24	9	12	18	18	25	20	60	12
Number of cylinders		2	2	4	4	2	4	4	3	3	4	4	2
Diameter of cylinders		3.54	3.93	4.33	5.11	4	3.5	4	5	5	3.93	5.51	5
Stroke		4.33	4.33	4.33	5.11	6	4.5	6	3.5	5	5.11	5.9	3
Revolutions per minute		1500	1500	1000	1000	700	800	700	800	700	900	1000	1200
Volume swept by piston (cubic inches)		42.6	52.52	63.73	104.75	75.36	43.29	75.36	68.7	98.15	61.98	140.65	58.89
Piston speed in feet per minute	Mean	1082	1082	721	851	700	600	700	466	583	766	983	600
	Maximum	1700	1700	1133	1337	1100	942	1100	732	916	1203	1544	942
Type of admission valve		A	A	M	M	A	A	M	M	M	M	M	M
Diameter of admission valve		1.25	1.45	1.37	1.53	1.87	1.87	1.87	1.62	1.62	1.41	3.46, 1.92	1.37
Lift of admission valve		.118	.157	.236	.236	.093	.093	.25	.375	.375	.315	.157	.375
Area of charge inlet port (maximum)		.462	.714	1.01	1.13	.545	.545	1.46	1.90	1.90	1.39	2.64	1.61
Charge velocity through inlet valve in feet per second	Mean	384	306	175	257	268	176	100	80	100	111	147	121
	Maximum	603	480	275	403	421	276	157	125	157	174	231	190
Area of induction pipe		.535	.817	1.30	1.65	1.47	1.47	1.47	1.47	2.40	1.09	1.74	.985
Charge velocity through induction pipe in feet per second	Mean								103		142	224	199
	Maximum								161		223	352	312
Diameter of exhaust valve		1.29	1.37	1.37	1.53	1.5	1.5	1.5	1.62	1.62	1.41	1.96	1.37
Lift of exhaust valve		.196	.196	.236	.236	.375	.375	.375	.375	.375	.315	.315	.375
Area of exhaust port (maximum)		.793	.842	1.01	1.13	1.76	1.76	1.76	1.90	1.90	1.39	1.93	1.61
Exhaust velocity through exhaust valve in feet per second	Mean	224	259	175	260	83	54	81	80	100	111	202	121
	Maximum	352	407	275	408	130	85	127	125	157	174	317	190
Area of exhaust pipe		1.02	1.74	1.30	2.68	1.76	1.76	1.76	1.47	2.40	1.22	2.46	1.09
Velocity through exhaust pipe in feet per second	Mean								103		126		180
	Maximum								161		198		282

		Napier.		Rochet-Schneider.		Sunbeam.		Talbot.		Thorny-croft.	Wolseley.		
Horse-power		15	30	16	24	10	16	11	14	20	8	24	50
Number of cylinders		4	4	4	4	4	6	2	4	4	2	4	4
Diameter of cylinders		3.5	5	3.93	4.33	3.14	3.14	3.54	3.14	4	4	4.5	6
Stroke		4	5	5.51	5.90	4.72	4.72	4.72	4.72	4.37	4	5	7
Revolutions per minute		1200	1000	900	800	800	800	1500	1200	900	900	800	850
Volume swept by piston (cubic inches)		38.48	98.15	66.83	86.84	36.53	36.53	46.44	36.53	54.88	50.24	79.5	197.89
Piston speed in feet per minute	Mean	800	833	826	786	629	629	1180	944	655	600	666	991
	Maximum	1257	1309	1298	1235	988	988	1854	1483	1029	942	1046	1557
Type of admission valve		M	A	M	M	A	M	M	M	A	A	A	A
Diameter of admission valve		1.62	1.31*	1.65	1.73	1.25	1.18	1.29	1.18	1.37	1.62	1.87	2.56
Lift of admission valve		.25	.125*	.236	.236	.315	.315	.275	.255	.156	.125	.156	.25
Area of charge inlet port (maximum)		1.27	2.05	1.22	1.28	1.23	1.16	1.11	.943	.670	.635	.915	2.01
Charge velocity through inlet valve in feet per second	Mean	101	132	136	150	65	70	174	129	204	199	193	232
	Maximum	158	207	225	255	102	110	273	202	320	312	301	364
Area of induction pipe		.985	2.74	1.09	1.47	.76	.75	.76	.75	1.22	1.47	1.76	2.74
Charge velocity through induction pipe in feet per second	Mean	130		153		106	108	254	162				
	Maximum	204		240		166	169	399	254				
Diameter of exhaust valve		1.59	2.43	1.65	1.73	1.18	1.18	1.29	1.18	1.5	1.75	2	2.5
Lift of exhaust valve		.375	.437	.236	.236	.315	.315	.275	.255	.312	.375	.375	.5
Area of exhaust port (maximum)		1.87	3.33	1.22	1.28	1.16	1.16	1.11	.943	1.46	2.05	2.35	3.92
Exhaust velocity through exhaust valve in feet per second	Mean	68	81	136	150	69	70	174	129	93	61	75	119
	Maximum	107	127	225	235	108	110	273	202	146	95	117	187
Area of exhaust pipe		.985	2.74	1.22	1.47	.95	.95	1.83	1.83	1.76	2.06	2.06	3.14
Velocity through exhaust pipe in feet per second	Mean	130	99			85	85					85	148
	Maximum	204	155			133	133					133	232

*There are four valves to each cylinder.

A SOLID-TYRED VOITURETTE.

This is a particularly interesting car, because when it was first fitted with Buffer solid tyres by Mr. McLulich for his wife's use it was regarded somewhat in the light of an experiment. Up to that time the makers had not, we believe, felt safe in recommending solid tyres to all four wheels for so light a machine originally designed for pneumatics, and we ourselves should have hesitated to have recommended them at an earlier date; but after the work which has been done on this car which often carries three people, as it will be seen it is a victoria with a hood and dickey—there need be no longer any hesitation as to its suitability for solid tyres. The tyres are 2½in., of the high conical pattern, and we can say from actual experience that the running of the voiturette is most pleasant. Although the same springs are used as for pneumatics, these are sufficiently flexible to absorb all ordinary road shocks. The hill-climbing powers are increased rather than diminished by the solid tyres, as a more nearly direct drive to the road is obtained; in fact, this particular 6 h.p. De Dion has been found faster with three up than some of its fellows with pneumatic tyres with two passengers. We have not seen these experiments, but have no reason to disbelieve them, as similar ones conducted with another make of vehicle resulted in a precisely similar manner. The life of the tyres is calculated at about 20,000 miles.

THE AMERICAN INDUSTRIAL VEHICLE TRIALS.

The American A.C., in its trials of industrial vehicles, from April 4th to 9th, taking a lesson from the last Liverpool heavy vehicle trials, will place the competing cars under actual working conditions. That is to say, the cars will be required to perform work for one of the American carrying companies, at whose service they will be placed during the continuance of the tests. A record will be kept of each day's work, cost of running, etc., and the awards will be based on the results as shown by the economy in time, fuel, ratio of paying load, ton-mileage, general reliability, and availability for service. The classification will be on the basis of dead load carried, and vehicles of the same tonnage, whatever their mode of propulsion—whether by petrol, steam, electricity, or any other fuel—will compete with each other in the same classes. The classification will be as follows: (1) Vehicles carrying 1,000 lbs. (8 cwts. 3 qrs. 20 lbs.) or under; (2) 1,000 to 2,000 lbs. (17 cwts. 3 qrs. 12 lbs.); (3) 2,000 to 3,000 lbs. (1 ton 6 cwts. 3 qrs. 4 lbs.); (4) 3,000 to 4,000 lbs. (1 ton 15 cwts. 2 qrs. 24 lbs.); (5) 4,000 to 5,000 lbs. (2 tons 4 cwts. 2 qrs. 16 lbs.); (6) 5,000 to 6,000 lbs. (2 tons 13 cwts. 2 qrs. 8 lbs.)

THE MANCHESTER MOTOR SHOW.

The first annual motor show, promoted by the Manchester and District Cycle Trades' Association, Ltd., was opened at St. James's Hall, Manchester, on Monday last.

Interesting speeches were made by the Earl of Shrewsbury—who performed the opening ceremony—the Lord Mayor of Manchester, Alderman Rudman, and others. The Earl of Shrewsbury warned those interested in the trade against the dangers of over-capitalisation. They had seen set-backs in many other industries by that policy, and he hoped it would not be the case in the motor trade. He was also of the opinion that British firms were well able to hold their own.

As regards the show itself, there is a grand display of all the principal makes of motor cars which attracted such attention at the recent Paris and London shows. Thousands of visitors have attended the show during the week. Many of the local makers are well to the fore with examples of their latest cars, such as Messrs. Horsfall and Bickham, Crossley Bros., Ltd., Marshall and Co., and other well-known firms.

The promoters are to be congratulated upon their enterprise.

THE AGRICULTURAL HALL SHOW.

Next Saturday, the 19th inst., Messrs. Cordingley's Motor Exhibition will be opened at the Agricultural Hall, and will remain open till the following Saturday. In all there are about two hundred and fifty exhibitors, and the building will be as full as it well can be. For the first time in connection with a motor exhibition the Berners Hall in the gallery will be utilised; not only so, but the Minor Hall will, as hitherto, be devoted to heavy vehicles, and the King Edward's Hall to new inventions, while, of course, the main floor and gallery will be fully occupied. The Aero Club have an airship and balloon section, and among interesting car chassis which have not been shown before will be a 40 h.p. and 60 h.p. Mercedes, the Hutton, and the Hotchkiss. Next week we shall give a guide to the show on our usual lines, which will briefly indicate the chief features of the exhibits. The social events in connection with the show include a dinner by the Automobile Club and a reception by the Ladies' Automobile Club. The annual meeting of the Motor Union will be held during the week. Several local club events have been postponed to prevent clashing with the show.

THE BRITISH ELIMINATORY TRIALS. The house seen in the background is the Quarter Bridge Hotel, the starting point for the eliminatory trials over the proposed Manx course.

THE BRITISH ELIMINATORY TRIALS. A view of the proposed course at Bishop's Court, Isle of Man.

THE MANUFACTURE AND USE OF PNEUMATIC TYRES.

The paper on the above subject read by Mr. J. D. Siddeley before the Automobile Club and reported in our pages last week was closely and exhaustively discussed, but the intent of the remarks of the several speakers can be sufficiently gained by the reply of the author to the several points raised during the discussion. In opening, Mr. Siddeley said with regard to the temperature of vulcanising, no exact figure could be quoted, its range was so great, and everything depended upon the length of time the cover was cured. But by means of the Doughty process of vulcanisation—a great advance—a tyre could be vulcanised in the twinkling of an eye. He had seen single and double tube tyres so vulcanised in a minute. Inner tubes were now being made by the Dunlop Company by this process. With regard to the suggestions *re* mixed rubber and pigments, the manufacturer who wanted to make a good tyre would provide a proper thickness, and it was as cheap to make a thick tyre of good as of poor rubber. In all tyres of repute the rubber used was as pure as possible with due regard to vulcanisation and toughening. He admitted that he never took a tyre off for examination simply, as in his view sufficient unto the day, etc. As to the question *re* rust in the rims, much of this was due to the tyres being put on to the rims before the latter were properly painted inside. Even the best makers erred in this wise. Blisters on the covers were frequently due to improper vulcanisation. In a moving tyre there was vast friction, and the rubber quickly ground itself into powder and formed the blister. Too light tyres were too frequently fitted, and those who suggested tyres of too little weight for the car did a great injustice. The question of tyre prices was rapidly adjusting itself. To determine what air pressure was required in tyres, he generally got his passengers and load into the car and inflated until the tyres were just ready to bulge under the load, no more and no less. Soft tyres might mean easy running, but they meant also wear and expense. Cuts, he thought, were irreparable by the amateur. A gaiter could be put on, or the cover might be patched from the inside. The value of burst covers was at the outside 2d. per lb., and the market even then had to be good. The contingency referred to by Mr. Swindley as to what might happen if the new cord Palmer tyre got badly cut was the same as in any other tyre. In the Palmer each cord was self-contained and could be separately dealt with. Any tyre that was really cut through was, in his opinion, of very little value, although he was frequently surprised to see what good jobs makers sometimes made of badly cut tyres. The disappearance of the steel bands introduced into the treads of some of the early bicycle tyres was due to disintegration by vibration and not to any chemical action. He did not anticipate any such action upon the steel pegs to which the Palmer cords were anchored. He agreed that the Palmer tyre was no novelty, but La Force and the Westwood tyres were self-contractile tyres in which inflation expanded the top and deflected the base of the tread. The new Palmer tyre was quite different. With regard to the repair question, it was, to his mind, very dangerous to go through three layers of fabric on the tread before sending the cover to the repairer. Mr. Siddeley then dealt very severely with the comments of Mr. Lupton, who criticised the behaviour of tyres during the thousand miles reliability trials in *The Autocar* correspondence columns. He considered that Mr. Lupton's deductions were altogether fallacious. He (Mr. Siddeley) had made an analysis of the figures, and found that while 104 cars started, seventy-nine finished the 1,019 miles, giving 80,501 car miles run, or 322,004 pneumatic tyre miles. There were eighty-seven tyre stops, or less than one per 1,000 car miles. These stops would be found less even upon closer analysis, for by reason of poor or unsuitable tyres, in many cases one car had five, six, or seven stops. This was more particularly the case with the light cars. He did not think the stops were in any way out of proportion to the work done.

WAR OFFICE TRIALS OF MOTOR LORRIES.

A series of trials of two Stirling motor lorries has just been carried out by the War Office authorities in and around Edinburgh. These vehicles have been constructed to carry a load of fully three tons over the roughest possible ground, such as is found in campaigning. The steering wheels have steel tyres 7½in. wide, and the driving wheels are 36in. in diameter, with steel tyres 9in. wide, the latter being also fitted with diagonal bars to prevent slipping.

By means of barrels of water and heavy pieces of iron, with loaded sacks on the top, the total weight was made up to seven tons; which, as the bodies of the vehicles are 10ft. 6in. long and only 4ft. 3in. wide, had to be piled up to a considerable height, thus constituting a good test for the springs owing to the swaying of the load when passing over irregular ground. Thus loaded, with some half-dozen officers and the engineers of the builders perched upon the top, the vehicles presented a striking appearance.

The Testing Ground.

The first day's testing consisted of a run through parts of Edinburgh, where steep hills could be found, and then out by the west end to Linlithgow by indirect roads, in order to encounter as many steep hills as possible. The roads were very deep in heavy mud, and a gale of wind and rain lasted all the day. The run was a continuous one from the works at Granton Harbour and back again, covering a total distance of forty-two miles. In spite of the load and heavy roads a speed of nine miles an hour was maintained on the level, though the contract only called for speeds of two and a half, five, and seven and a half miles an hour.

On the second day the route was from Granton through Newhaven, Leith, Portobello, and Musselburgh to Prestonpans and back, which should give examples of stone setts, tramway lines, and probably the worst road surface in Scotland, in order to test the springs and the frames, as well as the steering gear, when subjected to irregular strains and shocks. The run was successfully accomplished, and other tests of the special parts of the design were made.

Near the rear axle a large winding drum is fitted with a long steel cable for the purpose of extricating the vehicles from quagmires and the like. An interesting test was made on returning from Prestonpans by driving over irregular natural ground, part of which was deep in slippery mud owing to the continuous heavy rains of the past season. In the centre of the field was a hollow in which rain and mud had gathered so as to form a sort of morass. The heavily-loaded lorry plunged into the soft mud, finally sticking there, with the driving wheels buried up to the spokes. The wire cable was attached to a foundry chimney about one hundred feet off, and the engine being started the vehicle was hauled out.

After this the driving wheels were fitted with their spuds or "paddle blades," to enable the vehicle to travel over soft or treacherous ground. In this operation it resembled a paddle steamer.

Next day the engine and mechanism were taken to pieces in order to see how they had stood the long runs with an over load, and the severe strains and shocks of such rough usage, and they were found to exhibit no signs of distress.

Some Details.

These motor lorries have four-cylinder petrol engines, developing 24 b.h.p., at about eight hundred revolutions a minute. They are fitted with mechanically operated valves and solid cylinder heads. High tension electric ignition with accumulators is fitted in addition to the magneto. The power is transmitted by a large metal friction clutch to change speed gears giving three speeds, which are enclosed in an air-tight oil bath. No chains are used, the rear wheels being driven by a universally jointed shaft to a driving bevel pinion driving the countershaft, which latter is fitted with steel-toothed wheels engaging with driving rings made of a special metal attached to the inside of the wheels. When this type of driving was first adopted, doubts were expressed by experts as to whether the wear and tear on such exposed teeth, considering the great power which they had to deal with, would not be excessive. But an examination of the first car which was fitted with this method, and which has now run about 40,000 miles in very hard public service, shows that the quality of the metal is such that a very long life can be counted upon for these toothed wheels and rings.

Two brakes are fitted, and both of them will hold the vehicle with a full load upon a hill of one in six, and this either backward or forward. The foot-brake works upon a water-cooled drum on the shaft, and the very powerful hand lever brake actuates a system of internal expansion blocks inside the driving rings on the rear wheels. Wheel steering is used, with a special ring to absorb road shocks. The driver's seat is over the mechanism, thus giving him a very good view ahead, and shortening the total length, which is only 16ft., with a width of 6½ft. over the hubs, and a wheelbase of 9ft. All complications are avoided, the aim of the design being strength and simplicity. There are no circulating pumps, the cooling water for the engines having a natural circulation, which is so effective that only a very small amount of water is lost. This is a matter of great importance in military operations, especially in hot countries. Between the engines and the radiators there is only about seven inches of water-pipe to give possible trouble from leakage.

We are informed by the makers—Messrs. Stirling's Motor Construction Co. (1903), Ltd.—that the vehicles have passed through their trials, which have extended over several weeks, with every satisfaction. Some of the officers of the Royal Engineers, who have been conducting the trials, will drive to London on the waggons. The work done by the lorries during the trials has surprised even the makers, and has considerably exceeded the War Office requirements.

THE BRITISH ELIMINATORY TRIALS. The road approaching Laxey, Isle of Man.

CLUB DOINGS.

Derby and District A.C.

The inaugural run of the present year took place on Saturday last, when, in spite of the very adverse conditions, a good muster of local motorists was witnessed. Ashbourne was the destination, the following motorists participating in the run: Mr. H. H. Raphael (9 h.p. De Dion), Mr. C. L. Schwind (16 h.p. Rex), Dr. Le Fanu (10 h.p. White), Mr. C. T. Leech (6 h.p. Regal), Mr. J. Hill (12 h.p. Chatsworth), Mr. G. B. Fletcher (9 h.p. Mohawk), Mr. Francis Bolton (16 h.p. Daimler), and Mr. H. S. Chaplin (12 h.p. Panhard).

The Scottish Automobile Club (Western Section).

Cost, Care, and Upkeep of an Autocar.

A meeting of the above club was held on Monday, the 29th ult., Mr. John M. Ross in the chair.

Mr. John Adam, chairman of the section, and Mr. J. Hunter Steen introduced a discussion on "The Cost, Care, and Upkeep of an Autocar." Mr. Adam stated that "cost" was such an elastic term that the prospective buyer should make up his mind first as to the use to which he intended to put his car, the carrying capacity required, and having regard to the amount of money he was prepared to spend, should then fix upon the type of car he wished, and make the best terms possible with the seller. In his opinion, for one who was an absolute novice, and who had yet to learn to drive, it was advisable to purchase a second-hand car and practise on it. On the question of housing a motor car, he suggested a small house for a single car, which he advised should be 18ft. by 9ft., that the pit should be near the door, 6ft. by 3ft., and that the depth should be anything up to 5ft., if the drainage system would permit of this. The house should be of corrugated iron with wood lining, the roof having a layer of felt between the corrugated iron and the wooden sarking. Light should be admitted at the side, and there should be through ventilation. The cost of such a house he estimated at £24. A cement floor with the necessary drain trap would cost ten guineas, and a slow combustion stove £4 10s., all extra. Mr. Adam thought this would be a sufficient and satisfactory house for a motor car on the most moderate basis, though he said any person proposing to spend more money on it could do so advantageously. It was mistaken policy to pay a heavy price for a motor car and to begrudge a sufficient sum for its being properly housed. Mr. Adam advised any recruit to automobilism, immediately on getting his car, to make himself thoroughly acquainted with its working. Thereby the novice would have much less difficulty in the event of roadside or other troubles. He counselled a regular and methodical examination and adjustment of parts and brakes. He submitted statistics prepared by Mr. Steen of the cost of running a 10 h.p. car for 7,065 miles.

	£	s.	d.	
Light, oils, and grease	3	5	6¼	.11 of 1d. p.m
Petrol	22	12	8	.77
Repair and replacements	12	9	11	.42
Tyres	27	15	3	.86
Sundries, license, stabling, and washing	14	10	11½	.56
	£80	14	4	2.72d.

The quantity of petrol used was 346 gallons, the average consumption giving 20.41 miles per gallon. Mr. Steen explained that all the running had been done on Scottish roads, many of which were of the roughest and most primitive type. Mr. Adam further submitted similar statistics handed to him by Mr. Seligmann with regard to a 12 h.p. car, and which worked out as follows:

	Per mile.
Petrol	.76
Oil	.066
Grease	.033
Electric current	.016
Tyres	1.332
Repairs and sundries	.212
Stabling, washing, and license	.417
	2.836d.

These results were based on an experience of 5,000 miles, and attention was drawn to the marked similarity between the two results attained on similar makes of cars, both of which it was mentioned were 1903 cars. Mr. Adam dealt with the cost of transport of goods by autocar, and quoted the figures used by Mr. J. E. Thornycroft in his lecture to the Glasgow University Engineering Society a few days before with regard to vehicles for goods transport, in which it was made out that a steam lorry costing £665 would cost 2.75 of 1d. per ton mile. Mr. Adam also submitted statistics which he had prepared with regard to the use of a public service vehicle, 12 h.p., costing, say, £500, and based on an estimated annual running of 7,800 miles, which brought out that the expenditure would be as follows:

Solid tyres	£42
Petrol and lubricants	£32
Motor man's wages and entry form	£80
Attendant	£59
Repairs and upkeep	£30
Interest on capital	£25
Depreciation	£52
	£320

or 9¾d. per mile.

These statistics had been prepared for a public body in which he was interested, and which contemplated the substitution of mechanical for horse traction in the conveyance of poor house and asylum patients, and showed a considerable saving on the present expenditure for horse traction.

In the discussion which followed, Mr. Smith quoted his experience on a 6 h.p. four-seated car, which worked out at almost exactly 2¾d. per mile. Mr. Murray pointed out that those who had stated their experiences were their own drivers and looked after the cars personally. This had a very material effect on the reduction of expenses, particularly with respect to the cost of tyres. Mr. Steen thought that the bulk of cars were too lightly tyred. Tyres should never be run under 80 lbs. pressure. Non-skid chains, while they slowed the car about three miles per hour in ordinary running, increased the speed considerably on greasy roads and aided somewhat in lengthening the lives of tyres. His experience was that the chains would run about 700 miles, after which the expense of renewal amounted to about 20s. per wheel. All the costs quoted applied to pneumatic-tyred vehicles, and in no case was the owner's insurance premium included in the figures.

Manchester A.C.

The fourth annual dinner of the Manchester A.C. was held on Friday last, Mr. Frederick Smith presiding.

In proposing the toast of "Automobilism," the Chairman referred to the differences at present existing with regard to the Automobile Club. He said the organisation of the movement was a big thing, and had to pass through its natural phases of evolution. Certain men who were highly qualified to start the movement and who had rendered valuable service were perhaps not the best men to direct the movement in its present stage. Many mistakes had been made by the London club, and perhaps there was a disposition just now to forget its services, and it was always easier to look back and correct errors than to anticipate and avoid them. Speaking of the delights of automobilism, he said when the public realised how safe and how comfortable motor cars were these vehicles would be as numerous on the public roads as hansom cabs and private carriages. Much had been said about the dangers of motoring, rapid driving, reckless turning of corners, etc., but for a dangerous drive he commended his hearers to the hansom cab. A good deal was also said about the dangers of the motor car, but he would like to point out the reckless indifference to human life that was shown by foot passengers on the road. The danger of the motor was as nothing in comparison with the danger both to themselves and to others caused by that vacuous stupidity which too often marked the ordinary man in crossing traffic. Most of the accidents that happened in the ill-fated race from Paris to Madrid occurred through the reckless indifference on the part of the foot passengers. If the people could only be persuaded to keep to the footpath and exercise some reasonable precautions for their own personal safety what a boon it would be. When they got a perfect pneumatic tyre, an approximately perfect road, and a careful user of the road, there would be no limit to the possibilities of the motor car as a friend of humanity. Mr. D. Q. Henriques responded, and gave an amusing account of his motoring experiences. The toast of the visitors was proposed by Mr. Arrowsmith, and responded to by Mr. Lennox Lee and Mr. G. Haworth. A vote of thanks to the chairman, proposed by Mr. J. A. Morris, terminated the proceedings.

SERGEANT JARRETT AGAIN REBUFFED.

On Saturday last Mr. Claude Browne, the managing director of the Lacre Motor Co., of Poland Street, Oxford Street, W., was summoned before the Woking Bench for driving his 12 h.p. Lanchester car through Ripley village on the 21st ult. at a speed which was dangerous to the public.

The charge was preferred by Sergeant Jarrett, who in his evidence asserted that he had timed the car as it approached him round the curve in the village street for a measured distance of 176 yards, and found it to be travelling at a speed of thirty miles per hour. He also said that there were a number of people about the village, and that "two little children" crossed the street about five yards in front of the coming vehicle.

Under the severe cross-examination of Mr. Staplee Firth, who appeared for the defence, Sergeant Jarrett said that he timed the car with the same watch he had used to time Mr. Kelvie's car in the case which was dismissed by the Guildford Bench on the previous Saturday.

The police constable who stopped the car upon Jarrett's signal also gave evidence to the effect that the car was coming down the village street at a "terrific" speed, but that he did not see the children, nor did he see anybody in the road who could be said to be endangered by the progress of the vehicle.

The witnesses for the defence were Mr. Claude Browne, who was driving the car at the time, and who testified to the effect that he and his party, consisting of Mrs. Claude and Mrs. Rowland Browne and a mechanic, left Winchester about twelve o'clock, stayed half an hour at Petersfield for lunch, and reached Ripley at a quarter to five. It rained throughout the journey, and the roads were very heavy. He slowed down considerably on approaching Ripley village, and certainly was not driving a yard over fifteen miles per hour as he passed through. Upon receiving the signal to stop about fifty yards away, he pulled up within the length of his car. Jarrett then walked up to him and said, "You are going too fast." He replied that he did not think he was, as he was not travelling fifteen miles per hour, whereupon the sergeant replied, "Very well, then; I shall summon you for driving to the public danger."

Mrs. Claude and Mrs. Roland Browne both went into the box and gave evidence in support of what Mr. Browne had alleged, as also did Mr. Browne's mechanic.

In cross-examining these witnesses, Sergeant Jarrett failed to shake their testimony in the slightest degree.

Mr. Harry J. Swindley (*The Autocar*), hon. official timekeepr A.C.G.B. and I., was then put into the box, and gave evidence as to the speed of London traffic, particularly that travelling on the Thames Embankment between half-past four and five o'clock in the afternoon, when about eight hundred vehicles per hour were passing. He produced figures to show that the speed of hansom cabs was from nine to sixteen and a half miles per hour, and that people crossed and recrossed the road in considerable numbers and in perfect safety whilst he was engaged in making the tests.

While in the box, Sergeant Jarrett's watch was handed to him, and he was asked his opinion upon it as an instrument for taking speed records. He replied that in his opinion it was practically worthless for the purpose, as he had tested it and found that it could be stopped, either accidentally or intentionally, by a slight pressure on the plunger, in exactly the same way as he had shown before the Guildford Bench that Inspector Marks's watch could be influenced.

Mr. Swindley demonstrated to the magistrates the manner in which Sergeant Jarrett's watch could be retarded, and these gentlemen seemed somewhat surprised at the behaviour of the instrument.

The Bench retired without calling upon Mr. Staplee Firth to address the court upon the case, and upon returning dismissed the summons on the ground that the evidence was insufficient to prove the speed of the car.

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 3rd March, 1904. All notices of opposition to the grant of patents on the several applications should be filed not later than the 17th April, 1904.

1903.

3,128.—J. H. Wyatt. Epicyclic motor cycle gear attached to rear wheel hub.
3,184.—B. M. Young and W. G. Murray. Four-cylinder double-opposed horizontal motor.
5,507.—J. B. Brooks and J. Holt. Motor cycle saddle with compound springs.
6,422.—C. Lemale. Internal combustion turbine of Laval type.
7,882.—J. B. and J. B. Dunlop. Automatic carburetter with saw blade in jet to maintain constant flow.
7,932.—W. E. Clifton. Two-stroke motor compressing against under face of piston.
7,981.—M. Raabe. Dust screen to attach to rear of car.
8,309.—W. H. Clarke. Construction of triangularly braced frames.
20,127.—H. W. Hollmann. Driving, steering, and reversing mechanism for motor boats.
23,911.—E. Alexandre. Puncture-preventing outer cover for tyres.
23,958.—C. S. Schultz. Driving gear for motor vehicles with electrically-operated clutches.
24,650.—W. C. Lloyd and C. R. Townsend. Portable stand for motor cycles.
25,004.—B. C. Hicks. Motor car with central driving wheel arranged between rear wheels.
27,627.—Brouhot and Cie. Expanding friction clutch.
28,487.—T. Houlen. Non-slipping studded band to strap on wheel.

1904.

356.—R. A. Kent. Construction of solid tyres.
601.—W. H. Sewell. Tyre comprising spherical pads attached to wheel rim.