

THE AUTOCAR

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

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THE AUTOCAR.

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COLONIAL AND FOREIGN EDITION.

IN ADDITION TO THE USUAL EDITION OF "THE AUTOCAR," A SPECIAL THIN EDITION IS PUBLISHED EACH WEEK FOR CIRCULATION ABROAD. THE ENGLISH AND FOREIGN RATES WILL BE FOUND ON THE LAST PAGE. ORDERS WITH REMITTANCE SHOULD BE ADDRESSED "THE AUTOCAR," COVENTRY.

The Autocar can be obtained abroad from the following:

AUSTRALIA: Phillips, Ormonde, and Co., 533, Collins Street, Melbourne

NICE: Levant & Chevalier, 50, Quai St. Jean Baptiste.

UNITED STATES: The International News Agency, New York.

PARIS: Neal's English Library, 248, Rue Rivoli.

Notes.

The Paris Exhibition.

The wholesale manner in which the French makers have followed Mercedes practice, which tendency has been so plainly shown in the articles we have published on the exhibition in the last fortnight, seems to us, in many instances, to have been a very great mistake. We have only to mention one example to show our meaning. The majority consider that the outline of the Mercedes bonnet and the straight front to the radiator are by no means handsome, but their shape *per se* carries no particular virtue, and there is no reason why the outline should not be improved slightly, not only so far as the bonnet itself is concerned, but

the radiator might well be raked backward somewhat, particularly the radiators of the copiers, as many of these make no attempt at copying the Mercedes except in outline, and instead of the closely-packed square tubes, are using ordinary flanged radiators and all sorts and shapes of round, oval, and oblong tubes, which are worked into a metal frame of the approved outline. In other words, while some of the copyists have recognised the principles of the Mercedes design, and have endeavoured to obtain the same results, others appear to have regarded the outline as of even more importance, and firms which a year ago were showing praiseworthy originality have now sunk to the level of base copyists. The result, broadly speaking, is that France has fallen from her high position as leader in the design of automobiles. This is not without its benefit to the British manufacturer. Hitherto, when he has struck out a line for himself, he has been informed that his practice could not be right because none of the great French houses used similar devices. These objections no longer hold good, as quite a number of the one-time leaders are now followers, and it will undoubtedly give English firms who are not running on conventional lines, but who know their business and why they deviate from the regulation pattern, a better chance than they have ever had before, as they can point out that the former leaders of design have, with comparatively speaking few exceptions, thrown away their previous practice to copy the designs of another nation, and, be it marked, those designs not up to date, as the French have copied a 1902 type, the 1903 pattern having very substantial variations from the model they have so slavishly followed. At the same time, the movement has not been without its advantages. A few of the French houses have met it in a manner which does them the very greatest credit. They have recognised the demand for a silent-running car with an engine of the largest possible range of speed, and they have set about producing this in their own way, and undoubtedly have made a thoroughly good and well-executed design, which is not a copy, and which does them credit. It is a coincidence, but with one or two notable exceptions, the French firms which have followed out their own designs and have abstained from servile copying are those whose cars are best known and most used in this country.

Show Finish.

As there are still three British motor shows to take place within the next few weeks, it is well perhaps to utter a word of warning with regard to what is expressively known as "show finish." This, we need hardly say, refers to vehicles which are finished very much better than the ordinary stand

ard productions of the firm exhibiting them. This was particularly noticeable in the Paris Show. There were three or four firms at least who, to put it quite charitably, are not celebrated for the delicacy of their finish in the usual way, but who, nevertheless, staged chassis which were hand burnished all over. Every leaf of every spring—in fact, every part of the work—was finished in this way, and the beholder who did not know the average workmanship of the firm would be liable to form an entirely wrong opinion as to their standing as makers. Not only so, but those houses which exhibited frames and engines finished in the ordinary way of business neither better nor worse compared very unfavourably in the eyes of those who did not know with the exhibitors of highly-burnished work. The moral of this is that the show visitor should know something about the reputation of the firms taking part in the exhibition, or he is liable to be misled. Many substantial firms despise "show finish." They put in a chassis which is one of the ordinary everyday type turned out by them, and which exhibits sound work and practical finish throughout, and is a fair average sample of their work. At the same time, it is a little annoying for them to see a firm next door to them who really do not know what good work is in the ordinary way staging a chassis which may have cost a great deal of money to polish, and which is the only well-finished frame that its maker will turn out till the next show comes round again. Not only so, but it should be borne in mind that exterior polish is no guarantee of excellence of material or of internal accuracy.

Lord Heneage and Automobilmism.

At a dinner which was held last week at Market Rasen in connection with the twenty-seventh annual Christmas Fat Stock Show, Lord Heneage (the chairman) made some sensible remarks in connection with the question of automobilmism. He

said that a great many people thought they ought to be limited to a certain pace. He did not think that was a practical solution of the question, for in some places it was perfectly safe for a motor car to go at almost any speed, whilst in other districts it was dangerous for the vehicle to go beyond the ordinary pace of a trotting horse in a chaise. An autocar should be subjected to the ordinary laws of the land, and the driver of a car should not be allowed to drive at an excessive rate of speed in districts where it would be to the danger of the public. That, said his lordship, was the question which would have to be considered. It was one upon which the police would have to bring up their evidence, and one which practical magistrates could judge for themselves. As to saying that any ordinary policeman could gauge the exact pace at which a motor car, or even an ordinary trap, was going at any time, he believed it to be beyond the judgment of man.

Inaccuracy no Argument.

We think that the Automobile Club—if the attitude of its official organ is to be taken as representative of the association—has made a mistake in allowing itself to be biased in its statements in favour of the numbering question. Recently we were told that all sober-minded motorists were in favour of numbering; previous to that it was suggested that only people who either possessed no car or who did not drive fifty miles a year were opposed to the proposal. Anyone who knows anything of the facts at all is aware that both these statements are incorrect; but they suffice to show the manner in which the numbering proposals have been urged in the club organ. In the first place, such statements are not fair to those who have honest objections to the proposals, and in the second they are far more likely to arouse bitter opposition than carefully considered arguments in which no bias is displayed or misstatements made.



One of the King's cars leaving Sandringham. This machine is a 12 h.p. Daimler, and is specially constructed to carry His Majesty's loaders and gamekeepers.

USEFUL HINTS AND TIPS.

On Buying a Second-hand Car.

In continuation of this subject from last week, we will follow the order of things in sequence, and this brings us to the motor. Now, much has to be taken for granted here, as it is impossible to find out the exact state of an engine short of taking it down, and it is hardly likely that any owner would consent to this, unless under very exceptional circumstances. However, some very useful information may be deduced by anyone understanding the running of a motor. For those who are unable to get any experienced assistance, the following tests may be carried out: We are now supposing that a single-cylinder motor is being tried; the multicylinder we will deal with later. First test the compression. Take the starting handle, and turn round the crankshaft until decided resistance is encountered; then bear heavily upon the handle, noting the strength it takes to turn the handle until the compression stroke is passed. The longer the time and the greater the strength required to overcome this resistance the better the engine is as regards the fit and wear of the cylinder and piston. It must, of course, be seen that the valve lifter is down, or the compression relief is closed, otherwise no compression will be encountered. Another thing which will sometimes be found to seriously affect compression is that, through wear on the exhaust valve seating, the valve stem has got right down on to the plunger, so that it does not close down on to its seat perfectly. This and the proper fixing of the sparking plug and other cylinder fittings are obviously things to be attended to before carrying out this test.

x x x x

The next test is for wear in the connecting-rod bearings; this, in some cases, is very difficult to carry out. Where it is practicable to fix the starting handle, or a long spanner to the crankshaft end, a gentle movement backwards and forwards will disclose any looseness in these bearings. Failing this test, the engine should be listened to very carefully while starting up, running slow, and stopping. If a distinct and recurring knocking noise is heard it may be very safely assumed that the connecting rod bearings are loose and require taking up or renewing. If the two-to-one gearing is enclosed and cannot be viewed, remove the contact breaker cover, and by moving the cam backwards and forwards a rough estimate of wear can be formed. If these wheels have been badly cut in the first place the wear may amount to such proportions as would materially affect both the lifting of the exhaust valve and the moment of firing. Of course, the latter may be corrected by advancing the contact, but the late opening of the exhaust valve cannot be remedied without re-setting it on the shaft. As a general rule, there is little to be feared upon this point, though we have on two occasions detected it on vehicles which have been running upwards of four years.

x x x x

Examine the water jacket for cracks, particularly around the head and valve chamber, where the jacket is cast in one with a solid-headed cylinder. When the cylinder and head are cast separately with their water jackets there is less risk of such cracks

appearing. Attention should next be directed towards the water circulating pump, where such is fitted, and if driven by belt or friction wheel, the spindle should be felt to see that it is not too loose. It is as well to remove the stuffing-box nut around the spindle, for at this point there is usually a lot of wear taking place, and it is just as well to know exactly in what condition the pump spindle is. It will probably save a lot of trouble later on. Look over the water pipes and connections. A badly-dented tube restricts the passage of water, and, of course, affects the cooling of the cylinder to a considerable extent, that is, if it be a main delivery or return tube. The flexible connections of the water pipes should be of rubber hose-pipe, and should be free from leaks. It would be absurd to look at trivial points such as this with too critical an eye, yet we have known beginners make a trouble of a point like this, while they would say nothing about a lubricator which would not work, simply because they did not know it was out of order. This is where the experienced man comes in.

x x x x

The electric ignition apparatus should receive particular attention, as it is sometimes a little misunderstood of this part which brings a really good car into the market. The most important part of the apparatus is the contact breaker or commutator. As there is a general misunderstanding of these terms, it will be as well to state their differences here. The contact breaker is a piece of mechanism in which two parts are put into contact with one another for a time, and are then parted. A commutator is a disc of insulating material having on its periphery metallic pieces in a like number to that of the cylinder. Bearing upon the disc is a brush of copper gauze, sheet copper, or brass, which, when the metallic pieces in the commutator pass beneath it, cause the current to pass. As the commutator is now, perhaps, more frequently employed than the contact breaker, we will use this term, but it must be understood that any remarks apply to both equally. The first thing is to see that the commutator is set correctly. To do this relieve the cylinder compression, and turn the starting handle until the plunger rises to lift the exhaust valve; continue turning until the plunger drops. Now turn the handle round one revolution exactly, at which point the commutator should be about to come into action, that is, when it is set right back. Then move the sparking advance lever up, and note the amount of travel the brush has around the commutator; this represents the limits of ignition. A more definite method of finding the point of ignition is, when possible, to drop a stiff wire through the compression tap, letting it rest upon the top of the piston.

We are informed by the editor of *Cycling* that the motor mileage chart, of which we published a portion last week, was issued in its skeleton form—that is to say, without any mileages filled in—in his paper at the beginning of the present year.

THE INTERNAL COMBUSTION ENGINE. The Otto Cycle explained.

FOR the especial benefit of the latest converts to automobilism and new readers of *The Autocar* we publish this explanation of the principles of the internal combustion engine—or, as it is more popularly known, the petrol motor. In order to do this in the simplest form possible we have divided the motor and its components into the following parts: (1) The carburetter; (2) the motor; and (3) the ignition—each of these being sub-divided in sequence.

The Carburetter.

The carburetter is taken first, as it is this apparatus which supplies the gas to the motor for the purpose of furnishing power. There are two principal types of carburetter, but there are many adaptations of each. The most popular type is the spray, and in this the suction caused in the cylinder of the motor, by the movement of the piston, draws petrol (spirit of petroleum) through an orifice in connection with the supply tank. At the same moment air is drawn in, and the spirit vaporising or gasifying combines with it, forming a gas of high explosive power. The second system consists of drawing air, by the suction force of the motor, through or over the surface of a quantity of spirit contained in a tank. Other methods on this principle are to pass air through or around wicks, or over corks; by agitating the spirit by mechanical contrivances; or by injecting spirit directly into the cylinder, leaving the vaporising and mixing to be done there. The latter practice is chiefly confined to American machines.

In perusing present-day descriptions of autocars, there frequently occurs the sentence, "The motor governs on the induction," or words to that effect. To the beginner this conveys nothing, but what it means is this: By means of a governor (to be described later) actuating a valve or tap in the pipe conveying gas to the motor, the amount of gaseous mixture drawn into the cylinder is automatically increased or diminished to meet the varying demands for power. Thus the fuel consumption is kept in accordance with the amount of work the motor has to perform.

The Engine.

Having briefly touched upon the carburetter, we next come to the engine, or motor, itself. The working parts of a simple "Otto" cycle internal combustion motor are shown in the four diagrams in figs. 1, 2, 3, and 4. A A is the cylinder, which is usually of cast-iron. B is a water jacket, which surrounds the cylinder A A, combustion chamber E, and the valves F and G. C is the piston working within the cylinder A A, and is fitted with three cast-iron rings D. E is the combustion chamber, into which the gaseous mixture is compressed and ignited by the electric spark occurring at the plug I. F is the inlet valve, fitted with the spring F¹. In some cases this valve is mechanically operated in a similar manner to the exhaust valve. G is the exhaust valve fitted with a spring G¹, which keeps it to its seat. This valve is operated by the cam or eccentric roller N through the plunger N¹ and the valve stem by the projection of the cam, which revolves at half the speed of the crankshaft. H is the outlet through which the spent gases depart to

the atmosphere, *via* a muffle or silencer (not shown). I is the sparking plug, which is employed to ignite the cylinder charge of gaseous mixture. J is a connecting rod, by which the up-and-down motion from the piston is communicated to the crank K through the crank-pin L¹, thus giving a rotary motion to the crankshaft L. K¹ is a balance weight sometimes used to balance the weight of the piston and connecting rod, the momentum helping it to turn over dead centres. By dead centres it is meant those points in the circle described by the crankshaft at which the piston is at the top or bottom position of its travel within the cylinder. It will be seen that the piston has to stop at each end of its stroke and commence a movement in the opposite direction, and it is to assist it in starting again that the balance weight is employed. In many engines the balance weights are not used, extra weight being put into the flywheel to serve the same purpose. M is a shaft carrying the exhaust valve cam and the contact breaker or automatic switch, for the electric ignition. This shaft is caused to rotate at half the speed of the crankshaft through the gear or cog-wheels O and P, the latter being but half the diameter of the former. N is the exhaust valve cam upon the shaft M, and N¹ is the plunger lifting the exhaust valve. Q is a crank case enclosing the crank and valve gearing. The cylinder with its components is usually bolted to the crank case.

The Otto Cycle.

The motor and its contributory parts being understood, we will now endeavour to explain how the power which drives the engine is developed:

First Stroke (suction).—The first downward movement of the piston C (fig. 1) in the cylinder A A causes a vacuum therein; and the inlet valve spring F¹ only being sufficiently strong to hold up the valve F, it is drawn down from its seat, as shown in the diagram. The suction created by the full downward stroke of the piston—which is now acting as a pump—draws in a charge of gaseous mixture from the carburetter. The exhaust valve is, of course, closed during this operation.

Second Stroke (compression).—The first upward movement of the piston C (fig. 2) compresses the mixture into the combustion chamber E. Directly the piston reaches the bottom of its first stroke, and before it commences the second, the suction influences cease, and the spring F¹ pulls the valve F up to its seating, converting the cylinder into a gas-tight chamber. The function of the compression stroke is to reduce the cylinder charge of gas into a small space, thereby increasing its expansive powers and assisting in complete combustion. The higher the compression used the greater is the

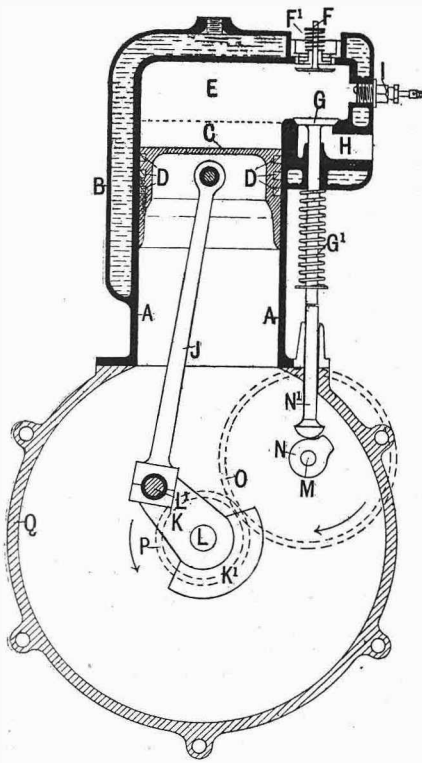


Fig. 1.—Suction.

- A, cylinder.
- B, water jacket.
- C, piston.
- D, piston rings.
- E, combustion chamber.
- F, inlet valve.
- F¹, inlet valve spring.
- G, exhaust valve.
- G¹, exhaust valve spring.
- H, exhaust outlet.
- I, sparking plug.

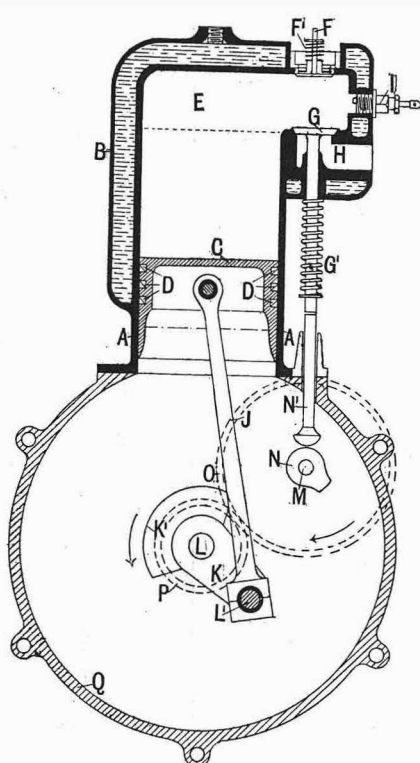


Fig. 2.—Compression.

- J, connecting rod.
- K, crank.
- K¹, crank balance weight.
- L, crankshaft.
- L¹, crank pin.
- M, half speed shaft.
- N, exhaust valve cam.
- N¹, exhaust valve plunger.
- O and P, rear wheels.
- Q, crank case.

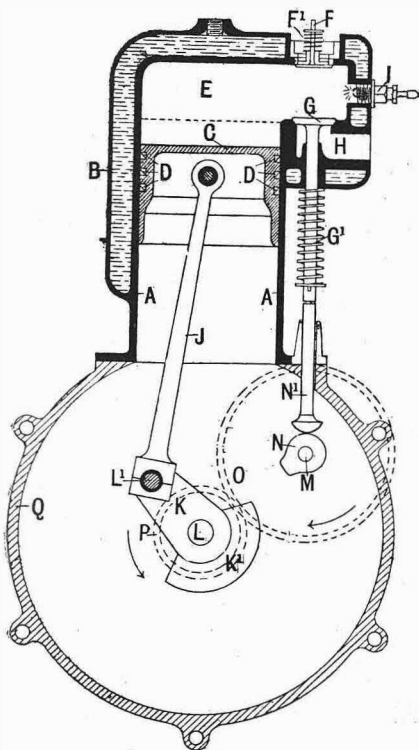


Fig. 3.—Explosion.

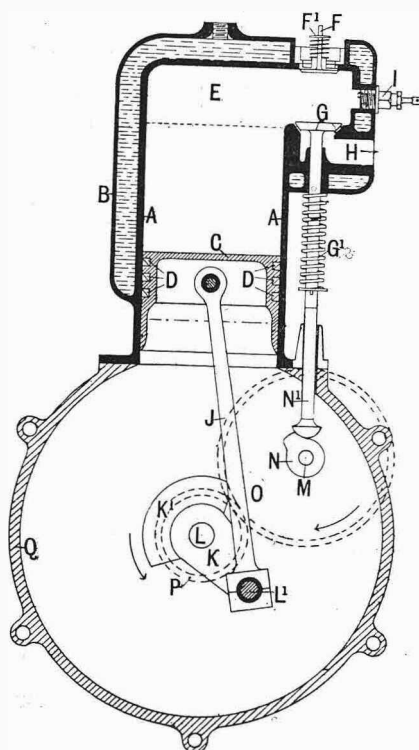


Fig. 4.—Exhaust.

power generated by the motor up to a certain point, which is determined by the amount of the motor's energy which is absorbed by this stroke. These two strokes constitute the first half cycle or revolution of the crankshaft L.

Third Stroke (explosion).—The second downward travel of the piston fig. 3 is the working stroke giving the power. This is caused by the compressed gaseous mixture being ignited and exploded. The valves F and G both being closed, there is but one direction in which the force of the explosion can exert itself, and that is upon the head of the piston C. This is forced downward to the bottom of the cylinder, the direct energy of the explosion being converted into a rotary movement through the connecting rod J, crank K, and crankshaft L. The igniting of the charge is usually effected by an electric spark occurring at the plug I. The method of obtaining this spark will be dealt with later on.

Fourth Stroke (exhaust).—The second upward stroke of the piston (fig. 4) ejects the consumed gases of the explosion. At the end of the third stroke the exhaust valve G is lifted by the cam N through the plunger N¹. If the diagram of this stroke is referred to it will be seen that the valve G is slightly lifted from its seat, and is about to be fully lifted by the cam N, and held fully open until the piston reaches the top of its stroke. At this point the valve closes to its seat again, and the cycle of operations is repeated, and continued so long as the engine is running. The spent gases escape through the orifice H in the direction of the arrow.

The "Otto" cycle is perhaps better known as the "four-cycle" motor, this name being applied to it through the fact that four strokes of the piston are required to complete the cycle or sequence of operations. This cycle is more graphically illustrated when tabulated in the form shown over page. By this it will be seen at once what is happening during each of the revolutions of the crankshaft.

First revolution of crankshaft. { First stroke (suction), fig. 1.
 { Second stroke (compression), fig. 2.
 Second revolution of crankshaft. { Third stroke (firing or explosion), fig. 3.
 { Exhaust stroke (exhaust), fig. 4.

The Ignition.

As already mentioned, the compressed charge of gas in the motor cylinder is caused to explode by being ignited by an electric spark. There are other ways of ignition, but at present the electric spark is used almost without exception. The apparatus for producing this is composed of a four volt battery or accumulator and an induction coil. The latter is used to intensify the low pressure in the battery to a high enough pressure to cause the spark to bridge the gap at the sparking plug points. A third part of the apparatus is the contact breaker or commutator, which, as we before said, is really an automatic switch. This is attached to the shaft M, which carries the exhaust valve cam N, and is so arranged that at the moment the cylinder charge is fully compressed (third stroke), the electric circuit is established, and the igniting spark occurs.

This is necessarily but a brief outline of this part of the internal combustion engine, about which so little is generally known even among experienced automobilists. We intend to deal with this more fully at an early date in *The Autocar*.

A TOUR IN ALGERIA.

The interesting project which we referred to in our issue of November 1st is now likely to become a tangible fact, and is already spoken of on the Continent as the Algerian caravan. The complete organisation has been carried through by Baron Pierre de Crawhez (for the Touring Committee of the Automobile Club of Belgium), and the hotel and other arrangements by the Société Internationale des Transports Automobiles, of Brussels, and Messrs. Thos. Cook and Son.

The party will leave Namur on January 5th, reach Algiers on the 15th, and be back at Marseilles on Sunday, February 8th, according to the following itinerary: Leave Namur (January 5th), arrive Charleville (5th), Reims (6th), Troyes (7th), Dijon (8th), Mâcon (9th), Lyons (10th), Avignon (11th), Marseilles (12th), stay Marseilles (13th), cross the Mediterranean (14th), arrive Algiers (15th), stay Algiers (16th to 22nd), depart for Kabylia and Biskra (23rd), arrive Tizi-Ouzon (23rd), Rougie (24th), Sétif (25th), Constantine (26th), Batna (27th), Biskra (28th), and stay Biskra (29th). Return journey: Arrive Batna (30th), excursion to the ruins of Timgad (31st), arrive Constantine (February 1st), Sétif (2nd), Rougie (3rd), Tizi-Ouzon (4th), and Algiers (5th).

A week will thus be spent in Algiers, during which period an attractive programme will be carried out. This will include "chacal" hunting in the Bay of Algiers, visits into the Arab town, fantasias, Moorish entertainments, the Algiers-Oran-Algiers race, and the mile and kilometre contests on the road from Maison Carrée to Roufba. Some highly interesting excursions, such as the classical one to the Gorge of La Chiffa, will also take place.

Special arrangements are being made for British

tourists who are willing to join the party at Namur or *en route*. If they do not bring their own cars, seats will be found them by the Société des Transports Automobiles. The number of subscribers is necessarily limited. An English interpreter will accompany the party throughout the journey.

THE CHENARD-WALCKER CAR.

This remarkable vehicle, which those who take note of what happens in French automobile circles will remember headed the list in the late consumption trials conducted by the French Government, covering a distance equal to no less than fifty-one miles on one gallon of petrol, was referred to in our report of the French Show; but for a reason which no longer obtains was not named. The description will be found on page 641 of our last issue, beginning at the eleventh line of the left-hand column. The mechanically-actuated induction valves operated by cams on a sliding sleeve—which cams are so formed that they vary the time of the full opening of the valves in obedience to the governor—the one contact commutator for two or more cylinders, the reverse cone clutch, cone brake, and the special spur gear drive from differential-shaft to road wheels running on ends of fixed axle, are all referred to there. As we have already stated, we hope very shortly to publish drawings and detailed description of what was certainly one of the most interesting and carefully-thought out and best constructed cars in the French show. We may say that while in Paris we made a run of some forty miles upon and drove the very car to which we have referred at the opening of these remarks, viz., the "consumption champion," and have nothing but praise for its sweetness of running, comfort, quietude, and speed. Owing to the roads being inches deep in mud, and the outward journey being made in the teeth of a howling north-easterly wind, no consumption test was made.

M. Ballef, the president of the French Touring Club, is reported as saying that the treatment of motorists, who are being sent to prison wholesale for alleged furious driving, is "too horrible for publication." In consequence, the club has decided to make representations to the authorities. It is alleged that the police have started a system of blackmail upon owners of cars who wish to keep outside the prison's walls.

* * *

"Motorist's Supporter" suggests, as a visible sign for the motorist to leave behind him as a warning after he has discovered a police trap, that a number of sticks or stones should be tied together and placed in a row at the edge of the road. He suggests they should be coloured. Perhaps some enterprising firm will place some small coloured sticks on the market, so that they can be carried in a car and thrown out when required. "Motorist's Supporter" is going to Worthing shortly, and wants suggestions for converting Col. Wisden. He is determined to break up all the police traps he comes across—a most praiseworthy intention, though we question whether it will have a mollifying effect on Col. Wisden.

THE LIVERPOOL TIP WAGGONS.



A group of Leyland steam tip waggons, supplied to the Liverpool Corporation by the Lancashire Steam Motor Co.

The above group of six steam tip-waggons, which have been supplied to the Liverpool Corporation, should be of particular interest to those of our readers who are interested in heavy haulage. The group forms the second order placed by the Liverpool Corporation, their first order being for a single waggon (No. 1), which was supplied some two years ago. The repeat order speaks for itself regarding the efficiency of these vehicles. Under the circumstances, the following description of a sample of these vehicles will not be out of place.

The body is constructed of well-seasoned oak framing, well supported with iron corner plates and tie bolts. The inside dimensions are 9ft. long by 6ft. wide by 2ft. 6in. deep, and have a swing-door at the back to open with a lever placed under the waggon body in a convenient position.

The wheels are made on the gun-carriage principle, with oak spokes and ash felloes, steel naves bushed with hard gun-metal, and have weldless steel tyres, 5in. wide at back and 4in. at front.

A patent cushion drive is fixed on the ends of the compensating gearshaft, which allows the engine to go almost a revolution before full power is exerted upon the rim of the road wheel. This considerably reduces the shock which would otherwise be put upon the engine and gearing when starting with a heavy load.

The boiler feed is by an automatic pump, which is driven by an eccentric from the compensating

gearshaft. There is also a steam pump of improved pattern for supplying the boiler when the engine is standing. An arrangement is also provided for working this pump by hand when steam is down. A water lifter is fitted to the side of the frame, and the water tank has a capacity of 130 gallons.

The framework is of channel steel, 4 $\frac{3}{4}$ in. by 2 $\frac{1}{2}$ in. by $\frac{3}{8}$ in., well stayed with cross channels and angle plates, and riveted up throughout.

The engine is a horizontal compound, having cylinders 3 $\frac{1}{2}$ in. and 6 $\frac{1}{4}$ in. by 6in. stroke. It is fitted with link motion, and has exceptionally large and long wearing surfaces. The low pressure cylinder can be worked high pressure for getting out of bad places. It is entirely cased, runs in oil, and, therefore, requires little attention.

The boiler is of the fire tube type, having eighty square feet of heating surface, constructed for a working pressure of 200 lbs. per square inch. It is so built that the outside shell can be lifted off for cleaning purposes. All the fittings are of the highest class workmanship and suitable for the pressure at which they have to work.

The gearing gives two changes of speed, which are operated from the driver's seat. The gear wheels are of steel throughout, having machine-cut teeth. These are bolted to turned-up flanges, thus dispensing with all keys, and are run in a dustproof and oil-tight casing, ensuring perfect lubrication and easy running under any conditions.

The dust nuisance is usually attributed to motorists, but the report of Mr. Thropp, C.E., surveyor to the Lindsey (Lincolnshire) County Council, puts a different complexion on the matter. He states that as in rural districts there is a tendency in summertime to dispense with roadmen, the roads cannot be swept and scavenged as they should be, so that when a motor comes along, the public, whether riding, driving, or walking, find the cloud of dust a source of great discomfort.

A resolution as to the "control of autocars" caused a heated discussion at a meeting of the Holywell Urban Council, a presumably sane member alleging that motorists passed his place like lunatics. "These new machines," then declared an only Jones, "rushed about the country barking like a dog, stinking like a cat, and frightened any animal, even donkeys." (This seemed apparent.) After some sensible remarks by more responsible members, the resolution was not adopted.

THE 6 H.P. DE DION-BOUTON VOITURETTE.

It was not probable that so enterprising a firm as Messrs. De Dion-Bouton have long since shown themselves to be would be for long left out in the cold so far as light voiturettes were concerned, and we have now the 6 h.p. De Dion-Bouton, an example of which has already arrived at the De Dion-Bouton depot, 28, Brook Street, Bond Street, W. This dainty and fascinating little car is, at the moment of writing, under colour treatment in the Mulliner ateliers at the above address, but before these lines are in type will have made its bow to the British public on the road. The single phaeton body, giving ample accommodation for two passengers, is particularly graceful in shape, and flowing in outline. In nearly all its mechanical features it may be said to be a miniature 8 h.p. De Dion, but reference to our various illustrations will serve to convey a very fair idea of its entire construction. In each and every detail it is designed, made, and finished with all the care and thought that have distinguished the cars which have issued from the great Puteaux works.

Turning first to figs. 1 and 2, the frame is, as

shown, of stout steel tubing inswept forward to allow of ample lock to the steering-wheels, and stiffened by four straight transverse and one central longitudinal member. The water-cooled engine, which has a cylinder diameter of 90 mm. = $3\frac{1}{2}$ in. and a stroke of 110 mm. = $4\frac{1}{10}$ in., giving the above-mentioned horse-power at 1,550 revs. per minute, is very strongly carried by stout brackets from the crank chamber to the second transverse member of the frame, and to the longitudinal tubes thereof. It is concealed from view by a particularly smartly-shaped engine cover with polished brass angles. The ignition is of the new De Dion type, viz., by accumulators, commutator, and trembler coil, but the primary being earthed at the commutator, that portion of the latter hitherto made in ebonite is now in metal. This construction will obviate irritating shorts, which, through unsuspected wear of parts, sometimes occurred in this region. The drive passes from the engineshaft through a horizontal doubly universally-jointed propeller-shaft Q to the mainshaft in the two-speed gear box AA, and from the countershaft therein by bevel pinion to the

bevel ring surrounding the differential gear. The propeller-shaft Q is made with a sliding joint in the socket of the universal joint f (figs. 1 and 2). The water for cooling the engine is contained in a tank placed on front of the dashboard within the bonnet, and the water is circulated from it through the single wide tier of radiators, carried forward below the frame, to the cylinder by means of a large rotary pump b (figs. 1 and 2), driven from the protruding end of the half-time shaft by a strong flexible shaft c. The water tank contains two and a half gallons. As can be discerned from the drawings, every part of the motor, with the ignition apparatus and pump, is most readily gettable as soon as the bonnet is raised.

One and the same gear case A A serves to enclose the expanding clutch two-speed gear and the

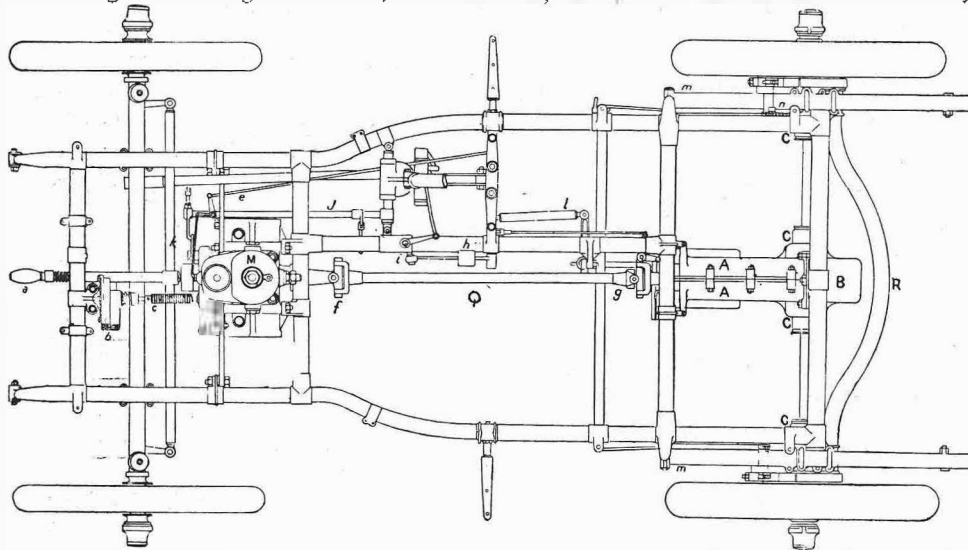


Fig. 1.

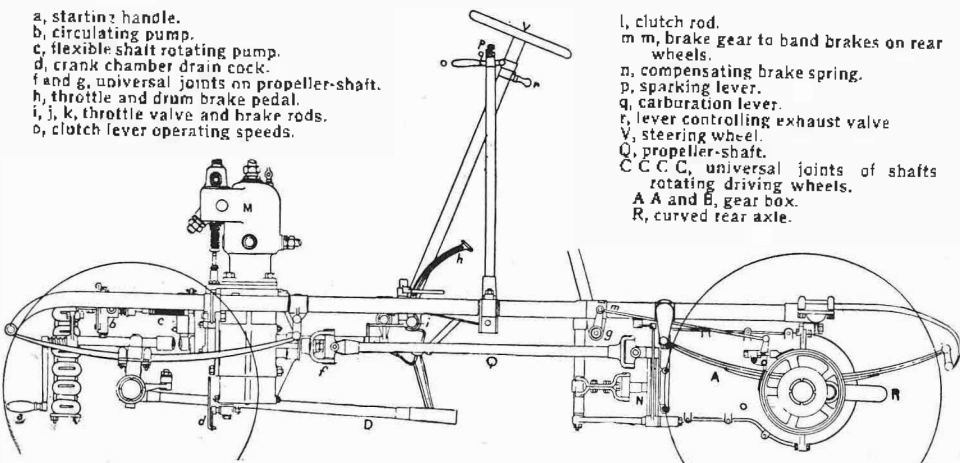


Fig. 2.

- a, starting handle.
- b, circulating pump.
- c, flexible shaft rotating pump.
- d, crank chamber drain cock.
- f and g, universal joints on propeller-shaft.
- h, throttle and drum brake pedal.
- i, j, k, throttle valve and brake rods.
- o, clutch lever operating speeds.

- l, clutch rod.
- m, m, brake gear to band brakes on rear wheels.
- n, compensating brake spring.
- p, sparking lever.
- q, carburation lever.
- r, lever controlling exhaust valve.
- V, steering wheel.
- Q, propeller-shaft.
- C C C C, universal joints of shafts rotating driving wheels.
- A A and B, gear box.
- R, curved rear axle.

differential gear. The fact that the gear case is cast in two vertical halves preserves the truth and alignment of the gearshaft bearings, reduces the noise of the gear to a murmur, and ensures perfect lubrication of all frictional parts.

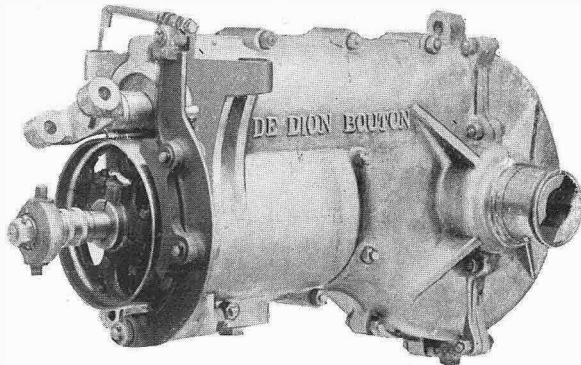


Fig. 3.—The gear box showing the band brake.

The gear case carries and encloses two shafts—the mainshaft connected to the propeller-shaft Q by the rear universal joint *g* (figs. 1 and 2), and a secondary shaft vertically parallel to same, which, at its rear extremity, carries the bevel pinion, meshing with the bevel-toothed ring surrounding the differential gear, and at its forward end the brake drum of the pedal

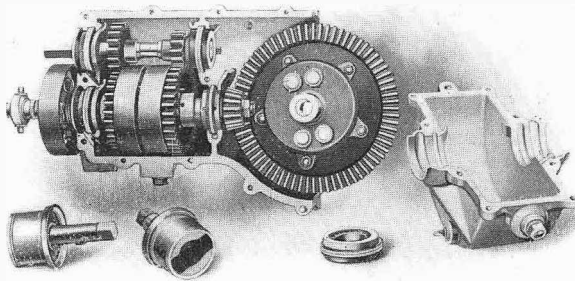


Fig. 4.

The interior of the gear box showing the change speed gear.

brake. Both these shafts run on ball bearings—indeed, ball bearings are fitted to all journals throughout, excepting the road wheels, which have plain. In order to facilitate replacements two sizes of ball bearings only are fitted. The shaft Q is square at its forward end, and enters the square hole made to receive it in the forward universal joint, as shown by the universal joint in fig. 5.

The gear box is suspended from the frame by hanging bolts at three points, the box itself being in three portions.

By detaching one side half of this gear case (the left) and the semi-circular end, the two-speed gear with its expanding clutch boxes is disclosed. Therein is seen the primary or mainshaft, which is rotated by the propeller-shaft Q (figs. 1 and 2), and the hollow secondary or

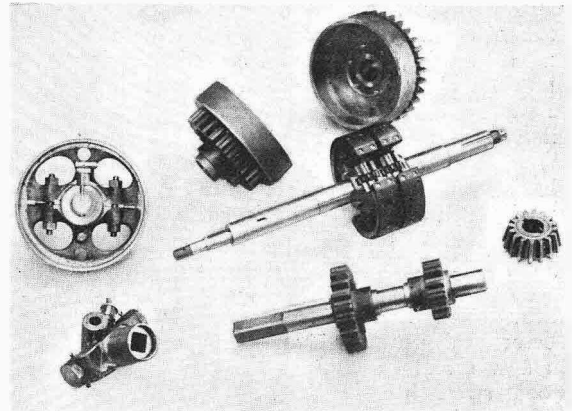


Fig. 5.

Details of the change speed gear mechanism. The expanding clutches are seen on the countershaft, the drums and gears being above, while the mainshaft and its pinions are seen below. The bevel pinion is seen on the right, the brake drum and universal joint being on the left.

countershaft. The former shaft carries two toothed pinions of unequal diameter, and upon the second shaft is mounted outside the gear case the brake drum and the two clutch boxes, each with their toothed rings bolted to them and meshing with the pinions on the former shaft already mentioned. The clutch boxes each run loose on the secondary hollow shaft, and only communicate the drive to that shaft when the expanding clutches, which are fast on the driven shaft, are expanded to grip their interior surfaces. When the clutch lever on the right of the steering standard is drawn back by the driver the expanding clutch within the box or drum grips the latter and causes the drive to pass to the bevel pinion and the bevel toothed ring through the spur gearing with which it is in relation. When the clutch lever is thrust right forward the same process takes place in connection with the second clutch box. The first gives the low and the second the high speed. The whole of the gearing within this box, together with the shaft bearings, depends upon dash lubrication, the lubricant being introduced through the crown of the box by a pump to be dealt with later. Leads are formed in the gear case to convey oil to all bearings and toothed gearing. In the driving portion of the gear box a constant level of oil is re-

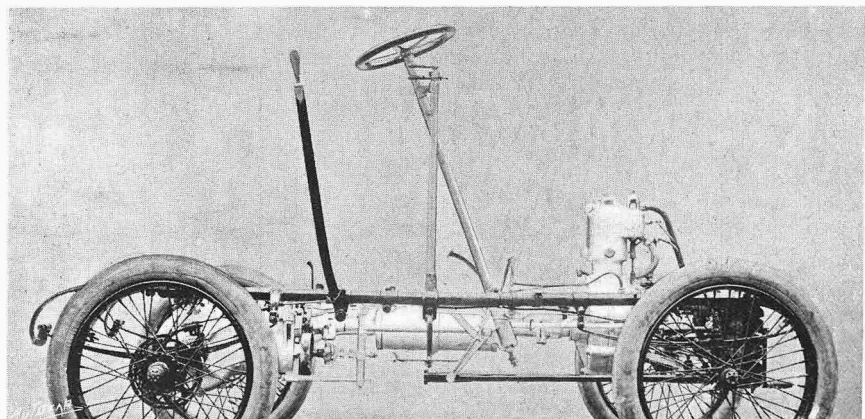


Fig. 6.—Elevation of chassis. This is the French type with wire wheels.

tained for the service of the wheels by a dam formed by the support of the bearing to the rear end of the drivingshaft. The road driving wheels are rotated by two universally-jointed drivingshafts in the manner now so well known to all who have the slightest acquaintance with De Dion construction. The universal joints are protected on these shafts from the penetration of mud and dust by the special fitting H, as shown in fig. 9.

The four road wheels are of equal diameter, viz., 28in., and the weight of the car is 6 cwts. 2 qrs. 20 lbs. The little vehicle is wheel steered through an inclined steering-pillar by worm and sector and usual steering connections (as shown in figs. 1 and 2). These connections are of exceptional strength and stiffness.

The steering column is stayed by the support of the two vertical tubes (see fig. 1), which carry the clutch connection from the clutch lever, and the sparking and air levers respectively. The clutch lever, which has forward fast, rearward slow, and centre free-gear positions, is at the left hand of the steering column. The maximum speed said to be attainable by this car is twenty-eight miles per hour. A lever projecting from the steering column below the wheel controls the lift of the exhaust valve. A pedal, applied by the driver's left foot, first slows the engine, and then applies the brake

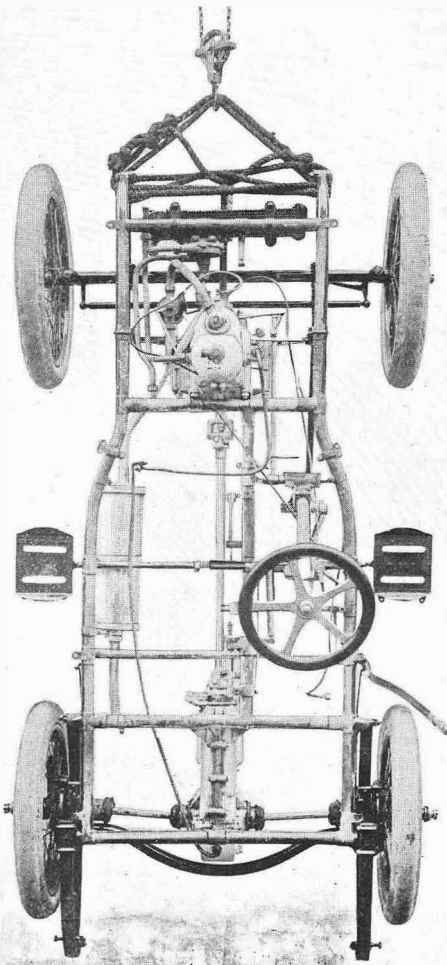


Fig. 7.—Plan of chassis.

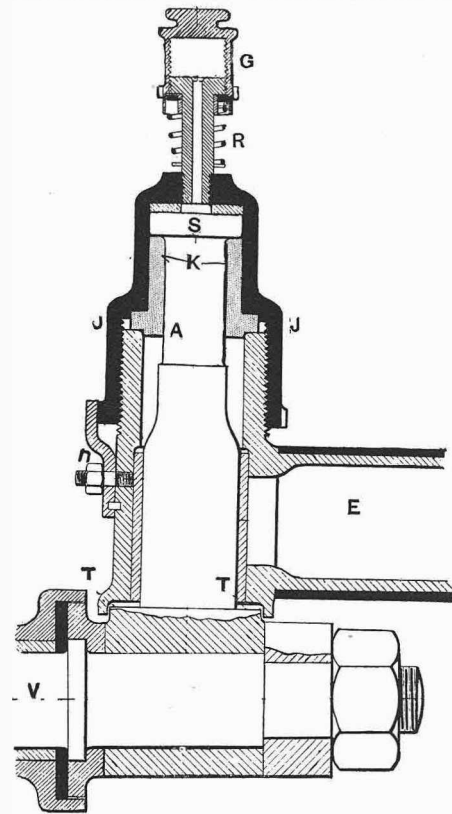


Fig. 8.—Mounting of steering pivots.
 A, steering pivot
 E, steering axle
 G, Stauffer lubricator
 R, spring to same
 S, steering pivot head
 K, gun metal bearing ring
 J, J, screw cap locked by set screw
 V, steering wheel spindle

blocks to the brake drum on the secondary gear shaft referred to above. By the side brake lever (shown in fig. 6) the driver can apply at will metal band brakes to steel drums mounted on the inside of the road-driving wheels. On the inside face of the dashboard is fixed the coil box and a hand pump lubricator fitted with a three-way valve, permitting the charging of the pump barrel and the delivery of its contents to the crank chamber or to

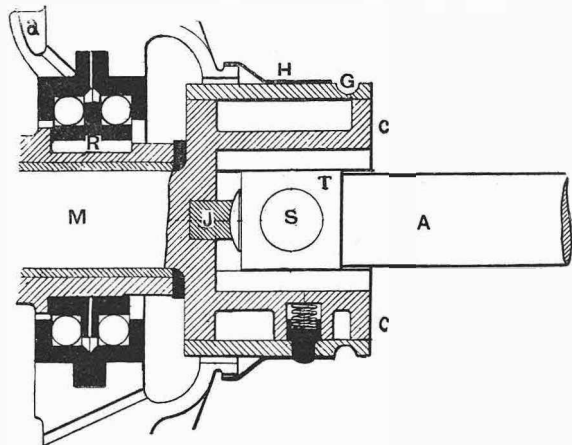


Fig. 9.—Mounting and articulation of universal joint to shafts rotating road wheels.
 A, shaft.
 C, C, end of differential gear-shaft.
 G, locking ring.
 H, dust cap.
 J, distance radial block
 M, differential gearshaft.
 R, cotter.
 S, cross-head pivot.
 a, oil duct from gear box to ball bearings.

the gear box at will. The accumulators and the petrol tank—whose capacity is three and a third gallons, sufficient for a run of 110 miles—are placed beneath the driver's seat. The careful and sound construction of the universal joints at the ends of the transverse shafts rotating the driving wheels can be seen by the drawing reproduced (fig. 9).

Fig. 8 shows the construction of the steering-wheel spindles and pivots, and the manner in which these are secured to the steering-wheel axle. The weight of the vehicle is supported directly by the head S of the pivot A. A Stauffer lubricator G serves lubricant directly on to the head S, which is surrounded by a gun-metal collar K. The open space below this collar serves as a lubricant reservoir.

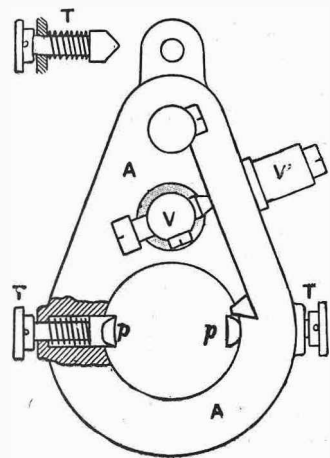


Fig. 10.—The commutator.

A A, commutator plate in metal.
V, insulated platinum pointed screw.
V¹, primary current terminal.
T T, thumbscrews for attaching A
i, blocks at end of thumbscrews in circular slot on distribution disc.
p, rubbing contact.

In this car the De Dion commutator will be found in an altered form. The fibre block has disappeared, its place being taken by a metal block of the same shape. The primary current is now earthed through this member. The platinum - pointed screw V alone is insulated by the fibre cylinder shown encircling it, and the current is conducted thereto by the terminal V¹. The block AA is secured to the metal boss carrying the distribution disc by the two thumbscrews T T, which have blocks entering a chase cut in the metal boss. The foregoing description and illustrations, though far from complete, will serve to show that the new 6 h.p. De Dion car is a particularly simple and carefully-designed carriage. The trial cars have been run from Paris to Vienna, in addition to many other trips.

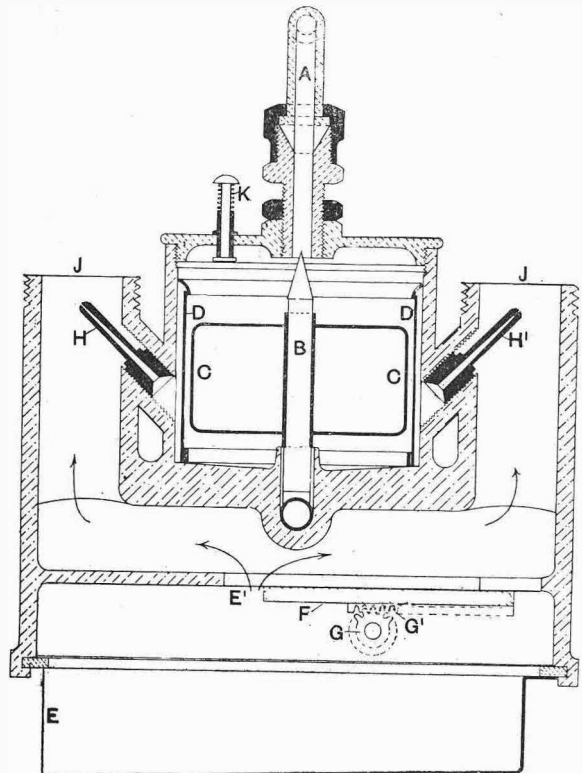
Messrs. Iliffe and Sons Limited are about to publish, in conjunction with Messrs. Charles Letts and Co., the well-known diary publishers, a special book for the use of motorists generally. This book, besides other useful features, will contain a list of recommended hotels whose proprietors are anxious to cater for motorists, and who have agreed to a fixed charge for stabling, etc.; a list of recommended repairers; and also names of agents where petrol may be obtained. The proprietors of any hotels wishing to have their names included in this book should write at once to the editor of "The Autocar Log Book," c/o. Messrs. Charles Letts and Co., 3, Royal Exchange, and any of our readers who have any suggestions to make are invited to forward them.

* * *

"Automobilium" is said to be the new name for an autocar sale mart in Paris.

THE GEORGES RICHARDS CARBURETTER.

The Richards 1903 cars, which we described and illustrated in *The Autocar* of December 6th, page 659, are—as we mentioned before—now being fitted with a special carburetter, of which we give a drawing below. This carburetter is made for a four-cylinder engine, and the particular feature about it is that a separate spray nozzle is provided for each cylinder. The apparatus is a square box-like structure having at its four corners the induction pipe connections, and at its centre a cylindrical float chamber. On reference to the sectional illustration,



A, petrol inlet pipe.
B, needle valve.
C C, float.
D D, float feed chamber.
E E¹, air inlet.
F, slide valve regulating E¹.
G G¹, pinion and rack operating F.
H H¹, petrol spray nipples.
J J, outlets to cylinders.
K, plunger to depress float.

the action of the carburetter will be clearly understood. Petrol enters the float feed chamber D D at the top through the pipe A, the supply being regulated by the float C C and the needle valve B. It will be seen that as the level of the spirit in the chamber decreases the float sinks, carrying with it the needle valve B and opening the petrol supply, the rising of the float closing the orifice again and shutting off the spirit. On the suction stroke of any one of the cylinders air is drawn in at the bottom of the carburetter E, and passing through the orifice E¹ it goes to its particular cylinder, sucking spirit through a nipple projecting into the induction pipe, as shown by H H¹. The air inlet E¹ may be regulated to suit atmospheric conditions by means of the slide valve F, which is actuated by the pinion G and the rack G¹. A plunger K is fitted, by means of which the float may be depressed and the carburetter flooded.

COUNTY COUNCILS AND HIGHWAYS.

By JOHN MORRISON.

The more or less wholesale scheduling by various county councils of highways to be barred against traction engines has not aroused the general interest it demands.

Those highways which are unfit for a traction engine are, as a rule, equally unfavourable either for a bicycle or a motor car. So that a road free to the first is the best possible guarantee of efficient maintenance for the others. The essentials of resilience, non-sponginess, and evenness of contour are necessary for all self-propelled traffic. Hence, if the terrible *vis inertiae* and prejudice of our highway authorities as regards modern road user generally are to be successfully overcome, and British roads engineered up to date, instead of being as at present coddled out of date, a strong confederacy of all interested forces towards such a consummation must speedily be proclaimed.

Once purely agricultural highways have now entered upon a totally new phase of existence, having been adopted as the common parade of the nation at large. The bicycle and the motor car have appropriated them, both for pleasure and business. Time also is an infinitely more serious factor than it was. The exigencies of life can no longer be satisfied with a carthorse pace. And it is absolutely essential that the character and the condition of our highways shall minister to the new *régime*. The £ s. d. is a secondary consideration. For a nation which can afford millions in support of its military prestige abroad can well afford to defend its internal welfare by the provision of efficient highways at home.

Foundationless Roads.

That English roads have no foundation is a terrible indictment. In the matter of highways *versus* traffic, the law should disallow a one-sided responsibility. Our roads must be good—not merely as a matter of variable opinion, but good for something as a matter of indisputable fact. And a highway of undeclared traffic-carrying capacity should enjoy no legal remedy against traffic injury. Also in this direction, the "extraordinary traffic" law as a law of double entente should be swept from the statute book, yielding place to something as easy to observe as the ten commandments.

Highways surveyors have, as regards the horse, been taught almost as a first principle that out of the total average traffic wear on macadamised roads, no less than forty-five per cent. arises from the scarifying, or chop-chopping, action of the animals' feet. Surely, therefore, a little serious, unprejudiced effort towards the elimination of a terribly fatal element which our highway authorities have for long fully understood, should prove infinitely more profitable than the unreasonable harassing of a more modern tractive agency which it is not uncharitable to suggest that they have not yet even begun to understand.

The British road of the immediate future must be a solid, coherent, waterproof, convex-surfaced, decently side and subsoil drained mass, secured against elemental disturbance under suitably-proportioned working loads. And with such a structure, weight

carrying will have little practically to do with total loads, which within the limits of transverse width must always be a mere question of wheel breadth.

The road must be rolled to within a reasonably safe distance of the crushing stress of its metal and to substantially beyond the working load per transverse surface inch, which it must be definitely made to support. And once a working load factor in terms of cwts. per inch of carrying wheel breadth is officially established, damage must no longer be suggested until the statutory "fair wear and tear" limit which this implies is exceeded.

The road also must not be a sieve, nor in its *materia medica* must organic matters be allowed; for the prevalent turf-blanketing of its metal must be known no more. It is a penal offence to cast rubbish into a navigable stream; so it should be to adulterate with soil or grass sods the honest macadam of a public highway. In the one case the stuff will either sink or float to sea; in the other the anathema of a porous, yielding, dust and mud provocative crust will remain.

The security of an efficient highway lies less in superabundance of metal than in imperviousness to water and consequent frost-defying capacity. A five per cent. road crust would be a perpetual joy; but one equal to carrying half its weight of water in suspension is a holy terror even to the operator of a wheelbarrow.

Parsimony on capital account, also, too often involves abnormal outlay on maintenance account. A comparatively slight increase in constructive cost will in many cases almost halve the amount of the annual upkeep bill. In short, the whole system of road management must be reformed, and traffic regulations as to both weights and speeds must be brought thoroughly up to date. The road must become a commensurate means to a necessary end—the end being the master and the means the servant. Economical transport must be as superior to an antagonistic preservation of its avenues as the dynamic comfort of a pedestrian must be superior to the static welfare of his boots.

The horse, likewise, must no longer be the privileged element, nor the self-propelled vehicle the one on sufferance. But that which will best implement the combined exigencies of speed, economy, and safety must form the controlling pivot round which all else must revolve. There should be premiums for the maintenance of roads in health, as well as penalties for their neglect when in incipient decay. And if our existing highway councils cannot, amid the rapid modernisation of road traffic, rise to a forward policy of "move on," they themselves must be firmly encouraged to "move off."

A Question of National Importance.

The whole question of British roads is then, I repeat, of widespread importance, and sooner or later must be most seriously tackled. Enormous sums are just now being lavished upon electric trams. And yet their future is by no means secure. For not only is one-half of their capital sunk in an expensive and street-obstructing track, but their success is largely owing to the monopoly they enjoy.

The area of their usefulness, too, is altogether circumscribed. So that what is really wanted is an independent tractive agency, which, while equally efficient, need not be imprisoned within the limits of special tracks, but may thread safely and quickly the mazes of our busy streets, and, in addition, bring the fresh country atmosphere within cheap and easy reach of the toilers of our cities.

Is not the repopulation of our healthy country districts with the anæmic dwellers at our factory gates something worth striving after? To this position, then, the master key lies in the bringing of our highways into line with such developments of mechanical road traction as will best minister to such a result. The latter agency—mechanical road traction—by hostile legislation has already been kept back almost half a century. And it will be a bad day for Great Britain when it is finally determined that the blunder shall be repeated in regard to roads.

What seems to be needed is a corps of inspectors operating under the control of the Local Government Board, and who, fully conversant with the circumstances and exigencies of modern road user, shall gradually manœuvre British highways into line by friendly counsels with the existing road surveyors. At present each local highway authority is an independent little oligarchy of itself, having its own special ideas and antipathies, and practically recognising no superior authority. And the result is an enormous variation in the character and condition even of our main roads. Some are beyond reproach, while some are beneath contempt.

Highway official animus is not confined to the traction engine, but extends both to the heavy motor wagon and the comparatively light motor car. And as it is absolutely essential that so antiquated a hostility shall be disarmed, and that public opinion in road matters shall at the same time be educated, a strong combination of all interested in self-propelled traffic is, towards this consummation, urgently needed.

And if by the wholesome agency of these suggested inspectorships, British roads and road methods can be standardised and made more worthy of a great nation, an enormous service to the country at large will be accomplished.

If, however, the existing highway rating system is found incompatible with such a beneficent result, and after the needful modifications, is found to unduly oppress the least interested section of the community, then I feel sure that those who are likely to derive practical benefit from legislative changes will not demur to such new taxative assessments as shall fully and equitably meet the altered condition of affairs.

A lay contemporary declares that the Surrey police, the deadliest enemies of the autocar in this country, heartily endorse the Scott Montagu Bill, because, if it passed, there would be less work and less exercise for them. They would merely sit down comfortably on a stile and jot down the number—very probably the wrong one—of any car which they imagined to be exceeding the speed limit. This would do away with the discomfort of hiding in pigsties and drain-pipes, while the returns would be ten times as large as they are at present.

Correspondence.

KEEPING WARM.

[2721.]—With reference to "Calorifer's" remarks in *The Autocar* of December 13th respecting motoring in cold east winds, it may be interesting to this correspondent and to others to know that we have fitted with great success a special arrangement of copper tubing for keeping the feet warm during cold weather. What we do is to pump the hot water through this tubing before it gets to the tank. This is accomplished by allowing the circulating water to pass through these pipes at will, a tap being fixed so that the foot-warmer can be thrown out of action. This is easily managed with the Benz cars, and the water in the tank keeps much cooler, and a double advantage is therefore secured.

HEWETSONS, LTD.

PETROL, STEAM, OR ELECTRICITY.

[2722.]—It occurs to me that there may be an opening for internally-fired engines, where power is required at a considerable distance from the boilers.

The object of this is to know if any of your readers have made reliable tests in comparing the cost of petrol motors with: (a) Ordinary steam engines; (b) electric motors, with current charged at 2d. per unit.

The advantages of the petrol and electric motors are that they can be started at once without any initial expense, and when at rest no expense is incurred. On the other hand, an engine running at a high velocity must have a shorter life than one running at a slower speed.

At the factory with which I am connected an electric current at 100 volts is always available, also plenty of cooling water.

I am addressing your valuable paper, as I do not know how otherwise to reach those who may have the information I am seeking.

E. J. BOAKE.

JOHN BRIGHT AND THE JUSTICES OF THE PEACE.

[2723.]—In touring through Suffolk I came across an original letter from the late John Bright, which I took a copy of, by the kind permission of the owner.

I think it interesting enough at the present time to send to you for publication. It is as follows:

"Rochdale, Jan. 12, '66.

"Dear Sir,—I have sent the *slip* you have inclosed to me to Sir Geo. Grey, to whom I have had occasion to write this morning on another subject, and have called his attention to the case.

"In all matters connected with game, justices of the peace seem to lose their heads.

"The Home Office should pull them up—but when the law is so bad, it is not to be wondered at that the administrators of it should be foolish and unjust.

"I am, faithfully yours,

"JOHN BRIGHT."

"W. S. Walpole, Esq., Bury St. Edmunds."

The above criticism, by an illustrious statesman, of the actions of the justices of the peace with reference to the game laws at that time is so strikingly applicable to the conduct of many of the same gentlemen at the present time in relation to the "bad" law governing the speed of motor cars, that it is not difficult to believe he would have been quite shocked at the "decisions" in motor car speed cases of thirty-six years later, and that in such an eminent reformer we should have had a champion, were he amongst us to-day.

W. J. BARNIKEL.

[We do not believe in the ordinary way of quoting the sayings of political personages, as automobilism is, of course, entirely distinct and separate from politics, but the opinion of Mr. John Bright, given above, is on a matter altogether outside politics, and one which the majority of automobilists will endorse. For proof of its accuracy we need only refer to the statement recently made by a chairman of magistrates that he supposed there was no harm in going above twelve miles an hour when the road was clear, but while the law was as it was he meant to enforce it, and he might have added, to countenance traps set for all who should exceed this speed on certain secluded open stretches of road.—Ed.]

THE RELIABILITY TRIALS IN AMERICA.

[2724.]—The remarks on page 64 of *The Autocar*, published November 8th, under the heading "The American Reliability Trials," includes several misstatements. The writer of the paragraph is evidently not very well informed on the rules governing our recent reliability test. He states:

"A bad defect in the rules, from a reliability point of view, was that any time lost in penalised stops could be made up by fast running, as the rules indicated that such stops would be counted in the running time. Thus a car with any speed about it could afford to lose anything up to half its time limit in such stops, and yet arrive at the end of its stage with a clean sheet, so far as obtaining a first-class certificate was concerned. The rule was unquestionably a foolish one," etc.

The rule on the subject is exactly contrary to that stated by you, and is as follows:

"Vehicles are not permitted to make up the time lost during penalised or during non-penalised stops by exceeding an average rate of speed of fourteen miles per hour, but the time lost during non-penalised stops will be credited upon arrival at controls."

We feel satisfied that your sense of justice and fairness will not permit your statement, and the consequent erroneous public opinion, to stand without a prominent public correction.

NATIONAL ASSOCIATION OF AUTOMOBILE MANUFACTURERS, HARRY UNWIN (Secretary).

[The criticism referred to in *The Autocar* by our correspondent seems to be entirely misunderstood, and we cannot see what inaccuracy there is in our statement. As we read the rules, it would appear that, if in a stage or control of four hours' duration, two hours were lost by an involuntary or penalised stop through failure of the mechanism of the car, the machine could still get in to time by doing forty miles an hour if capable of that speed. That is to say, it might average fourteen miles an hour in the four hours' stage whether it ran at fourteen miles in each hour or twenty-eight in two, through having broken down for half that period. If the rule stated that fourteen miles in any one hour should not be exceeded, it would be different. It is clear that an average speed is referred to, and we find that the leading American automobile journals endorse our views. With regard to the observance, we think our criticism was justified, when it is remembered that the observers were privately appointed, and kept to the same car each day throughout the trials. Here, again, we find the *Horseless Age*, the most practical motor paper of the United States, in accord with us. At the same time, it is only fair to state that we have a letter from the president of the American Automobile Club, in which he assures us that the rules were rigidly enforced.—ED.]

THE RELIABILITY TRIALS.

[2725.]—I have read with great interest Mr. G. C. Ashton Jonson's remarks on the "Locomobile" car appearing in a recent issue of *The Autocar*, and was extremely surprised to see Mr. Jonson state that only one brake is necessary on the "Locomobile."

I should like to ask Mr. Jonson whether he is aware that, to comply with the Light Locomotives Act, all cars used in this country must be fitted with two independent brakes. At the present time, when the authorities are only too ready to take advantage of the slightest opportunity for dropping on the unfortunate motorist, it is sheer folly not to comply with the law as far as ever it is possible to do so.

Personally, I think two brakes are, for safety alone, necessary on all cars. On the "Locomobile" braking with the engine is all right in theory, but would be useless in case the chain were to break or come off, as several did in the reliability trials. Also, in case of failure in the differential gear, both the engine braking and the present band brake on differential would fail to act, and the car would be uncontrollable.

In my opinion the judges in the trials did quite right in docking the "Locomobile's" marks in the brake tests, as tyre brakes are nothing but a "makeshift."

What the "Locomobile" requires to make it safe is a band brake on the hub of each driving wheel, in addition to the one on the differential.

Both these hub brakes should be controlled by one lever working in a rack to enable them to be locked on. Such brakes are invariably fitted to first-class modern cars.

As for the cars Mr. Jonson mentions which entered the trials with only one brake, had I been a judge I should have disqualified them altogether, on the grounds that it would be unsafe and illegal to use same in this country. A condenser is also necessary on all steam cars, in order to comply with another provision of the Light Locomotives Act, that is, that no visible vapour may be given off from the exhaust.

With a few additions, the "Locomobile" would, in my opinion, be one of the best light cars on the market. I would suggest the fitting of a glass gauge or float to show level of water in tank; mudguards to all wheels; a Klinger water gauge (most users say this is superior to the Locomobile Co.'s pattern); steam water lift, air pump, and blast to burner; a sprag, and a lock-up tool box; also an efficient paraffin burner.

I may say I have no interest, except as a user, in either the "Locomobile" or any other make of car.

PRACTICAL.

AN UNBURSTABLE TYRE.

[2726.]—Referring to the letter of "Anxious Enquirer" on "A Burst Tyre" in your issue of December 13th, I am pleased to announce that I have patented and fully tested a new air tube for motor tyres which is about to be placed on the market, and which is so made that should a cover burst the tyre will not deflate, but may be run without stopping until it can be conveniently repaired. The tubes are also designed to prevent pinching and chafing, and existing tubes can be so treated as to give them the same valuable properties. This announcement will doubtless be of interest, not only to your correspondent, but to all automobilists, as I claim these new tubes will avoid three out of four of the ordinary tyre troubles, including the avoidance of all risk of accident through a sudden burst.

A sole license has been granted to the Dunlop Pneumatic Tyre Company to manufacture these tubes, and specimens will be exhibited at each of the forthcoming shows.

M. D. RUCKER.

THE WHITE STEAM CAR.

[2727.]—For some years I have been what is called an enthusiastic motorist. During that time I have owned two motor tricycles, a New Orleans voiturette, and a Daimler car. I have ridden a motor bicycle, and have been a passenger on many different kinds of petrol-driven cars. Until I bought a White steam car, I had never driven a steam car, and only once had I been on one, and then only for a few hundred yards.

My experiences of the White may interest some of your readers. The car itself is very strongly built, it has a long wheelbase, and is the most comfortable one I ever rode in. Notwithstanding the long wheelbase, it turns easily in any ordinary road. One "starts it with a match," and, if calling or shopping, one can shut down the main burner and leave it for hours without any attention, then get in and start again immediately. The boiler is a "flash" one, free from the drawbacks but with all the advantages of this class of boiler, viz., one can use the condensed water over and over again, as the small amount of grease and oil in it after filtration does no harm. One can use any kind of water, so long as it is clean, with no fear of scale or deposit. There is no water gauge to bother one. The first day I had the car, I drove it ten miles at night without seeing the steam gauge even. One can go seventy-five to a hundred miles on ordinary roads without refilling water or petrol tanks. The water tank holds twenty gallons, and the petrol eight. The price is very moderate, and there are no extras. The engine and workmanship generally are better than any of American origin I have yet seen, and are, in my opinion, equal to English. The silent running, absence of vibration, and comfort generally come almost as a revelation to anyone who has only been used to petrol-driven cars. The White car, though perhaps not perfect, will take a lot of beating. F. E. R.

A SPEED INDICATOR.

[2726].—May I inform your correspondent "Loretap" that a speed indicator has been on the market for the past eighteen months which gives a "dead-beat" sight reading of the speed in miles per hour, which can be fitted with an aggregate mileage counter and with contacts arranged to ring a bell on the attainment of a certain speed.

Dr. Winter's speed indicator is a well-designed and strongly-made piece of machinery, and, when properly fitted and given the same attention as is given to the rest of the fittings of the car, it may be absolutely relied upon. The range is up to fifty miles per hour.

Assuming accuracy to be a *sine qua non*, and cars to be designed, as at present, regardless of the possibility of the addition of such fittings, your correspondent certainly places too low a value upon the instrument.

The requirements are very exacting, the difficulties of fitting are obviously considerable, and since scarcely any two petrol cars are of corresponding dimensions, skilled assistance is necessary in the fitting of the instrument to the car. It is true that steam cars present fewer difficulties in this latter respect, as their details render it possible to so standardise the driving mechanism as to considerably reduce its cost, and to so simplify it that it may be adjusted by any qualified driver.

Nevertheless, a speed indicator so made and fitted that its reliability and accuracy may be capable of proof will never, I fear, be obtainable at the figure suggested by your correspondent.

I may perhaps add that I am interested in Dr. Winter's instrument, and that I shall be very pleased to answer any enquiries concerning it.

F. L. ANDERSON.

MECHANICALLY-OPERATED INLET VALVES.

[2729].—I should like to mention one important point in connection with M.O. valves which has apparently been lost sight of by your correspondents, viz., that in a multi-cylinder engine, M.O. valves will do all and more than the automatic, and may all be set exactly to one timing and opening, so that each cylinder will receive identical charges, and practically develop equal powers—a most important advantage. It is admitted that power of the spring on an automatic valve greatly affects the running of the engine, and it is difficult to get and maintain a perfectly even tension on each spring on a four-cylinder engine, as is shown by the varying powers of the cylinders, which may be noted on almost any such engines having automatic valves. Also, the supposed complication in the case of M.O. valves is greatly imaginary; the direct mechanical lift against a strong spring is without the vibratory wear which occurs with automatic valves working against a very light spring, with the result that in many cases cotter pins and washers shake very loose and give trouble. Like the car itself, the M.O.V. has come to stay, it being a much more practical method of valve control; and I think users are not likely to return to the automatic valve.

H. E. HALL.

[2730].—We note that there is a challenge in Mr. Citroen's letter in your last week's issue. We shall have great pleasure in accepting this, and should like to hear from him the particulars of the tests he proposes.

We shall rely on our standard motor, which is 2 $\frac{1}{2}$ in. bore by 3 in. stroke (65 mm. by 76 mm.), or, if more convenient to Mr. Citroen, with our old pattern 2 $\frac{1}{2}$ in. bore by 3 in. stroke (63 mm. by 76 mm.)

We may say we do not care for the proposed wager, but if it is one of Mr. Citroen's conditions, we will accommodate him.

THE A.V. MOTOR CO.

[2731].—In your issue of December 13th, we notice a challenge from Mr. Citroen to match his Minerva motor cycle with mechanically-operated inlet valves against any other motor cycle with automatically-operated inlet valves for a stake up to £50.

We beg to accept his challenge, and will match our Gamage motor cycle against the Minerva, accepting all the conditions mentioned in Mr. Citroen's letter.

A. W. GAMAGE, LTD.,

W. A. VINCENT.

SIDESLIP.

[2732].—I have noticed a considerable amount of correspondence relating to sideslip, and suggestions and illustrations dealing with the matter. It appears to me that sideslip is the outcome of insufficient grip of the road wheel, and in mentioning road wheels, this, of course, means only two wheels out of the four, the remaining two wheels being steerers only and of little or no service in preventing sideslip. My contention is that, if all four wheels were drivers as well as two of them steering, sideslip would entirely disappear, as, owing to all four wheels being tractors, they would have four points of control or effectual grip, which would entirely eliminate sideslip. The tyres would also last longer, owing to tractive force being spread over four wheels instead of two.

H. H.

THE 7 H.P. NEW ORLEANS CAR.

[2733].—I bought a 7 h.p. New Orleans car in September, 1901, and I have been using it almost daily in my practice since; not so much at first, for I kept up my stable until I felt that I had sufficient confidence in the car to get along without it. I had trouble at first, principally ignition, from want of experience in lubrication, sometimes putting too much oil in the crankpit, at others not enough, and in regulating the mixture of air and petrol, and also from flooding of the carburetter—a complaint that was extremely troublesome and nearly drove me to despair, until it was eventually put right by the company.

The accumulators were not very durable, on one occasion stranding me, fortunately near home, by short-circuiting themselves, but after getting a set of Van Raden's I had no further trouble in that way, and finding that I could rely on the car I gave up the stable, and have been using the car ever since.

In September I started off to go to Oxford, but got stranded at Croydon, owing to the seizing of one of the exhaust valve cams through want of proper lubrication, through no fault of the car, but owing to my own negligence in not oiling it properly. After some difficulty, and with the kind help of Mr. Ivory, of Wimbledon, and afterwards of the New Orleans Company, I succeeded in getting the car to the works at Twickenham, where I left it to be repaired and overhauled. It has turned out that my breakdown at Croydon was really a blessing in disguise, for the company not only put the cam right, but they also altered the air intake, and substituted two large pinions on the half-time shaft for the three small ones which had given me some trouble on one or two occasions, and since then I have had no trouble of any kind. The car is much improved, and goes better than it did before, and with much more power, taking gradients on the second speed which I could only climb on the low before the alteration was made. I never have any difficulty in starting, and I am constantly stopping on my rounds, nor have I any difficulty with the carburetter, for since the air has been taken off the hot exhaust pipe I never have had occasion to change the mixture of air and petrol, not even through the short spell of cold weather that we recently experienced; so that the carburetter is now quite automatic, and so far has required no adjustment, although I do not know that it may not be necessary if we should get a spell of really cold weather during the coming winter. Altogether I am very pleased with the machine. The gear is not much worn, and looks as if it would stand a lot of work yet before requiring renewal. There is no doubt that it is a thoroughly strong and sound car, but I should like a little more power, as the district round Maidstone is a trying one for a motor, the gradients being very stiff in places. Some day I hope that I shall be able to get a 9 h.p. New Orleans car, which I have no doubt will climb any hills that are to be met with in this part of Kent.

EDWARD GROUND, M.D., Cantab.

Tottenham Urban District Council has resolved to buy a motor fire-engine at a cost of £750.

* * *

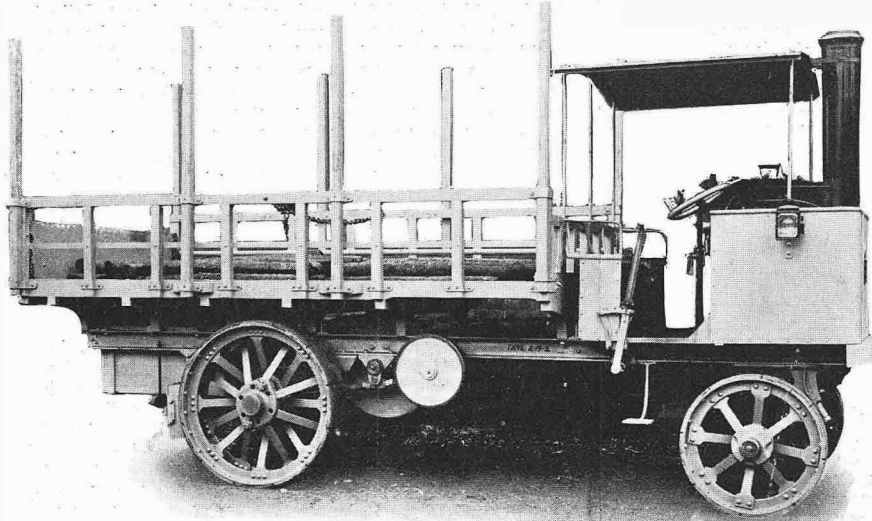
A deer hunt per autocar is one of the latest Midland automobile events. The car, carrying firearms, failed to come up with the deer—a stray one—which eventually met its death by getting too close to a lurking agriculturist, who had brought his gun.

Flashes.

The Clipper-Continental Co. tell us that 454 wheels in the Paris Salon were fitted with their tyres.

* * *

Quite a number of well-known people are going in for the new De Dietrich (Turcat-Mery system). Among those who have ordered the 1903 pattern from the Burlington Carriage Co., Ltd., of 315, Oxford Street, the sole authorised agents, are: Dr. Boverton Redwood, Mr. J. A. Holder, Capt. H. Pennington, and several more well-known automobilists.



In consequence of the epidemic which occurred last spring among the mules in the island of Mauritius, the necessity of some other means of collecting the sugar crop had to be faced, and the growers turned their attention to mechanical transport, probably some years earlier than they would have done but for the epidemic. Our illustration is of one of the two waggons built by the Straker Steam Vehicle Co., of London and Bristol, and shipped to Mauritius some months back. It is of their standard five ton pattern, with the exception of the body, which is provided with removable upright stanchions for the purpose of transporting the cane. We hear that both machines are working regularly, transporting loads of five tons, and performing daily six double journeys two and a half miles each way at an average of six miles an hour, and their regularity of running has done much to establish confidence in motor traction in the island.

Miss Helen Gould, about the wealthiest of American spinsters, has taken to automobilism, and drives a 16 h.p. car in New York.

* * *

As a warning against the purchase of unduly cheap second-hand cars—cars that really appear too much of a bargain—Messrs. Ewart-Hall, Ltd., of Nottingham, write us: "We had a car brought into our garage a few days ago to have some slight repairs done to it. The owner instructed us to send the car up to his house, as he had only just purchased it and could not drive it. The car was taken out of the garage and the engine started, and just as the man was setting off, the main arm of the steering gear broke clean away. An examination of this part showed that the threequarter-shaft, which controlled the steering, had been recently broken off, and it had been repaired by simply putting the two surfaces together and soldering it round the edges. Of course, a repair effected in this manner is nothing short of criminal, and the owner of the car may consider himself very lucky indeed that it did not come off when he was going at twenty miles an hour."

Mr. Frank Morriss, of King's Lynn, the pioneer of the motor movement in the district, has been appointed official engineer and repairer to the King. This is an unquestioned honour, as the Daimler Co. and Mr. Morriss are the only two automobile firms holding this appointment.

* * *

As an instance of the steady all-round progress of the motor industry in this country, we may well cite the Century Engineering and Motor Co., Ltd., of Cumberland Park, Willesden Junction, W., who have just enlarged their premises for the third time, having now practically doubled them in size.

* * *

Mr. Jarrott will drive the second Napier car chosen by the Automobile Club to represent Great Britain in the Gordon-Bennett race of 1903, while Mr. Edge will drive the other. The second car is already well advanced, and it is expected to be put on the road within two months from now.

* * *

The calendar which has been issued by the Road Carrying Co., Ltd., of Liverpool, is a very smart and businesslike thing. In the middle is a picture of a motor lorry, while around it are representations of the leading ships of the great steamship lines whose cargoes are partly distributed over Lancashire by the company's lorries.

* * *

A well made sparking plug is being handled by Mr. J. A. Ryley, of 23½, Martineau Street, Birmingham, who is now acting as a manufacturer's agent. The plug is simplicity itself, and is easily adjustable. Made to De Dion sizes, it retails at a very low price. A similar line in voltmeters is also one of Mr. Ryley's special lines.

* * *

Plans are being prepared by Mr. C. R. Garrard for a large automobile works in London. The concern will have for its chairman the Earl of Shrewsbury, and such well-known men as M. Clément and Mr. D. M. Weigel will be associated with the business. Mr. Garrard is an engineer of no small ability, and has a very extensive knowledge of automobiles, having built his first machine in 1893.

* * *

We hear from Mr. E. H. Warne, of Worthing, that, working in conjunction with the local cycle clubs, the Sussex roads will be watched as far as possible, the cyclists acting as scouts and warning motorists of any police traps they may come across, and also reporting their existence to Mr. Warne when they can. Mr. Warne is also having fixed, at his own expense, caution-boards where necessary in the district.

In connection with the recently much-advertised Franco-Italian duel, it is stated that "the combatants hid them away to a secluded spot on fast-driven motor cars."

* * *

An interesting and useful booklet on motor tyres has been published by the Dunlop Pneumatic Tyre Co. Full particulars of the Gordon-Bennett type of tyres are given, but chief interest will centre around the numerous practical hints for the repair and upkeep of tyres, many of which are, we notice, extracted from the article by Mr. H. W. Bartleet which was published in *The Autocar* of January 18th, 1901.

* * *

With regard to our remarks on three-cylinder engines last week, the Duryea Company write to us pointing out that Mr. Duryea introduced a three-cylinder engine in 1897, and has been using it ever since; and, as they introduced it into this country in December, 1901, they consider that, even from the British standpoint, they are the pioneers of the three-cylinder engine.

* * *

We have received an illustrated list from the Beaufort Motor Co. The types range from the small 6 h.p. phaeton at 145 guineas to the 18 h.p. four-cylinder cars, the intermediate models being of 8 h.p. and 12 h.p.—both two-cylinder vehicles. They are also introducing a four-cylinder car with mechanically-operated inlet valves and honeycomb cooler.

* * *

On Saturday last, at Christchurch, St. Leonard's-on-Sea, the marriage of Mr. Lionel Savory, proprietor of the Westminster Garage, and Miss Beatrice Norton, took place. Mr. Savory drove from London on the Friday on his 12 h.p. Gladiator, and was closely followed by the best man, Mr. Martin, in his 12 h.p. M.M.C. car, Mr. Reyner on his 8 h.p. M.M.C. car, and Mr. Shaw on his 7 h.p. M.M.C. car. The bridecake at breakfast was appropriately decorated with miniature automobiles and Lilliputian policemen. After the ceremony the bridegroom drove the bride away in his car to Brighton and the West of England.

* * *

The chassis of the new 16 h.p. De Dietrich car exhibited at the Paris Exhibition will be despatched at its close to the Burlington Carriage Co., to be exhibited at their showrooms, Oxford Street. The Burlington Co., by the way, build all the bodies for these cars, which are sent over in stripped chassis form.

* * *

On Tuesday, December 16th, in the Chancery Division of the High Court, Mr. Justice Byrne, on the petition of L. Hannen, judgment creditor for £205 6s., made a winding-up order against the British Power, Traction, and Lighting Co., Ltd. The capital was £52,000, divided into 50,000 preference shares and 2,000 ordinary shares, and the company had been in difficulties ever since June.

We have two letters addressed to "Board of Trade Engineer." On receipt of his address, which we have unfortunately mislaid, we shall be pleased to send them on.

* * *

Despite reports to the contrary, the Star Engineering Co., of Wolverhampton, are building a car for the Gordon-Bennett race. This will be a satisfactory and sound article, suitable for an ordinary private sportsman's use, after it has performed in the trial or the race, as the case may be. This should be a good opportunity for a sporting automobilist, for the makers—as is often the case when building a special racing car—are prepared to sell it at a very reasonable price, if ordered when laid down, particularly as, although a racing car, they are prepared to guarantee it for six months in the usual way.



A new type of Locomobile wagonette which has just been despatched to India. It is fitted with a 20hp. burner and boiler, and carries six people in the back and two in the front.

Messrs. J. H. McLaren and F. R. Cox, 2, Park Parade, North Finchley, write us that on Sunday evening, 7th inst., they accommodated an automobilist with two gallons of motor spirit for his car, which he said was stranded about a mile away. The spirit was supplied in a can valued at 2s., and this he promised to return immediately. This, however, he has not done. The man in question stated he was driving a 12 h.p. car belonging to the Motor Mfg. Co., Regent Street, W.; but the company, to whom Messrs. McLaren and Cox wrote with regard to the matter, say that they did not have such a car out on the day in question, and know nothing about it. The action, to say the least of it, is highly discreditable to the person concerned, and we hope if this paragraph meets his eye he will at once make an *amende honorable*. There is very little profit in the sale of spirit, and it is extremely hard and annoying that a firm which goes out of its way to oblige automobilists on a Sunday should suffer loss and inconvenience by doing so.



In the 1,000 miles run in 1900, Mr. M. Grahame White earned distinction by steering his vehicle after it had met with an accident by placing one foot upon the axle-box. Recently a son of Mr. R. C. Arter, of Barham, near Canterbury, performed a similar feat. When near Deal the main steering-pin broke, luckily resulting in no damage to car or occupants. Mr. Arter telegraphed for his second son, and between them they started to get the car home. They cut the end off a round handle spanner and put it in place of the broken pin, and then having taken off the wing and lamp, one sat on the step and steered the car home over ten miles of newly laid stones and narrow lanes. They went carefully until they reached the main road two miles from home, when they put in the top speed, having negotiated the ten miles in an hour and a quarter, altogether a very smart performance.

SCOTTISH AUTOMOBILE CLUB.

Discussion of the Numbering Proposals.

A meeting of the Western Section of the Scottish Automobile Club was held in the Windsor Hotel, Glasgow, on Monday week last, for the purpose of discussing questions regarding speed, numbering, and registration. Mr. H. M. Napier presided. Mr. John Adam, of Larchgrove, the president of the section, opened the discussion by reading a paper, in the course of which he said his object was to endeavour to come to some reasonable basis that would satisfy the public without at the same time hindering the progress of a trade which was at present in its infancy, but which might in the near future revolutionise the district carrying trade. The motorist known as the "road hog" could not be defended, and he was afraid the hog was often the cause of the reasonable man being caught and fined. Any law made to stop him would be willingly accepted by the majority of motorists. Regarding the question of speed, Mr. Adam remarked that motorists were at present breaking the law if they went a little faster than a London 'bus, and he did not think he was exaggerating when he said that Glasgow tramcars at parts of the runs touched sixteen miles. As to numbering and registration, he thought that the County Councils both in Scotland and England were looking at the motor law in a very reasonable frame of mind. They all admitted that an amendment of the law was desirable, if not necessary, and most of them thought that numbering and registration would meet that requirement. In the discussion that followed, Mr. J. Burns, Town Clerk of Motherwell, contended that numbering was not a satisfactory means of identification. Mr. William Kingsbury pointed out that if a number plate on a motor car was damped before going out for a run, the car would not get very far away before the number would be invisible. Mr. Norman D. Macdonald, chairman of the General Council, said he objected to private owners being subjected to rules and regulations of cabmen, nor could he see why the nobleman's carriage or the noble lady's brougham should be immune from restrictions imposed on a motor car owner. He strongly advised the meeting to wait and to take no action at present. Other speakers followed on the same lines, the general feeling being against registration.

[We notice in a report of the meeting which appeared in the last issue of the *Automobile Club Journal* that one or two inaccuracies occur. The meeting was practically to a man dead against the numbering and registration

proposals, whereas the report in question makes it appear as if the meeting was to a great extent divided in its opinion. Mr. W. Kingsbury is made to say that "he thought numbering should be accepted." As a matter of fact he spoke strongly against the resolution. Professor Galt in the *Club Journal* advocates numbering of all vehicles. What he said was that automobilists could offer no objection to numbering if every other form of vehicle was subject to the same regulation. Mr. Napier in summing up spoke strongly against the bill, and stated that he could see that the feeling of the meeting was with him. The report, however, omits all reference to this.—Ed.]

Every visitor to the Paris Automobile Show was presented with a ticket for a grand lottery, to be drawn for at the finish of the exhibition. The prizes included an autocar and a bedroom suite of furniture!

* * *

The Duryea Co. write: "Our attention has been called to a volume entitled 'The Automobile: Its Construction and Management,' by G. Lavergne, translation by Paul N. Hasluck, in which an illustration with description of the Duryea change speed and transmission gear is given. As, however, this shows a gear which we abandoned as far back as 1897, and does not in the slightest degree resemble the method we employ now, we would ask you to permit us, in order to avoid misunderstanding, to state that our present gear, which we have used for the last five years, consists of a simple epicyclic gear carried upon the motorshaft, which is inoperative at the high speed when power is delivered direct by a sprocket and chain to the road wheels, and gives us a low gear for hill work and a reverse when needed by tightening a brake band on either the outer member of the gear or upon the pinion carrier as required; and we may say, for the benefit of those who wish fuller information concerning it, that the best description which has yet appeared of it will be found, with illustrations, on pages 466 to 470 of a volume entitled 'Self-propelled Vehicles—A Practical Treatise on the Theory, Construction, Operation, Care, and Management of all Forms of Automobiles,' by James E. Hormans, A.M., which was recently published by Messrs. Andel and Co., of New York."



A snap shot of the crowd at Maidenhead toll-gate when Messrs. J. Taylor, C. Howlett, and J. Fullbrooke arrived in an autocar to protest against the imposition.

THE HISTORY OF THE AUTOMOBILE CLUB.

An Interview with the Retiring Secretary.

The announcement that Mr. Claude Johnson, whose name has been most intimately bound up with the automobile movement in this country and the Automobile Club of Great Britain and Ireland since 1897, is about to resign the secretaryship of the club—which office he has so brilliantly and ably filled since the date above named—will come as a surprise to the general body of the automobile public, as well as to the members of the club. We do not go so far as to say that no other man can be found to discharge the manifold duties which have fallen to Mr. Johnson's lot; but the man who will follow him will find a very hard furrow to hoe—that is, if he will hoe it as deeply, as thoroughly, and as symmetrically as has been done by the retiring club secretary.

Mr. Johnson has not taken to heart the advice of the dying Wolsey; he does not "fling away ambition"—indeed, quite the reverse. It is just that great passion which has impelled him to resign a position sufficiently honourable and sufficiently lucrative for most work-a-day folks, and descend from the pedestal he undoubtedly occupied as the club secretary, to take part in the ceaseless battle of commercial competition. Mr. Johnson's abandonment of official connection with the A.C.G.B. and I. is so much an event in the present-day world of automobilism that it is better he should speak for himself. Accordingly when the other day he discussed the matter with us, we very naturally asked why he had elected to relinquish his connection with a body for the good works and growth of which he had been so largely responsible.

"That's a perfectly natural question," replied Mr. Johnson. "About eighteen months ago one of the smartest men in the automobile industry did me the honour to telephone me, expressing surprise that I should continue in my present position, and asking when I intended to relinquish it? He paid me the compliment of asking me to let him know, whenever I made up my mind so to do, as he would like to be the first to make me an offer for my services in his business."

"But surely the manifold duties in connection with the growth of the club and the prosecution of its propaganda must have a certain charm for you?" we queried.

"Undoubtedly; the secretaryship of the club has been for me a most interesting position, but I have long realised that it had its limits. When, in 1897—five years ago—I took office, the club membership roll totalled 163; to-day it numbers 2,182, and there are sixty odd candidates up for election on Monday next. I have not tendered my resignation until the club has become

The Largest Automobile Club in the World.

It is now some little time since I arrived at the maximum remuneration, viz., £800 per annum, arranged at the outset, and though I have been given to understand that the club would advance this yet another £200, I feel that by accepting I should be writing *finis* to any commercial career I may or may not have before me. I cannot 'fling away ambition' at the age of thirty-eight, for the

club could not pay me more than the amount I have named, and the subsequent lack of incentive might have the effect of blunting my energies. I have to thank you for this opportunity of explaining, as I should not like it to be thought for one moment that my resolve is due in any way to any misunderstanding or friction with the members of the club-committees, from whom I have always received the greatest kindness and consideration."

"And what follows, Mr. Johnson?" we asked.

"I cannot at present tell you. The principals in three big motor groups—two of which are already eminently successful—have been good enough to approach me, but at present I have decided upon nothing."

"But in any case you will not sever your connection with the club. There are many men eminent in the industry who are doing good work on the committees, and the fact that you have held all the strings of the club's varied work in your hands for so long would make you a particularly valuable member of those committees which deal with the protection, advancement, and improvement of the sport, pastime, and trade."

"Indeed, it is my earnest hope that I may be honoured by election to the club and executive committees after the annual meeting next year. I may say right away that I have no stronger desire than to be allowed still to do all my best for the Automobile Club."

"Well, Mr. Johnson, your five years with the club have been pregnant with much—nay, all—that has brought automobilism to the position it at present occupies in this country, and will be regarded hereafter as the well-spring of all that is to follow. You will ever have pleasure in looking back at your past labours, and contemplating their fruits."

"Indeed, yes," returned Mr. Johnson. "What I am proudest of in relation to my connection with the Automobile Club is the testimonial which was given to me at the conclusion of the 1,000 miles trial, and which was signed by those who took part in the trial. Having the firm belief that the automobile movement is going to be

As Big as the Railway Movement;

that all the private horse-drawn carriages we see out of this window are to be replaced by automobile carriages; that all the horse-drawn omnibuses, cabs, carriers' vans, post-office vans, butchers' carts, vegetable carts, etc., which we see passing before us in Piccadilly are to be replaced by automobiles; that eventually automobiles will replace electric trams, and will be most important adjuncts to the railway systems; and that the use of the horse will be confined to the haulage of farm carts in fields and in farm lanes, to hunting, and to pageants—I feel that the generous testimonial given to me by those who took part in the 1,000 miles trial of 1900 will be a document which, if I live to be an old man, and in the imbecility of old age can persuade myself that it was deserved, I shall point to with pride. The testimonial, as you see, says, 'through whose able organisation and direction the club carried to a suc-

cessful issue a 1,000 miles trial of motor vehicles, the result of which not only exceeded all expectations, but marked a distinct era in the history of locomotion. We offer you this testimonial as a lasting memento of this important event, and in appreciation of the indefatigable energy displayed by you in its conception and promotion."

"Well, well, Mr. Johnson," we interjected, "we all know that imbecility is the last factor necessary to the realisation of so thoroughly deserved and—we speak by the evidence of our eyes—most laboriously earned a testimonial. Will you give us some impressions concerning the past five years?"

"Well, if you think it will please and not bore you, with pleasure. You will remember that when I took office the club had already been formed. The Hon. Evelyn Ellis, who was the first man in this country to run a petroleum spirit car, joined Mr. Fred. R. Simms in the idea of taking pattern by France and forming an automobile club for Great Britain and Ireland. It should never be forgotten that the Automobile Club owes a great deal to the energy of Mr. Harrington Moore and to the initiation of Mr. Simms in connection with its formation. When Mr. Wallace took up the chairmanship of the Automobile Club, he set about bringing about the amalgamation of the club with the Society of Encouragement in England, entitled the Self-propelled Traffic Association, which Sir David Salomons had already formed.

"I am very glad that Mr. Alfred Harmsworth and I were enabled to persuade the Marquis de Chasseloup-Laubat to include in his history of the motor car for the Badminton Library Book on 'Motors' a reference to the early date at which *The Autocar* was in the field. You will see that on page 23 he states: 'Mr. Henry Sturmev, who had long been associated with the cycle press, was quick to recognise that the motor car movement was to attain prodigious proportions, and on November 2nd, 1895, he produced the first number of a newspaper called *The Autocar*.'

"The early tours of the Automobile Club will always be very interesting to look back upon. I so well recollect the first meeting of the committee to consider the question. Mr. Simms said that we should not attempt more than forty miles a day, and really he was not far wrong, for in those days motor drivers were so ignorant concerning their cars that very often the most simple disorders would keep them hours on the road.

"Mr. Frank Butler drove me over the route of the first tour on his Benz car. When the tour took place, the majority of people on the road had not seen a motor car before, and it created the greatest enthusiasm; and you will recollect that this was the case with all the early tours of the club.

The First Important Step

taken was in 1899, when the first wholly automobile show ever held in this country, viz., the Automobile Club's show at Richmond, was held in connection with hill-climbing trials on Petersham Hill and a fifty miles trial on the Oxford Road.

"The exhibition as such was pronounced to be a success; but, generally speaking, the public at that time despised automobiles, and saw no reason for going to Richmond to look at them.

"The great event of the third year of the club's

history was the 1,000 miles trial. It is scarcely necessary to say that this involved an enormous amount of work. In my efforts to carry the matter through I was most loyally aided by the staff. Towards the end the work was terrific. For the last three weeks work as a rule began at six o'clock in the morning, and lasted until after midnight.

"It was at the beginning of 1900 that I first found it always necessary to have by my bedside a piece of paper and a pencil in order to make notes of matters which required attention. Ever since then it has been my practice to do all the thinking connected with my post in the early hours of the morning, in bed. It is then that one has one's only chance of initiating new proposals and thinking out the details of organisation of matters in hand. When once one arrives at the club, one's time and attention are too fully occupied to permit of careful thought.

"1901 was the county council year. After the 1,000 miles trial the most important work carried out by the Automobile Club was that performed in 1901. The action taken by the club in sending me with motor vehicles to various parts of the country and inducing other motorists to meet me there in order to take out on motor vehicles the leading county councillors and magistrates, together with the entertaining by the club of several hundreds of county councillors and chief constables, and giving them rides on motor vehicles, had an enormous effect upon the attitude of the public towards motor cars. The club commenced its campaign by the issue of the famous 'Blue Book No. 1.' The very telling instances quoted in that book of the opposition which was set up throughout the country against railways led county councillors to fear lest they might make themselves as foolish in their opposition to automobiles as their forefathers had made themselves in respect to railways. The result of the campaign was a recommendation of the County Councils Association to the Government that the speed limit should be removed. This was a very different attitude from that adopted by the county councillors at the beginning of the year, when very many of them were passing resolutions in favour of the reduction of

The Speed Limit to Ten Miles an Hour.

"In 1901 there was also held the second edition of the 1,000 miles trial, in the shape of the reliability trial at the Glasgow Exhibition.

"What do I think of the future of the club? I think that within the last month the club has started on a programme of far greater importance than anything it has ever attempted before, viz., the trial of delivery vans.

"The Liverpool section of the club has carried out very fine trials of the heavy class of transport vehicles; but the club has now in hand the very important question of vehicles for the transport of loads up to two tons. Just imagine what that means! Every sort of tradesman's vehicle, from the small tricycle delivery box to the heavy van carrying two tons. This includes post-office carts and vans, carriers' carts, railway carts—in fact, every sort of cart. When one realises that the motor manufacturers have only to produce an economical and reliable vehicle in order to bring about most assuredly the substitution of motor carts for all the vans and

carts one sees passing this window, one appreciates the enormous magnitude and importance of the automobile industry, and the very many thousands of men that must be engaged ere long in the construction of these commercial carts.

"Following on that, we shall doubtless have a trial of public service vehicles for the carrying of passengers. These, doubtless, will come into use all over the country for the purpose of transport of persons between villages and market towns, and as feeders to the railways, and also as substitutes for tramcars. The club, therefore, has plenty of work before it, and I am sure will continue to carry out with energy its functions as a Society of Encouragement."

"There has been plenty of hard work, Mr. Johnson?"

"Oh, yes, plenty. The secretaryship has not been a sinecure; one has had to sacrifice everything to the work of the club. This year, when the workmen invaded this club to such an extent that work was impossible, I retired to Scotland; but the letters of the club reached me every morning on the banks of a salmon river, and the instructions as to replies and general instructions concerning the work of the club were sent up by me to London daily. But although there has been plenty of work, the time really has been most enjoyable.

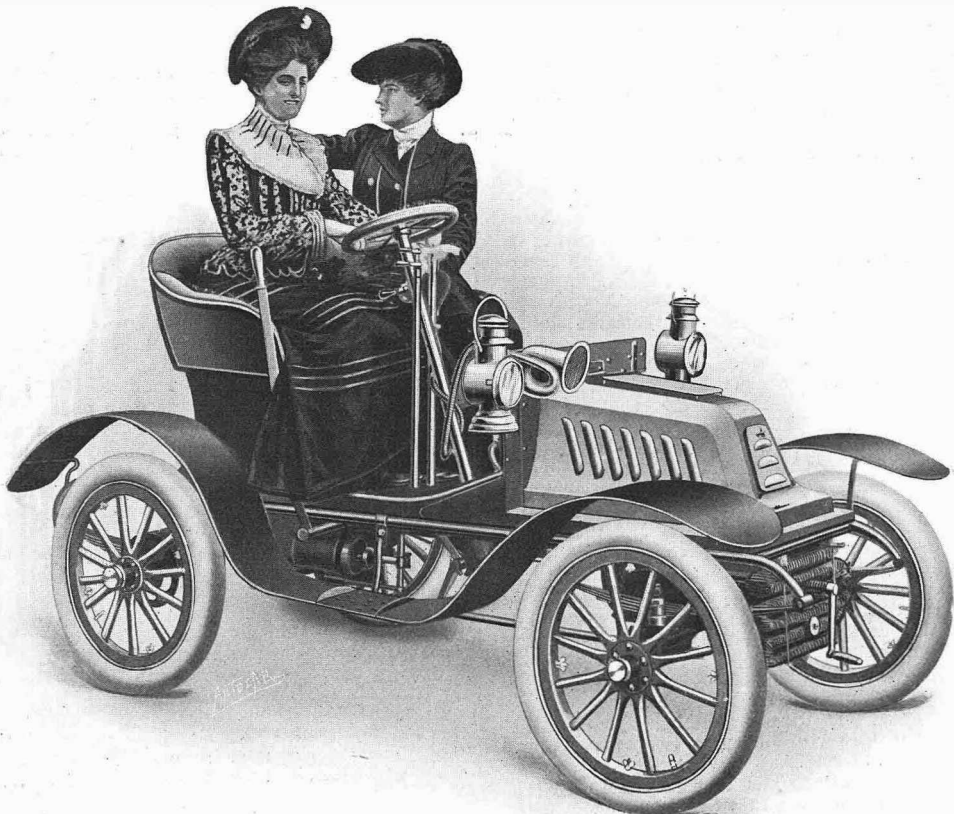
"In the first place, I have had the advantage of working with a committee composed of most delightful men, who always showed me the greatest consideration and kindness. What has been even

more important has been that they were men who were willing to sacrifice hours and hours every week to the work of the club. I have put before them agendas which would cause an ordinary committee to dissolve: but, under the chairmanship of Mr. Roger Wallace, the club committees have tackled the items on the agenda, given each one very careful consideration, and never spared themselves in order to deal with all the intricate and difficult questions connected with the club."

"But surely you will feel a pang at quitting all this?"

"Yes; of course, I shall be very sorry to give up the secretaryship, because the post has been made so delightful for me by the loyalty with which the members of the staff have always seconded my efforts, and by the continual encouragement and generous recognition given to me by the committees. I do not think the members half appreciate how much the committees do for them and for automobilism generally. Sometimes when members of these committees have got up and publicly acknowledged my services, I have often wished I could make it adequately known how much is due to the committees of the club."

And so at no very distant date Claude Johnson, who has well and ably occupied a position which has made him a marked man in the world of automobilism, will step into the arena of everyday business and competition, leaving behind him a record of work done for a cause to the equal of which but few men can point.



The 6 h.p. De Dion voiturette see page 662

THE DISCUSSION ON CAPTAIN LONGRIDGE'S PAPER.

(Concluded from page 653.)

Mr. J. G. Burford, continuing the discussion, said that he did not consider the engine the most important part of a motor car. The majority of troubles were in the transmission gear, and ignition, and other details. He considered that motor car construction should be taken up by engineers. If they did so we should find that everything we needed was procurable at home, and that makers would not have to go abroad for certain parts. This, the speaker pointed out, was proved by the fact that an entirely British car had won the Gordon-Bennett race. He believed that internal combustion engines would be used for heavy haulage work up to ten ton loads.

Mr. Maxwell Williams divided the automobile into four classes. The business vehicle, the pleasure carriage, the racing car, and the automobile for military purposes.

Capt. Longridge, in his reply, expressed pleasure at the large attendance which the subject of his paper had created, and the remarks and criticisms which it had brought forth conclusively proved the importance of the motor industry. With regard to the title of his paper, it would appear that some of the members desired a description of cars—such as were given in an admirable press devoted entirely to the subject—in addition to the details given in his paper. As he, Capt. Longridge, was a director of one manufacturing company, it was out of place to criticise the productions of that concern, therefore it would be bad taste to criticise the manufactures of competitors. Mr. Holroyd Smith animadverted on the number of details given, but while giving illustrations of principles and lines of improvement he, Capt. Longridge, had tried to avoid many details. The illustrations he had placed before them were for their criticism, and for suggestions of defects and remedy. Mr. Holroyd Smith appeared to find everything defective, yet failed to offer any suggestion as to improvement. With regard to some remarks he had made as to countersinking exhaust valves, the author pointed out that these had missed the mark altogether. It was not a question of getting increased outlet, but of getting a uniform one, which would avoid side strain on the valve stem and burning at one point. It would appear, said the author, that Mr. Holroyd Smith had not read his paper; he therefore pointed out that all the devices illustrated had been taken from cars of 1902. Mr. Holroyd Smith evidently thought that the author was in favour of the retention of a portion of the exhaust gases. This was not so, but at the same time he considered the disadvantages very much over-rated, and the advantages entirely ignored.

Messrs. Iden, Austin, and Beaumont considered the one-cycle engine complicated. If the word were intended to apply to something intricate and liable to derangement, it seemed, to the author, out of place. His engine had fewer valves, and although it had more connecting rods, there were more simple parts. Capt. Longridge dealt with the vertical v. horizontal engine, in reply to the remarks of the three previously-named speakers. All of these considered that the principal consideration was the transmission gear. That was an important observation; but if it meant the subordination of the motor to the gearing, then he held the view to be erroneous. The engine should come first, and after that the number of parts between it and its work should be reduced to the minimum. He considered that Mr. Lucas had made a progressive step in the elimination of the change-speed gear. Mr. Beaumont and Mr. Austin considered the automatic inlet valve and the spray carburettor more simple. If the speakers had said they looked simple he would have agreed with them, but when the internal troubles of decreased volume and imperfect mixtures—due to erratic working of the valve and jet—were considered, neither device was simple. Capt. Longridge read letters from makers of motors on the subject of mechanically-operated valves, the gist of which were as follows:

Mr. D. Citroen said that with the mechanically-operated valve an increase of power of fifteen to twenty per cent. was obtained in small engines.

Messrs. G. Milnes and Co. stated that they had used the M.O.V. for over twelve months on their 20 h.p. engines with excellent results, obtaining an increase of power and a quieter and smoother running engine. He agreed with

Professor Burstall in thinking that the magneto, or dynamo ignition was preferable to the accumulator system, and in connection with this it was noteworthy that on the Continent the low tension system was largely used on big commercial engines.

Governing at the exhaust was more economical than throttling the charge, said the speaker. Mr. Iden raised a by-question when he stated that exhaust throttling fouled the cylinder through the retention of burnt gases. He, Capt. Longridge, had examined a number of cylinders on motors which had been running for a considerable time with this system of governing, and he had never noticed undue fouling. He had also made enquiries on the subject; the Motor Traction Co. had replied that from their experience with the Germain car they had found throttling the exhaust more economical than throttling the mixture. They had experienced no trouble from cylinder fouling. Humber, Ltd., said that there was no doubt about the exhaust throttling being the more economical, but with volume throttling there were certain advantages over the former system. With multi-cylinder engines they found those cylinders which were cut out while the motor was running light for some time failed to operate on account of the sparking plugs becoming foul from the oil working past the piston being lodged on the sparking points. From other points of view mixture throttling was preferable to the other system, as for one thing it reduced the number of working parts, and was less liable to derangement. The Société des Automobiles Gillet-Forest wrote that the special feature of their motor was the method of governing on the exhaust. The exhaust cam is so constructed as to allow the valve opening more or less, and also for a larger or shorter period. They thus secured a means of keeping in the cylinder a sufficient portion of the exhaust gases to appreciably diminish the volume of the incoming fresh charge. The compression therefore remains constant, which is not the case when governing on the admission. Ignition is always easy to effect in consequence of the well-known phenomenon of stratification of the gases; the burnt ones being drawn down by the piston make room for the fresh incoming charge, and as these do not mix on the compression stroke an explosive mixture is always obtained round the point of ignition. Another important point is to be found in the lubrication of the piston rings. In consequence of governing by the exhaust, which only partly causes a vacuum behind the piston during the admission stroke, there is no tendency to suck in too much oil between the piston rings and the cylinder walls.

In speaking upon lubrication the author said he thought Mr. Rainey's advice to try water in the crank chamber well worth consideration. It had been tried in several cases with satisfactory results.

Capt. Longridge next discussed the question of steel cylinders. He had written to several firms for the analysis of the steel which they recommended, and he had received replies from three firms. The Weldless Steel Tube Company supplied an analysis of a hard steel which they considered suitable. With regard to nickel steel, they had rolled and tested a tube made from this material and found it stood 43.58 tons per square inch with an elongation of twenty-four per cent. in the test piece of two inches. Messrs. Krupp, of Essen, submitted an analysis which contained copper. The metal would be tough and quite high enough in tenacity for all requirements, but he doubted if copper was added by Messrs. Krupp; he thought it was probably present in the metal, and might be regarded as replacing manganese to some extent. The Weldless Steel Tube Company had quoted to the author for tubes containing approximately 0.60 per cent. carbon. Messrs. Krupp quoted Siemens-Martin steel having at least 0.7 per cent. carbon, also for tubes with 0.15 per cent. or 0.35 per cent. carbon. He thought that nickel steel would turn out to be the right thing.

The President of the Institute remarked that they had already expressed their indebtedness to Capt. Longridge for his paper in the vote of thanks they had returned to him at the conclusion of the paper. He most certainly thought that the name of Capt. Longridge should be added to the names of those who, in the past, had so materially increased the value of the proceedings of the Institute.

FRENCH SHOW ITEMS.

The clutch is receiving careful attention at last, and quite a number of different devices of the expanding type were to be found in the Salon.

* * * *

In the body of the hall we noticed a neat and strong form of cooler tube, as built up by P. Sage in his cellular cooler. It was made as shown in the rough



sketch given in the margin.

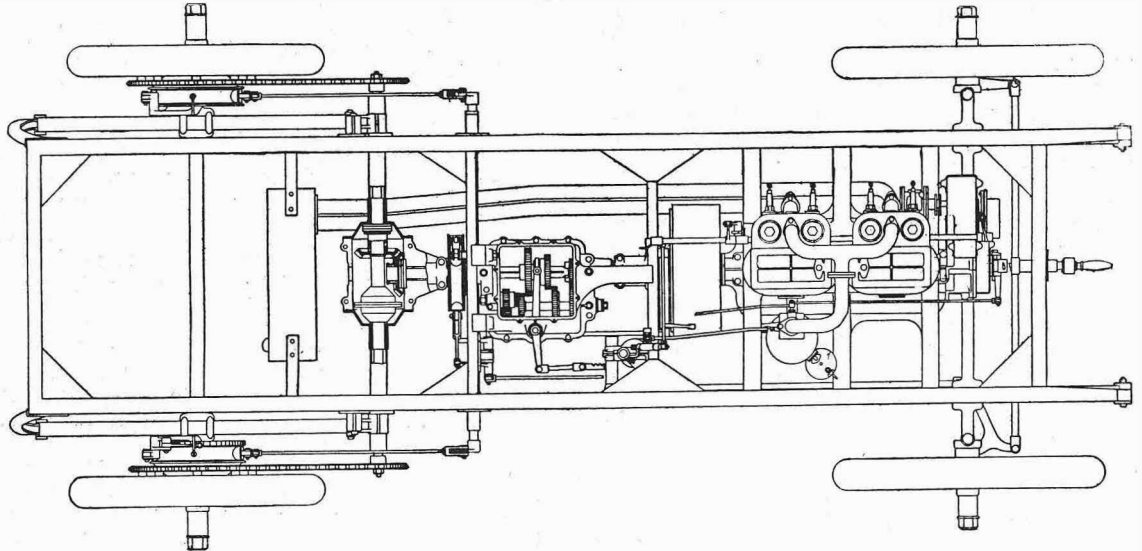
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Among the detailed improvement which is found in general use throughout the exhibition is a neat spring clip or tong by which the high tension cable is connected to the plug. This tong clips the plug, and it is only necessary to throw it back to disconnect the plug from the cable. This not only saves a great deal of time in taking out the plug, but it is also very useful in multi-cylinder engines for testing the ignition of each cylinder separately.

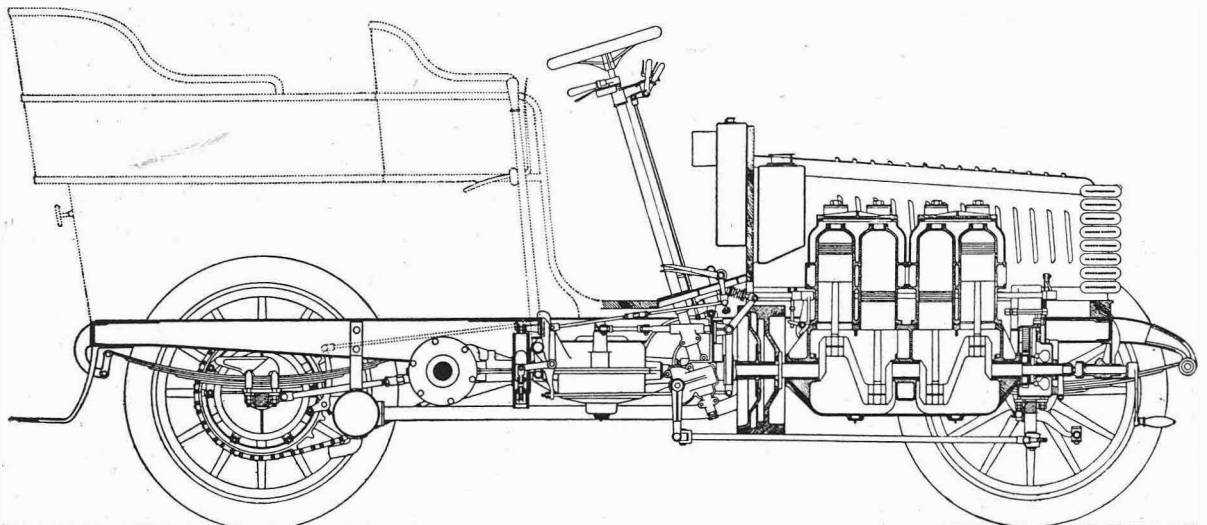
The Bardon engine cannot be started till the ignition has been put right back. This is a good point, as it prevents the possibility of the careless getting hurt through a bad back fire when trying to start the engine.

* * * *

Although so many of the French houses are fitting mechanically-operated inlet valves, it should be clearly understood that several of them are not placing the valves on opposite sides of the cylinder head. That is to say, instead of having the exhaust valves on one side of the engine and the inlets on the other, with a separate camshaft to operate each set of valves, the valves are all placed side by side, the exhaust and inlet for each cylinder being on the same side, and operated by a single shaft. This, of course, tends towards simplicity; but it has objections of its own, although the very fact that it obviates the necessity of a second valve-shaft and gear is a strong point in its favour.



Plan of the 24 h.p. Delahaye, fitted with the new Titan motor.



Part-sectional elevation of the four-cylinder 24 h.p. Delahaye. See *The Autocar* of December 20th, page 635

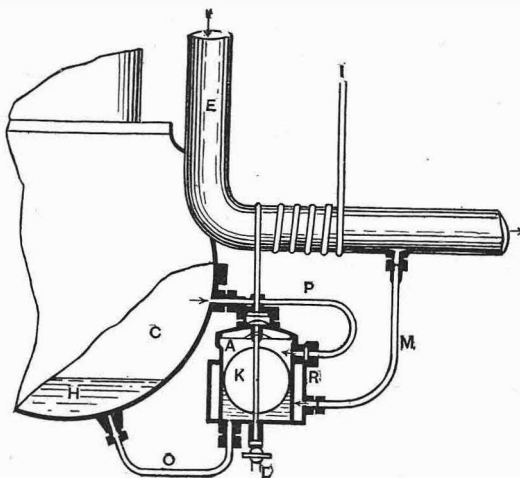
English visitors were particularly interested to see that quite a number of French houses had adopted the E.I.C. plugs, which are so well known in this country, and also they were not a little amused to observe at least one attempt to copy this pattern of plug. Another very noticeable feature was the manner in which the Simms Bosch ignition has been taken up by the French houses. We did not count the makes to which it was fitted, but they were sufficiently numerous to make a very decided impression upon the visitor.

* * *

Undoubtedly the most interesting and valuable exhibit in the Salon was that of the Decauville. We are not, at the moment, discussing the merits of the Decauville vehicles, as compared with the other makes. What we are referring to is the manner in which the firm prepared their chassis. This was sectioned all over. That is to say, practically every cover was cut away at some point in its length, so that the exhibitor could see the internal arrangement of the mechanism. By this means the new back axle and arborshaft, as well as the details of the engine and gear, were made perfectly plain to examination. Of course, the objection to this sort of thing is that to all intents and purposes it means sacrificing an engine and car to exhibition purposes; but the machine was so exceedingly interesting that we hope it will be brought over to England for the shows here.

* * *

The Belgica cars, with their two and four-cylinder engines, interest from one or two special features which distinguish them. They are ex-



Belgica automatic oil feed to crank chamber.

- | | |
|------------------------------|------------------------------------|
| A, float feed chamber. | M, pipe leading portion of exhaust |
| C, crank chamber. | products to jacket round |
| D, drain cock for float feed | float feed chamber |
| chamber. | O, oil feed to crank chamber. |
| E, exhaust pipe. | P, air pipe. |
| H, oil in crank chamber. | R, exhaust jacket space round |
| I, oil pipe from oil tank. | float feed carburetter. |
| K, float. | |

hibited by the Société Anonyme Franco-Belge de Construction Automobile, and are as elegant in outward finish as the title of the firm is lengthy. They are fitted with a refinement in crank chamber lubrication which somewhat appeals to us, and which may clearly be understood by the accompanying diagram. The pipe from the oil tank (which is carried

inside the motor bonnet for the purpose of keeping the oil as fluid as possible) is turned five times round the exhaust pipe close to the exhaust valve, and delivers the oil into a float feed chamber, through an opening which is opened or closed, as necessary, by a float-controlled needle valve therein. From the bottom of the float feed chamber passes a lead to the underside of the crank chamber, so that so soon as the oil level in the latter falls below the desired point the level of the oil in the float feed chamber falls therewith, the needle valve fans, and oil flowing in the float feed chamber passes to the crank chamber until the necessary level is restored. The oil float feed chamber is exhaust jacketed.

Last week we mentioned that Warne's Hotel, Worthing, had been reopened for the Christmas Holidays. It may be interesting to add that over eight hundred cars have passed through Mr. Warne's hands during the past year. As many London and Southern automobilists know, he has a properly-equipped garage with a competent engineer at his hotel; and, while quite a number of breakdowns were brought to his place, and though in some cases the cars had to be towed in, they were all able to get away under their own power. Mr. Warne has now added a 7 h.p. car to his equipment, and any motorist breaking down within twenty miles of Worthing can telephone to No. 0,199, Worthing, and this car will be dispatched with the engineer to the motorist in need of assistance. Further than that, a charging installation for accumulators has been provided, and arrangements made with the Corporation Electricity Works for the recharging of electric cars.

POLICE TRAPS.

On the London Road, between Patcham and Brighton.
Between Hawkhurst and Hawkhurst Railway Station.

Answers to Correspondents.

This week the following correspondents have been, or will be, replied to by post:

- | | |
|-------------------------------|--------------------------------------|
| A. S. L. and Co.
(Lisbon). | A. W. Wells.
Simpson and Marwick. |
| E. C. Sayer. | J. A. Menzies. |
| F. E. Harding. | S. (Gloucester). |
| H. B. Greening
(Canada). | F. Hedges. |
| A. Milbank. | F. Pluck. |
| F. J. and Co. | J. G. Thomas. |
| O. H. Browne. | J. Pullman. |

Our thanks are due to the following for items of news and various topics of interest which have been or will be dealt with: T. F. S. Tinne, J. W. Aspinall, A. L. (Brighton), F. Watson, and W. J. B.

Letter forwarded: R. Spencer.

NOTICES.

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