NOVEMBER 7TH, 1908.

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 681. VOL. XXI.] SATURDAY, NOVEMBER 7TH, 1908. [PRICE 3D.

The Autocar.

(Published Weekly.)

Registered as a newspaper for transmission in the United Kingdom. Entered as second-class matter in the New York (N.Y.) Post Office.

Three Editions every Friday.

The THREEPENNY EDITION, printed on Art paper.

The PENNY EDITION, printed upon thinner paper.

The FOREIGN EDITION, price 3d., printed on specially light bank paper for circulation abroad

Editorial Office :

COVENTRY.

Publishing Offices :

20, TUDOR STREET, LONDON, E.C., England.

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Subscription Rates :

British Isles—Home edition, 16s.; M.U. penny (thin paper) edition, 6s. 6d. Abroad (thin paper edition), 22s. 8d. per annum.

Notes.

The Autocars of 1909.

In this issue we publish our Buyers' Guide. As usual, this takes the form of a list of the cars which are being made for next year, and gives the leading particulars about each model, such as number, bore and stroke of cylinders, systems of ignition and lubrication, number of speeds, wheelbase, overall dimensions, price, and so on. In some instances full details are not available even now, this particularly being the case with foreign cars, as the British agents have not been able in all cases to obtain the details we want in time for publication. However, with comparatively few exceptions, the necessary particulars have been ascertained. Instead of classifying the cars by price and sub-classifying them by the number of cylinders, as we have done in the past, we have arranged them alphabetically, the number of cylinders being given immediately after the name of each car, but for those who prefer price classification we give a separate list at the end, in which all the cars in each range of prices are arranged so that the reader can see at once which makes come within his price limit.

Our list of cars has always been interesting as showing the tendencies of the time, and this year is no exception. Among the points brought out by the list is the fact that prices are in the main unaltered, the tendency being, as was the case last year, to improve the specification rather than reduce the price. This tendency is certainly the right one, as it is infinitely more satisfactory to make cars better than to make them cheaper, as they would not be cheaper in the long run. It is also notable that the small single-cylinder and two-cylinder car has not multiplied, and the same remark applies at the other end of the scale, as the very large and very powerful car has decreased in numbers. On the other hand, four-cylinder cars of between 75 and 90 mm. bore show a marked increase, and the differences between these smaller four-cylinder cars are much greater than the mere bore dimensions would lead one to expect. Those with a full 90 mm. bore and a stroke well over 100 mm. are really out of the category of small four-cylinder cars, but at the other end of the scale one finds some very small four-cylinder engines indeed, which are only fit for quite light two-seated vehicles. Then, again, the difference between the cars of the same bore but widely varying stroke must be considered, as well as the number of speeds. In the next class higher—that is, the class from 20 to 30 h.p.– the indication is also an upward one. It is when one gets to 40 h.p. and upwards that the diminution is noticeable. To turn from complete cars to their details, we find that this year's list shows a tendency to lengthen the stroke. We do not mean to lengthen it unduly, but the number of engines with a bore and stroke approximately equal is declining in favour of those which have a stroke of from ten to thirty per cent. greater than the bore. The high-tension magneto has become almost universal, even the cheaper cars having the high-tension magneto, though, of course, of smaller and cheaper type than that fitted to the more expensive vehicles. In most of the latter accumulator ignition is also provided. Mechanical lubrication is more in evidence than ever, and the drip feed has almost ceased to be used, except for quite small engines. The leather cone clutch is still holding its own, and appears likely to do so. The propeller-shaft drive is still increasing in popularity, though the few makers who have succeeded in turning out really satisfactory chain cases are, we are glad to note, sticking to this form of transmission. As was the case last year, there is still an upward tendency in the size of tyres. That is to say, more makers are fitting tyres which are well up to their work and load than was the case a year ago—another indication that better value rather than lower price is the order of the day.

National Defence.

We sincerely congratulate the Lincolnshire Automobile Club upon its plan for the mobilisation of the Territorial Force of Lincolnshire, and we congratulate the Royal A.C. with equal heartiness for having so quickly adopted such an excellent scheme. An outline of the proposition of the Club is given on another page, so it is only necessary to say that in the main the idea of the Club is to make the scheme a national one, whereas the Lincolnshire club very properly confines its scheme to the county of Lincolnshire. At the same time, while the R.A.C. is proposing to nationalise the scheme, it is not proposing to take it out of the hands of the county and other clubs, as will be seen by reference to page 694. To put the Lincolnshire scheme into a nutshell, we cannot do better than quote Mr. Godfrey Lowe, the hon. secretary of the Lincolnshire A.C., who writes from St. Catherine's, Lincoln:

It is possible, or rather probable, that an order to mobilise the Territorial Force will be most urgent, and a rapid concentration of troops on the coast of the most vital importance.

Each unit of the Territorial Force has a definite point on which to move in case of invasion or sudden raid, but this is liable to be altered according to circumstances.

On the order to mobilise being given the point of concentration will be named, and troops must be transported there as rapidly as possible. The railways will probably be occupied to their fullest capacity with the transport of guns, horses, ammunition, and, later on, of regular troops from York and other centres.

A few troops in the early stages of a hostile advance, supposing a landing to have been successfully accomplished, will be able to cause considerable delay by necessitating a deployment of the enemy. They may hold the roads, paths, etc., and hinder the scouting which must necessarily be carried out by a hostile force. While our main body is being brought up by rail or route march, a few energetic men under officers who know the country will be able to do much useful work. The infantry of the Territorial Force would therefore receive much assistance if a large number of motor cars were placed at their disposal at such a critical moment.

The infantry of the Territorial Force in Lincolnshire is divided into small units of a company or half-company, which have their headquarters at the principal towns of the county (except Lincoln, where there are three companies, and Grimsby, where there are two companies). These units would in the ordinary course have to move by rail either to their battalion headquarters at Lincoln or Grimsby, or direct to the point of concentration.

The advantage of having men delivered on the scene of action fresh instead of being exhausted by a long route march is almost too obvious to need mention.

It is suggested that owners of motor cars who would undertake to place their cars at the disposal of officers commanding units so that as many men as possible could be conveyed at once to the point required would have headquarters assigned to them, usually the town nearest to their place of residence where a unit of the Territorial Force is situated.

It is estimated that an average motor car could carry three or four soldiers with their arms and equipment, and if the distance was not a great one two or more journeys might be made. In this manner twenty cars would be able to transport a company (117) to a distance of, say, 50 miles within twelve hours.

If the motorists of Lincolnshire will undertake to offer their services to the military authorities in this manner, it is certain that a great service will be rendered to the country, which may have the most far-reaching effect. In case of invasion, business would be at a standstill, and every man's services would be required in some capacity. A knowledge beforehand of a useful sphere of work would possibly be welcomed by many.

The committee of the Lincolnshire Automobile Club have therefore every confidence in inviting owners of cars who are not engaged in the military services in any other capacity to allow their names to be enrolled as willing to assist in the circumstances above mentioned.

The committee are, of course, quite unable to offer any emolument or retaining fee, but the feelings of patriotism which must animate all residents of this county to do what they can in case of national danger will, the committee feels, lead all motorists to assist in this matter.

It is not under this scheme proposed that motorists should take any part in the military operations. Their duty will end with the delivery of troops at the place of concentration.

It is obvious that with slight alterations to meet the district considerations the scheme as outlined by Mr. Godfrey Lowe is applicable to any and every county. Quite apart from the welcome which we give this scheme as containing the germs of a really important strengthening of our national defences, it must be borne in mind that the enrolment of the great bulk of the motorists in the country as owners of machines which would assist in the mobilisation of troops must be regarded even by the most rabid anti-motorist with favour, and as he will look upon it as a sound and proper course, he must, unless he is quite hopeless, regard motorists and motoring in a more favourable light than he has hitherto done.

Front Wheel Braking.

Attention has been redirected to the subject of front wheel braking by a device which we describe in another column to-day, and also by a previous set of public trials of this invention, which were made last summer. We have always felt that front wheel braking has not been given the attention it deserves. We believe this has been mainly due to the few unsuccessful attempts which were made some years ago to use front wheel brakes; but many things point to the desirability of reawakening interest in the subject. Undoubtedly one of the most important reasons why the matter should be carefully considered is on account of the opposition on the part of some road authorities to the metal-studded tyre. There are several rubber non-skids available to-day which are very satisfactory, but with one or two exceptions it cannot be seriously contended that they obtain as sure a grip upon a treacherous road as a metal-studded tyre.

This lack of grip is most serious when the brakes are being used, and particularly when they are being used as they must be sometimes—with suddenness. There is also the descent of really steep hills to be considered. In several parts of the country there are hills which are sufficiently steep and often sufficiently greasy to make it impossible to drive a car safely down them with any but the most efficient non-skids. The driver may approach the hill with the greatest caution, he may put in one of his low gears, close his throttle, and use his brakes, but the combination of gradient and grease is often such that bad skidding results. The weight is largely thrown upon the front wheels, and the adhesion of the back wheels is so slight that they lock on the smallest provocation, and the car begins to sway most dangerously, and to descend the hill too fast, but no more brake power can be used, as the wheels are locked. As a rule, these slidings finish up in the gutter with nothing worse than the spoiling of a mudguard or an axle cap. This is annoying enough, but if there is other traffic upon the hill the matter may not end so lightly. Those who live in districts where greasy descents are unknown, or are very rare, scarcely realise the conditions which obtain on the numerous steep hills of Derbyshire, Gloucestershire, Somersetshire, parts of Yorkshire, and North Staffordshire. It is not merely the steepness of the hills that matters, but their horrible and dangerous state of greasiness.

So much for the country work. As to town driving, grease is prevalent in all towns more or less, and a great deal might be said in this connection to make out a good case for front wheel braking. There are many points in its favour, but the most important are:

(1) That in descending a hill the weight is thrown forward on to the front wheels, but whether on a hill or on the level checking of the speed of the car always throws the weight forward. (2) The back tyres have enough to put up with in transmitting the driving strains, and therefore the shifting of some of the braking stresses to the front tyres is desirable.

There are two objections to front wheel braking. The first is that there would be some small increase in complication, but this is so small that if provision were made for it in designing and building the car it would scarcely be worth consideration at all. The other, and more vital, objection has hitherto been the upsetting of the steering. Till this second objection was overcome, any advantage which front wheel brakes possessed were so utterly discounted that it was not worthy of consideration. However, as this objection has now been overcome without any vital structural alteration of the car, the case for front wheel braking has been very greatly strengthened, because practical experience shows that with properly constructed front wheel brakes the possibilities of side-slip are enormously reduced.

A few cars are made without propeller-shaft or counter-shaft brakes. These propeller-shaft brakes are immensely powerful, but they have the great objection of locking the balance gear cage, so that, while one wheel continues to roll forward, the other one revolves backward, but even when both the hand brake and foot brake are concentrated on the back wheels alone, and are not put upon the transmission at all, there is still the objection that the back wheels are caused to skid much sooner than if the same retarding effect were applied to the front wheels and therefore it certainly appears that the best plan would be to keep the hand brakes on the back wheels, as at present, but to have the pedal-applied brake—that is, the emergency brake—upon the front wheels. This would not only obviate the possibility of many a dangerous side-slip, and make the car altogether a safer vehicle, but it would, as we have already said, tend to prolong the life of the driving tyres without materially shortening the life of the front wheel tyres, as they, through skidding so much less readily, are not affected to the same extent as the back tyres by a sudden brake application. There are many other points in favour of braking all four wheels instead of two only, but we have contented ourselves by mentioning those which, in our opinion, are the most important.

ON THE TRACK. By H. C. Lafone.

Last week's doings at Brooklands are likely to provide topics of conversation for many a long day. My only regret in connection with the proceedings is that the excitement was concentrated into tabloid form, and administered in such a brief space of time. Properly divided up, the trials would have afforded me agreeable occupation for weeks to come.

On the Tuesday M. Naudin came down to practise on the racing Sizaire, in preparation for his official record attempts on the following day. During this preliminary canter the little machine ran so well that the establishment of good figures became practically certain, barring accidents. It was anticipated that the average speed for the hundred miles would work out at something just over sixty miles an hour, but I do not think that even Mr. Jarrott himself was sanguine enough to put the pace at over sixty-five.

On the Wednesday M. Naudin, who drove the car, was accompanied by M. Sizaire, who occupied the (for him) unusual position of mechanic. M. Sizaire's costume was *chic* to a degree, and aroused the bitterest pangs of jealousy in the breasts of those of us who had not mastered the art of living up to a pair of smart check breeches worn in conjunction with a blue sweater and stocking cap with tassel. Possibly we may find this fashion adopted for next year's race meetings by the more daring of our youthful amateur drivers.

Thursday was given over to Bablot's practice on Mr. Clement Hobson's Grand Prix Brasier. This is, of course, the machine in connection with which Mr. Hobson has this autumn twice issued fruitless challenges, and I can safely say that it is by far the fastest "60" that has ever been round the Weybridge track. On Friday Bablot made an attack on the existing 60 h.p. standard class short and long records. In the former he did a fine performance by putting up Resta's Mercedes figures from 103.615 miles an hour over the flying half-mile to no less than 108.45 miles an hour. The afternoon was clear and dry, and extremely favourable to first rate carburation. The Brasier attempt on the 60 h.p. ten laps' time was spoilt by the stripping of a front tyre tread. The rubber came clean off, and left the fabric bare all round. No burst occurred, but Bablot naturally did not care to go on with no rubber on his off front cover. On Saturday morning another attempt was made, and the well-known French driver covered himself, his car, and his tyres with glory by completing ten laps (about 27½ miles) at the rate of 101.778 miles an hour. The old long distance figures were between 86 and 87 miles an hour. The driver who betters Bablot's performance will need to have a fine car under him.

On Friday, too, Mr. Newton turned up on the 90 h.p. Napier "Samson" and defeated the old records for the class in easy style. The flying half mile, which had stood at just over 102 miles an hour, was put up to 114.98 miles an hour—a wonderful speed. The ten laps' record was also lowered, for Newton's speed worked out at 102.208 miles an hour. The tyres fitted for this event were Palmer Cords, which stood up manfully under the enormous strain. It will be noted that the Brasier and Napier speeds for the ten laps in the two classes are remarkably near.

There is a long distance tyre trial being carried out at Brooklands over a 4,000 miles course, the tyres being Spencer-Moultons fitted to a 14-20 h.p. Siddeley. So far both car and tyres are running faultlessly. I have it on the best authority that there is no fear of the Brooklands Track being closed through financial causes. The course could be carried on for another twenty years, even if the receipts were never any better than they have been during this year. The impending changes in the management are not likely to affect in any way the policy of the B.A.R.C. Mr. Rodakowski's resignation of the clerkship of the course is a matter of genuine regret to me. I have often squabbled with Mr. R., but we have always made it up again without difficulty and without rancour. I am very glad to hear that he is not severing all his connection with the racing club, but that he will still serve on committees and be at hand to give valuable advice next season.

THE LANCIA CARS.

A 15½H.P. FOUR-CYLINDER AND 30 H.P. SIX-CYLINDER ENGINED CHASSIS, BUILT TO THE DESIGNS OF THE CELEBRATED ITALIAN DRIVER, V. LANCIA.

If only for the racing fame attached to the name of the great Italian driver, Lancia, attention would be drawn to any cars so distinguished, but when it is known, as is not generally the case, that Vincenzio

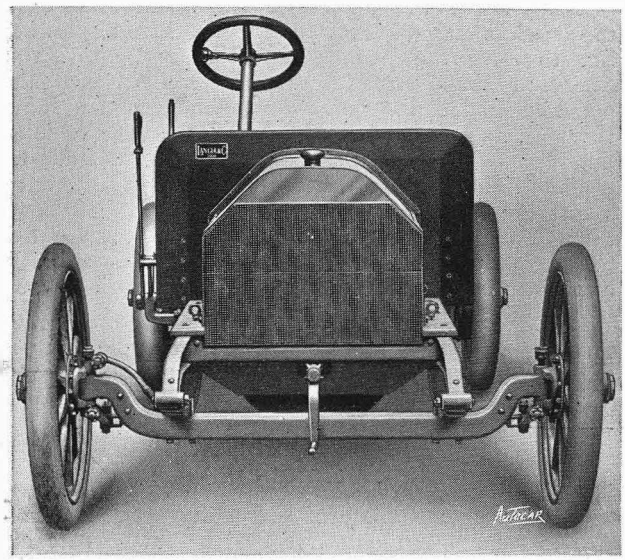


Fig. 1.—The substantial appearance of the Lancia front axle will be gathered from a glance at this illustration.

Lancia is not only a great driver but holds a prominent position in Italian engineering circles, and has enjoyed a long mechanical experience, which, combined with his racing knowledge, he has brought to bear upon the car named after him in an unmistakable and praiseworthy manner, his cars are certain to interest the automobile public. Photographic illustrations can hardly do adequate justice to this excellent and in parts original design, but drawings being unavailable photographs must content.

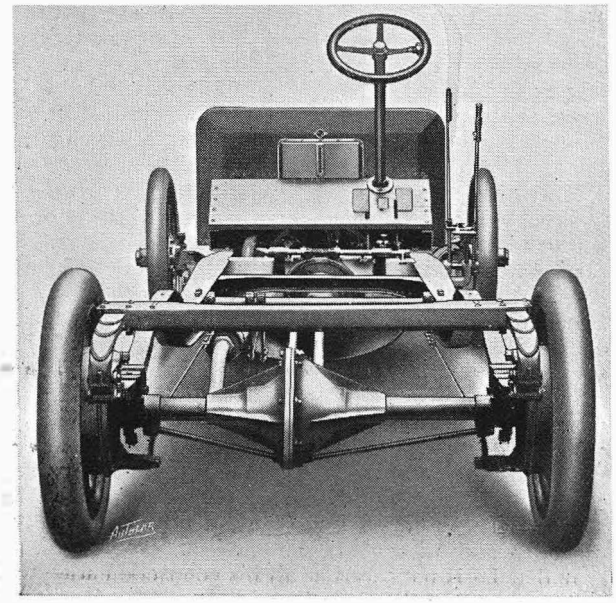


Fig. 2.—The Lancia chassis viewed from the back.

The Frame.

Fig. 3 gives an excellent view of the lines of the chassis, which shows character and distinction. The side members are as usual of pressed cambered channel steel, inswept forward of the dashboard and upswept and outswept over the back axle. The cross member immediately in rear of the dashboard is formed to support the brake fittings, etc., that immediately in the rear being well splayed and gusseted, while the rear member itself is of special and unusual design, as shown in fig. 2. It is formed and splayed to take the rear ends of the side members, and produced outwards to carry and anchor the ends of the laminated spring

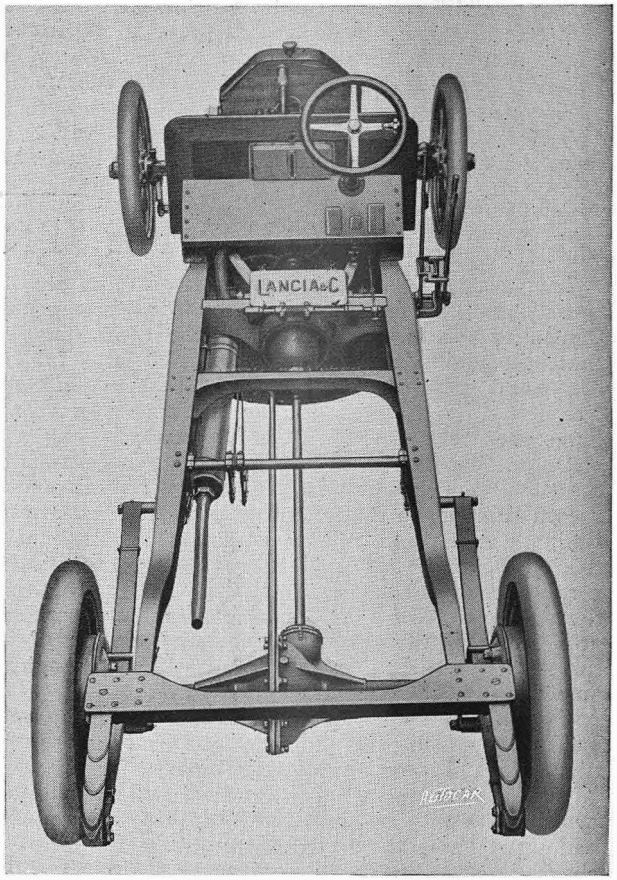


Fig. 3.—Plan of the Lancia chassis illustrating the clean and substantial design.

dumb irons. This arrangement makes for exceptional strength and stiffness, while keeping the frame itself narrow. In addition to the cambering of the side members, the flanges, it will be seen, are widened to afford the greatest sections at the points of the greatest stresses.

The Engine.

Both the engines of the 15 h.p. four-cylinder and the 30 h.p. six-cylinder Lancias have their cylinders cast and set in pairs upon the crank chamber. They are 90 mm. in bore, and have a stroke of 100 mm.—practically 3½ × 4in. The valve chambers are all on the left, thus necessitating one camshaft only. Off this camshaft the H.T. magneto is driven. The

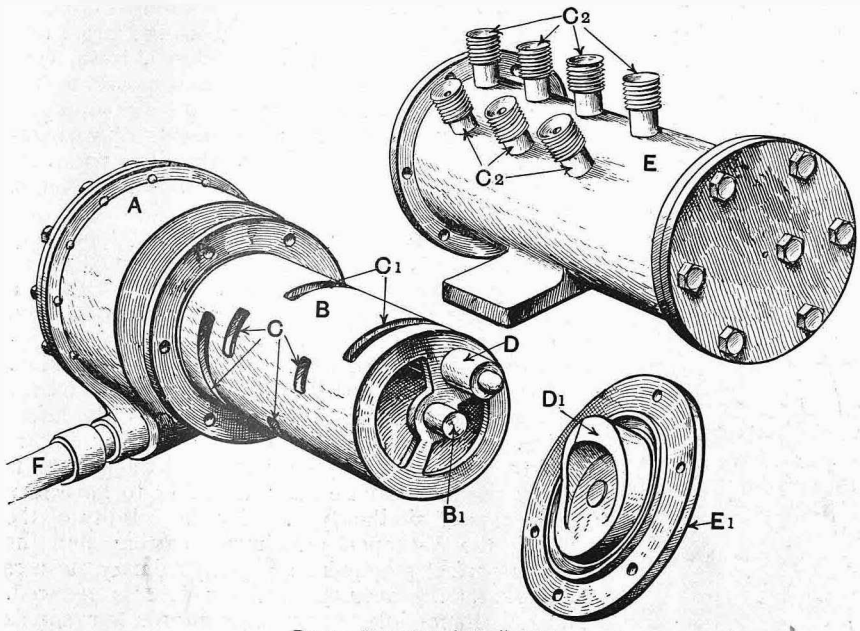


Fig. 4.—The rotary feed oil pump.

A, oil chamber
B, rotating barrel with delivery ports
C C1, oil delivery ports
D, pump plunger
E, cylindrical casing over rotating barrel B carrying delivery unions
D1, pump plunger cam
E1, end plate with cam for actuating force pump plunger
F, oil delivery to oil chamber
C2 C2, unions for attachment of oil delivery pipes
B1, barrel spindle

crankshaft, which is formed from a special solid forging, runs in three bearings of large dimensions. All the distribution gear is enclosed forward in a special casing, and is easily accessible. Ignition is by Bosch magneto in the usual way. The accessibility of those parts of the magneto which occasionally require attention is praiseworthy.

The engine is oil fed by means of the cylindrical oil pump shown by sketch (fig. 4), which is driven off the distribution gear. This method of engine lubrication is a special feature of Lancia design, a unique, interesting, and ingenious rotating force-feed oil pump being fitted for the purpose. Its construction and method of operation can be very easily gleaned by reference to fig. 4. This neat little apparatus is fitted on the crank chamber in such wise that the ported barrel B can be rotated from the distribution gear. The means provided for performing this operation are not shown in the sketch. The drawing shows the right-hand outer portion of the casing E carrying the delivery unions C_2C_2 and the end cam plate E_1, withdrawn from around the rotating barrel B for the purpose of showing the graduated delivery ports $C C_1$ and the head of the plunger force pump carried therein. Now it will be seen that when the outer cylindrical casing E, as shown in the sketch, is replaced over the rotating barrel B and secured to the flange on the oil chamber A, the barrel B, being rotated as above described, will bring the variously cut ports CC_1 under their respective deliveries C_2C_2 in the casing E. Also that as the barrel rotates within this casing the nose of the pump plunger pressing on the path of the cam D_1, which is of course stationary, will cause the plunger to travel up and down the barrel of the pump within the rotating barrel B. Now the chamber A and the interior of the barrel B are kept full of oil, upon which pressure is exerted by the operation of the pump plunger D as already described. The result of this is that oil is forced through the ports in $C C_1$ in the barrel B, and also into their respective delivery pipes, as long as the open port is travelling beneath them. The quantity of oil delivered to each bearing at each revolution of the barrel is apportioned by the length of the slot, and as the speed of the barrel is exactly proportionate to the speed of the engine the feed of oil is always in the set and due proportion to the requirement of the bearing and the engine revolutions per minute.

The Carburetter.

The Lancia carburetter presents several interesting features, illustrated in the accompanying sketch. It has two jets, the smaller remaining open alone up to 200 r.p.m., and both it and the larger coming into effect from that speed up to 1,500 r.p.m.

Its design and construction and operation can be readily understood by reference to the accompanying

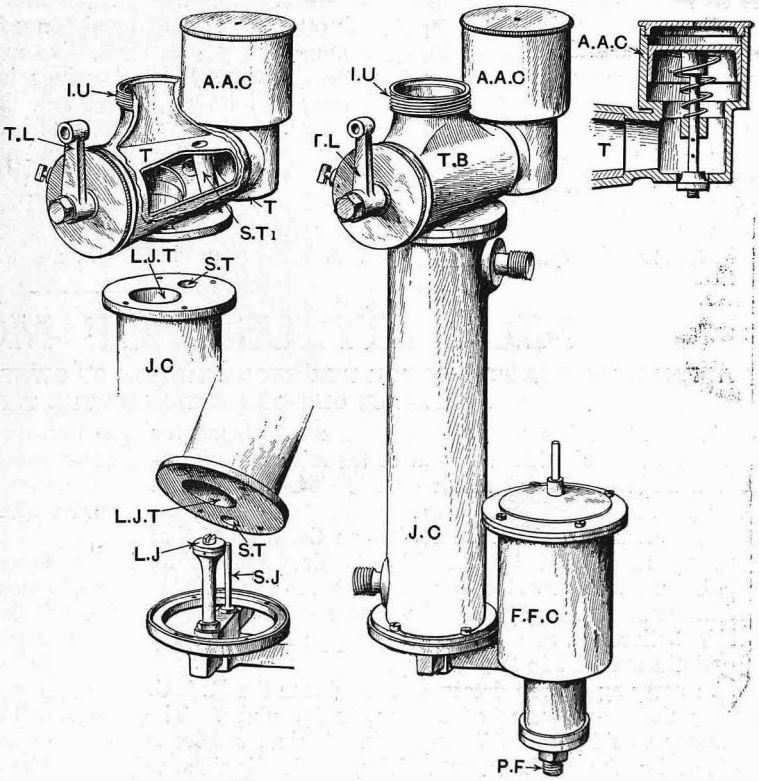


Fig. 5.—Details of the Lancia carburetter.

P F, petrol feed
F F C, float feed chamber
J C, jet column
T B, throttle barrel
T L, throttle lever
A A C, automatic air valve case
T, rotary graduated throttle
S T, small jet tube
L J T, large jet tube
I U, induction pipe union
L J, large jet
S J, small jet
S T1, small jet tube in throttle

dissected sketch (fig. 5). The float feed chamber is of the usual type, but the petrol supply pipe therefrom communicates with two jets, one small S J and the other the larger or main jet L J, both having their own mixture tubes S T and L J T formed in the jet hot jacketed column J C. These tubes run upwards to the tapered graduated throttle valve T, set above and across the jet column as shown.

Now the operation of the apparatus is as follows: When it is desired to start up the engine the throttle

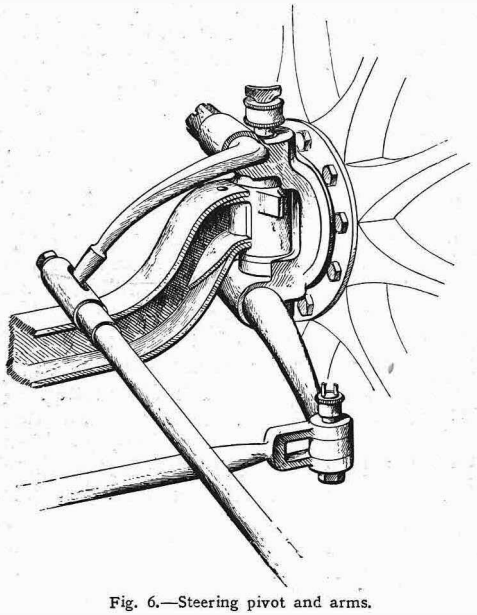


Fig. 6.—Steering pivot and arms.

is so manipulated from the steering wheel that the small tube S T seen traversing the throttle shell in a perpendicular direction is brought immediately over the upper end of the hole S T in the jet tube J C. The engine can then draw gas from the small jet S J, no part of the larger opening being free. Further movement of the throttle opens the large orifice in the valve to the upper end of the mixture tube L J T, when both large and small jets come into operation up to the maximum opening of the throttle. When the throttle is quite closed its movement can be extended until the small tube S T_1 is brought opposite an orifice in the outer casing, and, both the larger and smaller mixture tube outlets being closed, fresh, cold air is delivered to the cylinders in response to the engine suction. The additional pure air supply is obtained in response to the requirements of carburation by the automatic operation of the dash pot valve contained in the casing A A C and shown in section in the sketch.

The clutch is of the ordinary multi-disc type, very sweet and flexible, and absolutely oil-retaining. The drive passes from the engine through this clutch to a gear box formed in a V-shaped aluminium casting, which provides a pot for the encasement of the flywheel, and is bolted rigidly up to the crank chamber. This brings the gear box directly under the footboards and much closer to the flywheel than is the usual practice. The gear box, too, is extremely short; indeed the gearing is very compact, and the gearshafts are kept shorter than we ever remember to have seen them in cars of similar type. By the solidity of the box with the V-shaped aluminium casting and its shortness perfect alignment and extraordinary stiffness of the shafts are secured, while weight is reduced. Leakage is impossible. The gear affords four speeds forward, with direct drive on top speed. Immediately in rear of the gear box is found a large diameter brake drum mounted on the forward portion of the universal. Thence a propeller-shaft of a length rendered much above the average by the above cited position of the gear box transmits the drive to the rear axle. By the fact of its length the angular movement of this propeller-shaft is reduced to a minimum—a very excellent feature. The outward construction of the back axle can be realised from figs. 2 and 3. The differential gear casing is of robust design, well ribbed, and formed with sockets of considerable length to take the live axle casing. The road wheels run on ball bearings in the casings, as in all the best types of live axle drive. A pressed steel webbed and flanged steel torque member is interposed between the back axle and the frame to relieve the springs of the drive and the thrust of the brakes. In the absence of suitable drawings fuller details are not impossible, but we think enough has been said to show that the Lancia cars are well worth attention.

MILITARY USES OF MOTOR CARS.

A FAR-REACHING SCHEME FOR THE REGISTERATION OF OWNERS OF MOTOR CARS WILLING TO LEND ASSISTANCE ON MOBILISATION OF THE TERRITORIAL FORCES.

The R.A.C. has under consideration a scheme for placing at the absolute disposal of the military authorities a large number of motor cars for use in the event of a grave national emergency.

This scheme, which is somewhat on the lines of that already announced by the Lincolnshire Automobile Club, in no way trespasses on the sphere of usefulness of the existing Army Motor Reserve, and is one which it is believed would be heartily supported by every patriotic motorist in the country.

In carrying out the details of the scheme the R.A.C. seeks the co-operation of the provincial clubs. The country would be divided up into districts as determined by the military authorities, such districts to coincide so far as possible with the areas of influence of the provincial clubs. The secretary of each district would keep a list of the names and addresses of such owners residing in their districts who had undertaken to comply with the conditions of the scheme. Local secretaries would have to have one or more deputy secretaries, who would be prepared to undertake their duties whenever the head secretaries were absent from home.

In case of emergency the War Office would direct local secretaries or their deputies to wire to every member within their district to rendezvous with their cars at any place required. It would be possible occasionally to have experimental mobilisations in various districts to test the efficiency of the local organisations. Presumably owners would not require retaining fees. The expense of organisation would be very small. The War Office would presumably pay for the use of cars when employed under the scheme. Before submitting the scheme to the War Office the details should be roughly drafted by a committee which included some military members.

WHAT A SINGLE-CYLINDER CAR CAN DO.

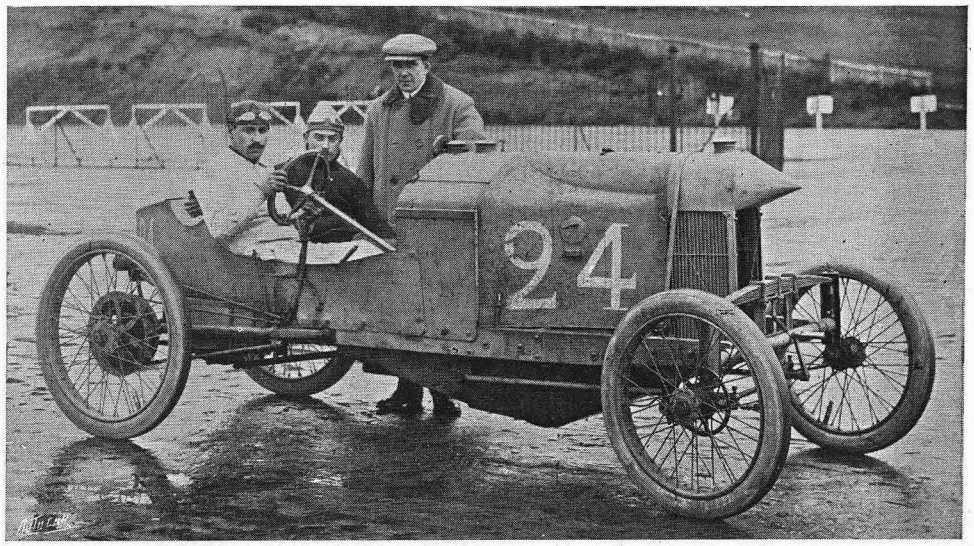
The long looked forward to trial of the Sizaire car at Brooklands came off on Wednesday of last week, and resulted in some marvellous speeds being attained, although the day was wet and windy.

Brief details of the car were given on page 671 of *The Autocar* last week. As then stated, the engine is a single-cylinder, having a bore of 4in., or, to be exact, 3.934. According to a French contemporary, the stroke is 220 mm. = 8.8in. On R.A.C. rating the horse-power is 6 h.p., and the results obtained from such a low powered car are remarkable.

Records were established for half a mile (flying start), fifty miles (flying start), one hour, and one hundred miles (flying start). The Sizaire created world's records for a car of the voiturette type. It ran under conditions conforming with the Grand Prix des Voiturettes. As a matter of fact the car weighed, minus passengers, water, petrol, or tools, 750 kilos (14 cwts. 2 qrs.), whereas the voiturette race conditions only stipulated a minimum of 600 kilos. It is the actual car which won the Coupe des Voiturettes last September.

An outstanding feature of the Sizaire trial was its consistent running. The fastest lap (the seventeenth) it accomplished in 2m. 30s., and the slowest (the last) in 2m. 39s. The average lap times varied between 2m. 31s. and 2m. 33s.

The car was driven by M. Naudin, who was accompanied by M. Sizaire. The tyres (Michelins) stood up well, and gave not the slightest trouble.



M. Naudin at the whee of the single-cylinder Sizaire-Naudin car which covered 100 miles on Brooklands Track at an average speed of 65 miles an hour. Standing beside the car is Mr. Charles Jarrott, whose firm have long since taken up the English agency for these speedy little cars.

The results were as follow: Half-mile (flying start).—Time, 27.075s.; rate of speed, 66.48 m.p.h. Fifty miles (flying start).—Time 45m. 54.247s.; rate of speed, 65.353 m.p.h. One hour.—65 miles 755 yards. Hundred miles (flying start).—Time, 1h. 31m. 53.452s., this representing an average rate of speed of 65.295 m.p.h.

THE 8-10 H.P. S.K. CAR.

An interesting new car which presents several distinctive features has lately been placed on the market. It is manufactured by Messrs. Smeddle and Kennedy, Ltd., St. James Street, Newcastle-on-Tyne, and is represented in London by Messrs. White and Co., 11, Southwark Street, S.E. The chassis is constructed to carry a two-seated body, and has a two-cylinder engine with cylinders cast in pairs; the bore and stroke are 3¼in. by 4¼in. The valves are of the overhead type, and are fixed in cages on the top of the cylinder. The camshaft is carried at the top of and within an aluminium casing, attached to the cylinder head by four bolts and wing nuts. The shaft is mounted in ball bearings at each end, and is driven by means of bevel gearing, and the valve tappets are provided at the ends with rollers. An inspection cover is fitted to the crank chamber, to which it is secured by one bolt. The flywheel is marked, as are also the camshaft spindle and the outer casing, and it is only necessary to set the mark on the flywheel opposite the pointer and place the marks on the camshaft and casing opposite one another, and no mistake can be made in re-timing if the gear has been removed to examine the valves. The cranks are arranged so that both pistons descend together, and when one is drawing in gas the other is firing. The ignition is by Nieuport high-tension magneto. An automatic type of carburetter is employed, and this is bolted direct on to the cylinders, there being no induction pipe.

The clutch is metal to metal, and the engagement is effected by means of internal expanding segments, and power is transmitted by cardan-shaft to a change speed gear box, which forms a single unit with the back axle.

The frame is of pressed steel, and four radius rods (two from the front axle and two from the back axle) converge towards two central brackets. The frame is carried at three points, there being a transverse semi-elliptical spring at the front and two long, flat springs at the back. The chief point aimed at in the construction of the car is simplicity, and nearly every part is interchangeable. The control is by means of an accelerator pedal, while the ignition point is fixed.

THE AUTOCARS OF 1909.

A list of cars with the prices and leading features arranged alphabetically with separate indices for prices and addresses.

Specially compiled for the use of Visitors to Olympia.

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cwt. qr.			
A *10 Adams (1)	120 × 152	Grav.	M.ht. Acc.	—	Pedals	C.C.	3	—	7 11	4 2	5 6	11 0	6 2	760 × 90	760 × 90	10 0	4	£170	£185
12-14 Adams (2)	105 × 120	Mech.	M.ht.	—	Pedals	P.S.	3	—	8 1	4 6	5 6	11 5	6 4	760 × 90	760 × 90	—	4	£275	£295
14-16 Adams (4)	86 × 92	Grav.	M.ht.	—	Pedals	P.S.	3	—	8 1	4 6	5 6	11 5	6 4	760 × 90	760 × 90	—	4	£285	£305
16-18 Adams (4)	84 × 110	Mech.	M.ht.	—	Pedals	P.S.	3	—	8 6	4 6	5 6	11 9	6 7	810 × 90	810 × 90	12 0	4	£350	£425
30 Adams (4)	105 × 140	Mech.	M.ht.	—	Pedals	P.S.	3	—	10 0	4 7	5 10	13 6	7 0	875 × 105	815 × 105	25 0	5	£550	£675
*7 Adler (2)	75 × 100	Mech.	M.	Metal cone	Gate	P.S.	—	—	6 10½	3 9	—	—	—	700 × 80	700 × 80	8 3	2	—	£180
*12 Adler (4)	75 × 88	Mech.	M. Acc.	Metal cone	Gate	P.S.	—	—	8 6	4 1	—	—	—	760 × 90	760 × 90	12 0	4	—	£295
16 Adler (4)	80 × 100	Mech.	M. Acc.	L'ther cone	Gate	P.S.	—	—	9 2	4 6	—	—	—	810 × 90	815 × 105	16 0	4 to 6	—	£425
20 Adler (4)	95 × 115	Mech.	M. Acc.	L'ther cone	Gate	P.S.	—	—	9 2	4 6	—	—	—	815 × 105	815 × 105	18 0	4 to 8	—	£545
30 Adler (4)	110 × 120	Mech.	M. Acc.	L'ther cone	Gate	P.S.	—	—	10 6	4 6	—	—	—	875 × 105	880 × 125	22 0	4 to 8	—	£725
40 Adler (4)	130 × 140	Mech.	M. Acc.	L'ther cone	Gate	P.S.	—	—	10 6	4 6	—	—	—	875 × 105	895 × 135	25 0	4 to 8	—	£850
*16 Albion (2)	124 × 127	Mech.	M.lt.	L'ther cone	Gate	S.C.	—	—	8 11	4 6	5 5	12 0	6 7	870 × 90	870 × 90	—	5	£360	£440
24-30 Albion (4)	108 × 114	Mech.	M.lt.	Metal cone	Gate	S.C.	—	—	9 6	4 6	5 7	12 4	6 8¼	880 × 120	880 × 120	—	5	£545	£633
*10 Alldays (2)	95 × 114	Mech.	Acc.	L'ther cone	Quad'nt	P.S.	—	—	7 6	4 0	4 9	11 0	5 8	750 × 85	750 × 85	—	2	—	£221
14 Alldays (4)	86 × 108	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	8 6	4 0	4 9	12 0	6 2	810 × 90	810 × 90	—	5	—	£326
20 Alldays (4)	95 × 114	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	9 6	4 6	5 6	13 0	7 0	815 × 105	815 × 105	—	5	—	£378
12-14 Argyll (4)	80 × 100	Mech.	M.ht.	Mult. disc	Gate	P.S.	3	3	8 3	4 2	5 3	11 9	6 5⅛	760 × 90	760 × 90	11 3	4	£270	£295
14-16 Argyll (4)	90 × 120	Mech.	Acc.	Mult. disc	Govan	P.S.	3	3	8 11¼	4 4	5 6	13 3⅛	6 4¾	810 × 90	810 × 90	17 2	5	£325	£375
40 Argyll (4)	120 × 140	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S.	4	3	10 9¼	4 8	5 9	15 0	7 7⅛	920 × 120	920 × 120	24 1	5 or 7	£585	£650
20 Ariel (4)	100 × 115	Mech.	M.	L'ther cone	Gate	P.S.	—	—	9 2	4 6	5 2	12 9	6 6	815 × 105	815 × 105	17 0	5	£320	£375
20 Ariel Town Carriage (4)	100 × 120	Mech.	M.	L'ther cone	Gate	P.S.	—	—	10 0	4 6	5 4½	14 0	6 9	815 × 105	815 × 105	17 0	5	£445	£630
30 Ariel (4)	112 × 135	Mech.	M.	L'ther cone	Gate	P.S.	—	—	9 8	4 7	5 8	13 8	6 8	875 × 105	880 × 120	20 0	5	£495	£550
*40 Ariel (4)	135 × 150	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	10 0	4 7	5 8	14 2	6 10	880 × 120	880 × 120	23 0	5	£595	£650
*50 Ariel (4)	155 × 150	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	10 0	4 7	5 8	14 2	6 10	880 × 120	880 × 120	24 0	5	£725	£780
*18-22 Armstrong-Whitworth (4)	95 × 120	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S.	4	4	10 0	4 6	5 2⅜	13 7	7 5½	815 × 105	815 × 105	18 0	5	£395	£470
*30 Armstrong-Whitworth (4)	127 × 100	Mech.	M.ht. Acc.	Mult. disc	Quad'nt	P.S.	4	4	10 0	4 6	5 6	13 6	7 0	920 × 120	920 × 120	20 0	5	£600	—
40 Armstrong-Whitworth (4)	127 × 152	Mech.	M.ht. Acc.	Mult. disc	Quad'nt	P.S.	4	4	10 6	4 6	5 6	13 10	7 4	920 × 120	920 × 120	22 0	5	£750	—

*10 h.p. Adams colonial model chassis, with 7ft. wheelbase, £201. 7 h.p. Adler, with four-seated body, £195; 12 h.p. Adler, with 7ft. wheelbase and two-seated body, £280. Albion chassis are built in a variety of wheelbases and tracks to suit special bodies. 10 h.p. Alldays, made in four models, £221 to £263. 40 h.p. Ariel chassis, with 11ft. wheelbase, £620; 50 h.p. Ariel chassis, with 11ft. wheelbase, £750. Ignition systems on all Armstrong-Whitworths are independent except for switch.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds.	Direct on.	Wheel-base.	Track	Extreme Width.	Extreme L'ngth	Dash-to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
A (cont.)	8 Aster (*1*)	105 × 110	Mech.	M.ht.	L'ther cone	Gate	P.S.	3	—	6 11	4 2½	4 7	9 0	4 10	700 × 90	700 × 90	12 0	2	£200	—
	10-12 Aster (*2*)	88 × 140	Pres.	M.ht.	L'ther cone	Gate	P.S.	3	—	8 2	4 5	4 10	11 6	6 2	810 × 90	810 × 90	14 0	2 or 4	£300	—
	*16-18 Aster (*4*)	84 × 110	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S.	3		8 2	4 5	4 10	11 6	6 2	810 × 90	810 × 90	14 3	2 or 5	£350	—
	*15 Austin (*4*)	89 × 102	Pres.	M.ht.	L'ther cone	Gate	P.S.	3	—	8 4	4 6	5 4	11 7	6 2	810 × 90	810 × 90	14 3	4	£300	£350
	18-24 Austin (*4*)	105 × 127	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S.	4	—	9 9	4 7	5 4	13 6	6 11	870 × 90	880 × 120	18 0	5	£480	£575
	40 Austin (*4*)	121 × 127	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S or S.C	4	—	9 9	4 7	5 4	13 6	6 9½	910 × 100	920 × 120	19 0	5	£600	£700
	60 Austin (*6*)	121 × 127	Mech.	M.ht. Acc.	Disc	Gate	P.S or S.C	4	—	11 0	4 7	5 4	14 9	6 11⅜	915 × 105	920 × 120	22 0	5	£800	£925
B	16 Bell (*4*)	90 × 114	Mech.	M.ht.	Metal plate	Gate	P.S.	3	3	9 6	4 5	5 6	12 10	6 10	815 × 105	815 × 105	14 0	5	£310	£370
	20 Bell (*4*)	102 × 127	Mech.	M.ht.	Metal plate	Gate	P.S.	4	4	10 3	4 5	5 6	14 0	7 4½	820 × 120	820 × 120	17 0	5	£400	£470
	30 Bell (*4*)	117 × 149	Mech.	M.ht.	Metal plate	Gate	P.S.	4	4	10 3	4 5	5 6	14 0	7 4½	880 × 120	880 × 120	19 0	5	£475	£545
	14-16 Belsize (*4*)	89 × 101	Mech.	M.ht. Acc.	Metal-metal	Gate	P.S.	3	3	8 3	4 3	5 3	12 0	6 1½	810 × 90	810 × 90	14 2	5	£265	£285
	20 Belsize (*4*)	101 × 114	Mech.	M.ht. Acc.	Metal-metal	Gate	P.S.	3	3	8 9	4 6	5 6	12 6	6 3	810 × 100	810 × 100	—	5	£350	£395
	28 Belsize (*4*)	116 × 127	Mech.	M.ht. Acc.	Hele-Shaw	Gate	P.S.	4	3	9 6	4 6	5 6	13 3	6 6	810 × 90	820 × 120	—	5	£445	£495
	40 Belsize (*6*)	116 × 127	Mech.	M.ht. Acc.	Hele-Shaw	Gate	P.S.	4	3	10 2½	4 6	5 6	14 0	6 3	820 × 120	820 × 120	—	5	£640	£695
	*11 Bentall (*2*)	100 × 95	Pres.	M.lt.	Fibre cone	Quad	P.S.	3	3	8 0	4 0	5 0	10 9	5 9	750 × 85	750 × 85	13 0	2	—	£235
	16 Bentall (*4*)	90 × 95	Pres.	M.lt.	Fibre cone	Quad	P.S.	3	3	9 3	4 4	5 2	12 10	6 3	810 × 90	810 × 90	15 2	5	—	£315
	18 Benz (*4*)	80 × 120	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 4	4 4	4 9	13 0	—	810 × 90	810 × 90	15 0	5	£390	£450
	28 Benz (*4*)	105 × 130	Pres.	M.lt. Acc.	L'ther cone	Gate	P.S.	—	—	10 6	4 9	5 0	14 9	7 2	880 × 105	880 × 120	21 0	7	£640	£740
	40 Benz (*4*)	120 × 135	Pres.	M.lt. Acc.	L'ther cone	Gate	P.S or S.C	—	—	10 3	4 9	5 0	14 6	7 0	920 × 120	935 × 135	23 0	7	£785	£885
	*8 Berliet (*2*)	80 × 90	Pres.	M.ht.	Plate	—	P.S.	3	3	8 3½	4 4	—	—	—	810 × 90	810 × 90	13 3	—	—	—
	*15 Berliet (*4*)	80 × 120	Pres.	M.ht.	Plate	—	P.S.	3	3	9 2½	4 4	—	—	—	810 × 90	810 × 90	14 3	—	—	—
	*15 Berliet (*4*)	80 × 120	Pres.	M.ht.	Plate	—	P.S.	4	4	9 9	4 7	—	—	—	810 × 90	815 × 105	16 1	—	—	—
	*22 Berliet (*4*)	100 × 120	Pres.	M.ht.	Plate	—	P.S.	4	4	10 6	4 7	—	—	—	870 × 90	880 × 120	17 3	—	—	—
	*40 Berliet (*4*)	120 × 140	Pres.	M.ht.	Plate	—	S.C.	4	3 & 4	9 2½	4 4	—	—	—	870 × 90	880 × 120	17 0	—	—	—
	*40 Berliet (*6*)	100 × 140	Pres.	M.ht.	Plate	—	S.C.	4	3 & 4	11 0	4 7	—	—	—	870 × 90	920 × 120	21 0	—	—	—
	60 Berliet (*6*)	140 × 140	Pres.	M.lt.	Plate	—	S.C.	4	3 & 4	10 6	4 7	—	—	—	870 × 90	920 × 120	21 0	—	—	—
	10-12 Brasier Cab (*2*)	102 × 100	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.			8 4½	4 5	—	—	—	810 × 90	810 × 90	14 0	6	£290	£380
	12-15 Brasier (*4*)	75 × 120	Mech.	M.ht. M.lt.	L'ther cone	Gate	P.S.	—	—	9 4½	4 7	—	—	—	815 × 105	815 × 105	15 2	5	£365	£445
	*16-26 Brasier (*4*)	90 × 120	Mech.	M.ht. M.lt.	L'ther cone	Gate	P.S or S.C	—	—	9 2½	4 7	—	—	—	875 × 105	875 × 105	18 2	5	£545	£605
	*30-40 Brasier (*4*)	112 × 130	Mech.	M.ht. M.lt.	L'ther cone	Gate	S.C.	—	—	9 4½	4 7	—	—	—	880 × 120	880 × 120	20 2	5	£650	£745
	*32-40 Brasier (*6*)	90 × 120	Mech.	M.lt.	L'ther cone	Gate	P.S or S.C	—	—	10 3	4 7	—	—	—	880 × 120	880 × 120	21 2	5	£765	£825
	*45-60 Brasier (*6*)	112 × 130	Mech.	M.lt.	L'ther cone	Gate	S.C.	—	—	10 10	4 7	—	—	—	920 × 120	920 × 120	22 2	5	£1000	£1080
	25 Brooke (*6*)	92 × 120	Mech.	M.ht.	Mult. disc	Gate	P.S.	—	—	10 6	4 8	5 6	14 10	7 1	880 × 120	880 × 120	18 3	5	£495	£595
	40 Brooke (*6*)	108 × 120	Mech.	M.ht.	Mult. disc	Gate	P.S.	—	—	10 6	4 8	5 6	14 10	7 1	880 × 120	880 × 120	19 3	5	£650	£675
	*20-22 Brown (*4*)	100 × 120	Mech.	M.ht. Acc.	Cone	Quad'nt	P.S.	4	4	10 2	4 6	5 5	13 8	6 11	810 × 90	815 × 105	—	5	£365	£450
	*25-30 Brown (*4*)	100 × 130	Mech.	M.ht. Acc.	Cone	Gate	P.S.	4	4	9 7	4 6	5 6	13 8	7 0	870 × 90	875 × 105	—	5	£500	£550
	40 Brown (*4*)	100 × 130	Mech.	M.ht. Acc.	Cone	Gate	P.S.	4	4	10 6	4 6	5 6	15 0	7 0	870 × 100	880 × 120	—	5	£700	£775
	14-18 B.S.A. (*4*)	90 × 102	Mech.	M.ht.	L'ther cone	Gate	P.S	3	—	8 6	4 4	5 6	12 0	6 0	810 × 90	810 × 90	15 3	4	£320	£370
	18-23 B.S.A. (*4*)	100 × 120	Mech.	M.ht.	Mult. disc	Gate	P.S	3	—	9 6	4 6	5 6½	12 6	6 7	875 × 105	875 × 105	17 2	5	£420	£510
	25-33 B.S.A. (*4*)	115 × 130	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S.	4	—	9 10	4 8	5 7	14 0	6 9¾	880 × 120	880 × 120	22 2	5	£575	£670
	*— Buick (*4*)	95 × 95	Mech.	M.ht. Acc.	Cone	Pedal	P.S.	2	2	7 7	4 8	5 8	11 0	4 1	760 × 90	760 × 90	15 0	4	—	£255

*16-18 h.p. Aster ignition systems are independent. 15 h.p. Austin chassis, with 9ft. wheelbase, £305. 11 h.p. Bentall four-seater, £15 extra. 8 h.p. Berliet is also made with a wider track for town carriage bodies: 15 h.p. Berliet, with four speeds, is also made with special dropped frame for town bodies: 22 h.p. Berliet is made with three wheelbases, also with a four-speed gear box direct on third and fourth gear, chain drive, and 920 × 120 mm. back tyres; 40 h.p. Berliet is also made with 3ft. 10in. wheelbase, wider track, and 920 × 120 mm. back tyres. 16-26, 30-40, 32-40, and 45-60 h.p. Brasiers all have two wheelbases. 20-22 and 25-30 h.p. Browns have independent ignitions. Buick car, with three-seated body, £240.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

The Antocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
C	10 Cadillac (*1*)	127 × 127	Mech.	Acc.	—	—	Plan'try	2	2	6 10	4 8	5 9	10 2	5 8	800 × 85	800 × 85	11 0	2 or 4	—	£242
	20-30 Cadillac (*4*)	102 × 115	Mech.	M.ht. Acc.	L'ther cone	Gate ..	—	3	3	8 10	4 8	5 9	12 2	—	810 × 90	810 × 100	—	5	—	—
	10 Calthorpe (*2*)	93 × 120	Pres.	M.	Hele-Shaw	Gate ..	P.S.	1	—	7 3	4 2½	5 0	11 0	—	750 × 90	750 × 90	10 0	2	£175	£190
	16-20 Calthorpe (*4*)	93 × 120	Pres.	M.	Hele-Shaw	Gate ..	P.S.	1	—	8 6	4 4½	6 0	12 6	—	810 × 90	810 × 90	15 0	5	£285	£325
	25 Calthorpe (*4*)	102 × 130	Pres.	M.	Hele-Shaw	Gate ..	P.S.	1	—	9 0	4 4½	6 0	13 0	—	815 × 105	815 × 105	17 2	5	£410	£450
	8-10 C.G.V. (*2*)	80 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 8	4 5	—	11 2	6 10	810 × 90	810 × 90	12 0	—	£250	—
	16 C.G.V. (*4*)	80 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	9 6	4 5	—	11 10	6 10	810 × 90	810 × 90	14 0	—	£315	—
	*22 C.G.V. (*4*)	95 × 130	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	3	9 4	4 5	—	11 10	6 10	815 × 105	815 × 105	19 0	—	£460	—
	30 C.G.V. (*4*)	110 × 130	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	S.C.	4	4	9 5	4 6	—	12 6	6 11	875 × 105	880 × 120	22 0	—	£540	—
	40 C.G.V. (*4*)	120 × 150	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	S.C.	4	4	9 5	4 6	—	12 6	6 11	875 × 105	880 × 120	22 0	—	£600	—
	50 C.G.V. (*4*)	140 × 160	Mech.	M.ht. Acc.	L'ther cone	Gate ..	S.C.	—	—	9 10	4 6	—	12 10	6 11	880 × 120	895 × 135	24 0	—	£720	—
	75 C.G.V. (*4*)	160 × 160	Mech.	M.ht. Acc.	L'ther cone	Gate ..	S.C.	—	—	10 0	4 6	—	13 2	6 11	880 × 120	895 × 135	25 0	—	£880	—
	8 Chambers (*2*)	85 × 106	Grav.	Acc.	Metal in oil	Epicyc.	S.C.	3	—	6 6	4 0	5 0	10 0	4 3	700 × 85	700 × 85	10 0	2	—	£185
	10 Chambers (*2*)	95 × 113	Grav.	Acc.	Metal in oil	Epicyc.	S.C.	3	—	7 0	4 0	5 6	11 0	5 7	760 × 90	760 × 90	11 2	4	£190	£245
	10-12 Chambers (*2*)	102 × 113	Grav.	Acc.	Metal in oil	Epicyc.	S.C.	3	—	7 0	4 0	5 6	11 0	5 7	760 × 90	760 × 90	12 2	4	£200	£255
	*12-14 Chambers (*4*)	85 × 92	Mech.	M.	Metal in oil	Epicyc.	Worm.	3	—	8 0	4 0	5 6	12 0	6 0	760 × 90	760 × 90	14 0	4 or 5	£250	£310
	12-16 Chambers (*4*)	85 × 106	Mech.	M.	Metal in oil	Epicyc.	S.C.	3	—	8 3	4 0	5 8	12 6	6 1	810 × 100	810 × 100	15 0	5	£300	£355
	*8-9 Chenard-Walcker (*1*)	100 × 120	Mech.	M.ht.	L'her to M'l	Quad'nt	P.S.	—	—	7 8½	3 11¼	4 6½	10 10	5 7	700 × 85	700 × 85	11 0	2	£175	£190
	10 Chenard-Walcker (2)	86 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	7 8½	3 11¼	4 6½	10 10	5 7	750 × 85	750 × 85	12 0	4	£195	£230
	12 Chenard-Walcker (*4*)	75 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	—	—	—	—	—	750 × 85	750 × 85	13 0	—	£235	£275
	14-16 Chenard-Walcker (*4*)	86 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	9 6	4 3	5 2	12 9	6 9	810 × 90	815 × 105	14 0	5	£335	£400
	30-40 Chenard-Walcker (*4*)	120 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 0	4 9	5 6	13 6	7 3	880 × 120	880 × 120	20 0	5	£540	£640
	10-12 Clement (*2*)	102 × 111	Grav.	M.ht.	L'ther cone	Gate ..	P.S.	3	3	7 9	4 4	5 2	11 0	5 11	760 × 90	760 × 90	12 2	2 to 5	£250	£300
	14-18 Clement (*4*)	85 × 102	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	3	3	8 6	4 4	5 2	12 0	6 2	760 × 100	760 × 100	13 0	5	£325	£380
	18-28 Clement (*4*)	102 × 111	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	4	4	9 9	4 4	5 2	13 8	6 11½	880 × 120	880 × 120	18 0	5	£425	£485
	25-35 Clement (*4*)	105 × 140	Mech.	M.ht.	Mult. disc	Gate ..	S.C.	—	—	9 10	4 7	5 5	13 9	6 9	875 × 105	880 × 120	21 0	5	£550	£630
	35-45 Clément (*4*)	115 × 140	Mech.	M.ht.	Mult. disc	Gate ..	S.C.	—	—	9 10	4 7	5 5	13 9	6 9	875 × 105	880 × 120	23 0	5	£600	£660
	6¼ Clyde (*1*)	88 × 110	Pres.	Acc.	Met. to met.	Quad'nt	S.C & P.S	2	—	6 0	3 9	4 3	9 3	—	700 × 80	700 × 80	8 3	3	£105	£125
	8-10 Clyde (*2*)	80 × 90	Pres.	Acc. or M.	Met. to met.	Gate ..	S.C & P.S	3	3	6 10	3 9	4 3	9 3	4 8	750 × 80	750 × 80	9 3	2 or 4	£175	£200
	— Clyde (*3*)	80 × 90	Pres.	Acc. or M.	Met. to met.	Gate ..	S.C & P.S	3	3	6 10	3 9	4 3	10 3	4 8	750 × 85	750 × 85	11 2	4	£205	£245
	— Clyde (*4*)	80 × 90	Pres.	Acc. or M.	Met. to met.	Gate ..	S.C & P.S	3	3	8 3	3 11	4 5	11 6	6 3	810 × 90	760 × 90	13 1	5	£270	£320
	20 Coltman (*4*)	102 × 114	Pres.	M.ht. Acc.	Met. to met.	Gate ..	P.S.	4	4	9 4	4 7	5 5	13 2	6 11	815 × 100	815 × 100	16 0	5	£410	£475
	20-25 Crossley (*4*)	100 × 125	Pres.	M.ht.	Metal cone	Gate ..	P.S.	—	—	9 6	4 6	5 3	13 6	—	875 × 105	875 × 105	18 0	5	£450	£550
	40 Crossley (*4*)	121 × 153	Pres.	M.lt.	Metal cone	Gate ..	P.S.	—	—	10 3½	4 8	5 7	14 0	—	910 × 100	920 × 120	21 0	5	£600	£700
D	22 Daimler (*4*)	96 × 130	Pres.	M.ht.	L'ther cone	Gate ..	P.S.	4	—	9 6	4 7	6 5	14 3	6 5	875 × 105	875 × 105	17 2	5	£475	£595
	*38 Daimler (*4*)	124 × 130	Pres.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	10 6	4 7	6 5	15 5	7 5	920 × 120	920 × 120	21 0	5	£610	£760
	48 Daimler (*4*)	140 × 150	Pres.	M.ht. Acc.	L'ther cone	Gate ..	S.C.	4	—	10 6	4 10	6 9	15 5	7 3	920 × 120	935 × 135	26 0	6	£695	£845
	56 Daimler (*6*)	124 × 130	Pres.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	—	10 6	4 7	6 5	16 0	7 5	920 × 120	935 × 135	24 0	5 or 7	£800	£975
	8-10 Darracq (*2*)	90 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	6 6	3 7	4 6	10 2	—	700 × 85	700 × 85	10 0	2	—	£175
	*10-12 Darracq (*2*)	100 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	8 6	4 1	4 7	11 6	7 3	760 × 90	760 × 90	14 0	5	£230	£250
	*14-16 Darracq (*4*)	85 × 100	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	8 6	4 1	4 7	11 6	7 3	810 × 90	810 × 90	16 0	5	£295	£325
	Four-inch Darracq (*4*)	100 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	9 10	4 7	5 0	13 4	8 0	810 × 90	815 × 115	18 0	5	£395	£425
	25-35 Darracq (4)	120 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	10 0	—	5 0	13 8	8 0	870 × 90	880 × 120	19 0	5	£450	£495
	50 Darracq (*6*)	120 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	11 0	—	5 0	14 7	8 0	870 × 90	880 × 120	20 0	5	£550	£595

*C.G.V. cars have their ignition systems independent. Chambers cars all have horizontal engines except the 12-14 h.p. with epicyclic gear on back axle. Chenard-Walcker cars are all fitted with gear pinions meshing with internal toothed rings on the wheels. 38 h.p. Daimler chassis with smaller tyres and shorter wheelbase, £50 less. 10-12 h.p. and 14-16 h.p. Darracqs with short wheelbase, £15 less.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.

Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.

C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheel-base.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cf. qr.			
D (cont.)	15 Deasy (4)	90 × 120	Mech.	M.ht.	Disc	Gate	P.S.	—	—	9 2	4 6	—	—	—	815 × 100	815 × 100	16 0	—	—	£425
	25 Deasy (4)	110 × 130	Mech.	M.ht.	Disc	Gate	P.S.	—	—	10 2	4 6	—	—	—	875 × 105	875 × 105	18 0	—	£500	£560
	35 Deasy (4)	127 × 150	Mech.	M.ht.	Disc	Gate	P.S.	—	—	11 2	4 6	—	—	—	880 × 120	880 × 120	21 0	—	£650	£725
	12-16 Decauville (4)	90 × 105	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	3	9 0	4 3	5 4	12 10	6 7	815 × 105	815 × 105	15 0	5	£300	£350
	16-20 Decauville (4)	100 × 105	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	3	9 0	4 6	5 4	12 10	6 8½	815 × 105	815 × 105	16 0	5	£400	£450
	8 De Dion (1)	—	Mech.	Acc.	Exp'g cone	—	De Dion	—	—	6 2	3 9	4 8	8 11	4 3	750 × 85	750 × 85	—	2 or 4	—	—
	8 De Dion (1)	100 × 120	Mech.	Acc.	Exp'g cone	—	De Dion	—	—	6 3	3 10	4 10	9 0	4 5	750 × 85	750 × 85	—	2 or 4	—	£170
	*9 De Dion (1)	100 × 130	Mech.	M.ht.	Parallel	Gate	De Dion	—	—	7 8	4 0	5 1	10 5	5 11	760 × 90	760 × 90	—	2	—	£225
	10 De Dion (2)	80 × 120	Mech.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	10 De Dion (4)	66 × 100	Mech.	M.ht.	Parallel	—	De Dion	—	—	8 4	4 0	4 10	11 6	6 1	760 × 90	760 × 90	—	2 or 5	—	£270
	*12 De Dion (4)	75 × 100	Mech.	M.ht.	Parallel	Gate	De Dion	—	—	8 3	4 0	5 1	10 11½	5 11	810 × 90	810 × 90	—	5 or 7	—	£330
	18 De Dion (4)	90 × 120	Mech.	M.ht.	Parallel	Gate	De Dion	—	—	9 9	4 1	5 0	12 11½	6 11	815 × 105	815 × 105	—	5 or 7	—	£425
	25 De Dion (4)	100 × 130	Mech.	M.ht.	Parallel	Gate	De Dion	—	—	10 0	4 3	5 4½	13 3½	7 0½	880 × 120	880 × 120	—	5 or 7	—	£475
	30 De Dion (4)	110 × 130	Mech.	M.ht.	Parallel	Gate	De Dion	—	—	11 8	4 9	5 11½	14 3	7 3½	935 × 135	935 × 135	—	5 or 7	—	£600
	10 Delaunay-Belleville (4)	85 × 120	Mech	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	9 0	5 0	6 0	12 0	—	810 × 90	810 × 90	15 0	7	£380	£440
	15 Delaunay-Belleville (4)	98 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 0	5 0	6 0	14 0	—	880 × 120	880 × 120	17 0	7	£480	£540
	20 Delaunay-Belleville (4)	110 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 0	5 0	6 0	14 0	—	880 × 120	880 × 120	19 0	7	£600	£560
	28 Delaunay-Belleville (4)	120 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	S.C.	—	—	10 0	5 0	6 0	14 0	—	880 × 120	880 × 120	22 0	7	£680	£740
	40 Delaunay-Belleville (4)	134 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	S.C.	—	—	10 6	5 0	6 0	14 0	—	935 × 135	935 × 135	24 0	7	£840	£900
	10 Delaunay-Belleville (6)	72 × 105	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	9 3	5 0	6 0	12 0	—	810 × 90	810 × 90	15 2	7	£420	£480
	15 Delaunay-Belleville (6)	85 × 122	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 3	5 0	6 0	14 0	—	880 × 120	880 × 120	18 0	7	£540	£600
	25 Delaunay-Belleville (6)	98 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 6	5 0	6 0	14 0	—	880 × 120	880 × 120	19 0	7	£780	£840
	40 Delaunay-Belleville (6)	115 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	S.C.	—	—	11 3	5 0	6 0	15 0	—	935 × 135	935 × 135	25 0	7	£960	£1020
	70 Delaunay-Belleville (6)	134 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	S.C.	—	—	11 6	5 0	6 0	15 3	—	935 × 135	1000 × 150	26 0	7	£1400	£1460
	18 Dennis (4)	85 × 110	Pres.	M.ht. Acc.	L'ther cone	Gate	Worm	4	3	8 6	4 3	5 6	12 0	—	810 × 90	810 × 90	—	5	£325	£380
	24 Dennis (4)	100 × 120	Pres.	M.ht. Acc.	L'ther cone	Gate	Worm	4	3	8 6	4 3	5 6	12 0	—	815 × 105	815 × 105	—	5	£400	£470
	28 Dennis (4)	110 × 130	Pres.	M.ht. Acc.	L'ther cone	Gate	Worm	4	3	10 4	4 6	5 6	14 0	—	880 × 120	880 × 120	—	5	£540	£660
	40 Dennis (4)	127 × 130	Pres.	M.ht. Acc.	L'ther cone	Gate	Worm	4	3	10 4	4 6	5 6	14 0	—	880 × 120	880 × 120	—	5	£580	£700
	30 Dolphin Two-cycle (4)	102 × 102	Pres.	M.ht. Acc.	Disc	Gate	P.S.	4	3	9 6	4 7	5 5	12 2	6 4	815 × 105	815 × 105	18 0	5	£445	£500
	16-20 Drummond (4)	95 × 102	Mech.	Acc.	L'ther cone	Gate	P.S.	4	3	9 4½	4 2	5 3	12 9	6 6	810 × 90	810 × 90	—	5	£290	£333
E	16-20 Empress (4)	90 × 127	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	9 0	4 4	5 6	12 6	6 8	810 × 100	810 × 100	16 0	5	£315	£375
	20-24 Empress (6)	90 × 127	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	9 0	4 4	5 6	14 0	7 4	820 × 120	820 × 120	18 0	5	£425	£495
	10-12 Enfield (2)	95 × 114	Mech.	Acc.	L'ther cone	Quad'nt	P.S.	—	—	7 6	4 0	4 9	11 0	6 2	750 × 85	750 × 85	10 2	2 or 4	—	£223
	18-24 Enfield (4)	95 × 115	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	9 3	4 2	5 3	12 6	6 6	815 × 105	815 × 105	15 0	5	—	£368
	25-35 Enfield (4)	120 × 135	Forced	Acc.	L'ther cone	Gate	P.S.	—	—	10 0	4 7	5 6	14 0	6 8½	875 × 105	880 × 120	18 0	5	—	£441
F	12-14 F.I.A.T. (4)	80 × 100	Mech	M.ht.	Disc	Gate	P.S.	3	—	8 4⅜	4 4⅜	—	—	6 4	810 × 90	810 × 90	14 2	—	£320	—
	15-20 F.I.A.T. (4)	90 × 120	Mech.	M.ht.	Disc	Gate	P.S.	4	—	10 1¼	4 6	—	—	7 6	810 × 90	820 × 120	16 2	—	£425	—
	20-25 F.I.A.T. (4)	105 × 130	Mech.	M.ht.	Disc	Gate	S.C.	4	—	10 3¼	4 7	—	—	7 2	910 × 90	920 × 120	—	—	£500	—
	28-35 F.I.A.T. (4)	110 × 130	Mech.	M.ht.	Disc	Gate	P.S.	4	—	10 2¼	4 7	—	—	7 5	910 × 90	920 × 120	19 0	—	£575	—
	35-40 F.I.A.T. (4)	125 × 150	Mech.	M.ht.	Disc	Gate	S.C.	4	—	10 6	4 10	—	—	7 3	910 × 90	920 × 120	—	—	£650	—
	40-50 F.I.A.T. (4)	130 × 150	Mech.	M.ht.	Disc	Gate	P.S.	4	—	10 7½	4 7⅛	—	—	—	910 × 90	920 × 120	—	—	£750	—
	90 F.I.A.T. (Taunus Type) (4)	140 × 129	Mech.	M.ht.	Disc	Gate	S.C.	4	—	10 0	4 7	—	—	—	870 × 90	880 × 120	—	—	£1050	—
	45 F.I.A.T. (6)	110 × 130	Mech.	M.ht.	Disc	Gate	S.C.	4	—	10 10	4 10	—	—	7 9	920 × 105	935 × 135	21 2	—	£800	—
	70 F.I.A.T. (6)	125 × 150	Mech.	M.ht.	Disc	Gate	S.C.	4	—	10 7⅛	4 10	—	—	7 3	910 × 90	935 × 135	—	—	£950	—

*The 9 h.p. and 12 h.p. De Dion models are also made with 8ft. 6in. and 9ft. 1in. wheelbase respectively; price of all models does not include tyres.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheel-base.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cl. qr.			
F	15-18 Ford (4)	95 × 86	Pres.	Acc.	—	Plan'try	Plan'try	2	—	7 0	4 6	5 0	9 0	4 6	750 × 80	750 × 80	7 3	2	—	£180
(cont'd).	20-24 Ford (4)	95 × 102	Mech.	M.lt.	Mult. disc.	Plan'try	Plan'try	2	—	8 4	4 6	5 0	12 0	5 6	760 × 90	760 × 90	10 3	5	—	£225
G	14 Germain (4)	92 × 110	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 3	4 1	5 3	12 10	—	815 × 105	815 × 105	15 0	—	£400	—
	18 Germain (4)	102 × 110	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 3	4 1	5 3	12 10	—	815 × 105	815 × 105	15 2	—	£440	—
	28 Germain (4)	120 × 130	Pres.	M.ht.	Met. to met.	Quad'nt	P.S or S.C	—	—	10 3½	4 9	6 0	14 5	—	880 × 120	880 × 120	22 0	—	£625	—
	100 Germain Grand Prix (4)	155 × 165	Pres.	M.ht.	Met. to met.	Quad'nt	S.C.	—	—	10 3½	4 9	6 0	14 5	—	895 × 135	895 × 135	25 0	—	£1 50	—
	20 Germain (6)	86 × 110	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	10 3½	4 1	5 3	14 5	—	815 × 105	815 × 105	18 0	—	£550	—
	30 Germain (6)	92 × 110	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 10	4 2	5 4	13 9	—	815 × 105	815 × 105	18 0	—	—	—
	40 Germain (6)	102 × 110	Pres.	M.ht.	Met. to met.	Quad'nt	P.S.	—	—	10 10	4 9	6 0	15 2	—	820 × 120	820 × 120	20 0	—	£700	—
	60 Germain (6)	120 × 130	Pres.	M.ht.	Met. to met.	Quad'nt	P.S.	—	—	11 3½	4 9	6 0	15 6	—	880 × 120	895 × 135	25 0	—	£90 0	—
	12-14 Gladiator (4)	80 × 110	Grav.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 0	4 2	4 8	12 5	6 9	810 × 90	810 × 90	17 0	5	£300	£375
	18-24 Gladiator (4)	105 × 127	Mech.	M.ht.	Mult. disc.	Gate	P.S.	—	—	9 9	4 7	5 4	13 6	6 11	870 × 90	880 × 120	20 0	5	£475	£565
	18-28 Gladiator (4)	95 × 130	Mech.	M.ht.	Mult. disc.	Gate	S.C.	—	—	9 6	4 7	5 4½	13 5	6 10	870 × 90	880 × 120	20 0	5	£440	£560
	25-35 Gladiator (4)	105 × 140	Mech.	M.ht.	Mult. disc.	Gate	S.C.	—	—	9 10	4 8	5 7½	13 9	6 10	875 × 105	880 × 120	22 0	5	£540	£635
	35-45 Gladiator (4)	115 × 140	Mech.	M.ht.	Mult. disc.	Gate	S.C.	—	—	9 10	4 8	5 7½	13 9	6 10	875 × 105	880 × 120	23 0	5	£600	£685
	40 Gladiator (4)	120 × 127	Mech.	M.ht.	Mult. disc.	Gate	P.S or S.C	—	—	9 9	4 7	5 4	13 6	6 9	910 × 100	920 × 120	23 0	5	£600	£685
	60 Gladiator (6)	120 × 127	Mech.	M.ht. 2 sets	Mult. disc.	Gate	P.S or S.C	—	—	10 6	4 7	5 4	14 3	6 6	915 × 105	920 × 120	25 0	5	£800	£885
	*15-20 Gobron-Brillié (4)	75 × 150	Mech.	M.ht.	Dbl. clutch	Gate	P.S.	—	—	—	—	—	—	—	815 × 105	815 × 108	18 0	—	£500	—
	28-40 Gobron-Brillié (4)	92 × 180	Mech.	M.ht.	Dbl. clutch	Gate	S.C.	—	—	—	—	—	—	—	880 × 120	880 × 120	22 0	—	£750	—
	40-60 Gobron-Brillié (4)	110 × 200	Mech.	M.ht.	Dbl. clutch	Gate	S.C.	—	—	—	—	—	—	—	920 × 120	920 × 120	26 0	—	£960	—
	70-90 Gobron-Brillié (6)	110 × 200	Mech.	M.ht.	Dbl. clutch	Gate	S.C.	—	—	—	—	—	—	—	935 × 135	935 × 155	30 0	—	£1550	—
	*8 Grégoire (2)	80 × 110	Mech.	M.ht.	Cone	Quad'nt	P.S.	—	—	7 3	—	—	—	—	750 × 85	750 × 85	—	2	—	—
	16 Grégoire (4)	80 × 110	Mech.	M.ht.	Cone	Quad'nt	P.S.	—	—	8 6	—	—	—	—	810 × 90	810 × 90	—	4	—	—
H	12-15 Hillman-Coatalen (4)	89 × 96	Mech.	Acc.	L'ther cone	Gate	P.S.	3	—	9 0½	4 2	5 0½	12 2	6 6	760 × 90	760 × 90	16 0	4	£268	£298
	25 Hillman-Coatalen (4)	127 × 127	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	—	10 0	4 7	5 5⅛	13 9	6 8½	810 × 100	810 × 100	22 0	5	£460	£500
	40 Hillman-Coatalen (6)	127 × 127	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	—	11 1½	4 7	5 10	14 10	6 8½	820 × 120	820 × 120	25 0	5	£650	£700
	12-16 Horbick (4)	80 × 90	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 0	3 9	4 8	10 3	5 10	760 × 100	760 × 100	15 0	4	£300	£350
	*20-24 Horbick (4)	108 × 114	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	3	8 10	4 3	5 4	12 5	6 3	815 × 105	815 × 105	17 0	5	£475	£550
	*30-40 Horbick (4)	—	Pres.	M.ht. Acc.	Hele-Shaw	Gate	P.S.	3	3	11 6	4 6	5 9	16 6	8 0	920 × 120	920 × 120	24 0	7	£650	£750
	18-24 Horbick (6)	80 × 90	Pres.	M.ht.	L'ther cone	Gate	P.S.	3	—	9 6	4 3	5 0	14 0	6 6	870 × 90	880 × 120	17 0	5	£500	£600
	†Hotchkiss																			
	8 Humber (2)	90 × 120	Mech.	M.ht. Acc.	Metal disc	Gate	P.S.	3	3	7 6	4 0	4 10	10 8	5 0	750 × 85	750 × 85	11 0	2	—	£195
	10-12 Coventry Humber (4)	83 × 95	Splash	Acc.	L'ther cone	Gate	P.S.	3	3	8 0	4 0	5 0	12 0	5 11	760 × 90	760 × 90	15 0	4	—	£250
	15 Coventry Humber (4)	97 × 114	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	3	8 10	4 3	5 3	12 10	6 5	810 × 90	810 × 90	18 0	4	—	£315
	20 Beeston Humber (4)	105 × 130	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	4	9 3	4 6	5 3	12 6	6 9½	810 × 90	810 × 90	21 0	5	—	£435
	22 Humber (4)	90 × 140	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	4	9 3	4 6	5 3	12 6	6 9½	820 × 120	820 × 120	21 0	5	—	£460
	28 Humber (4)	100 × 150	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	4	10 2	4 6	5 3	13 6	7 10	880 × 120	880 × 120	26 0	5	—	£525
	30 Coventry Humber (6)	102 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	3	9 10	4 4½	5 6	13 10	6 5	815 × 105	815 × 105	23 0	5	—	£450
I	16-20 Imperia (4)	90 × 120	Pres.	M.ht.	Hele-Shaw	Gate	P.S.	3	3	9 4	4 4	—	—	—	—	—	—	—	£350	—
	25 Iris (4)	108 × 133	Mech.	M.ht.	Mult. disc.	Gate	P.S.	3	3	10 3	4 8	5 5	14 1	7 3	880 × 120	880 × 120	18 0	5	£575	£650
	*35 Iris (4)	127 × 133	Mech.	M.ht. Acc.	Mult. disc.	Gate	P.S.	3	3	10 3	4 8	5 5	14 1	7 3	880 × 120	880 × 120	19 0	5	£700	£775
	40 Iris (6)	108 × 133	Mech.	M.ht.	Mult. disc.	Gate	P.S.	3	3	11 0	4 8	5 5	14 10	6 7	920 × 120	920 × 120	24 0	5	£875	£950
	† Itala																			

*Gobron-Brillié cars may be obtained in a variety of wheelbases. Grégoire cars are both made with 8ft. wheelbases for two or four-seated body. 20-24 h.p and 30-40 h.p. Horbick models have independent ignitions. 35 h.p. Iris has independent ignition systems. All models can have 12in. extra wheelbase at £25 extra.

†Particulars of these cars will be found at the end of the list if received in time to be included.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.

Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.

C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direction.	Wheel-base.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
J 8 Jackson Dogcart (*1*)	100 × 120	Pres.	De Dion	L'ther cone	Quad'nt	P.S.	3		8 6	4 3	4 9	11 0	6 6	800 × 85	800 × 85	10 0	4	£200	£225
12 Jackson (*2*)	85 × 140	Pres.	De Dion	L'ther cone	Quad'nt	P.S.	3	—	8 6	4 3	4 9	10 9	5 3	800 × 85	800 × 85	11 0	2	£230	£250
16 Jackson (*4*)	84 × 110	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	10 0	4 3	4 9	12 0	6 6	800 × 85	800 × 85	12 2	2	£320	£340
13 Jackson (*6*)	76 × 90	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	—	10 0	4 3	4 9	12 0	6 6	800 × 85	800 × 85	12 0	2	£320	£340
*25 J. and B. Vertex (*4*)	102 × 127	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	—	—	10 0	4 6½	5 2	14 2	7 0	875 × 105	875 × 105	15 0	5	£350	£400
16-20 J. and B. (*4*)	89 × 114	Vac'm	Acc.	Met. to met.	Quad'nt	S.C.	—	—	8 6	4 8½	5 8	12 0	8 3	870 × 90	870 × 90	15 0	6	£230	£380
25-30 J. and B. (*4*)	114 × 152	Vac'm	Acc.	Met. to met.	Gate ..	S.C.	—	—	8 6	4 8½	5 8	12 0	8 3	875 × 105	875 × 105	15 0	6	£300	£450
45 J. and B. Vertex (*6*)	133 × 127	Mech.	Acc.	Met. to met.	Gate ..	S.C.	—	—	11 6	4 2½	4 8	15 2	7 9	875 × 105	880 × 120	25 0	5	£450	£550
†Junior																			
L 12 La Buire (*4*)	75 × 120	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	9 1	4 5½	—	—	—	810 × 90	810 × 90	—	—	£340	—
18 La Buire (*4*)	100 × 130	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	9 10	4 5½	—	—	—	880 × 120	880 × 120	—	—	£512	—
28 La Buire (*4*)	120 × 140	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	10 0	4 7⅛	—	—	—	880 × 120	880 × 120	—	—	£620	—
*15 La Buire (*4*)	98 × 120	Mech.	M.ht.	Disc	Gate ..	S.C.	—	—	7 9	4 5½	—	—	—	815 × 105	815 × 105	—	2	—	£500
*28 La Buire (*4*)	120 × 140	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	9 5½	4 7⅛	—	—	—	815 × 105	815 × 105	—	2	—	£640
10 La Buire (*6*)	80 × 120	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	10 5	4 5⅛	—	—	—	815 × 105	815 × 105	—	—	£540	—
24 La Buire (*6*)	92 × 120	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	10 6	4 7⅛	—	—	—	880 × 120	880 × 120	—	—	£660	—
30 La Buire (*6*)	102 × 130	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	10 8	4 7⅛	—	—	—	880 × 120	880 × 120	—	—	£760	—
40 La Buire (*6*)	120 × 140	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	11 6	4 9⅛	—	—	—	920 × 120	935 × 135	—	—	£860	—
20 Lanchester (*4*)	100 × 75	Pres.	M.ht.	Mult. disc..	Quad'nt	Worm..	3	-	9 5	4 10	5 6	12 6	8 0	875 × 105	875 × 105	20 0	5	£450	£550
*28 Lanchester (*6*)	100 × 75	Pres.	M.ht.	Mult. disc..	Gate ..	Worm..	3	—	10 5	4 10	5 6	13 6	9 0	880 × 120	880 × 120	22 0	5	£600	£700
20 Lancia (*4*)	95 × 110	Mech.	M.ht.	Disc	Gate ..	P.S.	3	3	9 3	4 6½	5 5	12 6	6 10	810 × 90	820 × 120	15 0	4	£400	£500
15 Lancia (*4*)	90 × 100	Mech.	M.ht.	Disc	Gate ..	P.S.	3	3	9 3	4 6⅜	5 5	12 6	6 10	810 × 90	820 × 120	15 0	4	£400	£500
30 Lancia (*6*)	90 × 100	Mech.	M.ht.	Disc	Gate ..	P.S.	3	3	10 8	4 6½	5 5	14 6	7 3	810 × 90	820 × 120	17 0	4	£560	£660
*10 Laurin-Klement (*2*)	90 × 110	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	3	6 10	3 11	4 11	9 7	5 3	700 × 85	700 × 85	11 0	2 or 4	£180	£195
*14-16 Laurin-Klement (*4*)	84 × 110	Mech.	M.ht. Acc.	L'ther cone	Q. or G.	P.S.	3	3	8 10	4 4	5 4	12 7	7 0	760 × 90	760 × 90	17 0	4 or 5	£332	£399
8-10 Londonia (*2*)	102 × 102	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	3	8 6	4 5	5 4	11 6	5 10	800 × 85	800 × 85	10 2	4	£220	£260
20 Londonia (*4*)	102 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	3	9 6	4 5	5 6	13 0	6 10	870 × 90	870 × 90	16 0	5	£275	£350
40 Londonia (*6*)	102 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	3	11 0	4 8	5 9	14 6	8 2	875 × 105	875 × 105	17 1	5	£375	£450
10 Lorraine-Dietrich (*2*)	80 × 120	—	M.ht.	Cone	—	P.S.	—	—	8 2½	4 8	5 6	—	6 7	800 × 85	800 × 85	—	—	£236	—
15 Lorraine-Dietrich (*4*)	90 × 120	Mech.	M.ht.	Metal discs	Gate ..	P.S.	—	—	9 10½	4 8	5 6	13 6	7 3½	875 × 105	875 × 105	—	—	£450	—
*20 Lorraine-Dietrich (*4*)	110 × 130	Mech.	M.lt.	Metal discs	Gate ..	P.S.	—	—	10 3	4 9	5 9	14 0	7 6	870 × 90	880 × 120	—	—	£550	—
30 Lorraine-Dietrich (*4*)	120 × 140	Mech.	M.lt.	Metal discs	Gate ..	S.C.	—	—	10 0	4 9	5 9	14 0	7 0	870 × 90	920 × 120	—		£680	
40 Lorraine-Dietrich (*4*)	130 × 150	Mech.	M.lt.	Metal discs	Gate ..	S.C.	—	—	10 0½	4 9	5 9	14 6	7 0	875 × 105	935 × 135	—	—	£800	—
60 Lorraine-Dietrich (*4*)	146 × 180	Mech.	M.lt.	Met. to met.	Gate ..	S.C.	—	—	10 10	4 9	5 6	14 6	7 0	875 × 105	935 × 135	—	—	£960	—
15 Lorraine-Dietrich (*6*)	80 × 120	Mech.	M.ht.	Metal discs	Gate ..	P.S.	—	—	10 8	4 8	5 6	15 0	6 9	875 × 105	875 × 105	—	—	£540	—
70 Lorraine-Dietrich (*6*)	130 × 150	Mech.	M.lt.	Metal discs	Gate ..	S.C.	—	—	11 6	4 9	5 9	—	7 6	875 × 105	935 × 135	—	—	£1040	—
*10-12 Lotis (*2*)	95 × 95	Mech.	Acc.	Plate	Foot ..	P.S.	2	2	7 6	4 10	5 11	10 11	7 10	810 × 90	810 × 90	15 0	2	£250	£285
12-18 Lotis (*2*)	102 × 127	Mech.	Acc.	Plate	Foot ..	P.S.	2	2	7 6	4 10	5 11	10 11	7 10	810 × 100	810 × 100	16 0	2	£270	£325
M 18-24 Marca-Tre-Spade (*4*)	100 × 120	Mech.	M.ht.	Mult. disc..	Gate ..	S.C.	—	—	9 6	—	—	—	—	880 × 120	880 × 120	—	5	£400	£470
12 Martini (*4*)	63 × 90	Grav.	M.ht.	Disc	Gate ..	P.S.	—	—	8 1	4 0	—	—	—	700 × 85	700 × 85	—	2 or 4	£230	£290
16 Martini (*4*)	80 × 110	Pres.	M.lt.	L'ther cone	Gate ..	P.S.	2	—	9 0	4 1	4 9	12 5	—	810 × 90	810 × 90	14 0	4	£360	£425

*The J. and B. Vertex models have vertical cylinders; the other two have horizontal engines for landaulet bodies. La Buire *Voitures-du-Course*. Lanchester cars may be had with 12in. longer wheelbase. Laurin-Klement ignitions have distributer in common; 14-16 h.p. chassis with 9ft. 4in. wheelbase, £341. 20 h.p. Lorraine-Dietrich may be had with either M.lt. or M.ht. ignition, S.C. drive, or 10ft. 9in. wheelbase; 30 h.p., 40 h.p., and 70 h.p. models are also made with longer wheelbases. Lotis plate clutch has cork insertions. †Particulars of these cars will be found at the end of the list if received in time to be included.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Weight of Chassis	No. of Seats.	Price. Chassis only.	Price. Car Complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cwt. qr.			
20 Martini (4)	90 × 120	Pres.	M.lt.	L'ther cone	Gate ..	P.S.	4	—	9 5	4 3½	5 1	12 9	—	815 × 105	815 × 105	16 0	4	£400	£465
28 Martini (4)	105 × 130	Pres.	M.lt.	L'ther cone	Gate ..	S.C.	4	—	10 0	4 7	5 4	13 7	—	875 × 105	875 × 105	13 2	5	£500	£575
40 Martini (4)	126 × 150	Pres.	M.lt.	L'ther cone	Gate ..	S.C.	4	—	10 5	4 7	5 4	14 3	—	915 × 105	920 × 120	18 0	5	£700	£775
60 Martini (4)	134 × 140	Pres.	M.lt.	L'ther cone	Gate ..	S.C.	4	—	10 7	4 7	5 4	14 8	—	915 × 105	920 × 130	20 2	5	£800	£900
8 Mass (1)	110 × 130	Grav.	Acc.	L'ther cone	Quad'nt	S.C.	2	2	6 0	3 9	4 0	9 0	—	700 × 85	700 × 85	8 0	2	—	£100
8-10 Mass (2)	85 × 100	Grav.	Acc.	L'ther cone	Quad'nt	P.S.	3	3	6 8	4 0	4 11	10 8	4 10½	700 × 85	700 × 85	14 0	4	—	£195
15 Mass, Special (4)	95 × 120	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	3	3	9 0	4 3	5 6	13 0	6 8½	810 × 90	810 × 90	16 0	5	£325	£375
20 Mass, Special (4)	110 × 130	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	3	3	9 3	4 3	5 6	13 4	6 8½	870 × 90	875 × 105	18 0	5	£400	£485
24-30 Mass (4)	110 × 130	Mech.	M.ht.	L'ther cone	Quad'nt	P.S & S.C	3	3	10 0	4 3	6 5	13 8	7 2	870 × 90	875 × 105	21 0	5	£500	£580
28-32 Mass (4)	125 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	P.S & S.C	3	3	10 0	4 3	6 5	13 8	7 2	870 × 90	875 × 105	21 0	5	£500	£580
40-50 Mass (4)	135 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	10 0	4 3	6 5	13 8	7 2	875 × 105	680 × 120	25 0	5	£600	£700
25-30 Maudslay (4)	114 × 127	Mech.	M. Acc.	L'ther cone	Gate ..	P.S.	4	3	10 6	4 9	5 7¼	14 4¾	7 0	880 × 120	880 × 120	—	—	£575	—
*35-45 Maudslay (4)	127 × 127	Mech.	M. Acc.	L'ther cone	Gate ..	P.S.	4	3	11 0	4 9	5 7¼	14 10¾	7 6	935 × 135	935 × 135	—	—	£700	—
60 Maudslay (6)	127 × 127	Mech.	M. Acc.	L'ther cone	Gate ..	S.C.	—	—	11 6	—	6 0	16 0	7 6	935 × 135	935 × 135	23 0	—	£975	—
35-40 Mercedes (4)	110 × 140	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	11 0	4 9	5 9	15 0	—	875 × 105	880 × 120	23 2	—	—	—
45-50 Mercedes (4)	120 × 150	Mech.	M.ht.	Scroll	Gate ..	S.C.			11 0	4 9	5 5	13 6	—	910 × 90	920 × 120	22 2	—	—	—
65 Mercedes (6)	120 × 140	Mech.	M.ht.	Scroll	Gate ..	S.C.	—	—	11 2	4 10	5 5	15 0	—	910 × 90	920 × 120	26 0	—	—	—
75 Mercedes (6)	120 × 150	Mech.	M.ht.	Scroll	Gate ..	S.C.	—	—	12 0	4 10	5 5	16 0	—	915 × 105	920 × 120	27 0	—	—	—
14 Métallurgique (4)	75 × 110	Pres.	M.	Metal	—	P.S.	—	—	—	—	—	—	—	760 × 90	760 × 90	13 0	2	—	£275
18 Métallurgique (4)	85 × 130	Pres.	M.	Metal	—	P.S.	—	—	—	—	—	—	—	810 × 90	810 × 90	15 2	4	£380	£435
26 Métallurgique (4)	102 × 150	—	M.	Metal	—	P.S.	—	—	—	—	—	—	—	870 × 90	880 × 120	17 2	4	£525	£585
40-50 Métallurgique (4)	127 × 152	—	M.	Metal	—	P.S.	—	—	—	—	—	—	—	875 × 105	880 × 120	21 0	4	£750	£820
14-16 Miesse Petrol (4)	80 × 110	Grav.	M.ht.	Hele-Shaw	Gate ..	P.S.	3	3	8 5	4 3½	5 2	11 9½	6 6½	810 × 90	810 × 90	15 0	4	£225	£280
24-30 Miesse Petrol (4)	110 × 120	Mech.	M.ht.	Hele-Shaw	Gate ..	P.S.	3	3	9 3	4 3½	5 5	13 10½	7 0½	815 × 105	815 × 105	17 2	5	£440	£510
35-40 Miesse Petrol (6)	100 × 120	Mech.	M.ht.	Hele-Shaw	Gate ..	P.S.	3	3	9 9½	4 3½	—	14 10	7 0½	880 × 120	880 × 120	18 1	5	£600	£700
15 Minerva (4)	85 × 110	Mech.	M.ht.	L'ther cone	Gate ..	P.S.	4	4	8 7½	4 2½	—	—	—	815 × 105	815 × 105	—	5	£340	£395
18 Minerva (4)	102 × 115	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	3	9 5½	4 2½	—	—	—	815 × 105	815 × 105	—	5	£410	£465
25 Minerva (4)	106 × 115	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	4	9 5½	4 7	—	—	—	880 × 120	880 × 120	—	5	£480	£540
*38 Minerva (4)	124 × 130	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	4	9 10	4 9	—	—	—	880 × 120	880 × 120	—	5	£590	£650
40 Minerva (6)	105 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	4	10 9	4 10	—	—	—	880 × 120	895 × 135	—	5	£590	£650
*50 M.M.C. (6)	110 × 150	Mech.	M.ht. Acc.	Mult. plate	Gate ..	P.S.	3	—	11 3	4 6	5 4	15 1¾	7 3	880 × 120	880 × 120	27 0	—	—	—
10 Mors (4)	80 × 90	Pres.	M.ht.	Metal	Quad'nt	P.S.	—	—	9 0	4 3	—	—	—	810 × 90	810 × 90	16 0	4	£380	£440
15 Mors (4)	90 × 100	Pres.	M.ht.	Metal	Gate ..	P.S.	—	—	10 3	4 7	—	—	—	810 × 90	920 × 120	17 0	5	£400	£465
20 Mors (4)	95 × 130	Mech.	M.ht.	Metal	Gate ..	P.S.	—	—	10 0	4 6	—	—	—	880 × 120	880 × 120	18 2	5	£500	£575
30 Mors (4)	114 × 150	Mech.	M.lt. Acc.	Metal	Gate ..	S.C.	—	—	9 6	4 8	—	—	—	880 × 120	880 × 120	19 0	5	£680	£770
45 Mors (4)	125 × 150	Mech.	M.lt. Acc.	Metal	Quad'nt	S.C.	—	—	9 10	4 8	—	—	—	880 × 120	880 × 120	19 2	5	£800	£890
50 Mors (6)	114 × 150	Mech.	M.lt. Acc.	Metal	Gate ..	S.C.	—	—	11 4	4 7	—	—	—	880 × 120	880 × 120	23 0	5	£1000	£1090
9 Motobloc (1)	100 × 120	Grav.	M.ht.	Met. to met.	Quad'nt	P.S.	—	—	6 11	4 1½	—	—	—	750 × 85	750 × 85	11 0	—	£205	£225
14-16 Motobloc (4)	80 × 100	Grav.	M.ht.	Met. to met.	Quad'nt	P.S.	3	3	8 8	4 1½	—	—	—	760 × 90	760 × 90	—	—	£330	—
18 Motobloc (4)	90 × 110	Pres.	M.ht.	Met. to met.	Gate ..	P.S. or S.C.	4	4	9 2	4 6	—	—	—	810 × 90	810 × 90	—	—	£400	—
25 Motobloc (4)	100 × 120	Pres.	M.ht.	Met. to met.	Gate ..	P.S. or S.C.	4	4	9 6	4 8	—	—	—	880 × 120	880 × 120	—	—	£500	—
35 Motobloc (4)	120 × 120	Pres.	M.ht.	Met. to met.	Gate ..	S.C.	4	4	10 2	4 8	—	—	—	880 × 120	880 × 120	—	—	£620	—
45 Motobloc (4)	130 × 130	Pres.	M.ht.	Met. to met.	Gate ..	S.C.	4	4	10 2	4 8	—	—	—	880 × 120	880 × 120	—	—	£740	—
70 Motobloc (4)	165 × 140	Pres.	M.ht.	Met. to met.	Gate ..	S.C.	4	4	10 10	4 8	—	—	—	920 × 120	920 × 120	—	—	£1120	—
16 M.P. (4)	80 × 100	Pres.	M.ht. Acc.	Hele-Shaw	Gate ..	P.S.	4	—	9 0	4 0	4 6	11 6	6 4	810 × 90	810 × 90	17 0	—	£295	—
30 M.P. (4)	112 × 140	Pres.	M.ht. Acc.	Hele-Shaw	Gate ..	P.S.	4	—	10 0	4 7	5 4	13 6	7 6	880 × 120	880 × 120	19 0	—	£495	—

*35-45 h.p. Maudslay also made with chain drive and 11ft. 6in. wheelbase. 38 h.p. Minerva has slide valve engine. 50 h.p. M.M.C. has independent ignition systems.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.

Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.

C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
14-18 Nagant-Hobson (4)	90 × 110	Mech.	M.ht.	Mult. disc	Quad'nt	P.S.	3	3	9 0	4 4	5 4	13 0	6 8	815 × 105	815 × 105	14 2	5	£350	£400
20-30 Nagant-Hobson (4)	106 × 130	Mech.	M.lt. Acc.	Mult. disc	Gate	S.C.	4	4	9 8	4 5	5 6	13 6	6 9⅝	875 × 105	880 × 120	17 0	5	£475	£525
35-40 Nagant-Hobson (4)	125 × 140	Mech.	M.lt. Acc.	Mult. disc	Gate	S.C.	4	4	10 4	4 9	5 9	14 0	7 1	875 × 105	880 × 120	20 0	7	£650	£700
†New Arrol Johnston																			
14 Nameless (4)	80 × 90	Grav.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	3	8 6	4 0	5 0	11 8	5 6	760 × 90	760 × 90	15 1	3	£290	—
10 Napier (2)	82 × 127	Mech.	M.ht.	Met. to met.	Gate	P.S.	3	3	8 0	4 6	5 6	12 0	6 5½	810 × 90	810 × 90	14 0	4	£295	£375
15 Napier (4)	82 × 127	Mech.	M.ht.	Met. to met.	Gate	P.S.	3	3	8 8	4 6	5 6	12 0	6 6	810 × 90	810 × 90	16 0	5	£350	£430
30 Napier (6)	82 × 127	Mech.	M.ht. Acc.	Met. to met.	Gate	P.S.	3	3	10 0	4 8	5 7	14 3	7 0	870 × 90	880 × 120	19 0	5	£545	£635
*40 Napier (6)	101 × 101	Mech.	M.ht. Acc.	Met. to met.	Gate	P.S.	3	3	11 2	4 8	5 6	15 3½	7 5	880 × 120	880 × 120	23 0	5	£745	£865
45 Napier (6)	101 × 127	Mech.	M.ht. Acc.	Met. to met.	Gate	P.S.	3	3	11 2	4 8	5 6	15 3½	7 5	880 × 120	880 × 120	24 0	5	£795	£915
60 Napier (6)	127 × 101	Mech.	M.ht. Acc.	Met. to met.	Gate	P.S.	3	3	11 2	4 8	5 6	15 4	7 5	880 × 120	895 × 135	26 0	5	£975	£1095
65 Napier (6)	127 × 127	Mech.	M.ht. Acc.	Met. to met.	Gate	P.S.	3	3	11 2	4 8	5 6	15 4	7 5	880 × 120	895 × 135	26 0	5	£1050	£1170
90 Napier (6)	155 × 127	Mech.	M.ht. Acc.	Met. to met.	Quad'nt	P.S.	3	3	11 11	4 8	5 11	16 4	7 5	935 × 135	935 × 135	28 0	5	£1500	£1620
†N.A.G.																			
*20 New Engine Car (2)	114 × 114	Mech.	M.ht. Acc.	L'ther cone	Gate	Worm	4	4	9 6	4 7	5 1	12 4	9 6	875 × 105	875 × 105	19 0	4 or 6	£450	£550
30 New Engine Car (4)	114 × 114	Mech.	M.ht. Acc.	L'ther cone	Gate	Worm	4	4	10 6	4 10	5 4	13 6	10 0	920 × 120	920 × 120	21 0	6	£600	£700
*40 New Engine Car (4)	127 × 114	Mech.	M.ht. Acc.	L'ther cone	Gate	Worm	4	4	10 6	4 11	5 5	13 6	10 0	920 × 120	920 × 120	23 0	8	£700	£800
14-16 New Pick (4)	90 × 102	Force	M.	Fibre cone	Side l'v'r	Live axle	3	3	9 3	—	5 0	12 0	6 0	800 × 85	800 × 85	12 2	4	—	£195
16 Nordenfelt (4)	80 × 100	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	9 2	4 0	4 7	11 6	—	760 × 90	760 × 90	12 0	2 or 4	£295	£350
20 Nordenfelt (4)	90 × 120	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S.	—	—	9 5	4 4	5 2	13 1	—	815 × 105	815 × 105	16 0	4 or 5	£395	£450
30-35 Nordenfelt (4)	112 × 140	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S.	—	—	9 11	4 5	5 2	13 7	—	875 × 105	875 × 105	19 0	5 or 6	£495	£560
10 Northern (2)	100 × 112	Grav.	Acc.	L'ther cone	Quad'nt	S.C.	3	—	7 6	4 4	5 4	11 6	—	810 × 90	810 × 90	13 2	4	£240	£300
20 Northern (4)	100 × 112	Grav.	Acc.	L'ther cone	Quad'nt	S.C.	3	—	9 0	4 4	6 4	13 0	—	875 × 105	875 × 105	17 0	5	£365	£435
6-12 Opel (2)	—	Mech.	M.ht.	L'ther cone	Gate	P.S.	3	3	—	4 3	—	—	—	800 × 85	810 × 90	—	5	£235	£260
*8-14 Opel (2)	105 × 120	Pres.	M.lt.	L'ther cone	Gate	P.S.	3	3	7 4	4 3	—	—	—	800 × 85	810 × 90	—	4	£250	£290
10 Opel (4)	64 × 120	Mech.	M.ht.	L'ther cone	Gate	P.S.	3	3	—	—	—	—	—	—	750 × 85	—	5	£275	£300
10-18 Opel (4)	90 × 100	Mech.	M.ht.	L'ther cone	Gate	P.S.	3	4	9 6	4 3	5 3	13 0	7 3	810 × 90	810 × 90	—	5	£388	£450
18-30 Opel (4)	112 × 120	Mech.	M.lt.	L'ther cone	Gate	P.S.	4	4	10 4	4 8	—	—	—	870 × 90	880 × 120	—	5	£535	£625
25-40 Opel (4)	120 × 140	Mech.	M.lt.	Bronze cone	Gate	P.S.	4	4	10 8	4 8	5 6	15 4	7 4	870 × 100	880 × 120	—	7	£675	£775
45-60 Opel (4)	140 × 140	Mech.	M.lt.	Bronze cone	Gate	P.S.	4	4	10 8	4 8	5 6	15 4	7 4	880 × 120	895 × 135	—	7	£875	£975
*25 Orleans (4)	102 × 115	Mech.	M.ht.	Met. to met.	Quad'nt	P.S.	3	3	9 9	4 3½	5 4	13 0	6 10	815 × 105	815 × 105	17 0	5 to 6	£455	£575
*34 Orleans (4)	118 × 128	Mech.	M.ht.	Met. to met.	Gate	P.S.	4	3	10 0	4 6	5 6	13 8	6 10	880 × 120	880 × 120	21 0	5 to 6	£585	£710
40 Orleans (4)	136 × 150	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	3	10 10	4 6	5 6	14 11	6 10	920 × 120	920 × 120	23 0	5 to 8	£800	£900
45 Orleans (6)	110 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	3	11 0	4 6	5 6	14 9	6 10	880 × 120	880 × 120	21 0	5 to 8	£875	£975
*20 Owen (4)	102 × 120	Mech.	M.ht. Acc.	—	—	—	4	4	10 6	4 8	4 10	14 2	7 2	870 × 90	870 × 90	15 0	5	£330	£380
*40 Owen (4)	115 × 165	Mech.	M.ht. Acc.	Inv. cone	Gate	P.S.	4	4	12 0	5 0	5 4	16 0	8 5½	920 × 120	935 × 135	19 0	6	£485	£585
*60 Owen (6)	115 × 165	Mech.	M.ht. Acc.	—	—	—	4	4	12 0	5 0	5 4	16 10	8 5½	920 × 120	935 × 135	20 1	6 to 8	£650	£775
8-10 Panhard (2)	80 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 3	4 8	5 3	10 11	6 5½	810 × 90	810 × 90	—	—	£240	—
10-15 Panhard (4)	81 × 120	Mech.	M.ht.	Mult. disc	Quad'nt	P.S.	4	4	9 4½	4 8⅜	5 4	12 8½	7 2½	875 × 105	875 × 105	17 0	—	£400	—
15-25 Panhard (4)	91 × 130	Mech.	M.ht.	Mult. disc	Quad'nt	P.S.	4	4	9 6	4 8⅜	5 4	12 10	7 2½	875 × 105	875 × 105	18 2	—	£460	—
15-25 Panhard (4)	91 × 130	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 1	4 8⅜	5 4	14 2	7 5	920 × 120	920 × 120	19 0	—	£460	—
18-30 Panhard (4)	100 × 130	Mech.	M.ht.	Mult. disc	Quad'nt	P.S.	4	4	9 7½	4 8¾	5 4	13 3½	7 3½	920 × 120	920 × 120	19 0	—	£540	—

*40 h.p. Napier can also be supplied with quadrant gear change and chain drive at £695 chassis, £815 complete. 20 and 40 h.p. New Engine cars are also made with 10ft. and 11ft. 6in. wheelbases respectively. 8-14 h.p. Opel chassis, with 9ft. 2in. wheelbase, £275. 25 and 34 h.p. Orleans have independent ignitions.
Owen cars all have independent ignition sets. †Particulars of these cars will be found at the end of the list if received in time to be included.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cr. qr.			
P	18-30 Panhard (4)	100 × 130	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 2½	4 8¾	5 4	14 2	7 5	920 × 120	920 × 120	19 2	—	£540	—
ont.)	25-35 Panhard (4)	110 × 140	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 4½	4 9	5 4	14 3	7 5	920 × 120	920 × 120	21 0	—	£600	—
	35-45 Panhard (4)	125 × 150	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 8	4 9	5 4	14 5½	7 5	920 × 120	920 × 120	22 0	—	£720	—
	50 Panhard (4)	145 × 160	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 10	4 9	5 4	15 0	7 1	920 × 120	935 × 135	23 0	—	£1000	—
	30 Panhard (6)	90 × 130	Pres.	M.ht.	Mult. disc	—	S.C.	4	4	9 1½	4 3	4 10	—	5 0	875 × 105	880 × 120	20 0	—	£660	—
	65 Panhard (6)	135 × 140	Mech.	M.ht.	Mult. disc	Quad'nt	S.C.	4	4	10 6¾	4 8	5 3	14 8	6 4¾	920 × 120	920 × 120	22 0	—	£1160	—
	†Peugeot.																			
	8 Phœnix (2)	80 × 80	Pres.	Acc.	Mult. plate	Quad'nt	S.C.	2	2	6 1	3 4	3 10	8 10	3 5	700 × 80	700 × 80	8 2	2	—	£140
	10-12 Phœnix (2)	90 × 100	Pres.	Acc.	Single plate	Quad'nt	S.C.	3	3	8 0	4 0	4 10	11 4	5 6	750 × 85	750 × 85	12 0	4	—	£235
	12-16 Piccard-Pictet (4)	90 × 100	—	M.ht.	Disc	—	P.S.	3	3	8 10	4 3	—	—	—	810 × 90	810 × 90	13 0	—	£380	—
	18-24 Piccard-Pictet (4)	100 × 120	—	M.ht.	Disc	—	P.S.	4	4	10 0	4 5	—	—	—	875 × 105	875 × 105	17 0	—	£540	—
	28-50 Piccard-Pictet (4)	130 × 130	—	M.ht.	Disc	—	P.S.	4	4	10 4	4 8	—	—	—	920 × 120	920 × 120	21 0	—	£680	—
	28-40 Piccard-Pictet (6)	100 × 120	—	M.ht.	Disc	—	P.S.	4	4	10 11	4 8	—	—	—	920 × 120	920 × 120	21 0	—	£700	—
	18 Pilain (4)	90 × 120	Mech.	M.	Plate	Gate	Pilain	—	—	—	—	—	—	—	815 × 105	815 × 105	14 0	—	£420	—
	24 Pilain (4)	100 × 130	Pres.	M.	Plate	Gate	Pilain	—	—	—	—	—	—	—	875 × 105	875 × 105	18 0	—	£520	—
	35 Pilain (4)	124 × 140	Pres.	M.	Plate	Gate	Pilain	—	—	—	—	—	—	—	880 × 120	880 × 120	20 0	—	£640	—
	8 Pilgrim (2)	86 × 76	Mech.	M.ht.	Expanding	Auto.	P.S.	3	3	7 0	3 5	4 4	9 6	4 7	760 × 76	760 × 76	5 2	2	—	—
	*32 Pilgrim (4)	114 × 127	Mech.	M.ht.	Coil	Auto.	C.C.	3	2	8 6	4 6	5 3	12 0	7 2	860 × 102	890 × 127	20 0	—	£493	—
R	8 Renault (2)	75 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	6 5	3 4	4 5½	9 6½	—	700 × 85	700 × 85	—	2	—	£200
	10-14 Renault (4)	75 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	8 11	4 5	5 3½	12 6	—	800 × 85	810 × 90	—	—	—	—
	14-20 Renault (4)	90 × 120	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 1½	4 5½	5 5½	13 10	—	875 × 105	875 × 105	—	—	—	—
	20-30 Renault (4)	100 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	10 1½	5 2	5 1	13 6	—	875 × 105	880 × 120	—	—	—	—
	35-45 Renault (4)	130 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	11 0	4 7	5 6½	14 11	—	915 × 105	920 × 120	—	—	—	—
	50-60 Renault (6)	120 × 140	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	13 0	4 9	5 10	16 9	—	935 × 135	935 × 135	—	—	—	—
	*10 Reo (1)	120 × 152	Grav.	M. Acc.	Disc	Epicyc.	C.C.	2	2	6 9	4 8	5 6	9 10	6 5	710 × 85	710 × 85	8 2	2 or 4	£100	£125
	18-22 Reo (2)	120 × 152	Mech.	M. Acc.	Disc	Epicyc.	C.C.	2	2	8 4	4 8	5 8	11 8	5 4	820 × 100	820 × 100	12 0	5	£195	£224
	16 Rex-Remo (4)	86 × 110	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 8	4 5	5 4	12 2	6 5	810 × 90	810 × 90	17 0	5	£289	—
	20 Rex-Remo (4)	90 × 110	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 8	4 5	5 4	12 2	6 5	810 × 90	810 × 90	17 0	5	—	£338
	9 Riley (2)	86 × 89	Grav.	Acc.	L'ther cone	Quad'nt	S.C.	—	—	6 6	4 1	5 0	9 6	—	700 × 80	700 × 80	8 0	2	—	£168
	*10 Riley (2)	96 × 96	Pres.	Acc.	L'ther cone	Quad'nt	P.S.	—	—	7 6	4 2	5 0	10 6	4 10	750 × 85	750 × 85	11 2	2	—	£200
	*40-50 Rolls-Royce (6)	113 × 113	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	4	11 2	4 8	5 9	14 11	7 0	895 × 135	895 × 135	23 0	5	£985	£1105
	*25 Rothwell (4)	102 × 127	Pres.	M.ht.	L'ther cone	Quad'nt	P.S.	3	1	9 9	4 8	5 10	13 6	7 2	870 × 90	850 × 120	19 0	5	£400	£450
	6 Rover (1)	97 × 110	Mech.	Acc.	Single plate	Quad'nt	P.S.	3	3	6 0	4 0	4 10	9 3	4 0	700 × 80	700 × 80	8 0	2	—	£150
	8 Rover (1)	114 × 130	Grav.	Acc.	Single plate	Quad'nt	P.S.	3	3	7 0	4 1	4 9	10 3	4 8½	750 × 85	750 × 85	11 0	2	—	£210
	12 Rover (2)	97 × 110	Mech.	Acc.	Single plate	Quad'nt	P.S.	3	3	7 4	4 1	4 9	10 10	4 8½	760 × 90	760 × 90	13 3	4	—	£275
	*15 Rover (4)	85 × 110	Mech.	Acc.	Double pl.	Quad'nt	P.S.	3	3	9 1	4 4	5 2	12 8	6 3	810 × 90	810 × 90	14 2	4	—	—
	20 Rover (4)	97 × 110	Mech.	M.ht. Acc.	Double pl.	Gate	P.S.	4	3	9 6	4 6	5 3	12 8	6 1½	815 × 105	815 × 105	17 1	4	—	£450
	18 Roydale (4)	92 × 120	Pres.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	—	—	9 4	4 4	5 0	12 11	6 8	815 × 105	815 × 105	18 0	5	£400	£450
	25 Roydale (4)	102 × 120	Pres.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	—	—	9 8	4 4	5 0	13 2	6 10	875 × 105	875 × 105	21 0	5	£500	£550
S	14 S.C.A.T. (4)	85 × 120	Mech.	Optional	Mult. disc	Gate	P.S.	4	4	8 0	4 3½	2 7½	12 5	6 5½	810 × 90	810 × 90	13 0	4 or 5	£295	£350
	*22 S.C.A.T. (4)	102 × 140	Mech.	Optional	Mult. disc	Gate	P.S.	4	4	9 6	4 5	2 9½	13 13	6 7½	875 × 105	875 × 105	17 0	4 or 5	£395	£475

*32 h.p. Pilgrim chassis price does not include tyres. Reo prices include lamps and horn with complete car. 10 h.p. Riley is made with two wheelbases, and the 12-18 h.p. with three wheelbases. 40-50 h.p. Rolls-Royce chassis has independent ignition sets, and is also made with 11ft. 10in. wheelbase. 25 h.p. Rothwell chassis is also made with shorter wheelbase and smaller tyres at £270. 15 h.p. Rover chassis is also made with 9ft. 7in. wheelbase for landaulet body: price of 6 h.p. Rover includes hood and screen. 22 h.p. S.C.A.T. chassis is also made with 10ft. 6in. wheelbase. †Particulars of these cars will be found at the end of the list if received in time to be included.

M. = Magneto not specified.
M.t. = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

S (*cont.*).

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speed	Direction.	Wheelbase.	Track	Extreme Width.	Extreme Length	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
12 Scout (2)	102 × 115	Grav.	Acc.	Cork cone	Gate	P.S.	3	—	8 4	4 6	5 7	11 8	6 8	750 × 85	750 × 85	16 2	5	£258	£310
15 Scout (4)	90 × 115	Grav.	Acc.	Cork cone	Gate	P.S.	3	—	9 4	4 6	5 7	13 3	5 6	810 × 100	810 × 100	17 3	5	£355	£395
*20 Scout (4)	102 × 115	Grav.	M.ht. Acc.	Cork cone	Gate	P.S.	3	—	9 4	4 6	5 7	13 3	6 6	815 × 105	815 × 105	19 2	5	£440	£500
*30 Scout (6)	90 × 115	Grav.	M.ht. Acc.	Cork cone	Gate	P.S.	3	—	10 9	4 6	5 7	14 3	6 8	815 × 105	815 × 105	22 0	5	£590	£650
*— Sheffield-Simplex (6)	114 × 114	Mech.	M.ht. Acc.	Mult. disc	Gate	P.S.	2	2	10 8¼	4 8	5 10	14 4	6 10½	875 × 105	880 × 120	21 0	4 or 5	£625	£750
10 Siddeley (2)	102 × 114	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	3	3	8 0	4 0½	4 11	11 7	5 10	760 × 90	760 × 90	12 2	4	£260	—
*14 Siddeley (4)	91 × 102	Mech.	M.ht.	L'ther cone	Gate	P.S.	3	3	8 9	4 0½	4 11	12 3	6 3	810 × 90	810 × 90	14 0	4	£330	—
18 Siddeley (4)	102 × 114	Mech.	M.ht. Acc.	Metal cone	Gate	P.S.	3	3	9 9	4 3½	5 4	13 6	6 10	815 × 105	815 × 105	17 0	5	£450	—
30 Siddeley (4)	118 × 127	Mech.	M.ht. Acc.	Plate	Gate	P.S.	4	3	10 0	4 6	5 6	14 2	6 11	880 × 120	880 × 120	21 0	5	£600	—
40 Siddeley (4)	127 × 130	Mech.	M.ht. Acc.	Plate	Gate	P.S.	4	3	10 0	4 6	5 6	14 2	6 11	880 × 120	880 × 120	21 0	5	£650	—
40 Siddeley (4)	133 × 127	Mech.	M.ht. Acc.	Metal	Gate	S.C.	4	3	11 1	4 7	5 8	15 6	7 5	880 × 120	880 × 120	23 2	7	£675	—
20 Siddeley (6)	91 × 114	Mech.	M.ht.	Metal	Gate	P.S.	4	3	10 0	4 3½	5 4	13 8	6 10	815 × 105	815 × 105	17 2	5	£575	—
50 Siddeley (6)	118 × 127	Mech.	M.ht.	Metal	Gate	S.C.	4	3	11 3	4 7	5 8	15 5	7 5	880 × 120	895 × 135	25 0	7	£850	—
8-10 S.K. Simplex (2)	—	Pres.	M.ht.	Met. to met.	Gate	—	—	—	7 6	—	—	—	—	760 × 90	760 × 90	—	2	£185	£210
7-9 Singer (2)	80 × 90	Grav.	Acc.	L'ther cone	Gate	P.S.	3	3	7 3	4 0	5 2	10 0	5 5	700 × 85	700 × 85	12 0	2	£195	£215
*12-14 Singer (4)	80 × 90	Grav.	M.ht. Acc.	L'ther cone	Gate	P.S.	3	3	8 6	4 2	5 4	12 6	6 2	810 × 90	810 × 100	17 0	4	£310	£350
16 Singer (4)	85 × 110	Mech.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	3	8 6	4 2	5 4	12 6	6 3	810 × 100	810 × 100	17 2	5	£335	£380
20-25 Singer (4)	100 × 110	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S.	4	3	9 9	4 7	5 9	13 6	7 4	875 × 105	875 × 105	21 0	5	£450	£495
20-25 Simms (4)	105 × 125	Pres.	M.ht.	Cone	Gate	P.S.	4	—	9 9	4 5	6 0	14 0	—	875 × 105	875 × 105	23 0	5	£500	£570
30-35 Simms (6)	105 × 125	Pres.	M.ht.	Cone	Gate	P.S.	4	—	10 9	4 5	6 0	15 0	—	880 × 120	880 × 120	28 0	5	£690	£770
12 Sizaire-Naudin (1)	120 × 130	Grav.	M.ht.	Metal	Quad'nt	P.S.	3	—	8 0	4 2	4 9	10 8	—	750 × 85	750 × 85	12 0	2	—	£225
12 Sizaire-Naudin (1)	120 × 130	Grav.	M.ht.	Metal	Quad'nt	P.S.	3	—	8 6	4 2	4 9	11 6	—	750 × 85	760 × 90	13 2	4	—	£250
16 Standard (4)	89 × 108	Mech.	M.ht.	Cone	Gate	P.S.	3	3	8 6	4 6	5 1	11 6	6 6	810 × 90	810 × 90	14 0	5	£275	£350
20 Standard (6)	89 × 108	Mech.	M.ht.	Disc	Gate	P.S.	3	3	9 8	4 6	5 1	12 9½	6 11	820 × 120	820 × 120	17 0	5	£425	£500
8 Star (2)	89 × 114	Splash	M.ht.	L'ther cone	Gate	P.S or S.C	—	—	7 6	4 0½	4 8	10 4	5 2	750 × 85	750 × 85	10 0	2 or 4	£170	£185
10 Star (2)	102 × 114	Pres.	M.ht.	L'ther cone	Gate	P.S or S.C	—	—	6 9	4 0½	4 8	9 7	4 8	750 × 85	750 × 85	10 0	2 or 4	£195	£210
12 Star (4)	82 × 114	Pres.	M.ht.	L'ther cone	Gate	P.S or S.C	—	—	8 6	4 0½	4 8	11 5	5 8½	810 × 90	810 × 90	13 0	2 or 4	£240	£275
15 Star (4)	89 × 114	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S or S.C	—	—	8 9¼	4 3	4 10½	12 1½	6 0	810 × 100	810 × 100	14 0	2 or 4	£260	£300
20 Star (4)	102 × 127	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S or S.C	—	—	9 3	4 6	5 3	12 10	6 3½	875 × 105	875 × 105	16 0	4	£350	£400
25 Star (4)	108 × 127	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S or S.C	—	—	9 5	4 6	5 4½	12 10	6 6	880 × 120	880 × 120	19 0	4	£425	£500
40 Star (6)	108 × 127	Pres.	M.ht. Acc.	L'ther cone	Gate	P.S or S.C	—	—	10 7	4 8	5 6	13 11	6 3½	880 × 120	880 × 120	23 0	5	£525	£600
*6 Starling (1)	102 × 114	Pres.	Acc.	L'ther cone	Quad'nt	S.C.	—	—	6 0	3 9	—	9 6	—	700 × 80	700 × 80	8 0	2	—	£120
8 Imperial Starling (1)	114 × 120	Pres.	Acc.	L'ther cone	Gate	S.C.	—	—	6 0	4 0	—	9 8	—	700 × 85	700 × 85	10 0	2	—	£160
10 Royal Starling (2)	95 × 108	Pres.	Acc.	L'ther cone	Quad'nt	S.C.	—	—	7 0	4 0	—	10 0	—	700 × 85	700 × 85	14 2	4	—	£200
*16-20 Stella (4)	90 × 120	Grav.	M. Acc.	L'ther cone	Gate	P.S.	3	3	8 10	4 3	5 9	12 4	6 2	815 × 105	815 × 105	14 0	5	£395	£450
14-16 Straker-Squire (4)	87 × 85	Pres.	M.ht.	L'ther cone	Gate	P.S.	—	—	8 10	3 11	5 2	12 6	5 8¾	810 × 90	810 × 90	14 3	4	£285	£345
16 Sunbeam Station Cart	120 × 140	Pres.	M.ht. Acc.	L'ther cone	Gate	S.C.	4	4	10 0	4 6	5 8	15 6	8 0½	850 × 85	805 × 75	30 0	14	—	—
14-18 Sunbeam (4)	95 × 120	Grav.	M.ht.	L'ther cone	Gate	S.C.	4	4	10 0	4 3	5 6	13 2	6 10	815 × 105	815 × 105	16 0	5	£395	£425
*20 Sunbeam (4)	105 × 130	Pres.	M.ht.	L'ther cone	Gate	S.C.	4	4	9 10	4 3	5 6	14 0	7 1	880 × 120	880 × 120	23 3	5	£480	£530
35 Sunbeam (4)	120 × 140	Pres.	M.ht. Acc.	L'ther cone	Gate	S.C.	4	4	10 0	4 6	5 8	14 6	7 1	880 × 120	880 × 120	—	5	—	—
*10-12 Swift (2)	102 × 111	Pres.	Acc.	L'ther cone	Gate	P.S.	—	—	7 9	4 4	5 2	11 4	7 1	750 × 85	760 × 90	12 2	4	£225	£265
15-18 Swift (4)	85 × 102	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	8 6	4 4	5 2	12 2	7 1	760 × 100	760 × 100	13 0	4	£315	£350
18-24 Swift (4)	102 × 111	Mech.	Acc.	L'ther cone	Gate	P.S.	—	—	9 0	4 4	5 2	12 8	7 4½	805 × 105	805 × 105	16 0	4	£375	£430

*20 h.p. and 30 h.p. Scouts have independent ignition sets. Sheffield-Simplex chassis for heavy covered bodies, with three speeds and larger back tyres, £750. Siddeley models are all made with longer wheelbases and larger tyres at £25 extra, with the exception of the 10 h.p. model and the 50 h.p., but the 50 h.p. may be had with live axle drive. The Singer four-cylinder models have independent ignition sets. Royal Starling two-seater, £175. 16-20 h.p. Stella can be fitted with either high or low-tension magneto entirely independent of the accumulator system. 20 h.p. Sunbeam, with 10ft. 4in. wheelbase and landaulet body, £650 complete. 10-12 h.p. Swift chassis with 7ft. wheelbase, £210.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.

Acc = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.

C.C. = Central chain.
W.D. = Worm drive.

The Autocars of 1909.—

	H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheelbase.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Weight of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
		mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	cwt. qr.			
T	12 Talbot (4)	80 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	8 7½	4 2	4 2	12 1	6 3	810 × 90	810 × 90	16 0	4	£340	£375
	15 Talbot (4)	90 × 117	Pres.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	9 8	4 7	5 6	13 5	6 10½	875 × 105	875 × 105	18 0	5	£415	£460
	*25 Talbot (4)	105 × 120	Pres.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	9 8	4 7	5 6	13 6	6 10½	875 × 105	880 × 120	19 2	5	£505	£565
	*35 Talbot (4)	120 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	9 10	4 7	5 6	13 6	6 10½	880 × 120	880 × 120	21 0	5	£600	£675
	†Thames.																			
	18 Thornycroft (4)	95 × 114	Mech.	M.ht.	Mult. disc..	Gate ..	P.S.	3	—	9 8	4 5	5 1	—	6 6½	815 × 105	815 × 105	17 0	5	£450	£525
	30 Thornycroft (4)	114 × 127	Mech.	M.ht.	Mult. disc..	Gate ..	P.S.	3	—	9 10½	4 8	5 6	—	7 2½	880 × 120	880 × 120	24 0	5	£575	£650
	45 Thornycroft (6)	114 × 127	Mech.	M.ht.	Mult. disc..	Gate ..	P.S.	3	—	11 0	4 8	5 6	—	7 2½	880 × 120	880 × 120	27 0	5	£775	£850
	6 Torpedo (1)	102 × 114	Mech.	Acc.	L'ther cone	Quad'nt	S.C.	3	—	6 2½	3 8½	4 8	9 6	4 0	700 × 80	700 × 80	7 0	2	£105	£125
	10 Torpedo (2)	95 × 108	Mech.	Acc.	L'ther cone	Quad'nt	P.S.	3	—	7 11	3 10	4 3	11 6	5 6	700 × 85	700 × 85	11 0	2 or 4	£150	£200
	12 Torpedo (4)	76 × 89	Mech.	M. Acc.	Met. to met.	Quad'nt	P.S.	3	—	7 11	3 10	4 3	11 6	5 6	700 × 90	700 × 90	11 0	4	£200	£250
U	10-12 Unic (2)	102 × 100	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	8 7	4 2	—	—	—	800 × 85	800 × 85	14 0	5	£270	£300
	10-12 Unic Cab (2)	102 × 100	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	8 4½	4 5	—	—	—	810 × 90	810 × 90	14 0	6	£290	£380
	12-14 Unic (4)	75 × 110	Mech.	M.ht.	L'ther cone	Quad'nt	P.S.	—	—	8 7	4 2	—	—	—	810 × 90	810 × 90	14 0	5	£300	£330
	16-20 Unic (4)	87 × 110	Mech.	M.ht.	L'ther cone	G. or Q.	P.S.	—	—	9 10	4 2	—	—	—	810 × 90	810 × 90	15 0	5	£350	£380
	24-30 Unic (4)	102 × 115	Pres.	M.ht.	Metal	Gate ..	P.S.	—	—	10 3	4 4	—	—	—	875 × 105	875 × 105	19 0	5	£520	£600
	25-35 Unic (6)	85 × 120	Pres.	M.ht.	Metal	Gate ..	P.S.	—	—	10 3	4 4	—	—	—	875 × 105	875 × 105	20 0	5	£620	£700
V	25 Valveless, Two-stroke (2)	133 × 140	Pres.	M.ht.	L'ther cone	—	—	3	—	10 0	4 9	—	—	7 8	880 × 120	880 × 120	19 0	—	£395	—
	16 Vauxhall (4)	80 × 102	Mech.	M.ht.	Metal cone	Gate ..	P.S.	3	3	8 9	4 1	5 1	12 0	6 2	810 × 90	810 × 100	15 0	4	£310	£350
	*20 Vauxhall (4)	90 × 120	Mech.	M.ht.	Metal cone	Gate ..	P.S.	4	4	9 7	4 6	5 6	13 0	—	870 × 100	870 × 100	18 2	5	£420	£465
	16 Vinot (4)	80 × 110	Pres.	M.ht.	L'ther cone	Gate ..	P.S.	3	—	9 2	4 2	5 7	13 0	6 7	810 × 90	810 × 90	14 2	4	£300	£350
	30 Vinot (4)	102 × 130	Pres.	M.ht.	L'ther cone	Gate ..	P.S.	3	—	9 6	4 6	5 8	13 6	6 8	815 × 105	815 × 105	17 2	5	£440	£495
	40 Vinot (4)	120 × 140	Pres.	M.ht.	L'ther cone	Gate ..	S.C.	4	—	10 2	4 7	5 9	14 0	6 8	875 × 105	880 × 120	19 0	5	£595	£660
	10-12 Vulcan (2)	102 × 120	Pres.	Acc.	L'ther cone	Quad'nt	P.S.	3	—	7 8	4 1⅓	5 1	11 1½	6 0	750 × 85	750 × 85	—	4	£220	£260
	14 Vulcan (4)	89 × 108	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	—	8 6	4 1⅓	4 10½	12 3	6 1	810 × 90	810 × 90	—	4	£310	£350
	16 Vulcan (4)	92 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	—	8 7	4 1½	4 10½	12 4	6 2	815 × 105	815 × 105	—	4	£325	£365
	20 Vulcan (4)	102 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	3	—	8 10½	4 6	5 8	12 8	6 6	815 × 105	815 × 105	—	5	£385	£425
	25 Vulcan (4)	108 × 120	Mech.	M.ht. Acc.	L'ther cone	Gate ..	P.S.	4	—	8 10½	4 6	5 8	12 8	6 6	875 × 105	875 × 105	* —	5	£425	£475
	40 Vulcan (6)	102 × 120	Mech.	M. Acc.	L'ther cone	Gate ..	P.S.	4	—	9 11	4 6	5 8	13 8½	7 0	880 × 120	880 × 120	—	5	£500	£600
W	25 Weigel (4)	110 × 120	Mech.	M.ht.	Plate	Gate ..	P.S.	3	3	9 6	4 7	5 6	13 8	6 10	870 × 90	875 × 105	22 0	—	£495	—
	40 Weigel (4)	130 × 140	Mech.	M.lt.	Plate	Gate ..	P.S.	4	4	9 11	4 9	5 6	13 9	6 10	870 × 90	880 × 120	27 0	—	£975	—
	60 Weigel (6)	130 × 140	Mech.	M.lt.	Plate	Gate ..	P.S.	4	4	12 0	4 9	5 6	16 4	—	920 × 120	935 × 135	—	—	£1100	—
	20-30 Westinghouse (4)	100 × 130	Mech.	M.ht.	Mult. disc..	Gate ..	P.S.	4	4	10 1	4 6⅔	5 4	13 6	7 0	880 × 120	880 × 120	21 0	5	£580	£650
	35-40 Westinghouse (4)	120 × 140	Mech.	M.ht. M.lt.	Mult. disc..	Gate ..	S.C.	4	4	10 10	4 10½	5 5	15 0	7 11	920 × 120	920 × 120	26 0	5 or 7	£790	£860
Z	10-12 Zedel (4)	70 × 110	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	7 3	3 3	4 6	10 6	4 11	700 × 85	710 × 90	9 0	2 or 4	£200	£325
	15 Zedel (4)	80 × 120	Mech.	M.ht.	Disc	Gate ..	P.S.	—	—	9 1	4 3	5 0	12 6	7 6	815 × 105	815 × 105	15 0	4	£400	£450
	10-15 Brixia-Zust (3)	75 × 130	Mech.	M.ht.	Metal disc	Gate ..	P.S.			8 4	4 4	5 0	11 3	5 3	810 × 90	810 × 90	14 0	—	£295	—
	18-24 Brixia-Zust (4)	100 × 130	Mech.	M.ht.	Metal disc	Gate ..	P.S.	4	—	9 9	4 8	5 2½	13 1	7 4	810 × 90	820 × 120	16 0	—	£500	—
	20-35 Zust (4)	115 × 120	Mech.	M.ht.	Mult. disc..	Gate ..	S.C.	—	—	9 9	4 8	5 3	13 8	—	810 × 90	820 × 120	18 3	—	£650	—
	*28-40 Zust (4)	130 × 140	Mech.	M.lt.	Mult. disc..	Gate ..	S.C.	—	—	9 9	4 8	5 3	13 8	—	870 × 90	880 × 120	18 3	—	£700	—
	*50-70 Zust (4)	150 × 160	Mech.	M.lt.	Mult. disc..	Gate ..	S.C.	—	—	9 9	4 8	5 3	14 0	—	870 × 90	880 × 120	19 3	—	£1000	—

*25 h.p. and 35 h.p. Talbots have independent ignition sets. 20 h.p. Vauxhall may be had with 10ft. 3in. wheelbase. 28-40 h.p. Zust chassis is made with 10ft. and 10ft. 9in. wheelbases at £725 and £750 respectively; 50-70 h.p. Zust is also made with 10ft. 9in. wheelbase.

†Particulars of these cars will be found at the end of the list if received in time for inclusion.

M. = Magneto not specified.
M.lt. = Low-tension magneto.
M.ht. = High-tension magneto.

Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.

C.C. = Central chain.
W.D. = Worm drive.

STEAM CARS.

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Clutch.	Change-speed Gear.	Transmission.	Gear Ratios between Engine and Road Wheels.	Wheel-base.	Track	Extreme Width.	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats.	Price. Chas'is only.	Price. Car Complete.
	mm.						ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
10 Bolsover (4)	65 × 90	Mech.	—	—	Chain	2.5 to 1	6 4	4 4	5 3	10 8	3 6	700 × 85	700 × 85	11 0	2	£200	£235
*25-30 Fawcett Fowler (4)	76 × 89	Pres.	L'ther cone	—	S.C.	2½ to 1	10 0	4 9	6 0	15 0	7 6	875 × 105	880 × 120	25 0	5	£600	£700
*30-40 Rutherford (3)	89 × 108	Special	—	—	P.S.	3 to 1	9 9	4 4	5 6	13 6	6 8	815 × 105	815 × 105	18 0	5	£530	£585
10 Stanley (2)	76 × 102	Mech.	—	—	Direct	1½ to 1	8 4	4 6	5 3	11 0	—	800 × 85	800 × 85	—	2 or 4	—	£225
20 Stanley (2)	92 × 127	Mech.	—	—	Direct	1½ to 1	8 6	4 6	5 3	12 0	—	870 × 90	870 × 90	—	5	—	£375
10 Turner-Miesse (3)	49 × 89	Grav.	—	—	P.S.	—	8 0	4 0	5 0	11 6	5 7	810 × 90	810 × 90	16 0	2	£275	£295
12 Turner-Miesse (3)	54 × 89	Grav.	—	—	P.S.	—	8 0	—	5 0	11 6	5 8	810 × 90	810 × 90	17 0	4	£320	£350
15 Turner-Miesse (3)	57 × 89	Grav.	—	—	Chain	—	8 0	—	5 6	12 0	5 8	815 × 105	815 × 105	19 0	5	£400	£450
20 Turner-Miesse (3)	59 × 89	Grav.	—	—	Chain	—	8 6	4 6	5 9	12 3	5 9	880 × 120	880 × 120	23 0	6	£550	£650
30 Turner-Miesse (3)	76 × 76	Mech.	—	—	S.C.	—	9 0	4 6	5 9	12 3	6 0	880 × 120	880 × 120	25 0	6	£600	£700

*Fawcett-Fowler has single-acting pistons and flash generator. 30-40 h.p. Rutherford has semi-flash generator and single jet self-cleaning burner; with 10ft. 6in. wheelbase, £590 chassis.
White.—No particulars of this car received in time for inclusion.

Particulars of Cars which arrived too late for classification.

H.P., Name of Car, and Number of Cylinders.	Bore and Stroke.	Lubrication.	Ignition.	Clutch.	Change-speed Gear.	Transmission.	No. of Speeds	Direct on.	Wheel-base.	Track	Extreme Width	Extreme L'ngth	Dash to Back Wheel Centre	Tyres. Front.	Tyres. Back.	Wei'ht of Chas'is	No. of Seats	Price. Chas'is only.	Price. Car complete.
	mm.								ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	mm.	mm.	ct. qr.			
20-30 Austrian-Daimler	105 × 130	Mech.	M.ht.	Plate	Gate	P.S.	—	4	9 9	4 4	5 3	13 3	—	880 × 120	880 × 120	19 2	5	£590	£650
8½ Horley (2)	80 × 90	Mech.	M.ht. Acc.	L'ther cone	Quad'nt	P.S.	3	—	6 1	3 9½	2 5¼	5 9	4 3	700 × 85	—	—	2	£121	£131
*16-20 Hotchkiss (4)	95 × 110	Mech.	M.ht.	L'ther cone	Gate	P.S.	4	—	9 6	4 5	5 4	13 1	6 10½	875 × 105	875 × 105	18 0	5	£440	£500
*20-30 Hotchkiss (4)	110 × 130	Mech.	M.ht.	L'ther cone	Gate	P.S.	4	—	9 11½	4 7	—	—	7 0	875 × 105	880 × 120	—	5	£560	—
30-40 Hotchkiss (4)	120 × 140	Mech.	M.ht.	L'ther cone	Gate	P.S.	4	—	10 0	4 7	—	—	7 0	875 × 105	880 × 120	—	6	£690	£790
*40-50 Hotchkiss (6)	120 × 140	Mech.	M.ht.	L'ther cone	Gate	P.S.	1	—	11 1	4 7	—	—	7 0	880 × 120	880 × 120	—	5 or 7	£890	£1000
9 Peugeot (1)	105 × 120	—	M.ht.	—	—	P.S.	—	—	6 10½	3 9	2 4½	—	—	750 × 85	750 × 85	—	—	£210	—
*10 Peugeot (2)	90 × 120	—	M.ht.	—	—	P.S.	—	—	8 0½	4 1½	2 7½	—	—	760 × 90	760 × 90	—	—	£250	—
12 Peugeot (4)	80 × 110	—	M.ht.	—	—	P.S.	—	—	9 2	4 —	2 7½	—	—	810 × 90	810 × 90	—	—	£350	—
*16 Peugeot (4)	90 × 120	—	M.ht.	—	—	P.S or S.C	—	—	10 3	4 7	2 7½	—	—	820 × 120	820 × 120	—	—	£450	—
22 Peugeot (4)	106 × 130	—	M.ht.	—	—	P.S or S.C	—	—	10 8	4 9	2 9½	—	—	880 × 120	880 × 120	—	—	£570	—
35 Peugeot (4)	130 × 140	—	M.ht.	—	—	S.C.	—	—	10 11	4 11	2 11½	—	—	920 × 120	920 × 120	—	—	£730	—
20 Peugeot (6)	80 × 110	—	M.ht.	—	—	P.S or S.C	—	—	10 8	4 9	2 9½	—	—	880 × 120	880 × 120	—	—	£590	—
*60 Peugeot (6)	130 × 140	—	M.ht.	—	—	S.C.	—	—	11 4	4 11	2 11½	—	—	920 × 120	920 × 120	—	—	£1130	—
14 Withers (4)	84 × 110	Pres.	M.ht. Acc.	Met. to met.	Gate	P.S.	—	—	8 11	4 5	—	—	—	870 × 90	870 × 90	—	5	£425	£485
20 Withers (4)	95 × 130	Pres.	M.ht. Acc.	L'r to met.	Gate	P.S.	—	—	9 8	4 7	—	—	—	870 × 90	880 × 120	—	5	£525	£595
30 Withers (4)	110 × 140	Mech.	M.ht. Acc.	L'r to met.	Gate	P.S.	—	—	10 3	4 7	—	—	—	880 × 120	895 × 135	—	5	£575	£655
40 Withers (4)	120 × 130	Mech.	M.ht. Acc.	L'r to met.	Gate	P.S or S.C	—	—	10 3	4 7	—	—	—	880 × 120	895 × 135	—	5	£625	£725

*16-20 h.p. and 20-30 h.p. Hotchkiss with 1ft. longer wheelbase, £20 extra; 40-50 Hotchkiss car has dog clutch when clutch pedal is fully released.
*10 h.p., 16 h.p., and 60 h.p. Peugeots are made with longer chassis.

M. = Magneto not specified.
M.lt = Low-tension magneto.
M.ht. = High-tension magneto.
Acc. = Accumulator and coil.
P.S. = Propeller-shaft.
S.C. = Side chains.
C.C. = Central chain.
W.D. = Worm drive.

INDEX TO THE "AUTOCARS OF 1909."

Alphabetically arranged in groups according to chassis price.

Less than £150

7 Adler.
10 Cadillac.
8 Chambers.
6½ Clyde.
8-10 Darracq.
8 De Dion.
15-18 Ford.
6½ Horley.
8 Humber.
8 Mass.
8-10 Mass.
14-16 New Pick.
8 Phœnix.
10 Reo.
9 Riley.
6 Rover.
6 Starling.
[illegible]tarling.
6 Torpedo.

£150 to £200

10 Adams.
10 Alldays.
11 Bentall.
10 Calthorpe.
10 Chambers.
8-9 Chénard-Walcker.
10 Chénard-Walcker.
8-10 Clyde.
9 De Dion.
10-12 Enfield.
20-24 Ford.
10-12 Phœnix.
8 Renault.
18-22 Reo.
10 Riley.
8 Rover.
8-10 S.K. Simplex.
7-9 Singer.
12 Sizaire-Naudin.
10 Stanley.
8 Star.
10 Star.
10 Starling.
10 Torpedo.

£200 to £250

12 Adler.
8 Aster.
10 Bolsover.
— Buick.
10-12 Chambers.
12 Chénard-Walcker.
— Clyde.
10-12 Coventry Humber.
10-12 Darracq.
10 De Dion.
14 Métallurgique.
14-16 Miesse Petrol.
9 Motobloc.
10 Northern.
6-12 Opel.
8-10 Panhard.
9 Peugeot.
12 Rover.
12 Sizaire-Naudin.
12 Star.
10-12 Swift.
12 Torpedo.
10-12 Vulcan.

£250 to £300

12-14 Adams.
14-16 Adams.
14 Alldays.
20 Alldays.
12-14 Argyll.
14-16 Belsize.
10-12 Brasier.
16 Bentall.
16-20 Calthorpe.
8-10 C.G.V.
12-14 Chambers.
10-12 Clément.
— Clyde.
15 Coventry Humber.
14-16 Darracq.
12 De Dion.

£250 to £300 (*cont.*)

16-20 Drummond.
18-24 Enfield.
12-15 Hillman-Coatalen.
10 Mors.
16 M.P.
14 Nameless.
10 Napier.
16 Nordenfelt.
14-18 Opel.
10 Opel.
10 Peugeot.
16 Rex-Remo.
14 S.C.A.T.
12 Scout.
10 Siddeley.
16 Standard.
15 Star.
14-16 Straker-Squire.
10 Turner-Miesse.
10-12 Unic.
10-15 Zust.

£300 to £350

14-16 Argyll.
20 Ariel.
10-12 Aster.
15 Austin.
16 Bell.
16 C.G.V.
12-16 Chambers.
14-16 Chénard-Walcker.
14-18 Clément.
12-16 Decauville.
18 De Dion.
16-20 Empress.
25-35 Enfield.
12-14 F.I.A.T.
12-14 Gladiator.
12-16 Horbick.
15 Minerva.
14-16 Motobloc.
15 Mass.
20 Owen.
20 Rex-Remo.
14 Siddeley.
12-14 Singer.
16 Singer.
20 Stanley.
15-18 Swift.
12 Talbot.
12 Turner-Miesse.
12-14 Unic.
16 Vauxhall.
16 Vinot.
14 Vulcan.
16 Vulcan.
10-12 Zedel.

£350 to £400

16-18 Adams.
15 Adler.
16 Albion.
18-22 Armstrong-Whitworth.
16-18 Aster.
20 Beeston Humber.
20 Belsize.
18 Benz.
12-15 Brasier.
20-22 Brown.
4in. Darracq.
15 Deasy.
25 De Dion.
10 Delaunay-Belleville.
18 Dennis.
16-20 Imperia.
18 Métallurgique.
14-18 Nagant-Hobson.
15 Napier.
20 Nordenfelt.
20 Northern.
10-18 Opel.
12 Peugeot.
12-16 Piccard Pictet.
22 S.C.A.T.
15 Scout.
20 Star.
16-20 Stella.

£350 to £400 (*cont.*)

14-18 Sunbeam.
18-24 Swift.
16-20 Unic.
25 Valveless.
20 Vulcan.

£400 to £450

20 Ariel Town Car.
20 Bell.
28 Belsize.
18-23 B.S.A.
25 Calthorpe.
18-28 Clément.
20 Coltman.
22 Coventry Humber.
30 Coventry Humber.
16-20 Decauville.
24 Dennis.
30 Dolphin.
20-24 Empress.
15-20 F.I.A.T.
14 Germain.
18 Germain.
18-28 Gladiator.
16-20 Hotchkiss.
20 Martini.
20 Mass.
24-30 Miesse Petrol.
18 Minerva.
15 Mors.
18 Motobloc.
10-15 Panhard.
18 Pilain.
25 Rothwell.
20 Rover.
18 Roydale.
20 Scout.
2 Standard.
25 Star.
15 Talbot.
15 Turner-Miesse.
20 Vauxhall.
30 Vinot.
25 Vulcan.
14 Withers.
15 Zedel.

£450 to £500

20 Adler.
30 Ariel.
18-24 Austin.
30 Bell.
25 Brooke.
22 C.G.V.
28 Coventry Humber.
20-25 Crossley.
22 Daimler.
25-35 Darracq.
15 Delaunay-Belleville.
10 Delaunay-Belleville.
18-24 Gladiator.
25 Hillman-Coatalen.
20-24 Horbick.
25 Minerva.
30 M.P.
20-30 Nagant-Hobson.
20 N.E.C.
30-35 Nordenfelt.
25 Orleans.
40 Owen.
15-25 Panhard.
16 Peugeot.
32 Pilgrim.
18 Siddeley.
20-25 Singer.
20 Sunbeam.
18 Thornycroft.
25 Weigel.

£500 to £600

30 Adams.
24-30 Albion.
40 Argyll.
40 Ariel.
28-30 Austrian-Daimler.
16-26 Brasier.
40 Brooke.
25-30 Brown.

£500 to £600 (*cont.*)

25-33 B.S.A.
30 C.G.V.
30-40 Chénard-Walcker.
25-35 Clément.
50 Darracq.
25 Deasy.
30 De Dion.
15 Delaunay-Belleville.
28 Dennis.
40 Dennis
20-25 F.I.A.T.
28-35 F.I.A.T.
20 Germain.
25-35 Gladiator.
15-20 Gobron-Brillié.
18-24 Horbick.
20-30 Hotchkiss.
25 Iris.
28 Martini.
24-30 Mass.
28-32 Mass.
25-30 Maudslay.
26 Metallurgique.
35-40 Miesse Petrol.
38 Minerva.
40 Minerva.
20 Mors.
25 Motobloc.
30 Napier.
18-30 Opel.
34 Orleans.
18-30 Panhard.
20 Peugeot.
35 Peugeot.
18-24 Piccard-Pictet.
24 Pilain.
25 Roydale.
30-40 Rutherford.
30 Scout.
20 Siddeley.
20-25 Simms.
40 Star.
25 Talbot.
30 Thornycroft.
20 Turner-Miesse.
24-30 Unic.
40 Vinot.
40 Vulcan.
20-30 Westinghouse.
20 Withers.
30 Withers.
18-24 Zust.

£600 to £700

30 Adler.
30 Armstrong-Whitworth
0 Austin.
40 Belsize.
28 Benz.
30-40 Brasier.
40 C.G.V.
35-45 Clément.
40 Crossley.
38 Daimler.
48 Daimler.
35 Deasy.
20 Delaunay-Belleville.
28 Delaunay-Belleville.
25-30 Fawcett-Fowler.
35-40 F.I.A.T.
28 Germain.
35-45 Gladiator.
40 Gladiator.
60 Gladiator.
40 Hillman-Coatalen.
30-40 Horbick.
30-40 Hotchkiss.
40-50 Mass.
30 Mors.
35 Motobloc.

£600 to £700 (*cont.*)

35-40 Nagant-Hobson.
30 N.E.C.
25-40 Opel.
60 Owen.
25-35 Panhard.
30 Panhard.
28-50 Piccard-Pictet.
35 Pilain.
45 Sheffield-Simplex.
30 Siddeley.
40 Siddeley.
30-35 Simms.
35 Talbot.
30 Turner-Miesse.
25-35 Unic.
40 Weigel.
40 Withers.
20-35 Zust

£700 to £800

40 Adler.
50 Ariel.
40 Armstrong-Whitworth
40 Benz.
32-40 Brasier.
40 Brown.
50 C.G.V.
56 Daimler.
25 Delaunay-Belleville.
40-50 F.I.A.T.
40 Germain.
28-40 Gobron-Brillie.
35 Iris.
40 Martini.
35-45 Maudslay.
40-50 Metallurgique.
45 Motobloc.
40 Napier.
45 Napier.
40 N.E.C.
35-45 Panhard.
22 Peugeot.
28-40 Piccard-Pictet.
45 Thornycroft.
25-40 Westinghouse.
28-40 Zust.

£800 to £900

60 Austin.
75 C.G.V.
40 Delaunay-Belleville.
45 F.I.A.T.
60 Germain.
40-50 Hotchkiss.
40 Iris.
60 Martini.
45 Mors.
45-60 Opel.
46 Orleans.
45 Orleans.
50 Siddeley.

£900 to £1000

40 Delaunay-Belleville.
70 F.I.A.T.
40-60 Gobron-Brillie.
60 Maudslay.
60 Napier.
40-50 Rolls-Royce.

£1000 and over.

45-60 Brasier.
70 Delaunay-Belleville.
90 F.I.A.T.
100 Germain.
70-90 Gobron-Brillié.
50 Mors.
70 Motobloc.
65 Napier.
90 Napier.
50 Panhard.
65 Panhard.
60 Peugeot.
60 Weigel.
50-70 Zust.

INDEX TO "THE AUTOCARS OF 1909."

The addresses of the houses from which the cars included in "The Autocars of 1909" may be purchased. Arranged alphabetically.

ADAMS.—The Adams Manufacturing Co., Ltd., 106, New Bond Street, W.
ADLER.—Morgan and Co., Ltd., 127, Long Acre, W.C.
ALBION.—Lacre Motor Car Co., Ltd., 1-5, Poland Street, W.
ALLDAYS.—Alldays and Onions Pneumatic Engineering Co., Ltd., Matchless Works, Birmingham.
ARGYLL.—Argyll Motors, Ltd., Alexandria, Glasgow.
ARIEL.—Ariel Motors, Ltd., 101, New Bond Street, W.
ARMSTRONG-WHITWORTH.—Sir W. G. Armstrong, Whitworth, and Co., Ltd., 3, Blenheim Street, New Bond Street, W.
ASTER.—Aster, Ltd., 4, Prince's Street, W
AUSTIN.—Austin Motor Co., Ltd., Northfield, Birmingham.
AUSTRIAN DAIMLER.—F. M. Luther, Manor House, Marylebone Road, N.W.

BELL.—Bell Bros., Calder Ironworks, Ravensthorpe, Yorks.
BELSIZE.—Belsize Motors, Ltd., Clayton, Manchester.
BENTALL.—E. H. Bentall and Co., Heybridge, Malden, Essex.
BENZ.—Benz Motors, Ltd., 160-196, Great Portland Street, W.
BERLIET.—W. Watson and Co., 56, Renshaw Street, Liverpool.
BOLSOVER.—Bolsover Bros., Ltd., Eaglescliffe, Co. Durham.
BRASIER.—British Brasier Motors, Ltd., 8 and 9, Long Acre, W.C.
BROOKE.—J. W. Brooke and Co., Ltd., Adrian Works, Lowestoft.
BROWN.—Brown Bros., Ltd., 22-30, Great Eastern Street, E.C.
B.S.A.—Birmingham Small Arms Co., Ltd., Birmingham.
BUICK.—Buick Motors, 45, Great Marlborough Street, Regent Street, W.

CADILLAC.—Anglo-American Motor Car Co., Ltd., 19-21, Heddon Street, Regent Street, W.
CALTHORPE.—Calthorpe Motor Co., Ltd., 81, John Bright Street, Birmingham.
C.G.V.—London Motor Garage Co., Ltd., 33-37, Wardour Street, W.
CHAMBERS.—Chambers Motors, Ltd., 15, Cuba Street, Belfast.
CHENARD-WALCKER.—Chenard-Walcker Motors, Ltd., 18, Berkeley treet, London W.
CLEMENT.—Clément Motor Co., Ltd., 3, Leicester Street, Leicester Square, W.
CLYDE.—G. H. Waite, London Road, Leicester.
COLTMAN.—H. Coltman and Sons, Midland Ironworks, Loughborough.
CROSSLEY.—Jarrott and Letts, Ltd., 45, Great Marlborough Street, W.

DAIMLER.—Daimler Motor Co. (1904), Ltd., Daimler Works, Coventry.
DARRACQ.—A. Darracq and Co. (1905), Ltd., Walnut Tree Walk, Kennington Walk, S.E.
DEASY.—Deasy Motor Car Manufacturing Co., Ltd., 10, Brompton Road, S.W.
DECAUVILLE.—H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, S.W.
DE DION.—De Dion-Bouton (1907), Ltd., 10, Great Marlborough Street, W.
DELAUNAY-BELLEVILLE.—The Burlington Carriage Co., 315-317, Oxford Street, W.
DENNIS.—Dennis Bros., Ltd., Onslow Street, Guildford.
DOLPHIN.—Two-stroke Engine Co., Ltd., Shoreham, Sussex.
DRUMMOND.—North British Manufacturing Co., Ltd., Dumfries

EMPRESS.—Empress Motor Co., Stockport Road, Manchester.
ENFIELD.—Enfield Autocar Co., Ltd., Hunt End Works, Redditch

FAWCETT-FOWLER.—Fawcett, Preston, and Co., Ltd., York Street, Liverpool.
F.I.A.T.—F.I.A.T. Motors, Ltd., 37, Long Acre, W.C.
FORD.—Perry, Thornton, and Schreiber, Ltd., 117, Long Acre, W.C.

GERMAIN.—Théo Masui, 1, Hanover Court, Hanover Street, W.
GLADIATOR.—Gladiator Co., Ltd., 134, Long Acre, W.C.
GOBRON-BRILLIE.—Gobron-Brillié British Motor Co, Ltd., Piccadilly, W.
GREGOIRE.—Osborn and Co., 6, Great Marlborough Street, W.

HILLMAN-COATALEN.—Hillman-Coatalen Motor Car Co., Ltd. Pinley, Coventry.
HORBICK.—Horsfall and Bickham, Pendleton, Manchester.
HORLEY.—Horley Motor and Engineering Co., Balcombe Road, Horley, Surrey.
HOTCHKISS.—London and Parisian Motor Co., Ltd., 87, Davies Street, Oxford Street, W.
HUMBER.—Humber, Ltd., Coventry.

IMPERIA.—C. E. Whittaker, 66, Great Russell Street, W.
IRIS.—Iris Cars, Ltd., 19, Great Portland Street.
ITALA.—Itala Automobiles, Ltd., 89, Wigmore Street, W.

J. AND B.—James and Browne, Ltd., Westcroft Works, Hammersmith, W.
JACKSON.—Reynold-Jackson and Co., Ltd., 11-13, High Street, Notting Hill Gate, W.
JUNIOR AND O.T.A.V.—Junior, Ltd., 10, Jermyn Street, Piccadilly Circus, W.

LA BUIRE.—Hollingdrake Automobile Co., Ltd., Heaton Lane, Stockport.
LANCHESTER.—Lanchester Motor Co., Ltd., Montgomery Street, Birmingham.
LANCIA.—W. L. Stewart and Co., 166-168, Shaftesbury Avenue, W.C.
LAURIN AND KLEMENT.—Laurin-Klement Motor Agency, Ltd., 255, Tottenham Court Road, W.
LONDONIA.—Automobile Transport Co., Ltd., 1, Long Acre, W.C.
LORRAINE-DIETRICH.—Lorraine-Dietrich, Ltd., 5, Regent Street, W.
LOTIS.—Sturmey Motors, Ltd., Lotis Works, Coventry.

MARCA TRE SPADE.—Rusholme Motor Works, Wilmslow Road, Rusholme, Manchester.
MARTINI.—Hills-Martini, Ltd., Great Windmill Street, W.
MASS.—Lancaster Motor Garage, Lancaster Gate, W.
MAUDSLAY.—Maudslay Motor Co. (1907), Ltd., Parkside, Coventry.
MERCEDES.—Du Cros-Mercédès, Ltd., 127, Long Acre, W.C.
METALLURGIQUE.—Warwick Wright Ltd., 110, High Street, Marylebone.
MIESSE PETROL.—Miesse Petrol Car Syndicate, Pelham Street, South Kensington.
MINERVA.—Minerva Motors, Ltd., 40, Holborn Viaduct, E.C.
M.M.C.—Motor Manufacturing Co. (1907), Ltd., 157a, Manor Street, High Street, Clapham, S.W.
MORS.—Mors (England), Ltd., 45, Great Marlborough Street, W.
MOTOBLOC.—British Motobloc Syndicate, 12, Regent Street, W.
M.P.—J. E. H. Monypenny and Co., 17, Hanover Square, W.

N.A.G.—Connaught Carriage Co., Long Acre, W.
NAGANT-HOBSON.—H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, S.W.
NAMELESS.—Nameless Motor Car Co., Finchley Lane, Hendon, N.W.
NAPIER.—S. F. Edge, Ltd., 14, New Burlington Street, W.
N.E.C.—New Engine Co., Acton Vale Works, Acton, W.
NEW ARROL-JOHNSTON.—New Arrol-Johnston Car Co., Underwood, Paisley, N.B.
NEW PICK.—New Pick Motor Co., Stamford.
NORDENFELT.—British Bariquand and Marre Engine Co., Ltd., 10, Poland Street, W.
NORTHERN.—A. Blackburn and Co., Toft's Mill, Cleckheaton, Yorks.

OPEL.—British Electromobile Co., Ltd., Underhill Street, Camden Town, N.W.
ORLEANS.—Orleans Motor Co., Ltd., Orleans Works, Twickenham.
OWEN.—Owen Motor Car Co., 1, Long Acre, W.C.

PANHARD.—Panhard and Levassor, 14, Regent Street, W.
PEUGEOT.—Friswell Ltd., 1-11, Albany Street, Regent's Park.
PHŒNIX.—Phœnix Motors, Ltd., Blundell Street, Caledonian Road, N.
PICCARD.—Donne and Willans, 29a, Gillingham Street, W.
PILAIN.—A. Pellant, 74, Shaftesbury Avenue, W.
PILGRIM.—Pilgrim's Way Motor Co, Ltd., Farnham, Surrey

REX-REMO.—The Rex Motor Mfg. Co., Coventry.
RENAULT.—Renault Frères, Ltd., 19, Newman Street, Oxford Street, W.
REO.—Reo Motors, Ltd., Broad Sanctuary, Westminster, S.W.
RILEY.—Riley Cycle Co., Ltd., City Works, Coventry.
ROLLS-ROYCE.—Rolls-Royce, Ltd., 14-15, Conduit Street, W.
ROTHWELL.—Eclipse Machine Co., Ltd., Oldham.
ROYDALE.—Roydale Engineering Co., Trafalgar Works, Huddersfield.
ROVER.—Rover Co., Ltd., Meteor Works, Coventry.
RUTHERFORD.—Highclere Motor Car Syndicate, Ltd., Highclere, Newbury.

S.C.A.T.—Newton and Bennett, Ltd., King Street West, Manchester.
SCOUT.—Dean and Burden Bros., Ltd., Scout Motor Works, Salisbury.
SHEFFIELD-SIMPLEX.—Sheffield-Simplex Motor Works, Ltd., Tinsley, Sheffield.
SIDDELEY.—Wolseley Tool and Motor Car Co., Ltd, York Street, Westminster.
SIMMS-WELBECK.—Simms Manufacturing Co., Ltd., Kimberley Road, Kilburn.
SINGER.—Singer Co., Ltd., Coventry.
SIZAIRE-NAUDIN.—Charles Jarrott and Letts, 45, Great Marlborough Street, W.
S.K. SIMPLEX.—Smeddle and Kennedy, Ltd., St. James Street, Newcastle-on-Tyne.
STANDARD.—Standard Motor Co., Ltd., Coventry; Friswell's, Ltd., Albany Street, N.W.
STANLEY.—W. Galloway and Co., Gateshead; F. Wilkinson, Malt Street, Cornbrook, Manchester.
STAR.—Star Engineering Co., Wolverhampton.
STARLING.—Star Cycle Co., Ltd., Wolverhampton.
STELLA.—Stella Motor Co., 18, Regent Street, S.W.
STRAKER-SQUIRE.—Sidney Straker and Squire, Ltd., 5, Nelson Square, Blackfriars, S.E.
SUNBEAM.—Sunbeam Motor Co., Moorfield Works, Wolverhampton.
SWIFT.—Swift Motor Co., Ltd., Coventry.

TALBOT.—Clément-Talbot, Ltd., Barlby Road, N. Kensington, W.
THAMES.—W. T. Clifford Earp, Ltd., 74, Mortimer Street, W.
THORNYCROFT.—John I. Thornycroft and Co., Ltd., 2, Albemarle Street, W.
TORPEDO.—Hopper, F., and Co., Ltd., Barton-on-Humber.
TURNER-MIESSE.—Turner's Motor Manufacturing Co., Ltd., Wolverhampton.

UNIC.—Mann and Overton's, Ltd., 7a, Lower Belgrave Street, S.W.

VALVELESS.—Valveless, Ltd., 7, Upper St. Martin's Lane, W.C.
VAUXHALL.—Vauxhall Motors, Ltd., Luton, Beds.
VINOT.—J. T. Harman and Co., 6, Regent Street, S.W.
VULCAN.—Vulcan Motor Manufacturing and Engineering Co., Southport.

WEIGEL.—Weigel Motors, Ltd., 90, Goswell Road, E.C.
WESTINGHOUSE.—A. Gaal and Co., 17, Hanover Square, W.
WHITE.—The White Co., 35-37, Kingly Street, W.

ZEDEL.—British Automobile Commercial Syndicate, 95-98, Long Acre, W.C.
ZUST.—Zust Motors, Ltd., 100-104, Long Acre, W.C.

USEFUL HINTS AND TIPS.

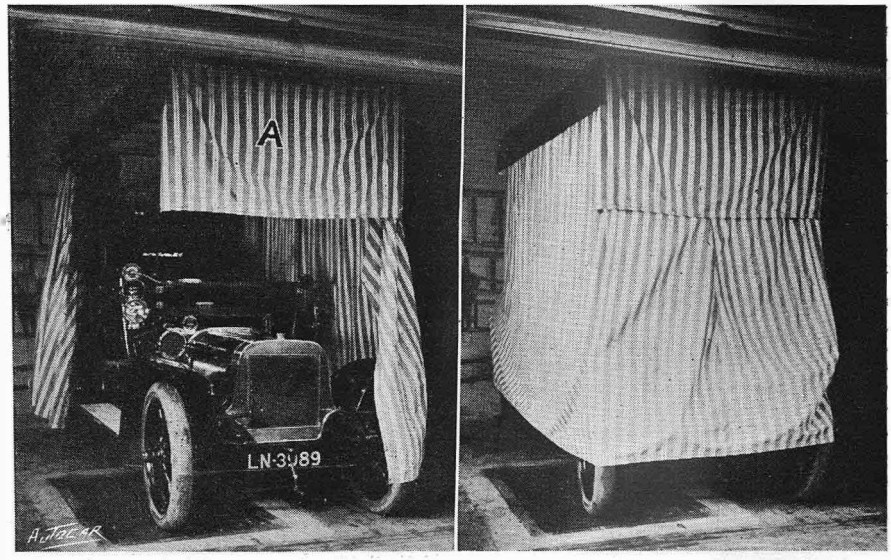
Cleaning Coachwork.

The cleaning of motor car bodies is very much more important than the majority of motor car owners are apt to believe. Cars which are constantly driven in town and seldom in the country should be washed as rapidly as possible at the end of the day's journey, because the mud collected from the town roads contains impurities which are far more likely to damage the varnish work than ordinary mud which is collected from country roads. It is almost superfluous to say that buckets of water should be thrown over the body before a sponge or leather comes near it, otherwise the highly varnished body will be scratched by minute particles of grit, which will cut like diamonds. In winter great care should be taken to prevent the water freezing on the paintwork, as it is liable to crack the varnished surface and cause it to peel.

A Useful Car Cover.

It is almost impossible for a man single handed to cover up a large car of the landaulet type properly without allowing some part of the cover to drag upon the ground, thus making it dirty and perhaps greasy.

A cover which overcomes these difficulties is illustrated herewith. It is made as follows: Two light steel ropes are fixed the length of the coach house, and are made taut with straining hooks at one end. A very light wooden frame is then made the size of the car. This is covered with an American cloth, and is suspended from the steel ropes by four hooks, so allowing the frame to travel the length of the coach house. When the car is driven backward into the garage, the cover can be immediately pushed exactly over it with the aid of a stick. On the underside of the frame light iron rods are fixed on the two sides and the back, so that the back piece, which is fitted with rings at the top, can be suspended from the rod and is easily detachable for cleaning at any time. The sides are made like curtains, fitted with rings at the top, and when unfastened are pushed back against the back wall of the coach house; they are buttoned down each side to the back piece of the cover. The side curtains are made sufficiently wide to come round the bonnet of the car, and are buttoned on to the flap A, which is fixed to the travelling frame. This flap is brought down low enough for a man to button up the cover without using any steps.



The useful cover for covered cars described in the accompanying article.

The cost for making a cover of this description is about the following:

	£	s.	d.
18½ yards 72in. striped blind material ..	2	18	7
6½ yards leather cloth	0	14	1
Making up the above	1	15	0
	£5	7	8
Frame rods and steel wires approximately	2	12	4
	£8	0	0

H.C.G.

Tappets of 12-16 h.p. Talbot.

Perhaps the following information may be useful to those who, like myself, have had trouble with the tappets of this particular car. Owing to the springs in the tappets sometimes breaking there is then nothing to keep the tappet down on the cam, and at high speeds the tappet turns round, with the result that the projecting cheeks on each side of the roller are cut to pieces, which pieces may do much harm in the crank chamber. Messrs. Clément-Talbot admit that the design (1906) is a faulty one, and offered to supply me with a set of new and improved tappets, but I found that it was quite possible to use the existing tappets with the following alterations: Mark the position of the gunmetal tappet holders when screwed into the crank case so as to know their position when removed therefrom. Screw a ¼in. peg into the tappet in the thick part above the roller, leaving a little less than ⅜in. projecting. Then cut a key way in the inside of the tappet holder in such a position as to bring the tappet roller in the correct position over the cam. Even if a tappet spring should break the tappet cannot turn round and damage to the projecting cheeks on each side of the roller cannot take place.

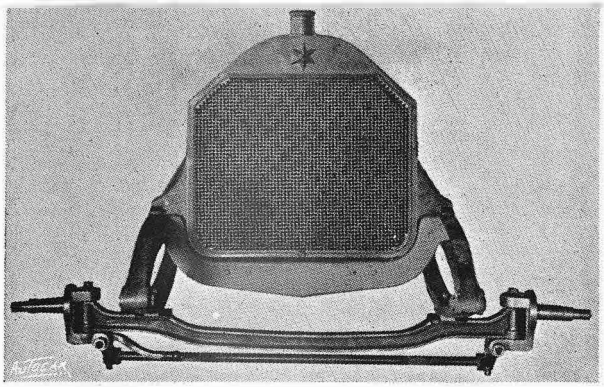
The whole job is a comparatively simple one which any competent mechanic can easily do. In connection with Talbot cars, I have been surprised at the poor quality of the pipe work. Instead of coned and ground joints, they are only ordinary flat joints, which one has to pack up with leather or fibre washers; also, in the water connections iron or steel rings are brazed on the pipes to form the joints, with the inevitable result that in a short time the surfaces are rusted away, and leaks develop. I have had to replace all mine with brass or gunmetal, but why they were not so made by the makers in the first instance I cannot understand.

J. A. MILNE.

[Both the defects referred to in our correspondent's Hint and Tip were rectified in the 1907 and subsequent models, but this in no way detracts from the usefulness of his suggestion, as there are many of the older cars running well to-day.—ED.]

NEW STAR MODELS.

The Star Motor Co., of Wolverhampton, are putting two new types of cars upon the market. One is an 8 h.p. car having a two-cylinder engine with 3½in. bore × 4½in. stroke, gate change, and direct drive on top speed. This car promises to be an extremely attractive little vehicle, and in addition will form an admirable cab chassis, but we are at present unable to give further details. The remaining new type is the 15 h.p. Star, which has a four-cylinder engine 3½in. bore × 4½in. stroke, leather faced cone clutch, four speeds forward and reverse, with direct drive on third speed—a very notable point in a car of this calibre. Although the cylinders are cast in pairs, the cylinder barrels are quite separate, there being ample water spaces between each of them. A White and Poppe carburetter is fitted. Lubrication is provided for by means of a Dubrulle type of lubricator set upon the dashboard. A force pump circulating oil to the crank chamber is also fitted. High-tension Bosch dual ignition will be used. The magneto and pump spindles are continuous, *i.e.*, the pump spindle is driven off the distribution gear, and is allowed to connect with the magneto spindle by means of a simple driving dog.



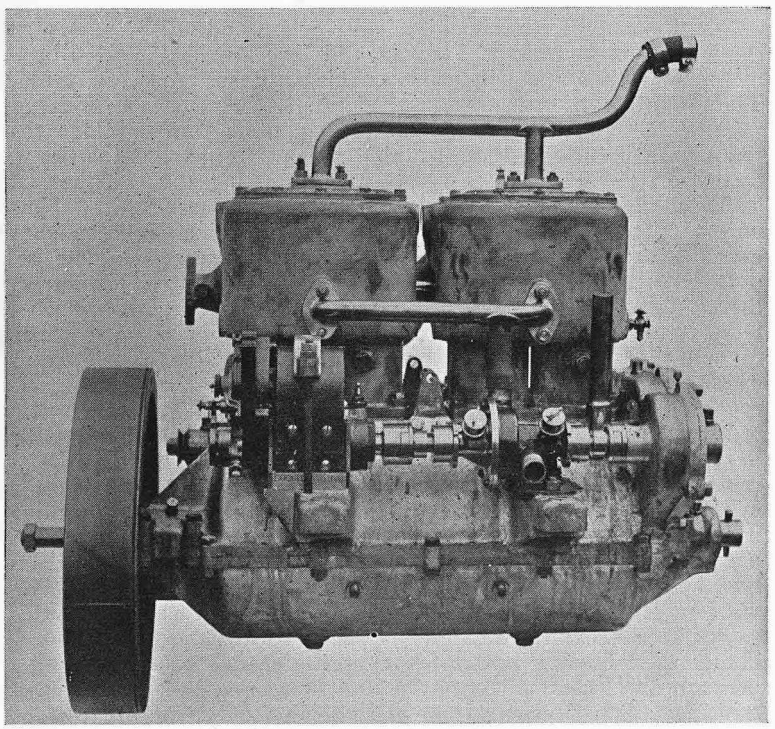
The distinctive radiator adopted for the 1909 15 h.p. Star chassis.

The engine and gear box are protected by an ample undershield. A flexible joint is provided between the leather faced cone clutch and the gear box, and the propeller-shaft is formed with cardan joints at each end. The driving bevel pinion is carried in ball bearings, a tail bearing being provided. The 810 × 100 mm. road wheels run on double ball bearings, carried on extensions of the live axle casings. Detachable gun metal brake shoes are provided, and an ample inspection lid is fitted to the differential gear case.

The control is by hand lever and accelerator pedal in the usual way. The steering is adjustable by the fact of the segment spindle being carried in eccentric bushes. An improved form of front axle is fitted, the steering jaws being formed on the steering wheel spindle. The steering pivots are carried in ball bearings, with thrust ball bearing at bottom.

The Star radiators are improved in shape by the fact of the lower angles now being rounded. The method of connecting the pump and magneto drive, and the design now adopted for the ends of the front axles, are shown in the accompanying engraving.

Miss Dorothy Levitt is one of the first Englishwomen to take a practical interest in the aeroplane, and has announced her intention of competing for the French prize for the first woman aeroplanist who flies a kilometre. With this end in view, Miss Levitt has requested Mr. Wilbur Wright to accept her as a pupil.



The magneto side of the 15 h.p. Star engine.

There is really quite a deal of nonsense written and talked about the cost of running a motor car. Some scribe having set the figure at £300, a correspondent living in a fashionable suburb writes asking how a married man with an income of £1,000 per year can possibly afford this annual drain. Well, in the first place, the car should not cost £300 per annum, or at least not the car which should find itself in the possession of a married man with a family and £1,000 per year. But, taking the figure as given, the thousand pound can hardly hope to afford anything in the shape of pleasure or recreation if he starts off by living in a house at a rental of £140, pays £240 per annum for the education of two children, and £40 per annum in cabs. Of course, if a man with £1,000 a year must live in Cadogan Gardens, then he is sacrificing the pleasures of motoring for the *cachet* of residence in a somewhat insalubrious though fashionable part of town. Now, if he will agree to his expenses being reduced by one-third, as they very well could be, he would find by very nearly wiping out his cab fares that he could quite well afford a motor car.

ON THE ROAD.

The New Daimler Engine.

Lots of people, who think I am an authority on motors and motoring simply because I write about them, ask me what my opinion is about the new Daimler engine. My reply usually is that it is just about as valuable as their own, because I know nothing more about it than what I have read. But if they persecute me, or give their own ideas on the subject, I put it to them that it is not likely that the Daimler Co. have been so foolish as to burn their boats without knowing where they were going on the other side, and for that reason I presume they are quite satisfied that they have got hold of the right thing. I have always had a great respect for the Daimler people ever since the time I went sparrow-catching at night with one of their earliest cars that rejoiced in tube ignition. And I remember that same car being sent to Coventry to have electric ignition fitted, and the owner telling me that it would have to be there a month because one of the Royal cars was being done and it would have to wait till that was finished. Which same car is still busy hauling about guns and lunch, taking home large quantities of game, and hacking up and down to the local station. I think also it originally rejoiced in a tiller, and even now it has a little bonnet full of holes all round. Therefore, I repeat, the Daimler Co. is not a firm that needs sensational advertisement, and, all the more because of this, I am sorry it has heralded the announcement of its new engine with such a Transatlantic type of trumpeting.

The criticism and remarks of engineers and rivals have been looked on as almost impertinences, though, in the main, they consisted in rebutting the statements of Mr. Knight with regard to the noisiness, unreliability, and general untrustworthiness of ordinary cars as now used. It would be rude and insular of me to write that the lecturer must have been contrasting the advantages of his own engine with the disadvantages of those he was in the habit of coming across in his native land, but to say that on our up-to-date cars continuous noise is mistaken for silence, and that the tremor of the tappets is felt all through the carriage, is, to put it mildly, to confess ignorance of what is best in the motors in this effete Eastern Hemisphere. Some critics were content to compare the behaviour of six-cylinder cars with his, but I will go further and give it as my opinion that many four-cylinder engines would not be improved if they were rendered any quieter than they are now. Speakers in the consequent discussion were perfectly right in denying that broken poppet valves are of common occurrence; indeed, so seldom does a valve break that very few motorists carry spare ones on their cars unless on tour. But the best criticism came from the speaker who insisted that nowadays the weakest points of motor cars lie chiefly behind the engine, and that there, too, lie the causes of most of the noises that give pedestrians just enough time to get out of the way. That is where we are looking for improvement, in the abolition of what engineers call that barbarous unmechanical gear box, the intricate differential, and the treacherous tyre, and though I trust Mr. Knight and the Daimler Co. have improved upon modern engines, yet I fear they have but painted the lily and gilded refined gold in comparison with what they might have done if they had brought out an invention for changing speed by pressing a button, or a tyre that was as easy as a pneumatic and would never go wrong. But even if they, or anyone else, did this, motorists would forbear to welcome it as perfect until it had been proved by time, distance, and under the rough hands of ordinary (not expert) drivers.

Understand, I am not crabbing an invention I have no experience of. I am simply regretting that Mr. Knight in his paper helped to praise his engine by deprecating its rivals, and did not seem to have posted himself up with the knowledge of how extremely good the great majority of them are. At the same time, my opinion of the Daimler Co. is so high that I am quite sure they have hold of a big success, though whether it will scrap all present-day engines I take leave to doubt, and my only regret concerning them is that they did not inform Mr. Knight that in England we go more by deeds than words, and that, amongst experts, he must not be offended if he should meet with criticism. In replying to objections, he has always the consolation that an ounce of fact is worth a ton of theory, and if he wants any more cheer he should get it from the knowledge that his invention has been taken up by the leading firms in almost all motor-producing countries. Except his own, apparently, but then, prophets never are supposed to have much of a time in their native land.

Napier and Lanchester Cars.

It is amusing to compare the reception generally given by the press to this new engine with the caustic approval meted out to the Napier four and two-cylinder design. But at the same time Mr. Edge is far too enterprising an opponent to take many liberties with, and I am anxiously awaiting his answers to the many correspondents who have been trying to draw him on. Mr. Napier and his works are held in much too much respect at home and abroad for him to be accused of not being capable of designing his own engines, and I am inclined to think that when two such heads of their profession as Messrs. Napier and Lanchester think alike the products of their brains will require a lot of beating. When I had my first run in a Lanchester (I think it was in 1903) I came to the conclusion that for smoothness in running there was nothing then to equal it, and I have often heard that the great disadvantage the firm suffered from was the idea that the machinery was far too complicated for ordinary people to understand. For instance, I remember at that time a man telling a story how an Irish doctor who was looking for a car remarked that he would have a Lanchester "if he was capable of performing the operation of appendicitis on the interior of a woodcock," and I have often wondered why the Lanchester people have not advertised the fact that their engine is no more difficult or inaccessible than that of other and far less reliable cars.

There seems to be no greater crime in the eyes of some motor critics than for a designer radically to alter his own designs, though very likely the reason for some of the alterations in cars at show time is to be found in the words of a friend of mine who is in charge of a very reliable English make. "The only differences," said he, "between last year's cars and this year's are some little things we put in to ensure 'attention from the press.' If the pattern was precisely the same as last year's there would be nothing at all for them to say about us at all, and that certainly would not mean business." Which is a shocking thing to write in a motor paper.

OWEN JOHN.

ROAD CONSTRUCTION.

THE PRACTICAL EFFECT OF THE PARIS CONGRESS UPON BRITISH METHODS.

The Paris International Road Congress is over, the delegates have returned to their respective countries, and the motoring press throughout the world is trying to impress on its readers that everything is *couleur de rose*, that the authorities and the surveyors have quite agreed that the roads must be improved for the benefit of the motorist, and are about to do their best to bring this happy state of affairs about, *et voilà tout*. But, unfortunately, this is very far from being the case, more especially in our own country.

Certainly the nett apparent result of the Congress has been the passing of a number of more or less innocuous resolutions which were already accepted axioms to the road builder; but there can be no disguising the fact, and it is of the greatest importance to motorists (especially of this country) to bear in mind, that the general opinion of the majority of the Congress was adverse to motors and motoring. There was, of course, no idea of preventing the use of motors upon the road—motoring is now an accepted method of locomotion in general use—but there was a strong feeling in favour of more stringent legislation and regulations, especially in regard to high powered cars. The Minister of Public Works in his speech on the opening day acknowledged that it was due to motors, and motors alone, that it had been found necessary to call together the Congress, and every speaker who followed laid stress on the fact that the great increase of wear and tear of the roads and subsequent increase of cost of repairs to the roads were due to the motor.

We may be sure that our own surveyors and local authorities will not be slow to take advantage of such statements, especially in view of the recommendations of the Congress of the necessity of thoroughly reconstructing main roads and others which are much used in all cases where there is no properly laid foundation—a case which is the rule, not the exception, in Great Britain. Loans for this object will be necessary, and to meet the interest on the loans and not add to the rates we may certainly expect a great outcry for the increase of taxation on motor cars. It is therefore the duty of every motorist to do his utmost to impress upon his neighbours that, so for from taxing the user of the road, it is the duty of the local authorities to do their utmost to put the roads into such condition as will facilitate the use of modern vehicles, that roads are intended to assist and promote the trade of their locality, that they are the highways of commerce, and therefore of prosperity, and that they never were or will be (except in the minds of our local Chadbands) intended to serve as playgrounds for children or as cottagers' fowl runs.

Need for a Central Authority.

That the recommendations of the Congress as to road foundations, repairs, etc., will be acted upon in every case is too much to hope for, and, although it was agreed that basalt and granite, broken into small and similarly shaped pieces, were the only materials with which roads should be repaired, we may be sure that for many a year to come cartloads of flints, gravel, and limestone will be dumped promiscuously on our highways in many localities, and patchwork will still be in high favour.

It is the curse of this country that we have no central authority, such as exists in every European country, to regulate how our highways shall be or shall not be kept up, and therefore in each separate locality there are different interests at work, which often seriously militate against the public welfare. A formerly incurred debt (a building scheme which has outgrown its estimate) may upset the local budget, and then everything has to suffer, and invariably the roads suffer first; cheaper materials, less labour, less supervision—anything to scrape through the year, quite regardless of the future, with the result that matters go from bad to worse, and the end is chaotic. As Mr. Maybury pointed out, road-making is no longer experimental, even with regard to the wear and tear of cars. If only the authorities will agree to the expense, it is now possible to build roads that will wear, will be waterproof and almost dustless, and will be no more expensive in the long run than the present roads. But therein lies the whole difficulty. The hand to mouth policy has ever been that of every local authority; it is only when you get a main central body that you get schemes considered and carried out which are for the ultimate benefit of the community.

Dust and Proper Methods.

With regard to the dust nuisance, it was generally agreed that surface tarring was only a temporary palliative, which had to be frequently renewed if the road were subject to much wear, and that the only sure way to *lessen* dust and increase the life of the road surface was the system of incorporating tar with the topping material to the depth of at least three inches. We have yet to see whether our local ediles will be stirred up to do their duty in this matter. We have written "lessen" instead of "abolish," as it is now generally known that an absolutely dustless road is an impossibility; a certain amount of dusty matter will collect on it, however carefully it is constructed, chiefly of animal refuse and dust blown off neighbouring land.

Two resolutions of much importance to town dwellers were: (*a*) That macadamised roads should cease to be laid in large towns and their suburbs; (*b*) that special conduits with openings at fixed intervals should gradually be constructed on an organised plan beneath all streets for the passage of water, gas, electric, and other mains. The objection that will be raised to the first resolution is the extra expense it will entail on that philanthropic individual, the speculative builder, who has done so much to deface the beauties and ruin the health of the country with stucco and pseudo-Early English atrocities, which can be guaranteed to vibrate from top to bottom at the slightest jar, such as the passage of a butcher's cart. Is it small wonder, then, if the unfortunate inhabitants do object to the passage of motor traffic, not because of the vibration of this traffic, but because they know their houses are too flimsy to stand? To the second resolution it will be objected by gas, water, and other companies concerned, that the increase of expense would be enormous, but this is a fallacy. Given a fixed plan laid down by a central authority, within some three to four years the whole of the mains could be enclosed in specially built conduits, bringing down the cost of repairs to a fraction of their present cost, through the facilities there would then be of immediately locating a leak or repairing damage of any kind, whilst the roadway, when relaid, would no longer be subject to being torn up every few weeks and filled in again regardless of foundation, of

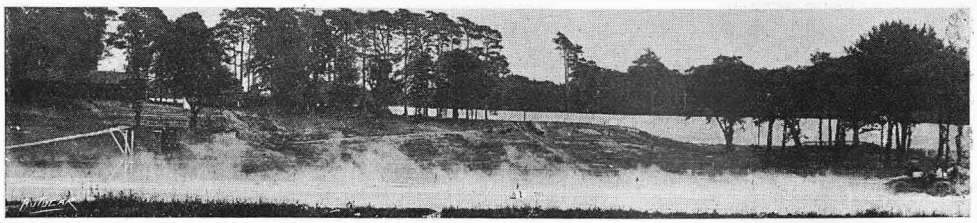
bed, or system of topping. It is wonderful that as matters are now arranged our roads last as they do.

With regard to motor cars generally, the Congress expressed the opinion that the wear and tear increases in direct proportion to the speed, and had it not been for the fact that the chairman of the discussion on "Motor Cars and the Damage done to the Roadway" was a leading member of the Automobile Club de France, it was evident from the tone of the meeting that strong resolutions as to speed limits would have been proposed and passed.

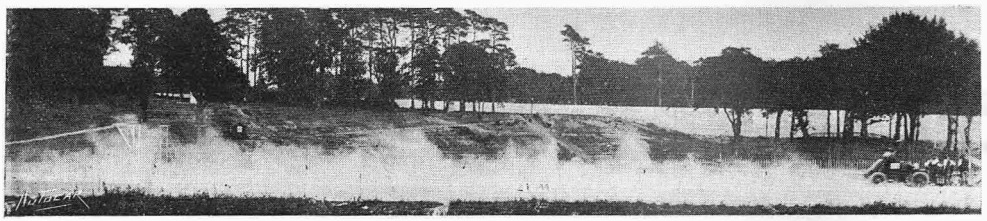
In the matter of non-skids, the Congress did not pass any resolution prohibiting their use, as was expected by many. It is true it was admitted that their use was injurious to the road surface, but it was conceded that such was the additional safety they gave, alike to the car and driver and to the pedestrian, that their use could not be prohibited at present. This was not passed, however, without a large number of dissentients, and there is no doubt that before the Congress meets again at Brussels in 1910 matters will have come to a crisis, especially in this country.

It is much to be regretted that only two resolutions of importance with regard to heavy motor traffic, namely, maximum weight and speed, were passed. This subject, which is of such growing importance in England, has not yet attained any importance on the Continent, and the Congress therefore decided to put off the discussion on the subject till the meeting at Brussels. It will be of importance to omnibus companies to know that the speed limit for a car weighing over three tons was settled at 9.3 miles per hour. This decision was come to more from consideration for the road surface than for any fear for the safety of the public.

On the whole, the Congress has been disappointing both to the extremists who were ready to shout "Down with the motor car" and to the motorist, who will feel that there is now a sword of Damocles overhanging him in the shape of a number of threatening resolutions, which he can only pray may not materialise.



The three illustrations on this page represent the Cadillac car in the R.A.C. Dust Trials at Brooklands, when it will be recollected the Cadillac was highly commended. Special interest lies in the fact that the car had a folding tonneau body. The above illustration shows the Cadillac travelling at 30 m.p.h. with the tonneau closed.



The Cadillac travelling at 30 m.p.h. with the tonneau half open. More dust.

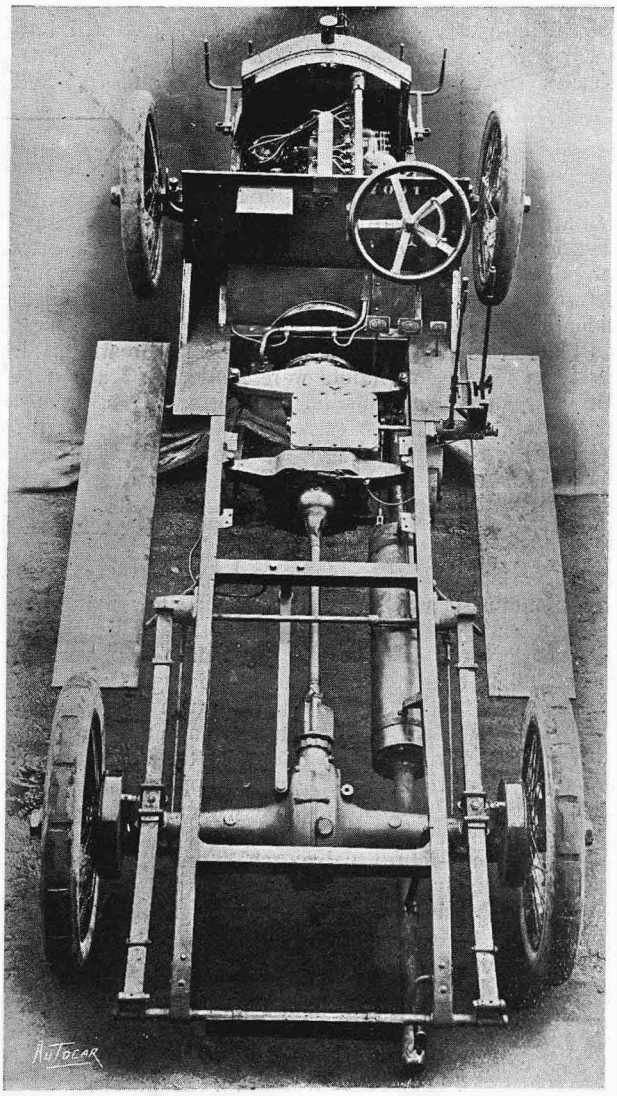
The Cadillac travelling at 30 m.p.h. with the tonneau right open—as a four-seater. Most dust.

A KEMPSHALL TYRE DEMONSTRATION.

On Friday last a run to Brighton and back organised by Mr. C. D. Clayton took place to demonstrate the good qualities of the new pattern Kempshall tyre. Starting from the Kempshall Tyre Co.'s premises in Trafalgar Square a fleet of six-cylinder Standard cars, placed at the company's disposal by Mr. Charles Friswell, bore members of the press to England's best known seaside town. Lunch was served at the York Hotel, at which Mr. J. Schack-Sommer, a director of the company, presided. Mr. Sommer explained that the new pattern Kempshall had been improved in many ways, and that the walls of the tyre had been strengthened by ribs or turrets which extended from the tread to the beading. This strengthening of the walls allows of the tyres being run with very low pressure, 40 to 50 lbs. per square inch being sufficient, with the result that the greatest possible amount of comfort is afforded. Among the many claims for Kempshalls may be mentioned that, owing to their strength and the thickness of their tread, they are practically puncture proof, and that the projecting turrets act like radiating fins by offering a large amount of cooling surface, and thus adding to the life of the tyre. As regards the non-skidding properties of the covers, it can be stated that even under the most trying circumstances—and on Friday the necessary conditions prevailed—there were no signs of side-slip. Eight cars in all took part in the run. Of these six were 20 h.p. six-cylinder Standards, the remaining two being a Daimler and a Sunbeam, all of which were shod with Kempshall tyres. The participators in the run were fully satisfied with the results obtained.

THE NEW 30 H.P. NAPIER.

We have already dealt with the new two-cylinder and four-cylinder Napiers which have just been introduced, and we mentioned in the series of small engine cars a 30 h.p. six-cylinder model. This we illustrate. It has six cylinders, 3¼in. bore by 5in. stroke, but here its similarity to the smaller cars ends, and the model is better described as a smaller and lighter edition of this year's 30 h.p. car. The whole chassis has been very much lightened, and the reduction amounts to no less than 5 cwt., so that although the engine is smaller the ratio of power to weight is in favour of the new model. Of general details it may be mentioned that very long springs are employed. The frame has been kept low, so that a landaulet body can be fitted when desired, and as, of course, this lowering in no way affects the ground clearance it is good in all respects. The main features will be easily gathered from the illustrations. It will be seen that the valves are enclosed, and that the gear box is not bolted up direct to the engine. Among the points which are not visible may be mentioned mechanical lubrication and multiple disc clutch. We have not tried the new car yet, but we should expect it to run delightfully.



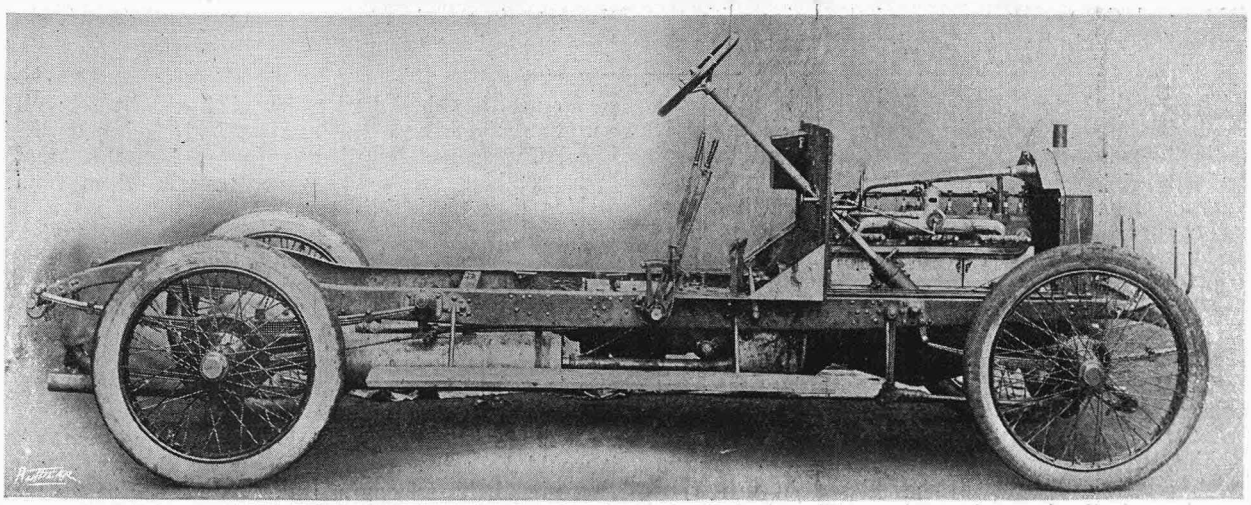
General arrangement of the new 30 h.p. six-cylinder Napier chassis.

IN THE HOUSE OF COMMONS.

Local Applications for Speed Limits.

Mr. Markham asked the President of the Local Government Board whether he had communicated with the London County Council or any other authorities advising them to make application to him for powers to reduce the speed of motor cars in populous towns to a speed not exceeding ten miles per hour; and, if not, whether he will forthwith do so, in view of the large number of accidents caused to persons by excessive speed.

Mr. Burns: The Board have not communicated with local authorities in the precise sense suggested, but in the circular which I recently issued on the subject of the Motor Car Act I dealt at some length with the question of low speed limits, and intimated my willingness to consider applications for the imposition of such limits in places where they may properly be imposed.



Side elevation of the 1909 edition of the 30 h.p. six-cylinder Napier chassis.

"MOTORING ILLUSTRATED."

Arrangements have been concluded whereby *Motoring Illustrated* becomes merged in *The Autocar* after the current issue of that journal. The goodwill and copyright of *Motoring Illustrated* have been purchased by the proprietors of *The Autocar*, and arrangements are being made to supply *The Autocar* in future to regular subscribers of *Motoring Illustrated*. In this—the last issue of that journal purchasable at the bookstalls—a copy of the new penny edition of *The Autocar* is included.

A NEW MOTOR SPIRIT.

In view of the recent Mansion House Conference, it is satisfactory to learn that automobile designers are distinctly on the *qui vive* as to the future of self-propelled vehicles of all types. At the meeting just referred to special stress was laid upon certain objectionable results arising from ignorance or carelessness on the part of the driver. In the same breath, as it were, in which complaints were made, we learn of a cure for smoky and noxious exhausts. To overcome this trouble experiments have been made for a lengthy period, the results of which were publicly demonstrated last Thursday at the Wolseley-Siddeley Garage, Westminster. A motor spirit known as the N.U., which had undergone a special process, was tried on this occasion against one of the usual brands, and certainly seemed to promise great things for the future, as the exhaust was practically smokeless and by no means unpleasant to the nose. We should, however, prefer that the spirit had been tested in the same car as the ordinary brand was, as then we could form a better opinion as to its value. As we are now personally testing a sample, we will be in a position to give the results of our experience a little later. At the moment the specific process by which the ordinarily noxious exhaust is transformed into a pleasant one is being kept a secret.

THE PRESHA TYRE PUMP.

All motorists will welcome a device for saving the labour inherent to those who use the indispensable pneumatic tyre. The Presha tyre pump is one which brings about the inflation of a tyre through the agency of the engine. What it does is to turn one or more cylinders of the car engine into a pump, using a purifying chamber which serves to cleanse the exhaust gases from all deleterious matter. The apparatus consists of a union with a cock provided with a sparking plug thread and screwed into the valve cap. This union contains a non-return valve, which must, of course, be set vertically. The union is connected with the cleansing chamber by means of a long coil of copper pipe, while the cleansing chamber is a cast-iron cylinder containing a perforated tube surrounded by wick, and is filled two-thirds full of water. Attached to the chamber are a pressure gauge and the rubber pipe connection.

The working of the apparatus is best described by explaining the method of procedure employed in running it. In the first place, the engine is set to run quite slowly, next the rubber connection is fitted to the tyre valve, and the tap on the top of the union with the engine is opened about half a turn, and as soon as the gauge shows a pressure of about 40 lbs. to the square inch, three of the cylinders may be cut out and the spark advanced about halfway. The pressure will then rapidly rise to about 55 or 60 lbs., when the spark should be advanced a little more until the requisite pressure is reached. Should over 75 lbs. be required the engine may be worked a trifle harder. The apparatus is manufactured by the Metropolitan Laboratories, 100, Evering Road, London, N., and is handled in the West End by Messrs. C. Grahame-White and Co., 1, Albemarle Street, Piccadilly, W.

We have seen the apparatus fitted to a 10-12 h.p. Humber belonging to Mr. Calvert, the inventor. It worked remarkably well, and by its means an 810 by 90 mm. tyre was pumped up to 90 lbs. pressure in about four minutes.

The apparatus is simple and very easily fitted, as it requires no further alteration than the fitting of the union to the valve cap and clamping the purifying cylinder to a convenient part of the car. Once in position it requires no attention except that it must be used according to the instructions sent out with it, and the water in the chamber must be changed after it has been used about twenty times in succession.

The Northallerton District Council have asked the North Riding of Yorkshire County Council to apply to the Local Government Board for a speed limit of ten miles per hour on motor cars passing through Northallerton. In support of their request they state that cars go through the place at sixty or seventy miles an hour. It appears that the police, after making strict observations for twelve days, found the highest speed of any car passing through the place to be sixteen miles per hour. It had not been found necessary to warn any motorist in the whole of the North Riding for reckless driving during the past eight months, nor had the police received any complaints from others on this score. The County Council, on the strength of this unimpeachable testimony, which cannot be said to be biased in favour of motorists, declined to take action. They invited the District Council to talk the matter over in friendly conference, but the District Council haughtily refused, and there is talk of the smaller body going to the Local Government Board over the heads of the larger body; nothing seems likely to restrain them from making themselves ridiculous.

* * *

What appears to be a simple form of detachable spare wheel has been invented by Mr. J. H. Hall, of 151, South Street, Moor, Sheffield. The spare rim consists of an ordinary tyre rim to which are riveted four angle brackets. These are held in place by four clip bolts which grip the rim of the car wheel on the far side. To fix the rim it is only necessary to screw up the four bolts, though we should be inclined to think it would be rather difficult to put on the spare tyre single-handed. Of course, there is no need to deflate the tyre on the car rim. It strikes us as being a practical and ingenious device.

THE NEW WHITE STEAM CARS.

EMBODYING A RE-DESIGNED ENGINE WITH JOY VALVE GEAR, AND OTHER INTERESTING FEATURES IN CARS OF 15 AND 40 H.P.

Late last week Mr. Frederic Coleman returned from a visit to America, bringing with him a chassis each of the new 15 h.p. and the new 40 h.p. White steam cars, as they are to be shown at Olympia and offered to the British public for 1908-9.

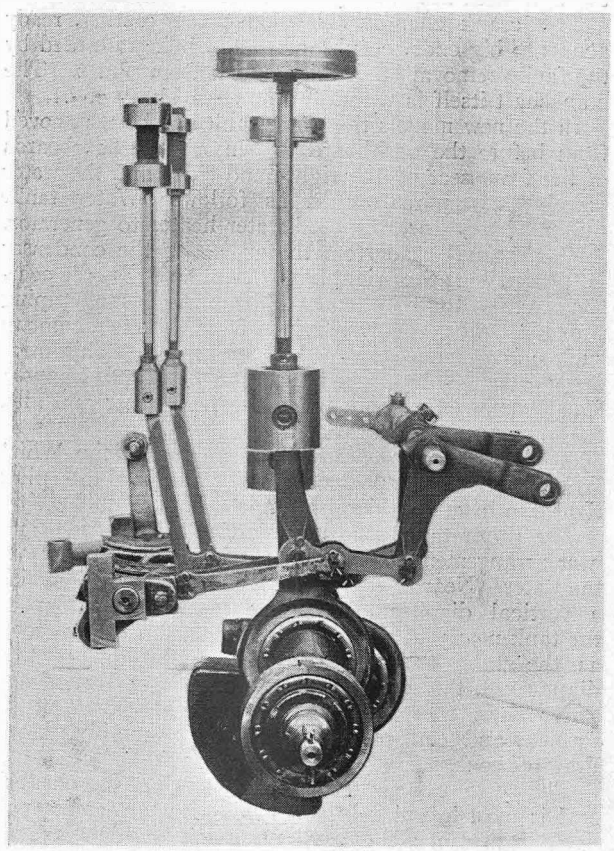


Fig. 1.—View of crankshaft in ball bearings, connecting rods, cylindrical cross head guides, valve actuating gear, and pump operating rocking levers worked off connecting rods, valve spindle guides and piston valves, and piston rods and pistons.

The description of their novel points we shall give here will only be of the sketchiest. It will, however, be more than enough to whet the curious appetite of every steam partisan, and should also serve to awaken the very serious consideration of all contemplative prospective purchasers of a motor car.

By enumeration of the salient points of the 15 h.p. we shall practically cover the detail of the 40 h.p., the latter, save for one particular feature, being a larger edition of the lower powered car.

The frame is of pressed channel section steel suitably cambered and curved, this being the first instance in which a frame of this description has been built into a White steam car. But this is a comparatively insignificant departure in comparison with the engine itself, which is of an entirely new design, and has been under serious test for the past two years in the States. From these tests it has emerged in a perfectly satisfactory manner, and is to-day presented to the world by the White Company with the utmost confidence.

The engine is carried on two cross members of the frame (which are so located that the entire weight of the engine is in rear of the front axle) in such wise that the propeller-shaft is perfectly horizontal fore and aft when the car is suitably loaded. The compound system, which has proved so satisfactory in the past, has been retained, and in the 15 h.p. engine the high pressure cylinder is 2½in. diameter and the low pressure cylinder 4¼in. diameter, with 3in. stroke. It is in respect to the valve gear that the great change has been made. In lieu of the Stephenson valve motion, to wit, the ordinary slide valves actuated by eccentrics off the crankshaft, an adaptation of the well-known Joy valve motion, with piston valves operated from the connecting rods, has been adopted, with great resultant simplification and saving of weight. Also the cylinders are brought closer together, thus permitting the use of a short one-piece crankshaft. It is possible to carry this shaft in two main ball bearings, thus ensuring absolute alignment by eliminating the third or more bearings. The connecting rod big ends are also fitted with ball bearings, all these being made with cages separating the balls, which are of large diameter. The connecting rods are one-piece nickel steel, pressed and formed with the collared hole to take the ends of the rocking levers actuating the piston valves. The crankshaft bearings are easily removable by detaching the lock nuts and washers. In fig. 1 the moving parts of the engine proper are clearly shown removed from the cylinders and crank chamber, in their relation to each other. On the left are the piston valves and the Joy

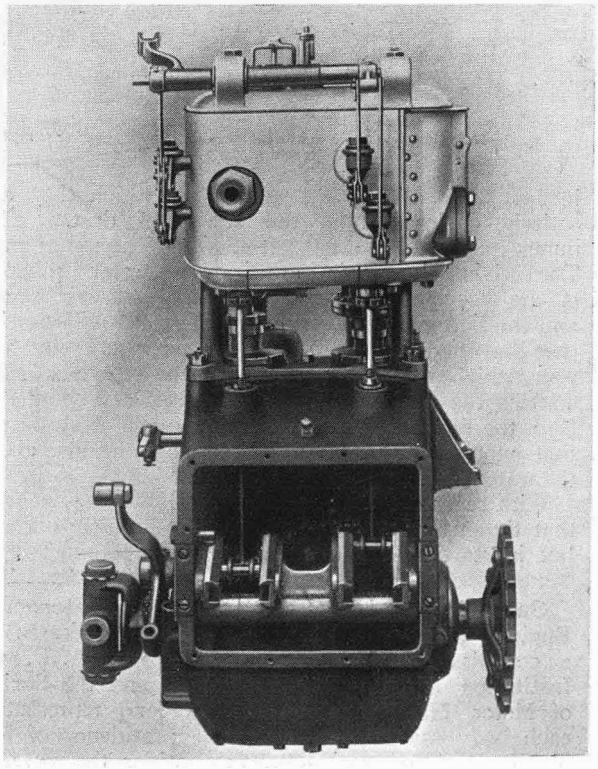


Fig. 2.—Offside view of the White engine, showing side inspection door of crank chamber detached exposing the Joy valve gear.

gear, in the centre are the crankshaft, connecting rod, cylindrical piston rod guide, piston rod and piston, and on the right are the rocking levers working the power water pump and the air and return water pump. By the fact that the steam is admitted through the centre of the valves, and the exhaust escapes at the ends, the pressure on the stuffing boxes is reduced to that of the exhaust from each cylinder. The small arm seen projecting inwards from the far pump rocking lever is connected by means of a rod to a ratchet device which operates the lubricator on the dashboard. This lever is seen in fig. 2, in which the forward half of the forward universal connection to the propeller-shaft is also seen on the left, and the condenser fan driving sprocket on the right. Stuffing boxes are provided to the upper ends of the crosshead slides preventing the emission of oil. The position of the power water pump and the air and water return pump is plainly shown

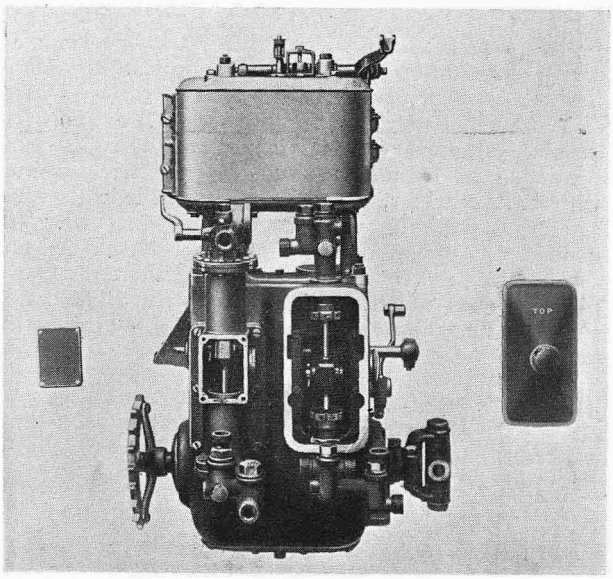


Fig. 3.—Near side view of the White engine, showing water power pumps and air and water return pumps exposed.

in fig. 3, as also is the manner in which they are entirely enclosed from the access of dust. The pumps are all on the left-hand side of the engine. The right-hand pair are power water pumps; of the left-hand pair, the top one is an air pump and the bottom one a return water pump. The cylinders are fitted with blow off valves for discharging any water which may have condensed in the cylinders before starting the engine cold. These valves can be opened from the dashboard before giving the engine steam, so that upon opening the throttle the steam at once ejects the water from the cylinders.

With regard to the control, the adjustment is such that the engine runs normally at about half cut off, but in starting, the operation of the simpling valve, always a feature of the White compound engine, but one which has been considerably modified and improved, being also of the piston type, allows full pressure for the full stroke. A cut-off pedal on the dashboard when pressed produces the same result. This pedal is for use only when slow, hard pulling is required, as when climbing very steep grades. By the well-known feature of the Joy valve gear (which maintains unchanged the lead of the valve when the cut-off is reduced), this engine runs much more smoothly on cut-off than was the case with the valve gear previously fitted.

The crank chamber is a one-piece casting, ready access to big ends, crankshafts, etc., being afforded by the facile removal of the side and bottom plates. The crankshaft itself is withdrawable from either end.

In the new models the water tank has been removed from before the dashboard to beneath the floorboards of the front seat on the right-hand side, and the water travel has been rearranged as follows: Water tank, pump, flow motor, and feed water heater to generator.

The exhaust lead from the engine to the condenser is placed on the right-hand side, and is of pear-shaped form to accommodate within a coil of piping through which the water flows from the flow motor to such coil which is the feed water heater. This neat arrangement, while constituting a neat and compact feed water heater, both heats the feed water and aids the process of condensation.

No means has been found of improving the White generator, which remains as of yore, but the pilot light has been considerably improved.

The water tank boasts a particularly simple and neat arrangement for the disassociation of grease from the water. Near to its rearward end it is provided with a vertical diaphragm, running from the bottom of the tank nearly to the top, with the result that as soon as the water reaches the level of the top of this diaphragm, the grease floating on the surface of the water flows over into the rearward compartment so formed, and can be drawn off by a suitably placed draw-off cock.

The petrol tank is set across the rear of the chassis, and is most ingeniously provided with an emergency compartment of a three-gallon capacity, which is fitted with independent pressure pipe and filler.

Space prohibits further particularisation of this most interesting chassis at the moment. There remain yet many interesting points, to which we hope to return by the light of fuller illustrations than are at the moment available, but we might conclude this all too brief and sketchy description by some general details of both chassis.

The 40 h.p. model with complete open touring car body to seat five or seven will have a wheelbase of 10ft. 2in. and wheels 36in. diameter, while the wheelbase of the 15 h.p. is 8ft. 8in. and the wheels are 32in. in diameter. The high pressure cylinder of the 40 h.p. is 3½in. bore, the low 6in., and the stroke 4½in.

On Wednesday last at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W., a commission appointed by the Royal A.C., the Institution of Automobile Engineers, and the Society of Motor Manufacturers and Traders, representing each body equally, sat under the presidency of Mr. T. H. D. Berridge, M.P., to consider the question of horse-power and rating formulæ. The basis of the discussion was the report recently issued by the Society of Motor Manufacturers and Traders containing certain recommendations on the subject which were dealt with in *The Autocar* of August 29th. The discussion was opened by Mr. Mervyn O'Gorman, who read a paper on "The Various Uses of Rating," and Mr. G. H. Baillie, whose contribution was entitled "Horse-power Formulæ." The same subject will be discussed by the Institution of Automobile Engineers on Wednesday next, at the same place. Cards of invitation may be obtained from the secretary, Mr. Rees Jeffreys, 1, Albemarle Street, Piccadilly, W.

A NEW CADILLAC.

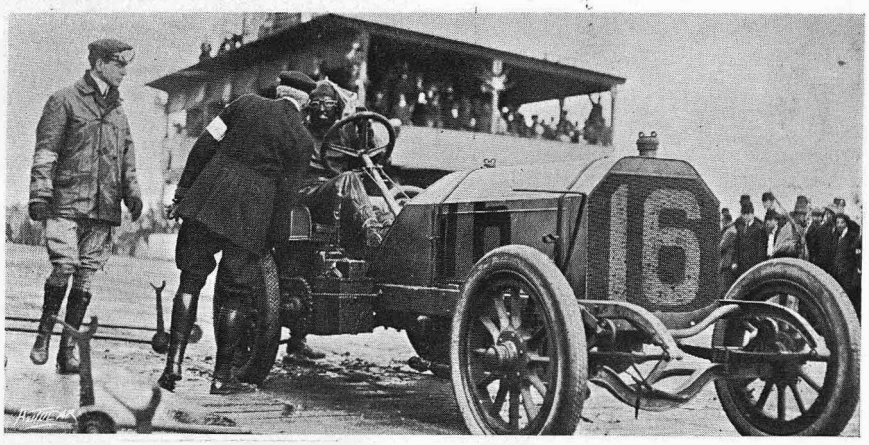
If only by reason of the now world famous interchangeability trials, which have made the term Cadillac synonymous with absolute exactitude, all fresh departures or deviation of type would ensure attention for a new Cadillac model. Our readers will recall our detailed description of the 20 h.p. Cadillac, which has won such favour on this side since its introduction here, and will be able to appreciate the new 26-30 h.p. four-cylinder Cadillac (25.6 h.p. R.A.C. rating), which has just arrived, and which will be found upon the Anglo-American Motor Car Co.'s stand at Olympia. The frame is of pressed channel section steel inswept and upswept at its extremities in the usual way. Forward is a fine example of tubular axle with well designed steering attachments. The radiator is of handsome and distinctive design formed of vertical tubes, linked up by transverse flanges. The four-cylinder engine (4in. bore by 4½in. stroke) has its cylinders set separately upon the crank chamber, and has spun sheet brass water jackets. In the separate combustion heads most ample waterways are provided round the valve chambers. The crankshaft runs in fine long plain bearings, and is formed with flanged central webs to avert side play. The valve chambers are all set on the right of the camshaft, and all engine, necessitating but one valve tappets are adjustable. The water circulating pump, oil pump, and magneto are all lineable on continuous spindles, the water pump being forward of the distribution gear case in a particularly accessible position. The oil pump merely lifts the oil to the sight feeds on the dashboard, but the dash lubrication is provided in a unique manner which makes it most certain and efficient upon the steepest grades. Each crank throw rotates in a separate compartment, and the oil thrown up by big end No. 1 is led by suitable catch leads to crank pit No. 2. Oil from No. 2 big end is led to crank pit No. 3, and so on, the oil from No. 4 being led back to crank pit No. 1. The results obtained from this ingenious scheme of lubrication have proved most satisfactory in Cadillac practice. The carburetter is of the usual Cadillac pattern with a few minor improvements, but the present engine is minus a governor, as it has been found unnecessary.

The control is by accelerator pedal and lever on steering wheel, but the clutch pedal upon declutching both closes throttle and backs ignition. Accumulator high-tension or high-tension magneto ignition is fitted. The cylinders are very slightly *desaxés*.

A well-designed gear box with four speeds forward and reverse is carried on cross members, and a change-speed device is fitted, which most ingeniously and serviceably provides interlocking between clutch and gear engagement. That is to say, the clutch cannot engage until the gears are properly and completely enmeshed. The propeller-shaft runs in a tubular casing, which connects with the frame forward by a spherical joint, and forms a perfect torque compression column. The back axle is of excellent design and great strength.

The chassis is carried on long semi-elliptical springs forward and side and a cross spring behind, the ends of the latter taking the load through a neat ball rocking joint. Lubricators are fitted to all spring shackles. A particularly handsome and comfortable double phaeton body is provided.

The closer the examination, the more fully it is realised that the greatest care has been exercised in the design and workmanship of this chassis and body. Considerable astonishment will be evinced at the very moderate price asked. Indeed, it would be difficult to indicate better value anywhere.



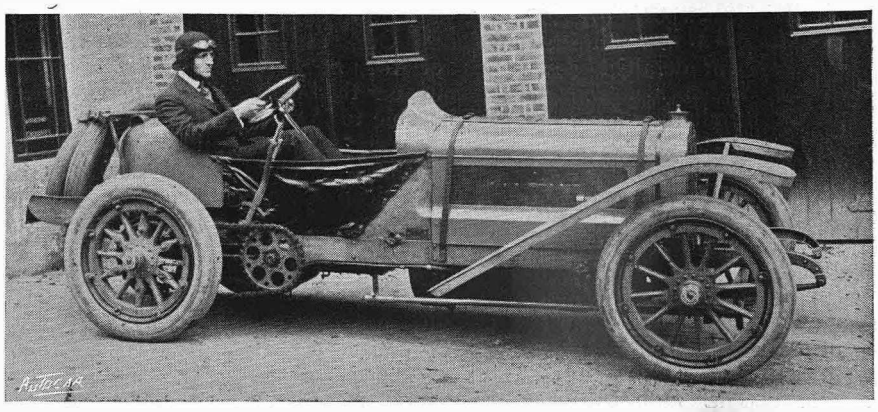
THE WINNER OF THE VANDERBILT CUP RACE. Robertson on the 120 h.p. Locomobile. He is talking to Mr. J. de Mont Thompson, chairman of the Cup Commission, and on the left is Mr. W. K. Vanderbilt, jun., donor of the trophy. Robertson is not a coloured man—it is dirt and oil encountered during the race that give him the appearance of being a negro. The race was reported on page 673 of *The Autocar* last week.

In our report of the discussion of Mr. Knight's paper about the new Daimler engine Lord Montagu's comparison between the new Daimler and a six-cylinder Rolls-Royce was included. Lord Montagu stated that, so far as his observations went, the difference in silence and flexibility between the four-cylinder Daimler engine and the six-cylinder engine of the "Silver Rogue" was negligible. In connection with this comparison, Messrs. Rolls-Royce write us pointing out that the "Silver Rogue" is not, and never was, a fair specimen of what they could do in the way of silence and flexibility, as it was specially built for the 2,000 Miles Trial, in which no marks were given for silence or smoothness of running, everything depending upon efficiency, power, and speed. Though not noisy in the ordinary sense of the word, it was noisy compared with the average Rolls-Royce. This we explained fully prior to the start of the 2,000 Miles Trial, when the "White Ghost" and "Silver Silence" were renamed "White Knave" and "Silver Rogue." In the matter of fuel consumption, Messrs. Rolls-Royce mention that Lord Montagu in a tour of 1,760 miles, which included the ascent of six mountain passes, aggregating in altitude to 23,700 feet, found that the consumption worked out at sixteen miles to the gallon. Of course, in this no special attempt was made at economy, as in the 2,000 Miles Trial the same car averaged 20.1 miles per gallon.

A CHART OF THE FOUR INCH RACE.

We have received from the Royal Automobile Club a most interesting and graphic diagram of the Four Inch Race. The chart is some three feet by two feet, and is ruled horizontally for minutes and vertically for miles, and the speed curves of the ten finishing cars are plotted across the diagram. The lines across the diagram of the first three cars are wonderfully even. To all intents and purposes they may be described as three parallel and nearly straight lines. They give the history of the terrific struggle between the Hutton and the two Darracqs at a glance, and we see where eventually Watson's line crosses George's, and, obtaining a slight advantage, keeps it till the finish.

Another very striking point indeed is the very even running shown by the fourth car—the Calthorpe. To all intents and purposes, this is a straight line right across the diagram; in fact, nothing more consistent is shown. As we go further back, the lines become more and more variable, and spread out fan-wise from the bold and nearly straight lines described by the leaders. From the diagram, it would appear that George's maximum lead at any time was about six miles, and he was leading by between four and six miles from the end of lap six to halfway through the seventh lap, but at this point his line began to converge upon that of Guinness's Darracq and Watson's winning Hutton. All interested in racing should obtain a copy of the chart from the Club. The price is 2s. 6d.



The Brasier car with which Bablot lowered both the short and long distance 60 h.p. class records at Brooklands last week. Reference to page 691, where details of the record are given, will show that the ten laps were covered at the rate of 101.778 m.p.h. Mr. Clement Hobson, the owner of the car, is at the wheel.

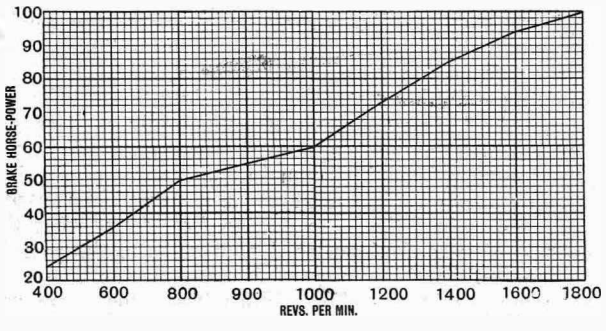
CHANGE SPEED GEAR.

Under this title, Mr. Charles Wicksteed, of Kettering, read a paper at the Royal Automobile Club last week. Unfortunately, lack of space prevents our dealing with it by more than a brief reference. The paper referred almost exclusively to the Wicksteed gear, upon which Mr. Wicksteed has been working steadily for the last three years or so. His gear was first shown at the Crystal Palace in 1907, when we described it and also its very satisfactory working, and we have referred to it since. The great idea of the inventor was to produce a gear which was practically undamageable by a clumsy driver.

It will be remembered that in the Wicksteed device the gears are always in mesh, and that the operation of any one pair is brought about by hard steel tapered clutches which are thrown in to engage the gears. The actual operation of changing simply consists in pushing a lever over a dial on a vertical column by the side of the steering column. It is just as easy of performance as the moving of the handle on the dial of an engine room telegraph, such as one sees on the bridges of steam boats.

The great interest of Mr. Wicksteed's paper was that he outlined the problem which he set himself to solve, and very interestingly described the difficulties he overcame in solving it. The great feature of his gear which distinguishes it from any other friction clutch gear was that he used hard steel clutches, and this was the secret of his success. He cited tremendous tests to which these clutches had been put without seizure or wear worthy of mention. In short, he showed from the first the principle he adopted was right, and that any troubles he had to overcome were simply due to not knowing the proper clearances or the exact taper which it was best to employ. These things once ascertained, there was no further trouble, and now every part of the gear box was quite satisfactory, and capable of withstanding strains far greater than those which could be imposed in ordinary driving, however clumsy the driver might be.

In our issue of October 31st we referred to a test which Mr. Edge brought up at the discussion on Mr. Knight's paper. He has sent us a copy of the Faraday House report, and we have plotted a curve from it. It will be seen that extraordinarily high power was developed at slow, medium, and high speeds alike. The bore of the six-cylinder Napier engine tested was $4\frac{1}{16}$in., which does not appear to be a standard Napier size, and, unfortunately, we have no information as to the stroke. The natural assumption will be that it was a long one, but as no information is available upon this subject we are bound to say that the curve is of no value for comparison with the performances of engines of which both bore and stroke are known. Perhaps some of the brilliant mathematicians who are devoting so much attention to the rating question will solve the problem and supply the unknown dimension.



CORRESPONDENCE.

EDITORIAL NOTICES.

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

Letters of a personal nature will be withheld.

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

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

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

CARS FOR MEDICAL MEN.

[13530.]—"Runabout" in his "Small Car Talk" in *The Autocar* of October 24th (page 627) has evidently suppressed the middle premise. Arguing from the fact that certain of his medical friends object to sit beside their chauffeur, "for it ill consorts with my professional dignity," etc., he deduces that the specification required is that of a modified taxicab with a four-cylinder engine tucked away beneath the driving seat.

While allowing that "Runabout" may be right as regards a small section of the medical profession, I think he has not grasped the motor requirements of the profession as a whole. How does the average medical man get through his daily round? If a motorist, he uses, as a rule, a light "two-seater"; if a non-motorist, he walks, cycles, or drives as light a dogcart as he can get consistent with strength and durability, for very few can afford the luxury of a victoria in summer and a brougham during the winter months.

Therefore if he is to be converted from horseflesh to automobilism, why try to tempt him with an article such as a modified four-cylinder taxicab, which, however desirable it may be, he knows he cannot well afford to buy, and which, if he did buy, he would find, to his great cost, he could not afford to keep in decent repair, to say nothing of that formidable item depreciation?

I do not think there can be many doctors whose dignity is offended by sitting beside their driver—"chauffeur" brings up visions of a big four or six-cylinder landaulet. There are, I should think, very many more who are offended at the suggestion. Few medicals want to be cooped up in a stuffy landaulet all day long.

In my opinion—and I am writing with over eight years' experience—the car for the medical man who decides on buying one must answer to certain requirements, which could be amplified according to the taste and pockets of the prospective buyer:

(1.) Its initial cost must not greatly exceed £200.

(2.) The car must have a two-seater body, or, better still, a body with detachable tonneau, wind screen, and hood.

(3.) It must be absolutely reliable, and must be of sound, honest construction, *e.g.*, it must last.

(4.) The car must be light on tyres, and the repair and renewal bill, including the annual overhaul, must be as small as possible.

(5.) It must be easy to drive, and should not have an array of accessories on the dash, such as lubricators and oil pumps, which have to be attended to at regular intervals during the day.

(6.) The car must be silent, up to legal limit on the flat, and fast on hills.

(7.) The car must be of simple construction, and the working parts must be most accessible.

The 10 h.p. single-cylinder Adams, one of which I have owned for about two years, and which I have driven well over 15,000 miles, seems to me to fulfil all those requirements. It is perfectly reliable—so much so that I take my man out with me on my rounds on the rarest occasions, preferring to leave him at home to work in the garden. The repair bill is small, and the car is very light on tyres. I have on my front near wheel at the present time a tyre that cannot have done less than 12,000 miles, and on the near rear wheel one that was retreaded in July, 1907, that has never been off the car since, and has still a lot of life in it. My dash is free of all accessories—no oil tank, no pump—for, to quote "Runabout," "somewhere in the entrails of the engine an ingenious little pump is forcing a precisely apportioned dose of oil to each working part."

With its epicyclic gear and pedals to push, it is quite foolproof, and that is no small matter for a medical man who cannot "shake off" each case especially if that case be a bad one—as he leaves his patient's house, and who may, however good a driver he may be, while thinking of weightier matters, mess up his gears.

The intermediate gear would certainly have an advantage, but the transmission is so efficient that it is little missed, and the other advantages of the car outweigh that deficiency. The car is silent, and quite fast enough on the top gear without any need of racing the engine, thereby causing vibration and injury to the engine. I have passed much bigger cars on the hills—cars that have previously passed me on the level.

The engine is so get-at-able and of such simple construction that my man, who was my coachman in past years, can dismantle it, clean the piston rings and cylinder head, clean up the valves—in fact, clean the engine thoroughly, and have it running again ready for the road in under five hours. I do not think one could begin to attempt that with a four-cylinder engine. It is several years now since *The Autocar* published its "Medical" number, and I believe it would be of the greatest interest to your medical readers, and a very great assistance to many, if other medical men having a fairly extensive experience with cars were to give their views regarding "The Cars for Medical Men" in the pages of *The Autocar*.

A. TENNYSON SMITH, M.D.

[13581.]—I quite agree with the article in *The Autocar* of October 24th, regarding cars for doctors in general. I am sure there is a large demand for such a car, and more especially for one about 9 or 10 h.p., preferably four cylinders, as quietness and reliability are a *sine qua non*. Also one with inclined steering column and push pedals, so that if an open body is put on in the summer it can be driven in comfort by the owner. I am sure if the present taxicab chassis had these alterations, there would be a large demand among medical men for the same.

MEDICUS.

MOTOR UNION AND ROYAL AUTOMOBILE CLUB.

[13582.]—The extraordinary attitude taken by the Royal Automobile Club Committee calls for comment, and I am sure that all reasonably minded motorists will agree with the resolution of the Derby and District A.C. Committee which states, "That the committee unanimously deplore the dictatorial tone in which the latter part of Clause 18 of such scheme (R.A.C. Associate Scheme) is framed, in which the Royal Automobile Club states that the clubs must be associated with the R.A.C. only . . . " etc.

It is somewhat difficult to believe that the Royal Automobile Club Committee can genuinely have the good of motoring at heart when they deliberately oppose all efforts which have been made to prevent division in the ranks of the various motoring clubs.

May I just draw attention to an interesting point in the way the R.A.C. carries out its promises? On page 25 of the *R.A.C. Journal* for January 9th, 1908, it is definitely stated that the work of the R.A.C. General (Associates) Committee is not subject to review, and yet, within nine months, when this General Committee recommends that a joint affiliation scheme for clubs to join the R.A.C. and Union be inaugurated, the R.A. Club Committee not only refuse this recommendation but immediately make a rule to oppose it. Is not this submitting the General Committee's work to review? The Associates have no control whatever. The R.A. Club Committee can alter and amend not only the whole Associate Scheme, but any action proposed by the Associates General Committee; and, in fact, have already done so.

There is a point in the "R.A.C. scheme" not generally recognised, and that is that the individual associates (subscription £1 1s.) have only one representative on the General Committee for every 100 members, while the clubs (who only pay a fee of 5s. for each member) have one representative for every fifty members—a somewhat unusual rule.

Now on the Motor Union Committee the clubs and individual members are equally represented by one individual for every fifty members (approx.); the work of the committee is in no way subject to review, and it has ample funds to carry out its work, its income this year already exceeding £11,000. It has always made every effort to unite motorists and not to divide them, and at this critical time when so much hostility is being shown, this is of supreme importance. The action of the R.A.C. is causing dissension and division.

Anyone who remembers the events of 1902 will recollect that the Motor Union was made an active body after the

Correspondence.

R.A.C. had for some sixteen months done all the work and had failed to call a meeting of the Motor Union Committee.

As long as the R.A.C. had a working majority on the Motor Union Committee it had no fault to find with the agreement, but as soon as it began to be outvoted by the clubs and individual members it endeavours to divide motorists into two camps. J. L. LOCK, M.A.

[13583.]—As one who has, from the commencement of motoring in this country, taken the greatest interest in the movement, I have watched with much regret the split which has gradually taken place between the organisations on which we depend for protection and help, and it is with added feelings of regret that I have read the new Royal Automobile Club scheme for association.

It is an obvious attempt to wreck a useful and active body which has done much, and is doing much, for the development and protection of the interests of motorists in this country. I feel sure many who, like myself, have been actively interested in motor politics in the past, but have wearied of the continual strife and have retired from the struggle, will see in this new scheme an endeavour on the part of the R.A.C. to bring about a return of the unfortunate position in which the provincial clubs found themselves prior to the resuscitation of the Motor Union in 1902.

A representative body—the Committee of the R.A.C. Associates—passed at Norwich, I believe, a resolution in favour of a joint scheme of affiliation to both the R.A.C. and the Motor Union, and, possibly owing to my not following the reports of meetings closely, I cannot understand how a resolution so passed comes to be utterly and completely reversed by the Committee of the R.A.C. It was this unfortunate, autocratic conduct on the part of the Club Committee which led to the trouble in the past.

I feel sure that the associate members of the R.A.C. never for an instant thought that the Norwich resolution would result in the scheme now put forward by the Club, but they are apparently powerless to prevent the inevitable disaster (probably amounting to extinction as regards some of the clubs) which this scheme threatens to bring about.

I have not attended any meetings this year, but I gather that the Motor Union has offered to agree to any generally approved scheme of joint affiliation, and that this offer has been finally declined by the R.A.C., as of course the Club has a perfect right to do; but surely it should stop there, and leave the provincial clubs to affiliate to each body separately, should they desire to do so.

I am a member of both the R.A.C. and the Motor Union, and I freely admit that several things have been done by both bodies of which I do not approve, but there is a considerable balance of good and useful work standing to the credit of both of them, and it is because I am sure that there is ample scope for each body to continue to do useful work on behalf of the motoring community that I am led to protest against a policy which can only have the effect of spreading dissension in the ranks of the provincial clubs, and thereby weakening our forces. J. A. COLE.

A DANGEROUS SPOT.

[13584.]—In reading your correspondent's account of the non-stop run of the new Daimler car, I was struck by the similarity of an incident described by him to one which happened to me several years ago when driving at night to the Southport motor races, and I cannot help thinking that it occurred at the same spot. The night was very dark, and the heavy rain considerably obscured the head lights, so I was endeavouring to drive with caution.

When we were a few miles south of Warrington approaching from the direction of Newcastle-under-Lyme, on coming round a slight bend in the road, which had been straight and wide for some considerable distance, it forked into two, one half running up to a narrow platform on the edge of a canal which crosses over the other fork by an arch at approximately right angles.

It was too late in the short distance between the front of the car and the edge of the canal after I had realised the situation, so nothing remained but to take a header with the car down the steep chalky bank, which I accordingly did, the turning angle being so sharp that the car tried to turn over and was only prevented from doing so by again going half-way up the bank and sliding down again, when we landed on all four wheels minus both back tyres.

Luckily we experienced no further damage beyond the luggage being shot out of the tonneau, and a fairly violent shaking to the occupants of the car. It took us about forty minutes to replace tyres and luggage, during which time not a soul passed.

I cannot help thinking that it was at the same spot that the accident recorded in your description occurred, and it appears to me that this must be a dangerous spot which should be marked by a warning light or otherwise, as there must be something more than coincidence for two similar accidents to occur at the same spot, and in the same manner, the more so as Bush is well-known to be an extremely careful driver, and would naturally be exceptionally so on such a particular run. It would be very easy in the fog to mistake the arch over the canal for a railway arch.

T. B. BROWNE.

ECONOMICAL RUNNING.

[13585.]—In reply to letter No. 13500, signed by "Paid Driver," with reference to the petrol consumption of twenty-five miles per gallon on a 35 h.p. Iris, may I point out that the car was a standard one in every way, except that the control of the petrol economiser was separated from the throttle? This method has been employed on one other 35 h.p. Iris, but as the same results are obtained when the economiser is coupled to the throttle, there is no object in departing from the Iris standard one lever control of the engine.

The above result was obtained on a chassis with light body loaded up to two tons to represent a heavy seven-seated landaulet, but, of course, that is not quite the same thing as the complete car with consequent wind resistance.

However, I can name several individual 35 h.p. Iris cars with one lever control that are doing their twenty miles to the gallon in the hands of private owners, and would recommend "Paid Driver" to write to the works if the car of which he is in charge is not doing well in consumption of petrol. Perhaps he has not an economiser fitted, or else it is out of adjustment. G. LL. HINDS HOWELL (Captain).

WORCESTER JUSTICE AND THE ENTENTE CORDIALE.

[13586.]—As a constant reader of your unequalled journal, I hope you will allow me to say a few words about the Worcester justice.

I was coming from Beeston on a 20 h.p. car three weeks ago, and although I may have exceeded the legal limit, I was not a little surprised to receive the visit of a detective to inquire who was the driver of so and so car, travelling between Worcester and Kempsey. I told him that I was coming from the works with a man working at Beeston, and that I could not tell him exactly who was driving at the time, as the car, being a new one, was to be tested, and I had never been stopped on the road, etc.

A few days later I received two summonses—one for driving a car dangerously and recklessly, and the other for driving negligently. We sent a solicitor and my clean license, but there was a witness who said that when he took my number I was travelling at fifty miles an hour, and that he had just time to rush from the centre of the road to escape. . . . (I never saw him.)

I have never met with an accident, nor killed a chicken yet, and the prosecuting solicitor told the bench that I was a racer at Brooklands, and an expert driver, etc.

This being my first offence, the bench said they would have to fine me two guineas and costs, and endorse my license, which has not come back yet. Of course, next day it was in the papers in Cheltenham. Now the people are watching me, and the other day a man on a bicycle took my number and reported me to the police at Cheltenham, telling them that he had just time to rush from the centre of the street to escape, etc. Do you think that I can be convicted simply on a publican's evidence?

The following article was published by the very same man who stopped me on the road, and again in the same paper. It tells enough of the public's feeling:

"ANOTHER CHELTENHAM MOTORIST FINED.

"BUT WHAT ARE FINES TO MILLIONAIRES?

"A man who fires at random a revolver into a crowd is not acting more to the public danger than a motorist hurling tons of machinery along a highway at forty miles an hour," etc.

He signs himself "Ben Worrid." I think he had better go back to France to see if the supposed "Entente Cordiale" stands on a better cordiality.

UN FRANCAIS DEGOUTE.

TYRE COSTS PER MILE.

[13587.]—I enclose you some particulars as to the wear and cost of covers that may interest your readers. It will be noticed that nearly all the covers burst and did not puncture, and the rate of driving is always moderate.

Wheel.	Type of Tyre.	Mls. run.	Why taken off.	What became of Cover.	Cost. £	s.	d.	Cost per Mile
MICHELIN TYRES.								
Off rear	Studded	2493	Burst	Scrapped	11	14	0	1.102d.
,,	,,	2562	,,	Retreaded	11	14	0	.78d.
,,	,,	1015	,,	Scrapped	7	0	0	
Near rear	,,	2850	,,	,,	11	14	0	.985d.
,,	,,	2814	,,	,,	11	14	0	.998d.
Near front	Round tread	3990	,,	Retreaded	9	8	10	.514d.
,,	,,	2043	,,	Scrapped	3	10	0	
Off front	,,	4783	,,	Retreaded	9	8	10	.441d.
,,	,,	2253	,,	Scrapped	3	10	0	
Near front	Square tread	6036	,, *	Repaired	8	1	0	
Off ,,	,,	6000	Still good	—	7	5	0	.32d.
Near ,,	,,	Just on	—	—	—	—		—
MOSELEY TYRES.								
Near front	Plain	2259	—	Retreaded	10	18	0	.84d.
,,	,,	1826	Burst	Scrapped	3	10	0	
,,	,,	2960	,,	,,	10	18	0	.87d.
Off front	,,	2276	,,	,,	10	18	0	1.105d.
PALMER TYRES.								
Off rear	Cord	4730	Burst	Retreaded	14	0	0	.44d.
,,	,,	2761	,,	Scrapped	6	10	0	
Near rear	,,	3099	Cracked at edge	Repaired	14	0	0	.56d.
Off ,,	,,	3686	—	Scrapped	2	0	0	

* Burst through badly vulcanised repair.

All tyres were 880 × 120 mm., and were fitted to a 24-30 h.p. Dennis car, carrying four and five passengers with luggage. Tours as far as Inverness north, Land's End south-west, St. David's west, and all round the South and East coasts have been made, and the car has been driven in every county in Great Britain excepting Radnor and Glamorgan.

G. H. PIZEY.

INCONSIDERATE DRIVING.

[13588.]—Could you, in the interests of motoring in general and of the ordinary users of the highway in particular, again emphatically protest in your journal against that abominable class of motor driver—the get-off-the-earth species?

Living as I do in close proximity to the Brighton Road, at Crawley, I have had, sad to say, ample experience of this class of motorist. Must I confess it? Well, quite half the offenders are not of the paid chauffeur type, but are, to all outward appearances, gentleman drivers. Their procedure is invariably to drive down the centre of the road, making room for no one, and compelling other motors and vehicles to hastily pull into the side, and in many cases have their near side wheels in the gutter, or perhaps on the turf. Within the last few days I have had three experiences of this sort. On Friday of last week a big Renault, driven by a man in green livery, forced me to drive my car more than half on to the turf bordering the road. This particular offender never made the slightest attempt to give me any room, but retained his line down the centre, and passed me with the most irritating and supercilious stare. I was far too employed trying to prevent my car dropping into the ditch by the road to be able to take his number. Had I been able to do so I would not have had the slightest compunction in forwarding it to the police and Royal Automobile Club.

The get-off-the-earth driver takes an unholy pleasure in seeing how close he can pass to anything else on the road without actually touching it. It was only lately that I had the melancholy satisfaction of being able to bring to book a driver who, devoid of the slightest idea of sport, had actually bagged me whilst sitting, or rather, I should say, whilst my car was standing still. Having dashed into me and done considerable damage he explained that he was trying to pass close to me, but had miscalculated his distance. The type of driver I have mentioned who deliberately retains the centre of the road, or else grudgingly gives you only a fraction of room, is one which the sooner we get rid of the better.

H. W. MOFFAT.

RUNNING COSTS.

[13589.] Herewith I am sending you cost of running my 12-14 h.p. Sunbeam for the years 1905, 1906, and 1907. I think I pointed out before that in the work done by a medical man should be calculated the time per gallon of petrol as well as distance per gallon. SUNBEAM 234.

	1907.	1906.	1905.
Standing Charges.			
Rent, rates, and taxes	£62 18 7½		
Insurance	11 17 6		
Spares	4 13 0		
Wages	54 12 0		
	£134 1 1½	£124 15 5	£131 6 0
Running Costs.			
Tyres	£35 1 7		
Petrol	32 5 0		
Oil	3 0 0		
Repairs	54 7 8		
Ignition	3 18 1		
Sundries	4 6 0		
	£132 18 4	£134 16 2	£121 19 4
Totals ...	£266 19 11½	£259 11 7	£253 6 1
Less share rent and various returns	12 14 3	20 18 0	19 1 0
Grand totals ...	£254 5 8½	£238 13 7	£234 1
	1907.	1906.	1905.
Mileage	6,866	6,318	6,183
Petrol	398 gals.	394 gals.	317 gals.
Hours	1,536	1,631	1,157½
Days	304	324	302
Miles per gal.	17	16	19
Hours per gal.	3	4	3
Miles per day	22	19	20

IS SILENT RUNNING DESIRABLE?

[13590.]—The increase in the number of road crossing and similar mishaps at sharp road bends seems to indicate that the silent running car will have its disadvantages, for it stands to reason that the chances of such mishaps are considerably increased with the ever-increasing number of motors on the roads. Collisions between cars are becoming of rather frequent occurrence, and I daresay if the facts were enquired into in some cases it would be found that insufficient warning was the resulting cause. Certainly the noiseless car will call for an increased use of the horn or other device of warning, and we may even see complaints in the dailies as regards the new "motor peril"—the silent car. Probably, too, special legislation would be imposed, *i.e.*, distinct and more prominent means of warning; thus extreme silent running would defeat its own ends.

MODERATELY NOISY.

ENGINE POSITION IN A MOTOR CAR.

[13591.]—The present arrangement of the machinery of a motor car is largely the result of actual experiments, and we know that a modern car is an efficient machine. Nevertheless, it appears to be a mass if inconsistencies to the old-fashioned idea. Many of the apparent inconsistencies have been discussed in your correspondence columns, but I have not noticed an explanation as to why the arrangement of the engine placed lengthwise in the chassis came to be universally adopted. Several arguments against this arrangement are obvious.

The crankshaft has a certain tendency to turn in a clockwise direction, this tendency being employed to drive the rear wheels. There must be an equal tendency for the engine case and cylinders to turn in an anti-clockwise direction. This tendency of the engine to turn bodily about its crankshaft is resisted by the frame which is held above the front axle by the road springs, so that the near side of the frame is lifted upwards and the offside pressed downwards. This must result in unequal work for the springs and unequal work for the tyres. It must also result (when

Correspondence.

the fronts of the springs are not shackled) in the front axle always being a little out of square with the frame, the off-side end being further back than the near side end, which must affect steering and tyres.

It may be that the gyroscopic action of the flywheel corrects the above defects, but some form of parallel motion arranged to make the front road springs work equally would appear to be an improvement.

Perhaps some of your readers will kindly say if such an arrangement has been used, and if it cured the faults mentioned, presuming they ever existed. R. D. S.

THE 1909 DAIMLER ENGINE.

[13592.]—I read with amazement, in view of the present public feeling in this country, of a twenty-four hours run at an average speed far above the legal limit on one of the new American Knight-Daimler motor cars, and I ask, was this a Royal Automobile Club official trial, and if so, how can such an illegal effort over the King's highway be justified? If it was not an official trial by the Royal Automobile Club, then it would be useful to know why Mr. Knight does not have official trials of his vehicle carried out by the R.A.C.?

W. GARDINER.

[Our correspondent is under a misapprehension. The engine in question was running for over twenty-eight hours. No illegal effort was made. The trial was not an official trial by the Royal Automobile Club; it was merely a one day's run out of a series of constant road tests which were being carried out by this particular car. On the occasion our representative accompanied it it merely ran for double as long as usual, and the main idea of the test was that we should satisfy ourselves that the engine could be run for much longer periods than engines are ever required to run in ordinary touring service without any sort of lubrication troubles. It is necessary to bear in mind that at this time one of the most constantly recurring criticisms of the new engine was that it would give trouble if run for any long distance. If oiled sufficiently to avoid overheating of the bearings it was to choke itself from the results of such lubrication, or else it was to seize from want of oil. As our account made clear, there was not the least difficulty or hitch of any sort throughout the long journey.—ED.]

[13593.]—I have read with interest the papers and letters *re* the Daimler slide valve engine, and as a mechanical engineer who has been for his whole service concerned with locomotives and motors, would like to add a few thoughts on the subject. In the first place, there seems no reason why the sleeves should give trouble. The Willans central valve engine is distantly connected to this design, and gives excellent results. The chain drive of eccentric-shaft has been criticised, but surely it is common knowledge that chains of the type adopted have been steadily taking the place of gears for motor drives, even those requiring considerable power. Such chains are more silent than gears, and I believe more efficient; certainly they are in the large sizes. I join in the enquiry as to why splash oiling is used. Is it for cheapness only? It is certainly not so efficient or so independent of carelessness. The engine should be cheaper to make than the ordinary type.

As regards the claims for cool running, I should prefer to have an outside opinion, as the Daimler engines, especially those of 1905-6, are notoriously hot ones, and it would not be surprising if the new engine were not better. Again, *re* noise, till a short time ago the Daimler people were content with their cams, etc., all unenclosed, and one can understand that even a centre valve engine with enclosed cams would be an advance in quietness, so that some doubt may be expressed as to the silence being so much greater than that of many existing high-grade engines. Napier has already enclosed his tappets in the new designs, and others have only to follow to put this right. I am looking forward very much to seeing the new engine in work, as it seems to me an advance in the right direction. I am a prospective buyer.

MECHANICAL ENGINEER.

ALLOTMENT OF SPACES AT OLYMPIA.

[13594.]—As regards the above, I beg to send you herewith copy of a proposal which I have submitted to the committee appointed to consider the above question.

As the method of selection in the past has always been more or less unsatisfactory, it would be interesting to have the views of your readers on the proposal, which appears to be the only method of fulfilling the following desired objects:

1. Of ensuring the main part of the hall being filled by first-class makers, without robbing the other exhibitors of their due importance by appropriating all the best spaces for the leading firms, which is detrimental to the show as a whole, as, if it be understood that the best cars are only to be bought in the centre of the hall, it would have a prejudicial effect on other firms to be there at all.
2. Of making it perfectly just to all members by ensuring that those who have stood by the Society in the past shall have some slight advantage for their loyalty.
3. Allowing for the biggest firms, who wish to assert their importance, to do so in the only fair way—by paying for it.

It seems to me, and I have given a considerable amount of time to considering the subject, to be the only way of giving absolute justice and satisfaction to every member.

[COPY.]

"PROPOSAL FOR ALLOTTING SPACES.

"That a certain number of the best positions be reserved, and that the number of these reserved spaces be equal to half the number of applicants eligible to participate in the first drawing.

"That the list of applicants eligible for the first drawing (by virtue of having signed the bond for three years in succession) be divided by lot into two sections 'A' and 'B.'

"That those in 'A' section ballot for the reserved spaces, which they will occupy for the year. That in the following year the 'B' section be entitled to the reserved spaces.

"That any firm in 'A' section, if desirous, be allowed to put up its space for auction or private treaty, same to be conducted by the Society, the bidding to be open to any member in 'B' section.

"That 25% of the profit be retained by the Society, the remainder to go into the pocket of the seller.

"That the seller be compelled to occupy the position vacated by the buyer.

"That newcomers in the first drawing go into 'B' section for the first year."

J. W. BENNETT.

THE KNOWING CHAUFFEUR.

[13595.]—The other day I was out in the country when I saw a Beeston Humber car in trouble. The owner said he did not know what was the matter, but from what I could see the engine would not take its advance, and it would only drive the car in the lowest gear. The engine was running nicely when free, but you could not make it go any faster. From a glance I should say that the commutator required replacing.

Anyway, now for the fun. A four-cylinder Panhard with limousine body came along, with one of the real chauffeurs at the helm. He stopped, volunteered the information that the engine was running perfectly, and it was the clutch that was slipping. Therefore, in an instant, he pulled up the floor boards, depressed the clutch pedal and picked up two handfuls of grit from the road, and carefully rubbed it in the leather and inside the flywheel. Did you ever hear of such a proceeding, and did it cure the fault? Oh, no. He also volunteered the information that he always did that to his car. No wonder that parts of cars wear out if they are subjected to this treatment.

J. R. MAIDENS.

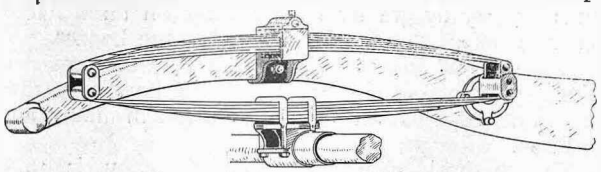
DISPENSING WITH PUMP.

[13596.]—Probably some of your readers are owners of 30 h.p. 1907 Beeston Humber cars, in which case the following may be of interest.

While touring in Devonshire in September last the water circulating pump on my car gave out, and on taking it down I found the pinion teeth so thin that most of them had broken off, rendering the pump useless. I had to scrap the pump and short circuited its connections with a piece of pipe in the hope that the water would circulate on the thermo-syphon system. This I found it did in a very satisfactory manner. The weather was hot and the hills stiff, but the water never once boiled in the radiator. The pump always leaked at the glands, so that I was more than pleased to get rid of it. I have only to add about half a pint of water every week to the radiator. I might also add that I can leave the engine running for a quarter of an hour without the water boiling. ARTHUR E. ROOKE.

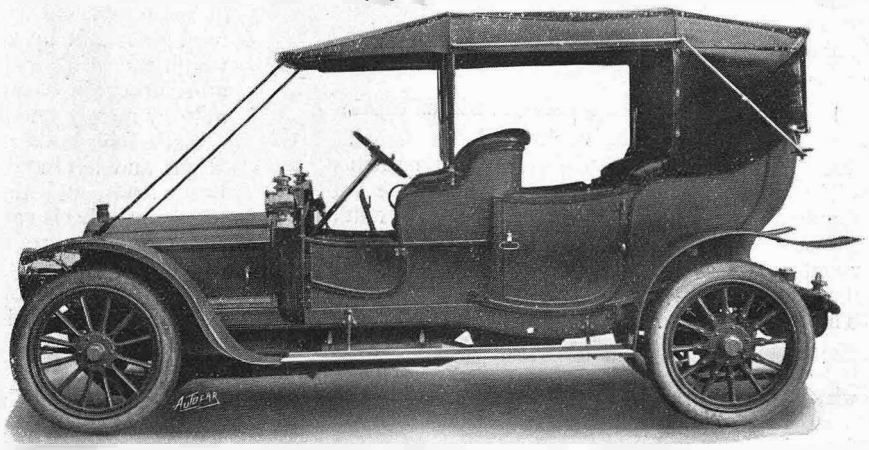
THE NEW AUSTIN REAR SUSPENSION.

Mr. H. Austin has patented a new rear suspension, which is being applied to some of the latest Austin cars. The idea of the invention is to permit the use of a complete elliptic spring without the disadvantages which were formerly associated with this kind of suspension. It stands to sense that so far as absorption of vibration is concerned an elliptic spring is better than the usually employed half or threequarter elliptic spring, because it to all intents and purposes doubles the length of the spring. However, the Austin arrangement does more than this, because the top and bottom springs are so proportioned that the top half is of extreme flexibility and absorbs all the smaller vibrations in a most satisfactory manner, but the great point about the invention is the elimination of the lateral instability which has hitherto been inseparable from the use of really flexible elliptic springs. This lateral stability is obtained by means of taking the drive at the extremity of each spring, and not in the centre, and vertical flexibility is secured by shackling the two springs together and by holding the top spring in a pivotal connection with the frame. The bracket itself is rigidly fixed to the frame, but within it is a fitting which clamps the spring, and which is free to move on a pivot in the rigid bracket. The result of the device as a whole is the combination of great stability with extreme vertical flexibility. The reasons for this are easily appreciated. It should be clearly understood that only one end of the spring is rigidly connected to the frame—that is, the right-hand end in our drawing. The back end is entirely free, and it will therefore be seen that as the two halves of the spring are connected together by shackles, this hinging allows them freedom, such freedom being further enhanced by the pivotal connection of the top half of the spring at the central bracket. At the same time, it is obvious that this central bracket, while interfering in no way with the free action of the spring in a vertical direction, makes it impossible in connection with the front anchorage for any greater lateral instability to exist than exists in the ordinary way with the half elliptic springing.



The new Austin complete elliptic spring.

The system appeals to us as a most workmanlike method of combining the advantages of the complete elliptic spring with those of the half elliptic type. It is, like the majority of Mr. Austin's inventions, of an essentially practical nature. This reminds us that in referring to his new clutch last week we overlooked one of its strong points, and that was that the leathers could be removed and a new set provided without taking off a single nut.



An Austin car with Denehurst phaeton body, enamelled leather hood, and the new system of rear springing.

In addition to the four-cylinder cars with the Knight engine, the Daimler Company have already had a six-cylinder engined car on the road, and are very pleased with its behaviour. Demonstrations have been given to several influential people and prospective purchasers. The six-cylinder model is being produced in the first instance, we understand, for export to the United States. The six-cylinder is one and a half 38 h.p. engine.

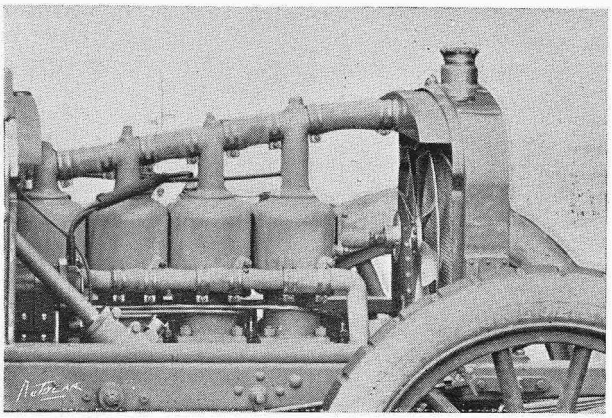
* * *

Messrs. Lodge Bros. have just brought out a coil for single-cylinder cars. This new Lodge coil is upon the same principles exactly as the now familiar Lodge coil described in *The Autocar* of November 9th, 1907, and which has been fitted to multi-cylinder engines of various makes and speeds, with gratifying results. The new model is, of course, much smaller, and is for use on one-cylinder cars only. It has been modified in several details, but the makers state that it produces the same vigorous spark as their multi-cylinder models. Our present experience of the new Lodge coil only extends over a few dozen miles, but we were very pleased with its behaviour. It was fitted to a small car of well-known make, which has a slow running single-cylinder engine with a bore and stroke of 114 by 130 mm. The point that impressed us most favourably was the excellent manner in which the engine pulled at very slow speeds on top gear. The clutch had recently been taken up, and it was not slipped at all. With the car stationary the engine could be run at 270-280 r.p.m. without a sign of a misfire. At all other speeds, and whether uphill or on the level, the car ran quite as well as when fitted with its usual coil. The coil is intended for use with a four-volt accumulator and ordinary wipe contact maker. Its dimensions are 7½in. by 4½in. by 7in. Messrs. Lodge have also recently placed on the market a new distributer. This is for use with petrol engines having two, three, four, or six cylinders, and it enables one trembler coil to fire each cylinder in turn. It is fitted to the engine in the usual way, and consists of a low-tension wipe contact maker combined with a high-tension distribution. The distributer appears well made and exceedingly well insulated.

THE 14 H.P. SUNBEAM.

A SMALLER EDITION OF THE LARGER SUNBEAM CARS EMBODYING MOST OF THEIR WELL KNOWN FEATURES.

Prominent amongst the new light medium-powered cars to be shown at Olympia will be found a 14 h.p. four-cylinder car by the Sunbeam Motor Co. This car has a standard frame of pressed channel steel,



The new 14-16 h.p. Sunbeam engine from the off-side.

inswept forward of the dashboard, as usual. The side members are thoughtfully strengthened and stiffened by queen post trussings—a feature which we should like to see introduced with greater frequency.

The engine, which is carried directly upon the side members, has its cylinders cast and set separately upon the crank chamber—bore, 95 mm.; stroke, 120 mm. The valve chambers are on the left of the cylinders, and one camshaft only is therefore necessary, and this is formed solid with the cams. The distribution gear wheels are cut with helicoidal teeth. The engine is fired by high-tension magneto, placed on a table formed on the crank chamber at the rear right-hand side of the engine, and is driven by a Hans Renold silent chain off the rear end of the camshaft. The carburetter is provided with automatic air valve, and is similar to carburetters which have been fitted and have done so well on Sunbeam cars of the past year or so.

As may be expected from the usual Sunbeam practice, thermo-syphon cooling is adopted. The radiator fan is driven by a V-shaped motor cycle belt off the end of the camshaft, the fan spindle being provided with a neat eccentric adjustment.

The crankshaft runs in five bearings, to which oil finds its way by gravity from a large oil tank placed on the front of the dashboard, within the bonnet.

A minor but very convenient feature is the provision of a four-toothed ratchet to the starting handle, so that the same engages with the crankshaft in almost any position.

The flywheel, which is of heavy section, is 18in. in diameter, and forms the male member of a leather-faced cone clutch enclosed by an aluminium cone-shaped cover.

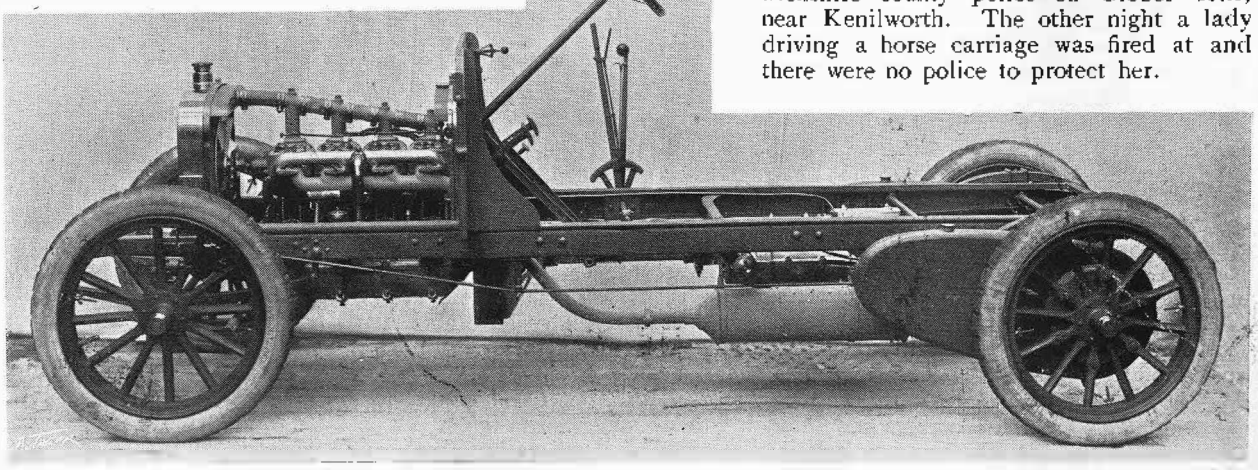
The transmission shaft from the clutch to the gear box is formed at its rearward end with a well-designed flexible toggle joint. Within the gear box is gearing providing four speeds forward and reverse, with direct drive on top. The drive from the counter-shaft to the road wheels is by Hans Renold chains of 1in. pitch, which run, of course, in the well-known Sunbeam silent oil-tight chain cases. These chain cases are detachable by merely undoing four set pins.

Both foot brake and clutch pedals are adjustable. Right and left-hand bottle nuts provide adjustment to brake rods, and the internally expanding brakes on the rear wheels are compensated. Adjustable ball thrust bearings are fitted to the steering wheel, and by this means wear can be taken up and play eliminated.

The control is of the simplest, the steering wheel being innocent of levers. The throttle is governed entirely by a pedal, and the ignition is fixed. A combined oil and electric switch is fitted on the dashboard, with the result that when the engine is switched off the oil feed is stopped, and *vice versâ*.

A downswept channel steel member passes across the frame beneath the radiator. An oval-shaped section front axle is fitted. The car is carried on double elliptical springs from the back axle, and very long flat springs forward. The wheelbase is 10ft. by 4ft. 6in., and the length overall 13ft. 3in.

During the recent fine summer days motorists have been trapped by the Warwickshire county police on Gibbet Hill, near Kenilworth. The other night a lady driving a horse carriage was fired at and there were no police to protect her.



The 1909 14-16 h.p. Sunbeam chassis. Like all previous models made by the same firm it is chain-driven with completely enclosed chains.

"THE AUTOCAR" LECTURES.

SETTLING DOWN TO WORK AT THE BIRMINGHAM CENTRE.

The second lecture of the series organised by *The Autocar* was delivered at Birmingham University on Wednesday, October 28th, by Dr. W. R. Ormandy. The good attendance at the first lecture was more than maintained. The points dealt with were steam cars, liquid fuels and their application to the production first of steam and afterwards of power by explosion, an explanation of the Otto cycle in the working of the four-stroke engine, and some observations on the two-stroke engine. Slides were thrown upon the screen illustrating the various types of steam cars in use—the Serpollet, the Reading, the Bibby, the Turner-Miesse, the White, the Fawcett-Fowler, and the Stanley. On the subject of steam cars the lecturer said this type of vehicle had been very much neglected and looked down upon to a large extent, owing to the fact that there was an enormous vested interest in this country in petrol cars. Unfortunately, the first steam cars in this country to get on the road had a boiler which was liable to give trouble; in fact, it was not liable to give anything else. It gave more trouble than steam as a rule—(laughter)—except in the hands of a person who was a sort of mechanic, physicist, chemist, and man of genius combined. The reputation which those cars left behind them was the heritage which steam had to fight against for a long time. In the meantime petrol was being pushed in France, where they never seemed to have any keen desire for the steam car. So that to-day makers of steam cars suffered for the sins of their forefathers. There was, however, a great deal in favour of the steam car. There was a flexibility about it which the petrol car, from the very nature of things, could not have, and this flexibility was enhanced by the fact of using double acting cylinders, which push and pull at each revolution, instead of only getting one working stroke out of two revolutions.

In dealing with the question of fuels, Dr. Ormandy emphasised the fact that what was required was something that was homogeneous, and that would volatilise equally throughout until the last dregs had disappeared. With many fuels it often happened that the first ten per cent. distillation came off at 70° Cent., the second ten per cent. at 80°, and the last portion at 150°. Clearly such a substance was not homogeneous, because if a body was a homogeneous chemical entity its properties must be the same from beginning to end. Alcohol, which boiled at 80°, was found to be homogeneous except for a small amount of impurities. The boiling test, though not absolute, gave a good deal of information as to the relative values of liquid fuels from the point of view of vaporisation and their capacity to take up air to form a perfect explosive mixture. There was another property of liquid fuels besides that of homogeneousness, namely, that of explosive range. This was shown by the following figures, which were thrown upon the screen:

	Percentage of explosive to air.	Explosive range.
Alcohol	4.0 to 13.6	9.6
Ether	2.9 to 7.5	4.6
Benzene	2.7 to 6.3	3.6
Petrol	2 to 5	3.0

These figures were given in several places, but how accurate they were or how they were determined he could not say. The explosive range was difficult to determine—it depended on temperature, compression, and many other things. Alcohol came to the front not only because more of its heat could be used, but because it was more homogeneous. A carburetter which would suit the first portion of alcohol in the tank would also suit the latter portion. Alcohol had a wide range of explosability, which enabled the engine to be extremely flexible. If it was running on the level more air could be let in and a nice explosion and smooth turning moment obtained. If it was desired to go faster the auxiliary air could be shut off and a bigger charge sucked through the carburetter; the same volume of mixture with less air in proportion gave a more violent explosion. Dr. Ormandy next, by reference to chemical action, showed the necessity for absolute vaporisation of the fuel in the carburetter to produce the best results and complete combustion. Spray, however fine, was not satisfactory.

The next slides illustrated the working of the Otto cycle, which was clearly described, and the pressures to which the various parts of the engine were subjected in the process of explosion. Indicator diagrams were also explained. At the close a two-cycle motor was illustrated, and its drawbacks pointed out.

As a matter of convenience for those attending the lectures at the Birmingham centre it was decided in future to meet at seven o'clock instead of half past, so as to allow more time for elucidation and questions at the close of each lecture.

PARTICULARS OF FORTHCOMING LECTURES.

The remaining lectures of the course will cover the ground of which particulars are appended:

THIRD LECTURE.—Generally speaking, will deal with the engine and all the component parts thereof—Crankshafts—Connecting Rods—Pistons—Valves—Camshafts—the Shape of Cylinders and the Position of the Valves—with a few remarks on Motor Cycles.

FOURTH LECTURE.—Clutches: Cone, Expanding, Metal-to-metal, Disc, etc.—Gear Boxes—Cardan-shafts—Universal Joints—Back Axles.

FIFTH LECTURE.—Carburation—Cooling and Lubrication.

SIXTH LECTURE.—The whole of this lecture will be devoted to various forms of ignition, particular attention being given to High Tension Distributing Systems and Magnetos.

SEVENTH LECTURE.—Frames—Steering—Brakes—Bearings—Chains, etc.

EIGHTH LECTURE.—Bodies—Wheels—Tyres—Accessories—Hints on Driving—Organisation.

The dates of the remaining lectures in each centre are as follow:

LONDON.—3.30 and 8.30 p.m. November 10th, 17th, 24th, and December 1st.

BIRMINGHAM.—7 p.m. November 11th, 18th, 25th, December 2nd and 9th.

LEEDS.—7.30 p.m. November 12th, 19th, 26th, December 3rd and 10th.

MANCHESTER.—4.0 and 7.30 p.m. November 13th, 20th, 27th, December 4th and 11th.

NEWCASTLE-ON-TYNE.—7.15 p.m. November 9th, 16th, 23rd, 30th, December 7th and 14th.

We draw special attention to the fact that to meet the wishes of some of our readers it has been arranged to issue tickets to admit to *any four* of these lectures at a fee of 10s. 6d. We strongly urge all those who have not yet applied to take advantage of the opportunity now afforded them of gaining a workable knowledge of their car.

Applications for tickets should be made immediately to the Lecture Secretary, 20, Tudor Street, E.C.

Motor Union Notes.

(Communicated by the Secretary.)

The Ipswich and East Suffolk A.C. has intimated its intention to affiliate with the Union only from January.

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The North-Eastern A.A. has arranged with the Motor Union to supply its members with the Motor Union edition of *The Autocar*. This is the second organisation to take advantage of the facilities for the supply of *The Autocar* which the Union has arranged for the benefit of its affiliated clubs.

◇ ◇ ◇ ◇

Application for tickets should be sent in without delay to the Secretary by members desiring to attend the annual dinner either with or without friends. The date for this yearly reunion of motorists from all parts of the country is November 18th, and it will take place at the Hotel Great Central under the presidency of Mr. W. Joynson-Hicks, M.P. Special terms have been arranged for visitors desiring to stay at the hotel for one day or more. Many hon. secretaries and representatives of clubs have already notified their intention of being present, and the guests and visitors are numerous and distinguished.

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For three years the Union has endeavoured to secure either the removal or the lighting of gates enclosing the pastures at Beverley. As the result of pressure applied through various channels, an important stage has been reached. The obstacle to placing lamps to denote the gates has been the fear that the party undertaking the lighting would be liable for an accident in the event of a light becoming extinguished. The Town Clerk has communicated that there is a possibility of surmounting the difficulty by insurance, and the Union is endeavouring to facilitate the necessary arrangements.

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In the event of there being a reasonable prospect of a successful appeal, the Union is giving ten guineas towards an appeal by a Dorsetshire member against a conviction at Wincanton under the Motor Car Act.

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A grant of £5 has been made towards the cost of defending an action threatened against a member by a tramways company on account of a tractor failing to remove, until after some delay, a furniture van from a tramway line.

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As long ago as the beginning of July the Union agreed to contribute ten guineas to an appeal to the Divisional Court by a member of the Bradford A.C., who had been fined on a summons alleging that he had driven past a tramcar on the wrong side of the road, in contravention of Article 4 of the Motor Cars Use and Construction Order, 1904. The motorist passed the tramcar on its near side, and had the misfortune to knock down a woman who jumped off just in front of the motor car. On the off side of the tramcar another tramcar was waiting to take up passengers, and at the side of the latter car a cart was drawn up at the roadside. The appeal is expected to be heard this term.

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The first colonial life member was elected at the last meeting of the General Committee, viz., Mr. M. A. Jenny, of New Zealand, who is the Union's hon. correspondent in the colony.

Dr. Page Robertson, hon. correspondent at Glasgow, recently appeared before the sheriff on an allegation of driving to the public danger on an open road, but the charge was dismissed. The member writes that the badge was carried on his car, but he felt so thankful at receiving "decent justice" that he decided not to apply to the Union for payment of any of the fees incurred in defence.

◇ ◇ ◇ ◇

Thirty M.U. signs were erected in October. The Union has now sent out seventy special caution signs in towns and villages, 280 near schools, and 120 denoting concealed turnings. Many have been supplied gratis or at half cost.

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Acknowledging the receipt of two warning signs presented to Corfe Castle Parish Council, after consultation with the hon. secretary of the New Forest A.C. and Hants M.U., Mr. F. Cavendish Bentinck, the chairman of the council, gratefully accepted the signs. The erection of these signs will be an advantage to cars going to and returning from Swanage. Two danger notices have been supplied gratis to mark cross roads on the Portsmouth Road in Old Netley. They have been erected by the Southampton and Itchen Floating Bridge Co., which will also maintain them. The Welsh A.C. has purchased and erected signs at Laleston.

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From the hon. secretary of the Sheffield A.C. a letter has been received thanking the Union for advice given to a member against whom three summonses were issued in respect to the driving of his car. The summonses were dismissed.

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A speed limit inquiry will be held on November 17th at Glossop. Motorists prepared to give information or appear in opposition to the proposals are asked to communicate with the Secretary, who will also be glad to hear from members and others in regard to ten-mile applications recently made for Southend-on-Sea and Stoke-upon-Trent.

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A driver employed by Mr. T. Penrose-Thomas was charged at Talybont with exceeding the speed limit by one mile. Mr. Leeder (Viner, Leeder, and Morris, solicitors to the Union at Swansea) defended, and the summons was dismissed. Mr. Leeder complimented the police upon the "straightforward and excellent way in which they had given evidence," whereupon the chairman added that the other side were to be "congratulated on bringing such a brilliant advocate." An application has been made under the car badge rules for a grant towards the legal expenses.

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Twenty-one members have undertaken to act as honorary correspondents of the Union since the last issue of these notes.

◇ ◇ ◇ ◇

Two hundred car and cycle badges were sent to members during October, the total issued being 4,760.

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In pursuance of the decision of the General Committee to promote among the children attending schools in the vicinity of M.U. danger signs a knowledge of rules and courtesies of the road, a letter has been addressed to the headmasters of several schools.

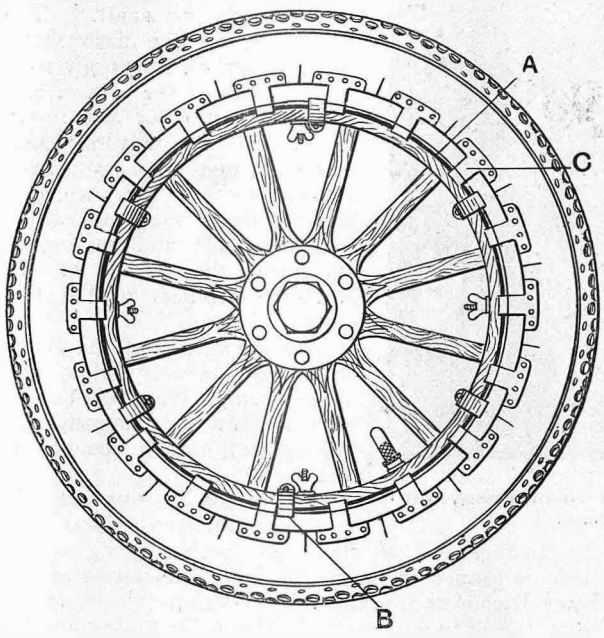
◇ ◇ ◇ ◇

The Motor Union. Chairman, W. Joynson Hicks, M.P.
1, Albemarle Street, London, W. "Speedway, London." 9090 Gerrard

A DETACHABLE BAND AND TYRE PROTECTOR.

A METHOD OF FIXING THE BAND WITHOUT INTERFERENCE WITH THE TYRE COVER.

The inventors of this ingenious and carefully thought out attachment claim to be the first patentees and makers of leather non-skid bands for pneumatic tyres. The experience gained since August of 1892 has been put to good effect in the design and introduction of the attachment herewith illustrated and described. On behalf of this Lee and Trigwell band, simplicity of attachment and detachment, preservation of the tyre cover proper, and entire absence of creeping are very justly claimed. The best manner of realising the



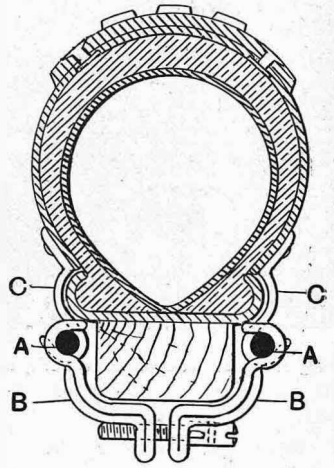
The Lee-Trigwell detachable non-skid band.

A, endless metal ring
B, one of the adjustable clips
C, one of the hooks serving to retain the band in position

above short of inspecting and handling the band itself is a perusal of the following description, together with the illustrations. The band itself is of specially prepared chrome leather, the tread piece being of toughened leather possessing great wearing qualities. This tread is studded with hard steel studs, and is attached by specially formed rivets, which permit its replacement on the leather foundation when renewal is required.

The band is secured upon and attached to the wheel and tyre in the following manner: At regular intervals specially designed hooks are riveted on each side of the band, as shown. These hooks pass round and under the lip of the tyre rim, the section of the hook enabling it to follow the contour of the rim edge, as seen in the section. Below the rim the hooks turn up outwards to take endless rings, their attachment thereto being a very simple and easy matter. When all the hooks are in position on the rings adjustable clips are placed over the latter and secured by means of the set-screw shown in the section. To put a band in position on a tyred wheel is the work of three or four minutes only, the only tool necessary for the job being a screwdriver for the purpose of screwing up the set-screws already mentioned.

The salient feature of the Lee-Trigwell band is the manner in which it is caused to embrace and keep in watertight contact with the whole surface of the pneumatic tyre without the rim. Reference to the section will show that this most desirable result is obtained by the shape of the hooks referred to and the face gripped by the endless rings. These rings are set right in under the tyre rim, and close up to the wood felloe by the approaching effect of the set screws upon the adjustable clips.



Section of a tyre rim and wheel felloe showing how the band is secured.

The easy and rapid manner in which this band can be detached permits of any dirt between cover and band being sponged clean in a few minutes, the dampness left between the cover and band conducing greatly to the life of the former. All the metal parts of the band are oxidised in gun fashion; new treads can be fitted again and again. Short of actual practical experiment with these bands, we are of opinion from report and inspection that they are a distinct advance in non-skid band design and attachment. They are marketed by the Automobile Contract Co., Ltd., of 51, Conduit Street, London, W.

In an appeal case before the Sheriff Court at Edinburgh on Thursday last week the Lord President, in giving judgment, observed: "If there was one rule more than another to lay down in such circumstances (a collision at cross roads) it was that it was the business of those who were crossing a main road to look out when they entered the main road and give way to all traffic going along that road. If there was any possibility at all of a collision it was the business of the person on the side road to give way to people on the main road. Accordingly a driver of a car on a side road should approach a main road with his car under control." This decision is interesting and valuable, inasmuch as it establishes under the authority of the Supreme Court of Scotland the principle which has long been recognised as the proper one, but which until now has had the confirmation of inferior courts only. It also incidentally supports the views expressed in *The Autocar* of October 31st (page 653), when we contended that it was on side roads and not main roads that warning sign posts should be erected.

THE NEW SHEFFIELD-SIMPLEX CAR.

A CAR WITHOUT A SEPARATE GEAR BOX AND ONLY TWO SPEEDS. A SOUND SYSTEM OF WIRING, UNIQUE PEDAL CONTROL, OIL LEVEL TAPS OPENED BY ONE LEVER, DETACHABLE DIFFERENTIAL, AND INCLINED REAR AXLE WITH ALL BRAKES ON REAR WHEEL DRUMS.

Last week on page 676 we gave a few particulars relating to a car without a gear box, which has just been produced by the Sheffield-Simplex Motor Works, Ltd., Tinsley, Sheffield. The short description of this interesting vehicle which we are now enabled to give will convey some of the points of interest, but for a complete examination of its features the reader should make a point of seeing this exhibit at Olympia.

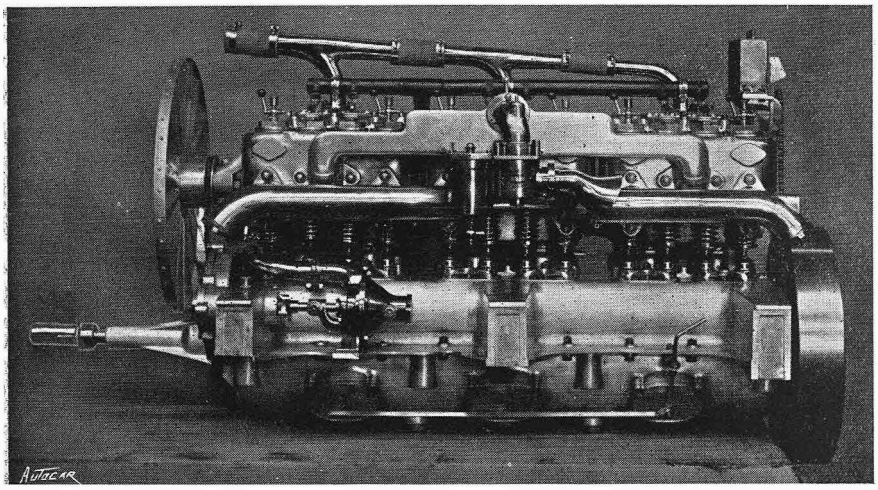


Fig. 1.—Valve side of the Sheffield-Simplex engine. This view shows the fan, water circulating pump, oil level taps, the inspection plates of the base chamber, and other features.

Referring first to the engine, only six-cylinder engines are at present made by the Sheffield-Simplex firm; the cylinders are in pairs, and have a 4½in. bore and stroke, this being sold as a 45 h.p. engine, although the R.A.C. rating is 48.6 h.p. The engine is fitted with ball bearings throughout, except to the big ends of the connecting rods. Exceedingly large ball races and balls are employed here and at all the other bearings of the car. Not the slightest trouble has been found in the adoption of this type of bearing. Mr. Percy Richardson has informed us that in cases where other firms have experienced trouble by reason of the balls breaking or the races scoring, this has been due to improper fitting of the ball races. Instead of forcing the inner race on to a journal or gripping the outer on the circumference, the centre race is clipped between the crank webs in such a manner that, if anything, the centre race is slightly compressed, and is not under tension, as is more usually the case. The crankshaft is interesting, for it is made up in several sections, so that all the ball races are clipped by the sections of the crank, and not one of them has to rely upon a threaded nut for its hold. Each cheek of the cranks is circular, and this particularly lends itself to correct machining and efficient balance. The bearings are carried in the upper part of the crank chamber, the lower part merely serving as an oil well.

Lubrication of the bearings is effected by means of a cam action plunger pump, which is chain driven from the rear of the camshaft. The sight feed on the dash shows the number of drops given to the bearings of the engine, and the same lubricator also serves to lubricate the universal joint contained in the spherical front end of the torque rod, the excess passing down the case of the propeller-shaft and serving to lubricate the whole of the working members of the rear axle.

The ignition is of the Bosch dual magneto and coil system, there being the high-tension special form of magneto and self-starting switch common to that system.

A special feature of the Sheffield-Simplex ignition is in the arrangement of the high-tension wiring. The cable is formed in one piece under the patent of Mr. Percy Richardson, so that only very short pieces obtrude from its end to join up the magneto distributer and the sparking plugs. The setting of the magneto armature is ingeniously arranged for by means of adjustable link pieces, which enable the magneto to be set with any degree of accuracy desired in the smallest possible

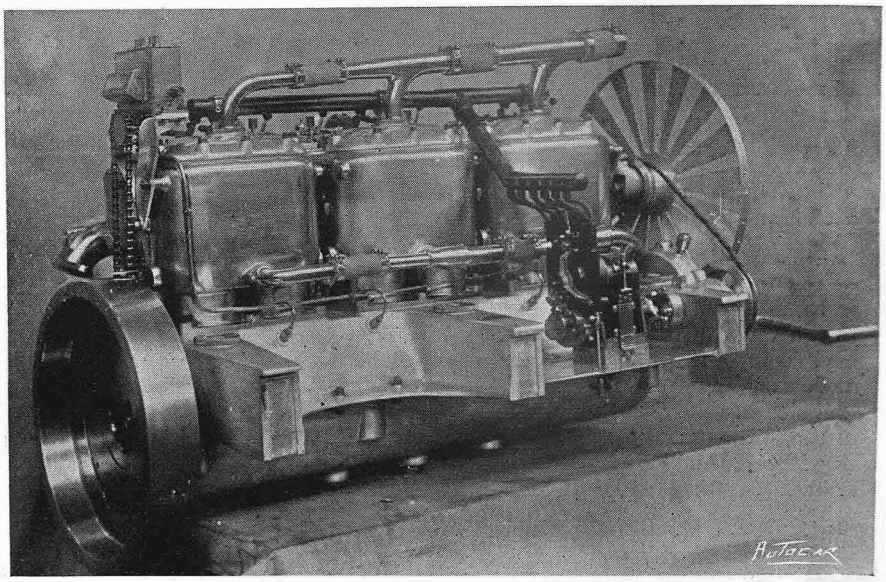


Fig. 2.—Magneto side of the Sheffield-Simplex engine. This view shows the chain driven lubricator and the neat wiring cables.

space of time. The same link drive serves to operate the water circulating pump, but in this case no adjustment of the link is provided or required. A special point of the pump is that an outer bearing is provided, so that all strain is taken off the packing gland. Further than this, the interior of the pump is arranged so that no grease can work from the lubricator into the circulating water. There is a light multiple-armed aluminium fan behind the flattened tubular radiator.

The Craven carburetter is fitted with an extra air valve, which can be operated from a handle arranged on the steering stem. This serves mixture to a special induction pipe, well shown in fig. 1. The special feature of pedal-controlled throttle operated by a horizontal movement of the right foot is embodied in this vehicle.

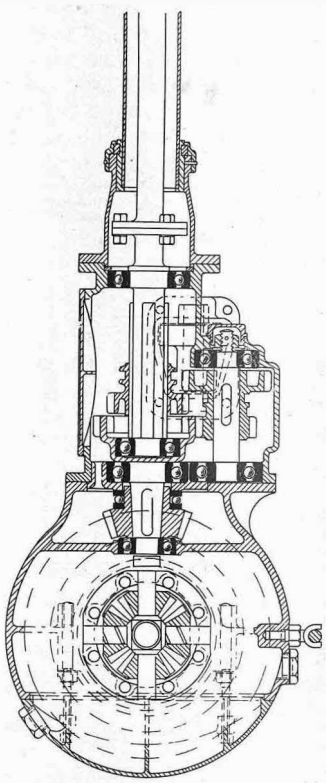


Fig. 3.—Elevation of the change speed gear.

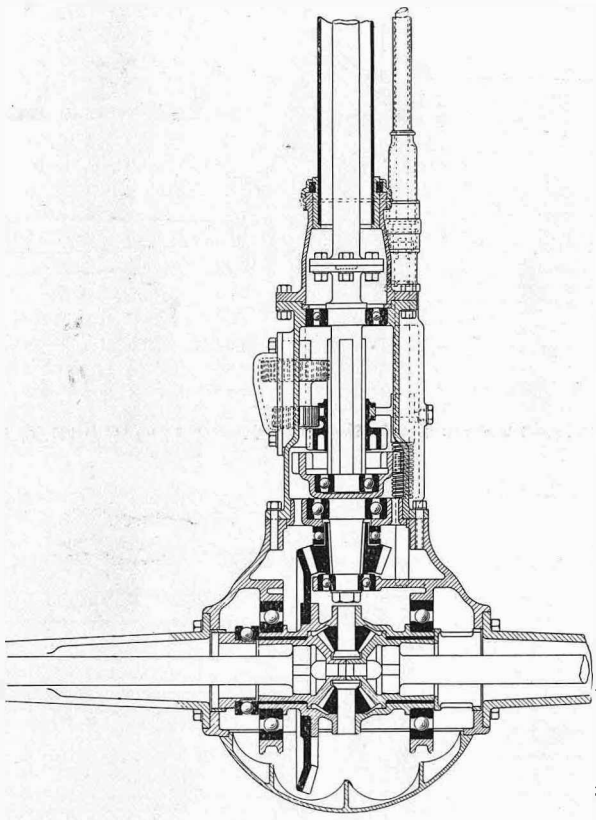


Fig. 4.—Plan view of the two-speed and differential gears.

There are two exhaust pipes, each of them fitted with three flanges, so that connection is made to the first, second, and third cylinders with one pipe, and the fourth, fifth, and sixth cylinders with the other, the single pipe connected to each of these three flanges being continued and joined on to a main pipe communicating with the exhaust box.

The clutch is of the multiple disc type, there being forty-five plates embodied in its construction; twenty-three of these plates are of sheet phosphor bronze and twenty-two of nickel steel. The outer plates are carried in an aluminium casing, which is effective, and at the same time very light. Withdrawal of the clutch is brought about by a cam, and further action of the clutch pedal applies the foot brake. Immediately behind the adjusting part of the clutch is the arm withdrawal, which is fitted with a ball race. The body of this race is kept full of grease, so that it never overheats. Close behind the race is the spherical bearing, which embraces the front spherical end of the torque rod. This spherical bearing contains the propeller shaft joint, which is kept well lubricated, as the bearing is made quite oil tight.

The continuation of the tubular portion attached to this spherical bearing joins up with the forward end of the rear axle casing, which really serves for the gear box. The gear gives two speeds and a reverse. The lower speed is really only an emergency gear for starting or getting out of bad places, as it is found that, owing to the reduction of weight by having no separate gear box, and also the efficient engine obtained by the use of ball bearings, the car can go practically anywhere on the top gear, as a 5,000 miles road test over the most difficult roads in Britain testifies. The low gear ratio is 6 to 1, the top 3 to 1. Changing of the gear is by means of a side lever operating in a step by step gate quadrant.

On looking at the neat change speed gear wheels great surprise is felt that so much can be done with so little, for the gear case takes up little space owing to the excellent arrangement of the parts. When on the direct drive the reverse shaft is thrown out of operation and the wheels are stationary, so that only the through drive shaft is running. The differential gear in the back axle is of the bevel type, and the connection between the sun members of this gear and the rear road wheels is by means of inclined shafts, which can slightly move in the bevels owing to the rounding off of the squared driving ends. By this arrangement both rear axle portions can be slightly withdrawn, the back plate taken off the rear axle case, and the whole of the driving mechanism thus exposed. Then by removing four nuts only the whole of the differential gear can be removed if desired. All the brakes are on the rear wheel drums, the footbrake shoes operating on a large diameter surface, the hand brake on one of smaller diameter.

General Particulars.

Space will hardly permit of a lengthy description at the moment, but we might just give a few main particulars.

Special attention has been given to lubrication of all the working parts, there being no working part, whether it be the spring bolts, brake shafts, or even the leaves of the springs, in which lubrication has not been properly considered.

The front axle is I section, all the steering joints being of the ball type, and the front swivel pins are inclined so that their extension would meet the tread of the tyre if produced, thus ensuring very easy steering.

Rudge-Whitworth wire wheels are fitted to this type as a standard, and it is intended that only the open type of body shall be fitted to this chassis.

The weight of the chassis comes out at 21 cwts. The wheelbase is 10ft. 8½in., the track 4ft. 8in., whilst the wheels are fitted with 880 × 120 mm. tyres to the back and 875 × 105 mm. to the front.

The frame is mounted on semi-elliptical springs at the front, and the same at the back, excepting that an extra transverse spring is fitted. The frame is of pressed steel, and the sides are parallel right through.

The other type of car which will be exhibited at Olympia contains the usual gear box and three-speed gear. This type will have wood wheels, and is intended for landaulet work. The weight of the chassis comes out at 24 cwts., while the high gear ratio is 3 to 1, the second speed 5 to 1, and the bottom speed 8 to 1. The same general arrangement of the other parts obtains throughout this chassis as in the one without the gear box.

From what we saw of the workmanship and the fine features embodied in this car, the Sheffield-Simplex stand at Olympia should be a great centre of attraction for those who understand the good points of a car.

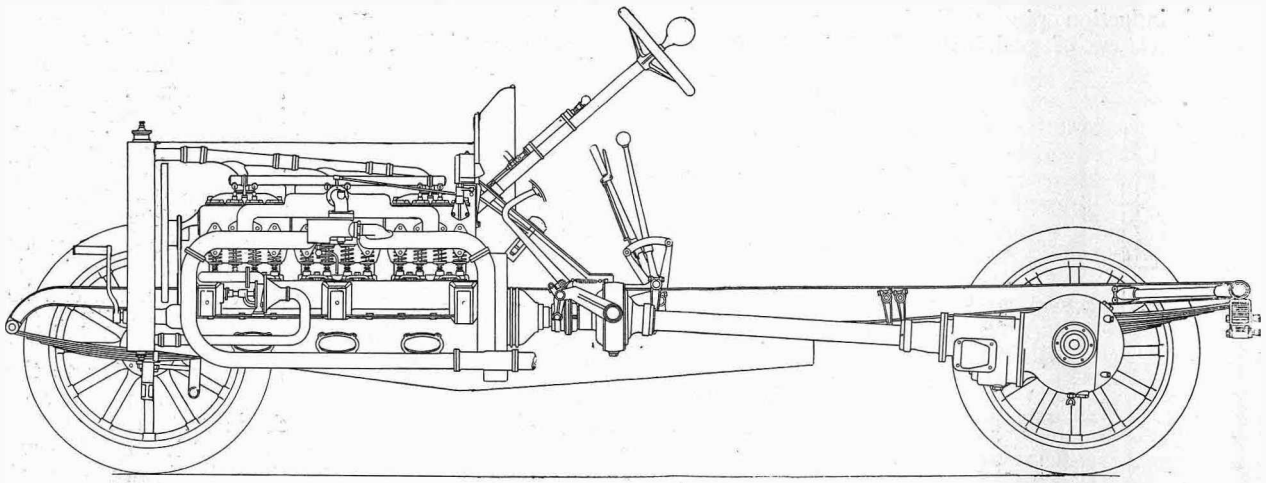


Fig. 5.—Side elevation of the Sheffield-Simplex chassis with left frame side removed.

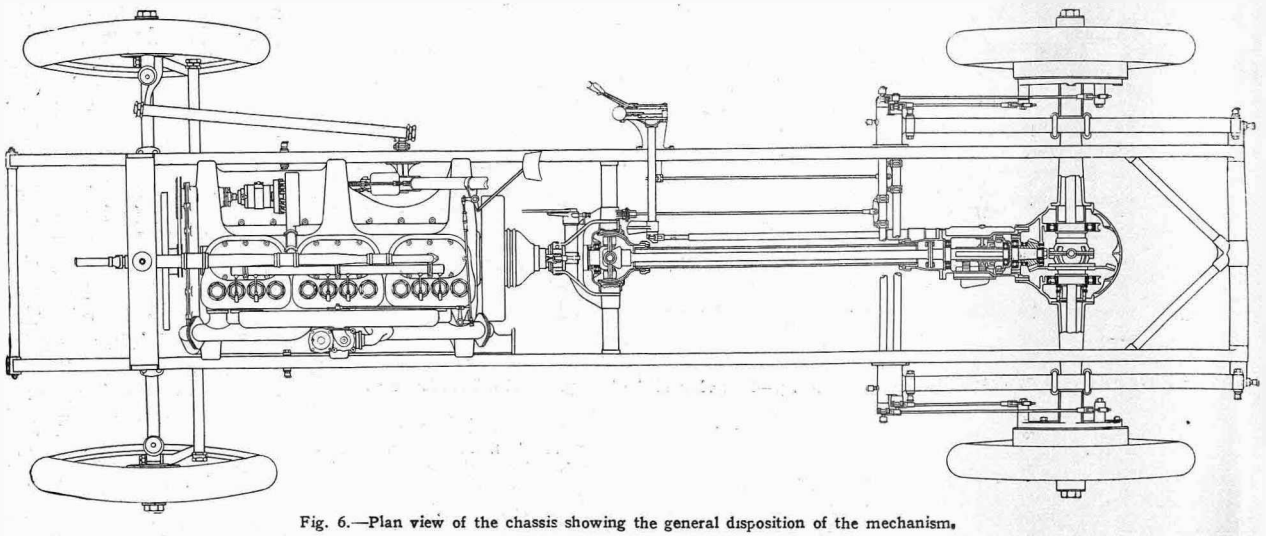


Fig. 6.—Plan view of the chassis showing the general disposition of the mechanism.

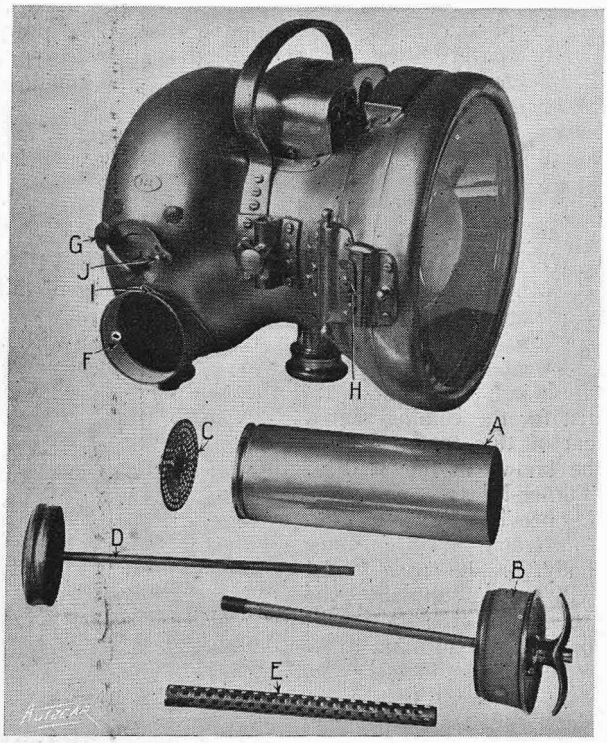
THE FUTURE OF THE PARIS SALON.

The question of suppressing the Salon, or at least only holding it every two years, is brought forward once more by a circular which is being distributed amongst the big firms proposing that a bond should be signed under which manufacturers undertake not to exhibit at any motor show in Paris during 1909 under a penalty of £2,000. It is stated that most of the big firms have expressed their willingness to sign, and if there be unanimity of views among the great makers the circular will be sent to the smaller firms. The matter was pretty well threshed out last year, when the Chambre Syndicale decided that a show was advisable if the expenses of exhibiting were cut down, which is accordingly being done at the Salon that opens at the end of this month. It is quite obvious that the big makers believe they have no interest in exhibiting, however much expenses may be reduced, as they can scarcely gain much benefit therefrom unless they can show striking improvements, which it is becoming more and more difficult to introduce. On the other hand, the small makers and accessory firms would hardly approve of the Salon being suppressed, as it offers the best form of advertisement they can have; but if the great firms hold aloof any show would be shorn entirely of its attractions, and the small makers would have to give in. It is possible, however, that a final decision will not be come to until it is seen how this year's Salon prospers.

BLERIOT ROAD ILLUMINATORS.

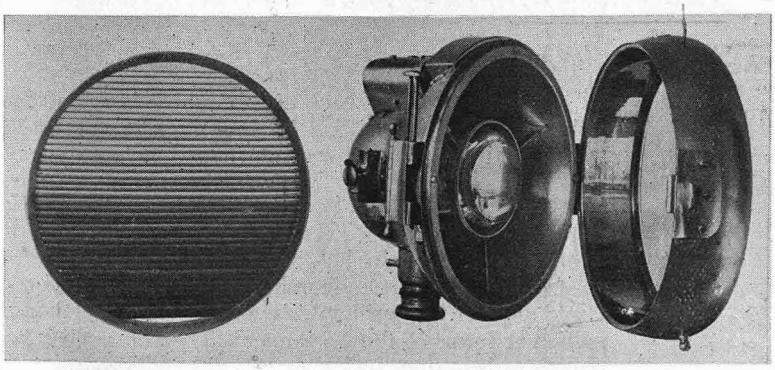
Messrs. Bleriot, Ltd., 53, Long Acre, W.C., with all the advantages of years of study on the road illumination question in France, are now about to turn out a thoroughly good article in their well-equipped London factory. They can be relied upon to supply lamps of every kind, which not only are well made, but give the maximum amount of light with the minimum amount of trouble. The most important part of a lamp is the lens (the central bull's eye), which throws a concentrated beam far away into the darkness and shows the distant object to be avoided in plenty of time to allow the driver to slow his car. These lenses are of three types—the ordinary parabolic single lens, the compound lens, and the catadioptric, each having a different degree of power. For example, a lamp which gives off 3,000 c.p. with a single lens will give off 4,000 c.p. with a compound and 9,000 c.p. with a catadioptric. Now, with so powerful a light as the modern acetylene lamp gives, which, by the way, is absolutely essential on a car, a certain amount of inconvenience is caused to other road users, and so, to obviate this, Messrs. Bleriot, Ltd., have constructed their automatic lamp shade, which consists of many rows of thin plates about 2in. wide arranged horizontally across the front glass, blackened above, but polished underneath, which automatically reduces the light as the car approaches by cutting off all the high rising rays, and projecting them on the ground just ahead of the car. Viewed two hundred yards away the plates are invisible, but as one approaches the light diminishes more and more until it becomes an inoffensive glow. The device is as ingenious as it is effective, and should be heartily welcomed by all considerate motorists.

Next in importance to the lens comes the generator. Bleriot generators are of two kinds—the "diving bell" pattern and the "drip." The latter is of a new type, which possesses several novel features. It is designed to work with ordinary calcium carbide, and a description of it will doubtless be interesting. Our illustration shows the generator of a self-contained lamp taken apart, this type being chosen so that both lamp and generator are illustrated at the same time. The separate generator, of course, follows exactly the same lines. When it is desired to fill the container the handle on the outer end of the container is unscrewed about three turns, which contracts the rubber joint. The inner end D is then held upwards, and is pulled straight out. Next the grid C is unscrewed, and if the container A be clean it may be filled about two-thirds full with ordinary carbide. The parts are then replaced, and the complete container is inserted through the orifice F, which, it will be seen, is porcelain lined so as to prevent the rubber from sticking, and thus providing a perfectly gastight joint. When the slot on the outer end B is brought into line with the small boss I under the water tap it can be pushed straight home and the handle screwed up. To render the lamp ready for lighting the water tap G is pushed forward until the end of it drops into the hole in the spring adjacent to it. This tap works against a spring, which keeps it permanently shut, so that when the knob J is pressed it instantly returns to the "off" position. Another excellent refinement is the provision of spring catches which prevent the lamp door bolts from being withdrawn until the former are released. Returning to the generator, if the latter has only been used on a short journey, the container may be removed and the inner end D withdrawn about two or three inches; the container may then be tapped, and the carbide residue will fall out, leaving only the unconsumed fuel behind, so that any excess of dust will not tend to choke the water and gas passages. The lamp itself is exquisitely made, strongly constructed, and beautifully finished. Over the burner there is a



Details of the Bleriot lamp and generator.

A, container
B, outer end of container with rubber expanding joint
C, grid screwed on to rod of B
D, inner end with rod
E, strainer, enveloping rod of B
F, porcelain orifice against which the expanding joint of B engages
G, water tap with catch to hold it in position
H, spring device holding lamp door bolt in place
I, boss on edge of container orifice
J, spring release for water tap



The Bleriot separate generator headlight with compound lens and patent shade. In order to illustrate it more clearly the shade is shown separately.

crystal chimney held in a spring clip and resting on two supports, which carries away the burnt products of the acetylene, and thus prevents the reflector from being tarnished. The reflector is splendidly polished and heavily plated, and, being held in by screws, it may be withdrawn in the unlikely event of it requiring to be specially burnished. The lamp is provided with two doors, one opening into the interior, and the other rendering the lens accessible. Numerous other models self-contained and with separate generators are supplied, but the description of the above practically covers these. The Bleriot petrol-oxygen lamp, however, is so much a departure from standard practice that it cannot lightly be passed over. In design it follows the lines of a naval searchlight, and for illumination it depends upon a petrol-oxygen flame playing on a disc of Zirconia or other rare earth. A small tank behind the lamp contains the petrol, while carried in a special box is an oxygen cylinder fitted with an automatic regulator. The lamp is mounted on a universally jointed bracket, so that its rays can be diverted downwards if its glare is an annoyance to those who meet it. As regards power, its light is unequalled, as it throws a beam twenty-four times as strong as that issuing from an acetylene lamp. The stock of Messrs. Bleriot, Ltd., is of so comprehensive a nature that they can meet the requirements of both the wealthy motorist and the motorist whose pockets are not overburdened with this world's goods. To show how comprehensive their stock is we may mention that they sell lamps with front glasses from 2in. to 18in. in diameter, and from 10s. to £75 in price.

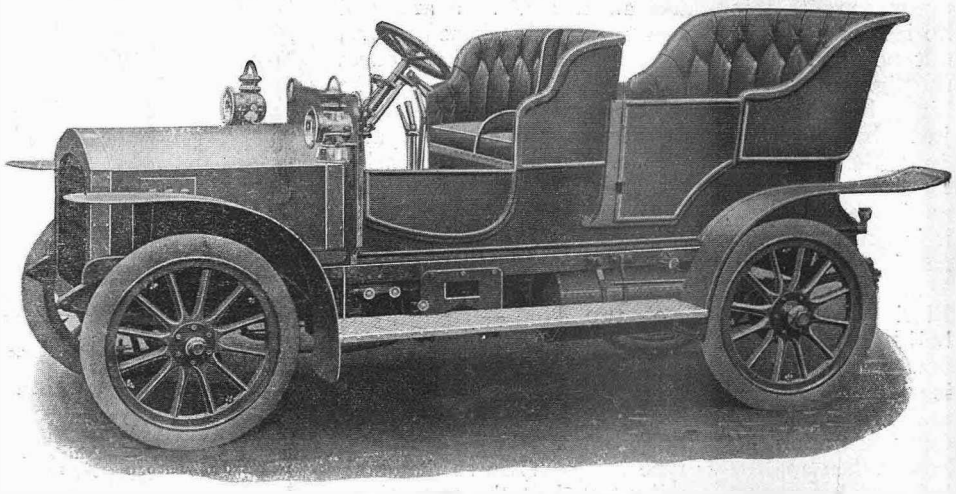
A NEW SMALL FOUR-SEATED STEAM CAR.

When the Turner Motor Mfg. Co. introduced their 10 h.p. two-seated steam car at the beginning of this year regret was expressed amongst many that they were not also marketing a similar chassis provided with a four-seated body. It gives us additional pleasure, therefore, to announce that the firm have decided to list for the coming year a car of this type. It will be known as the 10 h.p. Turner-Miesse, and will be provided with a light four-seated side entrance body. The new model will not supplant the 10 h.p. two-seater—it will be made in addition to it.

There is undoubtedly an excellent opening for a small four-seated steamer, and we feel sure that Messrs. Turner's venture will meet with the success it deserves. There are a large number of people who have a preference for steam but who have hitherto been unable to purchase owing to the comparatively high price which has been asked in the past for high class steam cars.

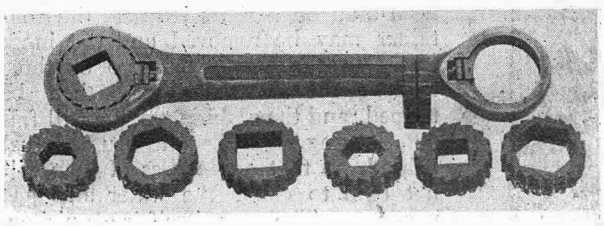
The new Turner-Miesse has a cardan axle, and is generally similar to the two-seater which was described in *The Autocar* of February 1st, 1908. The makers inform us that they have perfected a paraffin burner which cannot blow out or back fire, no matter how long it is kept standing, and which can be turned up and down quite readily, doing away with the use of a pilot light except for starting from dead cold. No petrol is required with this burner even during the operation of lighting up.

A feature of all Turner-Miesse cars is the simplicity of the control. One lever and one pedal is all the driver has to attend to whilst running. The one lever governs the supply of water admitted to the generator, and this regulates the speed, exactly as the throttle lever does on a petrol car. The single pedal instantly cuts off the steam, and when further depressed applies a double acting brake on the driving shaft.



A USEFUL SPANNER.

We have had for examination a set of the Schroeder ratchet spanners, which are being marketed by Messrs. Nettlefold and Son, Ltd., 54, High Holborn, W.C. The device, as may be seen by the illustration, consists of a handle piece, at each end of which is a ring into which is dropped a disc having ratchets cut on its outer periphery and a central shaped hole to engage a nut. This disc is held in place by a spring-controlled trigger pawl, to which is attached a thin moon-shaped strip of metal which engages with a slot cut in the ratchet piece, thereby holding it in place. The ratchet pieces are, of course, interchangeable to suit different sized nuts. The principle is applied to a number of different forms of these spanners, a set of ratchet box spanners being particularly noticeable. The workmanship is of the best, whilst the price at which the set is sold is quite reasonable.



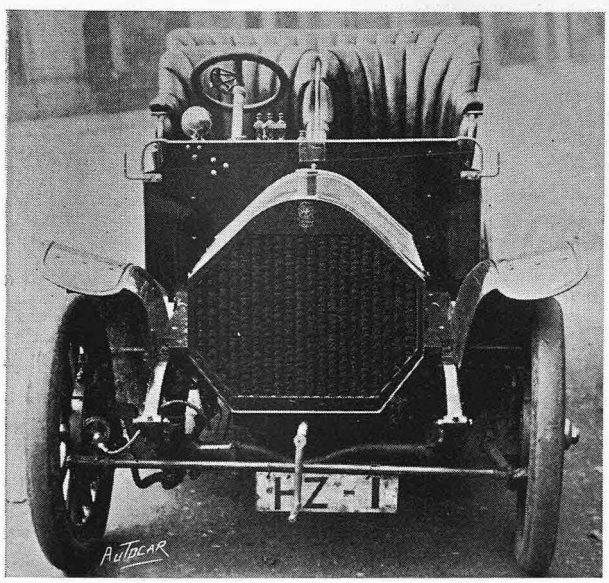
THE ALLEN-LIVERSIDGE FRONT WHEEL BRAKES.

A SYSTEM OF FRONT WHEEL BRAKING WHICH DOES NOT AFFECT THE STEERING AND REDUCES SIDE-SLIP.

Motorists are well aware of the various disadvantages which are inseparable from the modern type of driving-shaft brake. In the first place, there is always a tendency to strain the mechanism, and in the second place it is dangerous if applied suddenly on a greasy road. In the case of the front wheel brake the conditions are claimed to be totally different. Very few motorists indeed have had any experience at all with this form of brake except those who have begun at the right end and served their apprenticeship on motor cycles and tricars. The early type of tricar was frequently fitted with brakes of this character. It is true that they were often crudely and wrongly designed, but they served to indicate what could be done with brakes fitted in this way. They showed that, however powerful they were, and very few of them were sufficiently powerful, the vehicle would absolutely refuse to skid, even when they were applied under the most trying conditions, if the weight were correctly distributed. The brakes were sweet in action and extremely pleasant to use when descending a hill. More often than not they affected the steering, but this was a point which it was evident could be overcome without difficulty.

The Allen-Liversidge brakes, however, present a great improvement over those to which we have just referred. In the Liversidge brakes the steering pivots are inclined, so that a line drawn through their centres, if produced, would reach the centre line of the tyre at its point of contact with the road. This, it is claimed, is equivalent to placing the brake drum dead in the centre of the wheel—a position which is the ideal one if the steering is to be unaffected. Levers of considerable length are fitted to exert the greatest possible amount of power upon the brake drums with the smallest possible movement of the wires.

On a recent afternoon, accompanied by Mr. T. B. Liversidge and another gentleman connected with the firm, we drove a 15 h.p. 1908 Humber through London traffic and over roads which were of the most slippery and dangerous description for about an hour, using these brakes as frequently as possible, and confining ourselves entirely to them. On the car in question the driving-shaft brake had been removed, the front wheel brakes being used in its place. In actual practice the Liversidge brakes were found to be smooth in action, while, to our great surprise and satisfaction, they did not affect the steering at all, or, if at all, so slightly as to be of no moment. In fact, it may be said that any deflection felt was not due to imperfection in design, but to the fact that when the brake was applied very violently the front wheels were locked, and the car skidded onwards to a small extent, thus giving one the impression that the steering was influenced. This disadvantage of front wheel skidding is one which can be overcome by applying the brakes more gently in greasy weather or by using studded front wheel tyres; but a skid of this kind is not so dangerous as a back wheel skid, which turns the car completely round. During the trial the back brakes were applied occasionally, only to make the car tend to skid completely round on every occasion. A notable effect of the Liversidge brakes is to correct a skid which has been produced by the sudden application of the back brakes. This was demonstrated to us by Mr. Mackay on a road having a surface which was distinctly treacherous. The back brakes were applied suddenly, and the car described a quarter of a circle, but before it had time to go any further (and it was fairly on the swing at the time) the back brakes were withdrawn and the front brakes applied, and the car came under control as if nothing had happened. Messrs. Liversidge inform us that they are totally unable to explain the reason for this behaviour. Leaving the Cromwell Road, Kensington, the car was driven to Notting Hill, and being taken down the Aubrey Road, which has a gradient of 1 in 8 or thereabouts, on the front brakes only, they were found to be in every way sufficiently powerful to hold the car. In future models we understand that wider bands and wider drums will be fitted. When this has been done we think that these brakes will leave little to be desired. The alterations required to the car are to alter the angle of the pivots, if such be incorrect, and to fit new and stronger stub axles if the existing ones are not regarded as sufficiently strong. So much faith is felt in the brakes that the makers offer to take them off and refit the propeller-shaft brake if they do not perform as claimed.



A 15 h.p. Humber with Allen-Liversidge front wheel brakes.

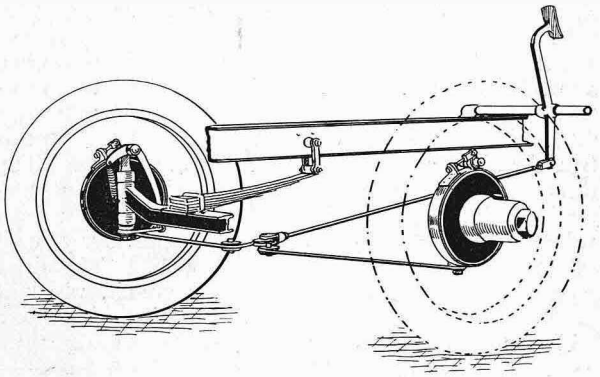


Diagram of the brakes showing the common centring of the steering pins and cable pulleys.

TWO NEW DE DION CARS.

For next year Messrs. De Dion Bouton, Ltd., are including two new models in their already excellent and varied list of cars. The two models to which we refer are the revised 8 h.p. single-cylinder and the 10 h.p. four-cylinder cars.

The new 8 h.p. De Dion is fitted with sliding sleeve gear change, and will be marketed at a lower price than any previous De Dion with this form of gear. The frame is of the usual form, being of pressed channel section steel inswept at the dashboard and with tubular cross members. The engine is on the lines of the previous and most thoroughly tested and highly appreciated 8 h.p. model. It has an automatic induction valve, with De Dion automatic carburetter as fitted to the four-cylinder 19 h.p. De Dions. In this type the air passing over the jet is heated by travelling through a jacket round the exhaust pipe. An automatic additional air valve is fitted close to the inlet valve. A throttle is provided, the previously used exhaust regulator being dispensed with. The drive passes through a leather faced cone clutch, which is used on this model only. The gear box contains a sliding type of change speed gear, providing three speeds forward and reverse, all shafts rotating on large ball bearings.

The gear box is provided with oil catches inside to conduct lubricant to the main driving-shaft bearings. To obtain ready access to the bevel and differential gears the rear half of their containing box is made removable.

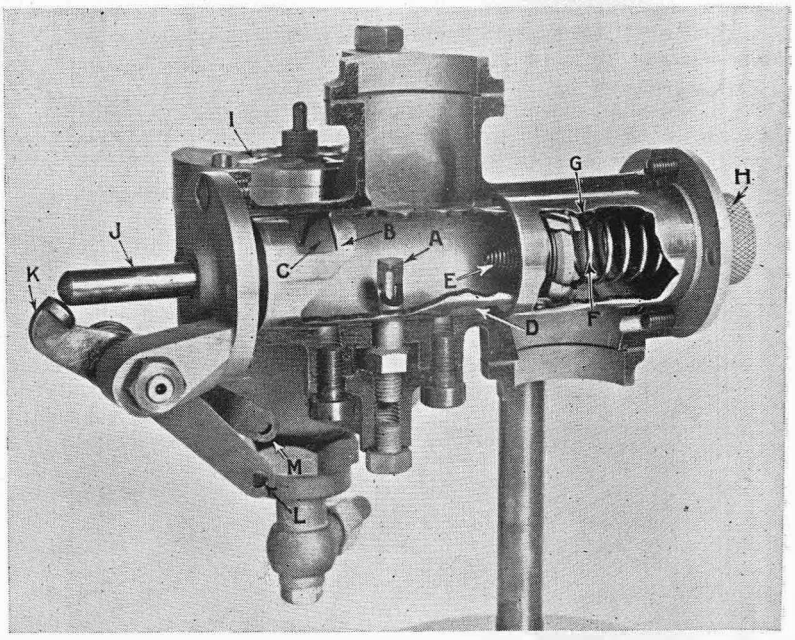
The 10 h.p. chassis is engined with a four-cylinder motor of 66 mm. bore and 100 mm. stroke. The cylinders are cast *en bloc*. The inlet valves on this engine are mechanically operated. Other parts are as follow: Automatic carburetter, pump to circulate lubricating oil, and high-tension magneto ignition with self-contained distributer. In this car the metal plate clutch is employed, as is the sliding type gear giving three speeds and a reverse.

The remaining models of De Dions are the 8 h.p. single-cylinder with expanding clutch gear, 9 h.p. single-cylinder with mechanically operated valves and separated gear and differential boxes (three speeds and reverse), 10 h.p. single-cylinder, 12-14 h.p. four-cylinder, and 18 h.p., 25 h.p., and 30 h.p., the three larger models also having four-cylinder motors.

A NEW CARBURETTER.

Messrs. Aster, Ltd., Wembley, have introduced for 1909 a new carburetter, which, if it is as efficient in actual practice as it is simple in design, should meet with universal approval. The accompanying illustration was taken from a photograph of a sectional model which will be exhibited at the Olympia Show.

The interior mechanism, as shown in the illustration, consists of a sliding inner sleeve B, through a slit in which the jet A protrudes, and an outer sleeve G. The sleeve B has cut in it the throttle aperture C and the air aperture D. The former has a specially shaped opening, which allows a very small quantity of mixture to be admitted when it is desired to run slowly. At the end of the sleeve B the extra air valve E is carried. This valve consists merely of a coiled conical steel spring, which only comes into action when the engine is suddenly accelerated. The spring F serves to keep the sleeve B in its normal position. The outer sleeve G has an aperture at the bottom (just seen in the illustration) through which the fixed air supply passes, and is capable of being rotated by the milled nut H, so that when atmospheric conditions require it the amount of air can be altered for the day's run or according to the seasons. The actuating lever K, which controls the sliding inner sleeve B, is provided with two connections, to which the inter-connected hand and foot controls are attached to vary the sleeve opening to the engine.



Section of vaporising chamber.

A, jet
B, inner sleeve
C, throttle aperture in B
D, air aperture in B
E, spring acting as extra air valve
G, outer sleeve with aperture at base to control fixed air supply
F, spring holding sleeve B in position
H, milled nut on G by means of which the fixed air supply can be varied
I, float chamber
J, throttle spindle
K, actuating lever with two connections
L & M, levers fixed to foot and hand control lever

An automatic tell-tale for the rear lights of motor cars has been invented by Messrs. Hicken and Kidston, 106, St. Paul's Road, Southsea. The use of the device is to warn the driver when the rear light has gone out. The rear lamp may be either paraffin or acetylene, or any other lamp which generates heat, except an electric lamp. If the light goes out it instantly ignites a small electric glow lamp fixed inside the dashboard. The principle is not new, but we believe the methods by which the tell-tale is worked are different from anything of a like kind which has preceded them.

Flashes.

The Austin Motor Company, we are informed, have already decided to build and enter four cars for the 1909 Grand Prix Race.

* * *

Mr. W. Biscombe, who has been making a business tour on a 15 h.p. Zedel, had three of the wheels fitted with the new Samson de Luxe tyre made by the Samson Rubber Co., of Willesden, N.W. He has covered some 3,000 miles, more than half of the distance being over very heavy and greasy roads, and he tells us he has found the treads very satisfactory, as he has had no side-slips and only one solitary puncture.

* * *

By the courtesy of Messrs. A. F. Mulliner, of Long Acre, the Automobile Association will have on their stand at Olympia a limousine body in the A.A. colours (yellow and black), mounted on trestles with special steps, so that it will serve as a private office. The Association is also indebted to Messrs. S. Smith and Son for a somewhat unique model of their speed indicator, to record the membership of the A.A., which it is anticipated will be constantly increasing during the Show. Members are reminded that letters, messages, telegrams, etc., may be addressed to them at the stand.

* * *

The motor car has been blamed for many things, but even the most imaginative of motorists would hardly be prepared for the assertion that the mere inhalation of the smell of a passing car is sufficient to produce intoxication. Yet this was the novel plea set up by a man who appeared before the West Hartlepool magistrates the other day. He was charged with a series of offences—drunkenness, assault on a police officer, and the use of obscene language—and, replying to the first of these charges, he declared: "It's not the drink. As soon as I get the smell from the motor cars I am drunk for a week after it." "The smell," he added, "is enough to kill me on the road." One of the magistrates asked defendant if he had been smelling motor cars that morning. "No, sir, thank God," fervently replied defendant, "and I hope I may never smell any more." Callously disregarding the defendant's story, the magistrates fined him 5s. and costs for being drunk, and a month's hard labour for the assault.

Meet of the A.C. of Victoria at Durrweil Heights on September 26th last.

The Oxford City Council has decided to apply to the Local Government Board for a speed limit on motor cars of ten miles an hour within the city boundary.

* * *

The Society of Motor Manufacturers and Traders calls attention to one of the rules and regulations of the forthcoming motor exhibition at Olympia to the effect that the Society has decided to abandon trial rides. No cars will be allowed to be stationed either in the grounds or in the private road leading to Hammersmith Road entrance of Olympia.

* * *

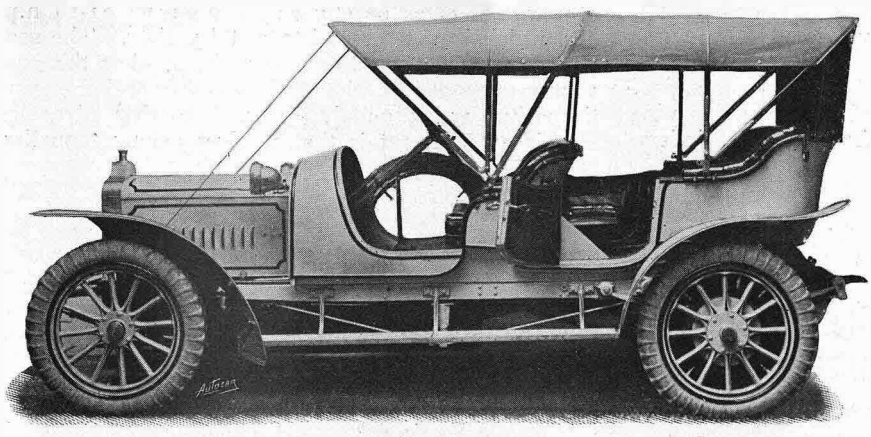
We understand from a local source that the prosecution of motorists passing through Skipton-in-Craven, Yorkshire, at a speed exceeding six miles per hour—to which reference was made under "Road Warnings" last week—is being vigorously proceeded with regardless of the fact that the limit mentioned is quite illegal. The Local Government Board has not issued any order with regard to it, nor are there any warning notices to indicate its existence.

* * *

Few of the people who hire taxicabs are aware that the taximeter is over 2,000 years old. Mr. J. H. Knight, the veteran motorist, calls attention to this fact in a letter to *The Engineer*, in which he refers to the old Roman device which was arranged to drop pebbles into a box at the completion of each mile, the number of pebbles at the end of the journey registering the distance accomplished.

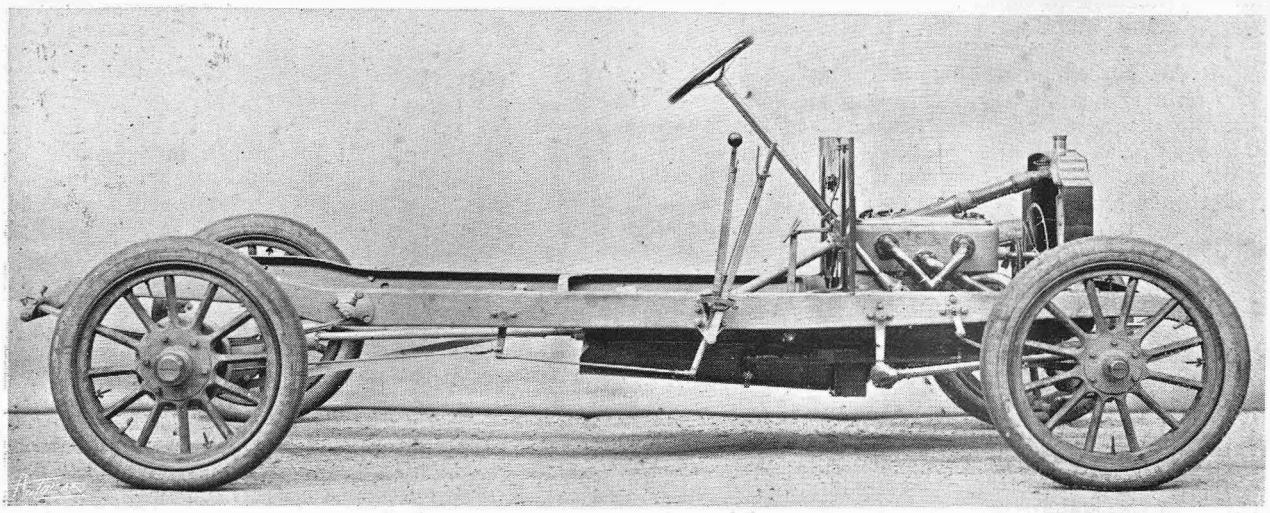
* * *

For some time past it has been an open secret that Messrs. Panhard and Levassor have secured the patent rights for France of the Knight silent engine, and we are now informed that the Mercedes Co. have acquired the German rights, so that in this country there will shortly be four important firms dealing in this type of engine. It is already well known that two of them are the Daimler and the Minerva, and to them must now be added the Panhard and the Mercedes. We are informed that Mr. Harvey Du Cros has secured the British selling rights for Panhards and Du Cros Mercedes.



A CAR FOR THE COLONIES. This six-cylinder Standard has been built for Messrs. Frisswell's Melbourne agents—Messrs. Richards, Miles, and Co. The car has a somewhat novel body, as the seats are all low and the tonneau is removable. The two small seats immediately behind the front seats are collapsable and form when shut a footstool for the occupants of the back seats. Thus the car may be used as a two, four, or six-seater at will. New pattern Kempshall tyres are mounted on the four 880 × 120 mm. wheels instead of the 820 wheels used at home. For the Colonies the larger size are always fitted.

NEXT YEAR'S VAUXHALL CARS.



Chassis elevation of the new 20 h.p. Vauxhall which has its four cylinders cast *en bloc*.

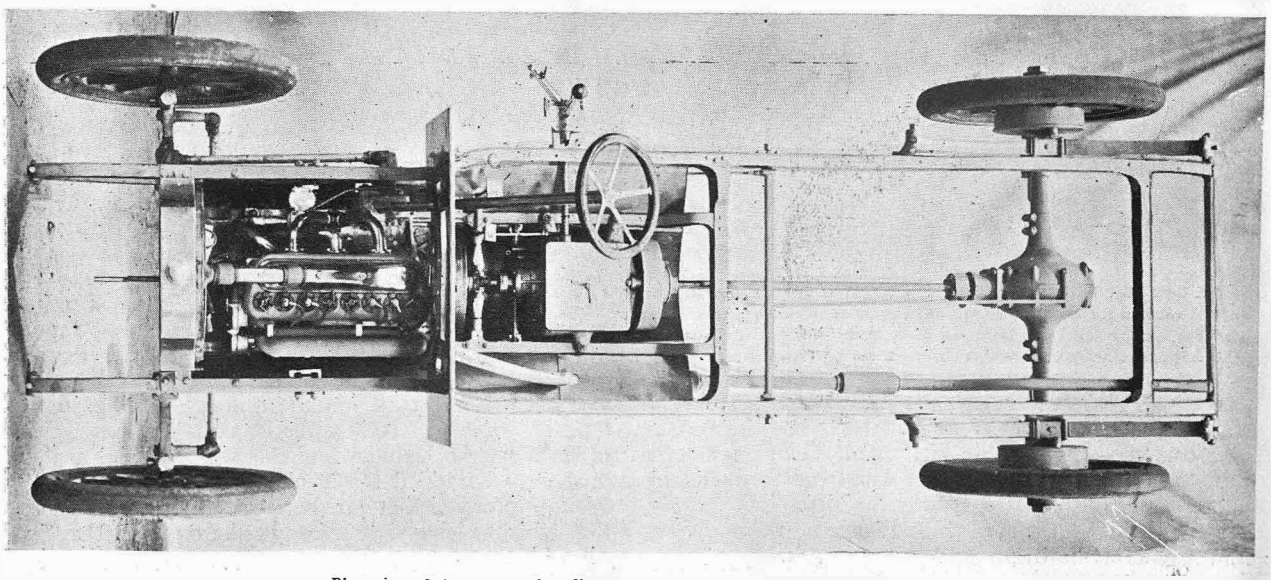
No car has figured more prominently in open competitions and trials during 1908 than the victorious Vauxhall. It is, therefore, very gratifying to see that the Vauxhall models for next year will be generally similar to the car which gained a gold medal in the R.A.C. 2,000 Miles Trial and many other awards during the course of the past summer.

There will be two Vauxhall models for 1909. One will be of 20 h.p. and the other 16 h.p. The 16 h.p. will be a smaller edition of the 20 h.p., the chief difference being that it has only three forward speeds instead of four as with the bigger car, and, of course, a smaller engine. For this reason we intend to deal with the 20 h.p. chassis, but the following remarks apply in a great measure to the smaller car also.

The 20 h.p. chassis has a four-cylinder engine, 3½ × 4¾in., cast *en bloc*. All the valves are on the near side, but in order to keep the valve gear accessible the carburetter is situated on the off side of the engine. The carburetter is automatic, and the induction pipe divides into two branches, each feeding two cylinders. The tappet rods and valve spindles are enclosed. Two interesting departures from previous Vauxhall practice are to be noticed in connection with this engine. One is that the cylinders are all in one piece, and the other that the thermo-syphon system of cooling has been adopted.

The excellent Vauxhall system of forced lubrication is, as might be expected, retained, but simplified by being cam operated instead of by reducing gear and eccentric. The chief advantage that the manufacturers claim for their lubrication arrangement is that there is never any smoky exhaust, and this has been borne out in practice. A high tension magneto fires the charge, whilst the control is solely by a foot throttle.

A stronger spring has been fitted to the clutch, but otherwise it is as exactly as in the 1908 12-16 h.p. car, which is of the metal to metal variety. The gear box comes close up to the clutch, so that the connections between the change speed lever and the gears themselves are absolutely direct. Another advantage of this arrangement is that it gives a long propeller-



Plan view of the 1909 20 h.p. Vauxhall chassis, showing long propeller-shaft.

shaft, and this tends to longevity of the back tyres. The gear box contains four forward speeds, the direct drive being on the top. The gear ratios for standard side entrance bodies are 12, 7·7, 5, and 3·3.

Immediately behind the gear box is the propeller-shaft brake, which is internal expanding, as are also the back hub brakes, and in connection with this it may be mentioned that the propeller-shaft and back wheel brake gears are interchangeable.

As will have been gathered from the above, the transmission is by propeller-shaft and live axle, the differential gear being straight cut and the weight of the car carried on the tapered axle tubes independently of the revolving shafts. The back hubs have ball bearings which are used throughout the chassis, except in the engine-shafts.

The frame is very deep inswept in front, and upswept at the back, the engine and gear box being carried on a sub-frame.

The 20 h.p. chassis is supplied in two lengths of wheelbases, the standard length being 9ft. 7in. and the longer one 10ft. 3in. The track in both cases is 4ft. 6in. 870 × 105 mm. tyres are fitted to all four wheels.

The 16 h.p. chassis has an 8ft. 9in. wheelbase, 4ft. 1in. track, and 810 × 90 mm. tyres. The standard body for this chassis is a four-seated one, of the rotund side-entrance variety.

CLUB DOINGS.

Lincolnshire A.C.

At a recent meeting of the club committee the Secretary reported that the direction plates to be erected in the Bull Ring, Horncastle, in conjunction with the Horncastle District Council, were now in position. Reports were received concerning the level crossing at Hubbert's Bridge, which the G.N. Railway Co. had now put in good order, and the level crossing at Weelsby, near Grimsby. The form of voting paper for the postal vote of the club on the question of affiliation was agreed upon. As the Royal A.C. has declined to enter into any arrangement with the Motor Union, it will be necessary for members to say to which body they wish to be affiliated. The voting papers are being sent out this month and must be returned within three weeks. Steps were taken to arrange with local authorities for notice of expiry of driving licenses to be sent to all holders of such licenses.

Scottish A.C. Checking Inconsiderate Driving.

At a meeting of the Executive Committee on Monday last, the sub-committee on inconsiderate driving submitted details of the action which had been taken by the club with a view to the stopping of improper driving and excessive speeds, particularly in towns, villages, and populous places. Schedules were submitted showing that reports had been made by the special club agents as to the driving of 1,552 cars, and a list was submitted of the cars comprised in that number, whose owners had been communicated with on account of the speed of the cars being greater than was considered by the sub-committee to be proper at the time and in the place where the observations were made.

Various letters and reports were submitted, which showed that the action of the club in this direction has met with general approval and is having very satisfactory results.

A number of cases of inconsiderate and reckless driving, which had been reported by members of the club and others, were considered, and the action which had been taken by the sub-committee thereanent reported. The secretary was instructed as to the finding of the meeting in each case, and as to the communication to be directed to the parties concerned.

Reports, verbal and in writing, were submitted from the delegates to the International Road Congress held in Paris from October 11th to 18th. It was agreed to invite the members of the Road Surveyors' Association to take part in a conference to be convened by the club on an early date, when the principal points dealt with or the resolutions arrived at by the Congress might form subjects of discussion.

The committee dealt with a number of applications by local authorities for speed limits, and the action to be taken by the club in each case was noted.

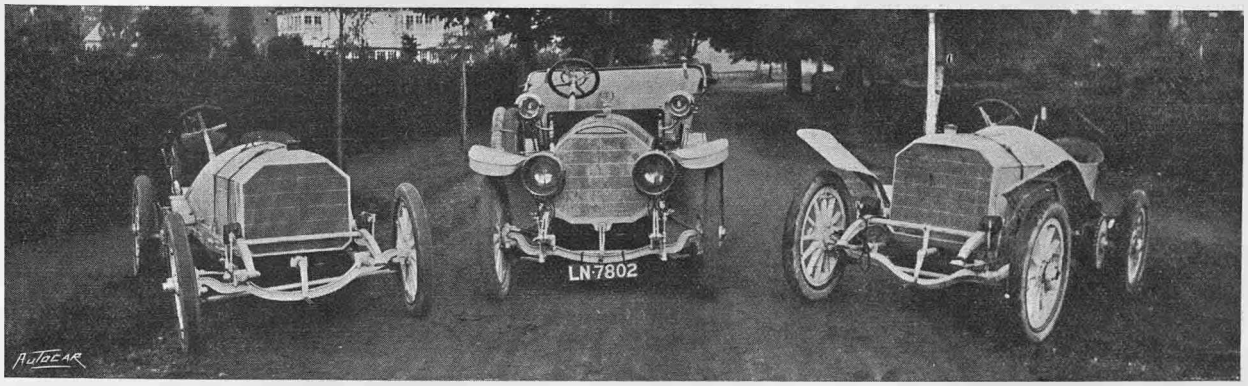
It was reported that the Buteshire County Council had agreed to ask for prohibition of motor cars on the String Road in Arran, and it was resolved to offer strong resistance to the proposal.

It was intimated that conferences had taken place with the Provost and magistrates of Dunfermline, and with the Provost, magistrates, and town council of Irvine, with regard to proposals for speed limits in their respective areas, and that, after discussion, both these bodies had agreed to refrain from any such proposal meantime, the club having arranged to erect certain notices and caution boards in each place.

Motor Yacht Club.

Now that the *Enchantress* has been moved to her winter berth in the Hamble River, members should note the resulting change in the Club address. For letters or telegrams, *Enchantress*, Bursledon, will suffice. The nearest station is now Bursledon instead of Netley, and members arriving by train should enquire at the station the way to the landing stage, from which the ship can be reached by boat in about a quarter of an hour.

The question of next year's Efficiency Trials will shortly be under consideration by the committee. This year's rules were apparently regarded on all hands as an improvement on every previous code, and were admitted to have provided a series of very instructive and interesting tests for the competing vessels. Any suggestion for further improvements from competitors, officials, or others will be gladly received, and should be forwarded to the secretary at once. A suggestion from the Society of Motor Manufacturers and Traders that a date in May or even earlier in the year would be more suitable than the end of July will also come up for consideration.



THREE MERCEDES CARS OWNED BY MR. F. R. FRY. Reading from left to right the cars are 135 h.p. 1907 Grand Prix Racer, 45 h.p. 1908 touring car, and 1908 Grand Prix Racer. The two outside cars are those which have been driven so successfully at Brooklands by Mr. D. Resta.

SOME QUERIES AND REPLIES.

Readers are invited to send in replies to the queries of their fellow readers. Letters should be addressed to the Editor of *The Autocar*, Coventry.

QUERIES.

No. 755.—Chemical Decarboniser.

MESSRS. Shippey Bros. advertise a chemical decarboniser, guaranteed harmless. Has any reader had any experience of it? How is it used, and is it effective?—WOLF.

No. 756.—Running Costs.

WOULD any of your readers be good enough to say what is the annual cost of a 15 h.p. De Dion or Siddeley car run for pleasure, say, at the rate of 100 miles per week, the owner with a fair mechanical knowledge and doing all driving himself?—WOULD-BE MOTORIST.

No. 757.—The Gregoire Car.

I SHOULD be very pleased if any user of an 8 h.p. two-cylinder Gregoire car would give his experience with same. Are there any parts that require special attention? Also as to miles per gallon, speed, lubricant, and wear of tyres.—W.B.

No. 758.—Sizaire et Naudin Car.

I SHOULD like to hear your readers' opinions of the Sizaire et Naudin car—(1.) Regarding speed, consumption, reliability, etc. (2.) Can the gears be inspected without taking down the back axle? Is this form of gear successful on the road? (3.) Are the sliding steering trunnions liable to rapid wear? Any other information from users will be greatly appreciated.—E.H.

No. 759.—14-20 h.p. Siddeley.

I SHOULD be much obliged if any owners of the above cars would let me know if they have had trouble with their big end bearings after running a few thousand miles. Also I should like to know if they find that much of the oil is thrown from the back division of the crank chamber into the front, souting up the sparking plugs in the two front cylinders, and leaving the big ends of the back two cylinders without sufficient lubrication.—LC 6100.

No. 760.—10-12 h.p. Four-cylinder 1908 Humber Car.

THIS little car was one of the features of the 1907 show at Olympia. Would some of your readers kindly oblige with their experiences after a season's use, in order that an expectant public may judge whether it is possible for an English car to be both cheap and durable, easy to drive and maintain, and altogether a car which the man of moderate means can buy with confidence that he will be able to keep his appointments, and that his repair bill will be reasonable?—UBIQUE.

No. 761.—Flames in Carburetter.

PERHAPS some of your readers could tell me the cause of the carburetter of my car (8-10 h.p. Darracq) taking fire. It occurred when starting the car in the morning. I flooded and started the engine, and after running for a few revolutions there was a slight "pop," and the engine stopped. On lifting the bonnet the carburetter was in flames. The magneto is above, but close to the top of the float chamber. I have the magneto completely covered in with a cloth cover, and the wires seem properly insulated. I shall be much oblized to hear of the cause, in order to prevent it happening again.—E.T.H.R.

REPLIES.

No. 747.—Non-skid Bands and Studded Tyres.

I think I am safe in saying that there are no metal-studded tyres on the market of an economical type, and speaking from personal experience I have found up to the present no tyre to come up to the Kempshall as regards elastic running, non-skid properties, and life. I have driven over 4,000 miles with a pair on the driving wheels of a 20 h.p. car, and there is scarcely a scratch on them. I have no financial interest in the Kempshall firm. I am certain that "Iris" would find these tyres quite satisfactory, more especially as they are now reinforced at the sides. I may add that the other day I had to run two miles on a flat Kempshall not through a puncture, and the cover proved none the worse for this harsh treatment, although it was not the reinforced type. I do not inflate above 60 lbs.—H. HUGHES.

I used for some time Durandal non-skids on the rear tyres of my 15 h.p. Humber, size 810 by 90, and found that we had few punctures and no bursts. But my man complained that they made the tubes too hot and injured them and the covers, though we had not had an excessive number of tubes and no new covers. So I changed to - - — studded tyres (I purposely omit the name), and after running between 1,000 and 1,500 miles only had great trouble with punctures and total loss of the covers, which were declared worthless. I believe that if they had been used under the Durandals they would have lasted longer, and certainly we should not have had so many punctures because the thick heavy leather cannot be punctured so easily; in fact, we found a nail only went through between the laps. Watch the covers and do not go too long before retreading, so as to prevent bursts. As to the heat complained of causing trouble, especially to repairs, I have found just recently that repairs did give, but this was through bad vulcanising, which was evident, since there were no punctures, but the "patches" had given way. Of course, there ought to have been no patches. I looked into the matter and am getting an H.F. car vulcaniser—there may be others, but I have seen this and tested it, and a friend uses it and recommends it. No more bad repairs I hope! I have no interest in either of the firms mentioned, but recommend both to aid the enquirer No. 747.—W.H.M.

No. 742.—14-18 h.p. Gladiator.

I am pleased to be able to give the results of my ownership of a 14-18 h.p. Gladiator, purchased from the Gladiator Co. in March, 1907, and since driven about 18,000 miles. I average at least 1,000 miles a month all the year round, driving nearly as much in the winter as in summer. My car has been driven several days a week in town traffic during summer months, and when out on country roads always has a very full load—friends are so appreciative! I seldom have less than five up. To take the enquiries seriatim: Hill-climbing.—The car climbs very fast on any hill which allows the engine to keep turning fairly fast, *i.e.*, on what one might call a "second speed" hill it will romp away from some cars with bigger engines. The "second" is very fast and pulls hard. I can come home from Brighton with full load with only one change—Handcross. It will take fifty stones up Knight's Hill, West Norwood, on second, and such slopes as Brixton Hill on top. Petrol consumption.—I reckon on an easy twenty miles to the gallon. I can get more if I try, but last year I toured 1,200 miles in North Wales, etc., with five up and luggage, and averaged just over twenty miles to the gallon. I give this as a fair instance of all-round work. Speed.—The Surrey and Sussex police cause us to think little of high speed, but on a fair road the car will approximate forty miles an hour, if pushed. Thirty five is easy. I think the control is about as easy as can be devised. With Bosch magneto the ignition needs practically no attention. If set at about six millimetres advance one never need worry about his ignition lever—I have removed mine altogether and drive with fixed ignition—and one has only to set the throttle lever to keep the engine just running and drive on the accelerator pedal. The hands have nothing to do but steer and manipulate the change-speed and brake levers. Driving then becomes a boy's work, it is so easy. I do not keep a driver, being my own chauffeur entirely. Only once has the car failed to bring me home, and that was through a nut working loose on the magneto clip, by reason of which the magneto became displaced and damaged. The compression is low, so that starting is very easy, and possibly this accounts for only one new set of piston rings being required in 18,000 miles, and valves only needing grinding in once in about 10,000 miles.—A. W. P.

No. 737.—30-40 h.p. Ariel.

I took delivery of my 30-40 h.p. Ariel double landaulet, weight about 2 tons, at the beginning of September, and have run about 1,200 miles on it. Previous to ordering this car I corresponded with fifteen recent purchasers of this make, and they were unanimous in their opinion of its excellence. It runs as smoothly on top at seven miles an hour as it does at forty-eight, and is practically noiseless. I have driven in many cars, and find the Ariel the most superior in reliability, flexibility, and easy running. To answer your correspondent's references in order: (1.) Reliability: Absolutely reliable. I have made several non-stop runs of over 160 miles, through the most hilly part of Wales. Beyond cleaning the plugs, no adjustment of any sort has been made. (2.) Hill-climbing: Will take almost any hill on top, such as Dinmore Hill, near Hereford, and I have never had to come into my first speed even on a mountain such as the Blorenge, near Abergavenny. The car is so powerful that it is almost a treat to find a good hill, so that you can really let it go. (3.) Petrol consumption: The makers, I believe, guarantee thirteen miles per gallon. As the tank holds twenty-two gallons, and my chauffeur keeps filling it up, I have made no calculations. (4.) Wear on tyres: I have one Palmer cord and one studded Continental on the back wheels; so far they have not shown the slightest sign of wear. (5.) If clutch and gears wear well: Changing gear is almost a pleasure, as it is absolutely noiseless. The clutch has not been touched since I bought the car. The gears are guaranteed, I believe, for two years. In conclusion, I might add that I do not think anyone having driven a 30-40 h.p. Ariel would think of purchasing anything else, as the car is as near perfection as possible.—R. BARNET BARKER (Captain).