THE AUTOCAR

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

EDITED BY H. WALTER STANER.

No. 435.] VOL. XII. SATURDAY, FEBRUARY 20TH, 1904. [PRICE 6D.

THE AUTOCAR.

(Published Weekly.)

Registered as a newspaper for transmission in the United Kingdom.

Entered as second class matter at the New York (N.Y.) Post Office

EDITORIAL OFFICES:
COVENTRY.

PUBLISHING OFFICES:
3, ST. BRIDE STREET, LONDON, E.C., ENGLAND

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"THE AUTOCAR" SUBSCRIPTION RATES.

British Isles, 16s.; Abroad (thin paper edition), 22s 6d per annum.

Notes.

Club Reform.

In another column we publish a letter from a correspondent which is worthy the careful attention of well-wishers of the Automobile Club. Unlike too many criticisms which have appeared on the club, it is constructive, and definite propositions are made for the reform of the club. A list of names is proposed for the committee, but beyond this, few names are mentioned. That is to say, there are certain notable omissions, but these are dealt with collectively, it being left to the commonsense of the reader to account for most of the individual omissions. It is taken as proved that the club policy has been an absolute failure during the past year, and the idea of "An Old Member" is to omit the names of those members of the present committee who, in his judgment, have been more or less responsible for the loss of club prestige. His list of names for nomination is a very complete one, and we think it will be found difficult to improve materially upon it, though, probably, here and there the individual will prefer to substitute another name for that of one or other of the gentlemen mentioned. However, this is a matter which will be settled by the postal ballot which will be taken on March 10th, the nominations closing on February 24th. As the club stands, it has lost prestige in every way, its two most serious shortcomings being its quarrel with the Parliamentary party and its recent action with regard to the show question. It must be remembered that the present club committee is responsible for these mistakes. Many of the names put forward by our correspondent are those of existing members, but the real significance of the letter is in the omissions, the effort of the writer having been to leave out those whom he believes to be responsible in the main for the more serious blunders which have been committed during the last twelve months.

The Ruling Body.

In the course of his speech at the inaugural luncheon of the Crystal Palace Show, Lord Stanley, M.P., when referring to motor legislation, pointed out that the future of motorists, so far as the administration of the Act was concerned, depended very largely upon motorists themselves. They must organise themselves to sternly repress any inconsiderate or reckless driving by any of their number. He inferred that the Automobile Club should be in a position to do this, and cited the Jockey Club as an example of what a ruling body could and should do, and expressed his regret that the Automobile Club had not the same power and prestige. Now, it appears to us that, while there is no denying the fact that the Automobile Club has not the prestige it should have, particularly since it fell out with its Parliamentary members, and generally lost its influence with the Local Government Board through its tactlessness, it is in every way at a disadvantage compared with the Jockey Club. That is to say, the word of the Jockey Club is law, and its decisions are indisputable, because it governs a sport. Hence, on the race track, the Jockey Club is paramount; it can bar any man who does not run straight, or conform to its regulations, from participation in the sport. Now, the case of the Automobile Club is entirely different. It is easy enough for it to govern the sport, but the sport is a very little thing compared with the pastime of driving upon ordinary roads. It is most important that the tide of prejudice should be stemmed as far as possible in the next three years, so that when the Act comes up again for revision its terms may be eased and not strengthened towards the automobilist.

The problem is, how can the club be given this power? It might do something with its members, but its position in this matter is a very difficult one, and a few of the men most prominent upon its council are perhaps the worst offenders. We do not mean that they have been involved in accidents, or have caused material damage to the public, but their driving is, to say the least of it, very much faster than that of the average motorist, and although they have caused little danger, they have created constant annoyance and no little inconvenience to the average road user. In wet weather they plaster him with mud splashes, and in dry choke him with dust, as wet or dry they drive just about as hard as is possible. Now, these facts are well known to the club officials, but no move has been made in the matter, and while we are not blaming anyone for this, we think it would be a great deal better if these questions were faced honestly. As it is, the club preaches moderation in speed, and yet knowingly permits its members to pursue the opposite course. The problem is a difficult one; who will solve it? The only way at the moment which occurs to us by which the power of the club could be made of real effect in preventing reckless driving would be for it to have similar power to that granted to the magistrates who are entitled to suspend a driver and cancel his licence. This, however, is impossible, not only because it would require an alteration of the law, but because the club is held in too little regard by the powers that be even to momentarily think of such a thing being seriously discussed by them. Consequently, it is impossible for the club to have any control over the average automobilist unless some better suggestion can be made. One course which naturally suggests itself as a remedy—an operation within the power of the club, and one which might perhaps prove effective in many cases—is that of expulsion. The expulsion of a few proved reckless drivers would undoubtedly have a salutary effect, and would inspire respect for the authority of the club, provided the power was exercised with due deliberation and mature judgment.

The Conference of Clubs.

The result of the representative meeting of automobile and motor cycle club delegates which took place at 119, Piccadilly, on Monday evening last, may be regarded as entirely satisfactory by those concerned and by the automobile world generally. The threatened federation of clubs independently of the parent body—which, notwithstanding the mistakes and false steps of the last few months, has done yeoman service for the movement—could only be regarded as a misfortune, even by those who might have provoked it, at a time when automobilism for its own sake should show a solid and undivided front to injustice and persecution all over the country. In the three schemes under which clubs may affiliate, the finances and the fancies of all clubs have been considered. Some will prefer one scheme, some another, but if we are any judge of men and clubs we believe that the example of the Reading club will be most generally followed, and the five shilling or No. 2 scheme will find most favour. The members of clubs affiliating under scheme No. 1 will enjoy advantages supreme over schemes Nos. 2 and 3, to the extent of—(1) Representation upon the general council of the club, a

ONE OF THE HASTINGS PUBLIC SERVICE MOTOR 'BUSES. This vehicle is a Milnes-Daimler, and duplicates of it provide some of the most striking features in the Crystal Palace show. Not only do we find vehicles for the use of corporations or local 'bus companies, but also for the Great Western and other main line railway companies. These companies are adopting the motor road vehicle to connect their lines with outlying districts. The Helston-Lizard motor 'bus service is already well known, and now the G.W.R. are starting others, one of them being between Slough and Stoke Poges. In fact, they have thirty Milnes-Daimler motor 'buses in work or on order.

somewhat barren privilege having regard to the fact admitted from the chair that the general council seldom, if ever, meets; (2) a free copy of the *Automobile Club Journal* weekly to each member; and (3) membership of the A.C.G.B. and I., with subscription reduced by one guinea. Now, the first privilege is obviously less than nothing, the second is entirely a matter of personal taste, while the third (a reduction of twenty-one shillings in the subscription of one who can afford or desires to become a country member of a London club) is, after all, very much of a bagatelle. Therefore, we incline to the belief that scheme 2—which would appear to grant to each club all the advantages which federation on the Reading lines was supposed to give them—is the scheme under which the majority of the clubs concerned in the recent agitation will be most ready to affiliate.

USEFUL HINTS AND TIPS.

A Cause of Heavy Petrol Consumption.

We very frequently receive from correspondents queries as to the reason of the high consumption of petrol by their motors. The details given by some of our querists are extremely bare and scant, so that it is impossible to arrive at the correct solution of the trouble. One source of excessive consumption is the heating of the carburetter to a much higher degree than is necessary, so that, independently of the suction by the motor, a comparatively large quantity of petrol is drawn through the jet in the form of pure vapour. This added to the subsequent charge of petrol drawn through the jet by the suction of the engine makes up the large quantity of spirit used. The resultant cylinder charge is, of course, much richer than is necessary or good for the engine, as sooty valves and plugs nearly always result. We use the words "nearly always" advisedly, as some engines have their valves and plugs so placed that they are automatically cleaned by the exhaust gases, one charge sweeping before it the soot deposited by the previous charge. Again, in other engines, the plugs, or, perhaps, the valves alone, are so placed as to prevent the accumulation of carbon deposit. We mention this, as probably some of our readers will wonder why their valves and not their plugs become dirty or *vice versâ*.

A Suggested Remedy.

Having given a probable cause of the trouble, we suggest a remedy which, to many of our readers, will be perfectly obvious, and that is to cut off the hot air or water, as the case may be, from the heating chamber by means of a simple tap. It is only when running through a keen frosty air, or when the atmosphere is heavily charged with moisture, that the heating chamber is actually required, yet on many engines no provision is made for cutting off the source of heat, hence the increased petrol consumption.

A Simple Tyre Protector.

A correspondent writing to our esteemed contemporary *La France Automobile* explains a means of protecting new pneumatic tyres which he has found quite effective and successful. He has taken an old cover of the same size as the new one, and with a sharp knife has made several transverse cuts in the stiffened edges of the old cover, and only in the stiffened edges. Then deflating the tyre on the rim he has forced the old cover over the new one, and reinflated the latter, where, thanks to the pliability gained by the cuts in the edges, it sits securely and perfectly, protecting and saving the cover beneath in a most satisfactory manner.

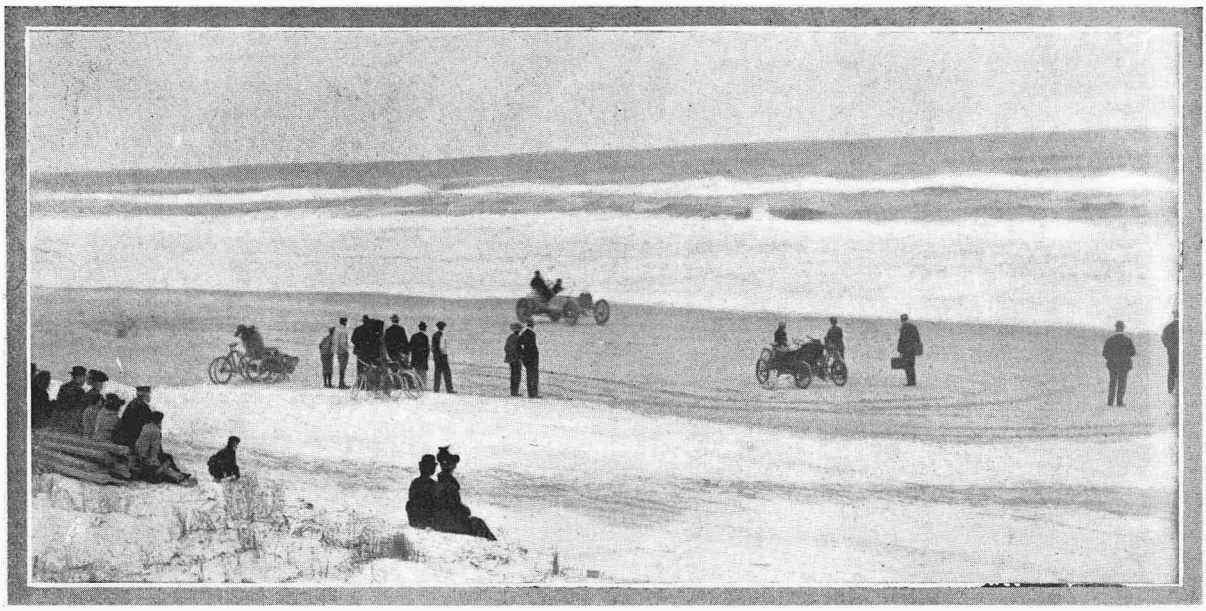
Troubles from Loose Terminals.

When accumulators are carried in boxes fixed to the frame, or, indeed, in any position which is at all troublesome or difficult of access, their terminals and connections are frequently neglected to the detriment of the ignition. On more than one occasion we have found faulty firing result from nothing more than a loose connection between accumulators, and as this does not exert its evil effect until the car is running, and the accumulators are subjected to road vibration, diagnosis of the trouble has often been at fault. When a cylinder is firing badly, time and annoyance are often saved by going straight to the accumulator box and tightening the connection screws. Also, it is advisable to clean these connections and screws and the accumulator terminals from time to time. The ignition will always be the better for it.

Lubricating Chains.

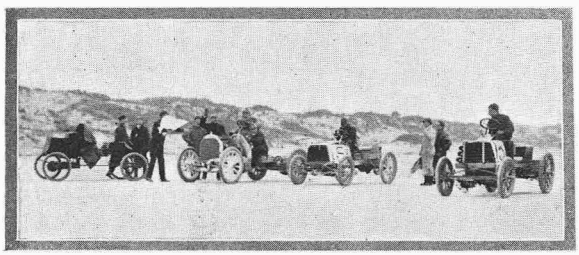
The only satisfactory manner in which driving chains can be lubricated is first of all to cleanse them thoroughly with paraffin, making sure that each roller of the chain is revolving freely on its rivet. Then place the chain, rolled up, into a shallow tin and put over it several lumps of good Russian tallow, which has previously been refined. The refining may be done by putting the tallow into a bucket of hot water and keeping it well stirred. All foreign matter will be precipitated, and, upon cooling, a cake of pure grease will be left on the top of the water. The tin containing the chain and the tallow should then be put on the top of a stove which is only moderately warm. The chain will become slightly heated—not sufficient to alter its temper by softening, but enough to permit of the tallow being melted and finding its way into the spaces between the rollers and the rivets, where, obviously, it is required most. We have used a mixture of graphite with Russian tallow, but cannot say that we found it of any benefit, owing to the fact that plumbago sinks to the bottom of the melted tallow, and, therefore, does not do the duty that is expected of it. In order to prevent the collection of dust and dirt on the chain as much as possible, when the chain is removed from the tallow it should be hung up and all superfluous grease allowed to drain from it into the tin placed beneath. There will, of course, remain a thin film of grease over the surface of the chain, but no more than is sufficient to protect it in wet weather, though even this film of grease will collect dust. Practically, the only efficient way of properly lubricating a chain is to have it encased in an oil-retaining gear case.

AMERICAN AUTOCAR RACES.



W. K. Vanderbilt creating his record on the Daytona Beach, with his 90 h.p. Mercedes. This and the remaining illustrations give a good idea of the nature of the track on which the races were run.

Particulars are to hand of the autocar races on the Ormonde-Daytona Beach, Florida, on Jan. 29th and 30th, at which Mr. W. K. Vanderbilt, jun., made the astonishing performance recorded in *The Autocar* of February 6th, page 165, of flying a mile in 39s. The track on which the races were held is so smooth that it is described in the report as the "tide-ironed" Florida beach. Some exciting contests were expected from the meeting of the two redoubtable champions, Barney Oldfield and the young millionaire; but the former, owing to the breaking of the crankshaft of his car (90 h.p. Winton-Bullet) in one of the preliminary heats, did not meet his



At the starting point.

rival, who had things pretty much his own way. The following are the details of the races:

ONE MILE INVITATION (open only to gentlemen amateurs).—Final heat: Won by Mr. Vanderbilt, jun., on his 90 h.p. Mercedes, time 48s.; Bowden 2, time 51s.

ONE MILE 1.05 CLASS.—Won by H. L. Bowden (60 h.p. Mercedes), time 52 2/5s.; F. A. La Roche (40 h.p. Darracq), 2, time 55 1/5s.; J. Insley Blair (24-35 h.p. Panhard and Levassor), 3, time 1m. 6 3/5s.

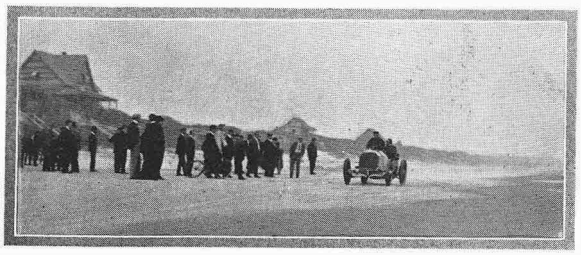
ONE MILE, FIFTY-SIX SECONDS CLASS.—Final heat: Won by Bowden (60 h.p. Daimler), time 50 4/5s.; F. A. La Roche (40 h.p. Darracq), 2, time 54s.; W. G. Brokaw (30 h.p. Renault), 3, time 56 3/5s.

FIVE MILES INVITATION RACE (gentlemen amateur drivers).—Final heat: Won by W. K. Vanderbilt, jun. (90 h.p. Mercedes), time 3m. 34 3/5s.; S. B. Stevens (60 h.p. Mercedes), 2, time 3m. 41 4/5s.

Nearing the finish of one of the heats.

FIVE MILES OPEN.—Final heat: Won by W. K. Vanderbilt, jun. (90 h.p. Mercedes), time 3m. 31 3/5s.; H. L. Bowden (60 h.p. Mercedes), 2, time 3m. 40 4/5s.

FIVE MILES RACE FOR RUNABOUTS.—Won by Louis S. Ross (6 h.p. Stanley steamer), time 7m. 53 1/5s.; Hugh L. Willoughby (11 h.p. Autocar), 2.



A group of spectators who cannot complain of being crowded.

FIVE MILES HANDICAP.—Won by S. B. Stevens (60 h.p. Mercedes), scratch, time 4m. 2/5s.; Joseph

Tracey (70 h.p. Peerless), five seconds, 2, time 4m. 28⅕s.; F. A. La Roche (40 h.p. Darracq), thirty-five seconds, 3, time 5m. 5⅕s.; J. Insley Blair (35 h.p. Panhard), fifty seconds, 4, time 7m. 46⅕s.

Owing to the fact that the course is less than fifteen miles long, some of the races had to be run on the instalment plan. For the fifty miles race the contestants drove their cars twelve and a half miles along the beach to the finishing line, where their times were taken. After this they slackened speed, turned, and came back at full speed, and were checked again for twelve and a half miles the other way as they crossed the original starting line. This was repeated until the whole distance of fifty miles had been made up, the times in which the short twelve and a half miles spurts were made being added together for the official time of the race. This juggling, as it were, with time gives, to say the least of it, a wide opening for error.

The 90 h.p. Mercedes in full flight.

A DRIVE ON A SIX-CYLINDER NAPIER.

The offer of a gentle midday stroll behind an engine boasting six cylinders was much too good not to be eagerly accepted, particularly when it was known that the car was to be controlled by so skilful, considerate, and careful a driver as Mr. S. F. Edge's particular engineer Macdonald, who handles this big, powerful automobile as though it were a voiturette. Small wonder, then, that the appointed time found us ready, Hoare-coated, ear-capped, and be-goggled against the biting blast, awaiting the arrival of the latest Napier tourist, its driver, and that most entertaining of Irishmen, R. J. Mecredy. Just the drone of an agitated bluebottle announced the big car's arrival with its designer and constructor on his green 12 h.p. in close attendance. We were aboard without delay, and got a first taste of the six's qualities in the way it moved away from the kerbside. The engine was quickened a trifle, the clutch let in sweetly and silently, and the kerb was left just as insensibly as a cross-Channel packet leaves the Admiralty Pier or a skilled express driver moves his train away from the terminus platform. There was absolutely no sense of departure. The car was on its way before we knew it; it just melted into speed. There is no mistaking the seductive drive of the six. Now, the roads out of London on Sunday morning last, thanks to the drying effect of Saturday's wind and the bright sun of the early morning, were just alive with fresh air seeking folks awheel, and for many miles we were to have example and to spare of the extreme control which, thanks to the most effective throttle, the driver exercises over this huge car, and the marvellous way in which its purring six-cylinder motor picks it up on the top speed sweetly, softly, and swiftly from a mere saunter, with never a touch of the clutch pedal whatever. Again and again we were running and hanging behind low-powered single-cylindered cars, and the only indication of a decrease or increase of speed was the force of the air impingement on the cheek and the flitting of roadside objects. As the car gathered way in the open, it was as though some mighty unseen hand bowled it forward on its course, so lacking in vibrative evidence was the engine drive. Nothing could be more convenient than the central position of the throttle and ignition levers, in the deeply-dished steering wheel, and either in slowing or speeding the car obeyed the merest movement of the little lever, as though it had been a magic wand.

Between Kingston and the middle of the Hog's Back—which is Farnham way, and which marked the limit of a run all to short on such a vehicle—the six cylinder Napier laid flat the road behind it. The hills on that stretch—even the first steep pitch by which the Back is attacked from the gates of Guildford Station—had no existence as hills from a gear change point of view, for, running fast or slow, checked or with its head free, the car just took them on its top speed, as though some giant power had pared them down before it. The climb of the Hog's Back without a change down, and from taking the station bend at a walk, struck both Mecredy and the writer as a very fine performance, and one which most effectively demonstrated the flexibility of this most flexible engine. The return journey before the wind was most enjoyable, the monotony of continuous travel being broken by a branch journey for a mile or two to assist in rescuing Napier and his 12 h.p. from three feet of flood water into which he had most incontinently plunged while spinning out time before lunch in exploring Surrey lanes. A Napier engine meets most calls valorously enough, but to ask it to back a car out of a dip with its bonnet awash is to request an effort that could only be expected of a turbine. The vision of M. H. and his 12 h.p. horse-hauled backwards from the yeasty spate will not shortly fade from the memories of those who witnessed it. It will always remain as a pleasing interlude in our recollection of our first run on a six-cylinder Napier. Few people would believe how reluctant is an explosion engine to part with water when it is filled with that otherwise useful fluid chock to the crowns of its combustion chambers, to say nothing of the silencer. And fewer still will credit what a starch-green, laundry-like aspect it can lend a Surrey landscape when it starts disgorging its unrequired contents.

After a considerable experience with the Parsons non-skid chains, it may be interesting to say that we have not found that they damage the tyres in any way. It is true there have been some complaints as to this, but, from our experience, we cannot help thinking that they have been due either to running with the non-skids too tightly screwed up so that there was no slip possible, or else the drivers have presumed too much upon the safety afforded them by the non-skids.

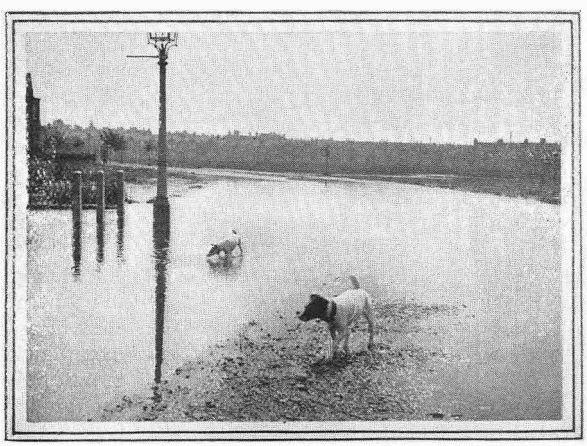
CARBURETTERS AND CARBURATION.

By F. Strickland.

There has been lately a great craze for carburetters with some spring arrangement for admitting an extra amount of air to the suction pipe when the engine sucks harder, and it is claimed that these give a much more uniform mixture than those not fitted with such an arrangement, thereby enabling the engines to be run slower without missing fire, and therefore more silently, and at the same time giving their full power at high speeds. That they are successful as far as running is concerned seems beyond doubt, but whether they really give a uniform mixture, and whether it is desirable that they should, seems rather doubtful.

If we examine the theory of a spray carburetter, we find that there is a petrol nozzle placed in the suction pipe in such a manner that when there is a vacuum formed in the pipe by the engine sucking at it the petrol is sucked out of the jet and mixes with the air. Now if we assume that the vacuum varies, and see what effect this has on the air and petrol that flow through, we find that in theory both the petrol and air will vary in proportion to the square root of the vacuum at the nozzle. That is to say, that in order to make twice the amount of air flow through the air inlet, there must be four times the vacuum, and four times the vacuum will suck twice the amount of petrol through the nozzle. Thus in theory, whether the engine was running fast or slow, whether throttled or not, the proportion between the petrol and air should always be the same. In practice there is one point which slightly disturbs this, and that is, it is assumed that the petrol is standing exactly at the top of the petrol nozzle, whereas this is, of course, not the case. As, however, it is generally within a sixteenth of an inch of it, this should not make any perceptible variation in any carburetter that is at all the right size for the engine it is working on.

It is evident that the introduction of the throttle-controlled engine has made the range over which a spray carburetter is required to work much greater. In the old days of the cut-out governor the engine, when working, always used a full charge wherever the valves were big enough to let it in, and the speed of the engine was only varied between very small limits. Now, however, most engines are required to work over a range of from 150 revolutions throttled, up to 1,500 revolutions per minute with the throttle full open. The consumption of mixture in the latter case will be something like thirty times that in the former, so that the carburetter has to work over a range of, say, thirty to one.



A view of the road from Cole Park, Twickenham, to St Margaret's Photographed by Mr. W. J. Shaw in June, 1903, and still up-to-date.

In order to ascertain what the requirements of a carburetter are, it may be well to see what happens in one that has no automatic arrangement, and also what is the effect of varying the mixture, when it can be done by hand.

If we run an engine with no automatic arrangement to vary the mixture, or cut off the air supply when the engine is slowing, we soon get down to a speed at which the engine will not run without stopping. When running as slow as it will without stopping, also, the engine will as a rule run very irregularly, and will first go off with a run and then miss a few explosions, and so on. This is particularly the case with a governor, as there the engine may be run fairly slow, but will run very irregularly, as first the engine will slow down and then will miss a few explosions; then the governor will open the throttle and the engine will run away again; next the throttle closes, and the same will be repeated.

The common explanation of this is that, as the engine sucks less, the mixture gets weaker till it ceases to be an explosive mixture, and then when the throttle opens the greater suction makes it get stronger, and so on. I rather doubt whether this is quite right, for this reason: Very often with an engine running in this manner, when the engine has missed a few impulses through the mixture being throttled down too much, the next ignition will cause an explosion in the exhaust box. This proves quite definitely that when running very much throttled the engine takes a certain amount of perfectly explosive mixture and passes it through to the exhaust box without firing it. I have a car now that does this always more or less when running as slow as it will go.

Now, I had my early experience on a tricycle, in which there was no governor, and all the air adjustments could be varied while running, and this taught me many things. Doing this, I came to some conclusions as to mixtures. One was that the mixture that is best for going slow is not necessarily the best for going fast. There is apparently one mixture that will pull the hardest, but this mixture is not the one that will enable the engine to run at its highest revolutions with a comparatively light load. It would appear that a weak mixture burns faster than a strong one, but that if the latter has time to burn it will develop a higher pressure. However, the variation required in practice to produce the best results is so small as not to be worth providing for. If we take an ordinary tricycle and run it along a flat road and make adjustments with the mixture we find that the result of giving too much petrol is quite different from that of giving too much air. If the air is gradually increased from the normal amount the engine will soon begin to misfire, but it

will continue to run very well and with no perceptible loss of speed till it does so. If, on the other hand, the petrol is increased, the result is that the engine soon begins to go slower, and slows down very much indeed before it misses to any great extent. Now, I have another experience that bears on this. I had a car once that had no governor, and the throttle was so inconvenient that I never used it. The range of ignition was also too small, so that it was not enough to make the engine run as slow as was desirable when the engine was standing. This car could always be made to run fairly slow by simply putting the ignition back as far as it would go, and then making the mixture richer than was right for running. In this case, there was no question about the throttle spoiling the mixture, as it was practically never used. Now, there is another point about mixtures. In starting a new engine, if of small size, and if there is slight leakage past the rings and little compression, I have always found that it is very difficult to get an explosion. The mixture may be all right, but without compression it will not explode.

Here again, a much richer mixture than that wanted when the engine is tight will explode easier.

The conclusion I have come to after considering all these facts is that, in order to make an engine run steadily when much throttled, what is required is not a uniform mixture, but a much richer one. This would exactly agree with theory, which shows that the ordinary carburetter should give a practically uniform mixture, while the Krebs type should give a poorer mixture as the vacuum increases. If this is so, one would expect that the Krebs type would not be quite so economical when running throttled as the ordinary type. It would be very interesting if experiments were made and published of the proportion of air and petrol at various speeds, and it would not be a very difficult thing to try.

There are some other things about mixtures that do not seem clear. One of the signs of the mixture not being rich enough, in many types of engines at all events, is that there are back fires in the suction pipe. This is a thing that I have never been able to account for, though I have often observed it. Whether it is that the incoming charge is ignited by the exhaust gas left in the cylinder, or whether the flame gets past the suction valve, I do not know, but it would appear that it must be one of the two.

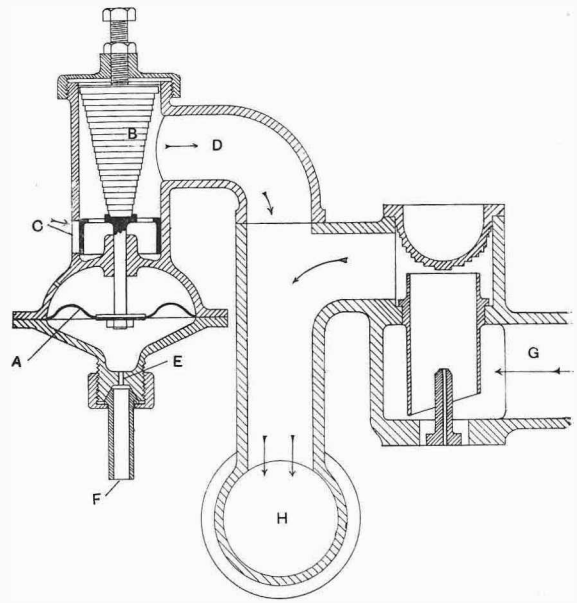
Another thing that is rather surprising is that the American "mixing valve" type of carburetter has not come into use more. It would seem to have in itself exactly the same adjustment that the Krebs has, that is to say, a tendency to strengthen the mixture as the suction gets less and to increase the air as it gets greater. In fact, it is a spray carburetter, with a slight head to the petrol nozzle, which seems just what one wants. Nevertheless, it has often been tried, and has not come to much. Possibly, a combination of the mixing valve and the float feed would be a good thing. That is to say, to have a float feed carburetter with the level in the float chamber a good bit above the nozzle, and to have the latter closed by a little valve that the suction of the motor would lift.

THE NEW WOLSELEY CARBURETTER.

One of the cars which the Wolseley Co. are running in the Crystal Palace grounds for visitors is fitted with a new carburetter. The device can be fitted to any existing Wolseley. It consists of a chamber containing a diaphragm A, which is acted on by the pressure of exhaust gases in the exhaust pipe of the motor. As this diaphragm rises against the spring B it opens air ports C. These air ports admit pure air from the atmosphere which passes through the pipe D, and mixes with the carburetted air in the mixture pipe.

It will be found that the pressure in the exhaust pipe varies with the number of discharges of exhaust gas, and consequently with the speed of the motor; thus, the faster the motor runs the higher the diaphragm rises against the spring and admits more air, thus neutralising the effect of the extra vacuum in the carburetter, and keeping the mixture of uniform quality.

It will be noticed that if the throttle should be partly closed, the exhaust pressure immediately drops, and so keeps the valve closed, giving a small quantity of rich mixture to the motor when the compression is reduced, due to throttling the charge. There is no danger of the apparatus becoming overheated, or, in fact, heated at all, as, although it is operated by the exhaust, there is no circulation, consequently the actual exhaust gases never get near the diaphragm. The small hole E to admit the pressure to the underside of the diaphragm causes the pressure chamber to act as a dashpot, and prevent violent variations in the position of the valve.



The Wolseley automatic carburetter.

A, diaphragm
B, flat coil spring
C, piston valve air ports
D, extra air branch pipe
E, inlet orifice to pressure chamber
F, pipe connected to exhaust pipe
G, hot air inlet
H, passage to inlet valves

OCCASIONAL GOSSIP. By the Autocrat.

The show, the show, and nothing but the show, is the epidemic from which motorists at large are suffering at the moment. They talk about cars they have seen at the show, people they have met there, and so on, till one finds, on analysing the petrol talk of the week, it is all provoked by or centring around the show.

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A good tale was told by Lord Stanley at the inaugural lunch at the motor show. He referred to the sterling work done by the motor volunteers. Some of them, however, were new to military work, and one gentleman, who was driving a distinguished officer on an 18 h.p. car, was requested by the officer to stop so that he could make an observation of the surrounding country. "What," said the motorist, "stop here and let that 10 h.p. car we passed at the bottom of the hill overtake us?"

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Speaking of this lunch reminds me of the fact that it was far too long a function. Most of the guests had retired before the proceedings closed. From half-past one till four o'clock is out of all proportion. One must have lunch, and two or three crisp, interesting speeches after it are not amiss, but two hours and a half are really too much of a good thing. The after-lunch programme was too long, and one or two speakers seemed unconscious of the flight of time, particularly the president. The chairman set a good example, and so did Lord Stanley. The president (Mr. Simms) is always so desirous of being thorough, and his thoughts come so rapidly that he is apt, when on his legs, to remain on them too long. However, I for one do not complain, as what he said was very interesting, but it appears to me, if an inaugural meal is necessary—I do not see why a show cannot open without three hundred exhibitors and guests being crowded together to feed simultaneously—it should take place in the evening; in other words, it should be a dinner, when men are not likely to be pressed for time as were the majority of lunchers on Saturday.

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Foiled of—or perhaps I might say scared off—the Circuit des Ardennes by the width to which the Belgian club opened its mouth when approached on the decision of the English eliminating trials over the Circuit des Ardennes course, Mr. Secretary Orde has been to the Isle of Man to see what can be done with the House of Keys, which, so far at least as the use of the island roads go, must be independent of Imperial Parliament with its majority of motor-phobist cranks. *Faut de mieux*, I hope that the representatives of the Manxmen will see profit and glory in the eliminating trials, and that before many weeks are over our heads we may hear that the legalisation of the trials in the island has been proclaimed from the summit of Tynwald Hill in both Manx and English.

× × × ×

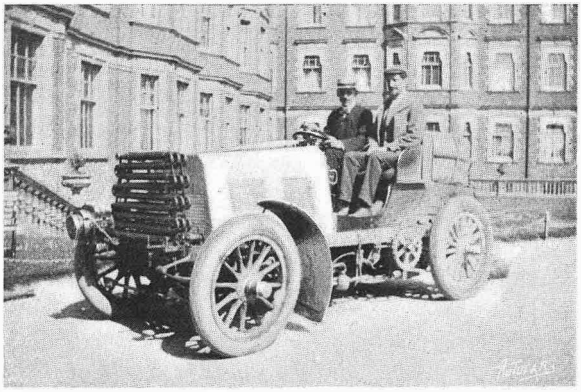
I am told, although the entry fees for the cars, etc., which took part in the thousand miles reliability trials amounted to over £3,000, that that sum has been more than swallowed up by the expenses, and that a loss rather than a profit results to the club finances. Now, £3,000 is quite a lot of money, and it would interest a good many members to know something about the disposition of so large a sum.

× × × ×

Really the Crystal Palace people might do something to improve their goods delivery yard. I am told that on Thursday and Friday of last week it was a veritable slough of despond, and that the struggles of the poor horses in their efforts to haul their heavy loads through the mire were painful to witness.

× × × ×

Some of my friends in comparing the Crystal Palace show with the Paris Salon seem distressed because the general effect of the English show is much less pleasant and striking than that of the French, and most of them seem to think this is due to the stands and the way they are arranged. I do not agree with this opinion altogether, as the English stands, if not quite so artistic as the French, are very handsome and well conceived. The real reason why the French show was so much more striking was the difference in the interior proportions of the two buildings. The Crystal Palace is practically a long glass tunnel, while the Salon is very much shorter, but wider. In proportion to its length, it is higher, and its glass roof is not spoiled by awnings. Owing to the condensation or leakage—I do not know which—it has been found necessary to hang what is practically a continuous awning the whole length of the Crystal Palace. This not only shuts out the light, but robs the building of the effect which would otherwise be produced by its loftiness. This effect is most necessary in a building having such a long plan, because as at present arranged, before the eye reaches the end the perspective has practically closed together the floor and the roof, and the observer simply looks into a bewildering mass of signs. However, the matter does not interest me. I hear a lot about vistas and general effects, but I do not go to motor shows for these things; I seek them in nature or in a beautiful cathedral. When I go to a motor show, I want to look at the cars one by one, and not to rhapsodise over a vista composed of multitudinous name signs, car tops, and a glass roof.



A 50 H.P. NAPIER 1901 RACER. The above illustration shows one of the 1901 Napier racers which at that time was quite up-to-date. Comparison with the 1904 G.B. racers show the alterations which have been made, particularly as to the front part of the machines.

CONFERENCE OF AUTOMOBILE CLUBS.

The much anticipated and much discussed conference of automobile clubs was held in the committee room at the Automobile Club, 119, Piccadilly, on Monday evening last, and was very largely attended. The chair was taken by Mr. Roger Wallace, K.C., the chairman of the A.C.G.B. and I. The clubs represented were: Auto Cycle, Bournemouth and District, Burnley and District, Cheltenham and Gloucestershire, County of Durham, Derby and District, Eastern Counties, Halifax, Hampshire Motor Union, Herefordshire, Hertfordshire, Irish, Isle of Wight Motorists' Association, Kent, Leicestershire, Lincolnshire, Liverpool Motor Cycle, Manchester, Midland, Norfolk Automobile and Launch, North-east Lancashire, Nottingham and District, Oxford and District, Reading, Scottish (Eastern Section), Scottish (Western Section), Sheffield and District, Southern Motor Club, Surrey (East), Surrey (West), Thames Valley Motor Cycling, Wolverhampton and District, Yorkshire, and a number of the members of the A.C.G.B. and I.

Notice of no less than eleven resolutions had been received, and although ten of them were more or less discussed and two amendments moved, the deliberations of the conference resulted in the adoption, with but one dissentient, of three schemes of affiliation given below. The schemes as they stood were strongly supported by Dr. J. Hopkins-Walters, (Reading, the club which was responsible for the federation suggestion). A delegate from Wolverhampton offered some opposition to the ultimate proposals, and in connection with affiliation scheme No. 1 desired representation upon the executive committee of the club, but found no supporters.

(1). AFFILIATION WITH THE A.C.G.B.I. AND MEMBERSHIP OF THE MOTOR UNION AT 10S. 6D. PER HEAD.	(2). AFFILIATION WITH THE A.C.G.B.I. AND MEMBERSHIP OF THE MOTOR UNION AT 5S. PER HEAD.	(3). AFFILIATION WITH THE A.C.G.B.I. AND MEMBERSHIP OF THE MOTOR UNION AT 2S. 6D. PER HEAD.
Representation upon the General Committee of the Motor Union, of which regular monthly meetings will be held at which *inter alia* general questions affecting the rights and privileges of automobilists, including questions of legislation and administration, will be considered.	Representation upon the General Committee of the Motor Union, of which regular monthly meetings will be held at which *inter alia* general questions affecting the rights and privileges of automobilists, including questions of legislation and administration, will be considered.	Representation upon the General Committee of the Motor Union, of which regular monthly meetings will be held at which *inter alia* general questions affecting the rights and privileges of automobilists, including questions of legislation and administration, will be considered.
Representation upon the General Council of the club, which is the final court of appeal for the affiliated clubs and the Motor Union.		
The consideration of any claim for financial and legal assistance in respect of actions at law, either civil or criminal, in connection with the use of motor vehicles.	The consideration of any claim for financial and legal assistance in respect of actions at law, either civil or criminal, in connection with the use of motor vehicles.	The consideration of any claim for financial and legal assistance in respect of actions at law, either civil or criminal, in connection with the use of motor vehicles.
Free copy of *Automobile Club Journal* weekly to each member.	Secretary to receive copy of the *Automobile Club Journal* post free; members to have right to purchase at reduced subscription of 7s. 6d. per annum.	Right of members to purchase *Automobile Club Journal* at the reduced subscription of 7s. 6d. per annum.
Free copy of Club and Motor Union Handbook to each member.	Free copy of Club and Motor Union Handbook to each member.	Right to purchase Club and Motor Union Handbook at 3s. per copy.
Members, if elected, can join A.C.G.B.I. at a reduction of one guinea from usual subscription.		
Information with regard to the best routes from place to place at home or abroad, and assistance in planning tours.	Information with regard to the best routes from place to place at home or abroad, and assistance in planning tours.	
Information as to customs formalities and duties.	Information as to customs formalities and duties.	
The benefit of a system now being organised to inform automobilists where they can secure, when on tour, good hotel and garage accommodation, adequate supplies of petroleum spirit, and the services of competent repairers.	The benefit of a system now being organised to inform automobilists where they can secure, when on tour, good hotel and garage accommodation, adequate supplies of petroleum spirit, and the services of competent repairers.	
The right of entering vehicles and taking part in any trials or sporting events organised by the Automobile Club of Great Britain and Ireland.	The right of entering vehicles and taking part in any trials or sporting events organised by the Automobile Club of Great Britain and Ireland.	

Individual automobilists may join the Union and receive the same benefits as in Column 1 on payment of an annual subscription of one guinea.

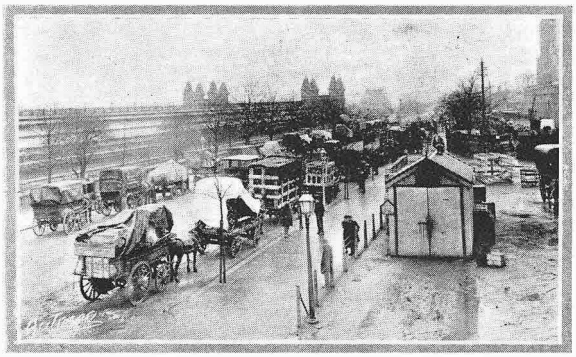
Local Centres.—In districts in which no affiliated or associated clubs exist the present scheme of appointing a local correspondent and forming a local committee of members of the Motor Union to be developed.

In subsequent discussion, Dr. J. Hopkins-Walters stated that the suggestion that members of clubs affiliated to the Motor Union be admitted as visitors to the clubhouses of other affiliated clubs did not apply to London. The proposition of Mr. Whittal (Hertfordshire), that members of affiliated clubs should be allowed the use and privileges of membership of the A.C.G.B. and I. for a limited number of days during the year, was not advanced, while Mr. C. J. Allin's (Derby) proposal as to the enlistment of the services of the A.C.'s engineer on the same terms as members of the A.C.G.B. and I., and Mr. J. R. Nisbet's (Scottish, Western Section) request for an explanation of the club's attitude with regard to exhibition patronage, were taken as a recommendation and a request to the club committee.

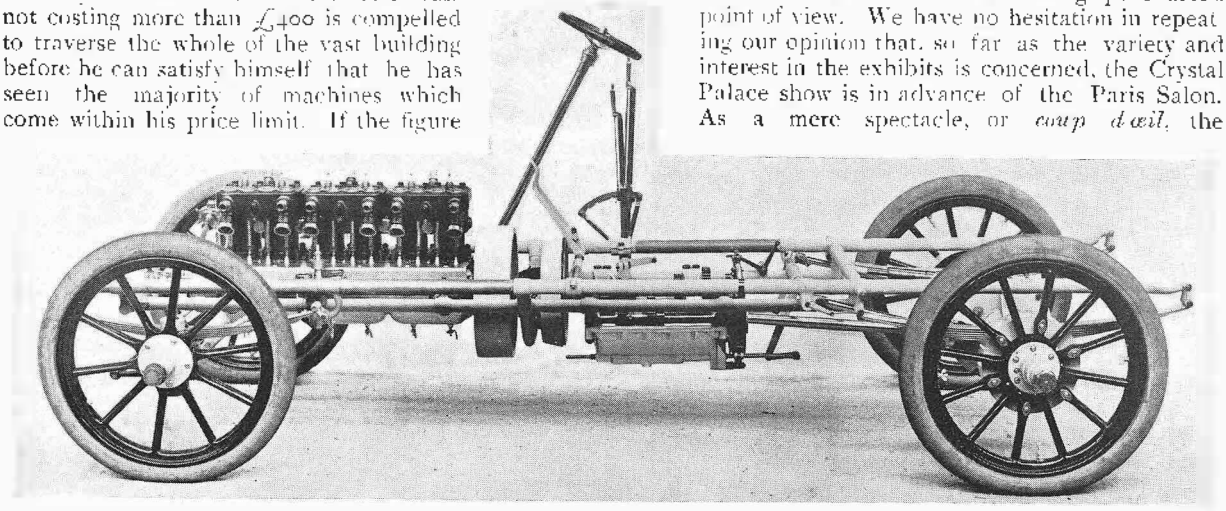
THE CRYSTAL PALACE SHOW.

ON FEBRUARY 6TH WE PUBLISHED A TABLE WHICH GAVE THE MAIN PARTICULARS AND PRICES OF PRACTICALLY EVERY CAR EXHIBITED IN THE SHOW. LAST WEEK THIS WAS SUPPLEMENTED BY AN OUTLINE OF THE MAIN FEATURES AND NOVELTIES OF THE EXHIBITION. TO-DAY WE GIVE A REPORT OF OUR INSPECTION OF THE SHOW.

LAST week we dealt at some length with the main features of the show as a whole, and also upon the tendencies of motor car construction as exemplified by the machines to be exhibited. There is, therefore, little that need be added to-day. It will suffice to say now that the Crystal Palace is as full of motor cars and requisites used by their owners as it can well be. There is a sort of overflow exhibition in the corridor which connects the Crystal Palace with the Low Level Station, while the lower hall on the terrace—which is used as a refreshment buffet on Bank Holidays or special occasions, and was employed as the garage for the cars running in the trials of 1902—is devoted to vehicles for transport and heavy traffic and to marine motors and launches. The exhibition is in every sense a fine one. It does the utmost possible credit to the British industry, which has unquestionably made a great advance since last year. It is equally creditable to the Society of Motor Manufacturers and Traders and the show secretary (Mr. Baily) and his assistants, for not only are the British makers represented to a man, but we find also the best brands of French, German, Belgian, and Italian cars exhibited through the British agents for these vehicles. From the visitor's point of view, the only serious fault which can be found with the show is lack of classification. That is to say, the man who is interested in cars not costing more than £400 is compelled to traverse the whole of the vast building before he can satisfy himself that he has seen the majority of machines which come within his price limit. If the figure we have mentioned happens to be beyond his means, and somewhere about half of it is the limit, it will be often very difficult for him to find the cars he wants. The ideal, of course, is that the show itself should be classified somewhat similarly to our list published a fortnight since, in which we grouped all the £200 cars together, and those between £200 and £350, and so on. This, however, is not practical from the exhibitors' point of view, as it would necessitate some exhibitors running four or more separate stands in the different price divisions. We think, too, that when a show develops to the vast size of the present exhibition, large plans of the building and the disposition of the stands, with the numbers and names thereon, should be posted in various parts of the exhibition, because the show plan in the catalogues, while a most excellent thing in its way, is certainly not particularly convenient for the visitor, who, cumbered with an umbrella and a few catalogues, does not find it very easy to open out a map some two feet wide. However, this matter is scarcely a vital one, though anything which adds to the convenience of the visitor is of great benefit to the exhibitors as a whole. The trials in the grounds and on the roads outside the Palace have again been taken advantage of by a large number of visitors on every occasion when the weather has permitted it, and they add greatly to the value of the exhibition from the intending purchaser's point of view. We have no hesitation in repeating our opinion that, so far as the variety and interest in the exhibits is concerned, the Crystal Palace show is in advance of the Paris Salon. As a mere spectacle, or *coup d'œil*, the



THE CRYSTAL PALACE PARADE. Early on the opening day. Exhibits still arriving in a shower of rain.



THE SIX-CYLINDER ARIEL CHASSIS. One of the most strikingly finished exhibits in the show.

Paris Salon is far ahead of the Crystal Palace show. This is not by any means on account of any inferiority in the character of the exhibits themselves, but solely by reason of the different manner in which they are housed. At the Paris Salon the graceful outlines of the lofty interior are not merely visible, but picked out and made the most of, while at the Crystal Palace, whatever of grace or beauty the interior of the building possesses is hidden by intervening canopies.

On this and the following pages we give a brief descriptive account of the main features of the show as we pass from stand to stand, but for the convenience of the reader we have classified the matter under various headings, with the names of the exhibitors in alphabetical order.

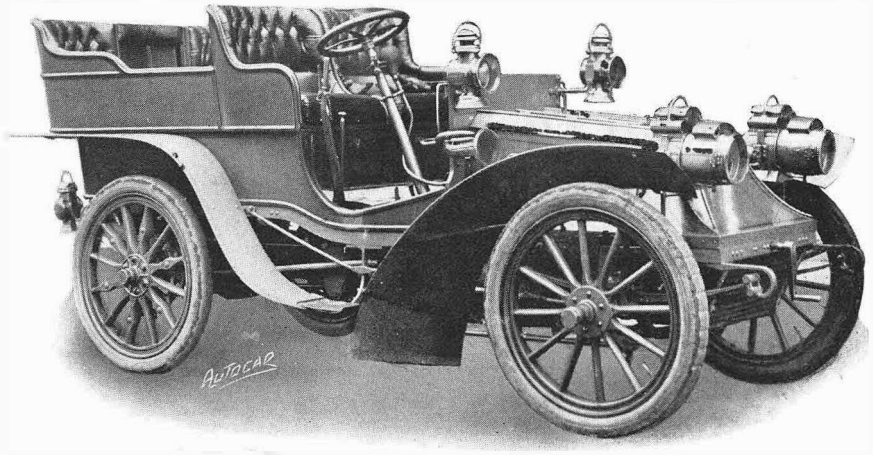
PETROL CARS.

THE ALBANY MFG. CO., LTD., Cumberland Park, W. (152).—The 10 h.p. Albany car is quite a surprise when the bonnet is opened. The length of the bonnet appears rather remarkable when one is told that it covers a single-cylinder motor, but a peep inside reveals the fact that it covers practically everything else as well. The cylinder is placed horizontally with the breach forward. The gear box is on the left-hand side of the car, and the internal clutch is situated between this and the engine. The clutchshaft is fitted with a worm engaging with a worm wheel on the gearshaft. On the top speed the drive is direct through a universally-jointed shaft driving a live axle, much in the ordinary manner. The two lower speeds and a reverse are provided by engaging gears of the Crypto type. The clutch is thrown in and out by an arm rotating on a coarse pitch multi-threaded screw. The pressure of the cooling water is employed to force the lubricant to the working parts, the lubricator being fitted with a sight-feed device. The 16 h.p. motor is fitted with an Aster engine and chain driving. This is furnished with a comfortable body of the tonneau type. The Albany radiators are, of course, used exclusively on these cars. They have a very neat appearance, and are largely used.

THE ALBION MOTOR CAR CO., LTD., Glasgow (134).—The latest constructional features of the Albion cars have been dealt with so fully and so recently in our columns that we could not add to our readers' information in the brief space at our disposal. Among these features are the magneto ignition and the Murray governor. The Mayfair car has an ingeniously constructed top, consisting of a canopy, and for the rear part of the car encircling glass screens. These may be detached if desired, and the canopy used alone, or the canopy also may be removed so that the vehicle may be used partially or wholly closed or entirely open as may be desired. It will be remembered that a 12 h.p. two-cylinder engine is used, and that an Albion did exceedingly well in the 1,000 miles trials.

ALLDAYS AND ONIONS PNEUMATIC ENGINEERING CO., LTD., Birmingham (107).—Commencing with the Traveller voiturette (one of the earliest of its type), we notice that the horse-power has been increased from 4½ to 5, and that the width has been somewhat expanded, so that the machine is still safe at the increased speed at which it is capable of running. The principal interest, however, will be centred in the new 6½ h.p. motors. These have been very well thought out, and look very businesslike little vehicles. The frames are of channel steel, and the motors are fitted with mechanically-operated valves. The throttle is depended upon for governing, and the cooling has had special attention. The radiating pipes are fitted in front between the top and bottom water tanks, no other tank being necessary. Pump circulation is employed, and the water-jacket is of ample dimensions. The gear provides for two speeds forward and one reverse, the top drive being direct, the countershaft thus standing idle in ordinary running. Artillery wheels are fitted, and the steering centres are pitched to cut the points of contact with the ground. The throttle and spark are controlled from small levers under the steering wheel, and the clutch and brake pedals are fitted, besides a side hand brake. One model has a two-seated body, and the other three-seated. In the latter a single bucket seat is provided for the driver, and a roomy back seat holds the two passengers, and a fourth seat can be provided by the side of the driver, but this is either folded or dispensed with altogether to give access to the back seats. Altogether this new vehicle will create a favourable impression.

THE ANGLIAN MOTOR CO., LTD., Beccles (207-208).—A 20 h.p. Aries chassis (four-cylinder), a 12 h.p. Aries landaulette, and a 6 h.p. Anglian light car. The 20 h.p. Aries chassis is certain to attract attention, if only for the reason that this is the first time that this well-known French car has found a place in an English exhibition. The frame is of the stamped cambered steel variety, and it looks all over thoroughly sound and efficient. The engine, which is carried upon a channelled underframe very slightly below the level of the main frame, is a four-cylinder Aster, with mechanically actuated valves of the usual type. The drive passes through a well designed aluminium internal clutch, with clutch spring enclosed and protected from dirt and dust by a gunmetal case. The gear box, which includes a gear affording four speeds forward and reverse, with direct drive on the top speed, is interesting from the form of the gear change, which consists of a rotating and a rotated sector, the latter carrying beneath it a horizontal cam, the form of which controls the movement of the gear striking forks. On the fore end of the primary gearshaft is set an internal expanding brake enclosed in a neat aluminium case. Between the end of the gearshaft and the spindle and the driving bevel pinion, a well designed universal joint is introduced. The drive from the road wheels to the countershaft is by chains in the usual way. The ball thrust bearing is placed in the forward bearing of the primary gear in the gear box, and another in the differential gear box to take the thrust of the bevel gear drive. The chassis throughout is well designed, proportioned, and finished. The landaulette body set upon the 12 h.p. Aries chassis is a very striking carriage, made with ample interior space, and finished very smartly in dark blue and red. The 6 h.p. Anglian light car is a neat and well-finished vehicle of its type, with De Dion engine, and change speed gear giving



The six-cylindered 18-24 h.p. Wilson & Pilcher car, which is now being manufactured by the well known engineering firm of Sir W. G. Armstrong, Whitworth, and Co.

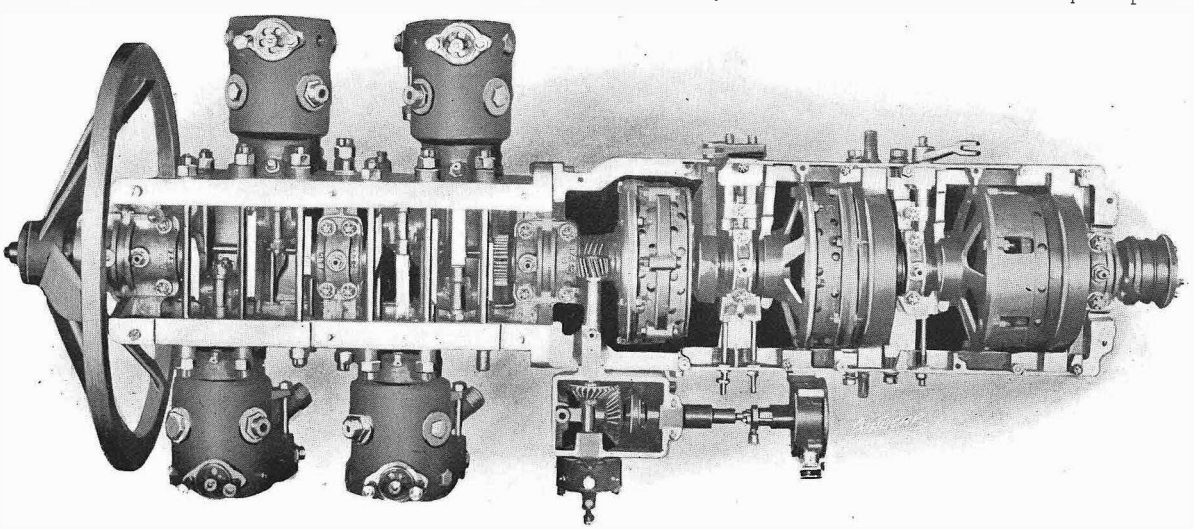
Show Report—Petrol Cars.

three speeds forward and reverse. It has wheel steering, sliding gear, and brake levers, with petrol tank set upon dashboard, neat nested flange radiator fitting the forward panel of the bonnet, and body finished in cream and black, picked out red, making altogether a very smart appearance. The body is formed into a deep box behind the back seat, from which turns up a comfortable rear seat when required.

THE ANGLO-AMERICAN MOTOR CAR CO., LTD., Heddon Street, W. (223).—The chief feature of this well arranged stand is undoubtedly the 6½ h.p. Cadillac at 175 guineas with two-seated body, and at enhanced prices with bodies giving greater accommodation. The simple but complete form of driving mechanism by which this car is propelled can be clearly grasped from examination of the chassis shown upon the centre of the stand, as well as by inspection of the parts of the engine and gear which are set out upon an adjoining table. The design and construction of this smart little vehicle are so well known, and have been so lately described in our columns, that we do not propose to enter upon a detailed description in this report, but we would draw attention to the many uses to which this car can be converted by instancing the smart van body which is set upon one of the chassis, the tonneau body close by, and the standard runabout body. It should be noted that these bodies are practically interchangeable, so that the owner of a chassis can run it as one or other of the three above mentioned types. Two smart Baker electric cars are shown. The runabout is a light and attractive looking vehicle, which is priced at the low figure of 195 guineas. It is run on twelve cells (twenty-four volts), and can be charged to run a total distance of forty miles with an amperage drop of nineteen. The Baker Stanhope is a large edition of the runabout car, with a handsome leather hood. This vehicle is particularly adapted for park use. Last, but not least, we come to an exceptionally good looking electric car by the Vehicle Equipment Co., which is described as a rear-driven Victoria from the fact that the driver does actually sit in a high dickey, from which he can see over the heads of his passengers and over the handsome hood when it is raised. It is not too great an assertion to say that there is no smarter electric car to be seen in the show. Before leaving this stand we should like to draw the attention of our readers to the enterprise shown by the exhibitors in installing a phonograph with fifteen receivers, from which may be heard a most interesting and clearly delivered lecture on the construction and characteristics of the Cadillac car. The chassis of the 6½ h.p. Cadillac, which did so well in the reliability trials, is being run in the grounds for demonstration of the car in actual working.

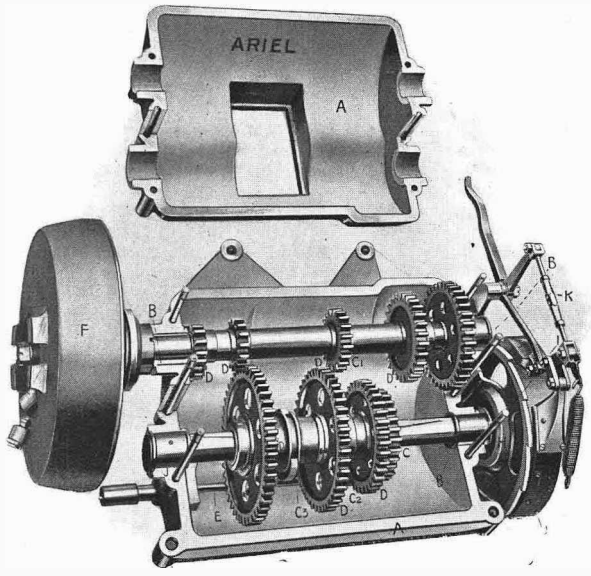
SIR W. G. ARMSTRONG, WHITWORTH, AND CO., LTD., Great Peter Street, S.W. (188-189).—This important north country firm have taken up the manufacture of the Wilson-Pilcher car, and are showing an 18-24 h.p. six-cylinder balanced silent car. The engine is arranged in the front of the vehicle in a horizontal position, with the cylinders in pairs with opposed pistons, the drivingshaft being longitudinal right through to the rear shaft, passing through the firm's patent reduction gear. This is worked by friction clutches of the direct acting cone type, no toggles being employed. The drive on the back axle is through the firm's own helical gearing, the reverse being operated by sliding either the right or the left helically cut bevel into gear with the helically cut bevel on the propeller-shaft end. A speciality is made of the firm's patent wipe commutator. These are made to suit engines with from one to six cylinders, and will be made shortly for eight-cylinder engines. The commutator itself is fastened to a sleeve running loose on the half-speed shaft, and one of the special points in connection with it is that the rubbing contact cannot possibly become detached from the carrier as long as the outer ring is in place. It can, however, be immediately removed by drawing off the outer ring from the two bolts, without the necessity of disconnecting the wires from the contact pieces—a great advantage when cleaning and adjustment become necessary.

THE ARIEL MOTOR CO., LTD., Long Acre, W.C. (118 to 120).—This exhibit would be hard to beat in any show, either British or continental. A year ago our French friends gave us something of a lead in the way of sectioned chassis, which enabled the public to obtain an inside knowledge of the exhibits of a far fuller nature than had previously been possible. The occupants of this stand are certainly no whit behind their foreign competitors in this respect at any rate, some of the bodyless specimens on this stand giving as complete an insight as one could possibly wish. The cars themselves, which range from 15 h.p. to 30 h.p., show the greatest attention to detail and great skill in designing throughout. The motors have four or six cylinders, as the case may be, and these are provided with mechanically-operated inlet valves, ample water-jackets, and other desirable and modern improvements. A very sensitive form of control is provided by the variable lifting of the inlet valve. The manufacturers' close connection with the cycle trade has borne good fruit, in the way, for example, of bringing the rim of the flywheel well over the shaft bearing. A fork connection transmits the motion from the motor to the clutchshaft. The rear wheel axle is enclosed in a tubular axle which carries the road wheels, the end coupling serving to transmit the drive to the wheels, while giving the latter a very steady support. The balance gear is capable of very fine adjustment and firm locking for setting the inter-gearing of the bevel wheel and pinion, the latter being supported on bearings fore and aft. The twist of the gear is resisted not only by the main springs, but also by a spring plunger device with a limited action. While much thought has been expended on the mechanism, proper attention is also given to the body work, upon which the comfort of the owner so much depends. In one of the larger vehicles the difficulty of giving access to the back seat has been neatly solved by a sliding door. On this car a series of steps is provided.



Plan view of the mechanism of a four-cylinder Wilson & Pilcher car.

on the coil case, by which any one of the cylinders can be cut out at will, the voltage ascertained, or the current switched off. The same vehicle has a curved glass screen behind the front seats, but this is so arranged that it can be easily raised and put out of the way immediately below the roof. In conclusion, we may refer to the mountain-climbing car, whose trip up Snowdon we recently described in some detail. It looks equal to doing that task and more any time it is given at all a fair



The Ariel change speed gear, clutch (male portion), and band brake.

chance. Before closing we must refer to the control from the steering wheel. This has been carried to a high state of perfection. The throttle and ignition levers are mounted on a transverse bar on the steering wheel, and, being in the form of levers, enable the driver to observe the positions of the parts in a way which is not possible with rotatable finger wheel. One can have no fear for the national supremacy in motor car construction after studying such a stand as this.

MONTAGUE ATKINSON, Wardour Street, W., shows two 24 h.p. Spyker cars—one with handsome Roi des Belges body.

AUTOMOBILES-CLEMENT, Leicester Street, W.C. (206).—In addition to the elegantly-finished 12-16 h.p. Clément chassis, which, we believe, is identical with the one we described fully in our report of the Paris Show, there is a beautifully-finished 12-16 h.p. Clément tonneau, and a 10 h.p. Clément landaulette, with a 15 h.p. Panhard to make up the quartette. The 12-16 h.p. Clément was so fully and so lately described in our Paris report that there is no occasion to traverse the entire detail here, but we would remind visitors to this show that the engine is fitted with an ingenious, simple, and well made form of automatic carburetter, which is well worthy of inspection. Further, the engine is protected from mud and dust by an under plate, and the universal joints on the propeller-shaft are also amply covered by ribbed leather protectors. The copper petrol tank fitted to this car is of very large dimensions, a feature which will recommend it to many intending purchasers. The water tank, which is carried beneath the floor at the rear part of the car, is most conveniently filled from a pipe running clear of the frame at the back. We could almost regret that a similarly easy method of replenishing the petrol tank is not fitted to this well considered chassis. Fitted bodies of the standard cars are, in future, to be finished similarly to those shown upon this stand, thus at the price demanded for these vehicles purchasers will have no ground for complaint.

AUTOCARS AND ACCESSORIES, LTD., West Norwood (153).—This firm succeeds Messrs. Wellers, Ltd., and we are very glad to note that that promising concern is not to become extinct. A very interesting gear is shown on the stand, and also as fitted to a Daimler car, on which it has

been tested over many hundreds of miles without any apparent wear. The principle of the gear, roughly, is this—that two pairs of gears are generally in mesh at a time, and the drive is taken through the pair giving the higher gear. As the speed is changed down, the motion is taken by the next lower gear, hence there is seldom any difficulty in changing from one speed to another, and it is not necessary to declutch either in changing up or changing down. The gear wheels are fitted on free-wheel clutches, so that when one is driving the other is overrunning, but ready to take duty when called upon. Another device attributable to the same inventor, Mr. Hitchon, consists in a detachable seat for a light car. The body behind the main seat is adapted to receive a second seat, and a well is left in the footboard. The additional seat, though rather low, is sufficiently high to allow of the rear passengers seeing over the back of the front seat, by which, of course, they are largely sheltered. A specimen of the new Minerva chassis is exhibited on the same stand. It is on modern lines, with three-point suspension gear, ratchet sprag, internal clutch, and other modern features. Altogether, the stand is a distinctly interesting one.

AUTOMOBILIA, Oxford Street, W. (242).—Automobilia stage a 12 h.p. Darracq beautifully finished in green and black, lined white, a 14 h.p. Renault similarly finished, and a 15 h.p. standard Panhard car with most comfortable Roi des Belges body.

THE AVON MOTOR MFG. CO., Bristol (27, Corridor).—What is probably the cheapest motor vehicle in the show is to be seen here. It is a three-wheeled machine, the framework of which is constructed with tubes on tricycle lines. The engine is placed about midway between the rear driving wheels and the front steering wheel. It is of 4½ h.p., vertically placed, and drives and actuates a sliding change speed gear giving three speeds forward. No reverse is fitted, as the vehicle complete weighs under 4 cwt. Wheel steering is provided, this controlling the front road wheel through rack and pinion gear. The change speed is controlled by a Bowden wire, and the engine control is also effected by a similar means. The price is 80 guineas.

L. R. BAILEY AND LAMBERT, 217, Piccadilly, W. (131).—A 6 h.p. voiturette with De Dion motor is exhibited here. It looks very fair value at the moderate price asked—150 guineas. The body takes the form of two bucket seats, and is constructed by Messrs. Rothschild.

JOSEPH BAKER AND SONS, LTD., Willesden, N.W. (255).—The Baker patent speed-reducing gear, which is shown on a Stevens-Duryea here, is a very interesting arrangement; but it is difficult to give a description without diagrams of a comprehensive nature from verbal description of the gear. In order to attract the visitor's attention to this combination, it is sufficient to suggest that in the three speeds and reverse gear four epicyclic trains of wheels, with corresponding brakes on the internally toothed rings, comprise the main portions of the arrangement. One or other of the rings is thrown into gear by the action of a brake lever set upon the steering standard, the movement of this lever to the respective clutches holding the internally-toothed ring corresponding to the gear required. Some diagrams of the efficiency of this gear were shown us, which indicate that an efficiency of over eighty per cent. has been obtained on test. We hope to illustrate this gear from comprehensive diagrams shortly. A Stevens-Duryea motor car, with buggy body, is also shown upon the stand.

THE BEAUFORT MOTOR CO., 14, Baker Street, W. (100).—The chief feature of this excellently appointed stand is the magnificently finished chassis of the 15-20 h.p. Beaufort Princess. In this car the frame is of stamped cambered steel in conformity with the usual practice, the frame being inswept forward to permit an extra lock on the steering wheels. The engine is carried on an inner frame, which is only an inch or two below the level of the main frame. The cylinders are cast in pairs, and have mechanically-operated valves—induction on the right and exhaust on the left-hand side cylinders. The engine has both magneto and high-tension current ignition, the magneto ignition being supplied by a rotary magneto driving off the right-hand camshaft. The commutator for the high-tension current is carried at the exterior end of the left-hand camshaft. An exhaust jacket carburetter is fitted, which has a circular

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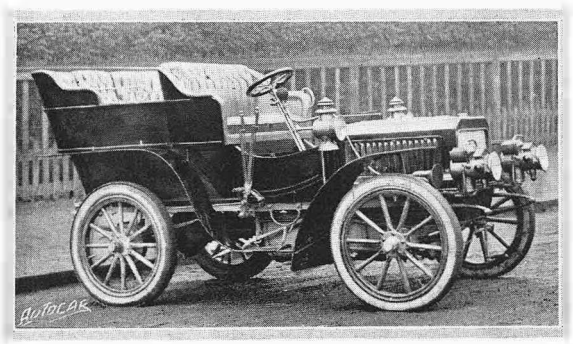
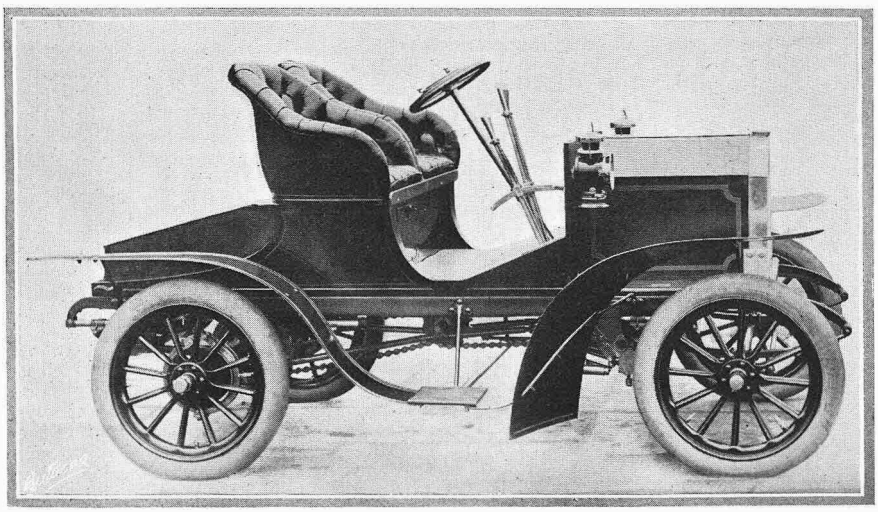
valve set in the induction pipe beyond the mixing chamber. This valve is both governor and hand-controlled from the steering wheel. An extra air inlet for use in exceptionally hot weather is provided with an inlet from the dashboard. The forward end of the bonnet is filled in by an ingeniously designed form of radiator, which consists of flat horizontal tubes, between the interstices of which the air is drawn by a large rotating fan belt-driven off the mainshaft. The water is circulated from this radiator round the water-jackets of the cylinders by means of slow-running rotary pump gear driven off the left-hand camshaft. A large and efficient ball thrust bearing takes the thrust of the clutch spring on the clutchshaft itself. The well-designed change-speed gear gives three speeds forward and reverse, with direct drive on the top speed to the countershaft, from which the drive passes by chains in the usual way. The whole space beneath the frame from the radiator forward to the rear of the countershaft is enclosed with a



A 10 h.p. two-cylinder Beaufort which is to be seen in theshow.

shaped steel apron. An expanding brake is fitted to the countershaft, this being applied by pedal on the dashboard, and powerful brakes of similar construction take effect upon the rear wheels, being applied by side brake lever in the usual way. These rear wheel brakes are ingeniously compensated. With regard to the control, the throttle and governor are both controlled by a rotating lever from the centre of the steering wheel, and the ignition is advanced or retarded by means of a lever set below on the steering wheel standard. The dashboard is encumbered merely with the automatic feed lubricator and force feed lubricator, which serve the pump spindle and the clutch thrust bearing. The radius rods serve not only to take up the slack in the chains, but also for the adjustment of the rear wheel brakes. The steering wheels are pivoted on the steering axle in the centre of the hub, and the steering connecting rod is set out of harm's way behind the steering axle. The steering wheel, road wheels, the camshafts, gearshafts, and countershafts on this car all run on ball bearings. A new type for this company is the 9 h.p. single-cylinder two-seated car, a chassis of which is staged. The whole mechanism is as simple as possible, the drive being through internal clutch variable gear giving three speeds forward and reverse, and propeller-shaft to live axle. The engine is fired by magneto in a manner similar to that already described in connection with the big car, and is further governed on the inlet. The valves are mechanically operated, and the crank chamber (which is carried on an underframe) has an ample-sized inspection plate. The clutchshaft is of extraordinary dimensions, and is fitted with ball thrust bearings. Ball bearings are fitted to steering and road wheels, gearshafts, bevel wheel spindle, and live axle on this car. It should be noted that the gear box, which is cast of aluminium in one piece, has its rear end closed up, a steel plate being bolted thereto; this plate can be detached, and the whole of the gear withdrawn without any trouble. A block brake is fitted to an extension of the gearshaft, and internal expanding brakes are fitted to the road wheels. These are applied in the usual way. The change-speed lever and the advance ignition lever are set upon the steering standard. The seven finished cars, with bodies of various types mounted thereon, are fine examples of design and finish, and we would draw particular attention to the Princess body built for the 15 h.p. chassis, which was described at the outset of this report. The four-cylinder 24 h.p. car shown is an enlargement of the 15 h.p. already described, with the addition of another speed. A refinement in the control of this motor is a lever set upon the steering standard, by which the petrol supply can be cut off without leaving the seat. The 10 h.p. is now fitted with a cellular cooler fan and pump placed above the crank chamber, driven by the motor off the crankshaft. The bonnet of this motor is of very neat design, and the body mounted thereon, finished in natural wood and brown patent leather, is one to which we would particularly draw attention. The double phaeton bucket-seated Princess body, which was shown for the first time at the late National Show, has been still further improved in detail. The wheelbase has been lengthened, and extra space is given for side access to the comfortable seat in the rear.

THE BELSIZE MOTOR CAR AND ENGINEERING CO., LTD., Manchester (137).—Two principal patterns of Belsize car are exhibited here—one of 15 h.p. to 20 h.p., and the other a 7 h.p. Taking the second first, it strikes us at once as being one of the best finished cars of its class we have seen. To begin with, it has a pressed steel frame, which one does not generally find in this type of vehicle. Three forward speeds are given, as well as a reverse. On the top speed the drive is direct, and all wheels are out of mesh. Though the motor has only a single-cylinder, it is governed, and has a mechanically-operated inlet valve. Again, the crankshaft is set crosswise with the vehicle, and at its side is the gear box. Motion is transmitted by one chain to a small countershaft mounted on the radius rods, and thence to the balance-geared back axle. The chains are provided with covers. The timing of the ignition and the throttle valve are controlled by levers mounted on the steering wheel, and the seats, which are of the bucket type, are built of aluminium. We think we have said enough to support our statement that the vehicle is one of the best equipped of its class. Turning now to the higher-powered cars, these have three cylinders with variable lifting valve control. The throttle is permanently regulated by the governor, but its operations can be minimised or increased by a hand control. A single trembler coil is employed with make and break device in the high-tension circuit. The same mechanism allows for the alteration of the timing being adjusted permanently as well as temporarily. In both the cars the two brakes operate upon drums on the road driving wheels. In the latter

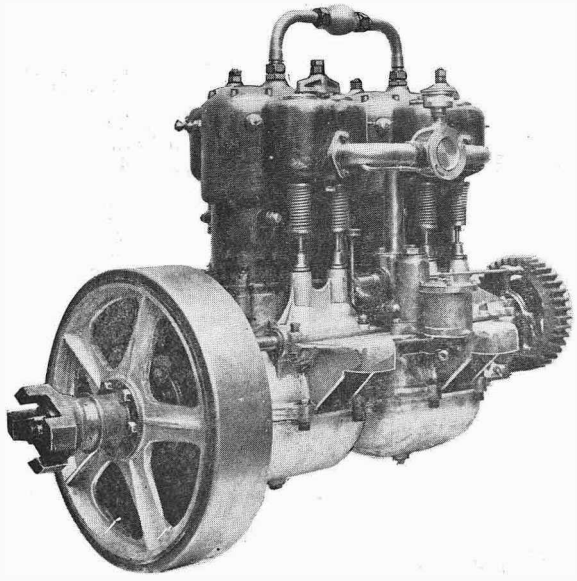


The Belsize voiturette, one of the smartest cars of its class and power to be seen in the show.

vehicle they are both external. In the heavier, one is internal and the other external. Dumb irons have usually a more or less unmechanical appearance, but the extensions of the girder section frame in this machine have evidently been well considered.

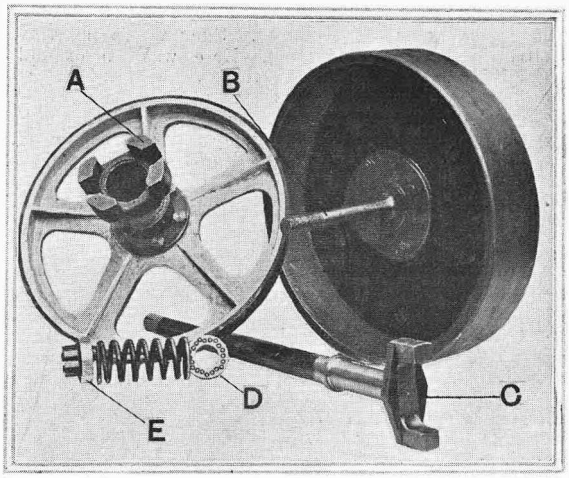
THE BROUHOT MOTOR CO., LTD., Mortimer Street, W. (211).—The 12-14 h.p. Brouhot chassis, fitted with Brouhot special clutch, exhibits several interesting features. The four cylinders are cast in pairs, with all valve chambers on the right-hand side, so that only one camshaft is needed. Perhaps the most interesting detail of the engine is the carburetter, in which an automatic conical air valve is fitted beneath a short air tower, and the attachment of the jet is so designed that it can be withdrawn by merely unscrewing the top of the mixing chamber. This is perhaps the most convenient means of getting at the jet for inspection and cleaning that we have yet seen. The engine is throttle-controlled on the induction pipe by a rotating throttle being set—an automatic air valve which, when the mixture is cut off from the engine, permits the pure air to attain access to the cylinders, and thus avoids the suction of lubricating oil past the piston rings by the vacuum which would otherwise be formed. The crank chamber is entirely divided into two parts, the lubrication being fed thereto by a force-feed lubricator set upon the dashboard. Special forms of ignition plugs are fitted, which are made very large in diameter, and which, it is said, seldom or never give trouble. Without suitable diagrams it is somewhat difficult to describe the particular form of internal expanding clutch which is employed, but it is so designed that the lined ring, which is expanded against the inner driving surface of the flywheel, can be detached from the expanding members of the clutch, and a new ring fitted thereto in a very short time. The gear in the gear box, giving four forward speeds and reverse, has direct drive on the top speed, the secondary shaft with its wheels being stationary when the top speed is in gear. The internally expanding brakes on the back wheels are practically replicas of the clutch mechanism. The completed car is also shown with the tonneau finished in red and upholstered in red leather.

BRUSH ELECTRICAL ENGINEERING CO., LTD., Loughborough (169, 170, 171).—The first vehicle on this stand which catches the eye is a large Brush 'bus built for public service. It has a seating capacity for fifteen inside and fifteen outside, the top seats being of the garden seat pattern. The speeds are three, six, and twelve miles per hour, the vehicle being propelled by a 30 b.h.p. petrol engine. The drive from the engine is taken through the



The 30 h.p. Brush four-cylinder engine

three-speed gear, the gear wheels being always in mesh. The drive from the countershaft, instead of being by chains from each end of the shaft to the road wheels, is by means of a pinion meshing with an internally cut wheel mounted on the inside of the wooden felloe and fastened to it by bolts. We next inspected the 22 b.h.p. chassis. This has a four-cylinder petrol engine with mechanically-operated valves and pressure feed lubrication throughout, the bearings being of white metal. The clutch and the brake



The Brush clutch details.

pedal both operate at will a throttle, so that when either unclutching or braking the engine is prevented from racing. This chassis is fitted with Doyle's automatic carburetter valve. This consists of an additional air orifice governed by a spring, the orifice being adjustable by means of a screw. The valve is moved on a screwed stem and afterwards locked in the required position. When the engine is started this valve is closed entirely, but when the speed of the engine increases it automatically opens in accordance with the speed, introducing an additional supply of fresh air to correct the mixture. When running downhill with the throttle closed cool air can be drawn in at the same orifice, a bye-pass being provided for this purpose owing to the throttle being closed. When the engine is running at the normal speed with the governor in operation, this acts on the inlet pipe and closes the supply of mixture, when the valve again comes into operation, drawing in charges of air which scavenge the cylinders and cool them. There are three other cars fitted with tonneau bodies, one of which has side doors to the tonneau and case covering the small sprocket wheel and that part of the chain which shows beyond the splashguard. One of the Brushmobiles of 6 h.p. is on view; also the 5 h.p. The first named is fitted with reverse, and artillery wheels, while the other has the wire wheels and no reverse. It is shown fitted with a canopy. Altogether a very practical exhibit. The Brush cars are fitted with an excellently designed but simple form of clutch, the construction of which can be easily gathered from the accompanying illustration. The central boss A of cast steel is bushed and made to a sliding fit on the shaft B, the outer end of A being bored sufficiently large to take the coil spring shown for two-thirds of its length. The boss A has lugs and jaws formed upon it to take corresponding lugs and jaws on the forward end of the gearshaft. This junction of parts is made with sufficient play to form a universal joint between gearshaft and clutch sleeve. The shaft B is practically a prolongation of the engineshaft, and its outer end has a thread cut upon it to take the castled nut E for the purpose of adjusting the ball thrust bearing D against the boss A. It will be seen that as the male portion of the clutch is mounted on the shaft B, which is an elongation of the crankshaft, it must always be in exact alignment, and as the compressional pressure of the clutch spring when the clutch is withdrawn is taken by the castled nut E through the spring washer, it is evident that there is no end thrust whatever upon either crank or gearshaft bearings

W. H. M. BURGESS, South Norwood, S.E. (135).—Four Panhard-Levassor cars and a 1903 Talbot are shown on this stand, together with a number of parts and fittings. Two of the Panhards have Roi des Belges bodies, and the

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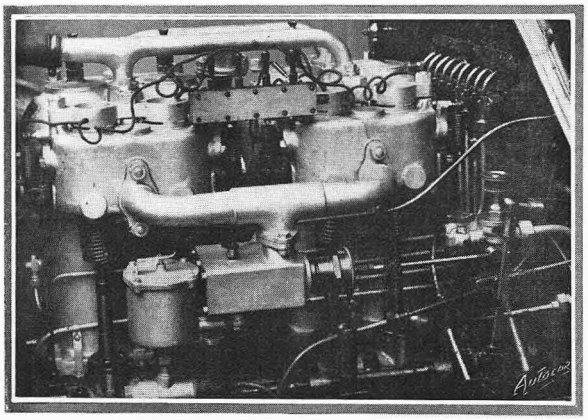
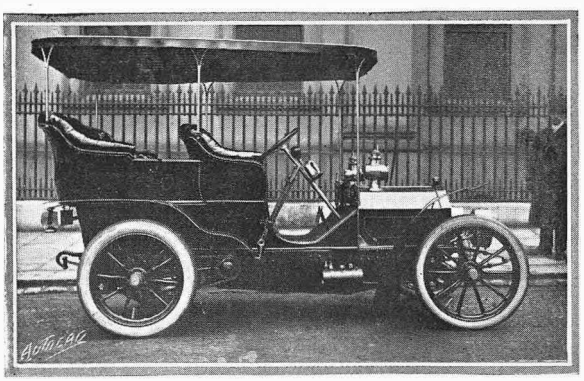
10 h.p. is fitted with the Shrewsbury phaeton body by J. Rothschild and Sons. In this car it will be remembered that in one of the front seats a portion of the side swivels so as to give access to the back seat. This accomplishes its object without necessitating the use of an exceedingly long wheelbase, and with two steps should be a great convenience to lady passengers.

THE CANNSTATT AUTOMOBILE SUPPLY ASSOCIATION, Shaftesbury Avenue, W. (53).—Here was an example of the 1904 Mercedes. In this there are many detail improvements, particularly with regard to the engine. The car in question has an 18-22 h.p. four-cylinder engine, both inlet and exhaust valves being operated mechanically. The exhaust is on the right-hand side of the engine, and the inlet on the left, each being operated from a separate camshaft, thus making a radical departure from last year's practice. The carburetter is the same as in last year's



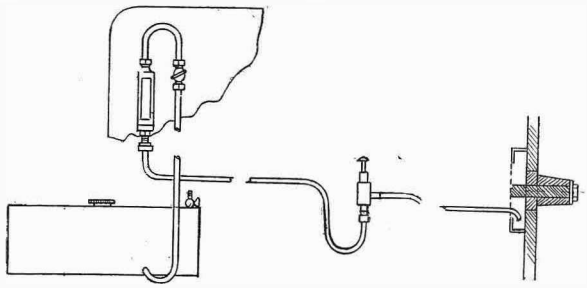
A right-hand side view of the 18-28 h.p. Mercedes engine, showing the plug switch board for disconnecting the firing in any cylinder.

type, though the alteration of the position of the inlet valves has enabled a shorter induction pipe to be used, so that the carburetter is now quite close, comparatively speaking, to the induction valves. The ignition is by magneto, as last year, though a separate fitting in the shape of a plug switch board enables any one of the cylinders to be cut out at will by the simple withdrawal of a plug, thus breaking the circuit to the particular cylinder to be tested. The magneto this year is placed on the right-hand side of the engine, the carburetter being on the left. The magneto tappets, it may be said, are operated from the same camshaft as the inlet valves. The water circulation is ensured by a rotary pump, gear driven from the exhaust valve camshaft. The water is delivered to the top of the cylinders on the exhaust side, so that the cooler water enters around the exhaust water jackets, which are admittedly the hottest parts of the engine. After circulating round the jackets of each cylinder, it proceeds from the top of the cylinders by the inlet valves to the top of the usual type of radiator, though it may be said that a



The Mercedes 18-28 h.p. touring car exhibited on stand 53.

slight alteration has been made in this, as a larger number of smaller tubes are now employed. The gear wheels of both the camshafts are of fibre, with the usual protecting and stiffening plates of brass. The flywheel is this year slightly larger in diameter, and contains within its boss a spring clutch, which we described in *The Autocar*, in connection with the 1903 type Mercedes. Passing from the clutch to the change speed gear box, we find that the gearing has not been altered here. On the countershaft is mounted the usual band brake, with a hollow water drum. By a simple and ingenious arrangement (a sketch of which is given herewith), upon depressing the clutch pedal a small valve is opened, and automatically admits water to the brake drum, so that it may always be kept cool, even when used in the descent of long continued hills. On the dashboard is fitted a small sight-feed apparatus, whereby it may be seen whether the water is passing to the brake drum or not, so that one can always rely upon having the brake in perfect order, provided watch is kept upon the water gauge. When driving through traffic and the clutch pedal is called into frequent use, a tap is provided whereby the water supply can be cut off, so that undue waste of liquid does not follow. The water for cooling purposes is contained in a small tank on the left-hand side of the frame, just beneath the dashboard, and pressure is kept on this from the exhaust, in the same manner as the pressure on the oil reservoir is maintained. Throughout the car, with the exception of the engine bearings, ball bearings are used. Oil is fed to all the bearings of the gearing and the engine by the usual pressure feed arrangement. The frame, which is of pressed steel, tapered and narrowed in front, is this year five inches longer than in the previous year's models, the wheelbase being eight feet. The rear and front axles are of the same section as last year, though they are thicker in the web, particularly towards the steering axles. Having dealt with the mechanism briefly, a few words should be said of the handsome tonneau body, which is fitted to this



The Mercedes water-cooled brake. This sketch shows the water tank, sight feed, water cut-off cock, supply valve, and brake drum.

car. The carriagework is most artistic in its details, beautifully finished in automobile red, with leather upholstery to match, and a light canopy supported on brass pillars. The price of the car is £1,450.

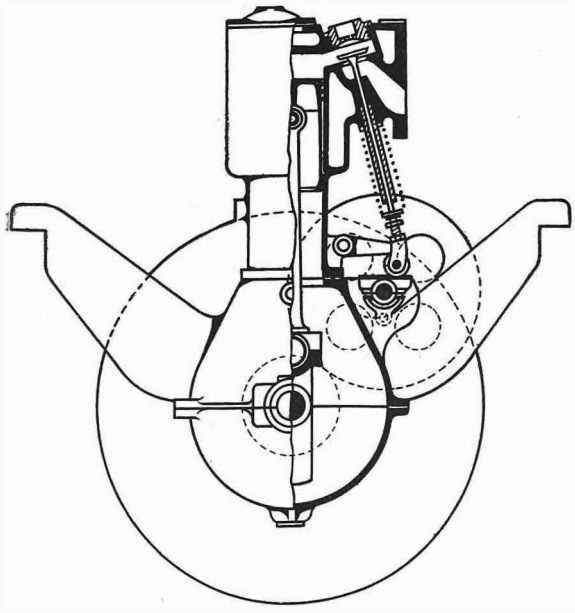
THE CENTURY ENGINEERING CO., Cumberland Park, W. (183-184).—The 22 h.p. four-cylinder Century car with the new Mutel engine is the centre of attraction here. The machine exhibited is splendidly finished, without being highly got up on purpose for the show, and presents a very high-class appearance. The 10 and 12 h.p. Century cars with Aster engines and 10 h.p. Century light delivery van complete the exhibit.

CHARRON, GIRARDOT, ET VOIGT, France (226 and 227).—Two chassis and three finished cars form the exhibit of this well-known French house. At the front end of the stand we find a splendidly finished 25 h.p. chassis, 1904 pattern, the engine having mechanically-operated valves, with layshaft each side of the cylinder, separate cylinder castings, high-tension ignition, and the well-known C.G.V. specialities, the high-tension ignition plugs having swinging connections on the magneto principle. Both the crank chamber and gear box are carried on the main armoured wood frame. The caps of the induction valve boxes are particularly neat in fitting, being secured in position by one nut only, without any cross-piece. Some novelty is shown in the fitting and drive of the force-feed oil and water pump. They are attached to the crank chamber, and driven by a train of gear from the left-hand layshaft.

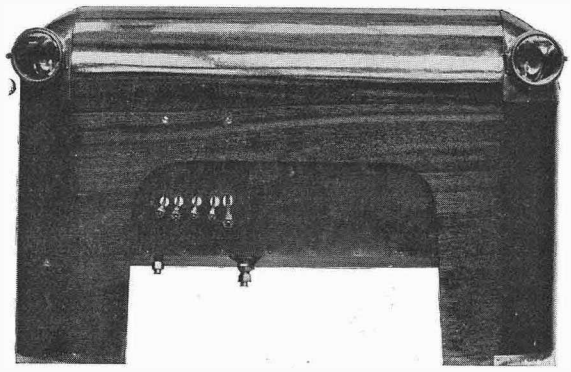
The nest of flanged radiating tubes, which are kept down midway between the frame, have induced draught by means of two fans driven by a friction wheel on an extension of the engineshaft. The gear and gear box are practically the same as in last year's pattern, with the exception that a ball thrust bearing is carried in a division in the gear box immediately behind the driving bevel wheels. The four-cylinder 15 h.p. chassis staged is at once remarkable for the swivelled lamp-bracket, by means of which the rays of the acetylene lamp can be thrown to the right or left at will from the steering wheel. This we remarked upon fully in our report of the late French show. The engine has automatic induction valves, and the oil and water pumps are driven in a manner similar to that described in connection with the 25 h.p. engine, save that they are placed below the underframe, which in this case carries the crank chamber and gear box. The gearshafts in this gear box all run upon ball bearings. The tonneau double phaeton has side entrance, and the landaulette bodies on the finished cars are painted and upholstered in the best style, and are of the very best patterns. This company still retain their special form of bonnet, which accords with the general line of the cars, and in this way we think they are wise, as their vehicles can always be distinguished when running upon the road.

COLES AND WYSS, Great Portland Street, W. (142).—This stand was hardly completely occupied when we called, but one of the new Wyss cars was on view, and illustrates well the principles of the firm's new speciality. On the 8 h.p. car a single-cylinder motor is used with mechanically-operated inlet valves. The lift of the valve can be controlled both by hand and by foot, and it is also coupled up to the main brake; indeed, the application of the brake also serves to declutch the engine, and at the same time to cut down the power. The carburetter is of the automatic air adjustment type, and the gear gives three forward speeds and reverse. The drive is direct on the top speed. The gear is turned out from Krupps, of Essen. The live axle is run on ball bearings, and has a steadying arm set between buffer springs. The Cardan shaft joints are of the block type. This car has coil and accumulator ignition, but the two-cylinder 9-11 h.p. car has magneto ignition. The value given seems excellent.

THE DAIMLER MOTOR CO., LTD., Coventry (160-162).—One expects a good show from the pioneer firm, and is by no means disappointed. The 18 to 22 h.p. may be taken as a standard pattern. This has a frame of wood with steel flitch plates, but the forward portion is entirely of channel steel. The motors are fitted with mechanically-operated valves, and all the valves are inclined so that the ports come close up to the combustion chamber. Plenty of room is left for water circulation, and opportunity is afforded for using parts of ample dimensions

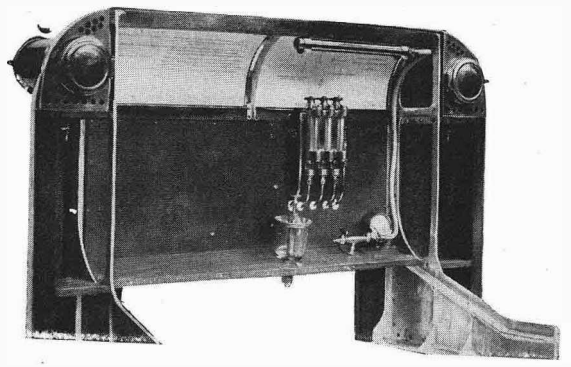


End sectional elevation of the new Daimler engine showing the inclined valves.



Front view of the new Daimler side lights in dash.

for the valve operating gear. The carburetter is connected up to the governor in such a way that the mixture is regulated according to the speed of the engine. The ignition is of the accumulator type, and a single coil is used for all cylinders. Some cars, including that running in the grounds, are fitted with the Georges-Richard high tension magneto ignition. The cooler consists of vertical radiating pipes communicating with water spaces above and below in aluminium chambers with radiating flanges. No separate tank is employed. An inspection lid is fitted to the water jacket on the top of the motor. The pedal

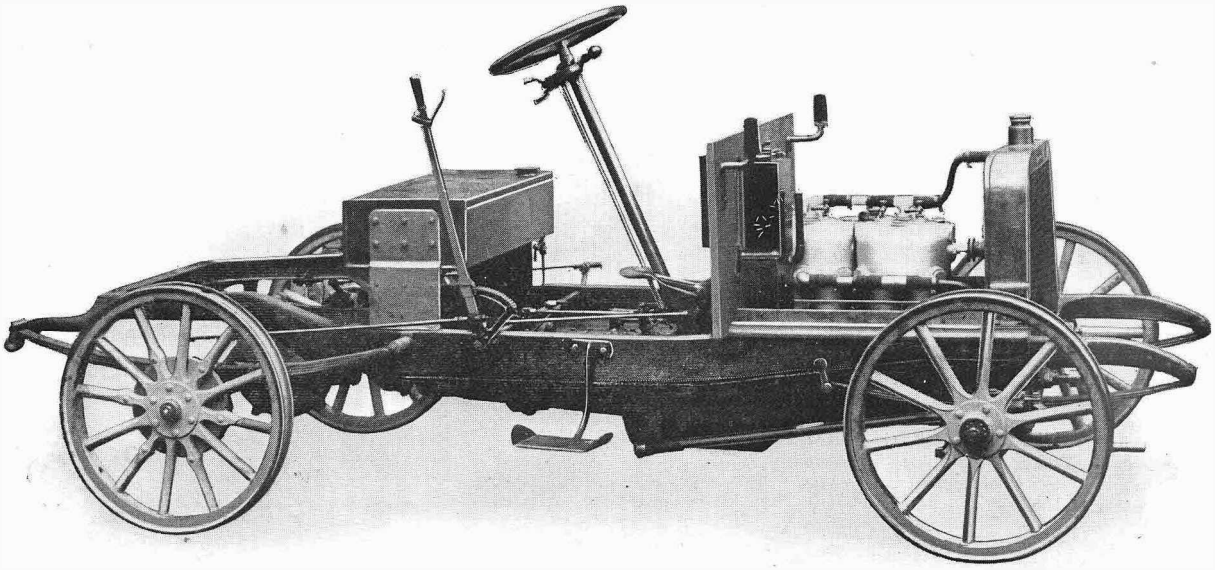


A rear view of the Daimler dash board with side lights.

lever, clutch spring, and other details have been improved, and brakes are now fitted to all four of the chain wheels. The silencer is set close alongside the motor itself, and is very effective. Some of the body work does infinite credit to the firm. Particular notice is drawn to the new saloon body, which is of handsome design; also that of the type of car which is supplied to H.M. the King. The Marlborough side entrance Limousine should also be a favourite. It is a very handsome and finely fitted car at a really moderate price. There is also exhibited a detached dashboard provided with the self-contained side-lights, which we mentioned in a short descriptive article of the 1904 Daimler which appeared in *The Autocar* last week. The two illustrations of these lamps given herewith serve to show the idea admirably. Altogether the Daimler Motor Co.'s exhibit is right in the forefront, as it should be.

A. DARRACQ AND CO., Oxford Street, W. (9, 10, 11, and 12, Roman Court).—A very fine display of twelve of the well-known Darracq cars of various powers, ranging from the 8 h.p. four-seated at £195 to the 28-32 h.p. at £750, are staged in this court. The 8 h.p. single-cylinder car is so well known among users of light cars that this stand is certain to attract a considerable amount of notice from visitors. A chassis of the twin-cylinder car with the Darracq patent pressed steel frame, which has been so frequently described and commented upon, is also staged.

Show Report—Petrol Cars.

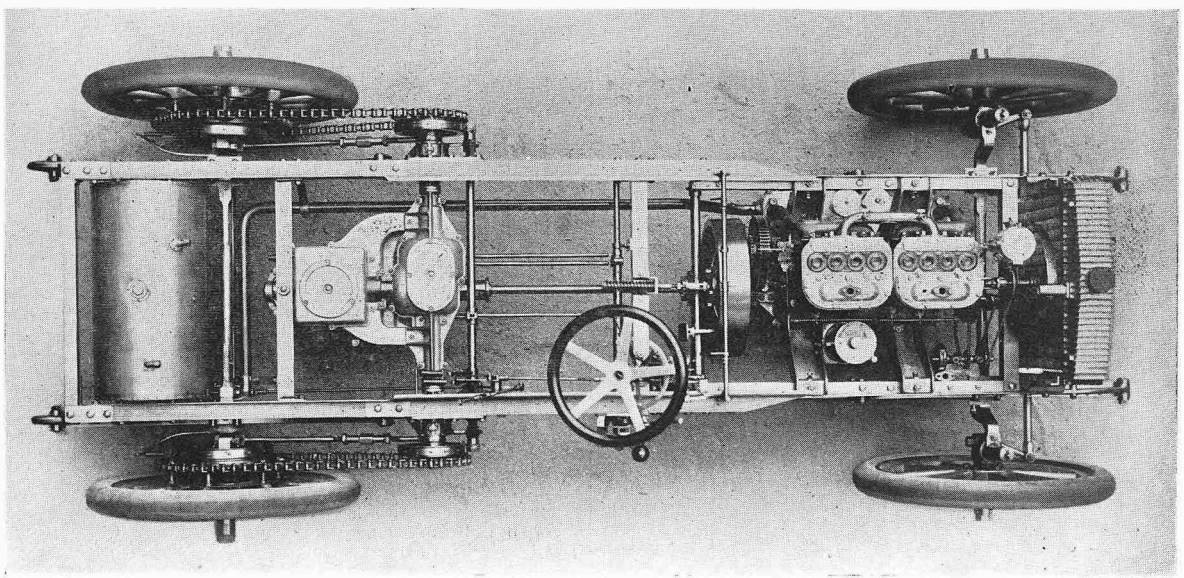


The Darracq chassis, with four-cylinder engine. The frame and underplate are stamped from a single steel plate.

The bodies, which are both by French and English body builders, deserve particular attention. One by Messrs. Holland and Holland, a deep-barrelled phaeton with side entrance, is particularly good. Two of the cars are fitted with brougham bodies and forward canopies. Altogether the exhibit is a very interesting one.

DEASY AND CO., Piccadilly Circus, W. (139).—The Martini cars and their reputation are so well known to our readers that there is no need to enlarge upon the fine exhibit staged. One or two points, however, may be mentioned. The gear now provides direct transmission on the top speed, and a Cardan joint has been introduced between the clutch and the first motionshaft. The clutch spring has been moved from the side to above the shaft. The carburetter is provided with a hot-air jacket, and an additional air valve is controlled from the dashboard. The car on which Capt. Deasy ascended the Rochers de Naye is exhibited, together with a specimen of the track upon which the feat was performed. If the tyres had given out on that journey we could have forgiven them.

DE DION-BOUTON, LTD., Great Marlborough Street, W. (163-165).—Messrs. De Dion make a most tasteful display of their various cars, the bodies of the cars and the decorations of the stand all being in pleasant shades of green. The 6, 8, 10, and 12 h.p. vehicles are all represented, together with a sectional elevation of the motor, and one or two illustrations of the adaptation of the engine to other purposes than car propulsion. The 8 h.p. is fitted with a new form of the firm's gearing. The expanding and contracting clutches are still utilised, but the gear is amplified in a way giving three speeds and a reverse. The teeth are for the most part always in mesh. Separate inlet pipes lead from the carburetters to two inlet valves, which we note are still automatic. Each inlet pipe is fitted with a throttle valve, and these two are coupled together, and are also coupled to a device for raising and lowering the choke tube in the carburetter, according to the speed of the engine. The cooling water, which, of course, is generally hot, is utilised to warm the bottom plate of the carburetter by spraying a jet on to the same. The 6 h.p. remains much as before, and it is still one of the leading cars in its class. This it well deserves to be, as we suppose no modern voiturette has had so thorough a testing in the hands of hundreds of amateur users as the 6 h.p. De Dion. One of these cars fitted up for doctor's use should



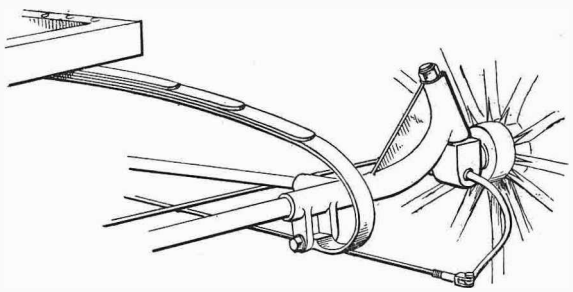
The chassis of the 18-28 h.p four-cylinder Daimler

be seen. It has solid tyres, hood, and detachable screen in front, and a very smart looking third seat at the back in the form of a bucket-dickey. It is just the thing to meet a medical man's requirements. Another striking car among the larger vehicles is a coupé specially built for ladies' use. This is not only glazed in front and doors, as usual, but at the sides of the seat, so that the occupants can see all round them—and be seen.

DENNIS BROS., LTD., Guildford (121, 122, and 123).—The Dennis cars are well exhibited both as complete vehicles and also as chassis. These bear evidence that the cars are well up to the times, and, moreover, contain some special features on their own account. The chassis exhibited at the time of our visit was constructed with pressed steel frame, four-cylinder Simms motor, and low-tension ignition. The valves are mechanically-operated, and the gas produced in the carburetter is led through a pipe from the right to the left side of the engine. Another pattern to arrive shortly has an Aster motor and a high-tension magneto ignition. Visitors should look out for this car, as it should be, if anything, more interesting than the one we were able to inspect. The power is transmitted through spur gearing, giving direct drive on the top gear without rotating the countershaft, and is transmitted to the balance gear through a worm and worm gear wheel. The road wheels are mounted on the ends of the stationary tubular axle, and receive their motion through stars fixed to the ends of the solid axle, engaging with the hubs of the wheel. A powerful grip brake is fitted to the gear, and expanding brakes to the road wheels. The dashboards are curved downwards at the top to protect the coil case, lubricators, etc. The pump is driven by the same train of gears as the magneto, but a slipping device is introduced, so that when the water pressure exceeds a certain amount the pump shall not be forced against it too strongly. The road wheels on several of the cars demand attention. They are of the artillery type, but instead of the spokes being arranged in one plane they are taken alternately to either end of the box, and so greatly increase the strength of the wheel laterally. The body work of the cars presents a considerable variety of design, and shows that no detail escapes the attention of the designer.

DOUGLAS COX, West Norwood, S.E. (13, Corridor).—One of the new three-cylinder Cottereaus, which was first seen in the Paris Exhibition, is shown here. The valves are mechanically-operated by separate layshafts, one on each side of the engine. The lift of the induction valves can be varied from the steering wheel by a lever, which, through the intervention of rack and pinion and screw, elevates or depresses the risers beneath the valve stems. The drive is direct on the top speed, three speeds and reverse being provided. The gear runs entirely on ball bearings. It is a very simple design, and we hope to describe it very shortly in greater detail. Among its smaller points may be mentioned a sliding bolt, which enables one to disconnect the brake and the clutch pedal, so that one can optionally use the clutch and brake simultaneously or independently.

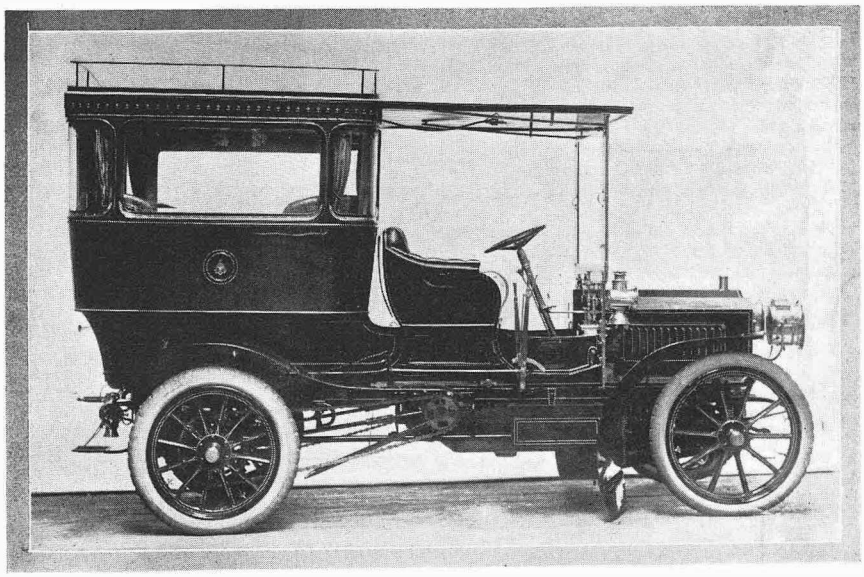
THE DURYEA CO., Coventry (190-191).—Willans and Robinson, of Rugby, have undertaken the manufacture of the Duryea engines and principal machine parts. Needless to say, the work is up to this firm's usual high standard. The principal detail improvements for this year shown on the chassis in the centre of the stand are interchangeable valves and seats, both mechanically operated, automatically governed carburetter and throttle, giving a perfect mixture at all speeds, and preventing racing. The ignition is now high tension, using ordinary sparking plugs, and is known as the Duryea-Dawson system. The induction coil is separately carried in the forepart of the car, as it was feared that the insulation of the secondary winding might be affected by the heat from the engine if placed too close. On the end of the armature-shaft is an enclosed governor, which, as the engine speed increases, flies out and operates the advance ignition. This is so arranged that the timing of the ignition is always automatically in accord with the speed. There are now triple brakes, metal to metal, round the gear and differential box. A new pattern of exhaust silencer is fitted,



The Duryea front axle, showing the inclination of the steering socket with its supporting web, also the attachment of the front springs.

which is claimed to be absolutely silent. A feature of the four-seated double phaeton body is the turnover front seat. By releasing one catch in the well on the tonneau the whole of the front is turned over on to the dash, exposing the mechanism. An important alteration in the engine is the water-cooling. In place of the old system the whole of the piston stroke is now water jacketed. The jacket, although on the average only ¼in. broad at the principal points, holds no less than two gallons, which shows that every part of the heated surface is covered by water where it is possible to do so. The valves, instead of being fitted in a pocket at the side, are now carried on the top, with outside conical springs in both patterns. On the stand are arranged six large blue prints of the different types of bodies that can be fitted to the Duryea chassis. The pattern which lends itself more particularly to this chassis is the brougham. It has been pointed out to us that in most other cars the engine transmission has to go right through to the rear, and the true brougham body cannot be brought down as low as is possible with this design.

MORGAN DONNE, St. John's Square, E.C. (2, Egyptian Court).—A 24 h.p. Rochet-Schneider chassis in ammunition grey alone occupies this stand, affording, however, means of careful examination; it is of very excellent



The 24 h.p. Napier Pulman car carrying six passengers (see page 240).

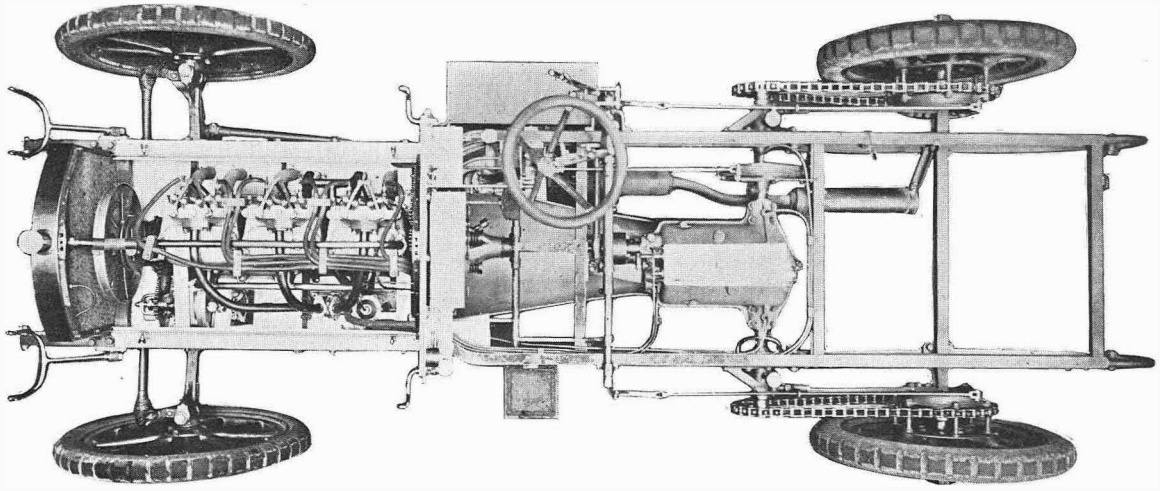
Show Report—Petrol Cars.

design and fine mechanical finish, for which this well-known car is renowned. We did not note any addition to the detail of the engine over and above those noted in previous descriptions of this car, but upon the chassis shown at the Palace we find a new form of carburetter made with a hot water jacket and piston throttle valve controllable by governor or hand from the steering wheel. The ignition and air admission to the carburetter are controllable by long levers moving on a section set upon the dashboard. The clutch and clutchshaft are detachable by withdrawing one central pin from the universal joint immediately in front of the gear box. This can be done without interference with any other member. The change-speed gear is as before, with direct drive to the countershaft on top speed, and thence by chain wheels and chain to the road wheels. The frame is, of course, of pressed steel with suitable stiffening members. A silencer of unusual dimensions is carried longitudinally beneath the left hand member. A suitably shaped aluminium screen protects the engine flywheel, universal joint, etc., from mud and dust. Four powerful brakes are fitted, two on the countershaft being set on each side of the gear box, and two on the chain drums of the road wheel in the usual way. An extra pedal is set on the pedal spindle for actuation of the second brake on the countershaft. The bearings of the gear box are lubricated by a force-feed lubricator from the dashboard. An ordinary Dubrulle lubricator serves the engine bearings. The front of the bonnet is filled in with cellular radiator with fan-induced draught.

THE EAGLE ENGINEERING AND MOTOR CO., LTD., Altrincham (225).—The Eagle tandem, 4½, 6, and 9 h.p.'s, an Eagle roundabout 5 h.p., and a 4½ h.p. Eagle chassis fitted as tradesman's carrier, are found on this stand. The design and construction of the Eagle tandems are too well known to necessitate lengthened description in this report, but visitors will be interested to examine the somewhat impressive-looking 16 h.p. racing tandem, which is driven by a four-cylinder engine set in a rectangular frame, with driver's seat immediately behind the motor and formed of a curiously-shaped petrol tank. The Eagle tradesman's carrier strikes us as being a vehicle likely to recommend itself particularly to business men requiring the delivery of light goods. It is a vehicle that any smart boy could drive efficiently and well. The seating accommodation for the driver of these three-wheeled vehicles is now made as comfortable as need be wished, and those who prefer this form of self-propelled machine to light cars will find this stand worth very close inspection.

S. F. EDGE, LTD., New Burlington Street, W. (128, 129, and 130).—The centre of attraction on the Napier stand is naturally the six-cylinder 18-30 h.p. car, which we illustrated and described at some length last week. This car is full of interesting points, and it may be interesting to add to those we touched upon the other day that the springs are of exceptional length, the back being some 52in. long. The rear brakes are of the expanding type, applied by pulling the lever backward in the now approved style. The reverse is operated by a separate lever, as this permits of a much simpler means of connection between the change speed lever and the gear box, though if anyone wishes it both the reverse and forward changes can be struck by a single lever. Personally, we have always been in favour of the separate reverse lever, as we think it, apart from any other considerations, desirable that the backward movement should be separated from the forward. The hollow form of the steering wheel is intentional, as it enables the throttle to be fitted with its quadrant in a most accessible position in the centre of the wheel. We give this explanation, as many have wondered at the somewhat unusually steep angle of the steering wheel spokes. The pump and governor are mounted on the same shaft, which is driven by a chain from the crankshaft, and runs at the same speed. The shaft runs upon ball bearings, and is so connected with the chain wheel that should neglect of lubrication or any other cause for stoppage of the shaft occur it will not break, the coupling being two light bands which give. The pump is very strong and slow running, while the governor throttle, which, as we have said, is also controllable by hand, is so arranged that it not only cuts off mixture when it commences to operate, but also extra air. The metal to metal clutch, which is of perfectly simple construction, is of the internal type, and beyond the fact that there is no lining to it, and that it is very carefully made and correctly proportioned, there is nothing which requires special description in addition to what was said last week. With regard to the direct drive on the top speed it should be clearly understood that when this is in operation the secondary shaft is not only idle, but the direct drive is obtained without the use of two sets of bevels. The shafts are of very great strength, and the flexibility of the engine is such that it is found three speeds are all that are necessary. The 15 h.p. four-cylinder and 24 h.p. four-cylinder vehicles have not been altered materially, but they are, of course, now fitted with the automatic hydraulic air regulator, and it will be noticed that the engines are entirely protected beneath by proper aluminium guards, while the lever operating the sprag is placed in a really accessible position, and it only requires a touch of the finger to drop it. A sprag is not often required on a Napier, but if it is wanted it is instantly available. Some of the bodies are very light, one in particular on a 15 h.p. with seating accommodation for four, weighing only 78 lbs. complete with upholstery.

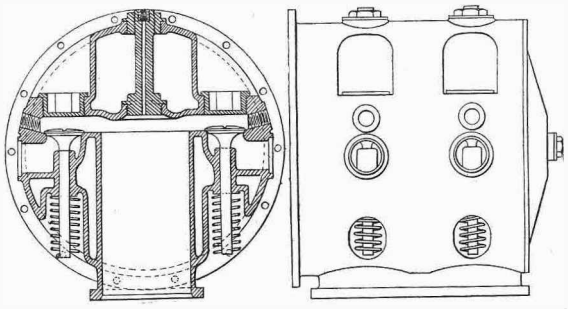
THE ELSWICK MOTOR CO., Great Russell Street (230-232). —Four handsome cars are found here. They comprise two 24 h.p. Elswick landaulettes at 850 guineas each, and two 24 h.p. tonneau cars at 800 guineas. The landaulettes are driven by four-cylinder Brouhot engines, and the tonneau cars by four-cylinder Mutel engines. One of the tonneau cars is finished in French grey with black mould-



Plan view of the six-cylinder Napier

ings picked out in red, and most handsomely and luxuriously upholstered in red-buttoned leather. The other is in light green with black mouldings picked out white, and equally upholstered in cream leather. The frame and motor bonnet of this car are finished in cream with green embellishments. The landaulettes are much quieter in tone, being finished in dark green and black picked out white. They have very long wheelbases, and are most beautifully and comfortably upholstered within. These are four automobiles des luxe which are worthy of inspection.

THE ELSWORTH AUTOMOBILE CO., Bradford (1, Egyptian Court).—Early visitors to the show were disappointed to hear the 80 h.p. six-cylinder Spyker racer would not arrive till Monday, and they therefore turned themselves to an inspection of the 12-16 h.p. chassis which occupied the front of the stand. Those who perused our Paris report will remember our comments upon the engine, which somewhat resembles a small boiler in outward form, the cylinders being cast within a long drum bolted together through flanges in the centre, so made to ensure a very large body of cooling water around the valve boxes and combustion chambers. The frame is of pressed steel, wood filled, the inner flanges being carried down to support the crank chamber and gear box. The engine has mechanically actuated valves throughout, the sparking plugs being set in pockets over the ignition valves; the latter are on the right, and the exhaust valves on the left of the engine



A cross section and side elevation of the Spyker engine water jacket. This sketch depicts the provisions made for the valves and the necessary induction and exhaust pipes.

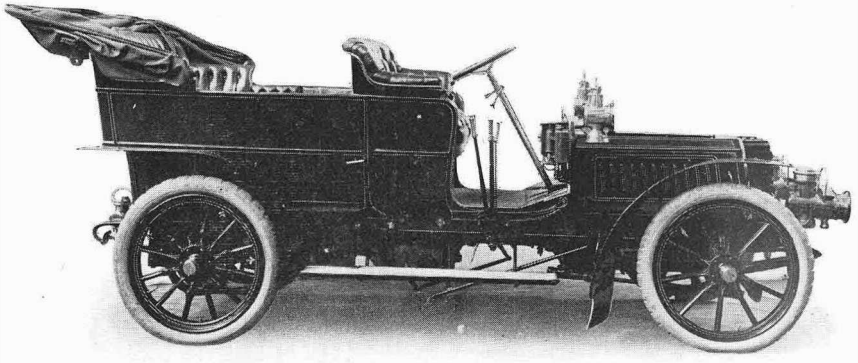
barrel. Ample inspection covers, both detachable by uncovering one thumbscrew, are provided. The radiator is in the form of a nest of flanged Loyal tubes with fan-induced draught, the fan being belt-driven off the engine-shaft. Both commutator and pump are brought to the front and outside the frame, and are therefore in a particularly accessible position. The gear box, which is of ample dimensions, contains a gear change, affording three speeds forward and reverse, is well designed, the gear shafts are of stiff section, and run in long bearings. We would draw special attention to the design of the universal joint immediately outside the rear face of the gear box, and the long sleeve bearings in which the propeller-shaft and bevel wheel spindle run. The clutch pedal is connected with the throttle valve, which automatically closes upon withdrawal of the clutch. The whole chassis strikes us as a fine conscientious piece of work. We have no doubt that the original form of the water jacket of the engine will have interest for those who appreciate something out of the way in design. The piston, throttle, and ignition are controlled from beneath the steering wheel. The brakes are powerful, and of good design throughout. A 24 h.p. of standard design, a noticeable feature of which is the ample water jacket and the combustion and valve chambers, is fitted with a good looking double phaeton body with side entrance, while another chassis of the same power carries a well designed limousine body smartly finished and upholstered.

THE FIAT MOTOR CO., Long Acre, W.C. (204 and 206).—The detail of the Fiat car has been so much discussed of late in automobile circles that we are not surprised to find a number of visitors anxious to inspect the 16-21 h.p. chassis, which occupies the centre of the stand. The four-cylinder engine has mechanically-actuated valves, induction on the right and exhaust on the left, and is carried by the crank chamber brackets on the main frame, which is of the steel cambered description. The especial feature of the 1904 Fiat engine is the new automatic carburetter—one of the few carburetters yet shown which control the petrol and air feed proportionately. This is done by a rising needle valve carrying at the top of the needle a plunger, which at the proper rate of speed of the engine uncovers or operates in an air column, and admits extra air to the induction pipe in due proportion. This combined petrol and air valve is controlled both by the governor and from the steering wheel. The engine is fired by magneto ignition from rotary magnets run off a right-hand half-time shaft. So far as cooling is concerned, an ample-sized cellular radiator closes in the front of the bonnet, and a draught is induced through the cells of the same by the fan-shaped arms of a large flywheel. The angle of the steerng column has been altered from 30° to 40°, which places it in a much more comfortable position than before for the driver. The clutch is much the same as the Mercedes coil clutch. The lubrication is effected by a lubricator with lifting buckets driven off the engineshaft. The ignition can be advanced either by pedal or hand lever on the steering wheel. Without going further into detail at present, we suggest that the mechanical detail of this car throughout is well worthy of attention. In addition to the chassis, five Fiat cars, with bodies of different designs, are staged, the upholstery and finish of which are without reproach.

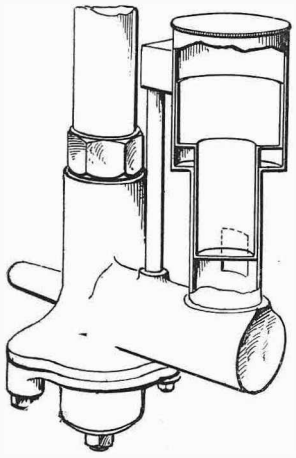
THE GENERAL MOTOR CAR CO., LTD., Norbury, S.W. (59-60).—A variety of cars ranging from 6 h.p. to 30 h.p. are exhibited on this stand. So far as the general exhibit is concerned, there are no special details to be mentioned, though the whole is worthy of a visit. Taking the higher-powered vehicle first, we find a 30 h.p. touring car fitted with a Simms-Bosch engine, having their well-known variable gear. The power developed by the engine is transmitted through the ordinary type of conical clutch to change-speed gear, giving three speeds and reverse, and driving by countershaft and side chains to the rear road wheels. The usual band brakes are fitted, the countershaft brake being pedal operated, and the road wheel brakes by side lever. The framework of the car is constructed of wood and cambered flitch plates. The engine and gear are carried on a channel steel underframe. Mounted on the framework is a four-seated tonneau body with a canopy top and ample provision for touring. From the 30 h.p. car the drop is to a chassis fitted with a two-cylinder 12 h.p. Aster engine, the specification of which is similar to that of the 30 h.p. car, with the exception that the final drive is by propellershaft and bevel gear to live axle in place of the side chains. A Royal Mail van carying about 18 cwts. on similar lines to the previous chassis, but fitted with side chains and van body complete, is also to be seen. Next in order we come to a 10 h.p. car having a two-cylinder De Dion engine fitted with the new carburetter with double throttle. This has the usual three-speed and reverse sliding type of gear giving a direct drive on the top speed. Power is transmitted by universally-jointed propellershaft to rear live axle, which runs on adjustable ball bearings. Ball thrust bearings are also fitted to the change-speed gear shafts. In this instance a tubular frame is employed. Two voiturettes fitted with 6½ h.p. Aster engines are also shown. Both of these cars are fitted with two seats and hood, making them particularly suitable for use by professional men, while one of them provides a third seat in the rear for a manservant if desired. The change-speed gear affords three speeds and reverse, and the transmission is by bevel gearing on the live axle. At this stand is also exhibited a chassis showing the Simplex variable belt drive. This chassis is fitted with a single-cylinder new pattern De Dion engine, which is attached to a pressed steel frame by brackets. At the rear end of the crankshaft is a clutch drum having an internal cone. Attached to the clutchshaft is one of the expanding drums, while on the countershaft on the right-hand side of the frame is a secondary gearshaft. These expanding drums consist of two conical serrated drums, the angles of the cones bisecting. They are interconnected by a simple mechanism, which ensures one drum expanding in unison with the contraction of its opposite drum. Thus the ratio between the primary and secondary gearshaft can be varied between zero and top speed by minute steps. The change speed is controlled by a single side lever having the quadrant well provided with notches for the large number of changes of gear which are obtainable. From the

secondary gearshaft the power is conveyed to the bevel gear on the live axle by universally-jointed propeller-shaft. The usual number of brakes are fitted. The foot-actuated brake works upon a drum formed as an extension of the male cone of the clutch, while the rear road wheels carry drums on their hubs, within which the brake segments expand. This is a new type of transmission so far as the British market is concerned, and one the capabilities of which are at present an unknown quantity. It may be explained that the belt which transmits the power from the primary to the secondary gearshaft consists of an ordinary chain, over which are placed a large number of triangular leather discs, these taking the driving power from the one expanding pulley to the other.

THE GLADIATOR CO., 14, New Burlington Street, W. (115-117).—A good selection of very highly-finished cars is shown here at really very moderate prices. The Gladiator is a well-tried car, and little can be said or done to add to its reputation. Little alteration has been made from last year's practice, but as evidence that the makers are up with the times may be mentioned the new automatic carburetter. The air is drawn into the carburetter through a vertical cylinder in which works a light piston. As the suction increases the piston is lifted, and in so doing the air aperture is enlarged and the mixture maintained practically constant. Aster motors are now fitted in all cases, and, if we may say so, we do not think the makers could have settled upon a better engine. The ignition throttle levers have been wisely removed from the dashboard to the steering column, where they are much more accessible. The larger engines have what may be described as an exhaust receiver, that is to say, the several short exhaust pipes open into one large cylindrical chamber, and are led thence by a pipe to the ordinary silencer at the back of the motor. A particularly powerful brake, well protected against dust, is fitted on the gear, and the pump also is similarly shielded against mud and external wet. A universal joint has been introduced between the clutch and the gear, thus preventing bending in the mechanism. Perhaps the handsomest car on the stand is the 18 h.p. This has mechanically operated valves and a very ample body. The back seat is wide enough to accommodate three passengers, and additional seats may be rigged up adjacent to the side doors, so that the car altogether can carry seven people—a task to which it looks fully equal under all ordinary circumstances. In fact we understand that it has so great a reserve of power that it only requires the third speed very occasionally.

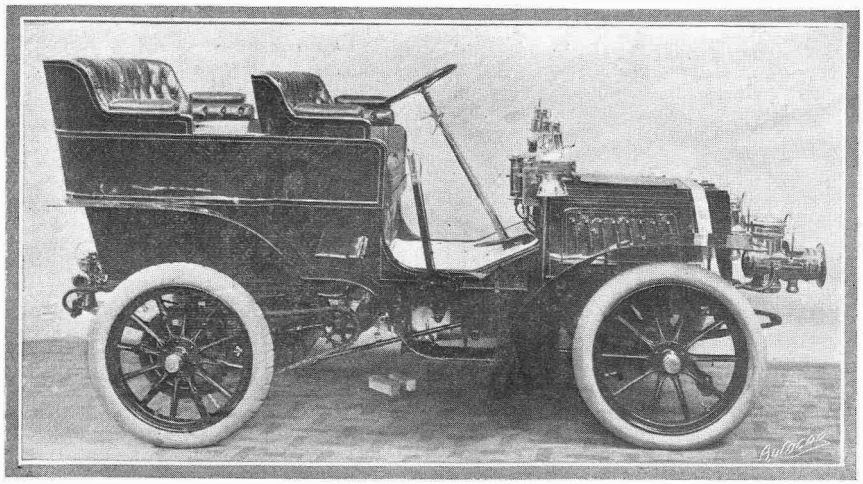


The 18 h.p. four-cylinder Gladiator car, with side entrance to back seats.



The Gladiator extra air inlet to the carburetter is plainly depicted by the part sectional portion of the sketch. It simply consists of an air tower in which works a piston actuated by vacuum produced in the tower by the motion of the engine. Increased vacuum follows increased suction, whereupon the air port is uncovered and additional air is taken to the engine.

THE GORDON MOTOR CO., Knightsbridge, S.W. (194).—The centre of attraction on the Gobron stand is the 25 h.p. chassis, which is the same as shown at the Paris Salon. One of the principal features is the double clutch. The centre one is metal to metal and engages slightly before the outer one, which has a leather face, by means of carefully designed levers. The force required to operate the pedal is very slight. On the inside of the flywheel are cast plates forming a fan, and mounted in front of the engine and behind the cellular radiator is another fan. The bonnet is of the closed type, and when the car is running there is a clear draught of air right through from front to back, the front fan drawing the air in and the rear exhausting it. Between the clutchshaft and the gearshaft and the countershaft and the sprockets are universal joints which allow for any bending or stress on the frame. All three brakes are of the expanding metal to metal type, and always have a sufficiency of lubrication, which is carried round by the shafts. The ignition on the engine is of the high tension magneto type made by Lacoste, the sparking plug being situated right over the inlet valves, which the makers consider the best position. This 25 h.p. chassis is practically the same as the 100 h.p. racer driven by Durey and Rigoly, with the exception that it is smaller throughout, the 12 h.p. being a copy in miniature of the same form. A speciality is being made of the 12 h.p. car, with either Roi de Belge, double phaeton, or tonneau body, double tubular frame, complete with acetylene lamps, oil lamps, and all accessories, including double set of accumulators, for £450. They are finding a demand for a light car, and believing that the smaller types are an

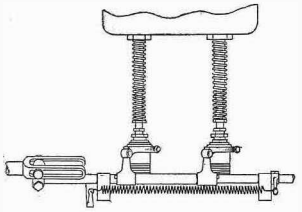


The 9 h.p. two-cylinder Gladiator.

introduction to bigger things, this firm has wisely taken up the sale of the Vauxhall light car, and exhibit two samples of this well-known and reliable little vehicle. A new pattern is the 6 h.p. with artillery wheels and reverse, the reverse being effected by means of a cone clutch locking ratchets on the back axle. Our readers will, no doubt, remember that the original Vauxhall was not fitted with reverse, and in place of the differential gear had ratchets at each end of the back axle in the hubs. The extra price charged for the artillery wheels, 6 h.p. engine, and reverse is only £13.

H. E. HALL AND CO., Tonbridge (140).—A good display of the Talbot cars is made by this enterprising firm, and the new features are well shown. Pressed steel frames are now used on all cars, except the 8 h.p. The cylinders on the others are separated from one another. Low tension magneto ignition is employed, and its use accounts for the fact that two camshafts are used, as to pack twelve tappets on to one shaft would be too close work to be pleasant. The control levers of the sparking and throttle are arranged behind the steering wheel, but do not turn therewith, so that the driver may depend upon finding them where he left them. The automatic air inlet valve is arranged above the jet in the carburetter, thus rendering the latter more readily accessible than hitherto. The brakes are all of the expanding type, and the gear brake drum is provided with ratchet teeth, on which a pawl acts as a sprag when required. The pump and carburetter are fitted above the underframe, where they are readily accessible. The sign over the stand will be familiar to those of our readers who visited the recent show in Paris. It is quite theatrical in effect, and the very best has been made of it.

HEWERSON'S, LTD., Tottenham Court Road, W. (102-103).—Specimens of the 12 and 22 h.p. Benz cars are shown in both chassis and complete forms. The higher power car has a four cylinder motor with mechanically operated valves. These engines have a variable lift, thus affording a means of control. Both high tension accumulator and low tension magneto ignition are fitted. A honeycomb radiator with fan, situated immediately behind the same, is depended upon for cooling purposes. The gearing provides four speeds forward and a reverse, the motion being transmitted direct upon the high speed. The rear end of the Cardan shaft is carried in a long sleeve projecting from the lever axle casing. This acts as an anchoring device, and only one universal joint is employed in the shaft. To provide for any possible twist of the live axle the springs are mounted thereon freely. A sprag device consisting of an eccentric pawl acting upon the drum of the expanding gear brake is employed for preventing the car running backwards accidentally on steep inclines. The hill-climbing feats of the Benz "Parsifal" show what merit there is in these long established cars, which have been entirely redesigned and brought up to date.

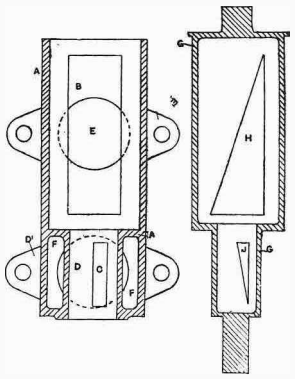


The Benz variable inlet valve mechanism. The plunger is threaded and fitted with a yoked nut connected to the control connecting rod

H. M. HOBSON, LTD., Basinghall Street, E.C. (145).—This stand was hardly complete at the time of our visit, the Darracq two-cylinder car with detachable brougham top being still on its way to the exhibition. The Hobson 24 h.p. cars were shown both in chassis and complete form, but as these are practically the same as the Rochet-Schneider class, with the latest construction of which our readers are acquainted, we need only refer them to our report of the Paris Show for particulars. The exhibit of motor cycles will be found dealt with in our contemporary *The Motor Cycle* of Tuesday last.

Show Report—Petrol Cars.

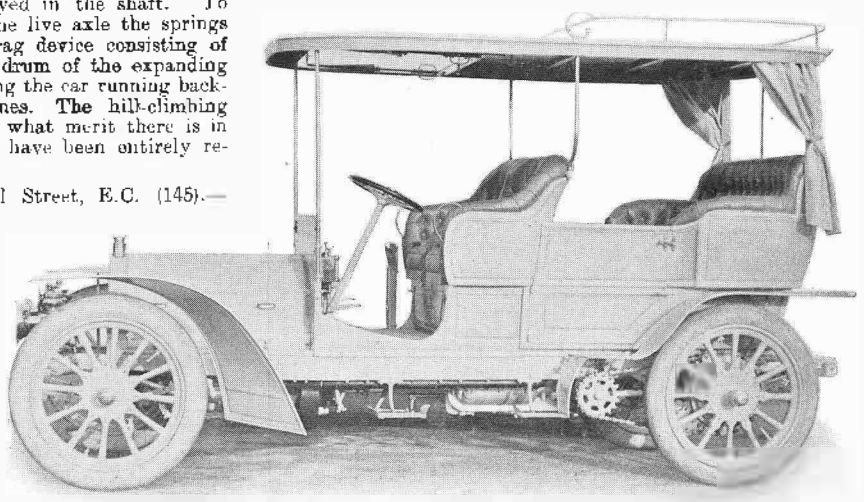
THE HOZIER ENGINEERING CO., LTD., Glasgow (85-86).—No material alterations have taken place in the construction of the Argyll cars since we last described them in connection with the reliability trials in September last. The chassis of the 12-14 h.p. three-cylinder car is staged so as to allow the visitor to make a ready examination of the salient features of the Argyll cars, chief among these being, of course, the change-speed gear. The Longuemare carburetter is employed on these cars, with an addition of the manufacturers' own in the form of an extra air inlet, a drawing of which is given herewith. This addition is attached to the induction pipe flange of the ordinary Longuemare carburetter, and at the lower portion of the extra air inlet chamber is a pipe taking in hot air. A given quantity of air always passes to the carburetter through the annular chamber, as shown by F F, and thence to the inlet valve of the engine. Working in the body of the apparatus is a cock or tap G G having opposite angular slots H and J, so that the quantity of mixture admitted to the cylinders is controlled by means of the governor which is connected to this cock.



Argyll extra air inlet.

A A, brass body attached to Longuemare carburetter.
B, rectangular port in A A opening to induction pipe and carburetter.
C, rectangular port opening to hot air intake and carburetter.
D, hot air intake.
D¹, flange connection to hot air pipe.
E, induction pipe.
E¹, induction pipe flange.
F F, annular passage conducting hot air to carburetter.
G G, hollow cock or tap working in A A.
H, triangular slot in G G working over the port B and controlling the mixture.
J, triangular slot in G G working over the port C and admitting additional hot air to the mixture.

In the lower portion of the chamber will be noticed a rectangular slot C, opposite to which is an angular slot J taking in an extra supply of hot air. As the speed of the engine increases, the governor cuts down the quantity of the mixture admitted to the cylinder, and at the same time admits by means of the angular lower port an extra quantity of hot air. The types of cars shown consist of a 9 h.p. tonneau having a single-cylinder De Dion engine; a similar car, 10-12 h.p., with a two-cylinder Aster engine; a 12-14 h.p. three-cylinder car; and a 16-20 h.p. four-cylinder Aster-engined car. On the complete 12-14 h.p. car is seen a new thermo-

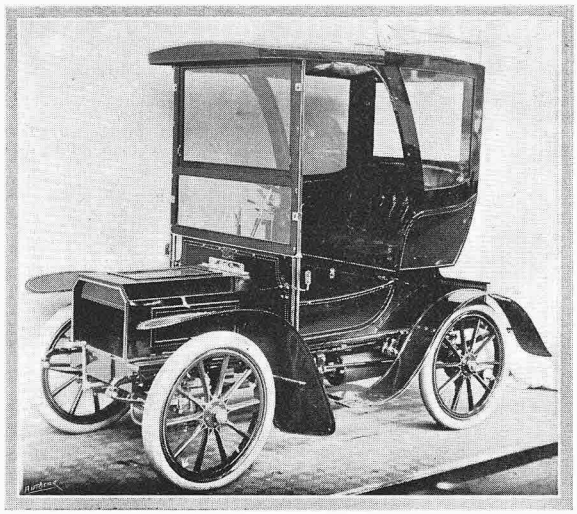


The Benz Parsifal side entrance tonneau. This car is fitted with a four-cylinder engine. A chassis illustration was given in our Guide to the Show issue last week.

Show Report—Petrol Cars.

syphon radiator. This consists of two water tanks interconnected by "Kitchen" radiator tubes, behind which is placed a draught-inducing fan, which will permit of the engine running cool for hours together with the car standing still. The water circulation, of course, is the same as that in the well-known type of radiator on the smaller-powered Argyll cars.

HUMBER, LTD., Beeston and Coventry (238).—Humber Beeston cars of 25 h.p. and 14 h.p., both with four-cylinders, four speeds, and reverse, two 8½ h.p. light cars with two-cylinder engine, three speeds, and reverse, one 5½ h.p., and one 5 h.p. single-cylinder Humberettes form the car portion of the exhibits on this stand, with chassis of the several powers. Much attention is attracted to the stand by the 5 h.p. and 6½ h.p. Humberettes in their Beeston and Coventry types. The 5 h.p. Beeston and Coventry Humberettes are fitted with two speeds forward and reverse, while the 6½ h.p. Beeston and Coventry have three speeds and reverse, and governors fitted on the crankshaft controlling the throttle valve in the induction

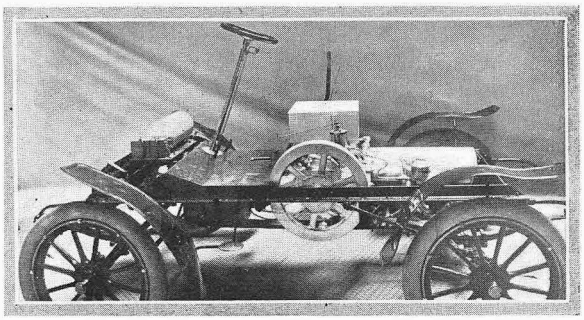


A Humberette for winter work.

pipe. The general mechanical detail of the Humberettes has been so lately described in our columns that it is unnecessary to refer to them in particular here. The whole arrangement of the car has been carefully considered, and the work is, as is only to be expected, of the very best description. The gear box particularly commends itself to notice, the gear shafts being stiff and short, and the gear wheels of ample width with well cut teeth. The price of the 5 h.p. Coventry Humberette is 125 guineas, the Beeston ditto 140 guineas, while the 6 h.p. Coventry Royal Humberette is £150 as against that of the Beeston 160 guineas. The 8½ h.p. two-cylinder chassis of tubular construction is well worth inspection. The cylinders are 3⅝in. bore × 4½in. stroke, and drive through a well-designed friction clutch to the gear box in the usual way. The crankshaft bearings are fitted with ring lubrication, which is also the case in connection with the outer bearings of the live axle and the sleeve bearing of the driving bevel pin. We note that the universal joint of the propeller-shaft next the gear box is of proper theoretical design, and is made so that the interior pins can be filled with lubrication to last a considerable period. The gear box and engine are carried on a neat but stiff tubular underframe. The clutch and brake pedals in the case of this car are push-forward pedals. The silencer is of large dimensions, and should effectually make the car a very silent running vehicle. The steering pins of the steering wheels are lubricated by forced feed lubricators through a central hole. The radiator, as also the tank, is of ample dimensions, and the water is circulated from and to by a toothed wheel pump driven off the half-time shaft. The brake power, which is obtained by pedal-applied drum brake on the end of the gearshaft, and two band brakes and drums mounted on the driving wheel hubs, is stated to be ample. The gear is changed by side lever, and the ignition and throttle are set on the steering standard below the wheel, access thereto being obtained through the wheel, as only one spoke is employed. A 14 h.p., with four cylinders and four speeds, with tonneau body, and a 25 h.p. with Roi de Belge body, are also shown. In these vehicles there is no change in detail from the cars shown at the exhibition last year. We may note that the bodies of both are beautifully finished, and both appear to be thoroughly substantial, high-class vehicles.

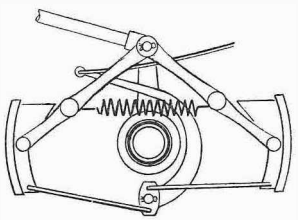
J. E. HUTTON, LTD., 81-83, Shaftesbury Avenue, W. (151).—Nothwithstanding that the principal item of attraction was not present at the stand when we called, the exhibit was a good one. The 20 h.p. Hutton chassis, incorporating T. W. Barber's patents which we referred to at some length recently, was not expected until the beginning of the week, but we shall doubtless refer to the same in our supplementary report. Dealing with the exhibits on the stand, we first noticed a 20 h.p. Hutton motor. This is provided with mechanically-operated valves located immediately over the top of the piston, and the lifting is variable by mounting the tappets upon eccentrics. Low tension magneto ignition is fitted. The cooler consists of a large number of small vertically placed aluminium tubes bent to a modified zigzag. Of the complete cars, the first was a three-cylinder Panhard with high tension magneto ignition and a very nicely finished brougham body. Next to it was a large 18 h.p. covered waggonette. A good specimen of the three-cylinder Brooke car of 12 to 14 h.p. was on view. This is one of the cars in which the crankshaft is arranged transversely, and bevel gear is consequently avoided. In fact, the transmission is by means of parallel shafts and chains throughout.

CHAS. JARROTT AND LETTS, LTD., Regent Street, W. (87, 88, 89).—The centre of interest on this stand is the new Crossley car, which has been described in detail in recent issues of *The Autocar*. Next in interest is the chassis of the 35 h.p. 1904 De Dietrich. The details of these are similar to those of the same make of cars of lower power. In the new type a pressed steel frame is employed with an underframe of channel steel carrying the four-cylinder engine and the change speed gear box. H section axles carry the frame on extra long springs. The engine is fitted with mechanically-operated inlet valves, these being placed above the exhaust valves and worked by tappets. A rotary magneto, gear driven, is employed, the tappets being worked from a single camshaft. The same type of carburetter as that used on the 1903 type of car is seen on the later type. The water circulating pump is now driven by spur gearing instead of chain drive. So far as the clutch and change-speed gear are concerned they remain precisely similar, though the teeth of the gearing have been widened. Four speeds forward and reverse are provided. An expanding brake is fitted on the countershaft, and similar brakes on the road driving wheels. The radius rod between the rear axle and the countershaft is of pressed cambered steel, lightened by being pierced so as to give it a girder appearance. With regard to the control, the push forward pedals are now fitted. Staged on the same stand are two 16 h.p. De Dietrich cars, one having a standard tonneau body and two others with Roi des Belges body. Needless to say, the finish of these, as a whole and in detail, is beyond reproach. To return to the Crossley, we may say that the sections of the engine attract a great deal of attention. They are certainly worth examination.

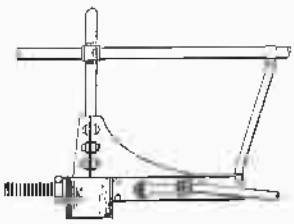


The 6 h.p. Cadillac chassis (see page 232).

JAMES AND BROWNE, LTD., Hammersmith (172-173).—One of the most noticeable features of this show is the number of manufacturers who have recognised the advisability of designing vehicles that are suitable for all weathers. Messrs. James and Browne have three vehicles with canopy tops and either partially or wholly enclosed sides. Also a landau, the rear portion of which can be opened in fine weather. On all of these cars the usual James and Browne mechanism is fitted, which has previously been described in these columns. The engine is practically the same, also the gear and method of transmission. There are one or two detail improvements, such as the new carburetter with automatic air inlet governed by spring. The engine is being shown, for the purpose of exhibition, fitted with automatic valves on the left and mechanical valves on the right. A refinement in connection with the exhaust valves is worthy of attention. This consists of a key which takes out of the same above the exhaust valve spring, leaving the spring in position. A tool is supplied with screwed end, which fits a tapped hole in the top of the exhaust valve. By means of this, the exhaust valve can be lifted out and replaced in two or three seconds, as demonstrated at the stand to interested visitors. The method of operating the mechanical inlet is by means of the usual tappet carried on an extension of the dog which holds the inlet valve seat in position. An advantage in connection with this is that the mechanical inlet can be immediately converted to the automatic, and *vice versâ*, if anything should occur necessitating serious repair to the operating mechanism of the valve. A new pattern wipe contact-breaker is shown for the first time and to a chassis which is on view, to show the workmanship, a high-tension ignition is supplied, but magneto will be fitted when required. The four-cylinder 12 h.p. is a smaller edition of the 18 h.p., which was seen for the first time at the Crystal Palace show a year ago, and we illustrate it in its landaulette form, though it is also made as an ordinary tonneau car with bonnet in front. We shall describe the new 12 h.p. in some detail in an early issue, as it has many points which appeal to the automobilist and to which we can refer with much satisfaction.



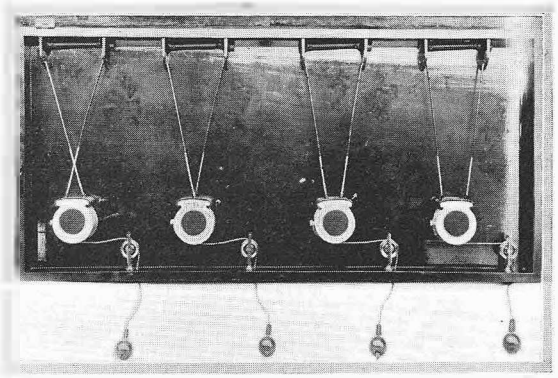
The action of the James and Browne expanding brake is clearly shown by this sketch; the oppositely placed brake shoes are compensated to exert an equal pressure on the brake drum



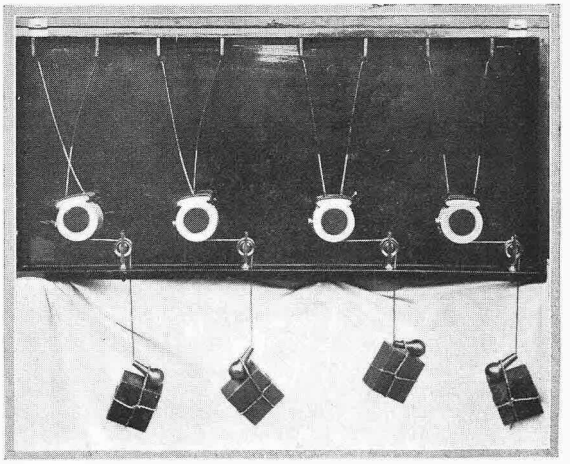
The James and Browne steering consists of an enclosed rack and pinion, as shown by the above sketch plan.

LAMB BROS., Gainsborough (202), show a new 15-17 h.p. three-cylinder car. The frame is of pressed steel, to which is riveted the steel underframe carrying the engine and gear box. The engine has three vertical cylinders cast separately with combustion chamber and water-jacket complete. The valves are on one side, and can be detached by unscrewing a single nut. The commutator is conveniently arranged in an inclined position at the rear end of the crank case, and is gear driven. The crankshaft is of nickel steel running in four long bearings, and the crank case is made so that the lower half can be detached without disturbing the bearings. The lift of the inlet valves is variable by a small lever on the steering wheel. The cooler is of the tubular type and of smart outline, while the fan is designed so that the slack or stretch of the belt can be instantly taken up—a most useful feature. Three speeds forward are provided, with direct drive on top speed. A double-acting metal to metal internal band brake is fitted to the mainshaft outside the gear box, and double-acting internal expansion brakes are fitted to the rear wheels. This well-designed car was illustrated last week on page 203 under the name of the Lamb. However, it is to be known as the National. It is of British manufacture, and is constructed by Messrs. Rose Bros., of the Albion Works, Gainsborough, for whom Messrs. Lamb Bros. are the selling agents.

THE LANCHESTER ENGINE CO., LTD., Birmingham (104, 105, and 106).—The Lanchester exhibit is always both good and interesting, and this year it excels on both counts. The 10 h.p. car, on which the firm's name and reputation have been made, still remains the standard article, but one or two new models have been introduced. The 16 h.p. is a development of the 10 h.p., the engine depending for its cooling upon the air draught, but in some cases, instead of the lateral louvres which have been hitherto employed, scoops are fitted, which look like an extension of the cones of the lamps. As a matter of fact, these cones are stopped at the rear end by the glasses of the lamps, and the air is led off through side passages to to the cylinders. The 18 h.p. car is the latest introduction, and is provided with water-cooling, the water being driven through radiators by a pump. The air cooling is still employed, and a series of horizontal flanged pipes are specially adapted to keep the engine cool while running with the car stationary. On these more expensive vehicles the mainshafts are mounted in roller bearings with ball thrusts. The oiling devices on the 18 h.p. car are of special interest, a periodical flooding device being employed to give the gearshaft oil as required. An automatic measuring device is employed for this purpose with a tell-tale gauge to show the quantity of lubricant at a glance. The 12 h.p. car may be described as a miniature of the 18 h.p., inasmuch as its engine is water-cooled, but it does not possess all the later features of the bigger vehicle. The Lanchester Engine Co. have hitherto adopted wire wheels as being the construction best adapted to meet the requirements of an automobile, and they have carried out the construction of these wheels in a more scientific manner, perhaps, than any other wheel builder has hitherto attempted, but to meet those who prefer the wooden



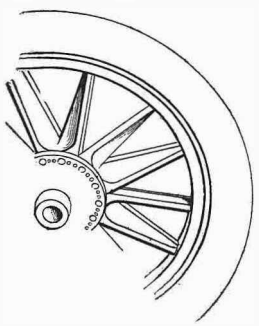
A series of models exhibited on the Lanchester Engine Co.'s stand to demonstrate the effects of building wire wheels on different methods. The models are here shown without any stress upon them



This photograph depicts the results of putting side strain on the models by attaching weights to the ends. The right hand model demonstrates the lateral stability of the Lanchester wheel.

Show Report—Petrol Cars.

spoked wheel something very special in this line has been introduced. The spokes are themselves radial, but they are of a peculiar section, somewhat resembling a dumb-bell set obliquely to the axis, and the spokes being tapered result in a double triangulation, that is to say, the spokes spread towards the centre in radial section, and they are also tangential in side elevation. In the early days the internals of the Lanchester cars were kept as strictly private as those of one's own body, but on this occasion the spirit of the age is yielded to, and many of the details are shown separately and fully. We anticipate that there will be a big crowd round this stand throughout the show, and those who study the details will know more of mechanism in general, and the construction of the Lanchester car in particular, than they have ever known before. Before closing we would like to refer to the excellent equipment of these cars, in the way of bucket seats and seating accommodation generally. Those who have had any difficulty in getting into and out of cars will appreciate the miniature staircase fitted to the new 18 h.p. vehicle. There are many other vehicles we would like to refer to, but visitors to the show, like ourselves, find it necessary to split up their time between all the exhibits, instead of lingering too long over any one, even this.



The Lanchester wood wheel, showing the shape of the spokes.

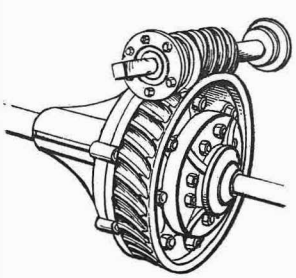
LEA AND FRANCIS, LTD., Coventry (136).—This is one of the most interesting exhibits in the show, and shows how far one may depart from current practice and yet not depart from well founded mechanical principles, and, indeed, may obtain some very substantial advantages. The frame of the car is of H section steel, but instead of being of parallel formation throughout, as such frames usually are, the ends are tapered by a special process. The motor consists of three cylinders arranged horizontally. A horizontal motor is naturally lower than a vertical one, but one of the first things that strikes one in the chassis exhibited on this stand is the fact that all the machinery is, so to speak, below decks. The layshaft actuating the valves is mounted in a casing which is hinged at one end, and may be readily turned up without disturbing the timing in any way. With the layshaft casing raised, the valve boxes are exposed, and may be readily withdrawn and attended to. The connecting rods are of great length —over thirty inches—and the crankshaft is thus located in the position usually occupied by the countershaft in a chain driven car. This also is a chain-driven car, and there is a chain at each side, but only one of these chains transmits the motion at a time, the sprocket wheels being of different proportions. Two clutches are fitted on the crankshaft, and when one is thrown into operation it gives the highest speed. When the other is thrown in it gives the second speed. Both of these chain gears drive a sleeve coupled up to the balance gear, so that at the top and second speeds the transmission is effected in one step. For the third speed and reverse a Crypto gear is brought into operation. The centrifugal governor operates on two butterfly valves, one regulating the air and the other the gas, so that the mixture and the quantity of gas are both controlled by the governor. Powerful brakes are fitted both to the crankshaft and to the road wheels. The steering has been carefully considered, and in this connection the steering heads deserve close inspection. The special arrangement of the mechanism allows of practically any type of body being fitted, with or without a bonnet in front. Before closing we would direct visitors' attention to the pump mechanism and to the arrangement of the fan immediately behind the honeycomb cooler. These vehicles do great credit to the designers and manufacturers, and Messrs. Lea and Francis bid fair to maintain in the automobile world the almost unique reputation they hold in the cycle world.

J. J. LEONARD AND CO., Brockley, S.E. (1, Corridor).—Two specimens of the Leonard two-seated light car at £145 are on view here. They are fitted with 6 h.p. De Dion on top speed. At the low price mentioned the makers include lamps, horn, jack and pump in the outfit. A Cape cart hood can be fitted at six guineas extra. In fixing the low price the makers have not disregarded quality, the workmanship showing care and neatness.

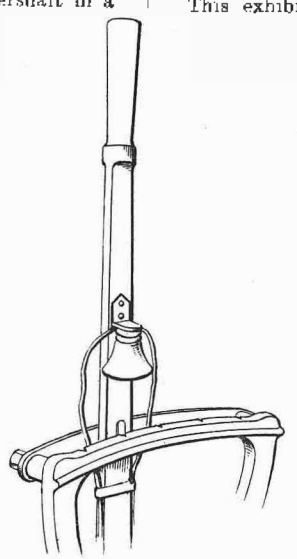
THE LONDON GENERAL AUTOMOBILE CO. (30, Corridor).—A 16 h.p. two-cylinder Maxim car is here shown. Throughout the car there is nothing in constructional detail which calls for attention, excepting the fact that the engine and gear box are carried on a pressed steel frame attached to the main pressed steel frame. The usual sliding type of gearing is employed, giving three speeds forward and reverse, the last transmission being by chains. The car exhibited is fitted with a nicely finished and upholstered body, and is altogether a smart and attractive vehicle.

MANN AND OVERTONS, LTD., Lower Belgrave Street, S.W. (7, Egyptian Court).—The Georges-Richard cars, 8 h.p. two-cylinder, 16 h.p. four-cylinder, and 24 h.p. four-cylinder, were dealt with in detail in our issue of last week. The 8 h.p., which is priced at £300, with standard body, is practically the 16 h.p. divided by two, so far as the engine is concerned, but with driving gear of suitable proportion on similar lines. The 24 h.p. is the highest powered four-cylinder car handled by Messrs. Mann and Overtons, and is practically the same in detail as the 16 h.p. referred to, but is, of course, of larger dimensions throughout. We refer our readers to our fully illustrated description above mentioned for further information. No cars have been more carefully improved for this year than the Georges-Richard. Just before we left the show a Mercedes Cannstatt Daimler was staged on this stand. A brief inspection shows it to be similar to the 1904 car which is described earlier in our report.

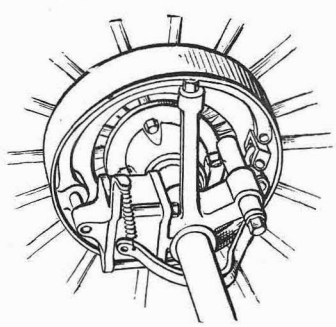
STEPHEN A. MARPLES, M.I.M.E., Holborn, W.C. (141).—This exhibitor devotes his attention principally to the Windora 18 h.p. four-cylinder car of high class. It is sold either in the chassis or the complete form, preferably the former. The motor is mounted on a pressed steel frame, and is fed from an automatic carburetter through mechanically-operated inlet valves. It is governed on the throttle, and drives on one of three speeds, chains being connected with sprockets on the rear wheels. The clutch spring is readily adjustable. The wheels are of large dimensions, and fitted with 4in. Dunlop tyres. A new form of irreversible



The Dennis worm drive which is referred to on page 239



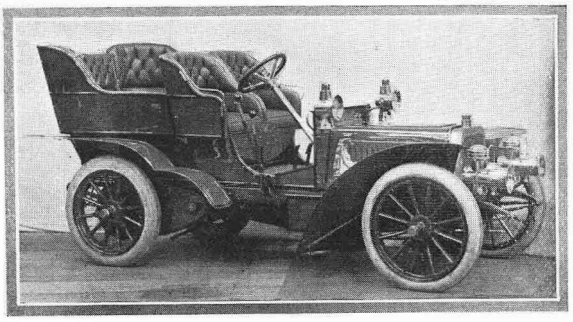
The Century change-speed lever fitted with electric lamp to illuminate the quadrant automatically while gear changing (see page 236).



The Ariel double-acting rear brake (see page 232).

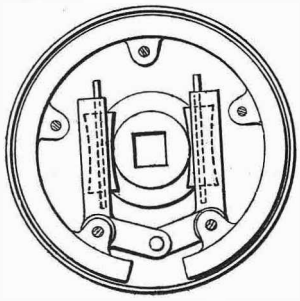
steering is fitted, and the comfort of the passengers is provided for by the use of very long springs. Mr. Marples's catalogue is worth obtaining, if only for the very fine illustrations appearing on the cover. A cheaper car having a two-cylinder motor, mechanically operated inlet valves, automatic carburetter, and other modern details, is sold under the name of the Mercury.

J. MARSTON, LTD., Wolverhampton (147).—Few cars have won for themselves so sterling a reputation in a short time as the Sunbeam. Two specimens of the 12 h.p. are on view. These are constructed with wooden frames



The latest pattern Sunbeam car.

strengthened by flitch plates, with underframes carrying four-cylinder motors, with the cylinders cast in pairs. The Loyal radiators of the multitudinal tubular type are employed for cooling purposes, and the strength and simplicity of the details are noticeable features. Lubrication is effected through a pump automatically, and the contact breaker is mounted on the dashboard in full view of the driver. The wiring has been carefully carried out, the low tension being encased in the manner familiar with electric light wiring, and the high tension leads are mounted in a strong red fibre tube. The engine is carefully encased, the front portion of the casing taking the form of a leather apron, which may be readily let down when required. The gearing is of the spur type, with sliding rod changing, and the side chains are, of course, cased in, this being a special feature of the Sunbeam cars. The throttle is controllable both by hand and foot. In certain positions of the hand control the pedal may be used as an accelerator, or the hand control may be set for high speeds when the pedal connection is thrown out. The time of the sparking is controllable from the steering column. An automatic carburetter of the firm's own design is fitted. At the time of our visit the new 16 h.p. car had not arrived, but it was expected during the day. This is a six-cylinder motor, there being three pairs of cylinders. The valves are mechanically operated, and the lift of these is variable, thus giving an additional control beyond the throttle valve. In this car, too, the gearing is direct to the bevels on the high speed. A specimen of the Mabley car is also expected. The 12 h.p. and 16 h.p. cars are available for trial in the ground. In conclusion, we may draw attention to the fact

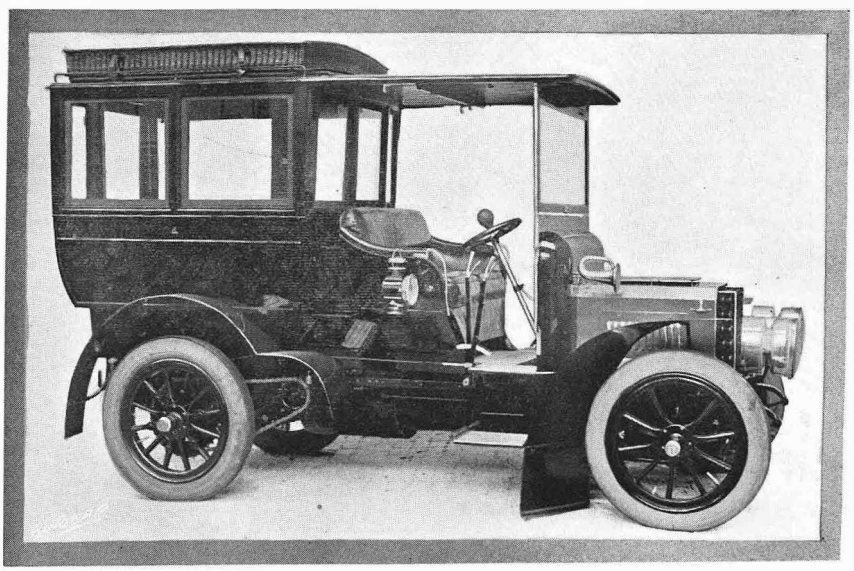


The new Sunbeam clutch.

that the steering gear on these cars is, and always has been, adjustable.

CAPT. THEO. MASUI, Germain motors, 1, Hanover Court, Hanover Street, W. (3, Egyptian Court).—Two 16 h.p. four-cylinder Germain standard cars are shown here, one with tonneau de luxe to seat five, with detachable hood; also 9 h.p. Germain delivery van. The 16 h.p. Germain car has only just been described and illustrated in detail in our columns, so that further reference is unnecessary. Visitors interested in the side-slip question will find here many samples of the Samson non-skidding leather bands. They are undoubtedly growing rapidly in favour. (See *The Autocar*, 30th January, page 118.)

THE MAUDSLAY MOTOR CO., LTD., Coventry (81-82).—It is difficult to say which feature of this exhibit attracts most interest—whether the waggonette-bodied cars (of which the firm makes a speciality), or the six-cylinder engine chassis. Taking this latter first, we find that it has six vertical cylinders, the cylinders being grouped in sets of three, the bore and stroke being 5in. × 5¼in. respectively. This engine running at its normal speed develops 40 h.p. It contains the features which are peculiar to the Maudslay car, the overhead camshaft operating all the valves. The carburetter is of the float feed type, and has at the centre of the induction pipe two automatic air inlet valves, which are opened by the suction of the engine. One commendable feature is the fitting of a trap for inspecting the interior of the crank chamber, and for the insertion of oil. This trap has a horizontal lid, which is opened by undoing a thumbscrew and swinging back a bolt. This leaves a sufficient space to see into the crank box, and gives ready admission of lubricant. The lubrication of the engine is effected by pump, which, it will be remembered, forces the oil through passages provided through the centre of the crankshaft and through the centres of the connecting rods, so that every bearing is assuredly oiled. A similar system is adopted at the gear box, a separate pump being provided for the circulation of oil through the bearings at this point. The complete cars are particularly worthy of inspection by those who intend to invest in a waggonette type of body. One particularly fine specimen is the 25 h.p. convertible waggonette omnibus, which gives comfortable accommodation for eight people. The omnibus top and front shield are readily removable, thus making it an ideal vehicle for either summer or winter use. The price of this handsome vehicle is a thousand guineas. Another type is the landau waggonette, the hood of which opens in the centre longitudinally. The leather sides fold back, and let the top down on to them in a manner which does not detract from the appearance of the car when the top is not in use. The price with 25 h.p. three-cylinder engine, is nine hundred guineas, and with the 18 h.p. engine one hundred guineas less. There is also shown an 18 h.p. double phaeton-bodied car.



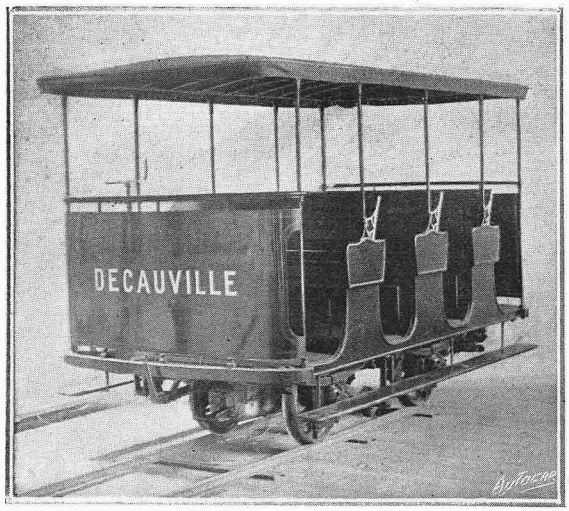
The Maudslay 25 h.p. three-cylinder six-seated omnibus, which is convertible to a waggonette

Show Report—Petrol Cars.

A. MEIER, Redhill (4, Egyptian Court), shows a 20 h.p. Germain, a four-cylinder Thornycroft car, with landauletic body, and a smart little 8 h.p. voiturette, by the Horley Motor Co., with three speeds forward and reverse, artillery wheels, Dunlop tyres, carrying two-seated body, with aluminium bucket seats, price 100 guineas. The engine has mechanically operated valves, and if the car is as good as it looks, it is undoubtedly remarkable value.

THE MOBILE MOTOR AND ENGINEERING CO., Birmingham (52).—A fine selection of popular-priced cars ranging from 170 guineas to 365 guineas is shown. The lower-priced car is fitted with a new 6 h.p. De Dion engine, and has three speeds and reverse gear, giving direct drive on the top speed. The usual brakes are fitted, the speeds being changed by side lever. The frame is of tubular construction, the engine and gear being attached by brackets. The body fitted has two ample and comfortable bucket seats. A similar machine in detail, but fitted with a third bucket seat behind, is sold at 170 guineas, while a particularly neat and useful-looking car with a tonneau body costs 185 guineas. It may be said that the engine is enclosed in a neat-looking bonnet, in the front of which are placed coiled radiators very similar in appearance to the well-known Panhards. Next are two types of the 12-14 h.p. Mobile car, one of which is fitted with a Prunel engine and gear and the other with a De Dion 12-16 h.p. engine. Both these are two-cylinder engines. The car to which the Prunel engine is fitted has a sliding type of gear, with three speeds and reverse, chain drive from countershaft direct on the top speed, while in the second car the same variations of speed are provided for, and propeller-shaft and bevel gear transmission communicate the drive to a rear live axle. In these cars a wood frame is employed, the engine and gear being carried on an underframe. At 350 guineas the cars may be had with either canopy top and glass front, with rail for luggage and with glass windows at the rear of the tonneau, while at 335 guineas a similar car is to be obtained with a neat Cape hood. Coming to the more expensive class, we find a 12-14 h.p. car, with two-cylinder Aster engine, this also giving three speeds and reverse, with gear drive by propeller and bevel gearing. Two types of this car are shown.

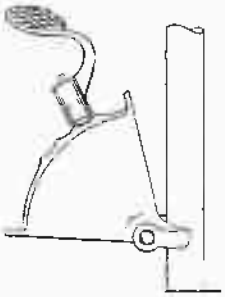
THE MO-CAR SYNDICATE, LTD., Paisley (199-200).—In a somewhat secluded portion of the show will be found the Arrol-Johnston cars, which take their name from the chairman of the company, Sir Wm. Arrol. There is practically no change in the general design of these now well-known cars—horizontal engines, all shafts parallel, Hans Renold silent chain drive from engine to gearing, thence to back axle by similar chain of a somewhat heavier type. A special detail improvement which the company have introduced for this year is a new method of operating the rear brakes and the differential brake on the countershaft. The brake remains as before, a band encircling a drum, the band itself being of steel with cast-iron segments riveted to it. The new portion is the toggle arrangement, which is operated by pedals, the motion from this to the band being conveyed by means of a Bowden cable. Any owner of an Arrol-Johnston car who has not got this refinement can fit it at a moderate cost, as the whole arrangement bolts to the angle plates of the car frame by three bolts and nuts. Another introduction is a control consisting of what is an additional air inlet to the induction pipe. This additional air inlet is controllable by the driver, and acts also in conjunction with a throttle at the discretion of the user. One of the claims made by this company is that they manufacture every portion of the car themselves, with the exception of the rubber tyres, radiator, tubes, chains, and one or two other minor parts. The magneto, which is of the low tension type, is of their own make, and is provided with their special sparking plug, which is, practically speaking, everlasting. A special 12 h.p. estate waggon forms a portion of the exhibit, this having been built for a member of the Scottish nobility since deceased. It is provided with seating accommodation, and may be called a combined goods and passenger vehicle, as the platform at the rear will take a good load. This having been originally built for a special purpose, is provided with a tip, which is very ingenious. It cannot possibly come into action without the will of the operator, and when it is being tilted the bolt which holds it down automatically places itself in the lock position, so that when tilted back it flies home and cannot be released without being withdrawn by hand. The gear box, which is exhibited for the first time uncovered, has sliding gear wheels, but in place of these sliding right through, as they would in the Panhard or Daimler type, they come in and out of gear. All bearings of the gear box and sliding shafts and collars are case hardened and ground, from two to six thousandths of an inch being taken off in the grinding process according to the size and requirements of the particular part being operated on.



An internal combustion engined tramcar built by the Decauville Co., and exhibited by the Motor Car Co.

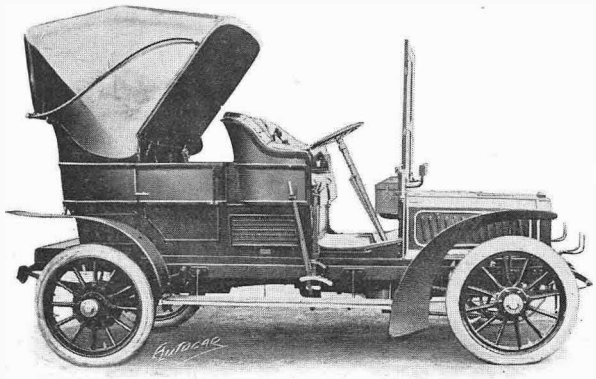
MOTOR CAR INDUSTRIES CO. (33, Corridor).—The Jackson tourist cars are of American manufacture, fitted with 8 h.p. single-cylinder horizontal engines. The gear is in a gear box, the top speed being direct from the gear box to the rear axle by means of a strong chain. To bring in the low gear the brake band is tightened round the gear drum, and by means of an epicyclic gear the speed is reduced. The reverse is operated by another Crypto with drum and brake. One of the bodies has a dogcart pattern, with rear seat, when more than two passengers are to be carried. A special point is made of the machining of the parts, several of which are on view on the stand.

THE MOTOR CAR CO., LTD., Shaftesbury Avenue, W.C. (222).—Five complete up-to-date Decauville cars, with bodies of various finish, are staged here; also a 12 h.p. Decauville chassis, giving an excellent opportunity for examining the mechanical design of, and work put into, this well-known car. This is one of the chassis which was shown at the late Paris Exhibition, when it was dealt with fully in our columns, but we would draw attention to the opportunity now offering for its inspection by those who did not attend that exhibition. A 10 h.p. tonneau, 14 h.p. bucket-seated double phaeton, and 12 h.p. brougham with extended canopy, are very fine examples of the Decauville cars, and were all staged at the Paris Show. The 8 h.p. motor tram standing at the end of the stand attracts a considerable amount of attention. It is covered by a roof supported on iron standards, and is seated to accommodate twelve passengers on comfortable wooden seats. The motor is carried on the frame in the centre between the wheels, and the front pair of wheels are driven through change-speed gear similarly to the car. The arrangement of gear gives two speeds forward and one reverse, and the top speed is said to be at least seventeen miles an hour on the level. This strikes us as



The Decauville pedal accelerator. This works over a quadrant, into the depressions of which a spring-actuated plunger engages, so that the pedal remains in any given position.

a remarkably handy little vehicle for public service on light railroads.

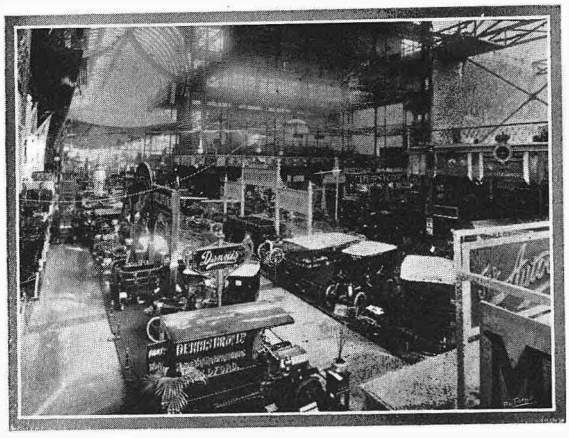


The 14 h.p. Decauville, with side entrance to the tonneau, front round shield and hood. It will be remarked that, although fitted with side entrance, there is still luggage room in rear of tonneau.

THE MOTOR MFG. CO., LTD., Coventry (174-175).—The company make a fine show of their standard cars, among which may be mentioned the 8 h.p. single cylinder with automatic inlet valve, the two-cylinder 7 h.p. governed on the supply, 10 h.p. two cylinder closed-in type governed on the supply, and the 20 h.p. four cylinder. A fine chassis of the latter forms the *pièce de résistance*, the whole of the frame, engine, and other details being polished. Although we do not believe in exhibiting cars finished in this manner for the purpose of the show, it nevertheless demonstrates that English firms, such as the Motor Mfg. Co., are capable of exhibiting a chassis which, for high finish, will compare favourably with anything that was shown at the recent Continental exhibition in Paris. The 20 h.p. M.C.C. was the winner of the silver medal in the thousand miles reliability trial in September, 1903, and is sold at prices varying from £700 to £900, according to finish, body, etc. At one end of the stand will be found the 25 h.p. M.M.C. saloon car, which was exhibited at the Paris show, and was most favourably commented upon by the Parisian journals. It is a very striking car. The body is finished in olive green with gold lines, the whole of the fittings being of polished brass. The interior is beautifully fitted up with revolving seats, one in each corner, and between them is a combined table and cabinet. There is a heating apparatus which derives its supply from the exhaust, the heat being passed through a coil and out into the silencer. As an example of what can be done by British manufacturing firms this does very great credit both to the designer and the company in whose workshops it was built.

NEUE AUTOMOBIL-GESELLSCHAFT, Berlin (54).—This firm, which, as its name implies, is of German origin, makes its introduction to the British public. So far as the mechanical construction of the cars is concerned, there is nothing which calls for special comment, unless it be the speed-changing lever. This is mounted on a separate standard, parallel with and attached to the steering column. The lever, projecting conveniently for the left hand, works in a vertical slot, having in it three horizontal slots extending on either side of the vertical slot. In the middle of the three vertical slots on the left-hand side one gets the low gear, while by simply operating the lever over to the right hand gives the second speed. For the third speed the lever is allowed to rise by means of a spring into the top horizontal lever, where the third and fourth speeds are obtained in a similar manner to the first and second. For the reverse the lever is depressed into the bottom slot, but before one can get it into the slot a small catch has to be raised, so that there is no fear of going into the reverse gear accidentally. From the reverse the change-speed lever returns automatically to the first speed slot on coming opposite the vertical slot. Two types of cars are shown. The 10 h.p. has two vertical cylinders and magneto ignition, three speeds and reverse, and gear drive, with an ordinary tonneau body. The second car is of 20 h.p., similar to the other, though having four cylinders and chain drive. This car is fitted with very handsome and commodious landaulette body, affording four very comfortable seats inside, while in front there are two seats. The entrance to the landaulette is of ample width, and it is to all intents and purposes a full-sized brougham body mounted on a chassis. The rear part of the carriage is devoted to a large trunk, wherein one's personal belongings may be stored, and in addition to this there is an adjustable rack for the carrying of luggage. We hope to give a photograph of this car in an early issue of *The Autocar*.

THE NEW ORLEANS MOTOR CO., LTD., Twickenham (252 and 253).—As we suggested in our guide to the show last week, the new 12 h.p. four-cylinder New Orleans car has as many points to attract the interest of the visitor as any chassis in the show. In the first place, the frame is of the wood steel flitch plate variety, but the four-cylinder engine is carried directly therefrom without the assistance of an underframe. The induction valves are automatic, and placed beneath hollow bridges, which serve as the induction pipe, and which are readily detachable by unscrewing one nut and slacking off a union. The cylinders themselves, with their valve chambers, are cast singly and bolted to the circular aluminium crank chamber. High-tension ignition is employed, the plugs being placed in the valve chambers immediately below the ignition valves. Above the uptake of the mixing of the Longuemare carburetter is placed a piston throttle valve controlled by an independent pedal, which, however, is actuated as well by the clutch pedal when the clutch is withdrawn. Dash lubrication is relied upon for the efficient lubrication of the pistons, big ends, and camshaft. The exhaust is received into an expanding chamber placed immediately beneath the aluminium sheathing which protects the engine, the exhaust products passing up a long pipe to a silencer set under the frame at the rear of the car. The clutch, as we explained in our preliminary notice, is quite novel in design, for although of the internal cone description, the cones are carried on a driving plate, and are detachable and replaceable by simply unscrewing three bolts to each segment in the space of a few minutes. The flywheel and clutch rotate in a shaped aluminium half chamber, which is bolted to the crank chamber at one end and the gear box bolts at the other. At its rear end the gear box is supported on a single joint to avoid any undue stress on the bearings from frame twist. The gear affords three speeds forward and one reverse, the drive on the top speed being direct, and when the mechanical clutch is in contact the toothed wheels on the secondary gearshaft are slid out of mesh with any of their fellows, so that this shaft with its wheels remains idle during direct drive. It should be noted that the ingenious but simple form of universal joint



A view of the show looking up the north nave from *The Autocar* stand.

connection is introduced between the ends of the clutch-shaft and gearshaft. This connection is detachable by the unscrewing of one bolt and the withdrawal of the pin it secures. The drive to the live axle is by propeller-shaft in the usual way, but the universal joint at the forward end of the propeller-shaft is most efficiently protected by a brass case. Band brakes, pedal, and side lever applied, are fitted as to the former on a prolongation of the bevel wheel spindle, and as to the latter on drums bolted to the drive wheel naves. In addition to this chassis a four-cylinder 15 h.p. tonneau car and a 9 h.p. two-cylinder tonneau car are also shown. The design and finish of the bodies of these two vehicles

are exceptional, and the addition of side doors and dash-board apron is certain to attract those who have a weakness for comfort and driving in cold weather. An example of the original 3½ h.p. single-cylinder car with which this firm commenced their career is also shown upon the stand.

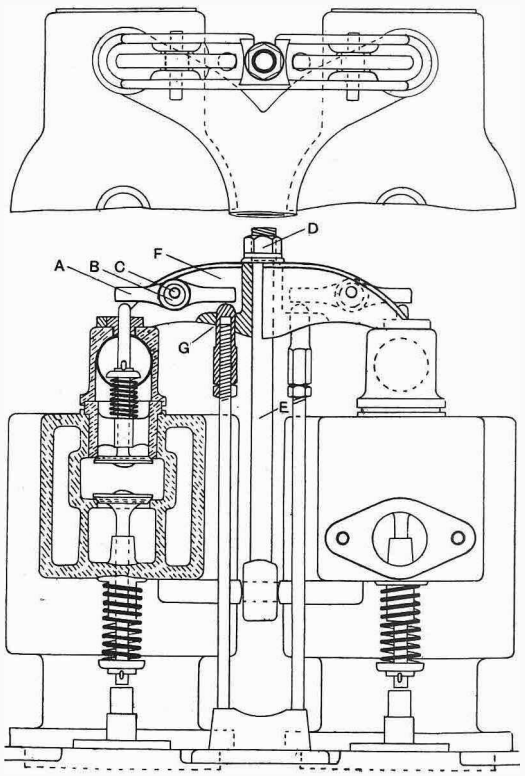
O'NEILL AND CO. (76).—Two Argus cars one with four seats and the other with two.

OLDSMOBILE MOTOR CO., 45, Great Marlborough Street, W. (154, 155, 156). A large assortment of Oldsmobile cars, for which the company have the sole agency for Great Britain. The original design of frame constructed with leaf springs is retained. These stretch from the front to the rear axles, and on the centre of them is built the whole of the mechanism and the body. For 1904 an improved cylinder with one ground joint is fitted, in place of the old pattern which had two. The ribs on the cylinder are also cast from the point where the water-jacket stops to the extreme end of the piston stroke. The carburetter, which is the best and most distinct improvement, has gravity feed now in place of the old forced feed type, when pressure had to be obtained before starting. The petrol feed is adjustable from the seat by means of a screw operating a needle valve. The seating of the standard pattern is two inches wider than formerly, and Diamond single tube tyres are fitted to all four wheels. On the stand is a working section, driven by an electric motor, this being the same model which was recently exhibited at the Paris Salon. The Oldsmobile racer, which is known in the States as the Pilot No. 1, and was recently illustrated in the columns of *The Autocar*, is a weird-looking vehicle, but, nevertheless, shows ingenuity in constructing a racing vehicle from what was never intended to be anything but a light runabout. One of two examples of hooded cars and a light delivery van are also on exhibition.

PANHARD AND LEVASSOR, Regent Street, W.C. (93 to 95).—Ten cars of various powers, and having samples of all the popular carriage bodies, are exhibited on this stand, as well as the new 24 h.p. chassis and the new three-cylinder 8 h.p. chassis. On both of the chassis the magneto ignition is seen. The magneto instrument is located in the rear of the dashboard, and is chain-driven from the camshaft. The coil is entirely separate from the magneto. The water circulation is by a rotary pump frictionally driven from the flywheel. In this case it is put above the level of the framework, and not below, where it is readily accessible and well out of the way of dirt and grease. Flange type radiators are used, and behind these is placed a high-speed draught-inducing fan. The gearing is, of course, of the well-known Panhard type. The framework is of wood with steel cambered flitch plates. It is unnecessary to go into further detail in regard to the construction of these cars, as they were fully described in our report of the 1903 Paris Salon.

THE PATENT AUTOMATIC FEEDING MACHINE CO., LTD., Rochdale (68 and 69).—This is an exhibit which should be carefully examined by those who are particularly interested in motor car design, as it contains what is practically a new feature in designing in some of its details, though its principle broadly has been exploited for some time past. The engine consists of a single horizontal cylinder containing two pistons, working on to two separate crankshafts placed fore and aft the cylinders. The particular feature is the interconnection of the two crankshafts by means of a Hans Renold silent chain. The cylinder is 8in. bore, and the crank throw 5in., which gives a total stroke of 10in. Running at 800 revolutions per minute the motor develops 24 b.h.p. Placed on the forward end of the cylinder is the carburetter. This is automatic so far as delivering a perfectly combustable mixture at all speeds is concerned. This is obtained by means of four sprays and four air inlets, the delivery of fuel being regulated in proportion to the opening of the air valves. A single induction valve, mechanically operated, admits the charge to the cylinder. In the exhaust valve we find a new departure, for here is a large diameter main exhaust valve, while beside it is a smaller mushroom valve, which on the exhaust stroke is given a slight lead on the main valve, thus reducing the initial pressure and preventing a large amount of strain on the valve-actuated arms and cams. Mounted on the rearward crankshaft is an epicyclic drum and a metal-to-metal expanding clutch. This clutch is operated by a pedal, and is interconnected with a side lever. This side lever is employed to positively lock the clutch, and with it the epicyclic gear when the top or bottom gear has been found. From the high speed the drive is direct, no gears being in mesh, power being transmitted to the rear live axle by a Hans Renold chain. For the low gear the epicyclic train is brought into operation. The framework of the car is constructed of channel steel, and is carried on particularly strong axles both front and back. In fact, we may say that it is one of the most solidly constructed cars in the show. The vehicle under notice is put before the public as an experimental car, and great improvement in detail and finish may be expected when the car is produced commercially.

THE PHŒNIX MOTOR CO., Southport (216).—In the chassis of the 12 h.p. two-cylinder car will be found some interesting details both as regards the engine and the driving gear. The valves of the two-cylinder motor are mechanically-operated by rocking levers mounted on eccentrics, the spindles of which are carried and contained in the valve bridge. By the rotation of the eccentric spindles the lift of the induction valve can be varied to any desired degree,



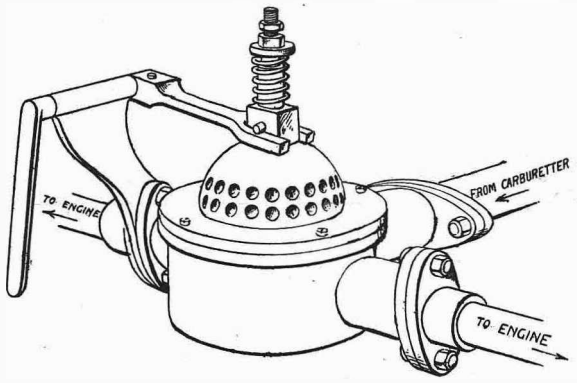
The Phœnix variable inlet valves.

A, tappet
B, eccentric mounting for A
C, spindle for B
D, nut holding down bridge-piece
E, swinging bolt for quick detachment.
F, bridge piece
G, valve actuating rod

and this varied lift is found to control the engine sufficiently without the intervention of a throttle valve. The exhaust tappet risers are made with ball bearings at their lower ends where they are struck by the cams. The lift of the valves is controlled both by the governor and from the steering wheel, but the manner in which this is effected is somewhat difficult of explanation in cold print. The carburetter is connected to the induction pipe, which is led across the top of the cylinder, by means of a wedged bayonet-jointed coupling instantaneously attachable and detachable. The dominating idea in the design of this engine and drive has been that of simplicity, and we are bound to say we think that this has been most successfully attained. The car is driven through friction clutch and change speed gear and propeller-shaft in the usual way, but the twist of the back axle, due to the bevel drive, is counteracted in a simple and effective manner by twin thrust rods attached to the top of the differential gear box and running back to a transverse member of the channelled

steel frame. These thrust rods have a slotted connection with the frame, which permits them the requisite amount of play. It should be noted that the universal joint between the clutch and gearshaft is formed of steel with two suitable segmental slots cut at right angles, which afford a perfect universal action. This joint permits the required sliding of the clutch and yet avoids any undesirable twist upon the gearshaft bearings. We hope to be able to describe and illustrate the interesting mechanism of this car in detail in an early issue.

THE PICK MOTOR CO., LTD., Stamford, Lincs. (113 and 114).—The Pick Co. have quite a large and essentially useful exhibit of their 6 and 10 h.p. cars. The 6 h.p. has not been materially altered since last season, which speaks well for the satisfaction it has given. We note that the platform behind the double seat is railed in, thus making the securing of luggage a much simpler matter, and the rails certainly add to the finished appearance of the vehicle. The 10 h.p. cars are shown in several different forms. One is a very handsome brougham, and another is fitted with a very serviceable hood of brown canvas. This looks very strong and has a depending portion in front, which should do much to protect those on the front seat. The sides can easily be rolled up out of the way when not required. Turning to the mechanism, something of a novelty is shown in an automatic air inlet valve fitted to the cylinders. This comes into operation at high speeds, and for hill-climbing or at other times when especially rich mixture



The extra air inlet on the Pick engine, which is fully described in the accompanying matter.

is required, as the valve can be cut out of action by one of the pedals. The driving, we may remind our readers, is through a central chain to the back axle. Central chains are not so much subject to mud troubles as side chains, but the exhibitors show that they have studied even this point, as they have introduced a chain protector, consisting of a leather strap which runs round the chain and is held in position by side flanges. This is distinguished as the Little Giant. A similar name is given to the firm's very powerful band brake. The ends of the band are fitted with half boxes, within which is contained a double cam. Rotation of this cam operates on the boxes, and tightens the band round the drum. It operates with equal effect backwards or forwards. The Pick Co. will fully maintain their reputation by their present exhibit.

PRUNEL AUTOMOBILES, Tottenham Court Road, W.C. (30a).—A four-cylinder 20 h.p. and two-cylinder 12 h.p. Prunel cars are staged on this stand. The 20 h.p. is the car which was awarded the Grand Prix at the Rome exhibition. It is priced at 575 guineas, while the two-cylinder car costs 325 guineas.

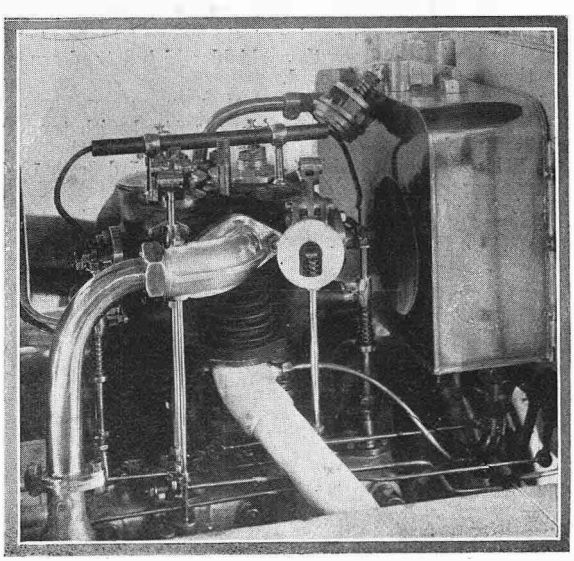
PRITCHETTS AND GOLD, LTD., Feltham (228), show a 12 h.p. four-cylinder with live axle and a 12 h.p. four-cylinder, chain-driven motor car, which are priced at £450 with lamps and tools. A 30 h.p. four-cylinder Meteor chassis, price £650, may also be seen. It has four-cylinder Mutel engine, and the drive is by friction cam clutch of four-speed Mors type gear, and change in usual way, with direct drive to countershaft on top speed. The engines fitted to the 12 h.p. cars are by Blake, of Kew, but otherwise the mechanical arrangement of the vehicles is the same as in the 30 h.p. car, with the exception that a Panhard type gear is fitted.

Show Report—Petrol Cars.

THE REX MOTOR MFG. CO., LTD., Coventry (6).—The two cars exhibited on this stand show no divergence in mechanical design from those that were exhibited at the Crystal Palace during the National Show last November, but we have no doubt many visitors will be pleased to renew their acquaintance with the two-cylinder Rex Simplex, which, although carrying a smart bucket-seated tonneau body, can yet be examined, so far at least as its engine is concerned, with comparative ease. We would remind our readers that this car is built with a hammered steel frame. Its engine has mechanically-operated valves, with a provision for giving off compression in starting, while the friction clutch is a member set entirely by itself on a prolongation of the engineshaft, the engine flywheels being contained within the crank chamber. The drive is transmitted from this clutch through the Rex silent gear, giving three forward speeds and reverse, and by propeller-shaft to live axle in the usual way. The other car on the stand is a 10 h.p. single-cylinder Rex, and this shows no departure from the standard pattern, as described in our report of the November show. So far as the bodies are concerned these are distinctly admirable, the finish and upholstery being all that can be desired. We would draw particular attention to the elegant form of the tonneaux of both cars. The Rex cars have now established so excellent a reputation that we feel it is unnecessary to dwell at any length upon their special and recognised qualities.

THE ROADWAY AUTOCAR CO., 19, Newman Street, W. (30 and 31).—Amongst the interesting exhibits on this stand is the 19 h.p. Mors chassis 1904 type, with its four-cylinder engine cast in pairs, mechanically operated valves, magneto ignition, the induction valves and make and break tappets being actuated off the right hand time shaft. The motor is enclosed in the distinctive Mors type of bonnet, the front panel of which is fitted with a closely set flanged tube radiator with fan driven off the engineshaft behind. The gear is of the well-known Mors type with direct drive to the countershaft on top speed giving four speeds forward and reverse. The chassis throughout is a fine example of standard work, and has not been specially prepared for exhibition, but is shown exactly as supplied to customers. An 18 h.p. Mors is fitted with a most comfortable and detachable limousine body, and the rest of the stand is occupied by a 14 h.p. and 10 h.p. Renault chassis and Renault cars, with handsome hooded single phaeton and brougham bodies. The Renault chassis is too well-known to need detail treatment, but is nevertheless well worthy of inspection.

THE RYKNIELD MOTOR CO., LTD., Burton-on-Trent (221).—Visitors to the show who take an interest in automobiles constructed entirely in this country will examine the 10 h.p. chassis, nicely mounted for exhibition at this stand, with considerable interest. The frame is of cambered channelled



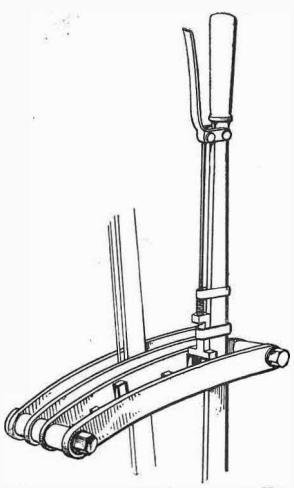
The Rykneild two-cylinder 10 h.p. engine, showing one of the inlet valves removed. Note the inlet and exhaust pipes.

steel, with underframe suspended therefrom supporting the engine and gear box. The two-cylinder engine has mechanically operated valves, being set above the exhaust on the left hand side of the cylinder, and actuated by overhead tappets in a similar manner to that of the Mercedes. The two valve covers are secured in position by one dog, which is immediately removable by detaching a central stud nut. The engine is controlled by a small butterfly throttle in the induction pipe, which is connected to the governor and to a hand lever set in the centre of the steering wheel. This engine carries a Simms-Bosch oscillating magneto, driven by an eccentric off the main shaft. The drive is through the Ryknield patent clutch, which was illustrated in our issue of Feb. 6th, 1904. It is the ordinary form of change-speed gear, giving three speeds forward, and a reverse, and propeller-shaft to live axle in the usual way. The rear wheels run on extensions of the live axle sleeve, being rotated from the outside flange. This engine and gear are run by a dynamo for demonstration, by which the action of the ingenious form of clutch can be clearly seen. Three 10 h.p. Ryknield cars are shown with bodies, one having side entrance, double phaeton body for an ordinary form of detachable tonneau, and the third having a smart-looking, roomy, van body fitted. These three cars are thoroughly well finished and upholstered, the pleasure vehicles being very smart in appearance. We are informed that a lorry body, with waterproof roof, propelled by a four-cylinder 20 h.p. Ryknield engine, has been bought by Lord Burton, for use as a shooting and station brake.

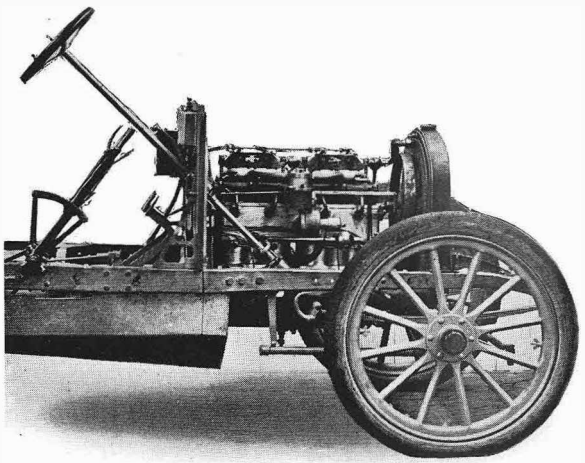
RYDE MOTORS, LTD., West Ealing (98).—A 14 h.p. three-cylinder car with tonneau body. A description of this was given in last week's *Autocar*, to which we have at the moment nothing to add.

O. C. SELBACH, LTD., Great Russell Street, W. (178, 179, 180).—On a practical stand where the exhibits can be easily inspected will be found a fine array of the well-known Regal motor cars. Practically all purchasers can be satisfied at this stand, the prices ranging from 135 to 900 guineas, and the horse-power from six to thirty. The 6 h.p. Regal cars are all fitted with the reliable De Dion engine. A speciality is being made of the Regal voiturette. This has been specially designed by the firm for the use of the medical profession. It has a body fitted with collapsable hood, the space between the dash and the seat being closed by doors of eighteen inches in depth. A dickey seat is provided for an attendant, and the car is propelled by the 8 h.p. De Dion engine. The Regal cars from 16 to 30 h.p. are fitted with the Mutel engine, but there is one new pattern 12 h.p. two-cylinder with tonneau body on exhibition which has the Selbach motor. A very fine car on the stand is the Regal 24 h.p. brougham. This is also fitted with the Mutel engine, the body being a very fine example of both coachbuilding and upholstery. The interior is finished off in fawn-coloured cloth, the roof, which is carried over the driver's seat, being provided with a luggage carrier at the rear. The front has a glazed wind and weather shield which lets down on to the top of the dashboard.

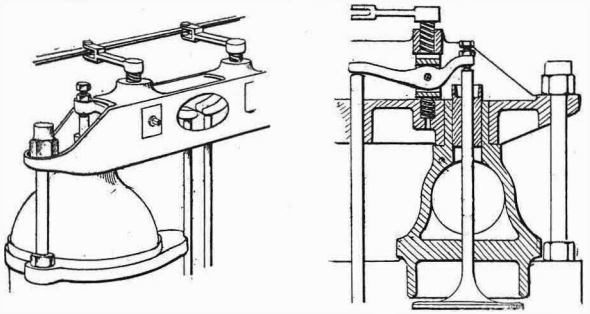
THE SIDDELEY AUTOCAR CO., York Street, W. (57 and 58).—Two chassis and a complete car fitted with tonneau de luxe body are exhibited here. One of the chassis is the 18 h.p., as described in *The Autocar* of 23rd Jan., 1904. The other chassis is a two-cylinder 12 h.p.—a reduced *facsimile* of the 18 h.p. There are also shown two of the 6 h.p. single-cylinder cars. In these the engine is placed horizontally, and attached to the crank chamber is the change-speed gear box, which contains a three-speed and reverse gear, the top speed giving twenty miles per hour. The drive is direct from a sprocket on the secondary gearshaft to a chain wheel on the rear live axle by central chain. The frame is constructed of channel steel, and is supported on the axles by long springs. One of the cars is fitted with a two-seated body, having a commodious box in the rear, while the other is the doctor's landaulette, price £250. This latter is fitted with the usual landaulette type of body, and is identical in its mechanism with the two-seated car. On this stand is also exhibited a 9 h.p. two-cylinder Peugeot, the engine of which is in the accepted vertical position, and fitted with a rotary magneto ignition, the timing of the spark obtained from this latter device being variable by means of angular cams set on the inlet valve camshaft, which is operated by hand. On the opposite side of the engine are the exhaust valves, which are actuated by a separate camshaft. An automatic carburetter is fitted, a suctional air valve giving an increased volume of air to the mixture. The water-cooling is on the usual system, the circulation being by pump, and a neat honeycomb radiator is provided for cooling purposes. A fan behind the radiator is driven at high speed direct from the engineshaft; an ordinary cone clutch engages with the flywheel and transmits power to the three-speed and reverse gear, whence it is taken to the bevel-geared rear axle by means of the universally jointed propeller-shaft. Mounted on the bevel pinionshaft is a brake drum, on to which segments are contracted by means of right and left multiple-threaded screws actuated by pedal on the footboard. The whole of the brake mechanism is enclosed in a sheet metal case, and the actuating screws are provided with a grease box, ensuring constant and sufficient lubrication. The road driving wheels are provided with drums on their hubs, the expanding segments therein being actuated by a side lever. The framework is of wood, with cambered steel flitch plates, the engine and gear box being carried on an angle steel underframe.



The change speed lever on the Siddeley is arranged to give a certain and easy change from one speed to another, this being principally achieved by a new design of quadrant with stops which can be felt.



The front end of the Siddeley 18 h.p. car. The comfortable rake of the steering standard will be noted.

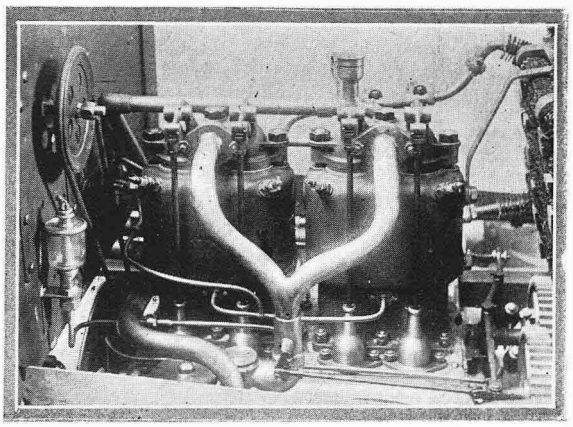


The Siddeley variable inlet valve gear which we described briefly in a previous issue of *The Autocar*. This sketch shows how the tappet levers are arranged to give a variable lift to the inlet valves by raising or lowering their fulcra by means of the screw and block.

THE SPEEDWELL MOTOR CO., LTD., London (111 and 112).—Four specimens of the new 24 h.p. Léon Bollée car are exhibited in addition to three specimens of the Speedwell. The new Bollée has been so recently dealt with in detail that we must refer our readers to our issue (October 24th, 1903) containing the description, as we have only space to recapitulate them. The frame is of the popular pressed steel pattern with tubular transverse members. In the four-cylinder motor, absence of noise and vibration are aimed at, and elasticity is secured. The ignition and carburetter levers are arranged on the steering wheel. The carburetter, it will be remembered, is a duplex arrangement, one or both parts coming into operation according to the speed of the motor. The movable part of the clutch is loosely mounted, so that when thrown in it automatically beds itself, and only a light spring is necessary, thus relieving the driver's clutch leg considerably. Both high tension and magneto ignition are employed, the former being specially useful for starting purposes. The fan is arranged immediately behind the honeycomb cooler, and is mounted in a long link provided with a spring, so that the tension on the bolt is maintained automatically. We notice that the steering centres, which are of substantial construction, are carried close up to the wheels, thus reducing the leverage set up by obstructions on the roadway—a point which is too frequently neglected. Turning to the less aspiring vehicle, we find a particularly economical little car in the 6 h.p. Speedwell. This is fitted with a genuine De Dion 6 h.p. motor, bucket seats, Michelin or Clincher tyres, two speeds forward and a reverse, at 125 guineas. Judging by the specimens exhibited, these little cars are very well finished, and finish and low price seldom go together. A de luxe pattern of the same car is sold at about twenty-five guineas more, and the last is a two-cylinder car of larger dimensions fitted with a Toni-Hubert motor. Thus it will be seen that this stand appeals to all classes.

THE STANDARD MOTOR CO., LTD., Coventry (77).—This firm are exhibiting for the first time in any automobile show a 12-15 h.p. chassis, and also a complete car of tonneau body fitted with hood. The chassis attracts particular attention on account of its low and small-looking engine. The details of this car were fully described and illustrated in *The Autocar* of December 12th and 19th, 1903, and an illustration of the car with side entrance was given in our guide to the show last week. The engine has two cylinders, 5in. bore and 3in. stroke.

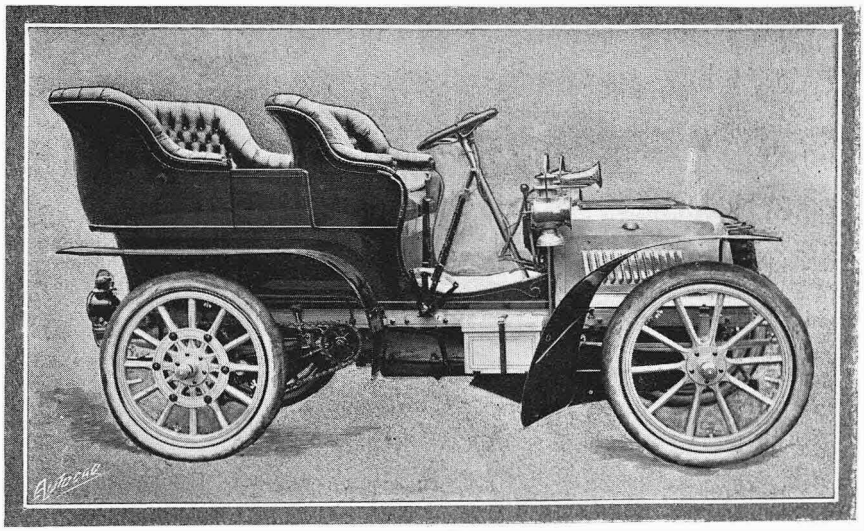
THE STAR MOTOR CO., Wolverhampton (240-241).—The nine Star cars of powers ranging from the four-cylinders 18 h.p. to the 6 h.p. little Star found here make a very fine exhibit. The feature of the stand, so far as novelty is concerned, is the new four-cylinder 12 h.p. Star, the engine of which has mechanically-actuated valves, the induction valves being on the top of the cylinders, and worked by rocking tappets *à la* Mercedes. The lift of these induction valves is controllable from the steering wheel by a rotating handle, which operates sliding cams on the half-time shaft. High tension ignition is employed, the sparking plugs being inserted just below the induction valves. In all other details the car is standard Star pattern, and is designed and finished in the usual excellent style. The price of this car with standard body is £500. All the Star cars are now fitted with a cleverly-adapted edition of the well-known Presto gear case for the purpose of protecting the chains. Another introduction to the Star patterns is the light 12 h.p. car with three speeds forward and reverse, the engine of which is on the same lines as that described above with all the rest of the detail of Star standard. We cannot speak too highly of the finish of all the vehicles staged, and we would again draw attention to the ingenious construction of the Roi des Belges bodies, built of American white wood strips, by which the Star Co. claim to be able to obtain any desired shape. The 6 h.p. little car will be found to be considerably improved both in detail and finish. Driven by a single-cylinder engine, the drive throughout is on Panhard lines, the wheels being rotated from the countershaft by chains in the usual way. This is now a particularly smart



The 12 h.p. Star engine with M.O. inlet valves.

little car, and one which, we understand, is being considerably taken to by medical men. One of the small cars shown is fitted with a moderately-priced canvas hood for doctor's use. The price of the car is £175.

THE SWIFT MOTOR CO., LTD., Coventry (148).—The Swift cars are now made in both 6 h.p. to 7 h.p. and 9 h.p. to 11 h.p., and several steps forward in their construction have been made. Thus the over-running clutches in the road wheels have given place to the more popular balance-geared axle, and the skew bevel teeth gearing is replaced by a sliding change speed gear giving a direct drive on the top speed. An important feature of these cars in the lower power is the mounting of the front of the frame on independent spiral springs, thus minimising the vibration. The driving bevel pinion is well supported before and behind in long bearings, and the casing and the balance gearing are tied to prevent twist in driving. The steering-gear has been carefully considered, and the rider's comfort is studied by the employment of a compensating rod with buffer springs to the ball joints. The 10 h.p. car is fitted to carry four passengers, and is driven by a two-cylinder Aster motor. The details of this car are worth studying, and an uncommon feature is noticeable in the internal ratchet sprag. Altogether the Swift models for 1904 are

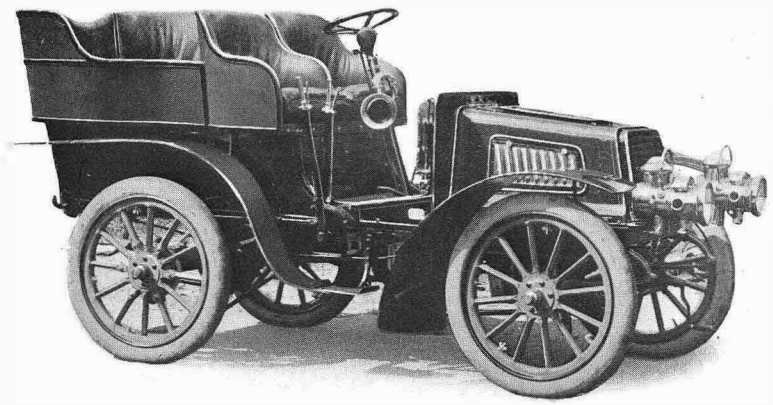


The 18 h.p. four-cylinder Star, with Roi des Belges body.

Show Report—Petrol Cars.

a considerable advance on their previous productions, and are well up to the times.

B. THOMPSON AND CO., LTD., Frome, Somerset (49).—On this stand we find two 8 h.p. two-seated Achilles cars with single-cylinder engines and gears giving three speeds forward and reverse. Also one 9 h.p. with tonneau body, also driven by a single cylinder and similar drive through out. The bodies are set upon tubular frames, artillery wheels, with 85 mm. Michelin and Dunlop tyres, and are altogether very smart, workmanlike, moderately priced



The 9 h.p. Achilles light car with standard tonneau body.

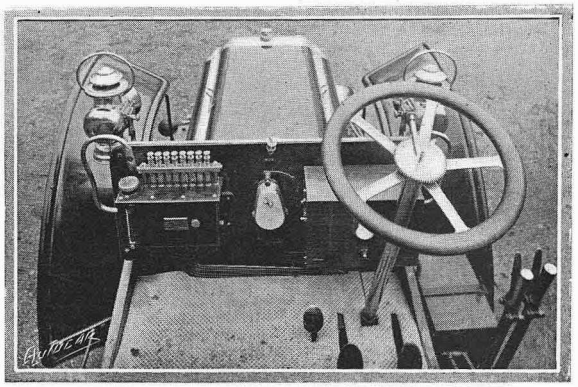
vehicles. Side lamps and tail lamps are included in the prices, which are £160 for the 8 h.p. and £245 for the 9 h.p. car.

THE THORNYCROFT STEAM WAGGON CO., LTD., Chiswick (237).—The Thornycroft exhibit consists of a 10 h.p. standard tonneau, a 20 h.p. double phaeton, and standard 20 h.p. chassis. An examination of this particular chassis will put the visitor into possession of the details of Thornycroft car construction so far as can be gathered from the inspection of such a chassis. It will be seen that the engine is of four-cylinder type, with the cylinders cast in pairs, with automatic inlet valves, fan-cooled radiator, high-tension ignition, and commutator conveniently placed at the upper end of a perpendicular shaft rotated by bevel gearing off the half-time shaft. Every part of the engine is most easily accessible, and made as simple as possible. Immediately behind the flywheel is a metal cylinder of considerable dimensions, which contains the grip plates of the Hele-Shaw clutch. This clutch has been found to give so much satisfaction that Messrs. Thornycroft are now fitting it to their standard motors (see *The Autocar* of Aug. 8th, page 199). The frame of the car is of shaped channelled steel, with underframe of lighter but similar section, and the whole construction impresses the observer with a sense of simplicity, strength, and reliability. We would draw attention to the carburetter, which is of special design, having piston valve affected by the piston speed, and opening additional air inlets as the speed of the engine increases. It has also hot water jacket from the cylinder jackets. Long plain gun-metal bearings are fitted throughout. The engine is controlled from the steering wheel by throttle valve in the induction pipe, which valve is also under the influence of the ordinary form of governor on the end of the crankshaft. The exhibitors lay special emphasis upon the fact that this car is of English construction throughout. The lubrication is of a simple and effective form.

THE VAUXHALL IRONWORKS CO., LTD., Wandsworth Road, S.W. (33).—Since we described the mechanism of the smart little Vauxhall car in detail in our columns several further improvements have been effected. To begin with, a large inspection plate is now fitted to the crank chamber, by which the big end can be most conveniently got at, while by the withdrawal of a light sliding aluminium diaphragm the piston can be withdrawn without any trouble. The bore and stroke of the engine have been increased, these being four inches and five inches respectively. A reverse speed has now been added, which perhaps was the only thing that was necessary to this little vehicle. Artillery wheels shod with three-inch Dunlop tyres are now fitted. The combined carburetter and air valve has been improved in detail. Lamps are also included in the price of £150. The tail lamp is adapted specially to illuminate the rear number in conformity with the legal regulations. The whole car is now finished in brass instead of black enamel and electro-plate, and we are bound to say that the alteration is a distinct improvement, and the Vauxhall car as here shown certainly deserves to be included amongst the best and simplest of the small, low-priced vehicles.

THE VULCAN MOTOR CO., LTD., Southport (2, Corridor).—Two 10 h.p. and a 6 h.p. cars are shown here, and both seem very good value for the low prices asked. The 10 h.p. two-seated car has been driven up from Manchester at the top speed, so it will be understood that it is a very serviceable vehicle. A two-cylinder motor is fitted, with mechanically-operated valves and automatic adjusting carburetter. The other pattern is fitted with five seats, and is more strongly built throughout. The smallest car gives three speeds and a reverse. The change-speed gear is enclosed in the same case as the balance gear on the live axle. As motion is transmitted from the engine to the gear through a universally-jointed shaft, there is practically no friction set up from the twist of the frame. One would prefer to see wheel steering instead of the tiller steering, but for £110 one must not expect too much.

THE WESTON MOTOR SYNDICATE, 14, Mortimer Street, W. (109).—Specimens of both the 12 h.p. and 18 h.p. Chenard and Walcker cars are exhibited, and the special features are well illustrated by a chassis of the more powerful vehicle. The makers have set themselves the task of providing a control by which, when an indicator is set to a special point, which may be determined at the will of the rider, the car will maintain the corresponding speed up hill and down dale. This is no easy matter, but from personal experience we are able to say it has been in a very large measure attained. The principle is broadly this, that the governor spring is automatically adjusted inversely to the speed of the engine, so that on meeting a hill, when the engine tends to slow down, the governor spring is automatically weakened, and the engine promptly picks up with increased power. The limits to speed provided range from zero to twenty miles per hour. Should the driver be minded to exceed the legal



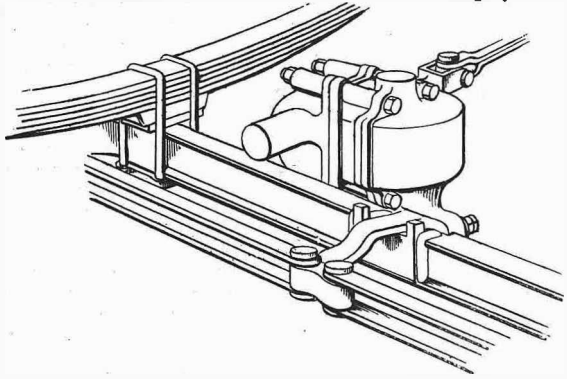
The Chenard and Walcker dashboard and steering wheel control.

limit he can throw out the governor by a pedal. The controlling lever is set in the centre of the steering wheel, but there is also a pedal connection. Another pedal serves to cut down the engine speed when the clutch is withdrawn. Two other reserve speeds are provided for specially steep inclines, thus making three in all. On the top speed the drive is direct through a Cardan shaft. The joints of this shaft are well worth inspection. The ordinary bolts are dispensed with, and each of the main star pieces has lugs arranged parallel to the axis. These lugs engage in suitably shaped recesses in an intermediate phosphor bronze connecting piece. This should make a very strong joint, the parts of which are readily separated without undoing

any nuts or such devices. The honeycomb type of cooler is employed, and the bodies of the tubes are fluted, thus greatly increasing the surface. The fan is arranged immediately behind the cooler, and the blades are mounted on a disc, so that the air does not pass through the fan to the engine, and consequently the dust simply falls away from the fan without getting into the working parts. No pump is employed in this cooling apparatus. The automatic carburetter was so fully described in a recent issue that we need not refer to it here beyond saying that it is constructed to provide a constant mixture of air and petrol according to the requirements of the motor at whatever speed it may be running. The smaller cars are fitted with two cylinder motors, and a modified arrangement of the constant speed control. Their most prominent feature is that of simplicity, except, perhaps, in the cooling, where on account of the cost a flanged radiator and pump are employed instead of the more expensive honeycomb cooler. The cars are fitted with bodies of various patterns, and all the old features for which the vehicles have been so highly reputed are maintained.

WILSON BROS., Bedford (8, Egyptian Court).—Of the three Bedford cars staged here, perhaps the 6 h.p. two-seated car at £165 is most interesting. It is driven by a 6 h.p. De Dion engine through a three-speed gear box of good construction, and is altogether a smart looking little vehicle. The footboard is comfortably enclosed with side doors, and an oval steering wheel of original design is fitted. The 10 h.p. two-cylinder and 16 h.p. four-cylinder Bedford cars are well constructed vehicles, but saving the fitting of the Ossant silencer, are not remarkable in any particular detail.

THE WOLSELEY TOOL AND MOTOR CO., Birmingham (239).—Two very fine and highly finished chassis occupy the ends of the Wolseley stand, one 12 h.p. two-cylinder and the other 24 h.p. four-cylinder. The latest Wolseley practice can easily be followed from either of these. Among the most prominent items will be noticed the pressed steel frame, H section front axle, ready accessibility to inlet valves, and the substitution of leaf springs for spirals for the exhaust valves. The countershaft brake has now been removed, and the gear box rendered practically oil-tight. The brakes are concentrated upon the road wheels, the pedal brake being of the expanding type, and the hand brake of the external band variety. The forward end of the rear springs are free to slide horizontally in a strong slide or box bolted to the frame, and we understand that this has a very considerable effect on the easy running of the car on bad roads. We are glad to note that the petrol gauge, which has always been a feature, and a most useful and practical one, of the Wolseley cars is retained. The silencer has been increased in size, and the escape is from a tube with a series of perforated holes lying beneath the back frame two feet or more from the ground, so that the blast is horizontal and right away from the road. The box containing the worm and wheel, which used to be bolted below the front axle, is now above, and it enables the engine to be much more easily protected, besides giving a neater appearance. The 6 h.p. Wolseley, at £175, which is a genuine miniature car, and thoroughly well made throughout, is shown for the first time in its now settled form, with the three-speed gear separated from the engine, as illustrated and described at some detail in *The Autocar* of January 9th, page 40. A new carburetter is now being fitted to the Wolseley cars (page 227).



The Wolseley steering gear box attached to and above the front axle.

VOITURETTES.

The number of voiturettes in the show was not so large as was expected by many people. These machines, like those of any other class, are scattered up and down the show, and for the convenience of those mainly interested in the motor car built for two we give a list of exhibitors who are showing such vehicles. In a few cases, three seats are available, and in one case four seats, but nothing over £200 is included in the list we give below, some of the cheaper cars being very much less than this. The prices of most of them will be found in the classified list of the autocars of 1904 which we published in our issue of February 6th. The main points of all the above machines are described in the preceding pages under the name of the firm responsible for them. Many of them are quite well-known machines now, having been made for the last twelve months or more, while two or three are still more thoroughly tried. Some, however, are new introductions, and have not been seen by the public before till the present show. Speaking broadly, the voiturette with two or three seats is separated into three distinct types. In the first we have the engine in front, placed vertically, and driving through an ordinary pedal-controlled friction clutch to a two or three-speed gear, and thence by a bevel drive on to a live back axle. The second type also has the engine in front, but it may be horizontal or vertical, and it is connected with the first gearshaft by a chain, and the secondary gearshaft in its turn driving the back axle through a chain. The third type is the American, in which the engine is carried horizontally beneath the seat, and drives through a single chain to the back wheels. These machines generally have two speeds by an epicyclic train of wheels contained in the driving pulley. In the list below the name of the firm is given when that of the car affords no clue to it.

	Stand
7 h.p. Belsize Junior	137
6 h.p. Argus (Farman Frères)	76
6 h.p. Firefly	131
5 h.p. Humberette	238
6 h.p. Little Star	241
8 h.p. Darracq (four seats)	9
6½ h.p. Doctor's car (General Motor Car Co.)	59
6½ h.p. Runabout (General Motor Car Co.)	59
6 h.p. Siddeley	57
6 h.p. Bedford (Wilson Bros.) (Egyptian Court)	8
5 h.p. Alldays' Traveller	107
6½ h.p. Alldays' Traveller	107
6 h.p. Mobile	52
6 h.p. Pick	114
6 h.p. Speedwell	111
6½ h.p. Cadillac Runabout	223
Mabley car (Marston, Ltd.)	147
7 h.p. Swift	148
5 h.p. Vauxhall	194
6 h.p. Vauxhall	33
6 h.p. Anglian	207
4 h.p. Avon (Corridor)	27
8 h.p. Horley (Egyptian Court)	4
6 h.p. Regal (Meier, A.)	178
6 h.p. Vulcan (Corridor)	2
6 h.p. Wolseley	23
5 and 6 h.p. Brush	142
4½, 5, and 6 h.p. Eagle	225
8 h.p. Achilles (Thompson, B., and Co.)	49
9 h.p. Beaufort	100
6 h.p. De Dion	163-5
6 h.p. Oldsmobile	154-5-6
6 h.p. Leonard (Corridor)	1
8 h.p. Wyss (Coles and Wyss)	142

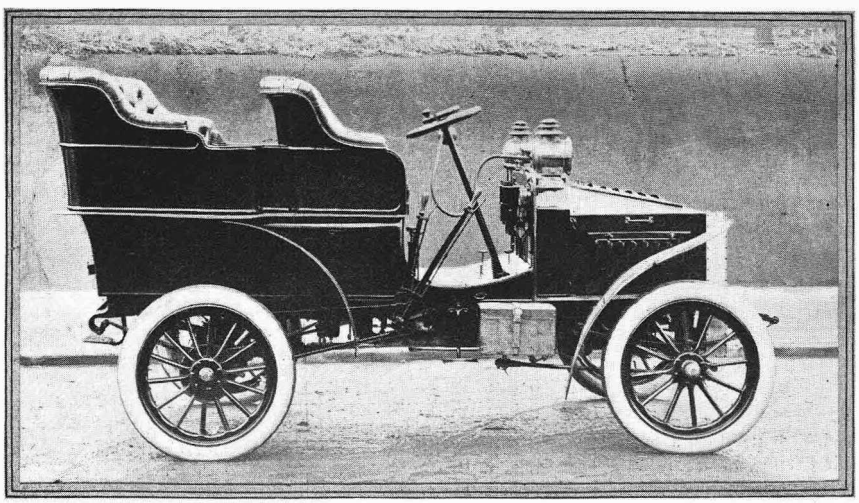
STEAM AND ELECTRIC CARS.

L. R. BAILEY, 217, Piccadilly, W. (131).—The principal exhibit here is the Miesse steam car, of which a chassis and complete car are staged. The chassis discloses several alterations since the first Continental Miesse car was exhibited some two years ago. The broad principle is followed by the English manufacturers, the Turner Motor Mfg. Co., of Wolverhampton, though many detail improvements have been effected. A full detailed description of the car was given in *The Autocar* of October 17th, 1903 (page 480), but for those interested in steamers a brief recapitulation of the system will be of interest. The car is propelled by a three-cylinder single-acting engine, to which steam is supplied by a flash type generator, beneath which is a paraffin-fed Bunsen burner, the supply to which is controlled by hand, so that the driver has the generator under his own control. Situated on the steering column is a small lever which controls the amount of water passed to the generator. It is claimed that by having the water and fuel control separated the driver can, after a little experience and the exercise of some intelligence, get the very best results from the car, with which we agree. The steam after passing through the engine is conveyed to a stack of radiators in front of the car, where it is condensed to water. An illustration of the Miesse car was given in the last issue of *The Autocar* on page 190.

THE ANTI-VIBRATOR, LTD., Croydon (25, Corridor).—This company, which has only recently come before the public, has spent the last two years in carrying out experiments to produce a satisfactory electric vehicle. The brougham which the firm shows is a handsome and well-designed vehicle. From a constructional point of view, the peculiarity lies in the fact that there is no frame proper, the body of the carriage serving for the frame. The front and rear axles are tied by tubular radius rods, which allow of the axles swinging to accommodate any inequalities of the road which may be encountered. Forty-four cells are employed, these being accommodated beneath the rear seat of the brougham and the front driving seat. The batteries are cut up into sections, so that the employment of a resistance for reducing the speed of the motor is done away with. The road wheels are mounted on combined roller and ball hubs, and the tractive resistance is so slight that only three and a half ampères are required to start the car.

THE ELECTROMOBILE CO., LTD., 7, Curzon Street, Mayfair, W. (236).—In addition to the C spring victoria double landaulettes, single landaulettes, single and double broughams, and cab electromobiles, an 8 h.p. electromobile chassis is staged, in which the disposition of the accumulators, motor, and the control can be examined with interest. The frame of the carriage is built of channel steel, and the forty-four Contal cells, which weigh about ten hundredweights, are carried in an underslung battery box in the centre. This gives rapid change of batteries, even distribution of weight, and simple and thorough examination and manipulation. The battery has a capacity of 135 ampère hours, and is sufficient to propel the double landaulette, over average roads in fair condition, a distance of about thirty miles. The motor is of 8 b.h.p. at 1,500 revolutions, but it can be run up to 16 h.p. for short periods. It is of the ironclad type, bi-polar, and series wound, having two separate commutators connected to separate armature windings. It is suspended from a transverse member of the frame by a strong spiral spring, and this support of the oblong bracket is bolted to the differential case casting. The drive is through a double train of helical gearing to the differential surrounding the live axle. Steel sleeves project from the differential gear box beyond the springs, and form bearings for the road wheels, which are propelled from the outside of the hub by a live axle passing right through. The car is fitted with wheel steering, and the control is actuated by a lever set immediately beneath the wheel. The bodies fitted to the chassis are of the most luxurious and highly-finished description; have electric lights inside, outside, and in rear, in conformity with the law.

KEENE'S AUTOMOBILE WORKS, LTD., 2, Bath Road, W. (5, Egyptian Court).—Lovers of steam cars will be interested to examine the Keenelette steam car, which is here shown for the first time. In outward appearance the car resembles as nearly as possible a petrol-driven vehicle. The engine is set beneath the bonnet, the forward end of which is filled in with flanged radiator tubes in the usual way. It has a 14 h.p. single cylinder, single action vertical steam engine, with mushroom valves actuated by special sliding camshaft, which gives any desired cut off from zero to full stroke. The direct drive on to the rear axle is by means of flywheel and friction cone, which is controlled by pedal from the footboard, and subsequently by propeller-shaft and bevel gearing. The generator is placed beneath the back of the car in a particularly accessible position, and consists of coils of tubes made from a brand of specially mild and tough steel. Each layer of coils slides in shelves, and is connected up to the coils above and below by a special clamp joint, detachable in less than a minute. Should anything happen to necessitate a fresh coil, one can be carried as a spare, and the damaged one replaced in a very short space of time. The boiler is of the semi-flash variety, the feed being into the top coil, the lower coils always containing water. Altogether there are three hundred feet of quarter-inch bore tubing in the generator. Mr. Keene informs us that the burner, which uses common paraffin, is of special construction, but at the moment of our visit particulars were not available for patent reasons. In order to prevent unpleasant heating on the back seat, from the fact of the generator being below, air funnels are set at the side of the car, which pass a rapid current of cold air into an eight-inch space between the top of the funnel and the bottom of the seats. This arrangement, we are informed, keeps the back seats perfectly cool. Water sufficient for a run of one hundred and fifty miles is carried in a longitudinal tank below the body, and is fed to the boiler by special automatic pumps, which require no adjustment, and which in combination with the safety valve never allow the pressure in the boiler to fall below 300 lbs. to the square inch. In consequence of this the car can always start right away at full speed, and no hand pumping is required. The engine can be allowed to run light at thirty revolutions per minute when the car is standing, thus permitting the boiler to be kept properly fed with water and everything ready



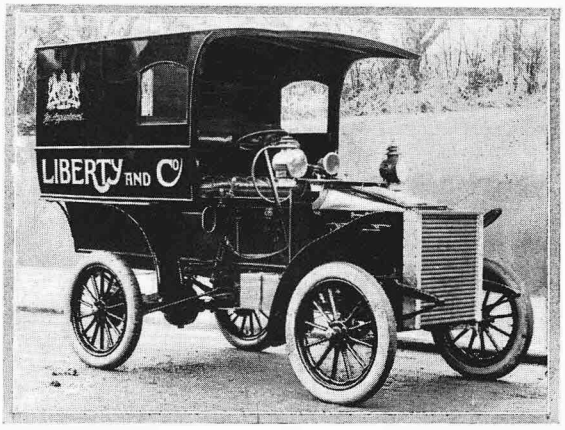
A White steam car with roomy tonneau body.

for an immediate start. A maximum speed of thirty miles an hour is claimed. A most ingenious and convenient method of filling oil and water tanks through permanent funnels on the side of the car, without the disturbance of any parts, is shown fitted. We hope to be able to describe in detail this interesting steam innovation at an early date. Internally expanding brakes are fitted on the driving gear spindle and the rear wheels.

THE LONDON ELECTRO MOBILE SYNDICATE, LTD., Euston Buildings, N.W. (61).—Late on Saturday evening there were placed upon this stand two light electric cars, one single phaeton and one brougham, this latter being specially designed for the use of medical men. The available particulars do not disclose any special new feature.

THE SPEEDWELL MOTOR ENGINEERING CO., LTD., 151, Knightsbridge, S.W. (111 and 112).—The 9 h.p. Gardner-Serpollet had not turned up at the time of our visit, but was expected at almost any moment. It was to be shown in chassis form, and several alterations tending to the simplification of the vehicle are, we understand, introduced. The purchaser is given the benefit of the simplification in the ease with which he can control and attend to his vehicle, and in the matter of price, this has been substantially reduced.

WHITE STEAM CARS, Regent Street, W. (83-84).—The 10 h.p. White steam car is shown here with a variety of bodies. In every instance the mechanism is precisely the same. The engine is a two-cylinder vertical one, placed in front of the dashboard beneath the bonnet. It has two cylinders, the high pressure one being 3in. in diameter, and the low pressure one 5in. in diameter, both having a stroke of 3½in. The piston rod guides, connecting rods, and the bearings are all encased in an aluminium casting. The power is transmitted to the rear live axle by a propeller-shaft and bevel gearing. A flash type generator is used, the steam being taken away from the bottom of the generator, so that super heat is obtained. The burner is of the ordinary Bunsen type, using petrol as a fuel. The supply of fuel is regulated by a thermostat, so that when the heat increases the amount of fuel supplied to the burner decreases in corresponding proportion, while any decrease in temperature gives an increase in fuel supply, thus allowing the burner to generate sufficient heat to keep the steam pressure up. The water supply is controlled by a diaphragm regulator. Any increase of steam pressure above the normal acts on the diaphragm, and cuts down the water supply, so that the water and fuel supplies are separately regulated, both being automatically kept to the correct proportions within narrow limits. The exhaust steam from the engine is led to a stack of radiators placed in front of the car, the cold air impinging upon this condenses the steam, and the resultant water is passed through a separator, in which any oil which has been taken up by the steam in passing through the cylinders is separated from the water, so that clean water is always passed through the generator. As demonstrated in the club trials, this car will run long distances on one charge of water As to the bodies, they are of the tonneau and limousine types principally. Another type consists of a light parcels van, similar to that which has been in use by Messrs. Liberty for some time past with eminently satisfactory results.



A White delivery van, suitable for light but bulky loads.

DELIVERY VANS AND VEHICLES FOR HEAVY TRAFFIC.

THE BRISTOL WAGGON AND CARRIAGE CO., LTD., Bristol (34).—This company exhibit one of their steam motor lorries having a platform capacity capable of dealing with five ton loads, and the vehicle is constructed to draw a trailer with an additional three tons. The engine is of the usual compound type, the boiler being placed vertically in front.

THE CADOGAN MOTOR AND GARAGE CO., LTD., Chelsea, S.W. (35).—Here is to be seen the only heavy road vehicle propelled by an internal combustion engine. This engine is of 34 h.p., and is placed forward beneath the driver's seat. It has four speeds forward and reverse, the final drive being from countershaft to road wheels by chains.

T. COULTHARD AND CO., Preston (7, 8, 13, and 14).—Staged here side by side are two Coulthard steam road vehicles. One of the old type where the driver sat in front of the boiler, and the other where the driver's accommodation and comfort have been more carefully considered. Both of these vehicles are the property of Messrs. Skurray and Sons, millers, of Swindon. The older one has travelled over 18,000 miles with loads varying from four to five tons upon the platform, and at times drawing a trailer carrying from six to eight tons. Needless to say, there are many alterations and improvements in the new vehicle which we are unable to go into detail with here. The mere fact of the two lorries being shown side by side

A Coulthard C type lorry, a *fac-simile* of which is shown in the Heavy Vehicle Section.

conclusively proves how well satisfied their users have been with them.

THE CARAVAN RESTAURANT CO., Queen Victoria Street, E.C. (3 and 4), exhibit a steam caravan fitted up as a refreshment saloon. The forward portion of the caravan is mounted on the rear end of a steam tractor on the Thornycroft system, the pivoted steering for the caravan being mounted directly above the rear axle of the tractor.

JESSE ELLIS AND CO., LTD., Maidstone (5 and 6 and 15 and 16).—Two steam vehicles—one fitted up as a sanitary tip waggon and the other as a platform lorry—are shown. This system has been described in detail in previous issues of *The Autocar*. Briefly, the engine is compound, driving on to a rear live axle by gearing. The boiler is placed over the front axle in vertical position.

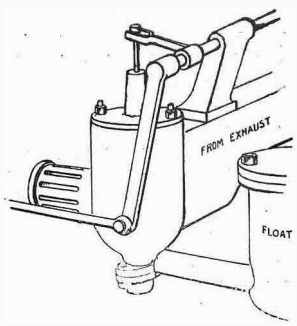
FIREFLY MOTOR CO., Croydon (132 and 133).—This exhibit is principally devoted to delivery vans ranging from 6 cwts. to 25 cwts. The 10 cwts. van is propelled by a 6 h.p. motor with mechanically-operated valves, the transmission gear being of the Cardan type. Similar chassis are also fitted with passenger bodies, and, of course, are geared higher. Some of the delivery van bodies are finished for well-known firms.

H. E. HALL AND CO., with no stand number allotted, are to be found in the Heavy Vehicle Section exhibiting a Foden steam waggon.

E. S. HINDLEY AND SONS, Queen Victoria Street, E.C. (36).—One five ton steam lorry with compound engine, vertical boiler in front, driving direct through gearing to live back axle.

TASKER AND SONS, LTD., Andover (1 and 2).—Two Little Giant steam motors are shown. These are practically miniature traction engines fitted with compound engines placed over an horozontal boiler, and generally following the lines of the traction engine. They are largely used for hauling loads on highways and for general agricultural work.

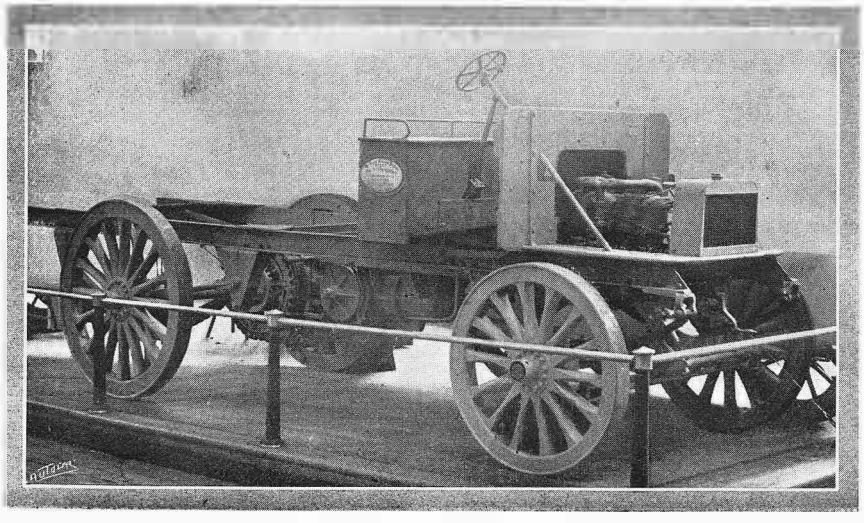
MILNES-DAIMLER, LTD., Tottenham Court Road, W. (166-168).—This company has made a speciality of heavy vehicles, and show two 'buses for the G.W.R. Co., to be run on their Penzance and Burnham Beeches routes respectively. These are both very fine vehicles, and are fitted with the company's well-known Daimler motor. These have mechanically operated inlet valves, and, of course, the Simms-Bosch magneto ignition. The transmission gear is not altered, motion being taken through a universally jointed shaft to a balance geared countershaft carrying spur pinions engaging with internal teeth on the road wheels. These are very powerfully built, are fitted with very large tyres, and are greatly dished. Two chassis are also on view, giving one a good opportunity of inspecting the very substantial construction. The G.W.R. Co. have thirty of these vehicles altogether, and the G.E.R. Co. have ordered six. In some respects the most important feature of the exhibit is perhaps the paraffin carburetter, which is simplicity itself. The ordinary float-feed and jet carburetter is used for starting the engine, being supplied by a small petrol tank. The exhaust from the engine is led by a bypass around the vaporising chamber of the paraffin carburetter, which, so far as principle is concerned, is precisely the same as the petrol carburetter. Of course, the proportions of the jet are somewhat different, but the carburetter, as such, is of the ordinary float and jet type, with the jet chamber jacketed and heated by the exhaust gases. As soon as the engine has made a few revolutions on petrol, and the jet chamber of the paraffin carburetter is warmed up, a lever is moved which simultaneously shuts off the petrol jet and opens the paraffin jet, and the engine continues its running on the latter. The arrangement is shown in the illustration, and, as we have said, is simplicity itself. We are assured that the results in practice are most satisfactory.



The Milnes-Daimler petrol-paraffin carburetter, details of which are given in the descriptive matter herewith.

THE STRAKER STEAM VEHICLE CO., LTD., Bush Lane, E.C. (9-12).—Here are shown two chassis, one constructed to take any kind of body carrying up to five tons, and the other two tons. These serve to show the construction of the vehicles to those interested. The engine is of compound type, steam being supplied from a vertical boiler placed over the front axle. A two-speed gear and reverse are provided, driving by duplex chains on to the rear live axle. Two completed cars of the same type are also shown, as well as a large 'bus built to run between Penrith and Patterdale in the Lake District, carrying twenty passengers and luggage; there is also a twelve-passenger omnibus.

THE THORNYCROFT STEAM WAGON CO., LTD., Chiswick (237).—At one end of Messrs. Thornycroft's stand is found a two-ton petrol van driven by a 20 h.p. engine, similar to that of the 20 h.p. pleasure car. The drive also passes through a clutch of similar description, to gear box, giving three speeds forward and reverse to countershaft, and thence by single chain to sprocket set around the differential gear on the live axle. Two elliptical springs are bolted to the ends of the live axle, and the drive is conveyed from these springs to the felloes of the wheels, this method being one of the company's patents. The lorry is braked by a powerful sheaved block drum brake on the end of the countershaft and a still more powerful band brake mounted on a drum over the differential. The frame is of channelled steel, and mounted on ample springs, the rear pair being carried below the axle. In the Heavy Vehicle Section (stands 19 and 20), Messrs. Thornycroft stage one of their standard four-ton steam drays, and a similar vehicle fitted with an enclosed top tipping body. The Thornycroft system is well known, and has proved successful in continual and extended use.



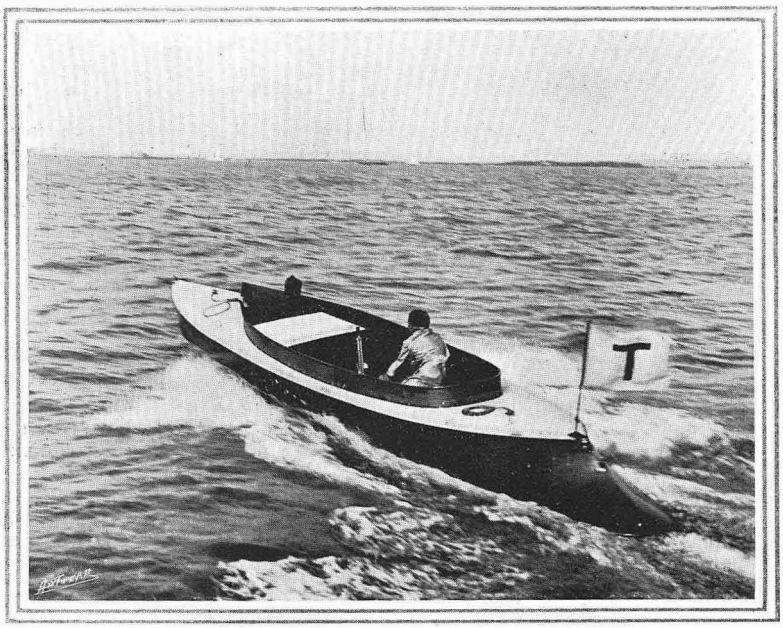
The 20 h.p. Thornycroft lorry, propelled by a four-cylinder petrol motor.

WALLIS AND STEVENS, LTD., Basingstoke (17-18).—This is a miniature traction engine shown in conjunction with a flat platform lorry, which is fitted with a new design of hauling connection, which permits of the vehicle being backed. This arrangement is simply a screw steering gear fitted on the front of the lorry, which for haulage purposes is put out of action. For backing, the steering is actuated so as to bring the lorry into the desired position.

MARINE MOTORS.

THE CANADA LAUNCH WORKS, LTD., Toronto, Canada (41).—Two beautifully finished boats of Canadian manufacture—one 16 feet and the other 18 feet long—are exhibited here. Both these boats are fitted with 2½ h.p. two-cycle motors, with magneto ignition, which actuate a reversible propeller.

THE GROSVENOR ENGINEERING WORKS, Chelsea, S.W. (24).—A 14-feet motor launch is shown here, fitted with a 4 h.p. water-cooled motor driving a reversing propeller. There is also a 4 h.p. engine set for fitting to a motor launch, this having a fixed propeller screw, the reverse being obtained by means of a clutch and epicyclic gear. A similar arrangement is shown in conjunction with a 15 h.p. four-cylinder engine. There is also shown a 25 h.p. four-cylinder engine designed for marine work. The Grosvenor circulating pump, which is on the same principle as the Panhard and many other similar pumps, is also to be seen, a speciality here being the long pumpshaft and asbestos packing, the tightening of which is arranged in a very simple and easily attainable manner.



A VIEW OF THE THORNYCROFT LAUNCH SCOLOPENDRA. This boat won the "Yachtsman's" cup and the Cowes cup, her time for the latter race being 1h. 32m. 42s, or an average of 14·5 knots an hour. The course was 22½ nautical miles.

J. E. HUTTON, LTD., Shaftesbury Avenue, W. (26, Corridor).—A trimly-built 15-foot yacht's launch constructed and engined by J. W. Brooke and Co., of Lowestoft, is the central feature of this exhibit. The engine is a two-cylinder vertical one, driving a reversible propeller. A 20 h.p. four-cylinder petrol motor is also exhibited, as well as an 8 h.p. three-cylinder Panhard engine arranged for fitting to a launch.

THE LAUNCH MOTOR CO., Chiswick (42, Corridor).—This firm is exhibiting Lozier marine launch motors, both of the two and four-cycle types. This motor is a favourite one in the United States, where it is specially constructed for employment in launches.

THE MAUDSLAY MOTOR CO., Coventry (81-82).—An 18 h.p. three-cylinder Maudslay engine, complete with propeller-shaft and propeller, is exhibited on a dummy keel. Engines for motor launches or yachts are made in the following powers: 18 h.p. and 25 h.p. each with three-cylinder engines, and 40 h.p. and 60 h.p. with six-cylinder engines.

THE MITCHAM MOTOR CO., Isle of Wight (40).—A beautifully designed and fitted 20-foot sea-going launch is exhibited. It is propelled by a single-cylinder 3 h.p. American-built engine. Similar engines of various powers are also shown. One interesting little set is a ¾ h.p. motor complete with propeller-shaft and reversing propeller. This set is suitable for a 10-foot boat, and costs £15.

SIMPSON, STRICKLAND, AND CO., LTD., Dartmouth (23).—On this stand is shown the only example of steam launch to be seen in the show. This consists of a thirty-foot yacht's launch which is claimed to be the fastest of its kind in the world, the mean speed being nineteen knots per hour. The engine is a quadruple expansion, giving 140 indicated h.p. at 1,200 revolutions per minute, and 375 lbs. pressure. Steam is supplied by a Thornycroft water tube boiler, and a condenser forms part of the equipment. Four sizes of quadruple expansion steam engines are also shown.

THE SIMMS MANUFACTURING CO., LTD., Willesden Lane, N.W. (27-28, Corridor).—Simms engines are shown, with one, two, and four cylinders, giving 6, 12, and 20 h.p. respectively, and fitted with clutch for going ahead and clutch and gearing for going astern. Also a 12-foot yacht's dinghy, fitted with a 3 h.p. single-cylinder engine. All these motors, of course, are fitted with the Simms-Bosch magneto ignition.

J. I. THORNYCROFT AND CO., Chiswick (21 and 22).—The Scolopendra thirty-foot racing launch, which won the "Yachtsman's" cup at the races held at Cork, which it will be remembered followed the Gordon-Bennett race, is shown here. This is fitted with a four-cylinder vertical petrol motor of 20 h.p., also with the Hele-Shaw clutch, and with reversing gear. The firm also exhibit one 20 h.p. four-cylinder and one 30 h.p. four-cylinder marine motor, which are also fitted with the Hele-Shaw clutches for going ahead and astern.

THE VIKING MOTOR CO., who do not appear in the catalogue, exhibit a small sea-going launch fitted with a 3½ h.p. motor. This boat has seen considerable service, and is stated to be capable of towing a 25-ton yacht.

ENGINES, PARTS AND FITTINGS.

ARMSTRONG, STEVENS, AND SON, Whittall Street, Birmingham (251).—This firm shows tubular and honeycomb radiators, coils, bonnets, tanks, steering gear, forgings, etc.

W. BEARDMORE AND CO., LTD., Victoria Street, S.W. (11, Corridor).—Pressed steel frames of British manufacture. The joints are hydraulically riveted, and the frames are turned out in the usual sections. A stamped steel wheel with cast steel shoes is also shown suitable for motor lorry use.

THE BEGBIE MFG. CO., LTD., Oxford Street, W. (181-182).—A fine exhibit, brilliantly lighted by the Lucas patent gas light, encloses a display of Aster engines and parts, which are under the name of Henry Whitlock, Ltd. On the same stand are exhibited Whitlock-Aster cars in 10 and 20 h.p. patterns. These are fitted with the well-known Aster engine, and as the Aster firm were one of the first to commercially standardise the light high-speed petrol engine, their manufactures can be relied upon to give most excellent results.

THE BIRMINGHAM ALUMINIUM CASTINGS CO., LTD., Birmingham (244).—This stand is interesting as showing how very largely aluminium castings now enter into the construction of the modern automobile. Some of the gear-case and crank chamber castings are of a most intricate description, and testify to the extreme skill and knowledge brought to bear in their production.

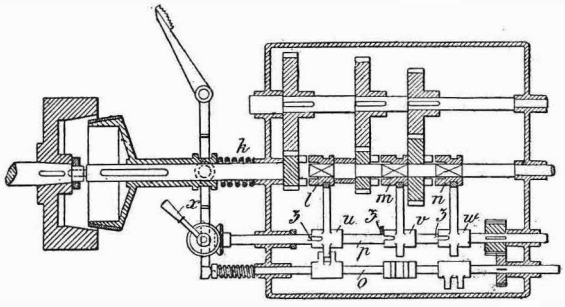
Show Report—Engines, Parts, and Fittings.

BRAMPTON BROS., LTD., Birmingham (45), show their well-known chains in every width of pitch used by the motor trade. Seventy-two patterns in all are exhibited. Chain wheels, chain wheel cutters, and ball bearing cups are also to be seen. Messrs. Brampton were the first pitch chain makers to take up the manufacture of such chains for motor cars, and their chains are as well-known and as widely used in France as they are at home.

CASSWELL, LTD., Great Eastern Street, E.C. (245), show a large and interesting assortment of accessories generally, and some items of motor clothing.

THE COVENTRY CHAIN CO., LTD., Coventry (50).—The motor cycle chains made by this well-known Coventry house have earned for themselves so excellent a reputation that eulogy of the work shown here is quite unnecessary. Buyers of chains will find samples of all the types made shown here. The special motor chain with integral bushes and side plates, which largely reduce the number of pieces in the chain, should be inspected.

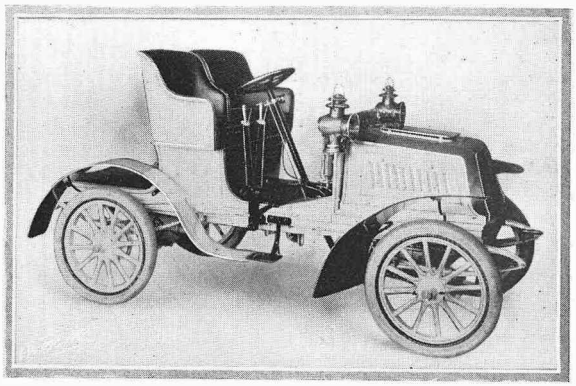
THE LANGDON-DAVIES MOTOR CO., Southwark Street, S.E. (235).—Although a motor van occupies the major amount of space on this stand, the specialities to which the exhibitors draw the attention of visitors are the new change speed for motor cars and the new friction clutch, which are both worthy of careful inspection. As will be seen by the diagram produced herewith, the gear wheels are always in mesh, and are locked to the shaft as required



The Langdon-Davies change speed gear.

by interlocking jaw clutches. When the clutch pedal is pressed down, it first releases the sliding clutch, then unclutches the wheel which happens to be in gear, and allows the selection of another gear wheel. When the pedal is released and rises, the spring pulls the camshaft *o*, and through the medium of one of the forks *u*, *v*, *w*, operates one of the clutches *l*, *m*, *n*. The clutch *l* engages the shaft *k*, giving a direct drive at top speed. The pins and slot *z* on the rod *p* prevent the handle *x* from being moved, except when the pedal is fully depressed, and also prevent any but the selected gear from being engaged, the handle

A Cadillac fitted with a light van body (see page 232).



One of the cheapest two-seated cars in the exhibition. It is built by the Horley Motor Co., and costs 100 guineas.

being definitely locked except when the pedal is depressed. The system is, of course, applicable to more than the three speeds and reverse, as shown in the diagram, and is fitted to the van and shown separately at this stand. The clutch, which to some extent resembles the Hele-Shaw clutch but has a distinct difference, is formed of a series of plates carried on a prolongation of the flywheel and clutch sleeve alternating with spring washers between each pair of plates. This clutch runs in oil entirely, and is said to take up the drive quite sweetly, even when the clutch is let in with considerable violence. We hope to clearly illustrate and fully describe this clutch in an early issue.

LOWE, BEVAN, AND CO., Birmingham (46), have a comprehensive exhibit of motor body furniture; also lamps, brackets, etc.

R. MELHUISH, SONS, AND CO., Fetter Lane, E.C. (214).—A large array of tools, machines, and appliances for general engineering and motor work.

W. MILLS, LTD., Sunderland (23).—A very fine array of most interesting aluminium castings of every description for motor work, launches, lorries, etc.

PHILIPP AND CO., New Broad Street, E.C. (198), show a collection of motor parts, gear boxes, axles, and lubricators of all sizes, from the small pump type with a single piston to the largest ones with from seven to ten leads.

J. RICHARDS AND CO., Birmingham (19).—A comprehensive exhibit of springs, axles, lamps, and general motor carriage iron work.

ROTHERHAM AND SONS, Coventry (90).—This exhibit is chiefly of interest to automobile constructors and those connected with the industry, as it consists entirely of small parts and fittings necessary in the construction of autocars. On the same stand are also shown watches and clocks for motor vehicles.

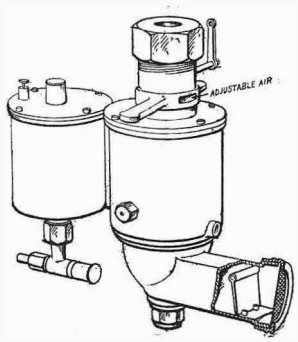
THE SIMMS MFG. CO., LTD., Kilburn, N.W. (149-150).—The principal alterations in the Simms chassis consist in making the clutch detachable without dismounting the engine or the gear, and in providing both a hand and foot accelerator. A strengthened edition of the Welbeck chassis is provided for delivery vans up to about 15 cwt., and to run at about fifteen miles per hour. Two new batteries of the Simms motor are introduced—one a two-cylinder 12 h.p. of very compact formation, and the other of 3½ h.p. guaranteed to give up to 5.4 h.p. at 1,800 revolutions, this being more particularly intended for motor cycles. Both have mechanically operated valves.

T. SMITH AND SONS, of Saltley, Birmingham (9, Corridor).—This is one of the oldest firms in the stamping trade, and they are quite up-to-date in the production of automobile parts, in addition to which they are also showing small motors and side flanges for motor car tyres.

G. STRAUS AND CO., Upper Thames Street, E.C. (247).—On this exhibit are found examples of the well-known 5½ h.p. to 6 h.p. one-cylinder and 12 h.p. two-cylinder Fafnir engines. These engines have mechanically-operated valves, with governor set on a perpendicular shaft above the crank chamber, and in an aluminium cylinder

bolted to the chamber. The downward continuation of the governed shaft rotates a water-circulating pump, while on the upper end of the same shaft the commutator is most conveniently fixed. Change-speed gears and back wheel axles.

UNITED MOTOR INDUSTRIES, LTD., Great Marlborough Street, W. (92).—Among the innumerable things shown on this stand are to be found many parts and fittings, which should be carefully enquired into by those interested in the automobile industry. These include several types of radiators and water-circulating pumps. The Cremorne carburetter is shown, as is also the Vaurs in various sizes. While the new Longuemare carburetter with the automatic extra air inlet is also to be seen here. The accompanying sketch clearly shows this. On the right there will be seen a swinging trap door, which opens in accordance with the suction of the motor, and takes in the requisite amount of pure air. Complete change-speed gears, clutches, countershaft bearings with sleeves, axles, and sprockets complete; automatic lubricators, steering gears, etc.



The new Longuemare carburetter.

J. TYLOR AND SONS, LTD., King's Cross, N. (27).—Petrol engines for various duties, also the Tylor float-feed carburetter and other accessories, will be seen on this stand.

THE WELDLESS STEEL TUBE CO., LTD., Birmingham (248), have their usual interesting exhibition of steel tubes, coils, flash boiler coils, cylinders, axles, etc.

TYRES AND NON-SKIDS.

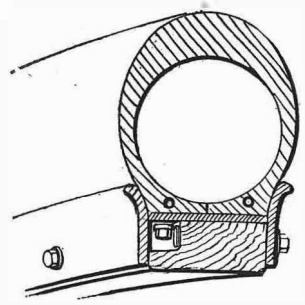
THE ANDERSON MOTOR TYRE CO., LTD., Great Dover Street, S.E. (74).—A large number of re-treaded tyres showing the quality of repair work executed by this company are displayed here.

W. AND A. BATES, LTD., Leicester (212).—A varied assortment of their well-known rubber goods for use in the manufacture of motor tyres is to be seen here; also several patterns of non-slipping bands.

THE BRITISH MOTOR TYRE CO., Manchester (18, Corridor).—The new red Seddon motor tyre, which can be used with or without an air tube and which we illustrated and described in *The Autocar* of Jan. 16th, p. 64, is shown for the first time in any motor exhibition. One of a set of tyres stated to have been driven 10,000 miles is on exhibition and in excellent state of repair; in fact, it looks very little the worse for its work. This is the only successful tubeless tyre which has been used for motor work, and is entirely different from the tubeless tyre employed for pedal cycles, as the joint all round the inside of the cover is a mechanical one and not a flap held down by air pressure.

THE CLIPPER PNEUMATIC TYRE CO., LTD., Coventry (37).—A large array of the well-known Clipper motor tyres are to be inspected at this tasteful stand. The goods can be examined in sections, of which there are many available. Considerable interest will be taken in the covers shown with the new non-slipping tread. These new tyres are to be seen also on many of the cars shown in the exhibition. The tyres used by Capt. Deasy on his trip up the Roches de Naye funicular railway are to be seen here.

THE COLLIER TYRE CO., LTD., 210, Shaftesbury Avenue, W.C. (43 and 44).—We now find the Collier tyre shown with an improved method of attachment to the rim. The wooden felloe is surrounded by a thin flat steel rim, after the manner of an ordinary iron wheel tyre, and upon this rim the feet of the rubber cover stand. On both sides of the wooden felloe beneath, small pockets are formed on each side, and on the upper side of the wooden felloes small pockets are formed alternately, in which the bolt ends of the flange bolts, and the small cone nut securing the stud to the cover are accommodated. The lower edges of the cover are preserved from damage by steel flanges with over-turned lips, these flanges being secured to the felloe by the bolts already mentioned. The new fastening is much neater in appearance, and makes altogether for the simpler and easier detachment of the cover. The new felloe is wider and much stronger in section than that previously used. When detaching the cover with the new fastening the use of tyre levers is unnecessary, the cover slipping off the flat steel rim so soon as the tyre stud bolts are released. On easels on the stand are mounted a set of 34 × 4½ × 4½in. Collier tyres, which have been run no less than 12,000 miles on a 16-20 h.p. Dennis car. The condition of these tyres is remarkable, and is ample evidence of the wonderful wearing qualities of the Collier tyre. We are assured that these identical tyres have never been removed from the rims for any purpose.

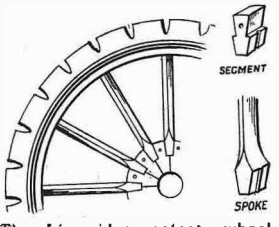

The new Collier tyre fastening.

THE DUNLOP PNEUMATIC TYRE CO., LTD., Regent Street, S.W. (39).—The non-slipping Dunlop cover, the efficiency of which has been proved to our satisfaction on more than one occasion, is the most interesting feature on this stand, on which are displayed the Dunlop tyres in all their various sizes. The generous Dunlop repair outfit, together with tyre accessories, valves, etc., are also shown.

GROSE, LTD., Northampton (64-65).—The Grose non-skidding and puncture-proof band. The non-skidding band consists of a strong chrome hide leather band, which is studded with a triple row of round steel studs. These attach to a thin flexible piece of chrome leather, which entirely encloses the outer cover of the tyre, being retained in position either by solutioning or by insertion between the beaded edge of the tyre and the rim.

THE HYDE RUBBER WORKS, LTD., Woodley (70-71).—The exhibit of the Grappler tyre, which is now being manufactured by this company. The hooked fastening, which was introduced by the Grappler Tyre Co., is made in several sizes and weights, also a sample of grey rubber inner tube.

J. LIVERSIDGE AND SON, LTD., 196, Old Street, E.C. (249).—Artillery-built wheels fitted with De Nevers grooved solid motor tyres. These tyres have a deep transverse groove all round their circumference at intervals of three inches, the groove being about 1½in. deep. They are claimed to be as comfortable as pneumatics. Motor car builders should see the Radial motor wheel, which finds a place on this stand. In this wheel the butt ends of the spoke are let in to radial slots cut in a wooden nave, which nave has the box and flanges bolted upon it.



The Liversidge patent wheel fitted with "De Nevers" solid tyre.

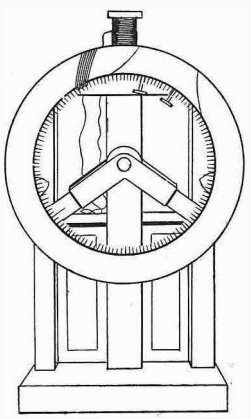
LONDON MOTOR GARAGE CO., LTD., Wardour Street, W. (157 to 159).—This company is exhibiting the Desclee non-skidding band. It consists of a strip of chrome leather, having tabs at intervals, and at the edges provided with hooks adapted to engage with the edges of the cover. On the tread the band is furnished with a series of plates, a projection of one plate entering a recess in the next, and so on. It is stated to be very effective, and when one series of plates is used it may be replaced by another, this operation being repeated two or three times before the band itself becomes worn out.

THE MARTIN PNEUMATIC TYRE CO., LTD., Rosebery Avenue, E.C. (215).—This now well-known flange-retained pneumatic tyre is shown here in various patterns, as well

as solid examples retained in a manner similar to the pneumatic cutter. The section of this tyre was described in *The Autocar* some little time since, and will no doubt be borne in mind by our readers who give attention to the pneumatic tyre question. From evidence produced it would appear that the Martin pneumatic tyre has given considerable satisfaction to a number of users, and certainly the absence of a tube frees it from a certain amount of complication and trouble. Detachment is a perfectly simple matter, though, as absolute freedom from punctures is claimed, that is an operation which should very seldom have to be performed.

THE NORTH BRITISH RUBBER CO., LTD., Edinburgh (38).—The Clincher pneumatic and Clincher-Michelin motor tyres, which are so thoroughly appreciated throughout the automobile world, are shown here in their various types, and there is also the Clincher-Michelin with square treads and metal insertions for heavy cars. Great wearing qualities and freedom from non-slip are claimed for these treads. The materials are, of course, the best possible for the purpose, and all that can be desired.

THE PALMER TYRE, LTD., Birmingham (47 and 48).—These stands are found in the large court on the right-hand side of the aisle. On them the new Palmer Cord motor tyre, which has attracted so much attention of late, is shown in various types and sizes. The construction of this tyre and its method of attachment to the wheel was described in *The Autocar* of December 26th, 1903 (p. 783), so that there is no necessity to go into the detail further in this report. An instrument somewhat resembling a pile driving machine stands in the centre of the court, and a tyred wheel being mounted thereon in such a way that it is raised to a height of 10ft. above the bed plate and then dropped. Travelling in guides the wheel rebounds from the plate to within two feet or so from the point from which it was allowed to fall, thus demonstrating the fact that the resiliency obtained from the Palmer corded tyre is equal to eighty per cent. or more of any pressure there should be put on it. Close to this machine are shown two formers, upon which female operatives demonstrate the manner in which the cord is laid in position before the rubber is applied. This is an operation which will interest the visitor, and its observation will show him the care with which this tyre is constructed. A new size of corded tyre 36in. diameter, 5in. transverse section, is also shown, and makes a remarkably fine tyre for large and heavy vehicles. It is also made in the 34in. by 5in. size. From the attendance within the court it is evident that the Palmer Cord tyre has attracted the general attention of the automobile world. The moulded jointless air-tube, which is quite a new departure in air-tubes, should certainly be seen. As the name suggests, it has no joint, and in transverse section is made to coincide with that of the form it will assume under inflation. The tab taking the valve practically countersinks itself inside the tube, so that the whole under portion of the tube lying on its bed is flush and smooth.



The machine upon which the Palmer Cord tyre is built.

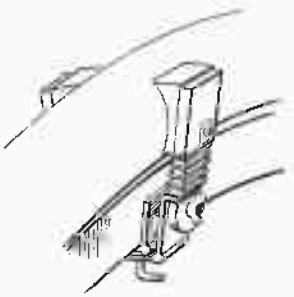
THE SHREWSBURY AND CHALLINER TYRE CO., LTD., Manchester (14), show a varied assortment of motor wheels fitted with Challiner pneumatic giant twin road and cup and King tyres.

THE SELF-SEALING AIR CHAMBER CO., LTD., Birmingham (28).—In addition to the well-known self-sealing inner tubes, the Hermetic reinforced treads, tyre solution, and stopping are found here. From the examples of repairs shown the hermetic stopping appears to be a most efficient article, and should be welcomed by those who have some reason to take care of their tyres.

THE SIRDAR RUBBER CO., LTD., Shirland Road, W. (96).—Here are shown the well-known Sirdar Buffer tyres attached to wheels, and also detached, thus affording an opportunity of examining the depth of the rubber and the ample fastening by which the tyres are secured to the rims. Several types are shown, from the single light tyre to a triple-tyred wheel suitable for carrying very heavy weights. We were shown here the new inner tube which the Sirdar Co. will shortly place on the market for use in pneumatic tyres of any make. In form the tube is the same as any other when inflated, but when deflated it takes the shape of the letter U with the upstrokes inclined inwards. In the process of manufacture the tube is so moulded to take this form, while the whole of the tube is in compression when deflated. When inflated the tube conforms to the section of the tyre without being in tension, thus contributing to the diminution of internal frictional heat. Among the many advantages of the tube is its stiffness when deflated, this and its size making it practically impossible to nip the tube in replacing the tyre.

TONI TYRES, LTD., 212, Shaftesbury Avenue, W.C. (79).—The Toni detachable tyre is shown attached to a wheel, and in other ways, covering a variety of sizes and strengths. A section is on view, which clearly depicts the method of attachment. This was illustrated in *The Autocar* of December 26th, 1903.

THE WILKINSON TYRE AND TREAD CO., Huddersfield (206A).—In addition to examples of the well-known Wilkinson tread, which has given satisfaction to so many users of motor cars, the exhibitors are showing here a new form of bracket non-skid, which consists of six or more double brackets which are attached to the felloes of the wheels, and, being hinged at the inner periphery thereof, can be turned up or down as it is desired to use them or not. The rubber heels which are fitted in the tread portions of these brackets will have the surfacing of the Wilkinson tread. We are assured by the exhibitors that these treads have been experimented with and found to be as efficient in every way as their own wire tread. They have been introduced to meet the requirements of car owners who consider that the resiliency of a tyre may be interfered with by the fitting of the ordinary tread.



Wilkinson's non-skidding device.

THE WILLIAMS TYRE CO. (215A).—The Williams solid tyres are retained on the channelled rims by means of an imbedded steel band anchored to the felloe at one end, and drawn round it by means of a hooked draw-pin contained in a sleeve set at an angle in the felloe. This is undoubtedly an ingenious and effective method of securing solid tyres to the rim, and as such has received a due amount of attention.

ELECTRICAL.

ALFRED DININ, Red Lion Square, W.C. (220).—Here we have an exhibit of the well-known and much appreciated Dinin accumulators for cars and motor cycles, and also batteries for different purposes. The accumulators are shown in various types from eight ampere hours (four volts) to sixty ampere hours (six volts). Various types of batteries are also shown for lighting the lamps of carriages or cars. Charging boards for recharging accumulators, either for home or carriage use, are also shown.

THE ELECTRIC BATTERY CO., High Holborn, W.C. (56).—The E.B. patent accumulators in a variety of sizes and capacities for electrical ignition purposes. The plates are so constructed as to make it practically impossible for the paste to become detached by vibration, and so cause internal short circuits.

THE ELEPHANT CHEMICAL CO., Neate Street, E.C. (73).—The Bridge accumulators in various sizes are here shown.

J. LACOSTE AND CO., Shaftesbury Avenue, W.C. (19, Corridor).—In addition to the Lacoste contact breaker, illustrated and described in *The Autocar* of February 6th, page 151, which has earned a well-deserved reputation for its reliability and simplicity, and is fitted to so many well-known makes of cars, we find a new coil. This has keys outside the box, so that the high-tension wires of any cylinder can be earthed without opening the box, while the other set enables the trembler to be started on one cylinder, so that it is almost always possible to restart the engine without dismounting. Another important item is the high-tension magneto working through ordinary sparking plugs. Speaking roughly, it may be described as a dynamo of special construction, entirely enclosed and working without the intervention of a coil straight to the sparking plugs. We hope later to go into it in some detail.

LONGSTREETH'S, LTD., Strand, W.C. (197).—Lithanode accumulators.

PETO AND RADFORD, LTD., Hatton Garden, E.C. (146).—As usual, this enterprising firm has some novelties of interest to put before show visitors. Our attention was first drawn to the Energy battery. This appears to be a most obliging form of accumulator. In its ordinary state, it gives off absolutely no current, but to obtain the energy two plugs of cadmium are dropped into the respective cells, when the voltage immediately runs up to about four. If the battery is left idle for some time, no internal action takes place. It can be charged either with or without the cadmium pellets in position. Next we noticed a speed indicator. This is run by a rubber belt off one of the wheels or some other rotating part of the machinery, and drives a small magneto, the result being indicated on a dial marked off for miles per hour. The new compound sparking plug contains no platinum, but the central wire is enlarged to the form of a disc, between the edges of which and the surrounding members the sparks scintillate. The body of the plug is of larger dimensions than usual, and may be left in position in the cylinder head, and the porcelain withdrawn by removing a plate held down to the body by screws, this construction being employed instead of the usual gland. The semi-solid accumulator and the terminal protectors are well known to our readers. Lastly, we may refer to a water turbine motor, which is suitable for charging batteries away from the usual charging stations.

THE SOLA ACCUMULATOR CO., Aldgate, E.C. (7, Corridor).—Some neat little dynamos, which may be employed for charging accumulators, are exhibited. Provided the necessary speed could be arranged for, these might be mounted on the car so as to charge the accumulators while running; also Sola accumulators.

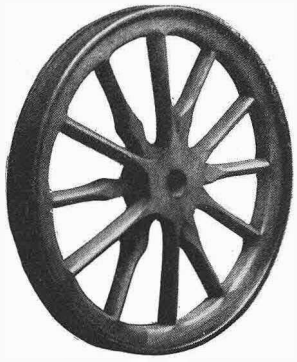
THE SIMMS MFG., CO., LTD., Kilburn, N.W. (149-150).—The Simms-Bosch low-tension ignition is shown with both rotary and reciprocating movements, and the new high tension has been considerably improved. The voltage, it is claimed, is higher than the accumulator system, and a special plug is accordingly provided for use with it, as the ordinary plugs do not seem to last very long. Very simple and effective advancing and retarding mechanism is fitted.

UNITED MOTOR INDUSTRIES, LTD., Great Marlborough Street, W. (92).—On this stand are shown the Castle accumulators and specimens of the Bassée-Michel manufactures, including new commutators; also the rotary magneto ignition, which was first exhibited at the 1903 Paris Salon.

HENRY WATERSON AND SON, Aston, Birmingham (217), show a most complete and interesting exhibit of the many articles which they handle in connection with the automobile industry. Here we find the firm's well-known high-speed ignition coils, the E.H. magneto coils, commutators, switches, ignition wires, etc.

CARRIAGE WORK, FRAMES, AND WHEELS.

ARTILLERY WHEEL WORKS, LTD., Camberwell, S.E. (229).—A number of the substantially constructed wheels made by this company's special process for voiturettes, cars, 'buses, and heavy lorries, on their patent twin spoke principle, may be seen here. In this method of construction the spokes are off-set at the nave, but in line at the rim. In other words, the spokes are wider apart at the hub than at the felloe, like those of a cycle wheel. This system is certainly calculated to make a very stiff, strong wheel, and we confidently expect to find these wheels coming into very general use.



A new pattern wheel, with off-set spokes.

THE BURKIN CANOPY CO., Beckenham (78).—Fitted to a light car is shown on this stand a very neat design of canopy top. The uprights are fitted by brackets permanently attached to the car. The canopy top consists of a light waterproof material, which is attached to a large spring roller on the forward standards. When not required, this top can be released at the rear end, and automatically rolls itself up. At the sides and in rear of the canopy are fitted spring blinds, which when drawn down attach to studs provided on the sides of the car. Projecting at an angle from the top and in front of the canopy is a short spring blind, which in brilliant weather protects the driver's eyes from the strong rays of the sun.

HAYES AND SON, Stamford, Lincs. (26).—Two tonneaus and a van body are found here.

JOSEPH OWEN AND SONS, LTD., Liverpool (22, Corridor).—Bent timber for panels of carriage bodies, mudguards, spokes, and other woodwork employed in automobile construction are exhibited.

HOLMES AND CO, Margaret Street, W. (13).—An exhibit of well constructed motor car bodies in the grey, with aluminium panels, etc.

LAURIE AND MARNER, LTD., Oxford Street, W.C. (138).—This exhibit was hardly complete at the time of our visit. In addition to a specimen of the 9 h.p. to 11 h.p. Clément, two specimens of this well-known carriage building firm's work in the way of body construction are exhibited. These are built up of wood and shaped aluminium, and are, of course, above praise. One is of the tonneau pattern, and the other is a similar type with an addition converting it into a brougham with forward canopy.

MARTIN AND FLEWITT, Birmingham (209a).—A well-finished four-seated tonneau body, a five-seated side-entrance body in natural wood, and a side-entrance double phaeton finished in white with red upholstery can be seen here.

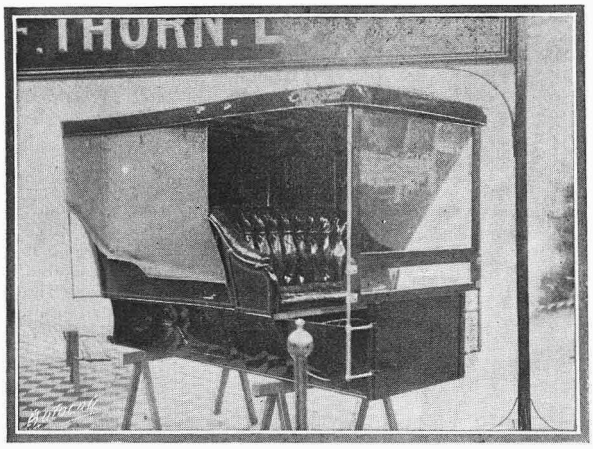
RUBERY AND CO. (18).—Examples of stamped steel frames and parts are shown here, and they are indications of what can be done in this direction by our native manufacturers. Channel steel frames are also shown.

SAVAGE BROS., LTD., King's Lynn (35, Corridor).—Motor car artillery wheels in various patterns. The firm make a speciality of supplying manufacturers with these, and have a large plant of wood working machinery suitable for the purpose.

SIMMS MFG. CO., Kilburn, N.W. (149-150).—This firm are showing the Soulas wheels. These are of the artillery type, but the outer ends of the spokes are received in metal sockets, which may be screwed free in or out to adjust the length of the spokes. The company are also sole agents in this country for the Arbel stamped steel motor car frames. One of these is shown of the Darracq pattern, in which the fan for the motor and gearing is stamped in a single piece with the members of the main frame. Other patterns are also shown, and are obtainable. Disc wheels are also found. In place of spokes two stamped steel dished plates are used, so that in section the wheel is thus V. These wheels are not handsome, but should be very strong and light in proportion to their strength. There is also shown a Darracq type frame fitted with pressed steel disc wheels, for which there distinctly appears to be a future.

Show Report—Carriage Work, Frames, & Wheels.

W. AND F. THORN, Great Portland Street, W. (209-210).—The various designs of motor bodies built by these well-known and old-established carriage builders are shown here. We would draw particular attention to the double phaeton motor body with canopy and wind shield, while the body with light storm hood on the Lonsdale system is

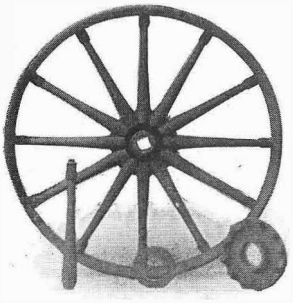


An example of the carriage work executed by Messrs. Thorn & Co.

one that will appeal to those who desire some form of light and easily-fitted weather protection. Car purchasers who are undecided as to the particular design of body they will have fitted should not fail to carefully inspect the cleverly-designed and beautifully-finished bodies which are shown on this stand.

THRUPP AND MABERLEY, Oxford Street, W. (234), show six beautifully-designed and finished bodies of various patterns. The curricle body fitted to a White steam car, and finished in cream and scarlet, and upholstered in red morocco, is quite one of the daintiest things in the show, whilst care and thought have evidently been given to the design of the Siamese phaeton body, having entrance between wheels, and protected from the weather by a large extension waterproof head of T. and M.'s own design. This body is in black, with small imitation cane panels lined white, and brass fittings. A roomy limousine with detachable brougham top, high back, door behind, to accommodate five people, with the roof having extension top and capable of carrying luggage, is a town and travelling car body which will meet the requirements of many purchasers. A landaulette body made to suit a Bollée chassis to the order of the Hon. Humphrey Sturt, M.P., is a very fine example of what our leading carriage-builders can do in the construction of automobile bodies. A Roi des Belges double phaeton, with bucket seats, built to the order of Mr. F. M. Frick, for an 18 h.p. Napier chassis, with side entrance between wheels, is a notable example of the type, and beautifully upholstered in real leather.

THE VULCAN MOTOR MFG. AND ENGINEERING CO., LTD., Southport (2, Corridor).—A specimen of Lord's steel wheel is exhibited on this stand. The spokes are tubular, and are put into tension by being drawn up by nipples much on the same principle as the spokes in a cycle wheel, but the spokes are all in one plane. They have annular heads, which are held in the body of the hub, which is built up of two parts held together by a locking ring.



A tubular spoked wheel.

ACCESSORIES.

S. BOWLEY AND SON, Wellington Works, S.W. (31, Corridor).—Bowley's special motor spirit.

R. DALMER, Cannon Street, E.C. (10, South Wing).—The Duplex motor car jack is on view here. Its speciality consists in the body being tapped with two screw threads and the base and top being similarly threaded. A ratchet spanner is employed for rotating the body, and thereby expanding and contracting the jack at double speed.

A. W. GAMAGE, LTD., Holborn, E.C. (261 and 262).—The exhibit at this stand, as might be expected on the part of the firm responsible for the display, is as profuse in motor clothing and accessories as that of any other exhibit in the show. The number and variety of motor accessories is altogether too great for particularisation, but we note that back lamps with number plates of excellent design are shown, also plain back lamps and number plates, which will undoubtedly find favour with those who have not as yet taken up their badges of identification. The pump actuated horn is a valuable innovation, and the improvement will be recognised by those who have been hitherto troubled by the perishing of the rubber bulbs so largely in use at present. A circular case made in fibre and covered with waterproof material is shown for the carriage of spare covers. This case can be strapped to the top of a canopy or hood, and so transported without trouble. A new type of expanding jaw spanner is shown, the action of which is extremely ingenious and certain. Some new non-slipping bands which can be strapped round the cover and felloe, and which are comparatively moderate in price, can be seen. A very neat and efficient form of exhaust lifter, by which the cup and spring are compressed, and enabling the cotter to be easily withdrawn with the fingers, is one of the novelties shown on this stand. Lamp covers neatly made in Selvyt are shown for all sizes and descriptions of lamps, and for those who regard the appearance of their light covers this will be found acceptable. In the matter of lamps a huge variety is shown, but it is well to note that special thought has been given to the production of back lamps for small cars. The Everlasting warmer has already been noticed pretty generally by the press, but it is shown here, and while the weather still remains cold, is certain to attract a good deal of attention. The Umbrella mackintosh coats are now being shown by Gamage here at reasonable figures, and indeed the whole range of motor garments, while turned out in the best possible styles, are priced at figures which bring them within the reach of the large majority of car owners.

THE ISOMETRIC LENS CO. (176).—Motor glasses and goggles of all kinds.

JOSEPH KAYE AND SONS, High Holborn, W.C. (219).—Here is a very interesting exhibit of patent oilcans in copper, brass, and steel, the design and convenience of which are varied to a degree. These articles are extremely well made, and bear every evidence of that soundness and finish which distinguish English manufactures of this kind.

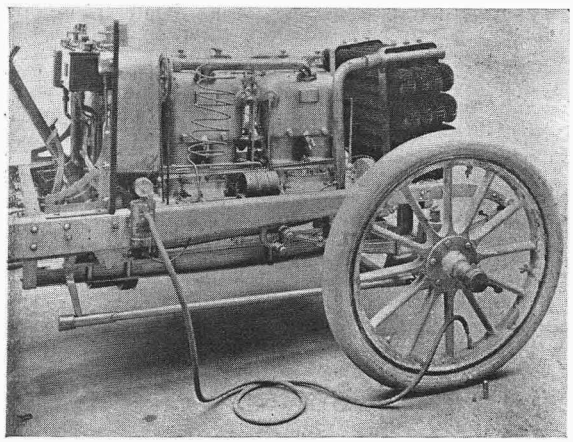
J. LECOQ, Neuilly sur Seine (15, Corridor).—Key spanners, accumulators, and other useful fittings, including non-slipping treads with metal studs in the centre portion of the tread.

JOS. LUCAS, LTD., Birmingham (55).—Motor horns in various sizes are shown here. In these we find a stronger and improved clip, while the reed itself is secured by a screwed collar, and is not dependent upon a mere frictional fit, as in the usual type. This is a new feature which should be appreciated, as it ensures the emission of a constant sound from the horn, which is not the case where the reed is liable to become dislodged. To small car owners a light lifting jack in two sizes should be of interest. Similar jacks in larger sizes are shown for larger cars. New shapes in funnels for petrol, water, and oil are shown, also various styles of lubricators, tyre repair outfits, and other accessories too numerous to mention. The Wells-Lucas motor oils have been in use by the automobile public for some considerable time, and are so well-known and appreciated that eulogy is unnecessary.

THE N.S. ELECTRIC STORAGE CO., LTD., Kirby (34, Corridor).—This firm make a speciality of storage cells for motor cars, and claim that by their method of making up the plates they are practically indestructible, and short circuits are very largely prevented. In the centre there is one large positive plate with two negative plates, one on each

side, and separated from the positive by a porous earthenware diaphragm, which prevents any small pellets of paste from filling up and bridging across the plates, and so causing short circuits. In addition, the plates are wedged into the celluloid case and surrounded by rubber bands, which hold them firmly.

JARROTT AND LETTS, LTD., Great Marlborough Street, W. (88).—A novelty in the form of an automatic tyre inflator is shown by Messrs. Jarrott and Letts. This has been designed to do away with the exertion necessitated by inflating large-sized pneumatic tyres by hand. The principle of the apparatus is that the pressure developed in one of the cylinders of the engine shall be communicated through a coiled pipe to a pressure tank placed in any convenient position on the chassis. In order that the charge delivered from the cylinder shall reach the tyres cool, it is passed through a long coil of piping before it reaches the pressure tank. When the apparatus is brought into operation, a cap is removed from the pressure tank, and the nozzle of the flexible rubber inflator tube is attached thereto, the other end, of course, being screwed down on to the tyre valve. While the engine is running, a cock



The new automatic tyre inflator.

is opened, so that pressure from the cylinder is delivered to the receiver tank, and thence to the tyre. On the receiver tank above-mentioned is placed a pressure gauge, whereby one may readily see what pressure is being passed to the tyre. The apparatus is permanently fixed to the engine and chassis, so that no connection beyond that of a flexible rubber tube is necessary to bring this particularly useful device into operation.

THE A. G. MULLINER MOTOR BODY CO., LTD., Accrington (214a).—Single and double motor artillery wheels, and their new Planish Steel mudguards, are shown.

C. J. PAFFARD, Penge, S.E. (201).—A most interesting patent speed indicator and distance recorder is shown in actual operation by this exhibitor. This is a combination of clockwork with the running mechanism of the car, which automatically counts the revolutions of the road wheels during the space of two seconds at regular intervals, and by a clever arrangement the gearing causes the dial hand to show the number of miles run per hour in accordance with the number of revolutions made by the road wheels in the above mentioned space of two seconds. The drive is taken off the countershaft or live axle by means of a brass arm carrying a wheel running in a dustproof aluminium case, and conveyed to the mechanism of the indicator by means of light rods with universal joints. The correctness of this instrument is guaranteed by the exhibitor, and, this being so, it strikes us as the best apparatus for its purpose which has yet been put before the automobile public.

G. T. RICHES AND CO., Gray's Inn Road, W.C. (254).—A very large and interesting assortment of electrical gear, together with carburetters, lamps, horns, etc., are found at this stand. The improved form of Eisemann high-tension rotary magneto is shown running for two, three, or four cylinders, and attracts a vast amount of attention. The new registered wipe contact is reducing this method of making and breaking contact to as simple and as indestructible a form as possible, and we were not surprised to find these well-constructed little instruments in considerable demand at the time of our visit. In the limited space at our disposal it would be quite impossible to enumerate the great variety of interesting fittings which are shown at this stand in detail. We strongly recommend every visitor to the show to give it attention.

ROSS, COURTNEY AND CO., LTD., Upper Holloway, N. (15).—A nice selection of the well-known varieties of hand and foot tyre pumps, lubricators, valves, gauges, and cocks, turned out by this firm.

S. SMITH AND SONS, 9, Strand, W.C. (80).—As mentioned in our forecast last week, Messrs. Smith are exhibiting a new speed indicator which examination shows to be of very neat design. The apparatus was exhibited in action, deriving its actuating motion from an electrically rotated road wheel. The principle of the apparatus is a compensated centrifugal motion of which we hope to give a diagram shortly. In actual use a flexible shaft communicates motion to the mechanism from a friction disc on one of the road wheels. As to the remainder of this exhibit it comprised carriage clocks and watches in cases for attaching to the dashboard of a car, and every description of chronographs for which the firm are famous.

UNITED MOTOR INDUSTRIES, LTD., Great Marlborough Street, W. (92).—This firm is showing all those accessories for which it is so well known. The exhibit is so comprehensive, embracing practically everything that the automobilist can require, that to enter into details would be superfluous. We may mention, however, some complete sets of box spanners suitable for every sized nut which is used in automobile construction. The spanners proper are interchangeable with a single handle giving sufficient leverage for the largest sized nut which it is capable of taking.

HENRY WATERSON AND SON, Aston, Birmingham (217).—An array of well-designed goggles, car covers, and most conveniently made valises for attachment to cars for touring purposes. Visitors to the show may profitably and pleasantly spend a considerable time in examining the exhibits here.

WILSON BROS., Bedford (8, Egyptian Court), show the Dalton patent jack, a particularly ingenious tool which serves equally well as jack, vice, and drilling machine, and is most efficient for all three purposes.

LAMPS.

ANDRE A. GODIN, Red Lion Square, W.C. (187).—Ducellier lamps are, of course, the speciality here. The new car lamp has been slightly altered in the method of construction. The joint on the top of the generator, which previously put a strain on the outer case, has now been altered, and the diving bell case inside now takes this portion of the work—a very much smaller washer being employed which is not more than 1¼in. in diameter. It has been found necessary to increase the size of the generator, as many people now use three headlights instead of two. Therefore, by using the largest size the lamp can be kept burning for twelve hours. A paraffin lamp with an oval lens is now introduced for those who wish to match the oval headlight gas lamps. These are beautifully finished examples of the lamp manufacturer's art, being made of brass throughout with plated copper reflectors.

ALFRED DUNHILL, LTD., Euston Road, N.W. (256-7-8).—It is impossible to pass this exhibit by without drawing special attention to the Light of Lights, and amongst other things Dunhill's duplex lens acetylene headlight, which gives 2,500 c.p., and is offered at the low price of nine guineas. Another lamp of slightly smaller dimensions, with a similar lens, is also shown at £8.

BRANSOM, KENT, AND CO., Goswell Road, E.C. (16 and 17).—A large and interesting assortment of the various accessories made in Hanwell by this well-known firm.

Show Report—Lamps.

E. BAEDEKER, Newcastle Street, E.C. (20).—The Helios paraffin headlight and other lamps are shown here.

JOSEPH LUCAS, LTD., Birmingham (55).—Here is a fine array of motor lamps, for which this firm is so justly celebrated. So far as detail construction is concerned there is practically no alteration on the patterns which obtained last year. As to variety of sizes and styles, this can only be justly appreciated by an examination of the goods themselves, though we may say that the styles are in plain black enamel, polished brass, and nickel plate.

SALSBURY AND SON, LTD., Long Acre, W.C. (243).—All the well-known types of Salsbury-Flare, Dietz, Searchlight, and Ovallight lamps are to be found upon this stand. A special novelty, however, is the Ovallight lamp, in which the body portion of the Salsbury-Flare light has been retained, but the lens is now made with the long diameter of the oval horizontal, and has a most effective metal hood over the upper portion thereof. The effect of this hood is to throw a broad low beam of light on the road, none of the rays of which rise into the eyes of drivers of horse-drawn vehicles. The new Salsbury-Dietz lamp is now made with the bail complete, and forms a most excellent side-light. The 371-3 pattern is the lamp specially designed by Messrs. Salsbury for the illumination of numbers on the back of cars. It shows a good-sized red light rearwards, while the numbers are sufficiently illuminated to satisfy those hypercritical gentlemen—the police.

WELDHEN AND BLERIOT, 54, Long Acre, W.C. (255A).—A very fine exhibit of the automobile lamps of this world-renowned firm is here shown. Dominating the area is a huge lenticular projector, which was in the evenings so remarkable a feature of the Paris show. The side paraffin lamp and horn in combination, the carbide cartridge acetylene lamp and the new regulation tail lamp, all of which we referred to specially in our Paris show report, are again seen here. For scientific construction and accuracy and beauty of finish the lamps of this firm stand second to none.

CLOTHING.

AQUASCUTUM, LTD., Regent Street, W. (259).—A large array of motor coats of various patterns for ladies and gentlemen, as produced by this West End house, are shown here in the Aquascutum material.

CHAS. R. BASE, High Holborn, W.C. (268).—Mr. Base was one of the earliest outfitters to turn attention to motor clothing, and consequently it will be found these garments in all materials are designed to give the best results against wind and weather. Some specially designed motor caps, both in leather and cloth, are shown, with well-arranged neck and ear protections. Gauntlets both in leather and fur, and motor gloves of various descriptions, are also shown. One exhibit on this stand should not be missed. It is a cosy fitting apron with shaped leg pieces, and rubber-soled receptacles for the feet. When these are strapped to the body the driver can descend and ascend the car with the apron in position, the soled portions of the foot receptacles enabling him to manipulate clutch, brake, and accelerator pedals with ease, while the draught is entirely excluded from the driver's limbs. Some smart livery overcoats are shown, our attention being particularly attracted by a dark green cloth with light green collar and nickel buttons. In these days of concern with regard to motor liveries these garments should be seen.

ALFRED DUNHILL, LTD., Euston Road, N.W. (256 7-8).—To attempt to enumerate the "Motorities" which are displayed on this most attractive stand would be beyond the space permitted to us. The goggles now made with horn frames are one of the greatest advances yet made in connection with these protectors, and are, moreover, sold at a reasonable figure. For ladies' use they are made with a partial horn mask, and as this is transparent there is practically no disfigurement when in wear. The lady visitors to the show should not fail to pay a visit to this stand, there really being some very elegant protections in the shape of motor hoods in various descriptions of charming materials. Of course, the usual motor garments are shown in the well-known Drencher tweed material, but the special attractions of the exhibit are, perhaps, the new motor garments for ladies in leather appliqué, deerskin, sealskin, and a specially dressed morocco leather. To enumerate the extremely varied exhibits made here is altogether beyond the scope of the present report, but minus the actual car it is undoubtedly true that automobilists of either sex should be able to fit themselves out, both in relation to the car and their own outfit, without moving from this stand.

HOARE AND SONS, High Holborn, W.C. (265).—This firm, the pioneer of motor clothing people, make a very fine exhibit of their expertly designed motor clothing in a very large range of materials. Here we find the old and well-known Hoare motor coat, as well made and as efficient as ever, though somewhat lighter than those which were turned out for the pioneers of the first 1,000 miles trial. A later edition of this coat is the Rex, a smartly cut coat with reinforced protection for chest and shoulders, wind cuffs, and all the necessary wind resisting fittings. The latest motor coat, however, is the Sandringham double-breaster, this being made on sac lines to give plenty of ease and comfort to the wearer when sitting in the car. Messrs. Hoare and Sons have also specially laid themselves out for the production of motor liveries, and several well-designed suits are exhibited on the stand. Their specialities in leather clothing deserve particular attention, while their storm smock in waterproof material is a marvellous and efficient garment at the price.

T. H. HOLDING, Maddox Street, W. (263).—For well-designed, well-made motor garments this exhibit is unsurpassed. We would draw particular attention to the useful motor ulster, the Holding patent apron, and the Kangaroo leather double-over vest with chamois leather lining, sleeves, and wind cuffs, which, to our mind, is one of the most protective and valuable motor garments yet produced. About the ladies' garments we hesitate to express an opinion, except that they strike us as being in the best possible taste and material. The leather motor overcoats in tan and brown, with fur collars, are perhaps the only leather garments it is possible for a gentleman now to assume. The dust coats and smocks are garments which appeal to one in contemplation of the time when they will be required, and in the different tones in drill and tussore silk make really smart garments for wearing in the car. The Kar-Poncho is a garment for bad weather which has just been introduced by Mr. Holding, and which should certainly be seen. It is designed to obviate the unsightliness of the ordinary rubber neck, and yet make a watertight protector round the throat, equal, if not superior in efficiency in every way. It is also much more easily assumed. The material which suits it best is army Paramatta.

H. J. NICOLL AND CO., Regent Street, W. (266).—Rainproof motor coats and leather-lined garments in frieze for both sexes are shown here. The wrap coats in various materials are particularly smart garments, and make an excellent appearance in the car.

SALSBURY AND SON, Long Acre, W.C. (264).—A nice range of the well-known Komilfo clothing, leather jackets, knickers, waistcoats, pony skin coats, etc., with examples of the Komilfo overcoat, are shown here. The genuine goat skin coats are good looking garments, and some sealskin coats are shown which will make very smart wear for car work.

SAMUEL BROS., LTD., Ludgate Hill, E.C. (269).—These well-known outfitters are now turning their attention to motor clothing, and are making an excellent show here with several motor garments in their well-known Omne Tempus rain-resisting ventilated clothing. They are also turning their attention to motor liveries, several examples of which are shown, together with numerous motor garments, such as leggings, capes, fur-lined coats, etc.

LUBRICANTS

THE AUTO LUBRINE CO., Fairfield, Manchester (16, Corridor).—A pyramid of tins of Auto Lubrine, about which we need say no more beyond the fact that we have used this oil for some considerable time with very great satisfaction.

THE ELEPHANT CHEMICAL CO., Neate Street, S.E. (73).—Motor lubricating oils and gear greases, and the Millennium puncture stop in motor car sizes.

MOEBIUS AND SON, Homerton (72).—A variety of oils suitable for lubricating engines and gears, and also for lighting purposes.

PRICE'S PATENT CANDLE CO., LTD., Battersea, S.W. (213).—The many well-known lubricants which have been produced for automobilists by this famous house are shown here in their various containers. Several new oils for engines, bearings, and gear boxes will be found here, while those old favourites, "Motorine," "Belmoline," and "Oleogene," of course, have their place in the exhibit.

THE STERN-SONNEBORN OIL CO., Gracechurch Street, E.C. (25).—A large assortment of the well-known and much appreciated lubricants marketed by this firm are found here.

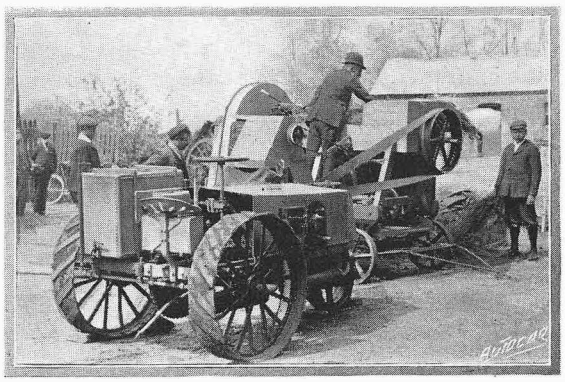
CHARLES WHITE, Curtain Road, E.C. (51).—White's Speedoline motor lubricants for engines and gears put up in convenient forms; also grease for bearings, and a specially prepared grease for the preservation of plated and polished parts.

W. H. WILLCOX AND CO., Southwark Street, S.E. (21 and 22).—Oils, greases, water circulating pumps, oilcans, belts, and other motor sundries are found here. We would draw special attention to a very handy motor kit which is amongst the articles shown.

MISCELLANEOUS.

ALFRED HERBERT, LTD., Coventry (35-35).—One frequently hears the remark that automobiles cost far more than they should, and that consequently the prospective buyer is delaying his purchase until such time as the price is reduced. The illusion that extraordinary profits are obtained from the manufacture of autocars may be somewhat dispelled by a visit to the stand of Messrs. Alfred Herbert, Ltd., where several of the machine tools used in the production of the component parts of automobiles are to be seen. A mere cursory glance at one of these machine tools will demonstrate to the uninitiated the great outlay that must be made in order to put down an efficient plant for the production of parts on even a small scale. These, of course, are some of the finest machine tools which are produced in England. Although the Americans are admittedly beyond us in some branches of machine tool manufacture, yet in other branches Messrs. Herberts are well able to hold their own. For the lessons that it teaches in the direction we have indicated, this stand is well worth a visit by everyone attending the show. The lesson will be emphasised by enquiry into the operations of one of the firm's hexagonal turret lathes. Nevertheless it will be realised that after the initial outlay in the purchase of machinery the average cost of production on the articles turned out by these machine tools is comparatively low, considering the work that is involved.

IVEL AGRICULTURAL MOTORS, LTD. (32 and 33, Corridor). Two agricultural motors are exhibited. These have been illustrated at various times in the columns of *The Autocar*, and show the various classes of work to which they may be adapted. In fact, there is scarcely anything in connection



The Ivel motor, working a small thresning machine. Two of these motors are exhibited in the show.

with agricultural operations which these machines cannot perform. The propulsive power is derived from a two-cylinder horizontal engine, transmitting its power by gearing to the rear wheels, which are constructed of iron and fitted with grip plates.

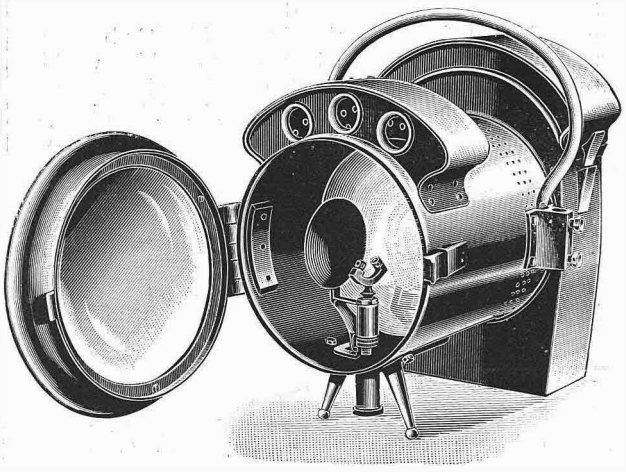
THE CAR AND GENERAL ASSURANCE CO., Queen Victoria Street, E.C. (63a).—Policies and particulars of car and accident assurances.

ELLIOTT BROS., Lewisham, S.E. (67).—Specimens of a combined motor meter speed indicator and Veder distance register is shown here. This instrument was described in detail and illustrated in *The Autocar* of Dec. 26th, 1903.

T. GREEN AND SON., LTD., Leeds (62).—Three different sizes of petrol-driven hand-steered motor lawn mowers; also one large self-propelled mechanically-steered 20in. lawn mower suitable for large lawns for cricket and tennis pitches.

RANSOMES, SIMS, AND JEFFERIES, LTD., Ipswich (177).—On a green cloth, in colour representing the lawns they are built to cut, are exhibited three motor lawn mowers. They are fitted with Sims motors, the small one being air-cooled, while the increased sizes are water-cooled. The air-cooled engine has a fan fitted alongside, the fan blades being enclosed by a light metal shield. Several of these machines have been supplied to members of the nobility.

A. G. TAYLOR AND CO., Poland Street, W. (66).—The Quick-grip spanner. This tool takes the form of a pair of square jawed pliers, which give a positive grip on the nut, and provide sufficient leverage to enable the largest nut within its capacity to be tightened.



A LIGHT SCREEN. To enable a driver to reduce the glare of his lamp if necessary, a device has been made by Messrs. J. G. Statter & Co., Newhall Street, Birmingham. It will be seen that a dead black screen or disc swings upon the burner column. In the ordinary way it is at the side of the light, and makes practically no difference to the illuminating powers of the lamp. When it is desired to cut off the extreme brilliancy of the light, the disc is swung round in front of the flame through a Bowden cord and lever. This stops all direct rays from the flame, but at the same time a light, and a very fair one, is maintained. The device has been under trial for twelve months and has worked quite satisfactorily. The disc can also be operated by electrical means from the ignition battery if desired.

THE INAUGURAL LUNCHEON.

On Saturday the show was inaugurated by a luncheon, at which the Hon. John Scott Montagu, M.P., the leader of the automobile party in the House of Commons, took the chair. He was supported by a number of distinguished guests and almost every exhibitor. After luncheon the Chairman proposed the King and also the Queen and Royal Family. When these toasts had been loyally and enthusiastically drunk, Lord Stanley gave the Automobile Industry, and in a most interesting speech he expressed his great belief in the future of motor transport for the army, referring incidentally to the excellent work which had been done by the Motor Volunteers. Touching on motor legislation, he urged every motorist to do his utmost to consider other users of the road, and to bear in mind that the Act was only for three years, and at the end of that time it would either be made more stringent or relaxed, and it would depend entirely on automobilists themselves which course would be taken. He referred to the work of the Hon. John Scott Montagu and Mr. Henry Norman in the House of Commons when the bill was passing through, and said that no one not in the House at the time could form any idea of the intense bitterness of the prejudice which surged through the House at the time the bill was under discussion; in fact, it was in one of its most dangerous moods. Many had expressed disappointment that the two gentlemen referred to and the automobile party had not effected more, but he could assure them that the temper of the House was such that he considered, as an old Parliamentary hand, that wonders had been done. As automobilists they must organise themselves to restrict those in the ranks of automobilism who broke the laws. The Jockey Club would suffice as an example of what a ruling body should be, and he regretted he could not feel that the Automobile Club held an equally high position in the automobile world at present, though he hoped it would ere long. He coupled with the toast the names of Mr. F. R. Simms and Mr. C. Jarrott. (Mr. Edge should also have responded to this toast, but was, unfortunately, prevented from being present by indisposition.) Mr. F. R. Simms, the president of the Society of Motor Manufacturers and Traders, made a lengthy speech, in which he traced the growth of the show, and emphasised the belief of the members of the society in one show only per annum being the right policy both for them and for the amateur automobilist. He expressed his faith in the future of the motor. The petrol engine, he believed, would have the widest use by far, but electricity would play its part for town purposes, and steam for heavy haulage. Marine motoring, too, was a delightful and fascinating sport which had received an immense fillip directly from the automobile world. He pointed out that alcohol as a fuel had been neglected in this country in a deplorable manner, and he thought that it should receive more attention, as the consumption of petrol was getting greater and greater, and if the supply were stopped or seriously reduced it would have a most deleterious effect on the industry, and might even ruin it. Mr. C. Jarrott said they all appeared to be very well satisfied with the exhibition. It was an unmistakable indication of the growth of the English industry, and further than that of the manner in which England was becoming a centre of automobilism, for they found assembled in the Crystal Palace a magnificent and most representative display of the best cars in the whole world. The visitors were proposed by Mr. Schenk, and Sir John Macdonald responded on their behalf, narrating in his own strain the experience he had at the first Crystal Palace Motor Show in or about 1896, in which one or two motors occasionally took part. Colonel Saunderson proposed the Press, and this was responded to by Mr. J. E. Vincent *(The Times)* and Mr. H. Walter Staner *(The Autocar)*. The Chairman was proposed by Mr. T. Stewart Wortley, M.P., who confessed that, although a brougham and not a motor was his conveyance, he was sighing for a number, as he thought the number plates looked so distinguished.

SHOW ITEMS.

The Lacre Motor Car Co., Ltd., have had a Wolseley car fitted with De Nevers grooved solid tyres. The car is running in the grounds of the Crystal Palace during the show. Those who have tried the car pronounce the tyres very comfortable.

* * * *

There is exhibited on stand 192-193 one of Henwood's rubber cushion hubs, having thirty-three square inches of rubber-bearing surface, eight cushions two inches diameter, simultaneously supporting the weight carried on the axle.

* * * *

The 60 h.p. four-cylinder racing Spyker, which attracted so much attention at the Paris Show, for the reason, it will be remembered, that all four wheels are driven, arrived at the Crystal Palace on Monday afternoon last, and will be found on Stand No. 1 until the close of the exhibition. Before the car was staged we were afforded the opportunity of making a short trip upon it over the roads about the Palace. It was impossible, of course, that such a powerful car should be given its head in a suburban district, but its driver gave us a suggestion of what the car could do by the way in which it took the very respectable slope of Anerley Hill. The rise simply seemed to fall down before it, and the sensation the climb afforded was more like an ascent in a fast lift than a run up on wheels. By the light of our brief trial we are inclined to the opinion that steering wheel driving may be considered with advantage.

* * *

Tuesday was ladies' day at the show, on which occasion members of the Ladies' Automobile Club attended in large numbers to see the exhibits, their visit being preceded by an "at home" at the King's Room. The chief attractions for the ladies might be supposed to have been the stands on which motor clothing for the fair sex was displayed, but this was not so by any means. They evinced an intelligent interest in the cars themselves, particularly those of the more luxurious type, affording shelter from the elements during winterly weather, or those which displayed any particular ingenuity in the attainment of comfort for the occupants.

STATISTICAL SYNOPSIS OF THE SHOW.

Specially compiled for "The Autocar" by H. Hewitt Griffin.

"A much larger show than last year" was the general opinion, and, taking their cue from the increase in the published number of exhibitors, and the official declaration that the platform space let had risen from 80,000 to 130,000 square feet (or, roughly, *three acres*), the young men of the daily press, as is their wont, rushed into all kinds of fancy figures regarding the number of cars present. The favourite stock estimate on these occasions (even when these shows were only half their present dimensions) was, and is, "1,000 cars." Last year I garnered a queer harvest of these flights of fancy, chiefly from well-known exhibitors, most of whom were as much at sea as the turn-to-all-things junior reporters. This year, time was too precious to glean a crop of these efforts at anticipating *The Autocar* census, but the few I obtained ranged from 450 to 950; last year 200 to 3,000 were the erratic estimates.

It will come, therefore, as a surprise to learn that the actual gross increase from all motor vehicles is only a comparatively small one, twenty-seven *(i.e.*, including all types), but if we exclude chassis (increase twenty-nine), steam tractors (increase fifteen), and only include practical cars for the conveying of passengers (including the very small "motorettes," increase fourteen), there is a *slight decrease in the number of cars.* As our figures were taken on Friday and Saturday—Friday's work being checked on the latter day to allow for missing machines and late arrivals—there may be some increase, which will balance matters. For instance, even late on Saturday, some stands were unoccupied, and cars were being brought in constantly.

The great increase in space and exhibitors comes from components, sundries, clothing, lamps, etc., firms. As will be seen from our table, the number of autocar exhibitors (including four absentees) is 109, or, with the heavy steam tractors, etc., 118—an increase of three on last year—while the total exhibitors have increased by sixty-six. The former figures do not include three exhibitors of agricultural implements and lawn-mowers—wholly or part motor—nor are the motor boats included, none of these being autocars.

Classification of Cars.

This is always difficult, and varies greatly according to the views of the enumerator. However, it will be found, without undue elaboration, difficult to improve on the system adopted in former years, and this we adhere to, thereby enabling immediate comparisons to be made. Concerning the last Paris Show (December, 1903), I have been unable as yet to obtain statistical particulars, so the 1901 figures must stand as a French record—now beaten by a slender margin, it is true, but still beaten.

At first glance, this year's return looks disappointing, as light and heavy cars and voiturettes only number 280 against 391 last year. If, however, temporary and permanent car covers be included (the former were not classified last year), the respective totals are—1903, 431; and in 1904 they are an even 400. Also the motorettes (not separately enumerated in 1903) are not reckoned, unless separately; these raise the total to 414. Vans are practically the same. If we add chassis *(in futuro)* to the car totals already obtained, we have—1903, finished and unfinished, 510; and 525 for 1904, these figures representing cars for personal use.

Statistical Analysis of Five Motor Shows.

A, Agricultural Hall, 19th to 26th of April, 1902.
B, Paris in December, 1901.
C, Crystal Palace, 30th January to 7th February, 1903.
D, Agricultural Hall, 21st to 28th March, 1903.
E, Crystal Palace, 12th to 24th of February, 1904.

Class, Division, etc.	A	B	C	D	E
1. Light and Heavy Motor Cars ...	171	416	273	241	212
2. Voiturettes ...	60	48	118	68	72
3. Motorettes ...				4	14
4. Covered Carriages, permanent	24		40	19	48
5. Covered Carriages, detachable				28	72
6. Vans and Lorries ...	21	15	24	15	23
7. Tractors ...				9	15
8. Omnibuses ...	14	24	11	2	8
9. Chassis ...	39	53	68	57	97
Grand Totals ...	329	556	534	443	561
Total (Catalogue) Exhibitors ‡ ...	248		189	238	255
Exhibitors of Motor Vehicles ...	111		115	122	118
Exhibitors of Motor Cycles (only)	9		14	6	15
Number of Motor Cycles ...	42	115	111	41	126
Method of Propulsion:					
1. Petrol (only) ...	231	261	438	363	512
2. Petrol or Alcohol ...		210		3	
3. Petrol and Electricity ...		2		2	
4. Electricity (only) ...	32	46	33	26	16
5. Alcohol (only) ...		22			
6. Steam ...	65	15	63	49	31
7. Petroleum ...					2
8. Liquid Air ...	1				
Grand Totals ...	329	556	534	443	561
Driving Gears:					
1. Chain ...			294	217	314
2. Propeller-shaft ...			196	189	225
3. Electric drive ...	32	46	33	28	16
4. Friction Contact ...			1	4	
5. Gear Wheels ...				3	5
6. Belt ...			10	2	1
	329	556	534	443	561

‡ Catalogue exhibitors include dealers in accessories, components, and sundries, plant providers, eyeglass exploiters, toy traffickers, and the like.

The Percentage of Popularity in Power and Drive.

Power.	1903 Cr'st'l Pal'ce	1903 Agri'l Hall.	1904 Cr'st'l Pal'ce	Drive.	1903 Cr'st'l Pal'ce	1903 Agri'l Hall.	1904 Cr'st'l Pal'ce
Petrol ...	82·022	82·618	91·264	Chain	55·056	48·984	55·971
Steam ...	11·798	11·061	5·526	Propeller-shaft	36·704	42·663	40.107
Electricity	6·180	6·321	2·852	Electric ...	6.180	6·320	2·852
Petroleum			·358	Friction ...	·188	·903	
				GearWheels		·678	·891
				Belt... ...	1·872	·452	·179
	100·	100·	100·		100·	100.	100·

Of the 114 exhibitors present on Saturday, 96 showed only petrol cars; 10 only steam; 3 only electric cars, 3 petrol and steam, 2 petrol and electricity. There were no cars with combined power.

Of the 114 exhibitors, 13 showed 42 bicycles and 5 motor tricycles. In addition to these 15 other firms only showed motor cycles 64 bicycles, 15 forecars, 3 sidecars. Grand total, 28 firms showed 106 motor bicycles, 17 with forecars, and 3 with sidecars, 126 cycles.

Chain driving is so reckoned where the chain is used in any way for driving.

Propeller-shaft driving is reckoned where the chain is *not* used at all.

Electric (or direct) drive is used on nearly all electric cars.

We are informed by Messrs. Van Raden and Co., electric ignition specialists, of Coventry, that they are now introducing a particularly neat and simple switch. The device measures but 1¾in. in diameter, and is 5/8in thick, and is made entirely of polished ebonite. It possesses the advantage of being practically watertight, and is self-locking. The device is made for single or double sets of batteries.

CORRESPONDENCE.

EDITORIAL NOTICES.

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

Letters of a personal nature will be withheld

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

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

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

THE GORDON-BENNETT ELIMINATING RACE.

[3535.]—May I be permitted to make a few remarks *re* the eliminating trials for the Gordon-Bennett race? Why should the trials be held abroad? No doubt the Circuit des Ardennes is an ideal course, but if Ireland could find a suitable course and permission was obtained to run the race itself, then surely something should be done towards holding the trials there?

Again, would it not be better for the expenses involved to fall into English hands rather than to swell the pockets of foreigners? although I should hardly think the Automobile Club was in a position to spend much money, having had, apparently, to stoop so low as to sell its patronage to a lesser exhibition to fill its coffers.

SID. GEO. GOODCHILD.

AUTOMATIC CARBURETTERS.

[3536.]—I should like to point out that your correspondent "Y72" falls into an error very general amongst motorists, viz., that when more power is required that end is gained by the addition of more *gas*. It is not necessarily so. Indeed, the addition of more *gas*, i.e., enriching the mixture, may mean less power, as G. F. Squire mentions in his letter (3501). There is one particular mixture which gives the strongest explosion, and any alteration, whether poorer or richer, means less power.

The example "Y72" mentions is just a case where it is not an alteration of mixture that is wanted (always supposing the mixture had been correctly adjusted before the hill was reached), but a reduction of the throttling action; the accelerator pedal will provide for this. By depressing this the throttle valve is opened wider, and, consequently, the *volume* of charge is greater, a higher compression follows, and a more powerful explosion.

Depressing the accelerator pedal does not necessarily mean more speed. In this case if depressed the correct amount, the extra power would be attained without increase of speed.

I said just now always supposing the mixture had been correctly adjusted, and it is just this automatic adjustment that the automatic carburetter provides for, and when it is once adjusted for the particular motor it looks after itself. It may be said that one does not always require the strongest mixture (by that I mean *correct* mixture, not excess of petrol, which I have pointed out above weakens the explosion), and that it is an advantage to drive on a weak mixture. That is so; but the automatic carburetter provides for that by *throttling* the correct mixture and admitting less of it, or, more correctly speaking, the governor does the throttling, and if the speed is still in excess of requirements a weaker spring on the governor will have the desired effect. To reduce the speed by retarding the spark is more often the cause of overheating than anything else; certainly nothing will make the exhaust pipe red hot more quickly than a retarded spark.

The mixture of petrol vapour and air certainly should *not* vary in proportion to the quantity as suggested by "Y72" in his last paragraph. Indeed, it should not vary at all; that is just where so many make a mistake. It is this unavoidable variation with ordinary carburetters that has been the trouble and what various inventors of automatic carburetters have been striving to avoid. The aim of all of them is to ensure *uniformity* and avoid the deleterious variation.

With the ordinary carburetter it is easy to hit on the correct mixture for any given speed, and if motors could be run at any one specified speed there would be no necessity for automatics.

D. G. TAYLOR.

INCOMPETENT EXPERTS.

[3537.]—I was extremely pleased to see Mr. R. E. Phillips's letter in last week's *Autocar*. I likewise feel that practical advisers are needed—men in such a position as to preclude all possibility of their accepting a commission on cars they may be instrumental in selling, and, of course, not financially interested, directly or indirectly, in the manufacture of cars. I have for some time been practising in this manner, limiting myself to the requirements of men of moderate means, and cars costing £500 downwards. In my opinion, this is the class most needing advice. The idea of general supervision of the car, once bought, is an excellent one. I would propose that *The Autocar*, being undoubtedly the leading organ of automobilism, should keep a register of consultants (men of good social standing), and should thoroughly enquire into the *bonâ-fides* of anyone wishing to be put on the register. A man wishing to buy a car or to have advice about repairs, etc., would write the editor for the name of the nearest consultant. I also think these consultants should not be allowed to advertise in the journals as experts, etc. I think the makers would welcome the idea. For one thing they would not be asked to pay commissions to the many so-called "unbiased experts." Of course there are many men in the trade who are perfectly straight and give good advice; my scheme would not interfere with these. A fixed scale of fees could be arranged.

B.O.H.

[3538.]—With reference to this subject and the comments by Mr. Phillips in your last issue, his suggestion is admirable, but as a vet. doctors a horse, why should not the autocar vet. doctor the car when necessary? The question of advice as to purchase, sale, upkeep, and so on, can only be of interest to those who are beginning their motoring existence; the man of ordinary intelligence who owns a car knows what he wants when it comes to buying a new one, and he also knows, or ought to, all about upkeep. To those who have no other interest in their cars than driving or being driven in them, the advent of capable experts to advise would no doubt be welcome.

Speaking for myself, and others in the same position (that is, lack of time), what is most necessary is a shop or shops where one could confidently leave a car to have repairs effected and know that these repairs were being done by *fitters*, and not tinkers, and also that the car would not be taken on the road without the owner's consent by persons whose ideas as to how gears should be changed are, to say the least, crude.

As an engineer, and one who has been through the shops, I know what wants doing and how it should be done, but, as already said, I have not the time, so when it comes to any necessary repairs—infrequently, certainly—I am at a loss where to go. Many of the men at repair garages may be able to erect finished material, but they cannot fit; how many of them can use a file or a scraper? R.

HORNS.

[3539.]—In all the numerous improvements advertised in your columns I look in vain for something to take the place of the harsh and nerve-shattering horn. Surely something more musical and equally effective can be found.

The bell or gong does not quite answer the purpose.

Perhaps some of your readers know of a substitute.

TOOT.

DISCREPANCIES IN HORSE-POWER.

[3540.]—What is the rule to calculate the h.p. of a petrol engine, as the h.p. given by different makers varies so very considerably for same size engine? In your list of 1904 cars, one sees in the four-cylinder ones 88 mm. × 130 mm. at 950 revolutions as 20 h.p., at 1,000 revolutions as 12 h.p., at 1,100 revolutions as 16 h.p., and at 1,200 revolutions as

14 h.p.; 110 mm. × 130 mm. at 1,000 revolutions as 27 h.p. and the same size at 1,500 revolutions only as 16 h.p. Surely the higher the speed the greater the power developed? The list of h.p. given is, to say the least, puzzling, and looks as if no guide. PERPLEXED.

HOW TO SAVE THE AUTOMOBILE CLUB.

[3541.]—There can be no doubt that, although the Automobile Club has increased in numbers, it has, during the last nine months, considerably lost in prestige. The annual general meeting of members is to be held on March 10th, and this meeting will give an opportunity to members to insist that the club shall not be again put in its present position with regard to the exhibition question. *There will be a postal ballot and the last day for nomination will be February 24th.*

The remarks made in the recent issue of the *Automobile Club Journal* are sufficient to show that those who are responsible at the present time for the regulation of the affairs of the club do not understand the gravity of the offence that has been committed by dragging down the club from the very correct and logical position it held in the exhibition matter ever since 1902—namely, that so long as the trade was divided the club would not give its name to either one faction or the other. This unfortunate change of position has apparently been brought about with the acquiescence of Mr. Roger W. Wallace, the chairman, and seems to have been due to the influence brought to bear upon the committee by Mr. Staplee Firth and Mr. Shrapnell Smith, and some others who are open and strong advocates of the Agricultural Hall Exhibition. Some of the other members also appear to have been in favour of the proposal, because they considered that the refusal of the Society of Motor Manufacturers and Traders to agree to the financial and other proposals of the club with reference to patronage was not couched in sufficiently polite or affable language, and did not imply the recognition of the importance of the goodwill of leading members of the committee. They appear to have thought that the giving of the patronage of the club to the rival show would be a suitable punishment for those who had dared to reject the club's proposals, and to have overlooked that, in endeavouring to punish the manufacturers and traders, they were at the same time dealing a deadly blow at the club's prestige. Such concerns as De Dion, Daimler, Edge, Panhard-Levassor, Thornycroft, Wolseley, and some forty other important firms have, moreover, signed a bond not to exhibit at the exhibition which the club committee is recognising, and which is supported by only part of the automobile trade generally speaking. I need hardly say that with Mr. Cordingley personally I have no quarrel, and if in the same position should have acted as he has done. I also recognise his enterprise in the early shows, and hope he has by now reaped his reward.

Members of the club would do well to see that some of the gentlemen who are responsible for this deplorable loss in dignity of the club are not again elected to its committees. This they can do, firstly by crossing through their names on any list of the new club committee, and secondly, by being certain to record their vote for not less than a total of fifty other members. How can this be done? As every member cannot be addressed individually, I am anxious to enlist support for a new committee through the press, which is the only means by which members can be approached. I beg, therefore, to put forward fifty good names, and assuming that these gentlemen will consent to serve, I beg to urge your club readers to vote for these fifty, and these fifty only. It is very desirable that every member should vote for not less than the full number.

Firstly, it is important that the club should be reinstated in the position which it formerly held as regards governmental and parliamentary circles. I therefore suggest the following names:

1. Sir Edgar Vincent, K.C.M.G., M.P.
2. Mr. George Montagu, M.P.
3. Mr. Henry Norman, M.P.
4. Mr. C. E. Shaw, M.P.
5. Mr. W. J. Bull, M.P.
6. Mr. Arthur Stanley, M.P.

The club's relations with the Continental and American automobile clubs have hitherto been most successfully conducted by a gentleman who was one of the automobile pioneers in this country, and I am sure his name should again be put forward as the chairman of the Foreign Relations Committee—

7. Sir David Salomons, Bart.

The scientific, and at the same time practical, side could be represented by:

8. Sir John Thornycroft, F.R.S., etc.
9. Dr. Boverton Redwood, D.Sc., F.R.S.E., A.C.I.E.

Our relations with the London County Council and with military automobilism could be entrusted as regards both to

10. Mr. Mark Mayhew, L.C.C.,

and as regards the latter especially to

11. Captain C. Skeffington-Smyth, D.S.O.

Although ill-health has prevented him from attending committees, seeing that he is responsible for one-third of the rent of the club's premises, no better honorary treasurer could be found than—

12. Mr. Paris Singer.

Trials and technical side of the club might be represented by—

13. Colonel Holden, R.A., F.R.S.
14. Major Lloyd, R.E.
15. Mr. Cozens-Hardy, M.I.C.E., M.I.E.E.
16. Mr. Lyons Sampson, M.I.M.E.
17. Mr. R. E. Phillips, A.M.I.C.E., M.I.M.E.

The interest of motor cyclists could be safely entrusted to

18. Professor C. Vernon Boys, F.R.S., and
19. Mr. O'Gorman, M.I.E.E.

The decoration and furnishing of the premises have been carried out in excellent taste in house matters, and should be in the future, as now, in the hands of

20. Mr. E. Keynes Purchase, the honorary architect.
21. Mr. Hugh Wegulin.
22. Mr. Ashton Jonson.

The automobile press might be represented by

23. Mr. Stanley Spooner, and
24. Mr. H. Sturmey.

Although the latter is not actually connected with the press now, the fact that he was the first to start an automobile paper seems to give him an undeniable claim, especially as he is now closely in touch with the movement. The general press should, I think, have at least one representative, and I suggest

25. Mr. C. Arthur Pearson, who is an enthusiastic motorist.

As unofficial and non-trading members, useful possibly on a finance committee:

26. Mr. Lionel Rothschild.
27. Mr. Frank Butler.
28. Mr. Henry Edmunds.

For knowledge of parliamentary procedure and close study of the legal position of automobilism, we might well rely on

29. Lord Russell,
30. Mr. F. P. Armstrong (barrister-at-law), and Mr. Scott Montagu, M.P., if he would serve, but I understand that he will only do so provided the present committee is radically reformed.

We next come to the representatives of the trade, and I would propose the following:

31. The President of the Society of Motor Manufacturers and Traders for the time being (*ex officio*),

and then as representative of the other section of the trade

32. The Earl of Shrewsbury and Talbot,

or, if his lordship will not stand, a representative of the Automobile Protection Society.

A man who is not frightened to express an opinion, and to express it in a forcible way, is often a useful member of a committee. Such a person would therefore probably be a useful addition; I refer to

33. Mr. W. H. Astell.

The following would probably be acceptable as representatives of the trade, which, considering the club is a society of encouragement as well as a social club, are quite in their right places if not forming a too large proportion of the club committee:

34. Hon. Stuart Bouverie (Wolseley Tool and Motor Co.)
35. Captain Deasy (representing the Martini Co.)
36. Mr. S. F. Edge (Messrs. S. F. Edge and Co.)
37. Mr. C. Jarrott (Oldsmobile Co. and Crossley Bros.)
38. Mr. Leonard (Carless, Capel, and Leonard)
39. Mr. Manville (Daimler Co.)
40. The Hon. C. S. Rolls (C. S. Rolls and Co.)
41. J. D. Siddeley (Siddeley Autocar Co.)
42. Mr. Claude Watney (London Motor Garage).

To represent electricity—
43. Mr. T. Chambers (Electromobile Co.)
and steam—
44. Mr. Thomas Clarkson (Clarkson, Ltd.)

It is impossible that all the affiliated clubs should be represented, but the Liverpool, Manchester, and North of England might be represented by
45. Mr. Calthrop,
the Midland Club by
46. Mr. A. Bird.
Ireland by
47. Mr. Goff.
Scotland by
48. Mr. R. J. Smith.

There is yet one other gentleman who has had unique experience of the club's affairs—
49. Mr. Claude Johnson, late secretary of the Automobile Club.

He would certainly be a most invaluable addition, and has done work of great value in connection with the Automobile Club.

Having ascertained that these gentlemen will serve, would it be possible to then ascertain from the Hon. Arthur Stanley, M.P., or possibly some other gentleman of undoubted position, whether, subject to this committee being elected, one of them would consent to be the chairman of the club? It cannot, I think, be hoped that anyone will be found to give up as much time as Mr. Roger Wallace has unselfishly done in the past to the chairmanship. In fact, I am inclined to think the club would be well served if the chairman would consent to attend the monthly meetings of the club committee, provided that the executive committee would agree that full minutes of their meeting should be forwarded to him, and that in the event of his disagreeing with any decision the matter should be rediscussed at a meeting at which he should be present. In these circumstances it would, undoubtedly, be necessary for the vice-chairmen to take more responsibility than they have hitherto, and probably some arrangement might be come to by which a vice-chairman should be appointed as a responsible head of the club in each week. There might be four vice-chairmen, each taking a week in each month.

A contributor to your columns has, I see, suggested that the late secretary, Mr. Claude Johnson, should take the place of Mr. Roger Wallace. Mr. Johnson, however, stoutly declines; in fact, he has already refused a pressing invitation from the existing club committee to join their body, on the ground that he would never consent to take a place in which he might be called upon to closely criticise the work of his successors.

I am sure that everyone will regret that members of the club may find it necessary to omit to vote in favour of some old and valued supporters of the club. The club must, however, be the first consideration of every member, as some of the present gentlemen are largely responsible for a policy which is not only undignified but disastrous; it is the duty of members not to include them in their new committee. There are others who have not been able from various reasons to attend committees except at rare intervals. *It must, therefore, be clearly understood that this is a matter of policy, not persons.*

In conclusion I must add that in most cases I understand that the gentlemen whose names I have suggested will act, but for the good of the club it is to be hoped that those who have not been previously approached will also see their way to officiate if elected.

AN OLD MEMBER.

WHY NOT MOTOR OMNIBUSES?

[3542.]—I am very much indebted to your kindly intentioned correspondent "Excelsior" for affording me an opportunity of supplementing arguments evincing the enormous superiority of motor omnibuses over an electric railway for passenger traffic along the ordinary roads of large cities—many of which advantages are equally apparent for less populous districts.

Respecting the danger of overhead wires, there are several cases of fatalities caused directly or indirectly from tramway wires, as "Valentine" admits, and although I don't keep a list of the electrocuted, I believe an electrician was killed last year at Sutton Coldfield, in which the voltage in contact was *only* 230 volts. However, to state that the man at Cardiff (to whom I never referred) was the medium of many thousands of volts, does not evince much knowledge of the voltage which is fatal. Electrocution in the United States of America is performed with 1,600 volts. But this question is not the most important to the main issue.

(1.) In reply to the size of engines, in motors we have our reserve, self-contained in each vehicle, and not several large costly engines with their huge attendant boilers, generators, and the remaining tremendous expenditure of a power station. A good motor 'bus can run a speed of from twenty down to three miles per hour, which is good enough for all practical purposes.

(2.) Our speed gears enable a motor vehicle to accelerate beautifully, and more recently the locomotive principle has been tried with success.

(3.) It is apparent that track brakes are impossible, but there is plenty of evidence to show that the braking power as arranged on the best cars is efficient.

(4.) As to wear and tear, I have personally inspected gear wheels for the tramcar motors, which have been worn as though they were cut from cheese after a few months' wear. It is a matter of proper material and workmanship. We have not the expenses of a power station, no metal track or overhead wires with their accessories to keep up, and the debit of their depreciation on our balance sheet. The expense of tyres is being overcome at the present moment.

(5.) The tractive power would entirely depend upon a good road surface and proper tyres. Our rate per car mile compares well with the average rate per car mile of the electric railway systems.

(6.) I have just been shown an admirable motor omnibus which will carry twenty-seven passengers, so that two would carry more than the average tramcar. The smell from motors is everyday becoming less and less disagreeable, and there will eventually be no offensive odour.

Since two buses are equal in capacity to one tramcar, it is evident that not only is a quicker transit possible, but that the traffic will be less congested, as they do not monopolise the road as a tramway does. Motors can overtake and steer round vehicles; trams cannot leave their groove, traffic must make way for them, and is necessarily congested. If a tram breaks down or the wire gives way, the whole service is blocked. But one motor 'bus does not stop the system or the traffic.

My figures as to costs are favourable to trams, and are therefore a good guide, but to deal with rates given, they are evidently most misleading, and are not the full facts. Other figures read as follows:

	Length of track (single).	Power costs.	Traffic costs.	Repairs.	Management.	Operating cost per car mile.
1901	8.25	1.49	2.42	.11	.61	4.63
1902	9.00	1.51	2.34	.32	.60	4.77

These are the figures for Carlisle, which is one of the smallest systems in vogue, and when we take a second year's record, the increase of only threequarters of a mile of track, whilst the management expenses are no more, at once raises the cost to 4.77.

Let us take the same figures for another small system.

	Length of track.	Power costs.	Traffic costs.	Repairs.	Management.	Cost per car mile.
1901	6.10	1.28	2.35	.17	.59	4.39
	7.79	1.39	2.21	.55	1.00	5.15

Here the line is only extended 1.69 miles and the cost per car mile rises over seventeen per cent. It is also well to note that the "local" tramway system only pays two per cent., whereas a motor 'bus service could easily pay five or six times that percentage in a populous city.

In a motor 'bus service we have thousands of pounds spent in plant, track, overhead equipment, and land to play with, besides avoiding the difficulties and expenses of obtaining or being refused Parliamentary rights.

H. BARKER LAKE.

A QUERY.

[3543.]—Will Mr. Ducros kindly say, through the medium of your journal, if the photograph of himself climbing Snowdon is faked or not, as on measuring it I find it about one in three, which in the snow would be an impossible climb? Besides, I see the telegraph post is not perpendicular, and I think myself that the photograph is misleading to the public. W. WINDHAM (Lieut.)

Flashes.

An automobile week is to be organised this year at the fashionable Dutch watering place of Scheveningen. The date of the meeting is from July 15th to 20th inclusive.

* * *

The stage is admittedly very partial to automobilism, and it is with pleasure that we record the fact that both Mr. Seymour Hicks and Mr. J. Hare have purchased 10 h.p. White steam cars fitted with Limousine bodies.

* * *

The youngest chauffeuse in New York is said to be a little girl under five years of age. Her automobile is 3ft. 6in. long, and at the highest point is two feet from the ground. The wheels are 16in. in diameter front and 20in. rear. It has three electric lights—one a miniature searchlight on the steering wheel.

* * *

The exhibition organised by the Manchester Motor Trades' Association will be opened by the Earl of Shrewsbury and Talbot on March 7th. Already the indications presage a run of success for this, the first provincial purely autocar exhibition. The entries are numerous, and thoroughly representative of the best English and Continental firms.

* * *

We are informed that the Motor Union has decided to assist in prosecuting the appeal against the decision of the jury in the case of Neave *v.* Rollet, heard at the Norwich Assizes on January 27th, and noticed in *The Autocar* of February 6th (page 158). Several correspondents have written us expressing their indignation at the action of the jury in finding for the plaintiff against the weight of evidence, and even against the direction of the judge, who throughout the hearing was decidedly favourable to the defendant autocarist. One or two correspondents have offered subscriptions towards defraying the costs of the appeal, which, it must be understood, will not be entirely borne by the Motor Union.

* * *

The James and Browne cars have not always been very easily seen in London, as the works are rather too far west. As this is the case, the makers are opening show-rooms at 395 and 397, Oxford Street. These will be fitted up with lift and all modern garage conveniences and appliances, and will no doubt be very useful not only to those who wish to try the cars, but also to provincial owners when passing through town.

* * *

The London Road Car Co. are buying two steam omnibuses, both of them being Chelmsfords.

"THE AUTOCAR" DIARY.

Feb. 12 to 24.—Crystal Palace Motor Car Show.
,, 20 to Mar. 6.—Turin Motoring and Sports Show.
,, 22.—Burnley A.C. Paper, "The Latest Improvements in Cars," by Mr. Harold Smith.
,, 23-27.—Hull Motor Car and Cycle Show.
,, 23-27.—Versailles Anti-skid Trials.
,, 24.—Motor Van and Waggon Users' Association Meeting.
,, 25.—Glasgow Univ. Eng. Soc. Lecture, "Motor Vehicles for Goods Transport." By Mr. J. E. Thornycroft.
,, 25.—Yorkshire A.C. Discussion on Motor Cars.
,, 25.—A.C.G.B. and I. Paper, "The Manufacture and Use of Pneumatic Tyres." Mr. J. D. Siddeley.
,, 26.—Nottingham and District A.C. Annual Meeting.
,, 27.—Midland A.C. Paper, "Wire Wheels Tyred." By Mr. F. W. Lanchester.
,, 29.—Entries close for A.C.G.B. and I. Side-slip Trials.
,, 29.—Scottish A.C. (W. Section). Discussion, "The Cost, Upkeep, and Care of an Autocar."
Mar. 3.—Junior Institution of Engineers. Paper, "Storage Batteries." By Mr. G. C. Allingham.
,, 4.—Manchester A.C. Annual Dinner.
,, 7.—Manchester Motor Show opens.
,, 7.—Scottish A.C. Paper, "Medical Aspect of Motoring."
,, 10.—A.C.G.B.I. Annual Meeting, 5 0.
,, 19-26.—Motor Car Show, Agricultural Hall.
June 17.—Gordon-Bennett Cup Race.

We are informed that a 20 h.p. Winton car with canopy top will be seen upon stand No. 223 during the course of the Crystal Palace Show.

* * *

The War Office now requires that officers of the Motor Volunteer Corps, in order to earn the volunteer proficiency grant, shall hold driving certificates from the Automobile Club.

* * *

The address of Mr. C. J. Paffard's motor car works and garage, referred to in *The Autocar* of last week as being convenient for automobilists attending the Crystal Palace Show, is 12b, Southey Street, Penge, S.E.

* * *

Messrs. S. Bowley and Son, of Wellington Works, Battersea Bridge, S.W., whose motor spirit is very much appreciated by many automobilists, now publish a list of agents who stock their spirit throughout the country.

* * *

It was definitely decided late last week that the French Gordon-Bennett eliminating trials will be run over the French Circuit des Ardennes course. The local authorities are all in favour, and it only remains for the French club to obtain the countenance of the Minister of the Interior.

* * *

The Royal Commission on London Traffic sat again on February 5th and 6th, and heard evidence from two civil engineers, neither of whom could do anything better than suggest an extension of the tramway system. By far the most practical suggestion, from an automobilist's point of view, came from Sir Ralph Littler, K.C., chairman of the Middlesex County Council, who said that in his opinion a series of main roads 80 or 100 feet wide should be constructed through the county of Middlesex at the national expense. This ever-present problem also occupied the attention of the Civil and Mechanical Engineers' Society at its last meeting, when Mr. J. F. J. Reynolds read a paper on the subject. In the interests of public safety, he insisted, amongst other things, upon the compulsory registration of all drivers, as now required for motor men. We hope that in the multitude of counsellors on this important question the case for the motor car will be adequately represented.

* * *

There have been a good many coincidences in regard to registration. Perhaps one of the best we have heard is the allotment of the distinguishing mark and number B.P. 175 to Mr. M. F. Mieville's car at Chichester. B.P., of course, is the district lettering of West Sussex, but as the machine is a Baby Peugeot and the price £175, the lettering and numbering are both most appropriate.

The Sussex County Council has decided to purchase a motor car for the chief constable. It was stated by the chairman of the Standing Committee that the cost of the car had been covered by fines imposed upon motorists.

* * *

A chauffeur's bureau has been established by the Motor Drivers' Registration Society, at 191, Hammersmith Road, London, W. The firm have a number of names of men on the look out for employment as drivers or mechanicians at different rates of remuneration. They accept no responsibility as to the future conduct of any member, but assure us they make most careful enquiries. If they do this, and take every precaution to see that only satisfactory men, with proper references, are allowed upon their register there is no doubt that the bureau will be a most useful thing.

* * *

A peculiar feature about the London traffic which we have noticed of late is that whereas the omnibus horse never takes the slightest notice of motor cars, the reverse is the case with the tramcar horses, which, as a rule, appear to be insufficiently broken in for their work. Frequently of late we have seen tramcar horses try to drag their cars sidewise off the rails away from a motor car. Tramway horses frequently evince terror even at a car which is standing still by the kerbstone with the engine at rest. Fortunately, the horses cannot drag the tramcar off the track, so that the only untoward result is that the drivers have a little difficulty in controlling their animals.

* * *

Among the ill-advised actions of the Automobile Club is the calling of a meeting of the club committee to consider what course, if any, shall be followed in regard to a statement made by the Hon. John Scott-Montagu in his paper, *The Car*, about the sale of the Automobile Club patronage. It would appear that because Mr. Montagu is a vice-chairman of the club, he has, in the opinion of the conveners of the meeting, no right to criticise its actions when he disagrees with them, though why he should not do so we are at a loss to imagine. He opposed the sale of its patronage right through, both as a member of the club and in his paper. However, as if to make the thing more foolish, the notice convening the meeting does not give the date on which the meeting is to be held. As this meeting is called by a requisition of the members of the general committee, it necessarily means that over half of them are implicated, as Rule 14, under which the meeting is called, requires that one-half of the members of the committee shall sign a requisition for a special meeting.

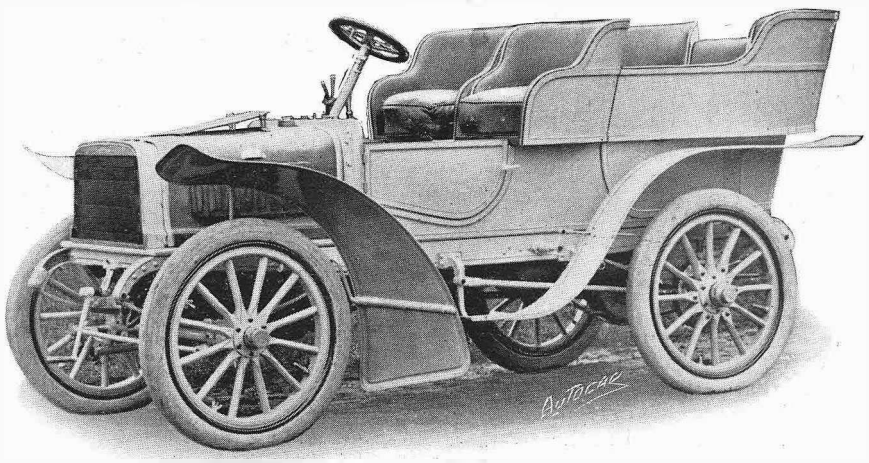
* * *

The Acton Hill Works, opposite the tramcar depot, Uxbridge Road, Acton, W., are now open for repairs, garage, etc. The proprietors (Messrs. Mort) inform us that there are 10,000 feet of floor space, 7,000 feet of this being in one workshop.

A well-appointed garage has been opened in Glasgow, at 96, Renfrew Street, by the Scottish Motor Garage Co., Ltd., with accommodation for two hundred cars. One of the features of the establishment is what is called the "breakdown car," which is sent out on receipt of wire or telephone message anywhere within a radius of twenty-five miles.

* * *

The Marquis of Londonderry has just ordered a 24 h.p. F.I.A.T. car from the British Automobile Commercial Syndicate. This car will be fitted with a body by Messrs. J. Rothschild et Fils, and will be of the type known as the Berline. It will be a covered carriage, with glass all round, having one side entrance. It will give accommodation for six people inside, and three of the seats will be arranged as *fauteuils*, which will revolve on pivots similar to a ship's saloon seat. The whole of the windows open, and thus render it practically an open carriage also. The carriage will be one of the finest ever made by Messrs. J. Rothschild et Fils.



The 10 h.p. Rykniel car, which is exhibited at the Crystal Palace for the first time. A description of the Rykniel Co.'s exhibit will be found on page 251.

The New Rossleigh Motor Co., Ltd., of Dundee, have just taken a new garage, workshop, and petrol store, close to their offices in Nethergate, and have a thoroughly efficient staff of mechanics under the supervision of Mr. T. G. Parsons, A.M.I.Mech.E.

* * *

While confirming our statement that the Napier Co. were the first British company to announce, and, for the matter of that, to put upon the road, a six-cylinder car, Mr. Frentzel claims upon behalf of the Motor Car Emporium that his firm was the first to exhibit a six-cylinder motor (of Continental make) not only in England, but on the Continent.

* * *

Mr. Oliver Stanton has had his arms blazoned upon the panels of his 20 h.p. four-cylinder Clément. Whether he applied to the Heralds' College for his coat or not, we cannot say, but as the same presents itself to view on his car, a friend who dabbles in heraldry tells us it may be so described. "On a shield *or*, a disc azure bearing the head of a Thomas Cat *noir*, with eyes *vert regardant*. Supporters, two lions rampant *rouge*, gripping two sparking plugs *or*. Crest, on a fesse *rouge* and *blanc*, a clenched fist gripping a starting handle *vert*. Motto: '*Ca va sans dire.*'"

SOME QUERIES AND REPLIES.

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

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

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

PLUG PROTECTION WANTED.

On my 7½ h.p. Wolseley I am much troubled in wet and muddy weather with mud splashing my plugs and short circuiting the high tension current. The Wolseley Co. advised a leather shield from the front axle under the engine, but this is what I have had always. Is this trouble inherent to the horizontal engine? Can any Wolseley owners kindly advise?—W. N. DREW.

We have never had any trouble in this respect on a car of the same make and power, as we have always found the engine to keep very clean owing to the side extensions to the wings. It would appear as though the leather shield is not high enough in front, so that the mud and water find their way directly on to the plugs. It should be perfectly easy to fit a small addition to the leather shield which will protect them.

THE SIZE OF TYRES.

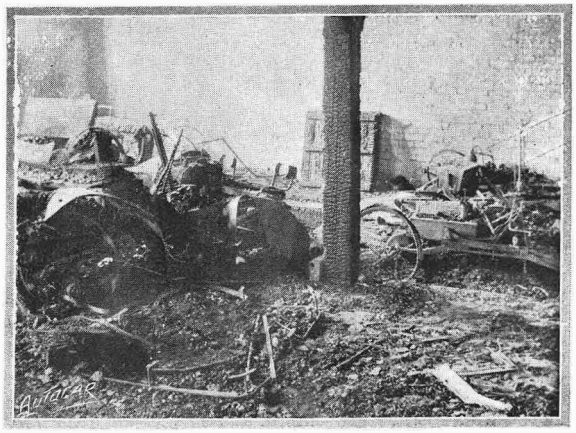
Would you kindly inform me: (1.) How the diameter of road wheels are measured? Is it from rim to rim or does it include tyres? (2.) How are tyres measured? If a pneumatic tyre is called 870 mm. by 90 mm., is 870 mm. the diameter of the wheel it is meant to fit, and how are the 90 mm. measured? In the case of solids, say 3in., where are the 3in. measured? (3.) What is the explanation of the enormous difference between calculated h.p., makers' selling h.p., and b.h.p.? For instance, a 12 h.p. four-cylinder car, said to give 16 h.p. on the brake, works out by calculation about 8½ h.p. Yet in the reliability trials it gets full marks for "accuracy of h.p.," and there are dozens more in the trials list similarly marked. (4.) On my car, with gear driven pump, I have a gauge on the dashboard, indicating, I presume, pressure of water, and as the pressure must vary with the speed of the engine, it indirectly indicates also the speed variation of the engine. Now, when I am driving on the lower gears, this gauge or indicator marks, say, five (the actual figure is immaterial): when I put in the third speed it will immediately drop to, say, four and remain there; and when I put in the fourth speed it will drop to, say, two and a half, or less, though the car in both cases travels faster, of course.—ENQUIRER.

(1.) The diameter of a road wheel is measured from the outside of the tyre across the centre of the wheel. This is best done by placing a strip of wood on the ground in an upright position outside the hub, and then placing a rule across the top of the tyre at a right angle to the upright stick. Then measure from the bottom edge of the rule to the ground. This will give the diameter of the wheel. (2.) A pneumatic tyre is measured from the outer edges, across the centre for its diameter and across its sectional area for the width. Thus the tyre would be 870 mm. across its diameter and 90 mm. across its section. In measuring the size of solid tyres the depth from the tread of the tyre to the bed of the rim is the measurement taken. (3.) The term "horse power" is unfortunately very loosely used. The term was first adopted by Watt when he introduced the steam engine as a more economical power than horses. The usual formula for calculating horse power in trials is the height of a hill climbed, the total weight of the car and passengers, and the time in which the car ascends to a given height. This gives the actual efficiency of the car as a whole. (4.) The gauge on the dashboard which indicates the water pressure is subject to variations in pressure in ratio to the speed at which the engine runs, so that when you are on the low gears the engine is running fast and driving the pump at a high speed, so that a bigger pressure is maintained. When the third speed is employed, the speed of the engine is somewhat reduced, owing to its having more work to do to drive the car on that speed. Therefore the water pressure falls still lower. The same thing applies when the fourth speed is put into engagement.

FOREIGNERS AND THE NEW ACT.

I shall be much obliged to know through your paper how the new Act will affect foreigners, as I intend touring in England for a week or so next spring. Shall I want a number plate and a license? If so, how am I to obtain same, before or on landing? If I need a number plate my car will be a sight indeed! A plate for Belgium, one for Holland, one for France, and one for England! And what about police traps? Supposing I am caught, fairly or not, and I give my correct address here, shall I be tried on the spot or shall I be summoned later and have to go to England or appoint a solicitor to avoid being judged by default? In case all this red tapeism—to which we here are used, or supposed to be—has to be complied with by any foreigner touring in your country for, say, a fortnight or three weeks, many will no more think of it, beginning with, yours truly, P.R.

As the point raised by our correspondent is one that has not yet come under the new Act, we submitted it to the Local Government Board, who without going into details as to how or where a foreign tourist should obtain his license or get his car registered, merely state that "it will be necessary for a foreigner to have his motor car registered and to obtain a license." A driving license must be obtained before you can drive a car. For this purpose you might temporarily reside, or have a postal address, at the port of landing, and take out your license from the council of the county or county borough in which that place is situated, and register your car at the same time, and, having done this, get the identification plates affixed. As to police traps, if you should inadvertently fall into one, your best plan would be not to give the police any more trouble than necessary, but do all in your power to facilitate matters and get the case over as speedily as possible. The employment of a solicitor would relieve you of the necessity of making an appearance in person before the court. The Automobile Club, we believe, is making arrangements to assist foreign visitors in matters of this kind.



A DESTRUCTIVE GARAGE FIRE. In *The Autocar* of the 6th inst. we recorded a destructive fire which occurred at Mr. E. C. Criswell's garage and repairing shops at Newmarket. The above photograph of a portion of the garage shows how completely the building was destroyed. Unfortunately, the loss was only partly covered by insurance.

CLUB DOINGS.

Leicestershire A.C.

At the annual meeting of the above club it was decided to become affiliated with the A.C.G.B.I.

Hertfordshire A.C.

At a meeting of the committee of the Hertfordshire Automobile Club on February 10th, it was decided that an opening run should be held on Saturday, March 19th, the route and details of which will be announced later.

North-East Lancashire A.C.

The second annual dinner of the North-East Lancashire A.C. took place last week. Mr. W. Birtwistle presided, and amongst the guests was Mr. Charles Jarrott. Mr. A. Birtwistle proposed "The A.C.G.B. and I. and the Motor Union," and Mr. Siddeley responded. "The N.E.L.A.C." was proposed by Mr. Shrapnell Smith, who appealed to the members to fight their cases on principle when prosecuted, because a conviction created an impression that they took it "lying down." When a case was fought and won it made others afraid to prosecute. Mr. G. D. Walmsley, hon. secretary, also replied, and, alluding to the cordial relations existing between the local constabulary and members of the petrol fraternity, he said it was gratifying to note the conciliatory attitude which had always been exhibited. He thought that if the same attitude had been taken up in other places there would not have been the same amount of friction between the police and motorists, which in some cases had degenerated into absolute and vindictive antagonism. Dr. Musson submitted the toast of "Automobilism," to which Mr. Chas. Jarrott responded. Referring to his racing experiences, he said if anyone ought to have won the last Gordon-Bennett race it was himself, on all chances and on all possibilities. Never before had he taken the trouble over a race that he did over that. He realised that he had a big responsibility on his shoulders. He had been chosen as a representative of England, and he felt it to be his bounden duty to do everything in his power to win. The toast of "The Guests" was proposed by Mr. R. Crossley, and responded to by Mr. M. Brothers, the magistrates' clerk, and Mr. W. M. Letts.

County of Durham A.A.

A meeting of automobilists was held at the Station Hotel, Newcastle-on-Tyne, last Saturday week, Captain H. S. Streatfield, of Ryhope, presiding, at which it was unanimously decided to form a district branch of the County of Durham Automobile Association in the North-western portion of the county. Mr. A. Wood was elected president, Captain W. C. Blackett vice-president, Mr. F. Herbert, Birtley, R.S.O., honorary secretary, and these three gentlemen, together with Mr. Percy Taylor Smith and Dr. Cox, were appointed a general committee. A good number of members were enrolled, and the Chairman impressed upon those present the necessity for careful driving, especially in congested areas. The rules provide for the suspension and even expulsion of members who drive to the public danger.

THE QUARTERLY 100 MILES TRIAL.

A Single Competitor.

On Friday, February 12th, the quarterly hundred miles non-stop trial of the Automobile Club was held. The route was, as usual, from the club through Uxbridge, Beaconsfield, High Wycombe, and Stokenchurch to the cross roads immediately beyond the forty-ninth milestone on the Oxford Road, and back to London. The road was very bad in parts owing to the recent rain. Only one competitor started—a 5 h.p. Coventry Humberette, weighing 8 cwts. 1 qr. 20 lbs. empty, and 11 cwts. 1 qr. 26 lbs. with observer and driver. It used 2 gallons 3 quarts 1 pint 14 ozs. of petrol and 2 gallons 1 pint of water. The speed on the outward journey was 13.82 miles per hour, and on the return 12.9 miles per hour. The run was made without a stop. The hill-climbing speeds were as follows: (a.) The steep portion of Dashwood Hill.—Time to danger-board, 4m. 10s., equals 9.65 miles per hour. (b.) One mile, including Dashwood Hill.—Time for the mile, 5m. 20s., equals 11.25 miles per hour. (c.) Aston Hill.—Took two passengers all the way up in 15m. 10s., equals 6.42 miles per hour. The trial was the first which has been held since twenty miles an hour became the legal limit, and it is somewhat surprising that only one maker took part, though probably the occurrence of the show at the same time may account for it. The performance of the Humberette, considering the extremely sodden condition of the roads, was an excellent one.

THE BRITISH AUTOMOBILE INDUSTRY, 1904.

On Thursday, February 11th, Mr. T. C. Aveling, A.M.I.C.E., read a paper before the Automobile Club upon the "British Automobile industry." It was a review of the present state of the industry so far as the author could ascertain it, and a considerable portion of it was devoted to a list of the firms engaged in the various branches of the industry. Consequently, while the paper will have a considerable historic value, it is not very interesting reading at the moment; that is, speaking of it as a whole. There are many items, however, which are distinctly interesting, and some of them must have entailed a great deal of enquiry and time before they could be written. As an instance, it may be mentioned that the author estimates that some forty thousand persons are engaged directly or indirectly in the motor industry. At the present moment there is in hand some £840,000 worth of work, exclusive of tyres, which will probably be delivered within the next six months. The total output capability of the firms now in the industry in gross value is estimated at about £2,000,000. Another very interesting portion of the paper was that dealing with racing, in which it was very plainly shown that the French owed a great deal of their supremacy to racing and to the keenness of their drivers and mechanics generally. The paper closed with a sterling ring, and we cannot do better than quote the last few words: "Are we cognisant of the fact that the automobile not only revolutionises our methods of commercial transport, but that also, ideally, it brings into our lives a new pleasure? The other day I took a deaf and dumb friend for a ride for the first time on a small car. He entered the car with a dull, inert, and hopeless expression; after the run, and when I had landed him at his door, the expression on his face had entirely altered. A new light was in his eye; he looked confident that after all there was some pleasure left in his life."

Last week we described a pump for inflating pneumatic tyres by the power of the motor. We are informed that this patent is the joint production of Messrs. Boot, Taylor, and Eddiss, all of Addlestone. It is a useful device, but we should scarcely have thought it required three people to bring it out.

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