THE AUTOCAR

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

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THE AUTOCAR.

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Notes.

Mr. Hickman, who was fined for excessive speed in the neighbourhood of Corfe Castle, as recorded in our last issue, writes us that at the time he was proceeding very slowly indeed—certainly not exceeding ten miles an hour—and what particularly annoys him is that he heard nothing about the occurrence until he had arrived home two weeks afterwards, and that he had to go down from Northampton to Wareham for the purpose of answering the summons, by which Mr. Hickman opines he has been very hardly treated—an opinion with which we feel very much inclined to concur, more especially as he informs us that at the time his Bollée was going very poorly, owing to the valves leaking badly.

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Autocar makers and riders, no less than cyclists, will be interested to learn that a fall in the price of rubber is expected. The United States Consul at Para sends home what is described as an "enthusiastic" report concerning the rapid development of the rubber industry in Parma and Amazonas. The output is said to be increasing rapidly, and besides South America, Africa and the South Seas can now be relied upon to furnish practically illimitable quantities. However, we have little faith in the published reports on the state of the rubber market, for it is a subject which very few persons understand, as it necessitates an intimate knowledge of the rubber producing regions in both hemispheres. The few who do know keep their dearly-bought experience and knowledge to themselves.

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Londoners have missed for some weeks the familiar sight of the electric cabs, and it has been understood that these were being overhauled, and would shortly make their appearance again. We now learn that the renovated and new cabs are to commence running again on May 15th, and that during the period of their sequestration several improvements have been carried out. The vehicles have been redecorated, and will make their appearance in new colours, and when they do commence to run again there will be no less than seventy-five on the streets, whilst in addition to the regular cabwork the company will be making a regular business of hiring out electric private carriages. As to the rumour that the cabs, when they make their appearance again, will be fitted with the taxameter, nothing definite is yet known, but from what we can gather this rumour will be found to be incorrect. The company are now endeavouring to get together as many of their old drivers as possible in view of the recommencement of service, as above stated.

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Mr. F. Parker, of High Street, Slough, has invested in a Daimler *char-à-banc* which carries eight comfortably, in addition to the driver. Last week it ran its trial trip locally, and created a wonderfully favourable impression. The representatives of the local press seemed absolutely delighted with their experiences, and speak highly of the way the car ran, and of the manner in which it was handled by Mr. Parker. Their comments, too, are decidedly to the point. Thus the *Slough, Eton, and Windsor Observer* says: "A motor *char-à-banc!* what an excellent conveyance for parties. No weary horses to consider. All you have to do is to take your seat and away you go at a swinging pace to your destination—distance no object. One of these admirable vehicles has been introduced into Slough by Mr. F. Parker, the cycle engineer, of High Street, who proposes to let it out to parties. It is better than a motor waggonette, because a party can sit more comfortably facing the direction in which they are going than sideways knee to knee." We have no doubt that a good many pleasure parties in the district will avail themselves of the opportunity of a motor picnic.

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The experience of our correspondent, Mr. A. Valintine, recorded in *The Autocar* of last week, that some of the passengers who accompanied him on an autocar otter hunt had their prejudices against motor cars removed by what they say and enjoyed on that occasion, is by no means uncommon. There is nothing like practical experience for removing prejudice of any kind, and many other autocarists could no doubt adduce evidence to the same effect. They have friends who once disliked autocars with an antipathy so ingrained as to seem absolutely irremovable, but who, nevertheless, under the seductive influences of an autocar run, found that feeling of antagonism giving way before a sentiment something akin to enthusiasm in the opposite direction. We fear, however, it would take a good many autocar runs to convert some of our country magistrates. Nevertheless, we fervently wish that we could organise

a gigantic otter hunt on autocars, so that we might try its effect on the great army of Justice Shallows, whose delight is in the law as directed against automobilism. Such an excursion might, perhaps, tend to redeem them from the narrow ruts of the autocrat, and enlist their sympathies on behalf of the broadening ways of autocarists, even if it did not induce them to join their ranks.

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Comparatively early in the history of cycling the police found that machine useful in the pursuit and capture of wrongdoers, and early in the eighties the Coventry authorities went so far as to start a police tricycle, with very good results, and we believe that to-day a large number of bicycles are used in police service throughout the country. It has remained, however, for an autocarist at Northampton (Mr. Jack Harrison) to be the first to demonstrate the advantages of the motor car in this direction, and we have no doubt the assistance thus rendered to the Northamptonshire County Police will not be without its influence upon "the force." It seems that Barnum and Bailey's show is proposing to visit the town, and last week a man describing himself as an agent in advance for that organisation turned up in Northampton disposing of tickets alleged to be bogus at low rates. By the time suspicion was aroused against him the man had commenced to make tracks, and Sergeant McLeod was dispatched in search of him. Hearing he had been seen on the Weedon Road, and Mr. Harrison's car being handy at the time, the officer at once jumped to the possibilities there presented, and Mr. Harrison, being nothing loth, the car was started with the officer on board, and was soon speeding up the Weedon Road as fast as the motor would drive it, coming up with the fugitive between Harpole and Flore, where the sergeant immediately apprehended his man, and speedily brought him back to the station. We are not told if twelve miles an hour was exceeded at any part of the chase.

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We have frequently said in these columns that autocar services in good districts would pay, and pay well, and quite a number are being organised throughout the country. Recently a friend of ours had an idea of starting such a service, but, being a cautious man, he took the precaution before investing of making enquiries from one who had already been at the business two or three months, and addressed a series of six questions to him, which questions with the replies they elicited are as follow: 1. Do they work satisfactorily?—Yes, we have found them quite satisfactory. 2. Do they take hills, with a load of eight or nine?—Yes, easily, but, of course, slow speed. 3. Cost of oil per mile?—About ½d. to 5/8d., according to conditions of roads. 4. Repairs?—The lasting of gearing and wearing parts depends greatly on proper attention and cleaning. 5. Cost of depreciation?—We put by £1 per week for each car. We do not think it will take all this, but yet it is best to be on the right side. 6. In a good district we think, if well managed, it should pay twenty-five per cent. after putting a good reserve fund by. After the receipt of these, need it be stated that our friend promptly purchased his cars, and is now rejoicing in the possession of three vehicles, which are making very good returns indeed. To ourselves the replies are eminently satisfactory, because they bear out exactly as the result of experience our own calculations on the subject.

* * *

The committee of the Automobile Club have sent a circular letter to manufacturers informing them that the demand for space at the forthcoming exhibition has been such as to fill more than twice the covered exhibition area which was thought at the outset would be sufficient for the purpose of the show, and that the special features of the show will be the running of motor vehicles on the track in the open air, and the provision made by the committee for giving the public an opportunity of riding in the carriages not only on the track, but on the highways and in the parks in and about Richmond. Special attention is also directed to the trials, and the certificates which are to be issued in connection with them, the purposes of these trials being to place the club in a position to give authentic information as to the capabilities of various forms of motor vehicles, and the best forms of motor vehicles for specific purposes, that manufacturers may be placed in possession of evidence by disinterested and competent judges as to the capabilities of their vehicles, and that the club will be enabled to obtain such information as will protect intending buyers against the purchase of worthless articles. In another column we are giving a list of medals and diplomas, and the different classes into which the trials will be divided. It is pretty clear that the Automobile Club are working whole-heartedly towards a big success.

* * *

"Why are French motors better than English?" asks *The Daily Mail*, and it further adds, "We are modelling nearly all our motor vehicles after French patterns, but though we may work as closely as possible to their specifications, the unfortunate fact remains that our machines are still inferior." Fortunately, *The Daily Mail* is only partly right, for it is a fact, and an undoubted fact, that we have cars made in this country which are in every respect as good, and, in some respects, better than the French models, except in the one point of speed, and in this respect we have the authorities to thank rather than the manufacturers. In France there have been no limits placed upon the speed at which cars could travel, and the French makers have had every inducement to design and experiment in the direction of producing speed vehicles, with a result which has naturally improved the construction of the slower forms of machine, in the same way as the cycle racing path has had a considerable influence upon the construction of road bicycles. In this country, however, there has been no such inducement, for with speed rigidly confined to twelve miles an hour the manufacturer has been compelled to restrict his attention solely to the requirements of the machine for touring purposes. Of course, our French friends have had many more years experience in the motor industry than we have, and that counts for something, and, taken broadly, it is true that, as *The Daily Mail* says, the French are considerably ahead of us, still, as we have just said, the fact remains that cars (although not many) are being built in this country which will compare in point of quality of workmanship and practicality for road requirements with anything the French are producing.

As we recently noted in these columns, a considerable boom is just now on in America, both in the direction of autocars themselves, and in the direction of the formation of companies to manufacture them. Electricity and compressed air appear to be the principal propulsive forces favoured in the States, and within the past two months a series of companies with what will be considered in Europe enormous capitalisation have recently been registered, as the following list will show:

American Air Power Co.	$7,000,000
International Power Co.	8,000,000
New York Auto-Truck Co.	10,000,000
Pneumatic Carriage Co.	500,000
Boston Auto-Truck Co.	10,000,000
Electric Vehicle Co.	10,000,000
New York Electric Vehicle Transport Co.	25,000,000
New England Electric Vehicle Transport Co.	25,000,000
Columbia Automobile Co.	3,000,000
Woods Motor Vehicle Co.	10,000,000
Lewis Motor Vehicle Co.	5,000,000

At the same time it may be said that all of those companies do not propose to build autocars in the sense in which we understand them on this side, and that, so far as we can gather, the largest capitalisations will devote their energies more to tramcar work than to autocar work, pure and simple. Of the companies mentioned, whose choice of power is not indicated in their title, we may say that the International Power Co. and the Auto-Truck Co. will use compressed air, whilst Woods Motor Vehicle Co. is an electric carriage concern, and the Columbia will deal both with the electric, petrol, and air power vehicles. Of the Lewis Co. we have no information.

* * *

Mr. Frank Morriss, the enterprising agent of King's Lynn, calls our attention to an exceedingly shocking accident which occurred in that town last week, resulting in the death of one little girl, and serious injury to another small child, the cause of the accident being the running away from some unexplained reason of a horse attached to a heavy tumbril, which dashed along a narrow thoroughfare crowded with small children at play, and the only wonder appears to be (from the newspaper report of the occurrence which Mr. Morriss sends us) that even more serious damage was not done. The animal appears to have been a strong, lusty brute, four years old, only broken in a few months, and admitted by its driver to be "a bit nervous," whilst that worthy further informed the coroner's court that they "were getting him 'gentled' by using him in the tumbril." And yet such an animal as this is sent out in charge of one man, who is required in the course of his work to do other things than give the beast proper attention. Naturally, the affair has created considerable comment locally, and the local journal devotes a column to it, but beyond the district how much attention will be given to the subject? Mr. Morriss not unnaturally asks what would have been the case had such an accident—had it been possible for it to have occurred—taken place with an autocar? and would not every journal in the kingdom have had something to say about it, and the terrible dangers of these new-fangled devices? But really cases of this character, which are happening in dozens every day, taking the country through, are of such common occurrence that, beyond a momentary expression of regret, no one takes any notice of them, looking upon such matters as quite in the ordinary course of events, yet the moment an autocar appears on the scene these callous ones hold up their hands in horror at its supposed danger, entirely oblivious of the fact that, as compared with the horse, it is safety itself, and that with the new vehicle accidents of the character recorded above cannot by any possibility occur.

* * *

An inquest was held last week at Exeter on the body of George Morgan, thirty-seven years, a clerk in the employ of St. Thomas's District Council. Deceased, who was a cripple, purchased a motor tricycle on which to ride to business. On 11th February, when he first mounted the machine, he was able to steer for a short distance, when the tricycle capsized. The man was picked up, and, after being medically attended, was removed to his home. A fortnight later it was found that he was suffering from an alarming hemorrhage from the hip, the result of the accident. He died on 23rd ult. A verdict of accidental death was returned. The foregoing is a short summary of a sad event, but one which is not without its lessons to motor cyclists, or perhaps we should say, to intending motor cyclists. Of course, in the case of the unfortunate cripple, he had evidently never learned to ride and steer a tricycle, but people who are expert bicyclists need to be just as careful at the start when they mount a tricycle, especially a motor tricycle, as if they had had no cycling experience whatever. Some few men with a purely bicycling experience manage a three-wheeler at once, but the great majority are not able to do this. The fact of the machine canting to the gutter seems to utterly demoralise them after being used to the bicycle, which keeps upright on any sloping road along which it is possible to ride it. All novices at tricycling seem to find this demoralising, and at once commence to steer towards the gutter. These peculiar sensations are very soon overcome, and there is really nothing easier than the management of a front steering three-wheeler, but it is necessary to ride very slowly indeed till the new conditions are thoroughly mastered. If this is not done, the chances are that an accident will happen. Speed should only be increased by degrees as the rider gains confidence and knowledge, though when he has once mastered the art, it is perfectly safe and easy to steer and manage the machine at all speeds.

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The case at Lancaster, which we report in another column, is a glorious example of police timing. In the first place we should like to know what sort of watches the policemen had, and how they got them to synchronise, and in the second place it is simply delightful to read that one constable, who was admitted to be five hundred yards away from the spot, and that, too, in the worst possible position for getting an accurate time, corroborated the evidence of the other as to the time the autocarist passed the milestone. Then there is something beautifully suggestive in the times recorded. The autocarist passed the first milestone at 1.45 after one, and the second one exactly at 5.10. This is so beautifully simple to reckon, but it makes a wonderful difference in the speed given when worked out. We have had a good deal of experience in timekeeping for a period of fifteen or twenty years, and police evidence on a matter of

this kind is always somewhat humorous, that is to say, it would be were it not for the fact that police evidence is accepted by the magistrates, who in this particular case showed a decided bias in the suggestion of one of them that the brakes might have failed, and in remarking, "Supposing someone had been killed." Some day in the dim and distant future even the magistrates will learn to understand something about autocar matters, and then we shall begin to expect a little fair play. Personally we have been through all this before in the pioneer days of cycling, so we are not surprised at anything which policemen and magistrates do. In the case in question, however, they clearly went out of their way to trap the unwary motorist. There is no evidence that anyone whatever was upon the road traversed; there is no evidence that the speed was dangerous to the public, only that it was over the limit. A prosecution such as this is distinctly unfair, and decidedly malicious, and the law was not made to provide policemen with cases of this kind. The object of the speed limit was to protect the interests of the public, and to give some guide as to what would be considered safe in the ordinary traffic of the roads. With a perfectly clear road with nothing on it, what on earth can it matter to anyone what speed the motorist travels at? At Hoylake another case with a more satisfactory termination was heard, though with the utter rubbish and exaggeration which was talked about the speed of the car we do not see how any bench could have done otherwise than pompously announce that "the defendant would be given the benefit of the doubt," especially as it so happened that one of the occupants of the car, who strenuously denied the police and other estimates of pace, was a brother J.P. and ex-mayor of Bootle. Would that all magistrates were sufficiently unbiassed to take a trial drive in an autocar, as did Dr. McMurray, J.P., ex-mayor of Bootle.

Tours and Runs.

Under this head we shall always be pleased to insert notes descriptive of practical work by users of autocars.

THE AUTOMOBILE CLUB RUN.

On Saturday, the 29th ult., there was a club run to Frensham and back, a distance of eighty-eight miles. Members of the club had previously scoured the country near London, and it was suggested that the beautiful district of fir trees, heather, water, and sand, which lies beyond Godalming, south of Farnham, should be visited.

An early start was made, namely, nine o'clock.

Mr. W. M. Hodges was driving one of the Daimler carriages, which are turned out by the London Motor Van and Waggon Co., of which he is the amiable and courteous manager. On board this carriage were Mrs. Hodges and a lady friend, Mr. John Taylor, F.R.G.S., Mr. W. H. Taylor, of Mortimer, Mr. W. H. Cox, of Dunkeld, N.B., and Mr. Julian, of Teignmouth. Mr. Frank Butler was on his five horse-power Benz dogcart with Miss Butler. The Right Hon. the Lord Justice Clerk of Scotland, Mr. A. C. Poole, and the secretary, were on one of the Automobile Association's Mors dogcarts, driven by Mr. Freutzel. Mr. S. F. Edge was on an "Aster" tricycle, and Mr. Robert E. Phillips and Mr. Herbert Capel on De Dion tricycles. Mr. Fuller drove his Daimler, and gave a seat to Mr. Cordingley for the drive down. Mr. Hewetson was driving a Benz Ideal, and Mr. and Mrs. Buttemer a similar carriage. Mr. Knight joined the party also on a Benz. The first stop was at the "White Lion" at Guildford. The Mors was delayed by a tyre puncture, and consequently was "last in" at Guildford at 12.15. The next stop, except that Mr. Fuller's pneumatic was punctured, and the Mors had a "wait" through imperfect lubrication, was at the charming residence of Colonel John Davis, A.D.C., Whitmead, Tilford, which commands a magnificent view of Hind Head and the surrounding country.

From thence the cavalcade started for Frensham Pond Hotel. At least the start had its droll incidents. One member, it is rumoured, capsized off his tricycle into a ditch five feet deep. But he has done this before, and looks upon it as part of the day's fun. The Mors drove bravely to the portico of Colonel Davis's house, and there stopped, and the search into the flaw in the electric ignition was of so protracted a nature that the occupants started to walk to Frensham, five miles off. They arrived there after a walk over moors and hills as deserted, but as beautiful as a Scotch deer forest—with the appetite which arises between an 8 a.m. breakfast and a 4.30 p.m. luncheon—in time to see the other vehicles starting for Mr. Buttemer's residence at Godalming, where members were to take tea.

At 5.30 the Mors turned up, and at six a start was made for London, but, owing to continual tyre troubles, the journey was abandoned at Guildford at eight.

On arrival at the club, it was found that ill luck had attended Mr. Hodges's carriage. The countershaft broke, and the journey from Godalming to London was made by train.

Mr. Butler and Mr. Hewetson stayed, in accordance with their original intention, at Frensham Pond Hotel, and Mr. Fuller proceeded to Brighton.

The tricycles, it is believed, came through the ninety miles run victorious.

The next Automobile Club run is on Saturday, the 13th inst., to Burford Bridge, Box Hill, where the night will be spent. A tour in the district and the return to London are to be effected on the Sunday.

THE AUTOCAR A "SHIP OF THE DESERT."

The camel will have to look to its laurels as "the ship of the desert," for, after the adventurous tour of two Belgian autocarists into the regions of North Africa—particulars of which are just to hand—the motor car will be able to lay claim to the title which has hitherto been exclusively enjoyed by the hump-backed quadruped. The news comes from Brussels, and is to the following effect:

"Two adventurous Belgians, Baron Pierre and Baron Joseph de Crawhez, have just finished a three months' Automobile tour in Northern Africa. Pierre is the winner of the Brussels-Ardennes-Spa automobile race, and it was with the same vehicle, christened the "Devastation," that he undertook the journey into Africa. Joseph steered an autocar of his own. From Brussels the brothers drove to Paris, and thence through France and Spain. They embarked for Algiers, and started for the interior of Algeria.

Traversing the gorges of the Oued-Djemma, they made their way to Sakkamodi, which they reached after a toilsome climb of nearly seventeen miles. They next descended the heights of the oasis of Tablat, and penetrated into the desert. M. Pierre de Crawhez says the desert sand was most favourable for the autocars, which attained a great speed at this point. At Aumale—a French military station seventy-eight miles south-east from Algiers, with a population of 4,560—the sound of their horns produced something like a scare among the population. The natives flocked out of their houses, and formed a wondering circle round the autocarists, who received every courtesy from the French authorities. The setting in of the rains compelled the travellers to turn back. They reached Bonira, but a few miles farther on the road had been swept away by a torrent, and they found themselves in front of a precipice, which they avoided by making a long détour.

"Next a river barred the way, but Pierre de Crawhez nothing daunted, drove boldly into the flood. The bottom was very rough, and the car bumped from side to side, but he succeeded in gaining the other bank, and was shortly joined by his brother. Among other incidents of the voyage may be mentioned the crossing of a ridge of the Atlas Mountains, through the snow, at a height of 6,500 feet above sea level. The farthest point reached was about 400 miles from Algiers. [This would be in the desert of Sahara.]

"The explorers have brought back an interesting collection of photographs taken *en route*. M. Pierre de Crawhez intends to make another journey in the same region next year."

A GEOGRAPHICAL EXCURSION.

An Englishman, Scotchman, and Irishman on a French car in North Wales.

For some weeks previous to Easter we had been getting up a motor and cycle trip for the holidays; we formulated a programme as long as one arm, and a list of intending passengers as long as the other, and all looked hopeful, even the weather. There were to be three motor cars, three motor tricycles, and six cyclists, which, with seven passengers in addition to the drivers, made a total of nineteen. Given fine weather, we had here the makings of a very enjoyable little trip, but only three persons turned up at starting time. The owner of one car was taken ill a week previously, that of another twenty miles from home the night before starting, one cyclist could not get away from business, and for various other reasons, all good ones, our numbers were so cut down that we almost decided to abandon the scheme.

However, we three were a host in ourselves, and, looking at the matter philosophically, we decided to carry out our programme. Two of us on a French Bollée, and one on a cycle, the riders changing occasionally, all but one man, who could not be persuaded to try the bicycle, as it was too small for him.

A French Bollée is not everyone's ideal of a car, but there is no doubt in my mind, and I am speaking with some experience, that a greater amount of work, power for power, can be got out of this class of car, than almost any other.

To begin with, we had the valves made so that they never require grinding in; it was thus not necessary to even look at them during the whole five days' trip. Sundry other small alterations were made, which enabled the car, under a test, to carry fifty-seven stones weight at a speed of twenty miles an hour on the level, and three men at twenty-five miles an hour—all this with what I believe is a *nominal* power of one and threequarter horse.

We made a start at six p.m. on Thursday, March 30th, going through Derby to Utoxeter, a distance of twenty-five miles, where we arrived at eight p.m., the roads being pretty good, and put up at the Red Lion. About eleven p.m. it commenced to rain persistently till noon on Friday, when we ran out of the rainy region.

We resumed our journey at ten a.m. on Good Friday, going through Stone; when we got past there on the way to Market Drayton, the roads were dry and hard. We dined at Drayton, and then went on through Whitchurch, Ellesmere, and Chirk, to Llangollen, a distance of seventy miles for the day, the Irishman riding the bicycle most of the day. The roads were very hilly in places, which made cycling very hard work, more especially as there was a strong wind against us the whole of the way. It was dark when we arrived at Llangollen, and we had a very fine view of the lights of Cefn, across the valley, as we rode down.

A friend of mine who used to ride a Boudard geared bicycle told me that the tour we had selected was all down hill.

I, in my guilelessness, believed him, and repeated the information to my friends. Personally, I do not mind it so much, as I do not cycle when there is a car about, but it is very annoying to have the friends of your bosom, so to speak, panting behind the car, and asking you, in agonising whispers, to get off and do a scorch on this sample bit of "down hill."

At Llangollen we put up at the Eagle's Hotel, where Host Allen presides; his house is well worth a visit. He is a great collector of curiosities, from the first railway ticket of a new line to rabbits with teeth two inches long. He has the tobacco box which belonged to Ben Brierly, the Lancashire poet, presented by the owner. A unique telegram, framed, in which occurs the jaw-breaking name of the town which has the honour of being the longest in the world, containing about forty letters, and which caused no end of trouble to the postal authorities. He also showed us a photograph of Miss Stewart, of Hafod-y-coed, who, when dressed in regal robes, is the most perfect double of our Queen; so great is the resemblance that, if the two portraits are taken and shuffled together, it is impossible to tell which is which.

Host Allen is also an engineer, and is never so happy as when he is helping a lame dog over a stile; we found that one of our tyres on the car had got such a rent in it that it was impossible to do any good in the way of repairing with rubber and solution, and he found us a good leather bandage, and helped us to lace it on, and also to overhaul everything on the car, and I understand this is not the first time he has acted the good Samaritan to autocarists.

Leaving Llangollen at 11.30 on Saturday, we went to Corwen, where we arrived at 12.30, intending to push on further before lunching, but the fates, in the guise of an idiot on one of those prehistoric

animals, a horse, willed it otherwise. The man could not manage the horse, and declined to get off and lead it, but sawed away at its mouth, and backed it into the car. As soon as the animal felt the car, it let go with both heels, and reduced the machine to what looked like a scrap-heap. Both front wheels were doubled up, one like a very bad figure 8, and the frame was bent nearly double, the driver's leg being entangled so fast amongst the wreckage, that one wheel had to be taken off to release him.

Restraining our wrath, we borrowed a primitive workshop, and, having taken the wheels to pieces, straightened the rims and spoke, patched one rim, straightened the frame and wheel axles, and were again ready for the road in about five hours from the time of the accident.

We had no brazing apparatus, except a paraffin paint burner, and no tools, but a few files without teeth and a vice with one jaw half an inch higher than the other.

The Irishman was afraid the repairs were not permanent enough, and declined to risk his life on the car all the next day. He therefore enjoyed the uphill work on a bicycle as far as the Penygwryd Hotel at the foot of Snowdon. As we did over 200 miles on the car after the damage, 120 being with three people on board, there could be no doubt the repairs were all right. I cannot say that we enjoyed the job, but there is a satisfaction in feeling that you can, upon occasion, be independent of other people.

By a most singular coincidence, after we had finished our repairs, and spent an hour refreshing, we proceeded on our journey, and had not gone more than a mile past the place where the accident occurred when we again met the same man on the same horse. This time we were in no mood to be trifled with; the horsey genius commenced sawing at the horse's month, and the animal began to back on us as before. We remonstrated in the most expressive English we could muster, but without effect. We then took him off his horse, and gently, but firmly, laid him down on the other side of the hedge, and sent his horse off home. This was a much easier and more enjoyable process than repairing the car. Indeed, it seemed to do us good.

A little further on we encountered two sportive bullocks. We were light hearted, except the man in the front seat, and so were the bullocks, who persisted in racing with us. Every now and then we would get level with them, and the betting would be slightly in our favour. Eventually, one of them jumped over a wall, and the other, which was a good way ahead, turned back and prepared to receive cavalry. When we were about four yards apart, he also turned tail, and bounced over a wall, probably frightened by the man on the front seat jumping off into a furze bush, who, had he known what he was to suffer from the thorns, would probably have preferred seeing the charge through. Anyhow, we gave him all the sympathy we could, and pushed on, as it was getting dark.

That night we slept at the Saracen's Head at Cerrig-y-Druidion. There is no doubt about the sleeping; we had had an eventful day, and our minds were at peace with all men. This was more than we had expected, as we had no idea we should so soon be able to get even with the man on the horse.

It has struck me that, as the place is 850 feet above the level of the sea, there might be something in the air that makes one feel sort of careless, for I saw an entry in the visitors' book, that some men had come on a car from Llangollen, which is all up hill, in one hour—twenty-four miles. I considered this was fairly good travelling, and proposed to the Scotchman, who always did our writing, that he should put our time down, but he, being of a pious turn of mind, would not.

After dinner at the Prince Llewellyn Hotel, we went on towards Portmadoc by way of Tremadoc, over a vile piece of road, more like soft soap than anything else, with a variation after we left Portmadoc of about four miles of new metal, for the privilege of riding over which, and cutting the car tyres to ribbons, we had to pay to go through a tollgate to get on to a private piece of road, and also to pay at the other end to get off. This beats the free shows in America, where you go in for nothing, and have to pay to get out.

Whether the jolting of the roads had done it or not, we found that the car would scarcely take its own weight up the hill into Harlech, after we left the tollgate. On arriving there, we found that one of the valve springs had been broken, and we had to repair it.

After a short stay at Harlech, we resumed our journey to Barmouth, the latter part of the road being very greasy; this was the worse for us, as it was getting dark, and there are a good number of turns. The road being down hill, we had to exercise a good deal of caution to prevent running into the walls at the sharp turns. Arriving at Barmouth, we put up at the Lion Hotel, having done sixty-five miles during the day.

Monday morning showed signs of wet weather as we set off towards Dolgelly, so we sent the bicycle home by train, rigging up a seat for the third man on the back mudguard of the car; this was a much better arrangement than dividing the party, and worked well all the way. We ran into fine weather about five miles out from Barmouth, although the roads were still somewhat sticky in places. We called at Dolgelly for a short rest, and to let the cylinder cool. We had a very gratifying escort out of the town, which the Scotchman maintains was got up in our honour, but I think it was the usual Easter Monday parade of children. As we came up the railway bridge they broke loose from the ranks, and raised the blue vault of Heaven with their shouts. It was very kind, but very embarrassing, as we dare not run away, for fear of killing a few hundred.

About five miles out from Dolgelly, close to Druis-y-Nant Station, we discovered that the back tyre was so badly cut that it was not safe to go any further. Welsh miles are apparently measured with an indiarubber tape, as the Scotchman, who volunteered to walk to a village half a mile back to get a leather bandage and some laces, was over half an hour covering the distance. Fortunately, he found in the village a youth who had a cycle, and got him to bring us the bandage, so that we had the job finished when he returned.

The next day (Sunday) we started about ten, and had a delightful run through Pentre-Voelas to Bettws-y-Coed, and then up the road through Capel

Curig to the Penygwryd Hotel, at the foot of Snowdon. Part of this road was delightful, though hilly, but the latter part, over the mountain, was simply abominable. There was also a strong head wind, so that the cycling member of our party, who was afraid of trusting his valuable life to the car, had a very heart-breaking time of it.

We had not much better luck on the car; the Scotchman on the front seat said it was mist, but I came to the conclusion, before we got to the foot of Snowdon, that a saturated solution of air and water is not the best thing to add to vaporised petrol to make an explosive mixture.

At the hotel we met a party of the Manchester Wheelers, who were baiting a Snowdon guide for amusement. As we could not see Snowdon for the mist, we proceeded on our way, with about nine miles down hill into Beddgelert. It was a glorious run; for about six miles we ran the car with the engine stopped, as we always did down long hills, and at one place had an exciting chase after a mountain sheep, the odds, for two miles, being very much in favour of the sheep, but when I tightened the belt and started the engine, the sheep got demoralised and ran without judgment, and so lost.

We sailed along to Bala at a good twenty miles an hour; the roads were good, the weather fine, and the bread, cheese, and ale at the little inn raised our spirits so that we forgot our woes, and went on our way rejoicing. I shall never forget the glorious succession of runs for the next day and a half. From Bala to Corwen was one series of either down hill or level road, until we got on the Holyhead Road again, which is simply perfection. Down the hills from Corwen to Llangollen we swung at full speed, often without the engine. After a short stop at Eagle's for tea, we resumed our journey; the engine seemed to enter into the spirit of our enjoyment, and took us to Chirk on top speed. After Chirk, to Oswestry, it was mostly down hill again, and we were there almost too soon.

We stayed at the Queen's Hotel. We had wired a day or two previously for some petrol to be sent to the station here, and we went to see if it had come, only to receive at eleven o'clock a wire to the effect that the railway company would not carry it. We then went to one Solly Evans, and got some deodorised naphtha, in the event of our supply of petrol running out.

We then started for Shrewsbury, and here I must insert a word of praise for the Shropshire County Council and their road engineer. During that day we went over about ninety miles of road that were perfect. On fifty of these in Shropshire we never saw a loose stone, and, although it had recently been raining, not a pool of water. The roads are hard, properly macadamised, with a fine gravelly surface, and simply delightful to run on. I am afraid that on some of the long straight stretches we went nearer thirty miles an hour than the legal thirteen, and, if we had been brought up before the magistrates, we should have blamed the roads. Our only plea would have been, "couldn't help it." At the same time I wish to say that we were never guilty of such insane speed when there were people, vehicles, or houses in sight.

We found the streets of Shrewsbury very trying. They are bad at the best, a good many of them being planted edgewise up, but, being market day, and it having been raining, they were awfully slippery, so we had to go cautiously. We stayed there for dinner, and then went on for Lichfield, about forty-two miles, *viâ* Wellington and Shifnal, but found we had been misdirected, and went some miles out of our way, but the roads were just as good, and we did not mind.

We were ready for tea at Lichfield, but, as time was getting on, we decided to go on to Burton, and have tea there. The distance is about twelve miles; the roads being clear nearly the whole of the way, we did the distance in the half hour, but we very nearly came to grief. A party of men returning from some races or sports with a cartload of trestles, boxes, and boards, seemed to resent our passing, and threw some long boards on the top of us. The first board, intended for us, struck their own driver on the back of the head, and he at once went for the man who threw it, with the result that the whole load was upset, men, boards, trestles, and boxes being mixed in sweet confusion on the road as we passed, the men's tempers by no means being improved by our unrestrained laughter.

Arriving in Burton on good terms with ourselves, we had tea at the George Hotel, and proceeded in the dark, very cautiously, on our way to Derby, and thence six miles further to our destination, our only mishap being to lose the Irishman and the portmanteau off the back of the car as we went up a steep hill. We arrived home just before eleven o'clock, having completed a run of about 300 miles.

C. H. Guest.

The Humber motor tricycle being used by Messrs. R. M. Wright and Co., Lincoln, has been well received and has created quite a little excitement. The pace has been pretty high at times, but the machine is easily managed, steered, stopped, and started. A Daimler *char-à-banc* has been running about, too.

* * *

Mr. Andrews, of the Andrews Manufacturing Co., Birmingham, called on us this week with the latest pattern of the Swerdna wheel for autocars and motor cycles, which we illustrated recently in these columns. He reports that it is being received with considerable favour in autocar trade circles.

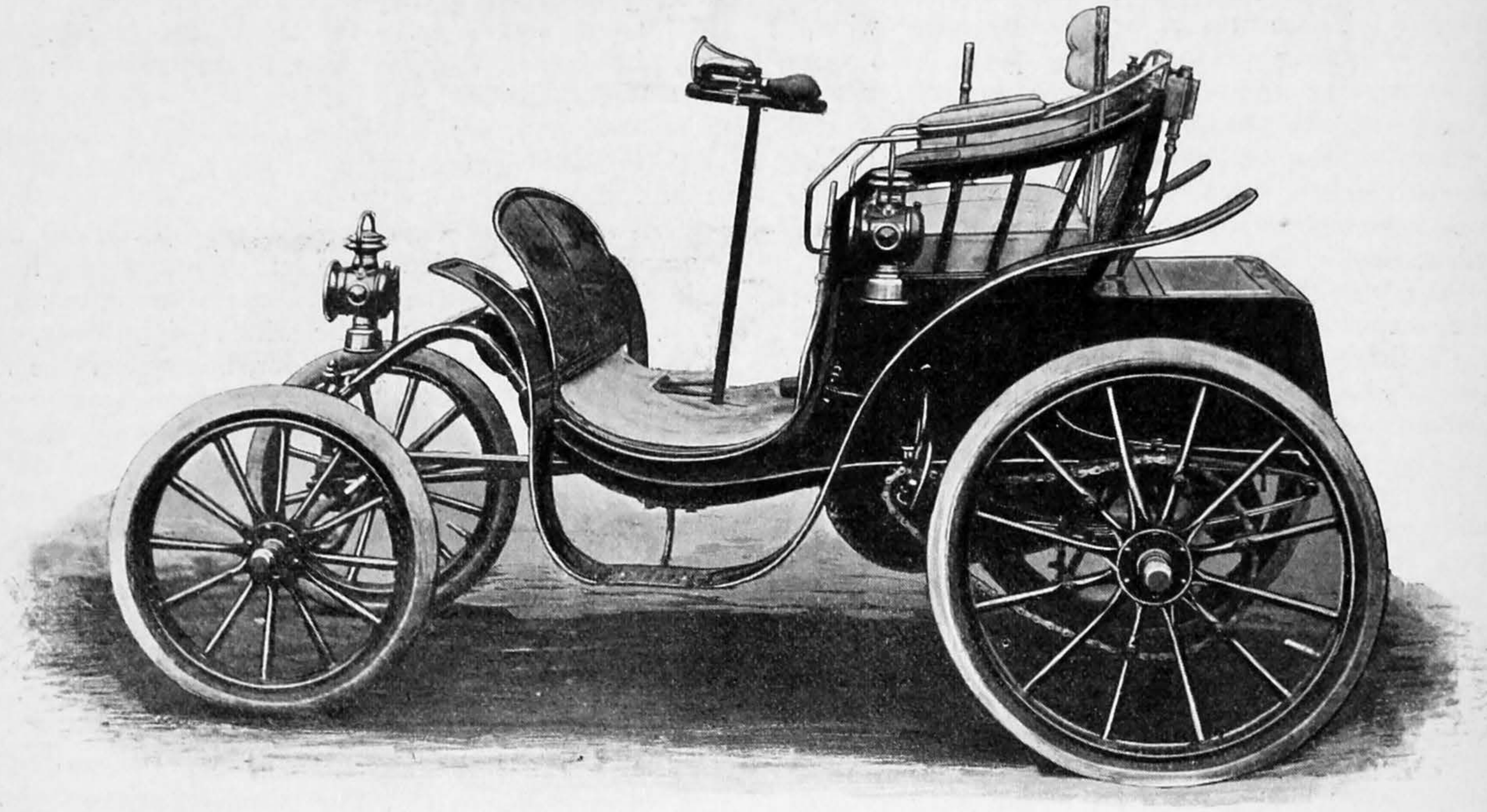
* * *

We had a call this week from Mr. George Dresden, the British agent for Porteus Butler, of Paris, and were interested to learn the very considerable amount of business in motor tricycles, motors, and fittings which is being done. It is quite clear that motoring is steadily catching on in this country.

* * *

Autocar matters are moving ahead in Scotland, and both the Scottish cycling journals are giving considerable attention to the subject, *The Scottish Cyclist* going so far as to issue a regular "Motor Car Supplement." This was first issued under the name of "The Motor Car World," but the post office authorities objected, and our Scottish contemporary promises that it shall make its appearance as a separate publication as soon as it can see its way to doing so.

THE LIGHT PANHARD CAR.



The big autocar firms who turn out driving mechanisms of standard powers have so much business in hand that they do not find it worth their while to cater for customers desiring a lighter and cheaper form of vehicle, because, in many cases, this would necessitate an entire modification in the design of the motor and propelling gear, and so long as makers can book as many orders for the ordinary cars as they can execute, they are not disposed to go to the trouble and cost of further experimental work. A noteworthy exception to this rule, however, is the Société des Anciens Etablissements Panhard et Levassor, who, on receiving numerous enquiries from their customers for a cheaper car than they were then manufacturing, immediately set to work to devise one. As the cost of the car lies principally in the motor it was obvious that the engine must be of simpler and cheaper construction than the Daimler, and the firm decided to employ a motor specially devised for a light carriage by one of the directors, Commandant Krebs. In designing this engine the inventor had naturally to aim not only at simplicity but also at economy of weight and space, and as in a light vehicle there is not much resistance to the vibration of a motor, the mechanism had to be so arranged that the vibration would be taken up with the least inconvenience to the passengers.

In the motor of Commandant Krebs all this has been accomplished with remarkable success. He has adopted a single cylinder, inclined at a few degrees from the horizontal, and situated behind the countershaft at the rear, where it is very accessible, and well open to the cooling influence of the air, which circulates through the movable perforated plates forming the back of the car. The motor is fired by incandescence. It develops four horse-power, and the body of the cylinder is cooled by flanges, but as air is not a sufficiently good conductive medium for an engine of this power, the combustion chamber has had to be cast with a water jacket. The advantage of this arrangement lies in the very small amount of water used. The ailettes or flanges radiate the heat from the body of the cylinder, and, to a much smaller extent also, the heat developed by the explosions, and as there is very little heat to be conducted by the water, only a small quantity need be carried. Again, as the water circulates by difference in temperature there is no necessity for a feed pump, so that one of the little sources of annoyance in the autocar is done away with. The engine operates on the countershaft by means of spur wheel gearing, which is arranged for three speeds with a maximum of thirty kilometres, and it also has a reversing gear, as well as two brakes, one operated by the hand and the other by the foot, so that the vehicle fully complies with the requirements of the new law. The brake and starting levers are both at the side, and very handily placed. The car is steered by a wheel, and is very sensitive and accurate in operation, and one of the advantages of the new system of steering is that the front wheels are absolutely rigid, and cannot be deflected by stones or other obstacles.

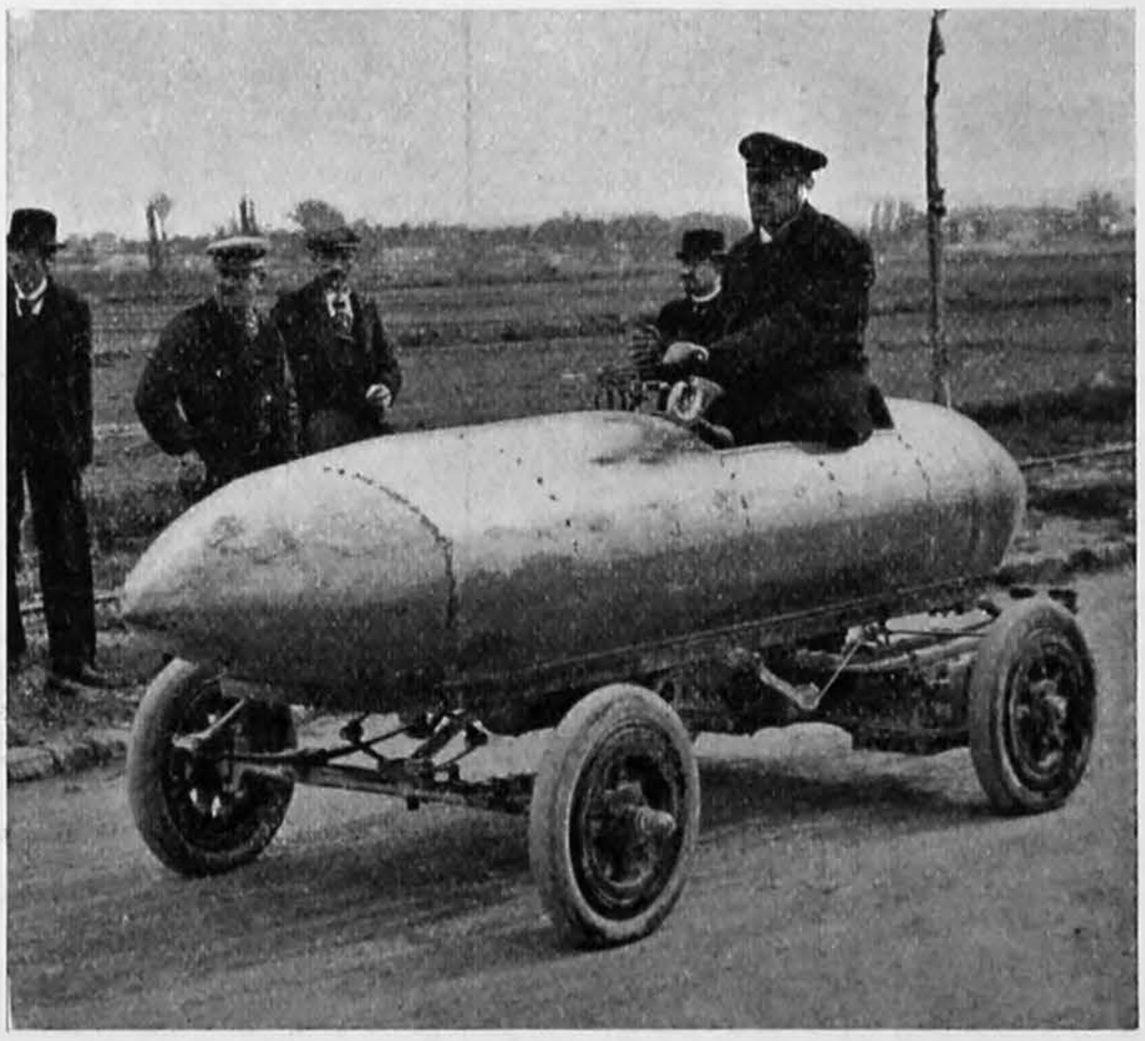
Weighing 350 kilos. in running order, the carriage has roomy seats for two persons, and except for the steering wheel there is absolutely no mechanism in the way of the passengers. The splashboard is sufficiently high and wide to afford plenty of protection, and it carries in front the petrol tank. The underframe extends forwards in a series of four tubes, two of them horizontal and the two others bent in a manner to give the greatest support to the front part of the car, and all of them converge to the spindle on the fore axle. In the first cars constructed this arrangement gave a very long wheelbase, and the length of the tubes appeared, indeed, to be a source of weakness, but in the new vehicles the base has been shortened, though it is still sufficient to give plenty of stability

to the car without sacrificing its strength. As with everything turned out of the Avenue d'Ivry Works, the carriage gives evidence of the greatest care in construction, and it is built with as much attention to the smallest details as the vehicles costing four times the amount. We are able to say from experience that the vibration is practically imperceptible, and there is no more noise than in the most perfect types of the bigger cars, while as to facility of handling and management, the new light vehicle is all that can be desired.

FRENCH JOTTINGS.

It would seem as if some of the laws in this country are like promises, in that they are proverbially made to be broken, and, though the new laws regulating autocar traffic have been in operation some little time, they do not appear to have had the slightest effect in checking the reckless driving of chauffeurs. Comte de Cossé-Brissac has written to the Prefect of Police complaining of the way in which the chauffeurs drive their vehicles in the Bois, dashing by at full speed close to high-spirited horses, which can only with difficulty be kept in hand by their drivers. At one time we should have regarded such complaints from those who display their horsemanship in the Bois as dictated merely by prejudice, but it cannot be denied that since the law limited the speed in frequented places to twenty kilometres, they have a right to protest when chauffeurs dash through the traffic at thirty or forty kilometres an hour. On Sunday we saw more than one narrow escape from collisions between cyclists and voiturettes, and one fool was driving a light car at high speed through the thick traffic near the Jardin d'Acclimatation, while the young lady on the front seat was shrieking with terror. The guardians of the Bois say that they can do nothing. All that they can do is to hold up their hand, but the chauffeurs will not stop, and it is, of course, hopeless to expect to catch them.

Fast driving is a craze that grows with what it feeds upon, and appears, therefore, to be insatiable, but there is at least one man who ought to have slaked his thirst for speed. M. Camille Jenatzy, the Belgian inventor of the system of electrical propulsion which came so successfully through the heavy car and motor cab trials last year, is not only a clever electrician, but also a thorough sportsman, and there has been a keen rivalry between him and Count de Chasseloup-Laubat over the kilometre record. When the Count secured the record by doing the kilometre from a standing start in 48 4-5s., and the flying kilometre in 38 3-5s., it looked as if Jenatzy would have some difficulty in lowering these times. About a month ago he made an attempt, when, unfortunately, through a mistake of the timekeeper, the full distance was not clocked. Jenatzy could not start again, as after such a tremendous effort, not only were the batteries exhausted, but probably also seriously damaged, and it was, therefore, necessary to postpone the attempt for another day.



M. Jenatzy on "La Jamais Contente."

The date fixed for Jenatzy's fresh attempt was Saturday afternoon. All the chauffeurs felt that there was likely to be something very big in the way of record riding, and there was a long file of autocars and petroleum tricycles scorching along the splendid roads through the Forest of Saint-Germain, in the direction of Achères. The course, which has become

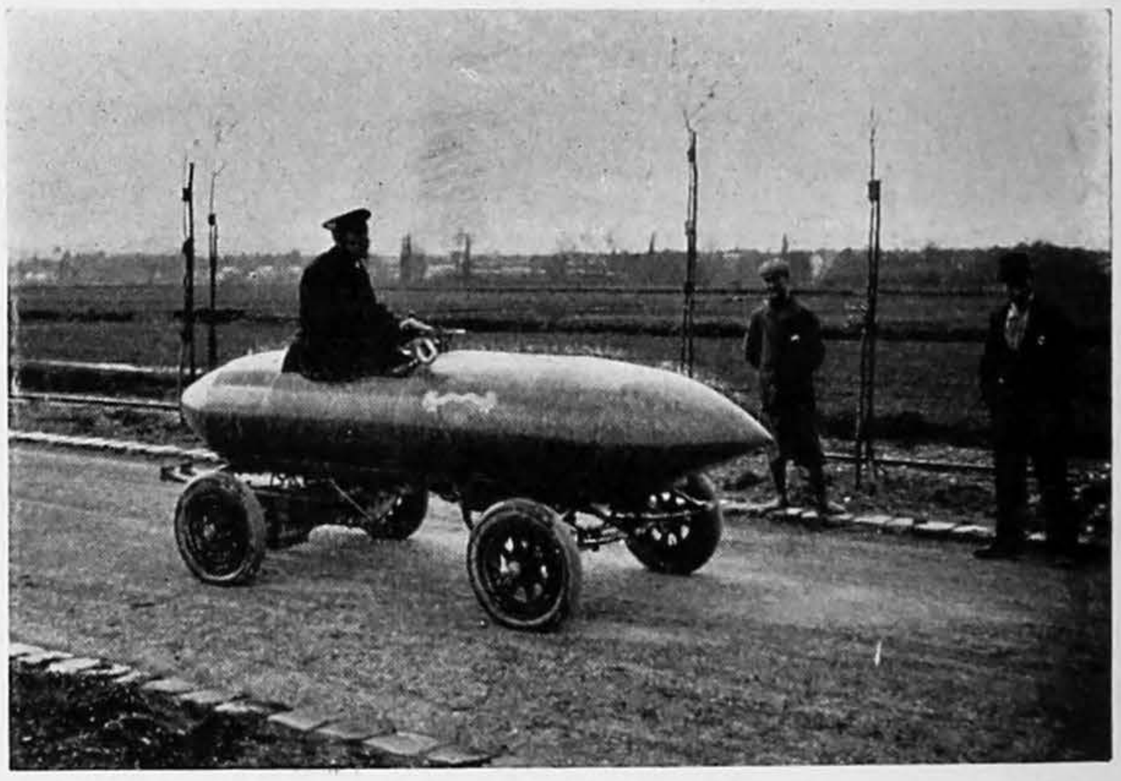
BEFORE THE START.

the classic one for the kilometre records, is a perfectly straight and level road running through the new sewage farm lying off the highway between Saint-Germain and Constans. It had a distance of two kilometres, marked out by flags. The first kilometre is ridden from a standing start, and the time is also taken as the vehicle flies over the tape at the end of the kilometre. The road was in fine condition, the dust being laid by slight showers that had fallen a little while previously, and this was particularly fortunate, as a rather strong breeze was blowing along in the direction the vehicle was to take. Heavy black clouds were banking up, and threatened a terrific downpour. The car which Jenatzy was riding was the famous "Jamais Contente," an appropriate name certainly for a record vehicle, which is never satisfied with its performances, but is always anxious to go one better. The vehicle is built of sheet iron, and is torpedo shaped, so as to offer as little resistance to

SIXTY-SIX MILES AN HOUR.
A snap-shot taken as the car flew over the second kilometre.

the wind as possible, at the same time that it gives plenty of room for the batteries. The opening at the top makes an extremely tight fit for the driver. He is just able to sit with his hands on the steering wheel, upon which are fixed a horizontal and a vertical handle, so as to allow of the driver getting a good grip, and holding the wheel absolutely rigid. The controller is immediately at the side of the driver, and the ampère and volt metres are in front, though it is doubtful whether Jenatzy was able to consult them during his ride. The car had to fly or burn. It is mounted on a low underframe supported on very small wheels with big pneumatic tyres. The motor is geared directly on the rear axle, the whole of the mechanism being enclosed in a metallic case. The body of the car hangs on leaf springs over the rear wheel, but the front part is more rigid. The car is painted a greyish blue, with her name, "La Jamais Contente," near the bow.

"La Jamais Contente" was towed from Paris by a petroleum car, and probably also it was towed back. A good deal of time was lost at the start, owing to the difficulty of getting a clear course, as there were some hundreds of people along the route. After a good deal of signalling with flags, M. René de Knyff gave the start. The car moved off, and, after going about ten yards, literally bounded forward. From our coign of vantage at the end of the



SIDE VIEW OF THE RECORD MACHINE.

first kilometre we could see the car rapidly looming up. Almost before we were aware of it, "La Jamais Contente" had rushed past with a subdued noise like the rustling of wings, and as the car disappeared she scarcely seemed to touch the ground, but undulated like the dipping of a swallow along the surface, this no doubt being due to the give of the springs and the pneumatic tyres. The impression we had was a most sensational one. Nothing had ever travelled on the road at such a speed, and the spectators were anxious to know not whether Jenatzy had broken the record, but by how much he had reduced the time. As I said, the dust had been laid by the showers, and where the car had passed it left two broad, white wheel tracks in the middle of the road, absolutely straight, and converging in the distance like a line of rails. As an example of accurate steering, it was wonderful. It is true that, had Jenatzy swerved an inch to the right or left, his record breaking days would probably have been over. After comparing the times, it was found that he had ridden the first kilometre in 47 4-5s., and the second in 34s., which is equivalent to 105 kiloms 882 (65 miles 1,404 yards) in the hour. "La Jamais Contente" is not

even yet satisfied, for Jenatzy thinks that he will be able to do the flying kilometre at the rate of about 120 kilometres, or about seventy-five miles an hour. After such a tremendous effort, it would have been interesting to know the state of the batteries, but this is one of those points upon which curiosity is regarded as an indiscretion. Moreover, the heavy storm which burst and drove everyone away did not permit of our seeking out Jenatzy, who was at the other end of a wild waste of shelterless country.

As a comparison with the electric car, it may be interesting to give the results of trials with the petroleum vehicles, whose owners profited by the occasion to go over the course. M. Lefebvre, on his Amedée Bollée car, did the first kilometre in 1m. 17s., and the second in 58 4-5s.. Charron, with the six horse-power Panhard car, which won the Paris-Bordeaux race three years ago, did 1m. 18 4-5s. and 1m. 2 1-5s. respectively; M. H. de Rothschild covered the first kilometre in 1m. 28 3-5s., and then stopped through a mistake; Girardot did 1m. 22 4-5s. and 1m. 17 2-5s., and Oury 1m. 12s. and 1m. 7 1-5s. It must be remembered that these petrol cars, having made their records, could go on none the worse, whilst with the electric fliers the batteries were completely run out in one wild, mad sprint.

The Poste Electrique Internationale is a company which has the ambitious programme of establishing posting houses on all the highways throughout Europe, where it will lay down electric charging stations for vehicles, supply petrol, and all the other requirements of the chauffeurs, and have in connection therewith cafés and restaurants. It is very doubtful whether such a venture can succeed, as the needs of the chauffeurs are very well catered for at the moment by the hotel keepers, and I do not see how the laying down of charging stations is going to facilitate electric locomotion, as the batteries would take several hours to charge, and this would leave the electric vehicle at a great disadvantage as compared with the petroleum car. The company, however, has apparently decided to commence operations by laying down a series of stations between Paris and Brussels as follows: Paris (Porte de Pantin), Villeparisis, Meaux, La Ferté-sous-Jouarre, Charly, Château-Thierry, Dormans, Ville-en-Tardenois, Reims, Isle-sur-Suippe, Rethel, Lannois, Mézières-Charleville, Rocroy, Fumay, Givet, Dinant, Nevion-Namur, Gembloux, Wavre, and Brussels. It will be interesting to see the result of this experiment.

Just lately Mr. J. W. Stocks has been experimenting with a seat arrangement fastened on the front of his motor tricycle, carrying another passenger, and even with two up we hear that on Saturday he was seen moving at a rattling pace up the slope to Victoria Park, Small Heath.

* * *

Mr. Archie Millership, of Birmingham, has been summoned at Bournemouth for furious autocaring. A police constable said the car was going "like a flash of lightning, almost," and a cabdriver stated "that a racehorse would have had as much trouble as possible to keep up with it." On such evidence Mr. Millership was fined £1, including costs, as a "deterrent to others," said the Chairman.

Correspondence.

THE HOYLAKE MOTOR CO.

[725.]—I notice in last week's *Autocar* a note that there will be motor cars running in this neighbourhood some time this season. May I be allowed to tell you that the Hoylake Motor Car Co. has been running in this neighbourhood for the last six weeks.

2nd May. W. C. HEAVYSEGE,
Chief engineer for the Hoylake Motor Car Co.

"POPPING" IN THE DE DION CARBURETTER.

[726.]—Will some well disposed one or ones of the noble army of automobilists give a slight lecture on the following matter, and oblige yours truly, and perhaps others? In riding a De Dion '99 tricycle, I sometimes notice at starting a peculiar popping sound that seems to proceed from the carburetter, and there is a bulging of the sides of the latter, which I am inclined to think is synchronous with the popping. Is this a common phenomenon, and is it due to a leakage backwards past inlet valve? Does the spring of inlet valve become ever too weak in course of use, and require renewing or tightening?

A LOVER OF THE GAME.

RUBBER PAVEMENTS.

[727.]—In a paragraph of your issue of April 22nd last, page 330, we notice that it is said that the North British Rubber Co. laid down some rubber pavement at the entrance to the St. Pancras Station.

We beg to inform you that we laid down in 1875 the rubber pavement under the hotel on the arrival side of the station, and that it is almost free from signs of wear at the present time. Some years afterwards we laid down the pavement on the departure side of the same station, and subsequently that under the Euston Hotel.

All these pavements have proved eminently satisfactory, and have outlasted both the wood and asphalt pavements with which they have been in contact.

CHAS. MACINTOSH AND CO., LTD.
Manchester, 29th April.

AUTOCARS ON SNOW-BOUND ROADS.

[728.]—In reference to Mr. J. E. Tuke's letter *re* above, an experience I had in January last may be of some interest to your readers. I had gone over to Paris, and arranged to do my calls on a Mors car. One morning snow had fallen quite 6in. deep. It was pretty frosty, and the snow was quite dry, but very light. We nevertheless went to Versailles, and although the route is up and down hill all the time, the car seemed to take no notice of the snow. I timed myself on starting from the Porte Maillot in Paris, and arriving in Versailles and comparing the time with that required on former occasions, I found that the car had worked through the snow at a speed about two miles only less than under ordinary circumstances. This seemed pretty good to me, and I think one may safely say that snow will make not very much difference to a car with sufficient horse-power.

1st May. SYDNEY ATKINS.

THE BARRIERE TRICYCLE IN THE "CRITERIUM."

[729.]—We have perused with great interest the account given in the last number of your valuable paper of the French Motor Cycle Criterium, but should like to add a few details which have been omitted as regards the "Barrière" tricycle. A private gentleman, who had never done any racing before, entered his machine—an ordinary "Barrière"—and his was the only tricycle of this make that took part in the race. Of the thirty-eight cycles taking part in the race, seventeen met with accidents more or less serious, whilst the "Barrière" covered the whole distance without a single hitch, and arrived safely as twenty-first. As the machine in question was not a racer, nor in any way got up for the race, it is unfair to compare the speed it did with that of its competitors, but once more this race has shown that for ordinary touring purposes, in the hands of the general public, there is no tricycle more reliable or better built than the "Barrière."

THE AUTOMOBILE ASSOCIATION, LTD.

1st May.

THE EFFECTS OF VIBRATION, ETC.

[730.]—Will any of your readers state their experience in regard to the jarring effect on the spine in using a motor bicycle at high speeds on roads which are lumpy? I find after thirty or forty miles at fast speeds on a De Dion tricycle, if the road be lumpy, not rough or stony, but frequent hollows, that the succession of shocks on the base of the spine is so great that I have been unable to bend to put my shoes on. It seems to me that no saddle or seat yet used is really suitable for use on a De Dion running at twenty to twenty-five miles an hour with pneumatics blown hard, and I shall be glad to hear from anyone who has had the same trouble, and if they have also found a remedy. I did twenty-three miles through thick mud and rain on a hilly route yesterday in 1h. 25m., which I thought was good travelling, but my appearance on arrival was not elegant, as there were no mudguards on the drivers, and I was a mass of mud from head to foot. There is no doubt but that the 1899 De Dion with electric ignition is a perfect machine. I have had two years' experience of tricycles, first electric ignition with accumulators, then tube ignition, and now electric and primary batteries, and I would not on any consideration again go back to the lamp and tube, which I consider inefficient, troublesome, and dangerous.

Bradford, April 25th.

JAMES EDW. TUKE.

MORS *V.* PENNINGTON.

[731.]—On April 14th Messrs. Pennington and Baines challenged the Mors car for a straightaway run, commencing ten miles south of the summit of Shapfell. They then said: "For this match we will enter our two-cylinder motor car carrying two passengers—the Mors car to carry the same number—but we are indifferent as to whether their car has a ten horse-power, or even a sixteen horse-power motor, and has two cylinders, or four." Clearly and distinctly, without using any circumlocutions, or raising any objections, we accepted.

As reply, Messrs. Pennington and Baines have sent a letter to you, in which they again alter the challenge originally issued, firstly trying to restrict us to the use of a four-cylinder Mors, secondly trying to mix up this challenge with a new one they are issuing for tricycles, and lastly objecting to a customer of theirs and of ours following the contest.

The shifting ways of Messrs. Pennington and Baines are wonderful, indeed. So wonderful that our patience is exhausted. On April 21st we warned them that their challenge of the 14th was the last one we would accept, and to this decision we shall adhere. If Messrs. Pennington and Baines mean to run the race on the lines laid down by them on April 14th, we are ever willing to do our part, but we flatly refuse to further lend our name to Transatlantic advertisements of a firm of whom the world so far has seen little beyond words.

THE AUTOMOBILE ASSOCIATION, LTD.

M. WEIGEL'S CHALLENGE.

[732.]—In reply to M. Weigel's letter in your last week's issue, I do not in any way admit the impossibility of my machine to climb the Brighton hills without human aid. It is simply a question of gear, and in M. Weigel's first challenge, when he forbade the use of pedals, without mentioning the fact that he had a two-speed gear on his machine, it was certainly not what one would term a bit of fair dealing. When he stated his conditions as to the non-pedalling, he certainly ought to have mentioned the fact that his machine was fitted with this gear. I have before stated that a two-speed gear is an advantage for climbing hills, and all that I require M. Weigel to do is to race to Brighton and back, or have a hundred miles race on the track, leaving out all restrictions, and let it simply be each one to get the best possible speed out of his motor.

I am most anxious to meet M. Weigel, but, at the same time, his new conditions are really beyond my reach. I have not time to run all the matches which he asks me to do, neither do I see the necessity of going to the expense of having another crank wheel made; my present gear is sixty.

M. Weigel seems to have a great preference for the roads, which are so well looked after by the police. As before stated, personally I prefer the track, where the speed could be judged; moreover, he has a distinct advantage in having a tricycle fitted with a motor which holds the hour record, viz., nearly thirty-seven miles an hour. I only claim thirty-three for mine, therefore he has an advantage of four miles an hour, and, on paper, it is practically a walk over for him from the commencement, but, irrespective of that, I am most anxious to meet him, but do not wish to make any restriction on either side.

2nd May. C. G. WRIDGWAY.

TO END BELT TROUBLES.

[733.]—As a constant reader of *The Autocar*, I often notice that owners of belt-driven cars appear to have considerable trouble with the leather driving belts usually used on these cars, through their slipping, stretching, and breaking, owing to this variable climate of ours.

My advice to anyone so troubled is as follows: Discard leather belts immediately, and try Dicks's

patent driving belts, and then I think their troubles will be at an end.

My experience with these belts extends over seven years, and in no case have I known them to fail to give satisfaction, although leather and also several other composition belts have absolutely failed under the same conditions.

As one or two of the most trying conditions under which these belts are running, I may mention the following, and in each case they are giving the greatest satisfaction:

(1.) At a large laundry, running through steam. Put up two years ago, and has not been touched since. Leather gave out in three months.

(2.) A large clothing factory. Put up two and a half years ago, and not been touched since. During at least three months of the year this belt runs through water. Leather broke within a week after the water touched it. I could give dozens of other examples, but space forbids.

The cost is about the same as best leather in the first instance, but I venture to say one of these belts will wear out three or four ordinary leather belts, and cause no trouble while in use.

Should any reader of *The Autocar* wish for more information regarding these belts, or experience any difficulty in getting them, I shall be very pleased to aid him. The belts are guaranteed by the makers to be free from stretch, and to be unaffected by climate, steam, or water, and in my experience they have done all the makers claim for them.

A. C. WESCOMBE.

Wood Street, Swindon, 1st May.

RAMSHACKLE MOTOR SERVICES.

[734.]—Lately, several people have mentioned to me how the motor industry must be boomed, owing to the way local 'bus and *char-à-bancs* services are being inaugurated.

Now, there is no doubt that this method of popularising autocaring could not be better, but there is one thing that seems to me to be wanting, and that is, the certainty of the cars themselves being treated properly.

I have had the opportunity of inspecting some cars which have been in use on one of these services for only a very short time, and a more decrepit collection of things called motor cars I never saw, and all of it was owing to their bad treatment; not that there was really very much the matter with them, but they looked bad and they rattled.

One method of treating them that seemed to me entirely wrong was that when they were brought in at night, never mind how dirty it was, they were left in their filthy condition until the next morning, and only cleaned just before going out, the result being that after they were washed there was no time for them to dry properly, and directly they got out, if it was dusty, the dust stuck to them, and if it was not dusty they dried in a very dirty-looking way.

The steering handles, steering gear and wheels themselves had a tremendous amount of shake, so that there was a large amount of rattle and knock, and generally the cars themselves would do the industry much harm instead of good.

I am afraid that many of the companies who are starting so gaily just at the moment will, unless great attention is given to having proper men to look after the cars and driving, suffer very badly in this direction.

The private user, however, is just the opposite, as a rule. Everything about his car is well kept and well looked after, and he tries to get the best result possible out of it, with the result that people seeing private cars are fairly well impressed, but seeing public conveyances are rather inclined to be prejudiced against such dirty rattling vehicles.

27th April. S. F. EDGE.

PRACTICAL EXPERIENCES.

[735.]—We have read Dr. A. Charpentier's letter in this number of *The Autocar*, and are pleased to see that he is so satisfied with his "International." He says that he has ridden the car 2,000 miles during the past winter, "in all weathers, mostly wet, on all roads, mostly atrocious." He also says: "The engine goes better now than it ever did." The only fault he has to find is the chains have worn in carrying him this 2,000 miles. We admit that 2,000 miles is not a great distance for a motor, but when you consider the vile state the roads have been in, acting on the chains as an "automatic supply of emery powder" to nicely grind them away, we do not think that those chains have done so very badly after all. However, we do not say that we are satisfied ourselves with the result, as, although 2,000 miles is as much as many would do in a season, it is, nevertheless, a fact that Dr. Charpentier's chains have worn out in 2,000 miles, which is annoying. We have tried every chain of note in the world, we think, and have now come across what we think is the *absolute best*. It is of French make—we wish it were English, but it is not—and from the very severe tests we have given it during the past wintry months we have come to the conclusion that there is nothing to equal it in the market. We have, therefore, adopted it, and the pair that Dr. Charpentier now has are of this pattern, and we are sure will wear well. They are expensive, but, as we never have yet "spoiled the ship for a little tar," we shall fit them to all our cars in future without extra charge. We candidly admit that chains and tyres have been our "skeleton." We do not think we brag when we say that our motors themselves never have given any great trouble. As a customer of ours writes us only to-day, "The International for hard wear wants a lot of beating."

These chains cost £5 a pair, which seems to some a lot of money, but surely it is better to give £5 for a pair of chains that will wear well than £3 for a pair that will be all in pieces in a few hundred miles. There is an old English saying, "If you want a good thing you must pay for it." If persons will insist on considering every penny, then they are sure to get landed with a rotten article. It is surely better to spend a few pounds more on a car when buying, and know that you have the best, than pay a few pounds less and be continually having to pay for this and that, besides the frequent occurrence of having to "get out and push." We are, of course, not referring to Dr. Charpentier; he asked for the best car we had suitable for his purpose, and he got it. Price was never stipulated by him. He has, consequently, got a thoroughly satisfactory motor. For a motor to run properly and give its owner satisfaction, it is absolutely necessary for it to have a great amount of

care bestowed on its manufacture, and final adjustment. Every part must be thoroughly tested and tested again, till proved to be right. This work is done by men who earn good wages, and consequently this adds a trifle to the cost of the car. When finished, it is not, however, a death-trap, and even if it has cost a few pounds more, is it not better to give £110 for a good article than £100 for a carelessly-made car which will only cost £40 or £50 within a month or two of buying, owing to the rotten state in which it was bought? Of course, we do not hold with high prices, but we do say most decidedly that "the cheapest is not the best," but merely a death-trap, in very many cases.

INTERNATIONAL MOTOR CAR CO.
F. O. Seyd, manager.

Kilburn, N.W., April 29th.

[736.]—I have read many interesting letters in your valuable paper about motors, especially those which refer to the Benz.

The letter in your paper from Mr. A. Valintine (April 29th) is something fresh, in the hunting line, although not the first time motors have been to hunting meets. The thirty-three miles non-stop run is not the longest made by a car on the road in England, as mentioned in Mr. Valintine's letter. I know a Daimler which ran forty-five miles non-stop. I have a Benz, which often runs thirty-two miles non-stop.

Here is something which a pneumatic-tyred Benz car did: On April 19th, before eight o'clock, I ran a car four miles out and four miles in, the roads being in lovely condition, the morning fine, which made me determine on a day's drive. I soon found a willing party. Starting from Northampton at nine o'clock, we reached Coventry by eleven o'clock (thirty-two miles, non-stop). Round and about Coventry from eleven o'clock till four we reckon we did ten miles from Coventry to Warwick (ten miles), and we met you, sir, between Kenilworth and Coventry on your Daimler motor. [Quite right.—Ed.] We left Warwick a few minutes to six o'clock, and arrived in Northampton before eight o'clock, non-stop being a run of thirty-four and a half miles, making a day's run of ninety-four and a half miles. We intend trying to run from Northampton to Birmingham non-stop; if we do, we will let you know. In conclusion, I must say I am sorry for those who have been so unfortunate with Benz cars. I say, master them; what is weak make good. But, above all, use good pneumatic tyres. Then you can do a non-stop run which is marvellous with a fascination indescribable. Motors have come to stay.

JACK HARRISON.

P.S.—I am not a motor agent, nor in any way interested in the sale of cars.

[737.]—It is certainly remarkable that there should be two letters in your issue of the 22nd ult. in regard to Benz cars containing such diametrically opposite views and experience in regard to the workmanship and working of these motors.

I think under the circumstances that it is due to the makers of these cars, and also for the guidance of intending purchasers, that your readers who possess a Benz should give their experience regarding them.

I purchased one of the No. 2 Ideals 1899 pattern a short time since, and so far I am perfectly satisfied with it. With the exception of one or two minor matters that might have been prevented, had a little more care been taken in the first instance in their workmanship, I have found the car do her work well. I have done some wonderful hill-climbing with her in this very hilly district, and quite astonished the "knowing ones," who ridiculed the idea of a motor being able to negotiate some of our hills, and prophesying she would "blow up" in the attempt. If I have been in any difficulty in regard to the management of the motor, I have always found a letter to Messrs. Hewetson meet with an expeditious and courteous reply.

It would be a great help to beginners like myself who have not much knowledge of engines, or of electric matters, if some of our brother automobilists of experience would write a few articles in your paper, giving in detail the management and working of the Benz motors, 1899 pattern. The little pamphlet issued by the makers is not up to date, and not explicit enough. It assumes the reader knows more about the matter than he actually does. Could not Mr. John Hope find the time to undertake this, assuming, of course, that you, sir, can spare the space in your valuable paper for the purpose?

Ilkley, May 1st. W. H. SCOTT.

[We would make a point of finding space for a contribution from Mr. Hope.—Ed.]

[738.]—I have been reading with considerable interest the various correspondence by your readers who have Benz cars of the '98 pattern, and much regret to say that I have a big stock, and a lot more on order of Benz Ideals with this hill-climbing gear. I must admit that I am getting more orders for cars without it than I am for those with it. There is no doubt it is very useful to people who live in extremely hilly districts, and who have to go over very big hills every day, but for the average man it is absolutely unnecessary, both in itself, and the expense of it. Moreover, it is very noisy, and also adds to the necessary lubrication, which gives more trouble than enough to the ordinary autocarist.

You will no doubt be very pleased to hear that I have recently found in Paris a new little car for two persons. It will go up a hill one in six at eight miles an hour with five people standing on it. I shall have the pleasure of sending you photographs of same in the course of the next day or so with full particulars, and I hope to have the pleasure of showing it at the forthcoming exhibitions. There is no doubt that what is wanted is a stronger and smaller car.

London, E.C., April 29th. C. FRISWELL.

[739.]—I am another who cannot understand why so many complaints have been made by purchasers of the Benz car. The following is my experience: I bought a Benz Ideal in February last, and after two hours' instructions drove the car the following day with two friends about sixty miles, without the slightest hitch or difficulty. The car is not used daily, only twice a week, generally for long journeys. During Easter I drove the car with two friends, a portmanteau, and a brass container, filled with extra petrol, from Southsea to Bristol and back. On the

return journey we mistook the road twice, once at Westbury, and again after leaving Romsey, when we went into Southampton by mistake, thus making the return journey about one hundred miles. On this occasion we left Bristol at 6.10 a.m., and arrived at Southsea at four p.m.; deducting two hours for stoppages, it leaves about eight hours for the hundred miles, which I think good work considering the load. Altogether, I have driven the car over 1,200 miles. As regards repairs. The spring of the exhaust valve has broken twice; the cause of this was owing to the spring fitting too tight to the nut on the bottom of the valve-spindle; this has been altered, and I do not think it will trouble me again. I have had the spoon brake lengthened with a piece of steel, of the same curve as the wheel, and fitting the tyre; this is adjustable with four small set bolts, one at each corner of the spoon, and two countersunk bolts through the piece of steel and the spoon.

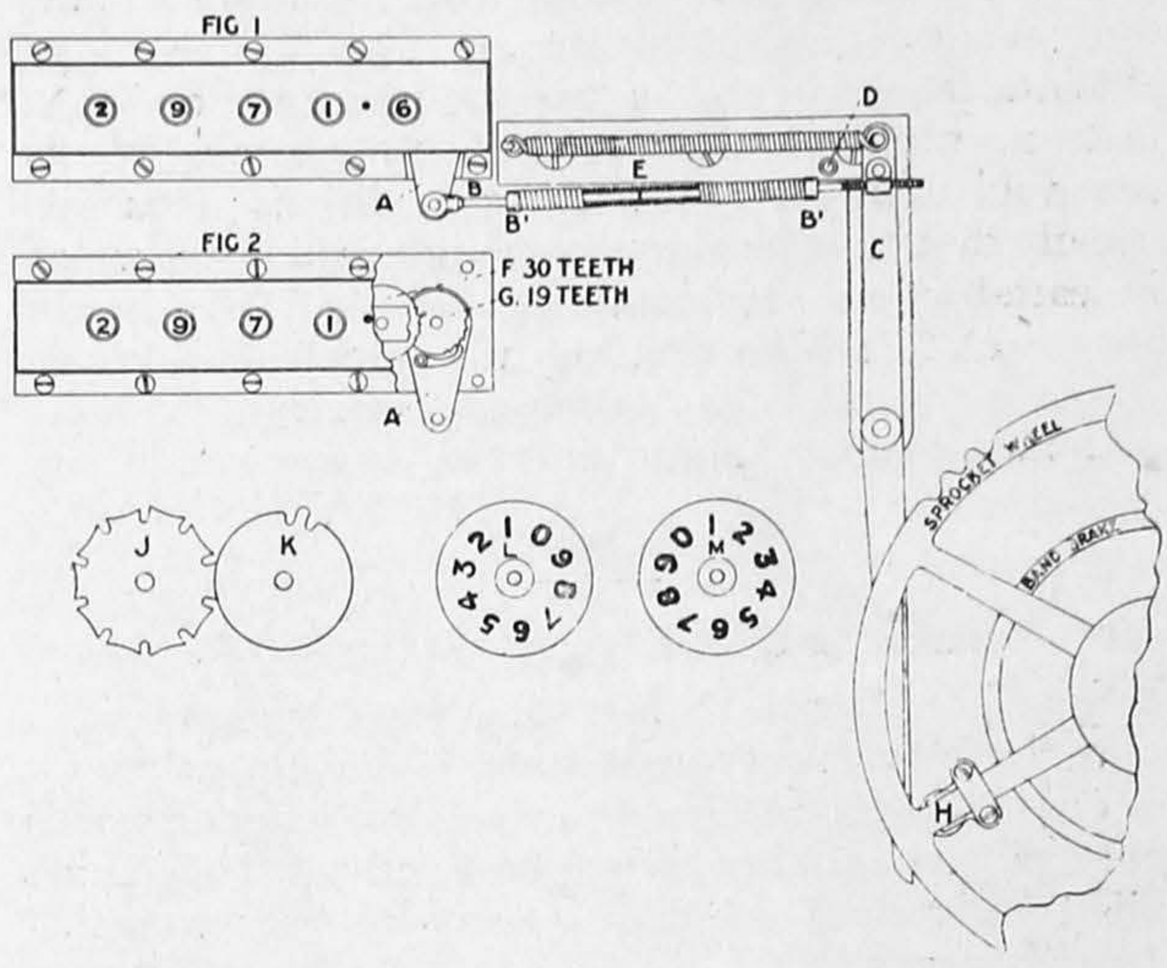
The car is fitted with Connolly tyres, which look as good now as they did when the car was new. I have only had to screw up two nuts on the crankshaft bearing. It seems to me that some of your correspondents have used a file and spanner too often, and the oilcan not often enough, and I quite agree with your correspondent who says that the best-made car would be a failure in some people's hands. I notice that another correspondent used vaseline for a lubricant; this is only fit for a makeshift; it is too soft. Stauffer's lubricant is the best; it costs from sixpence to eightpence per pound. A pound would last for months. I noticed that my car ran much better on some occasions, and a few days ago saw sparks leaping from the spring which makes the electrical connection across to one of the nuts on the wood-adjusting lever. Thinking that the spring was too close to the nut, I loosened it and put it further away. The car certainly goes much better. I might say that I have not yet adjusted the vibrator, or interfered with the sparking plug, in any way. The accumulators have been recharged once, and the chains taken up twice. The foregoing is absolutely all that has been done. I am delighted with the machine, and consider the engine an exceedingly simple one, and very well made. I am not interested in the sale of the Benz car in any way, and hope that some English firm will be able shortly to make as good a car at the same price, or cheaper. Apparently one thing is lost sight of, and that is there are as many Benz cars running as the whole of the other makes, and one would naturally expect to hear more complaints.

J. WHITE.

Southsea.

MR. HOPE'S CYCLOMETER.

[740.]—I send you a tracing of cyclometer for motor cars. It will require very little description. Fig. 1 shows the instrument complete screwed as shown against frame of car. E is a bracket screwed ditto to support lever C. Lever C is actuated by the roller H (¾in. face) clamped to arm of sprocket wheel. The movement of the lever C is limited by stop D. It will be necessary for anyone who may make one to notice the construction of link B. It is in two pieces, which are held straight by a tube fitting over it, and which is again surrounded by a spiral spring. The ends of this spring are fastened to the small bosses B[1]. The purpose of this is to compensate for the vertical movement of the carriage on its springs. If the carriage passes over an obstacle, say a stone, or an indent on the road, it will oscillate vertically. It will move downward, say, 1in. more or less. If the roller H should be acting on the lower end of the lever C at the same moment, the upper end of C would



move through a larger arc, in consequence of its fulcrum being nearer to roller H. The construction of the link B as shown prevents rupture. The wheels J and K are drawn to a larger scale, also the dials L and M.

Fig. 2 is minus some details, but there is enough to show the design. First wheel nineteen teeth, second wheel thirty teeth. Three rotations of first wheel move second wheel through an arc of three teeth, one-tenth of a mile. The circumference of the carriage wheel is 111¼in., nearly. 111¼ × (19 × 3 = 57) = 6341.25 ÷ 12 = 528.43 ÷ 3 = 176 yards = 1-10th mile.

JOHN HOPE.

IGNITION AND OTHER MATTERS.

[741.]—I not only fully agree with Mr. Buttemer that ignition is a very important matter, but would impress upon autocarists that it is *the* most important part of any car driven by an internal combustion engine.

There are two or three points in his letter which are not in accordance with my experience, and I venture to think it may be of interest to mention them.

It is implied that "complete" and "sudden" combustion are obtained in a varying degree according to the type of ignition device employed, whereas "complete" combustion (assuming correctly-timed ignition) depends entirely upon the richness of the mixture and its being homogeneous, and "sudden" combustion depends upon these same conditions together with the compression and temperature of the mixture prior to ignition. It is also implied that "complete" and "sudden" combustion are synonymous with "great" and "rapid" expansion, whereas they are only so if the ignition causes the effective explosion to occur at precisely the correct time in the cycle.

A "weak" igniter does not cause slow combustion, but it takes longer to effect ignition. The weaker the igniter the earlier in the cycle must "apparent" ignition occur, *i.e.*, the earlier must the igniter be applied

to the explosive mixture in order to obtain effective explosion at the correct time; if this is done, and all other conditions are the same, equally rapid combustion will result, irrespective of the area and temperature (within limits) of the igniter. A "weak" igniter is, of course, undesirable, because the increased "explosion lag" renders greater variations of timing necessary for any variations of speed, and also limits the range of speed obtainable.

With reference to "advancing the ignition," the first object of an ignition device is to ensure correctly-timed ignition under all working conditions; it is only necessary to fit an engine with an ignition device which is variably and automatically timed by the speed governor to realise that such a provision entirely revolutionises an engine, although even it cannot automatically compensate for all other varying conditions.

ANTHONY G. NEW.

THE FUTURE MOTOR CAR.

[742.]—In reply to Mr. Goodwin's suggestions, I take the liberty to criticise some of his ideas:

(1.) The frame should be rigid, but hung on elastic springs, and could of course be fitted with axle boxes similar to railway vehicles or tramcars, but would that be an improvement?

(2.) I think a fixed axle preferable to a revolving axle, which would be expensive to make, and more liable to give trouble. Must also have one or two bearings in centre, which involves a lot of work (having fitted one, so can give an opinion). Two chains are not difficult to adjust accurately.

(3.) Renold's autocar chain will not wear long, and is wrong in principle. Gear should, of course, be protected.

(4.) The steering appears to be one of the simplest problems in designing a motor car. Cycle handle-bar style appears to me the best. If wheels are brought to a right angle to the frame the car will not steer, as both wheels would be pushed straight ahead unless some arrangement is used to drive one wheel only for turning. Ball bearings to steering are an unnecessary refinement.

(5.) As almost all vehicles are carried on wheels supported inside and one side of wheel only, why attempt a doubtful improvement, very expensive and almost impractical? Locomotives are seldom now built with outside bearings.

(6.) Are ball bearings a necessity? Pneumatic tyres are of course preferable, but solid tyres give good results.

(7.) Quite right.

(8.) As stated before, the steering is not a difficulty. Should like to try a car for fast travelling to steer same as the electric cabs.

(9 and 10.) Doubtful.

(11.) The greater part of the weight should certainly be on driving wheels, say three-fourths, or the steering would be unnecessarily heavy, and front would push very hard on soft roads, although there must be a tendency to lift front wheels when driven from behind.

(12.) Of course.

(13.) To give a reasonable clearance for obstacles on the road.

(14.) Common sense.

The best motor is only a compromise, and am afraid it always will be.

Electricity, at present, is a very poor power for an everyday and everywhere car.

Before oil engines disappear practical primary batteries must appear, but when?

All are agreed that a steam engine is better than an oil engine, but the boiler is the trouble, and always has been.

Very useful motor cars are running to-day, but are open to many improvements.

What is wanted is practical common sense, not fads, as they are the bugbear of the trade and pastime.

PRACTICAL.

VEXATIOUS PROSECUTIONS—A SUGGESTION.

[743.]—Mr. Friswell's letter appearing in your last issue can only arouse indignation and sympathy in the minds of every strong and straight Englishman, and especially so with autocarists, who have already suffered unjustly from the law as now administered. Whatever the political opinions of the average J.P., he usually displays the most rigid conservatism in regard to any deviation from the old-fashioned hay motor, and unless the defendant has some thoroughly good advocate to literally bully, frighten, and plead his case, he is punished for having driven the usual "fifty miles per hour" speed, and left to pay.

As one who has bled for the cause, in pioneering the industry and sport in Eastern Counties, I am often annoyed to meet with Englishmen imagining that God's pure air and the Queen's highway are not for one and all alike, but more often am I struck with the various and trifling circumstances that change their opinions and gain confidence. A few weeks back, driving second speed (six miles per hour) on one of my Daimler cars, a fussy old busybody went across the road to a police officer after I had passed and made a complaint. A friend happened to stand close to the officer and overheard the following conversation: Fussy old B.B.: "Policeman, that car is travelling twenty miles per hour. Did you observe several people narrowly escaped with their lives?" Policeman: "Well, sir, what pace is that cart a going which he's following right down the road steadily?"

Now, sir, it is very evident that had the noble defender of the public peace (pace) in question been seeking distinction, or what autocarist he might devour, that another forty shillings fine and sixty shillings costs would have been scored. I may state that ever since the above circumstances I have taken kindly to this officer, but more particularly am I glad to state that the fussy old gentleman was immediately converted to the much maligned autocar by the policeman's logic, and that I have had the pleasure of taking him for several spins on my cars since!

As it is merely prejudice and ignorance we as autocarists have to fight against, would it not be possible to form an autocarists' mutual protection society, retaining the services of, say, one or two good advocates willing and capable of defending genuine vexatious and unjust prosecutions? Amongst the daily increasing ranks of autocarists the fee of membership need only be very small.

FRANK MORRISS.

King's Lynn, April 25th.

Flashes.

The Automobile Club have arranged a two-day tour to Burford Bridge, Boxhill, leaving the club on May 13th at two p.m., sleeping at the Burford Bridge Hotel.

* * *

Alderman Dr. Rawlings, of Swansea, considers autocars may soon be regarded as a tonic, and thinks that even the horses are now beginning to look upon them as rather philanthropic.

* * *

It is reported that a new type of electrical motor-carriage is on the stocks at the works of La Société de Construction de Cycles et d'Automobiles (La Marque "Georges Richard"), at Auteuil, Paris.

* * *

A perusal of the autocar notes in various cycling and other journals shows that the columns of *The Autocar* are largely drawn upon for information by the writers, chiefly, however, without acknowledgment.

* * *

One of the latest additions to the ranks of English autocarists is Mr. Alfred Harmsworth of *The Daily Mail*, who has gone in for an eight horse-power "Panhard," of which, we understand, he is considerably enamoured.

* * *

We are asked to note that at the tourist races held at Nizza a few days ago there were twenty-one cars competing, and the first, second, and third prizes were awarded to German Daimler cars made under the patents owned by the British Motor Co.

* * *

Messrs. G. F. G. Des Vignes Cloud and Co., general engineers, etc., of Strand-on-the-Green, Chiswick, are now making a specialty of small boilers for steam motors. They employ special boiler hands for this work, and are prepared to make to inventors' designs if required. With the many years' experience that this firm have had in all classes of steam boilers, there is no doubt that they will have no difficulty in securing a good share of the business to be done in steam generators for autocar work.

* * *

The Swansea folk are getting quite poetic over their autocars, for the local poet says:

Hi! the motor car! Who-a, the motor car!
Turning the corners in style supreme,
Girls they skip aside with a scream;
Councillors and hobblers; baby with its mar,
Everyone means to have a ride in the rorty motor car!

"Rorty motor car" is not elegant.

* * *

The Endurance Motor Co. are bringing out a light four-wheeled two-seated car, which they will sell at £150, fitted with a single-cylinder motor of the Benz type. Simplicity of construction is its principal feature. We had a short spin on the first one last week.

* * *

The Leicester Motor Car Co. have started three cars, and are running regular services to Mountsorrel and Anstey, villages from four to six miles out, the fare being sixpence each way. The journey occupies about half the time which the horse-drawn vehicles hitherto used to take, and the cars are loaded every journey.

The most complete price list we have yet received of motor cycle fittings and autocar requisites is that which has just been issued by Brown Bros., Ltd., of Great Eastern Street, E.C. This firm has been for many years one of the best known and most pushing of the factoring firms in the cycle trade, and the list we have received shows that they bid fair to attain a similar position in the motor world. Illustrated particulars are given of a complete set of parts for a De Dion motor, and parts for a tricycle, and these can be bought to suit the building accommodation of the purchaser. For instance, the motor itself can be purchased complete, the frame can be purchased already built up, or the frame and motor together can be obtained, and so forth. Other tricycle parts, frames, and motors are kept in stock, as well as hubs, tyres, chains, and chain wheels of all sorts and qualities for both cars and motor cycles.

MOTOR CARS IN POLAND.

It is something new to find a reference to autocars in a Consular report. Quite a lengthy one is, however, given in the report of the British Consul General for Poland and Lithuania, which has been issued during the present week, and, as it is of interest, we reproduce it in full:

"Various efforts have been made to introduce the use of motor cars for different purposes in this Consular district. The most important has been an attempt to establish a regular motor car passenger service from Piotrokoff to Kalisz, a distance of eighty miles, but so far this has failed, as the cars, which were built in Germany, proved too heavy, and had not sufficient motor power for Polish roads. It is now proposed to turn this undertaking into a company, and to order fresh cars from Paris.

"Another attempt is to be made this year to establish a similar service from Wroclawsk to Lipno, in the government of Warsaw, a distance of twenty-four miles.

"Several market gardeners and others in the neighbourhood of Warsaw have ordered motor cars from Dessau, in Germany, for the purpose of bringing their own and their neighbours' produce to Warsaw for sale, but it is to be feared that they will not find these cars a success, as the motive power of the Dessau cars is gas, which will be expensive and complicated, besides which they will have to compete with the light railways which now run along every high road into the town.

"A sugar factory in the government of Lublin has started a motor car to take passengers to and from the railway station, which is, I believe, the only motor car in this district which has so far proved a success.

"Various private persons have bought motor cars for their own private use and pleasure, one French firm having disposed of nine cars in this district last year, but the real impediment to the extended use of such means of locomotion is the badness of the roads, only the main roads connecting the chief towns being, as a rule, possible for delicate-wheeled vehicles.

"A machinery dealer who tried hard to introduce their more general use has now abandoned the attempt for this reason, after experiencing, I understand, a considerable loss."

MR. J. D. ROOTS'S EXPERIMENTS WITH PETROLEUM MOTOR VEHICLES.

At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. John C. Fell, president, in the chair, a paper was read on "Petroleum Motor Vehicles" by Mr. James D. Roots.

The author first referred to the prejudicial effects upon road locomotion which were brought about by early prohibitory legislation, which was continued until 1896, when the Locomotives on Highways Act came into force. He then described in approximate chronological order the various types of petroleum road vehicles, commencing with the earliest known efforts to solve the problem of road locomotion by vehicles in which the propelling agent was the power produced by an explosion or internal combustion engine. The Daimler, the Hardaker, the Benz, the Butler, the Roots and Venables, the Bollée, the De Dion, and the Petter petroleum motor vehicles of various dates and types were described, and their comparative merits and demerits pointed out.

Speaking of his own early efforts in autocar construction Mr. Roots said: "Up to the year 1892 no attempt had been made, so far as the author is aware (at all events he has not found any record of any such attempt in the Patent Office), to make a petroleum motor vehicle of any kind to work with petroleum oil instead of spirit. In the year 1892 the author commenced work upon the problem of road locomotion, in preparation for what he then believed to be the sooner or later inevitable repeal of the restrictions upon that class of locomotion. The specification 23,786 of 1892 describes and illustrates the small motor vehicle he made in that year, using petroleum oil in preference to spirit, although it is an easy matter to make a spirit motor work successfully, and a very difficult matter to make an oil motor do so, for he perceived clearly that history would repeat itself in this matter, and that if the public could get an oil motor at only approximately the same price as a spirit motor there would be no longer a sale for the latter. This is, in fact, what occurred with the fixed motor or stationary engine, and what will occur in the immediate future with vehicle motor. A certain number of benzoline spirit engines—three, the author thinks—were on the market in 1888, when Messrs. Priestman produced the first oil engine that was exhibited for sale. The author does not mean by this the first oil engine that was successfully running, for in 1886 he had an oil engine on the De Rochas cycle at work. Not very long after the introduction of the Priestman oil engine, spirit engines for stationary purposes gradually ceased to exist. There was no longer any sale for them."

After describing in detail the construction of his first vehicle, the author continued: "It will be seen that except for the use of a bevel for the ordinary pinion and wheel, and a friction clutch, the arrangement is similar to that now in use on the De Dion tricycles. This motor was attached to a tricycle of the Coventry Machinists' make, but it was not very successful, for the motor would occasionally fire the new charge directly after it entered the cylinder and during compression, and this had the effect of reversing the tricycle and running it backwards. It was tested repeatedly for some months in Holborn, at about two o'clock in the morning, but as the author could not cure the motor of the liability to reverse, it was taken off with the intention of changing the cycle to the De Rochas."

In 1893 Mr. Roots made a small vertical motor, an illustration of which he showed, and of this he said: "It gave rather over one brake horse-power, and weighed complete only ninety pounds. It worked upon the ordinary De Rochas cycle, and was constructed especially for vehicles, but was controllable by hand only, and had no governor. The speed was four hundred and twenty revolutions. The oil tank was fitted at the top as in the earlier tricycle motor. The crank chamber was completely enclosed, and air-tight, and the crank worked in an oil bath. A few of these were sold in 1893 and 1894, some on the Continent. This motor was exhibited at the Stanley Show of 1894. The vaporiser and oil feeder were very similar to those used at present on the Roots motor. The exhaust valve was operated by skew gear, the second or half speed wheel being placed eccentrically upon its pin, in this way operating its rod, which pushed open the exhaust valve. The fault of this engine was the absence of a governor. It was intended to be controlled by hand, by simultaneously throttling the admission valve and reducing the stroke of the oil feed spindle. This was effected by a small hand lever upon an eccentric pin, but it was not done sufficiently effectively to prevent the motor increasing speed unduly, when not driving, and when this occurred, misfires followed, making the exhaust smoky. The author was informed that one of these motors was fixed in Genoa to a tricycle, and when running and driving worked satisfactorily without smoke after it had got hot, but the absence of a governor made the motor give off a considerable amount of smoke when running free and not driving the tricycle. This motor, however, ran more satisfactorily than any other attempted oil vehicle motor the author has since seen or heard of. In August, 1895, the author, conjointly with his partner, Mr. Venables, commenced the construction of the first motor carriage propelled by a petroleum motor made in this country. There had been small and light vehicles of the tricycle type, such as those which have been described, built before, but none so far as the author is aware, with a carriage body of ordinary construction. It was fitted with a vertical oil motor on the Roots principal of vaporisation and feeding of oil, and was of two and threequarter brake horse-power, and of three and a half indicated horse-power. The method of steering is the cycle head and fork, with the addition of a heavy coil spring fitted inside the head, which permitted the fork spindle to slide vertically within the head. When the carriage was first tried in February of 1896 the motor had a friction clutch or drive attached to the crankshaft, so adjusted that if more resistance than the equivalent of two and threequarter brake horse-power were placed upon the clutch, it would automatically slip. In practice, this slip only took place when starting, when changing speed from slow to quick, and when on the steepest hills. A chain from the friction clutch drove the outer casing of a box of gear providing two speeds, a maximum of eleven, and a slow speed of four miles an hour. It was first tried with a speed of thirteen miles an hour, but the side slip or skidding of the single front steering wheel made the steering, when going at this speed, on a greasy road, very erratic and even dangerous. The reduction to eleven miles an hour, together with the addition of weight over the steering wheel, completely surmounted this difficulty. The weight of the car was about 13 cwt. About eighteen gallons of water were carried in a tank beneath the floor of the car. A large copper cooling coil was placed in front of the petrocar behind the louvre slats. The water was pumped through the jacket round the coil and into the tank. The governing was effected by an inertia governor operating upon the exhaust valve and the oil feed. This was not found to be perfectly satisfactory, because the dropping of the vehicle wheel in a depression in the road or going over an obstruction would act upon the weight of the governor, throwing it out of position when not at express speed, so that a rough road would sometimes slow down the motor. The motor had ordinary plate springs to attach it to the frame, while the frame rode upon coiled

springs fitted to blocks sliding in guides in a similar way to tramcar springs. The box of gear for changing speed was not found to be very satisfactory, and early in 1896 this was taken off, and the transmission effected by belting and toothed wheels. Two pulleys were fitted to the crankshaft, and two others on a countershaft, the bearings of which were fitted to the same slide block moving vertically in guides which carried the ball bearings for the axle, so that the centres of the two shafts were always relatively at the same distance from each other. A large gear wheel on the axle geared always with and was driven by a small pinion on the countershaft. The straps connecting the crankshaft pulleys with the countershaft pulleys were both normally loose, and whichever speed it was desired to use, one of two jockey pulleys tightened the one strap, and still further slackened the other. The motor used on this vehicle was a single cylinder vertical motor of very simple construction. The cylinder was five and a quarter inches diameter, and six inches stroke, and was tested frequently in the shop before fixing to the vehicle frame. It gave about 2·75 horse-power on the brake at four hundred revolutions, and ran with great steadiness and freedom from smoke or smell. It required some months of the closest attention and labour to make it run in the same way on the car. No doubt the power was the same, but the vibration of the vehicle, the giving of the springs, affected the accuracy of the measurement of the oil feed, and in this way prevented that perfect combustion in the motor which was obtainable when bolted to a solid foundation. The most careful attention and adjustment also were required to make the inerta governor behave in about the same way on the vehicle as when working stationary. These difficulties were, however, surmounted, and the vehicle ran very successfully for two years, and covered some thousands of miles. From the running of this carriage the author came to the conclusion that rather less vibration would be caused by a horizontal motor than a vertical one, which opinion was afterwards justified in his adoption of the horizontal form."

The second vehicle constructed by Messrs. Roots and Venables was built in the summer of 1896. "It was," said the lecturer, "also built largely on cycle lines, so far as regards the steering arrangement and frame. The double tubular frame was carried round the vehicle from the cycle head on the one side to the cycle head on the other. The tubes were also of like gauge and diameter to that in use upon an ordinary bicycle, but they were doubled. The tubes were connected together by malleable iron joints brazed in position. The four wheels were of heavy cycle construction, having spokes of one-eighth of an inch thick, fitted with pneumatic tyres. The front wheels were fitted with ball bearings, while for the back wheels the ball bearings were on the axle. The body, built by Messrs. W. and H. Thorn, weighed one hundredweight. The water tank in front of the vehicle held ten gallons of water. The motor at the rear of the vehicle, which was mostly beneath the seat, was of one and a half brake horse-power. It used equally well American Tea Rose, Royal Daylight, or Russian oil, the Russoline brand. The total weight of the motor including flywheel was 140lbs. As in all the vehicle motors of these makers' construction, the crank chamber formed an air-tight enclosure. The essential working parts, the crank and piston, being completely protected from dust, it was not thought so essential in this vehicle to cover in the motor. A pump driven by the motor maintained a constant circulation of water round the jacket of the motor, through the tubular frame of the vehicle on the one side to the water tank shown in front between the steering wheels, and back again to the motor by the frame tubes on the other side of the vehicle. The total weight of this motor vehicle was five hundredweight. After running about 3,000 miles it was superseded by another vehicle, having later improvements.

"In February, 1897," continued Mr. Roots, "the author was requested to exhibit this car at the Battersea Polytechnic. Nine Elms Lane is laid with stone setts and tramlines, with a delightful disregard of a plane surface. The road was very greasy, mud of the smooth pasty order, and the author was a little late. There is a short hill at a narrow part of the lane, and he thought it a good opportunity for a quick run down. A tram-car, about twenty yards in front of the motor car, suddenly pulled up at the narrow part, and another vehicle closed the only passage. Although the author locked the back wheels the motor car continued its way down the incline at only a slight angle with the line of motion, until the front wheel tyres gently collided with the back of the tram. The author has not had a puncture through the cover, but the inner tubes would never hold the pressure for a reasonable time, and the continuous trouble they give in their present stage of development outweighs whatever advantages they may possess on the other side of the balance. The transmission gear of this car was altogether different from that of the tricycle before built, and of the carriage or petro-car. Two small flanged wood pulleys were keyed to the countershaft, and two large flanged wood pulleys were keyed to the axle-tube, to which was also fixed at the other end the balance gear box. The large flanged pulleys on the axle are shown in the illustration. On the shorter arm of the hand-operating lever were attached two small jockey pulleys, both running upon ball bearings. Both jockey pulleys being upon the same arm, and being placed between the upper lengths of the two belts, the extreme position of the jockey pulley in one direction tightened one strap, and the extreme position in the other direction tightened the other strap, while the intermediate position left both straps too loose to drive. This car ran very satisfactorily except for the trouble given by the straps; they would stretch, break, and slip, slipping so much at times as to refuse to drive at all. The straps generally selected some spot where the traffic was thickest, and, therefore, it was most undesirable to have anything of the sort occur. They refused to drive in this way once when stopped by the traffic-regulating policeman in front of the Mansion House, and on another occasion in Piccadilly Circus. It was such occasions as these, particularly at this date (1896), when cars were so few, that gave the drivers of 'buses and cabs a golden opportunity for the display of that kind of sarcasm and humour in which they are such adepts, and they generally made use of the opportunity to the full. Another method of arrangement of straps was also tried upon this vehicle, but the author's experience of them and their unreliability made him resolve never to use straps on a motor vehicle again."

After describing the machines which Messrs. Roots and Venables exhibited at the disappointing *Engineer* competition in June, 1897, Mr. Roots dealt with a four-wheeled car, also built and entered for that competition, but which was not ready in time, in the course of which he said: "The frame of this car was built of cycle tubing throughout. The double tube was joined up at intervals round the sides of the frame by means of malleable iron castings, and all the joints and connections were made in this way. The object, of course, in using the tube, is to make the frame light, and generally save weight, but in all those cases in which the makers have tried it up to the present, this object, owing to the great weight of the malleable iron joints, has not been attained. Indeed, the weight of the frame finished has always been rather greater than it would have been by using angle or channel iron or steel. This latter, viz., channel, is the section they have adopted, and will continue to use in all their vehicles,

until such time as the industry becomes so advanced that they are able to purchase ready-made frames in steel tube. There is, however, one great advantage in the use of steel tube which must not be overlooked, and that is, being able to utilise the frame for the conveyance, and therefore cooling, of the water from the motor jacket to the water tank, and this the author believes was first mentioned in his specification No. 23,786 of 1892. In the construction of this four-seat carriage there were two friction clutches, one a slow speed of about four and a half miles an hour, the other a quick speed of about eleven miles an hour. With these clutches, however, any speed whatever between the maximum and one mile is easily obtained by the degree of slip allowed upon the clutch used. It might be expected, indeed it was frequently observed to the author, that there would be a great loss of power in allowing this slip—in fact, he rather expected it himself, but in practice it is not so, nor do the clutches become heated to any appreciable extent. When this car was first completed the chains drove direct from the valveshaft to the axle with a provision for taking up slack in the chain. But it was soon found that it was more convenient, as the car was arranged, to fit another countershaft farther forward and to drive the axle from this shaft. The balance gear was fitted to the axle, and the exhaust box parallel with the axle below the car as shown. This car, in all probability, did about 5,000 miles before the design was superseded. As with the previous cars, this one exceeded considerably the weight calculated from the drawing when designed. It weighed 12 cwt. A copper cooling coil for the water from the jacket was placed round the flywheel, and blades fitted to the flywheel to induce a greater centrifugal action of the air through the coil. This method of cooling the jacket water, permitting only a small amount to be carried, is decidedly the most effective that the author has seen. Chains and chain wheels connect the crankshaft to a countershaft, on which are keyed the friction clutches. These clutches drive either of the two chain wheels directly to the axle of the vehicle. The cranks of the motor are placed opposite each other. The method of governing by operating the exhaust valve and the oil feeder simultaneously, and by the same mechanism, enables a clean exhaust to be obtained, and the construction of the parts surrounding the vaporiser and igniter relatively to one another ensures complete combustion. The method of governing was only arrived at after some years of experiment. The automatic burner for heating the ignition tubes enables the motor to run continuously so long as it is supplied with oil, without any attention whatever, which, the author thinks, cannot be claimed for any other oil motor, whether for vehicle or for other purposes. The water is pumped through the jacket; it then traverses the whole of the tubes of the copper coil, and after passing through the tube round the frame of the vehicle returns to the water tank and the pump. There is a practically complete cut-off of the oil when the governor cuts out; a minute quantity of oil is fed to the vaporiser, but not to the engine during the time the governor is cutting out, so as to provide for the larger feed required for the first explosion following the cut out; there is, therefore, no graduation of oil for governing purposes. The idea of graduating the feed in the tube-ignited vehicle oil motors is born of inexperience. The oil descends by gravity from the oil tank to the two grooves in the oil-feed spindle, which is moved to and fro by the lever. The eccentric on the valve shaft, actuated by the crankshaft by chain wheels and the chain, moves the oil-feed spindle out, and it is returned by the spring surrounding the exhaust valve spindle. The larger groove is for feeding the oil for the explosion in the cylinder, and the smaller groove is for supplying the automatic burner with oil by means of the pipes leading to the vaporiser. The blast of air necessary for the automatic burner is taken from the air valve on the crank chamber. Air is displaced by he hollow side of the piston through the air valve and along the pipes, to meet the oil supplied by the smaller groove in the oil-feed spindle. When the speed of the motor increases, the governor cuts out, and, by means of the lever, moves the blocks so that they keep open the exhaust valve; at the same time the oil-feed lever is only permitted to have a very slight movement to and fro. As soon as the blocks are released by being pulled back by the governor lever, the usual oil-feed commences again, and the exhaust valves are closed by the springs surrounding their spindles. When the piston is moving outwards, air is drawn through holes in the side of the vaporiser. The air coming through these holes sweeps off the oil from the larger groove in the spindle, and together the oil and air pass round the inside of the vaporiser, and through the valve into the explosion chamber. They become thoroughly mixed and heated in passing round the vaporiser, and are in the form of a gas or vapour. When the piston returns, it compresses this gas or vapour, and some of it is forced into the ignition tube which fires it, and the piston is forced outwards again. In returning it displaces the burnt gases through the exhaust valve, which is opened at the right moment for their displacement. The cycle then recommences."

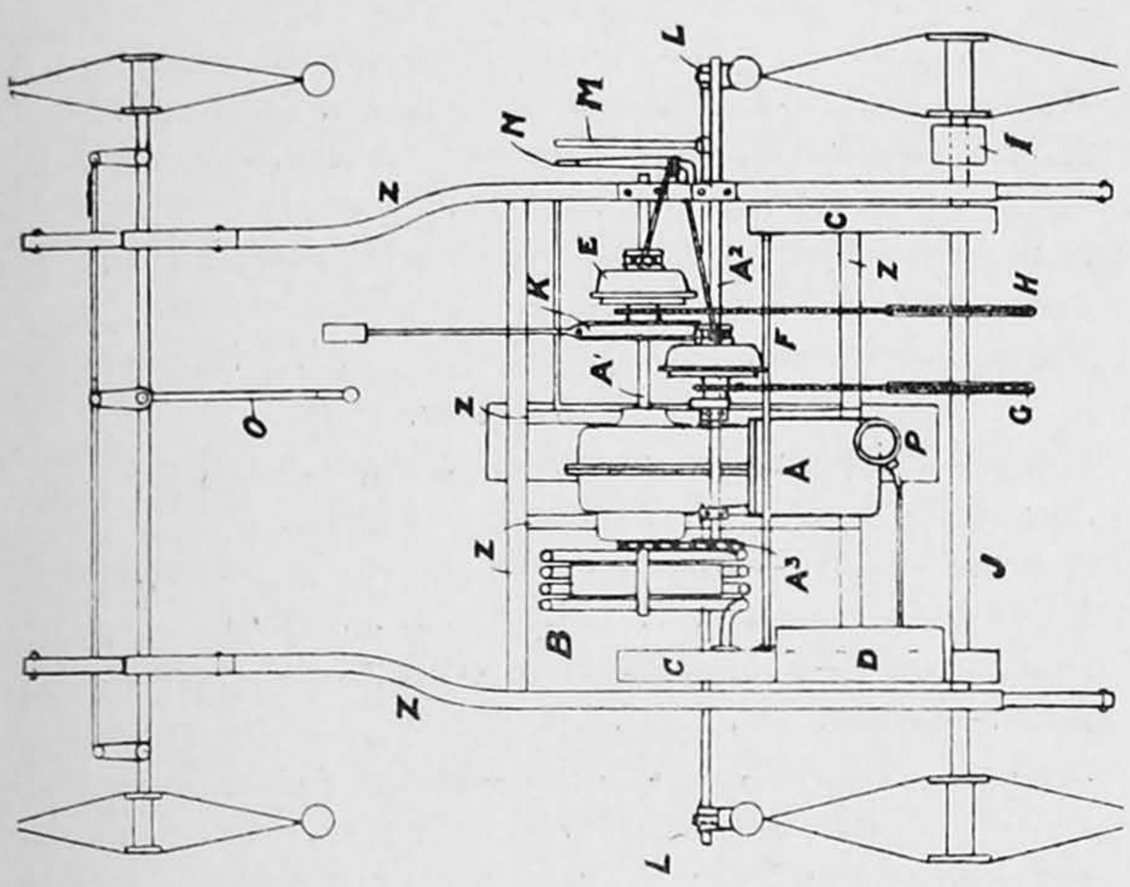
After dealing with the De Dion, Bollée, and Benz cars, Mr. Roots showed an illustration of a car, "the first of a type which was built by the author's firm in March, 1898, and which since that time has been in continuous use, having in all probability travelled about 7,000 miles, without showing undue wear in any part to impair its efficiency or satisfactory working. In fact, only the rubber tyres and the varnish on the body show perceptible wear. This car was frequently tested for consumption of oil, which was found to be only six pints of oil (Tea Rose, for which 4½d. per gallon was paid) for every twenty miles. The running cost of this three horse-power car, therefore, works out at about ·168 pence, or one-sixth of a penny per mile. The motor driving this car is the same as that on Messrs. Roots and Venables's four-seat car previously described, but with a few detail improvements, which have increased the power and eliminated the smell. From this three horse-power twin-cylinder motor, 4·2 brake horse-power at 600 revolutions is now obtained with a perfectly clean exhaust."

The lecturer next showed an illustration of "a Roots and Venables van propelled by a six horse-power motor, which has been doing about thirty miles daily for some time past. It is intended to carry loads up to one ton. The maximum speed is ten miles an hour, while the slow-speed clutch gives four miles an hour, and the reverse is about three. The consumption of oil on a tested fifty-miles run of this van, everything being carefully arranged to obtain accuracy, was thirty-one pints. The van, fitted with a very heavy and solid body weighing seven and a half hundredweight, carried a load of fifteen hundredweight. The oil used was Tea Rose at 4½d. per gallon.* The cost of the fuel, therefore, for the run was 1s. 6d. The cost of the lubricating oil for the run was 2d.; the total oil cost of the fifty-miles run was, therefore, 1s. 8d."

The author further showed illustrations of his most recent two-seat light car, the annexed plan showing the mechanism of this latest carriage of 2·2 brake horse-power and the arrangement of the transmission gear which, Mr. Roots thought, had the fewest working parts of any petroleum car he had met with. "A is the motor, B the water-cooling coil, C C water tanks, D oil tank, E quick-speed clutch attached to the crankshaft A1, F slow-speed clutch attached to the valveshaft A2, which is driven from the crankshaft A1 by the

* The price of oil has risen since, and is now about 5d.

chain and chain wheels A3, G large chain wheel on the axle driven by the slow-speed chain from the clutch F, H large chain wheel driven from the crankshaft clutch, I the balance gear box, J the axle, K the band brake operated by a foot lever, L rubber-block tyre brake, M the brake lever, N the operating lever for both clutches, O the steering lever, P the exhaust box, and Z the frame. It will be obvious to anyone having any knowledge of motor vehicles how advantageous in all ways this arrangement is. Its chief advantage is simplicity, the very minimum of working parts for a car. The quick speed drives direct from the crankshaft to the axle. Although there are only two clutches, any speed can be obtained with this arrangement, from one mile to the maximum. As there are so few parts, there is less likelihood of anything getting out of order. Other advantages are



Plan of the Latest Roots Car.

cheapness of manufacture and lightness of weight, the total weight of the car being only four and threequarter hundredweight unloaded. The quick-speed clutch is set for twelve miles, and the slow speed for four miles, per hour. Pneumatic tyres of two and threequarter inches diameter, or preferably solid tyres of one and three-eighth inch width of rim, are fitted to the wheels, which are of the tension type. The front wheels are twenty-eight inches diameter, and the back thirty-two inches. There is only one operating lever for all speeds and for stopping. A considerable portion of the mechanism is made of malleable iron instead of cast iron in order to reduce weight."

Finally, Mr. Roots concluded his remarks as follows: "It must be remembered that in an absolutely new industry, as that of petroleum motor vehicles was, a designer had no data to work upon, and everything practically had to be worked out *ab initio*. He had to calculate and consider about almost everything, to the smallest parts. Even the ball bearings had not only to be designed, but also to be made by the author's firm. In the cycle trade as it is now, various small parts of the machine, and, indeed, all the parts, may be purchased separately, and the whole machine put together by the purchaser. Of course, in those cases where a motor vehicle was imported from abroad and had only to be copied, the way was made smooth. As the second living pioneer of this industry in this country (Mr. Butler was undoubtedly the first), and, as the author believes, the only early pioneer who has persevered, he has the satisfaction of having acquired all his own data, of having, as it were, been completely through the mill in obtaining his knowledge and experience of petroleum motor vehicles. He has designed and worked out eight wholly different types of vehicle, and four different motors, with as many different kinds of transmission gear. The result of all this thought and labour is that the three vehicles last described, driven respectively by the two-brake horse-power, four-brake horse-power, and six and a half brake horse-power motors, are satisfactory commercial machines. With regard to the vexed point of electric ignition and tube ignition, the author would observe that during 1885 he made numerous experiments with two forms of electric ignition upon a stationary spirit engine, viz., a battery and a magneto-electric machine. The ignition tube was also fitted to the same engine. Better results were always obtained with the tube than with either method of electric ignition. He, therefore, gave up electric ignition, and has always placed his trust in the tube, which he is still convinced has the balance of advantage in its favour. It must be conceded that electrical ignition generally is in a much improved condition to what it was at the time he experimented with it. Nevertheless, both are destined to be superseded in the immediate future by another system of ignition, which has all the advantages of both systems, and some of its own. This method consists of the use of a small additional piston, which fires a small quantity of the charge by compression prior to and separately from the main working charge, and admits it to the working cylinder at a pre-determined time, which can be varied at will. This method of ignition is not, however, sufficiently perfected to be described further at present."

THE AUTOMOBILE CLUB SHOW.

Trials and Awards.

The following gentlemen have been invited by the Show Committee, and have consented to serve as judges in connection with the official trials to be held in June, and the award of medals and diplomas at the Show, with power to add to their number:

Judges.—Professor C. Vernon Boys, F.R.S., Mr. W. Worby Beaumont, M. Inst. C.E., Mr. Dugald Clerk, Mr. Bryan Donkin, M. Inst. C.E., Professor Hele-Shaw, LL.D., M. Inst. C.E., Major Holden, R.A., F.R.S., Mr. W. H. Preece, C.B., F.R.S., Mr. Boverton Redwood, F.R.S.E., Sir David Salomons, Bart., J.P., and Mr. James Swinburne.
Judges' observers.—Messrs. Richard Muirhead, Robert E. Phillips, H. Percy Boulnois, M. Inst. C.E., Walter Hancock, J. Lyons Sampson, E. Shrapnell Smith, Stephen Terry, M. Inst. C.E., and R. W. Buttemer.

Only such vehicles as have been entered for and have taken part in the trials are eligible for awards in Sections Nos. 1 to 45. The judges may award (a) One gold medal in each of the six classes, but extra gold medals may be awarded for vehicles of special merit; (b) a silver medal in each of the forty-five sections; (c) a bronze medal in each of the forty-five sections; (d) diplomas in each of the forty-five sections.

Class I. Motor Cycles (irrespective of nature of the mechanical power).—Section 1, bicycles; 2, tricycles; 3, quadricycles; 4, tricycles with trailers or fore-carriages; 5, quadricycles with trailers or fore-carriages.

Class II. Spirit (Internal Combustion) Motor Vehicles.—*Weighing under one and a half tons unladen:* Section 6, Passenger vehicles, to carry not more than three persons, including driver; 7, passenger vehicles to carry four or not more than seven persons, including driver; 8, passenger vehicles to carry eight or more persons, including driver; 9, vans. *Weighing one and a half tons and under two tons unladen:* Section 10, passenger vehicles; 11, goods vehicles. *Weighing two tons and under three tons unladen:* Section 12, passenger vehicles; 13, goods vehicles.

Class III. Oil (Internal Combustion) Motor Vehicles.—*Weighing under one and a half tons unladen:* Section 14, passenger vehicles, to carry not more than three persons,

including driver; 15, passenger vehicles to carry four or not more than seven persons, including driver; 16, passenger vehicles to carry eight or more persons, including driver; 17, vans. *Weighing one and a half tons and under two tons unladen:* Section 18, Passenger vehicles; 19, goods vehicles. *Weighing two tons and under three tons unladen:* Section 20, passenger vehicles; 21, goods vehicles.

Class IV. Electrical Vehicles.—*Weighing under one and a half tons unladen:* Section 22, passenger vehicles to carry not more than three persons, including driver; 23, passenger vehicles to carry four or not more than seven persons, including driver; 24, passenger vehicles to carry eight or more persons, including driver; 25, vans. *Weighing one and a half tons and under two tons unladen:* Section 26, passenger vehicles; 27, goods vehicles. *Weighing two tons and under three tons unladen:* Section 28, passenger vehicles; 29, goods vehicles.

Class V. Steam Vehicles.—*Weighing under one and a half tons unladen:* Section 30, passenger vehicles to carry not more than three persons, including driver; 31, passenger vehicles to carry four or not more than seven persons, including driver; 32, passenger vehicles to carry eight or more persons, including driver; 33, vans. *Weighing one and a half tons and under two tons unladen:* Section 34, passenger vehicles; 35, goods vehicles. *Weighing two tons and under three tons unladen:* Section 36, passenger vehicles; 37, goods vehicles.

Class VI. Motor Vehicles propelled by other Methods than the above named.—*Weighing under one and a half tons unladen:* Section 38, passenger vehicles to carry not more than three persons, including driver; 39, passenger vehicles to carry four or not more than seven persons, including driver; 40, passenger vehicles to carry eight or more persons, including driver; 41, vans. *Weighing one and a half tons and under two tons unladen:* Section 42, passenger vehicles; 43, goods vehicles. *Weighing two tons and under three tons unladen:* Section 44, passenger vehicles; 45, goods vehicles.

Appearance.—Section 46: The judges may award gold, silver, and bronze medals and diplomas for the motor vehicles which, in their opinion, are meritorious as regards general design, finish, and appearance.

Automobile Attendant's Uniform.—Section 47: The Automobile Club Show Committee offers a gold medal for the best design for the uniform of a gentleman's attendant accompanying and assisting him on a motor carriage.

Special Prize.—Section 48: Major H. A. Barclay, J.P., offers a prize of £21 for an efficient device by which the burners of a motor vehicle having tube ignition shall be automatically extinguished in the event of the vehicle being tilted either forwards or backwards, or to one side or the other, to an angle at which the vehicle might overturn. The decision as to the award of this prize rests with the judges, who may refuse to give it if, in their opinion, none of the devices submitted are of sufficient merit. Entries should be made on or before May 13th, by letter, to the secretary of the Automobile Club Show, 4, Whitehall Court, London, S.W.

Messrs. Hoyer and Glahn, of the Welt Rad Fahrradwerke, Schonebeck am Elbe, Germany, have taken up the construction of motor tricycles.

It is reported in financial circles in Boston, U.S.A., that the Columbia Automobi'e Co., Col. A. A. Pope's promotion, has two heavy deals in train, one to manufacture for the electric vehicle companies recently organised by the Philadelphia Storage Battery interest, and the other to construct the electric automobiles for the New England Vehicle Co. and allied concerns.

THE DISTRIBUTION OF MOTOR SPIRIT.

Below will be found a list of 160 odd names of agents and others who keep Messrs. Carless, Capel, and Leonard's motor petrol:

London.

Battersea.—Bowley, S., and Sons, Wellington Works.
Bethnal Green Road.—Jones, H., and Co., 78, Viaduct St. (agents).
Brady St., 80, E.—Jones, H., and Co., Whitechapel (agents).
Brixton.—Southern Motor Car Co., 59, Brixton Road.
Buxton St., 52, E.—Jones, H., and Co. (agents).
East Dulwich.—King Motor Car Co., 23, Oakhurst Grove (agents).
Gray's Inn Road, 182.—London Autocar Co.
Holborn Viaduct, 18.—Friswell, Ltd.
,, 47.—Motor Manufacturing Co.
Holland Park.—Automobile Association, 1, Prince's Road.
Kilburn.—International Motor Car Co., 18, High Road (agents).
Lambeth.—Jones, H., and Co., 53, Cornwall Road (agents).
Long Acre, 93.—Motor Car Co.
Three Colts Lane, 19.—Jones, H., and Co. (agents).

Provincial.

Alton.—Hetherington and Son, ironmongers (agents).
Andover.—Lynn, T., ironmonger (agent).
Ashford (Kent).—Broad, J., 24, Park St. (agent).
Baldock.—Redhouse, G., Hitchin St. (agent).
Basingstoke.—Julian and Sons, Church St. (agents).
Bath.—Colmer, J., Ltd., Union St.
Bedford.—Caporn, E. P., 48, Prebend St.
,, Bacchus, H., 35, High St. (agent).
Bideford.—Meredith, H. J., 18, High St.
Biggleswade.—Morton and Kinman, ironmongers (agents).
,, Albone, Dan, Ivel Cycle Works.
Birchington-on-Sea.—Cousins, G. (cycle works).
Birmingham.—Williams, F., 281, Broad St.
,, Miles, W., Norfolk Works, Price St.
,, Shufflebotham, E., and Co., Rotten Park St.
,, The Midland Motor Agency, Acocks Green.
Bodmin.—Jane, W. H., Cycle Works, Fore St.
Bournemouth.—Birmingham and Coventry Cycle Co., Holdenhurst Road (agents).
Bradford.—Yorkshire Motor Car Co., Ltd., Albert Buildings.
Bridgwater.—Carver, H., cycle agent.
Brighton.—Miles, J., 1, Trafalgar Court.
Bristol.—Colthurst and Harding.
,, Loxton, C. B., 7, St. Augustine's Parade.
Burton-on-Trent.—Mason Bros. Cycle Co., 23, Bridge St. (agents).
Bury St. Edmunds.—Smith, S. C., and Co., 21, Cornhill (agents).
Cambridge.—Swann, F., 32, Bridge St. (agent).
Canterbury.—Court Bros., 13, Butchery Lane (agents).
Chelmsford.—Tomlinson, J., Tindal Square (agent).
Chichester.—Ballard, A., 7, East St. (agent).
Colchester.—Kent, Blaxhill, and Co., 104, High St. (agents).
Coventry.—Beeston Motor Co., Ltd., Little Park St.
,, Coventry Motor Co., Ltd., Fleet St.
,, Endurance Motor Co., Ltd., Gosford St.
,, Daimler Motor Co., Ltd., Motor Mills.
,, Motor Mfg. Co., Ltd., Motor Mills.
Cardiff.—Evan Thomas and Co., 1, Guildford St.
Croydon.—Miles, C. F., Onward Cycle Works, 423, Brighton Road (agent).
Derby.—Wallis, G., Alaska Works, Monk St.
Devizes.—Bolland, F., 46, New Park St (agent).
Doncaster.—Clark, W. E., and Co., Station Road (agent).
Dorking.—Pierson, C. J., and Co., 22, High St. (agents).

Dover.—Pepper, M., High St. (agent).
Dunstable.—Brown, W. H., 6, High St. (agent).
Eastbourne.—Fear, A. J., 40, Pevensey Road (agent).
East Grinstead.—Brigland Bros., London Road.
Epping.—Cottis, W., and Sons, ironmongers (agents).
Exeter.—Knapman and Co., 206, High Street.
Fareham.—Clark, H., ironmonger (agent).
Farnham.—Tily, M. and J., 7, Castle Street (agents).
Folkestone.—Francis, Wm., 66, High Street (agent).
Gainsborough.—Heinle and Co., 50, Trinity St.
Gloucester.—Pitt and Son, Barton St.
Great Yarmouth.—Leach, J., Market Place.
Guildford.—Shellingford and Co., 135, High St. (agents).
,, Lawes and Co., Bridge St.
Hanley.—Chew, A., and Co.
Henley-on-Thames.—Heckman and Sons, cycle agents (agents).
Hertford.—Cooper, J., and Sons, 13, Maidenhead St. (agents).
High Wycombe.—Potter, R. C. R., 1, Corn Market (agent).
Huntingdon.—Cater, R. W., and Son, 93, High St. (agents).
Kettering.—Hunt, W., and Co., Montague Cycle Works (agents).
King's Lynn.—Morris, F., cycle agent (agent).
Kingston-on-Thames.—Lewis and Co., London Road.
Landport.—Smith, Wm., 316, Commercial Road (agent).
Leamington.—Sleath's, Ltd., Clemens St. (agents).
,, Crowden, C. T., Motor Works.
,, Valintine, A., Heath Terrace.
Leeds.—Askham, J., and Sons, Ashdell Grove.
Leighton Buzzard.—Cooper, S., 14, Market Square (agent).
Lewes.—Broad, J., and Son, oil merchants (agents).
Lincoln.—Clarke's Crank and Forge Co., Ltd.
Littlehampton.—Ockenden Bros., High St.
Liverpool.—Hope, J., and Co.
Lowestoft.—Simpson, O., 94, Denmark Road (agent).
Lyndhurst.—Haynes, J., New Forest Cycle Depôt (agent).
Maidenhead.—Thompson and Walton, chemists (agents).
Maidstone.—Allcorn and Co., 30, Stone St. (agents).
Malvern.—Late Coventry Cycle and Motor Co., now H. Mayo.
Malvern Links.—Santler and Co., engineers (agents).
Manchester.—Simpson and Bodman, Lund St., Cornbrook.
Mansfield.—Mansfield Motor Car Co., Leeming St.
Market Harborough.—Kitchin, S , ironmonger.
Market Rasen.—Jevons, W. B., chemist (agent).
Newbury.—Stradling and Plenty, 79, Northbrooke St. (agents).
Newcastle-on-Tyne.—Rowland, Barnett, and Co., 41, Dean St.
Newport Pagnell.—Odell, J., ironmonger (agent).
Northampton.—Mulliner, A. F., 79, Bridge St. (agent).
,, Johnson and Wright, Gold St. (agents).
,, Grose Gear Case, 63, Gold St.
Norwich.—King, T. C. R., 35, Prince of Wales Road (agent).
Olney.—Sowman, J. W. and E., 33, Market Place (agents).
Oxford.—Foort, R., 19, Queen St. (agent).
,, Oxford Cycle Co., 68, St. Giles.
Paignton.—Fawcett, E. M., New St. (agent).
Pangbourne.—Hull, W. G., and Co., engineers.
Peterborough.—Sturton and Sons, chemists (agents).
Petersfield.—Jones, B., The Square (agent).
Preston.—Coulthard and Co., Cooper Road.
Plymouth.—Bazley and Co., 52, Bedford St.
Reading.—Fuller, J. H., 52, Minster St. (agent).
Redditch.—Enfield Cycle Co.
,, Eadie Manufacturing Co.
Redhill.—Marriage and Co., High St.
Reigate.—Marriage and Co., Bell St.
Richmond Hill.—Beard's Cycle Stores.
Royston and Hitchin.—Innes, G. H., and Co., ironmongers (agents).
Ryde.—Turner, G., 134, High St. (agent).
Saffron Walden.—Robson and Sons, Freswell St. (agents).
Salford.—Kitchen Cycle Accessories Co.
Sevenoaks.—Humphrey, G., 166, High St.
,, Bywater, F. W., 5, London Road.
Shipley (Yorks).—Cundall, R., and Sons, Airdale Ironworks.
Sittingbourne.—Pantene, A., ironmonger (agent).
Southampton.—Hendy, F. A., and Co., East St. (agents).
,, Fay and Co., 80, High Street.
,, Summers and Payne, Belvedere.
,, Birmingham and Coventry Cycle Co., 136, Above Bar (agents).
Southport.—Oliverson, C. H., 1, Queen's Road.
Southsea.—Rose, S., and Co., Castle Road (agents).
Spalding.—Shadford and Co., 21, Market Place (agents).
St. Albans.—Norman, R., Victoria St. (agent).
St. Ives.—Turner, W., and Sons, Market Hill (agents).
St. Neots.—Lynn, J., ironmonger (agent).
Stratford-on-Avon.—Rose, A., Swan's Nest Hotel.
Sunderland.—Milburn and Surtees, 17, Norfolk St.
Taunton.—Taunton Motor and Cycle Manufacturing Co., 58, East St. (agents).
Tewkesbury.—Osborne, S. J., 123, High St.
Thetford.—Brown, G., 11, King St.
Tonbridge.—Wightwick and Sons, 105, High St. (agents).
Torquay.—Radcliff, Wm., St. Heliers.
Towcester.—Ashby, V., cycle agent, Park Road (agent).
Tonbridge Wells.—Reeve and Co., 55, St. John's Road (agents).
Uckfield.—Flint, W., High St.
Wakefield.—Whitehead's Autocycle Co., Corn Exchange.
Warrington.—Caldwells, Ltd., 60, Horsemarket St.
Warwick.—Glover, W., and Sons, Ltd., Eagle Works.
Watford.—Rogers Bros., 61, High St. (agents).
Weston-super-Mare.—Appleton, Wm , cycle agent.
Weybridge.—Pedley and White, The Quadrant.
Weymouth.—Whitehead and Co., Torpedo Works.
Wigton.—Hayton, T. J., 37, High St.
Willesden Green.—Middlesex Motor Car Co., Station Parade.
Winchester.—Frampton, H. W., 1, Jewry St.
Windsor.—Brooks, W. H., and Sons, 28, Peascod St. (agents).
Wolverhampton.—Star Cycle Co., Ltd, Steward St.
,, Electric Street Car Co., Wednesfield Road.
Worthing.—Page, T., 3, South St.
Woodbridge.—Rowland, R. H., hardwareman, The Thoroughfare (agent).

THE PENNINGTON MOTOR (FOREIGN PATENTS) SYNDICATE, LTD.

In the Chancery Division of the High Court of Justice, on Wednesday last, Mr. Justice Wright had before him the petition of Humber and Co. (Extension), Ltd., for the winding-up of the Pennington Motor (Foreign Patents) Syndicate, Ltd.

Mr. Stewart Smith, on behalf of the petitioners, asked that the petition should be dismissed.

Mr. Gore-Browne, for the Pennington Co., in reply to a question as to whether there were other creditors, said he had no instructions on the point.

Ultimately the Judge dismissed the petition subject to any creditor coming in and making application on the subject within a month.

Messrs. Dickin and Co., general ironmongers of Shrewsbury, advise us that they stock motor spirit.

TWENTY MILES AN HOUR AGAIN.

At the Birkenhead County Magistrates Court, before Messrs. C. J. Bushell, J. Elliott, H. Hind, and W. M. Mellor, last week, a summons was heard against Mr. Richard Bradshaw, of the Downs, Blundellsands, for having on the 18th March driven a motor car through Market Street, Hoylake, at a speed exceeding twelve miles an hour.

Sergeant Jackson stated that at 6.40 on the evening of the date in question he was in Market Street with Police-constable Breeze when the motor car "whizzed" past them. It "flew" past so quickly they could hardly see it. It was going at the rate of eighteen or twenty miles an hour, and the street was very busy at the time. Constable Breeze expressed the opinion that the speed was twenty-four miles an hour. Mr. McMasters, for the defence, urged that it was impossible for the engine to go more than twelve miles an hour, because Mr. Bradshaw had geared it so as to prevent it exceeding that speed. Dr. McMurray, ex-Mayor of Bootle, and Mr. Rogerson, who were in the motor car at the time, stated that the machine was going considerably under twelve miles an hour—in fact, it took them thirty-six minutes to go from West Kirby to Leasowe Castle gates, a distance of five or six miles. The magistrates dismissed the case on account of the conflicting nature of the evidence. They did not believe the car was going over twelve miles an hour, but still they considered it was travelling at too great a speed in a crowded thoroughfare like Market Street, Hoylake.

POLICEMEN AS TIMEKEEPERS.

Before a full bench at the Lancaster County Petty Sessions on Saturday last, Mr. Arthur K. Haythornthwaite was summoned for driving a motor car at a speed exceeding twelve miles. Defendant pleaded not guilty.

P.S. Dickenson deposed that in consequence of complaints he set a watch on the Caton road. He and P.C. Dodd timed their watches, and waited for the defendant. Dodd was on his bicycle. Defendant and his motor car passed the third milestone at 1m. 45s. after 1 a.m. He was going at sixteen or eighteen miles an hour, and witness had not seen anything travel so quick on the road before. P.C. Dodd went forward and timed the defendant as he passed the second milestone in the direction of Lancaster. Dickenson cross-examined said that Dodd was on his bicycle 400 or 500 yards in front of defendant when the latter passed the third milestone. Dodd, however, corroborated Dickenson as to its being 1m. 45s. after 1 a.m. when defendant passed the third milestone, and after going at a speed of eighteen to twenty miles an hour down Denny Beckbrow he passed the second milestone at 5m. 10s. after 1 a.m.—having covered the mile in 3m. 25s. The defendant stated the car was quite incapable of doing twenty miles an hour, because he had had an accident at Caton, the lock nuts of the transmission gear having come off, and he was making his return in consequence. Under the circumstances it would have been exceedingly dangerous to drive fast, and he made a remark to that effect at Caton. Mr. W. P. Brash corroborated as to the accident to the car, and said the speed did not exceed ten miles per hour. Down Denny Beck Bank they put the brakes on. Mr. Henry E. Wilkinson, motor car engineer, said his attention was called to the car after the accident, and from what he knew of the car, and the nature of the accident, he said it was impossible for the defendant to have travelled at the speed alleged. A magistrate suggested the brakes might have failed, and supposing someone had been killed. The witness replied that he never knew a motor car brake to fail yet. The magistrates imposed a fine of 40s. and costs, total £2 13s. 6d. This was the first prosecution of the kind in the district.

Answers to Correspondents.

W. M. Morriss.—To hand, with thanks.

Botcher.—We are obliged for the information contained in your note.

Inexperience.—Pressure on our space compels us to withhold till next week.

M. E. and A. Hickman.—We have not space to publish your letters, but we note their contents.

A. J. Aldred.—Pressure of news compels us to withhold your interesting communication till next issue.

W. Crawley.—To hand, and noted. We are glad to welcome you as an early subscriber still with us.

A. G. N.—We insert your letter. With reference to the p.s., we like to give everyone a fair hearing, even if we do not agree with the sentiments expressed.

P. Hamilton.—Many thanks for yours. Have noted change as desired. We shall be very glad to have the log of your voyage, and hope it will be a pleasant one.

W. Vanderbyl.—We are sorry you have had such an unfortunate experience, but regret that the laws of libel in this country will prevent our publishing your letter.

W. C. H.—Many thanks for yours. From what we have seen of him we quite endorse your views of the gentleman mentioned. He goes into things with such originality and thoroughness. We wish you every success in your undertaking.

S.—You will find the spirit sold by the Anglo-American Oil Co. under the name of "Motor Spirit," and which has a specific gravity of ·680, will give you satisfactory results. If you are not certain of the quality your local dealer is supplying you you had better test it.

W. Lea.—We thank you for your suggestion. This is already having our attention. From time to time we publish the names of such dealers as we receive them. A few weeks since we published a list of depôts supplying motor spirit, and give another list in the present issue.

H. P. Fernald.—The address of the gentleman referred to is Springvale Terrace, Hammersmith, London. The machine is fitted with a "Gaillairdet" motor, and is made by the Société Française d'Automobile, 1, Quai National, Puteaux. We believe M. Weigel is the British agent, but are not sure of this.

F. Parker.—Many thanks. We are glad to hear of your success. Will note other matter next week. The maps supplied by our publishers, Iliffe, Sons & Sturmey Ltd., 3, St. Bride Street, E.C., are, we think, all that can be desired. Good ones, too, are supplied in each of their "Way About" series. Petrol list see to day's issue. The other suggestion is good too, and we will see what can be done.

Sirius.—The car referred to, you will find on reading later numbers, was a "Stanley." This was the first announcement, and at the time our correspondent was not at liberty to divulge any names. You will also note that the firm have somewhat modified their ideas since that time. However, there is no doubt they are going into the question with business-like intent, and before long we expect to see some of their carriages on this side of the Atlantic. As soon as this is the case we shall announce the fact.

—. I.—(1.) In reply to your first letter there is no doubt that the experiences of our correspondent are not usual; he has been particularly unlucky. The machine in question is probably one of the most reliable made, and if one takes the trouble to thoroughly understand its mechanism, and keep it in good running order, it is most satisfactory, but be sure that you get a genuine one of recent type. If you are using it on bad roads and hilly country see that it is not geared too high. The tip refers to the practice of carrying a small supply of petrol of very light density, say ·650, as it sometimes happens that after standing the petrol in surface carburetors will not vaporise, but a start can be made by pouring in a little of the lighter spirit; then with the vibration from the road and the warmth from the motor the old spirit will vaporise all right by the time the lighter gas has been used up.

Miscellaneous Announcements.

All advertisements inserted in this column must be strictly prepaid.

Under this head we are prepared to insert advertisements of autocars and other goods for sale, situations vacant and wanted, patent rights, partnerships, businesses for disposal or wanted, and other miscellaneous announcements of a like character. The charge for each insertion is 2s. 6d. for thirty words or less, and 6d. for every six words or less in addition, and a discount is offered of one free insertion in a series of thirteen, i.e., *a 2s. 6d. advertisement will be inserted thirteen times for £1 10s., etc. All advertisements or series of advertisements inserted in this column must be strictly* PREPAID, *and must reach* COVENTRY *not later than* MIDDAY *on* WEDNESDAY *to ensure insertion.*

Numbered Addresses.—*For the convenience of advertisers, letters may be addressed to numbers at* THE AUTOCAR *Office. When this is desired, 2d. will be charged for registration, and three stamped and addressed envelopes must be sent for forwarding replies. Only the number will appear in the advertisement. Replies should be addressed "No. 000, c/o* THE AUTOCAR, *19, Hertford Street, Coventry," or if "London" is added to the address, then to the number given, c/o* THE AUTOCAR, *3, St. Bride Street, Ludgate Circus, E.C.*

Deposit Department.—*Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with* THE AUTOCAR *both parties are advised of this receipt, and upon intimation of the arrival and acceptance of the goods, the money is forwarded less a charge of 1s. for registration, and a deposit fee of 1¼ per cent. on the value of the transaction. All deposit matters are dealt with at Coventry.*

All advertisements inserted in this column must be strictly prepaid.

TRANSFERS for Autocars.—Write for sketch (free) and prices, enclosing wording, to ILIFFE, SONS & STURMEY LTD., Coventry.

TWO h.p. alternating motor by Langden Davies, to suit 100 volt circuit, with starting switch and resistance; has never been used; £25.—ILIFFE, SONS & STURMEY LTD., *The Cyclist* Printing Works, Coventry.

DRIVERS for Daimler Cars.—Wanted, steady and experienced drivers for seaside; apply at once.—SALMONS & SONS, Motor Car Works, Newport Pagnell.

SACRIFICE Daimler Universal Sporting Car, cost over £400, perfect order, equal to new, can be seen and tried by appointment; price £260, must be sold.—SALMONS AND SONS, Newport Pagnell.

BEESTON Tricycle, 1½ h.p., tube ignition, fast, powerful machine, side mudguards, splendid condition, only reason for selling owner purchased car; seen and tried by appointment; price £35, including spare platinum tube and burner.—SALMONS & SONS, Newport Pagnell.

PASSENGER Waggonettes and Chars-à-bancs.—We are building these in all sizes to carry from nine to thirteen. Prompt delivery. We delivered the first Bedford car to carry thirteen in three weeks from receiving the order. Passenger services arranged.—For photos and particulars write to SALMONS & SONS, Motor Car Works, Newport Pagnell.

WANTED, De Dion or Beeston Motor Tricycle, 1¾ horse-power; must be cheap for cash.—C. KORTE, 25, Gallway Street, Dewsbury Road, Leeds.

WANTED, Daimler Motor Car; must be cheap for cash. State lowest cash price, when new, and where to be seen.—LANGLEY, 172, North Street, Leeds.

WANTED, a first-class man, well up in Daimler motor and gear, for charge hand in repair shops in London.—No. 1,487, *The Autocar* Office, Coventry.

MOTOR Car Drivers wanted immediately, permanent places, none but good men need apply; wages 30s.—L. HODGSON, 71, Suffolk Street, Sunderland.

THREE De Dion Motor Tricycles, only shop-soiled; to be sold cheap.—Apply to FRANK F. WELLINGTON, 58, Rosslyn Hill, N.W.

FOR Sale.—Two nearly new Beeston Motor Tricycles, fitted up in grand style; to be sold cheap.—Apply to FRANK F. WELLINGTON, 58, Rosslyn Hill, N.W.

ONE 1¾ h.p. De Dion Electric Motor Tricycle; a grand machine, with front seat to fix on over front wheel.—Apply to FRANK F. WELLINGTON, 58, Rosslyn Hill, N.W.

TWO Daimler Rougemont Motor Carriages, almost new, finished in grand style, 5½ b.h.p., new last August; to be sold cheap.—Apply to FRANK F. WELLINGTON, 58, Rosslyn Hill, N.W.

FOR Sale, one Daimler Rougemont, fitted with a spare 'bus top for winter use, painted yellow, 5½ h.p., to carry eight to ten persons, grand condition, new last August.—Apply to F. F. WELLINGTON, 58, Rosslyn Hill, N.W.

ONE Daimler Waggonette, to hold eight to ten persons, painted yellow, 5½ h.p., new last July.—Apply F. F. WELLINGTON, 58, Rosslyn Hill, N.W.

FOR Sale, one Daimler Waggonette, a grand carriage, quite new, to be sold cheap, 5½ h.p.—Apply F. F. WELLINGTON, 58, Rosslyn Hill, N.W.

ONE De Dion 1¾ h.p. Tricycle, fitted with detachable front seat, to carry two.—Apply to F. F. WELLINGTON, 58, Rosslyn Hill, N.W.

THREE De Dion Tricycles, in perfect order, only shop soiled, to be sold very cheap.—Apply F. F. WELLINGTON, 58, Rosslyn Hill, N.W.

WANTED, a man well up in the Daimler motor and gear, to take charge of a hiring business in provinces.—Apply, Box 1,486, *The Autocar* Office, Coventry.

FOR Sale, Panhard & Levassor Daimler Car, 6 h.p., perfect condition throughout; written guarantee.—S. F. EDGE, 7, Tavistock Chambers, Hart Street, London.

FAST Motor Tricycle, fitted for long distance work, De Dion motor, winner of both races Sheen House Motor Car Meet last November; condition perfect, with guarantee.—S. F. EDGE, 7, Tavistock Chambers, Hart Street, London.

JULIUS HARVEY & Co. supply steam, oil, and electric motor vehicles of every description; illustrated catalogues on application.—11, Queen Victoria Street, London, E.C.

WANTED, De Dion Bouton Tricycle, 1¾ h.p., electric ignition, perfect condition; also Werner Motocyclette; state lowest cash price.—T. MALONI, Ayr, N.B.

THE MOTOR AGENCY Co., Ryley Street, Coventry.—We have several Bollées for sale, and are prepared to prove they are the best in the market. Trial solicited; all prices.

MOTOR Carriages, deliverable directly, system Panhard, Benz, Peugeot, Mors, Decauville, Cambier, Rochet, Silmeider; tricycles.—Apply to GÉO. DE LA NÉZIÈRE, 51, Rue Vivienne, Paris.

WANTED, motor cycle or light motor car, not necessarily in running order, cheap for cash; state full particulars and price.—No. 1,488, *The Autocar* Office, Coventry.

GRADUAL Change Gear, one to four or more speeds, reverses, brakes; suit syndicate to make, grant licenses, and exploit foreign patents.—Address GEARING, Swallow Cycle Co., 28, Essex Street, Birmingham.

YOUNG Man, 28, seeks a situation where accuracy of work, experimental ability, and an excellent knowledge of mechanical work, would be useful; partial knowledge of oil motors.—H. Walkinton, 19, Putney Road, Handsworth.

BENZ Car Fittings.—Chain lubricators, guards, tanks, extra air valves and cylinder covers, plugs, Deitz lamps, rubber mats, long-spouted oilers that won't leak. Any other fittings quoted for.—Below.

ELECTRICAL Ignition.—Special coils, flaming spark, ignition plugs, portable accumulators a speciality; motors, frames, transmission gears, wheels, etc., manufactured to any specification; enquiries invited; repairs promptly attended to, charges moderate.—F. C. BLAKE, Ravenscourt Works, Dalling Road, Hammersmith, London, W.

BENZ Motor for sale, with hood, in new condition, Connolly tyres, and all improvements; will sacrifice for 100 guineas, cost twice as much; write for appointment to view, etc.—G. C. G., 2, Ravenscroft Park, Barnet.

1899 De Dion Tricycle, 1¾ h.p., new in February last, all latest improvements, complete with extra tank, side wheel mudguards, lamp, etc; price £65; may be seen and tried in London.—NAPIER, Parkside, Surbiton Hill Park, Surbiton.

EXCEPTIONAL Offer.—New Benz Cars, all our latest improvements, electric light, regulating lever handy, etc. Eclipse cars sold by others for power. £25 worth extra work put in. Sold at usual prices.—HUNTER, Eastdown Works, Lewisham.

EXPERIMENTAL Work, repairs, oil-retaining gear cases for motor tricycles a speciality.—JAMES & BROWNE, 155, Buckingham Palace Road, London, S.W. (near Victoria Station). Telephone 363, Westminster. Telegrams, "Jeminess," London.

AILSA CRAIG MACHINE COMPANY, LTD., Putney.—Nickel-platers, enamellers, motor engineers; repairs, accumulators charged, fittings supplied. Complete cars quoted for, first-class workmanship, moderate prices. Enquiries solicited. Telephone 192, Battersea.

MOTOR Cars.—Phaeton bodies, iron up with edge plates and body irons ready for motor and gearing, £14; neat design, two or four persons, three horse-power motor, complete, £30, horizontal.—COBORN CARRIAGE AND MOTOR WORKS, Alfred Street, Bow Road, London, E.

NEW and second-hand Autocars for sale.—Accommodation for motor cars; repairs promptly carried out by skilled workmen; petrol, grease, etc., in stock.—ROWLAND BARNETT & Co., LTD., electrical and mechanical engineers, 74, Northumberland Street, Newcastle-on-Tyne.

INTERNATIONAL (Benz) Phaetonette, 1898 pattern, in very good order, with extra seat for two children, cost £160. price £85; also International (Benz) Phaetonette, fitted with hood and detachable apron, good as new, seat four, cost £200, price £125.—MORRIS, Solicitor, Swansea.

DAIMLER Phaeton for sale, 5½ b.h.p., near to new, will take any hill, has been running in Lake District and Derbyshire; fittings, electro silver-plated; upholstery, best morocco; owner purchasing more powerful car.—Can be seen at our London Showrooms, 219, Shaftesbury Avenue, London, W.C.

QUICK automatic steam generators, specially constructed for motor cars, 1 to 4 h.p., light, reliable, economical, free from smoke, smell, or dirt; price list 1½d.—BROUGH, 29, Cornbrook Road, Manchester.

WORKS Manager, Assoc. M.I.M.E., open for engagement, good organiser, with practical experience in managing large works, engaged on light motor vehicles and motor cycles, and in designing same throughout; speciality, interchangeable system of manufacture.—No. 1,490, *The Autocar* Office, Coventry.

BOILERS! Boilers!! Boilers!!!—Des Vignis Cloud and Co. are now making a speciality of boilers for all kinds of motor vehicles; also engines for same. Everything manufactured on the premises.—Particulars on application to DES VIGNIS CLOUD & CO., Engineers, Strand-on-Green, Chiswick. Inventors' designs carried out if required.

THE renowned Delahaye racing car for sale, will take steepest hills loaded with six adults, smoothest and fastest carriage going, will go 120 miles without requiring further supply of spirits or water, fitted with pneumatic wheels, also a set of ordinary wheels; to be seen, tried, and tested.—Apply L'HOLLIER, 6, Bath Passage, Birmingham.

"ON an Autocar Through the Length and Breadth of the Land," by Henry Sturmey, being notes on a tour of over 1,600 miles from Land's End to John-o'-Groat's, London, and Coventry, illustrated with thirty-six views taken *en route* by the author. Bound in green cloth. Price 4s. 6d. nett; postage 3d.—ILIFFE, SONS & STURMEY LTD., 3, St. Bride Street, Ludgate Circus, E.C.

ONLY driven fifty-four miles, neither more nor less, one International Modèle de Luxe Motor Car, seat four persons, practically new, purchased February, 1899, owner took a chill on his second ride, has been invalided ever since with bronchitis and pneumonia, and is advised to sell on account of his health; price £195, will accept £145, or offer. Full guarantee given.—Apply NAWELL, 219, Stretford Road, Manchester.

ADVERTISER, after five years' practical experience, is open to negotiate with firms entering the motor car industry to manufacture, from own patents and designs, light oil motor cars, to carry two or three persons, and sell from £100 to £150, ample motor power, with electrical ignition, light weight (about 5 cwt.), simple construction, no vibration, and noiseless gearing, with any variation of speed.—PETROL, No. 1,489, *The Autocar* Office, Coventry.

MATS.—Sole manufacturer of the pure white indiarubber footboard mats; made to any pattern and accurately fitted by experienced workmen. Waterproof aprons, knee rugs, dust covers, waterproof coats, gloves, etc., etc., specially designed for motor car requirements.—Write for new illustrated catalogue, post free, from ALFRED DUNHILL, 145 147, Euston Road, London. Established over a century Telephone, 568, King's Cross.

FOR Sale, 400 fully paid £1 ordinary shares in the British Motor Company, the parent company owning the patents under which the London Electric Cab Co., the Daimler Motor Co., the Motor Manufacturing Co., the London Motor Van and Waggon Co., the Beeston Motor Co., Humber & Co., the Cycle Components Co., the London Steam Omnibus Co., and other firms are working. Will accept £500, or offers.—No. 32,175 (London).

TO Manufacturers and Syndicates.—Persons desirous of securing land for manufacturing purposes in the Midlands can be suited with from one to twenty-five acres. The land is freehold, well situated for development, in close proximity to the motor-making quarter of the city, within a few yards of the L. & N.W. Ry., and possesses nearly a quarter of a mile of canal frontage. For all particulars apply to MCCARTHY & Co., Well Street, Coventry.