

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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COLONIAL AND FOREIGN EDITION.

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

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Notes.

Sauce for Goose and Gander.

Mr. Walter Long's reply to the resolution passed by the Central Chamber of Agriculture is reassuring as far as it goes. It demonstrates that gentleman's solidity on the abolition of the absurd speed limit in a manner which must shock the non-progressive,

bucolic-minded individuals responsible for the resolution which so arrogantly insisted that no motor bill could be accepted which did not generally define a speed limit. The incontrovertible arguments against anything so manifestly absurd, the absurdity and ludicrousness of which has been patent to all people of commonsense and foresight any time these three years, are plainly set down by Mr. Long in his letter of the 24th ult. Mr. Long tells the Chamber that he is advised by those who are administratively in touch with the question of safeguarding the public that the present legal limit of speed does not, in fact, constitute any effective protection to the ordinary user of the road. Rather, he points out, does it tend to bring the law into contempt, and those who seek to detect infractions thereof into disrepute and contumely. Our police forces throughout the country have never been set tasks so degrading and so lowering to the self-respect of all honest men who wear constabulary uniform as in the preparation and working of the motor traps to which they have been hounded by those set in authority over them, and who after capture further sit in judgment—if judgment it can be called—upon the quarry so miserably secured. Mr. Long announces the intention of the bill to be to cast the onus for reckless driving, so far as reckless driving tends to the endangerment of the public, and at this, tempered by other considerations, the automobilist will not cavil. But other things must in justice to the car owner be taken into consideration.

Chief Justice's Law.

The fact that the Lord Chief Justice of England, in his exceeding wisdom, has held that a motor car may be driven to the danger of the public upon a road upon which no single member of the public was present, because from above or below the earth some public might presently appear, must not be lost sight of. Before a car driver has heavy fines imposed upon him, or is even imprisoned, it should surely be fairly and adequately shown that he was endangering somebody, and that somebody should be obliged to appear and prove his peril. At present it looks as though the simple, ingenious opinion of a policeman will be all that is necessary to damn the automobilist lock, stock, and barrel, the word of the constable being sufficient to prove the danger to the public, present or miraculously to appear. It is not possible that the Motor Cars Bill can become law in so monstrous a spirit of unfairness to a class of road users, whose offence, minus the admitted wrong-doings of the small minority of inconsiderate cads who are at the bottom of all the trouble, is after all the single one that they drive vehicles which have the stamp of novelty still upon them. The pioneer has always had to suffer in this custom-

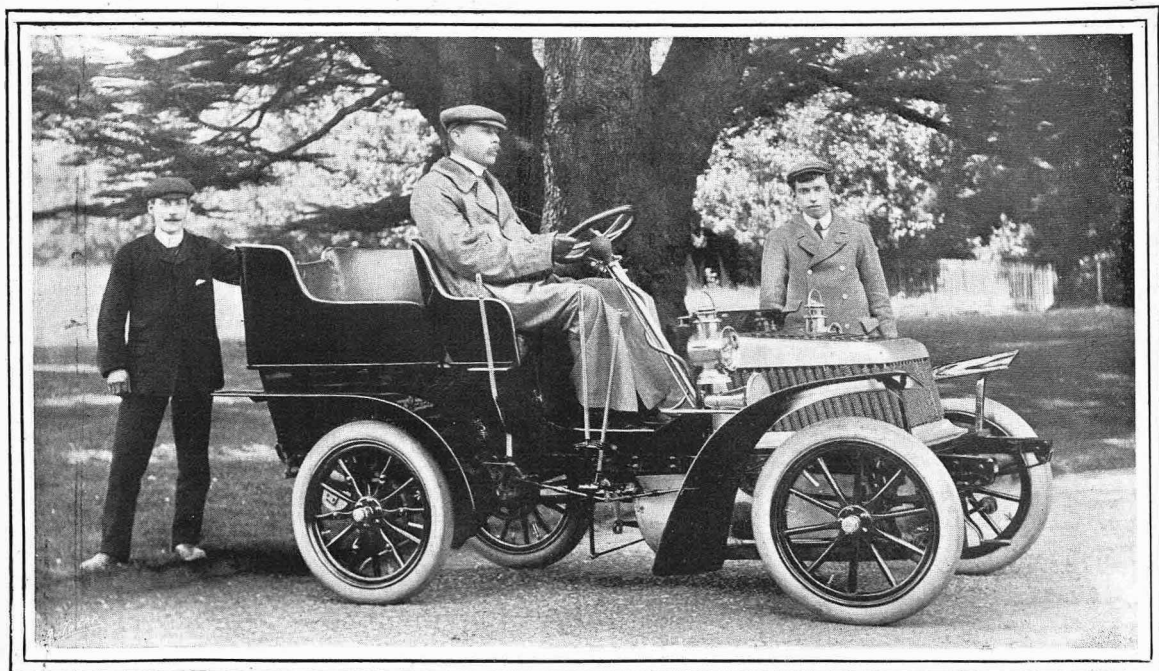
bound country, and, aware of the tricks and manners of his countrymen, the pioneer of automobilism has been more or less prepared to find prejudice arrayed against him in no measured degree.

Pioneers Suffer.

But when that prejudice, which in the last century would have hung George Stephenson from one of his own signal posts, develops into sheer legalised persecution, it is time to call a halt. The Central Chamber of Commerce has drawn Mr. Long with regard to its own selfish view of the question, with what result we have already seen. Surely it is time that the Automobile Club, which is not altogether without responsibility for this bill, should follow the Chamber's example, and by force of a communicated resolution obtain some pronouncement from the President of the Local Government Board with regard to the points which, lacking any definite information upon the subject, threaten to lay the automobilist open to punishment for what may be unproved offences, or in what should be the spirit of the law, no offences at all. Are we to be left to the unsupported evidence of the single policeman, who will remain the sole and finite proof as to the question of public danger? Are we, by reason of the exhibition of numbers, to be liable to be cited to answer offences of the committal of which we remain in ignorance until summoned? Are we to be doomed, when cast heavily in fines, or condemned to imprisonment by benches of magistrates who have avowed themselves on and off the bench bitter enemies of automobilism, to appeal from one set of these gentry to another? If the Central Chamber of Commerce can obtain an expression of opinion from Mr. Long so can the Automobile Club, and upon the points we have raised they should not allow the grass to grow under their feet before so doing. Unless they do so, and that right early, they will be lacking in their duty.

The Efficiency of Brakes.

No more conclusive proof of the efficiency of the brakes now being fitted to the modern motor vehicle could be given than that afforded by the hill-climbing and stopping tests organised by the Midland Automobile Club, and referred to in detail elsewhere. It is not so very long ago since an outcry was raised against the inefficiency of brakes, particularly as to their holding backwards. Out of twenty cars competing in the hill-climb referred to only one ran back any appreciable distance when the brakes were released to start the car, and there was not a single instance of the failure of the brakes recorded either among the cars which ascended and were stopped upon the hill officially, or on those which attempted an unofficial trial climb on their own account, when the competition was concluded. Another noteworthy fact is that an analysis of the programme shows that sixteen out of the twenty cars were of British manufacture, while three were of French origin, and one an American. When one considers that practically the whole of the braking power used for holding the cars on gradients of one in six was confined to the two band brakes on the back wheels alone, and that some of the vehicles with their loads, which must have weighed in several instances upwards of thirty hundredweights, were so held, it shows to what a state of efficiency these fittings have been brought. There is no doubt that all the competitors had given the greatest care and attention to the adjustment of their brakes before setting out upon the journey, and every automobilist for his own sake should take similar precautions, for in the event of an accident occurring through a car running backwards on the hill, it is obviously unfair to attribute it to bad brakes, for there is no excuse for a manufacturer to fit inefficient brakes, and this he will not do for his reputation's sake, as tidings of such failures rapidly get abroad.



The Earl of Buckingham on his 10 h.p. Argyll, which was supplied by Messrs. Kingham and Brook, of Aylesbury.

USEFUL HINTS AND TIPS.

On Fitting Piston Rings.

Signs of Bad Rings.

A loss of compression means a loss of power. To discover the cause of this loss of power is one of those things which often baffle the motorist, even though he has got through the novitiate stage. Loss of compression is liable to be caused by several things—for instance, leaky induction and exhaust valves, a badly fitting combustion head (that is, where the head is separate from the cylinder barrel), or by badly fitting piston rings. It is with these latter that we have to deal at the present time. Supposing that we have a single-cylinder engine, whose compression is bad, the valves have been taken out and ground in to a perfect fit, the joint at the combustion head has been examined, and there is no doubt that this is perfect, but still the compression is bad. This points to the fact that the piston rings need some attention. It is therefore necessary to disconnect the cylinder entirely from the crank chamber, so that when the former is removed it leaves the piston attached to its connecting rod. Care should be exercised when removing the cylinder not to disturb the piston rings, but to note the relative position of the slots in these as the cylinder comes off. If the slots in the rings are approximately in line, this in itself is sufficient to cause a loss of compression without the rings being absolutely bad. The internal combustion motor, as a rule, is fitted with three piston rings, and the slots of these should be equidistant from one another, to ensure there being no leakage past them.

The Cylinder Removed.

The cylinder now being removed, we are enabled to carefully examine the piston and its rings, and provided that the slots in the rings have not been opposite to one another, we now have to look for the cause of the trouble. If the rings are bad, the points at which the gas has been escaping by the piston and rings will be denoted by a burnt or brown or roughened surface on the polished surface of the piston, and the rings. It will frequently be found that these places occur near the slots in the rings, these being quite discoloured for perhaps a quarter of an inch from each end of the slot, or it may be that one ring has not been really true when it was first put in, and it has allowed the gas to escape in small quantities at first. Continued compression of the gas has caused an increasing escape, until quite a large area of escape has been created. This, as in the other case, will be noted by the discolouring of the ring.

The Removal of the Rings.

Having discovered the bad ring or rings, their removal is the next question with which we have to deal. The rings being bad, it is practically immaterial whether they are broken or not in the process of their removal, but we would advise those who are fitting new rings for the first time to be very

careful in the removal, as the experience thus gained will be of benefit to them in replacing the new rings. Two pairs of hands are really required to carry out the operation successfully, though with a little extra caution and trouble it may be equally efficiently carried out by one person. The first thing to do is to open the ring by springing the ends apart at the slot, and this is best done by means of two implements; practically anything will do that will fit into the groove of the piston. These being inserted into the slot in the ring, they are gently forced apart, so that the ring is expanded. Then, by inserting a finger or fingers between the implement the left hand can be passed round to the opposite side of the cylinder, and the ring lifted, so that it rests upon the edge of the groove. It can then be forced gently off the piston. In removing the middle ring, care will have to be taken, or the ring will drop into the groove vacated by the top ring. If this does happen, it will, of course, have to be removed in the manner before mentioned. In many instances, the bottom ring can be slid over the trunk of the piston and sprung open sufficiently to pass over the connecting rod, thus saving the possibility of its falling into the two grooves above, and the subsequent trouble of its removal.

The Form of the Ring.

When the rings are removed, it will be noticed that they are not of the same thickness all the way round, but the bore of the ring is slightly concentric, and that the slot in the ring is placed at the thinnest part. These rings, it may be stated, are turned from fine grey cast-iron, this having proved, after many years of experimenting, to be the best metal from which such rings can be constructed. This form is given to the ring so as to give it a certain amount of spring, by means of which it shall at its own accord keep in close contact with the walls of the cylinder. It is not without interest to know how these rings are made, and, therefore, we give a brief *résumé* of their construction. A concentric ring is turned off a suitable iron casting somewhat larger than the finished size required. The rings thus obtained are split open at any point, and a given length is taken from the circle. They are then closed together by being forced into a piece of tube, in which state they, of course, form an untrue circle. The tube with the rings, in which all the slots are in a line, is passed on to a bar provided with a shoulder at one end and a large flange or washer with lock-nuts at the other end. The flange is put over a bar or mandril, and the lock-nuts tightened up, so that the rings are held firmly in position. The tube which has served to hold the rings together is then knocked off, and the rings are turned down to the required size, this process leaving them thinner on the one side than on the other.

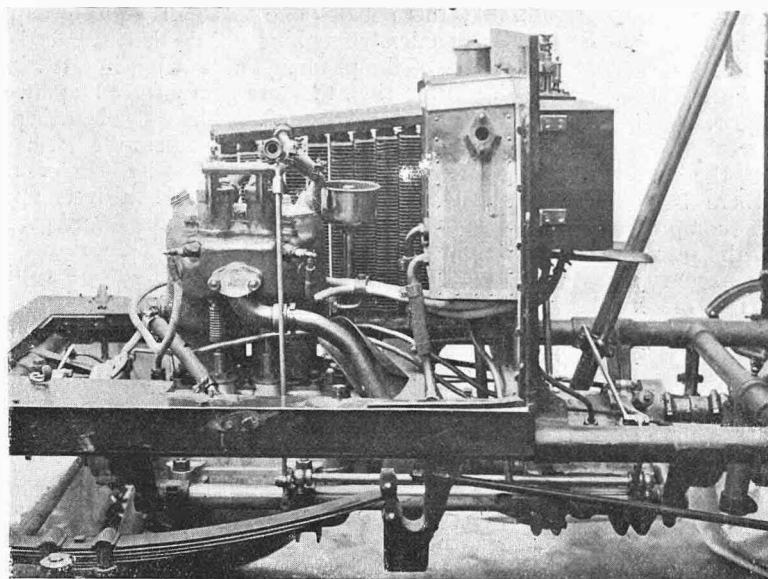
(To be continued.)

It will be of interest to London automobilists to know that the United Motor Industries, Ltd., of 45, Great Marlborough Street, are now stocking Brampton chains for Daimler, Gladiator, M.M.C., Napier, and Wolseley cars.

During the Irish fortnight a reporter arrived at a village at four o'clock one afternoon and enquired whether he was in time for the afternoon post. "Oh, yes," was the reply, "it goes out at half-past three to-morrow afternoon."

THE RENAULT LIGHT CARS.

Throughout the automobile world it is doubtful whether there are more interesting vehicles of their type than those manufactured by Messrs. Renault Frères. In the early part of 1898 M. Louis Renault constructed his first car, which was furnished with a $1\frac{1}{4}$ h.p. engine. Even at this time it was fitted

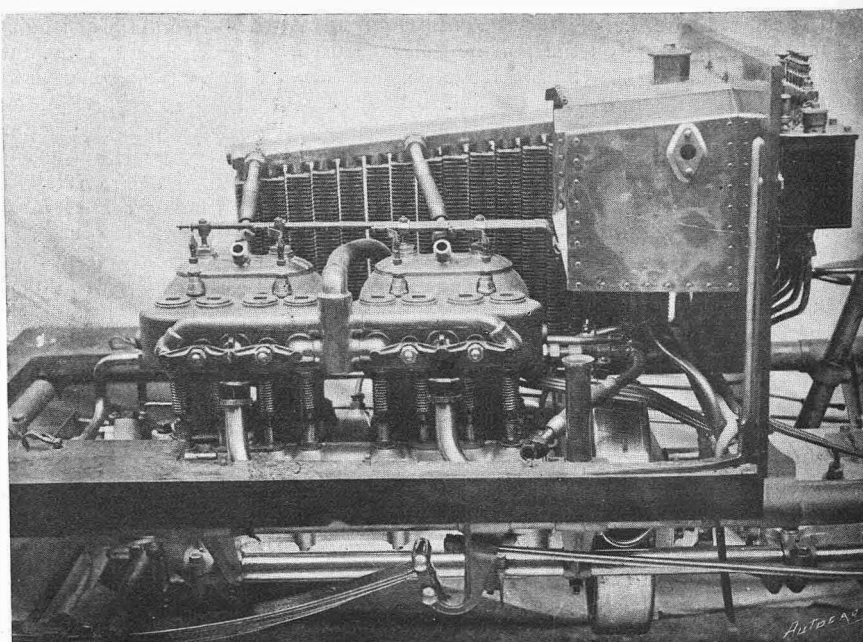


The 10 h.p. Renault engine.

practically with the same mechanism as that which obtains in the present type, viz., a three-speed forward gear driving direct on to the high speed, the transmission being by propeller-shaft, with universal joints and bevel gearing, it being, to the best of our knowledge, provided with this system of transmission. The $1\frac{1}{4}$ h.p. car was soon followed by another boasting a $3\frac{1}{2}$ h.p. engine, which was water-cooled. It was then that the thermosiphon system of water-cooling was introduced on a mechanical road vehicle, and to this system the firm have ever since rigidly adhered, the engine of the 14 h.p. car now under notice being similarly water-jacketed. In due course there followed the 8 h.p. and 9 h.p. cars, until they arrived at the present 14 h.p. A 20 h.p. car of the same type ran so successfully in the Paris-Vienna race last year that it was definitely decided that it should be in future the standard pattern to leave the Billancourt shops, but that a 14 h.p. engine should replace the 20 h.p., so that the two principal types which are now being turned out are the

10 h.p. with two cylinders and the 14 h.p. with four cylinders. In addition, Messrs. Renault Frères are also turning out cars of 6 h.p. and 9 h.p., with single cylinders.

In our first illustration, the engine of the 10 h.p. car is depicted, and in order to make this as clear as possible the left-hand radiator has been removed. In this engine it will be noticed that the inlet valves are automatically operated, the exhaust valves being placed immediately beneath them, with the sparking plugs situated in the port between the two valves. The water tank is seen set on front of the dashboard. The four-cylinder engine is shown in the four following illustrations. Of these, the first shows the left-hand side of the engine, with the radiator removed. This engine is provided with mechanically-operated valves, all actuated from a single half-time shaft which are enclosed in an oiltight chamber. A single spray carburetter supplies mixture to the four cylinders, while the exhaust is carried away by two pipes into a large-sized silencer. It will be readily seen from the illustration that the two inner valves are the exhausts, while the two outer ones to each pair of cylinders are the inlet valves. The sparking plugs are placed in the port leading to the combustion chamber, and are provided with spring connections, so that any one of the plugs may be instantly put out of operation for testing purposes. Each pair of cylinders are separately water-cooled, and have their own connections to the



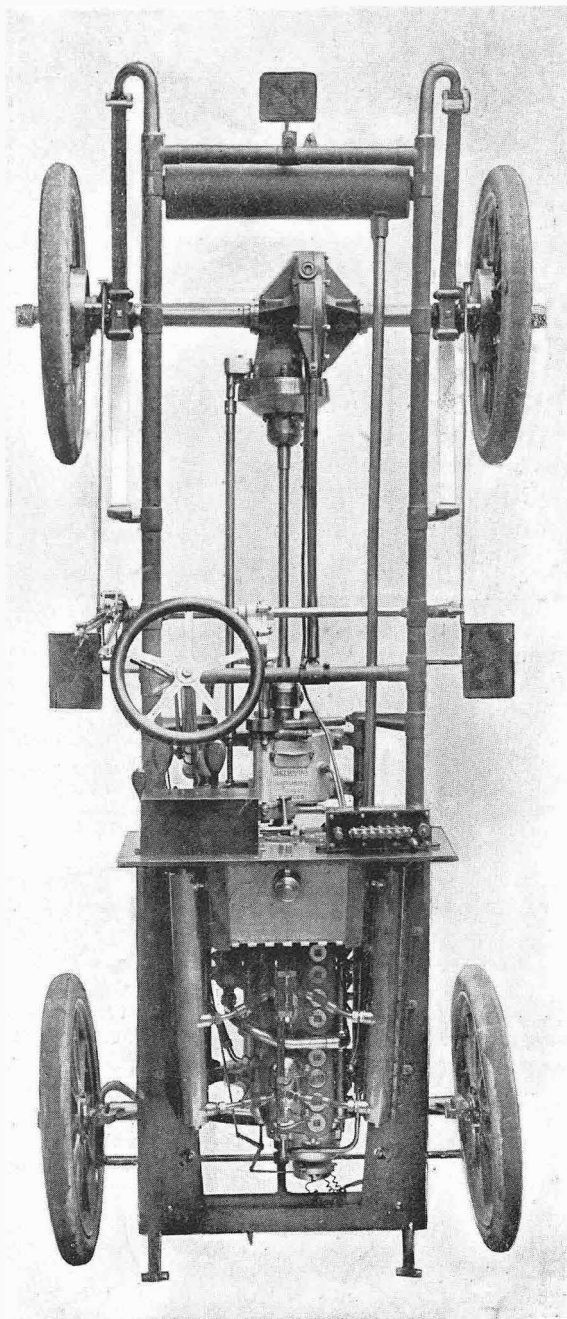
The 14 h.p. four-cylinder Renault engine.

water tank and to both the side radiators.

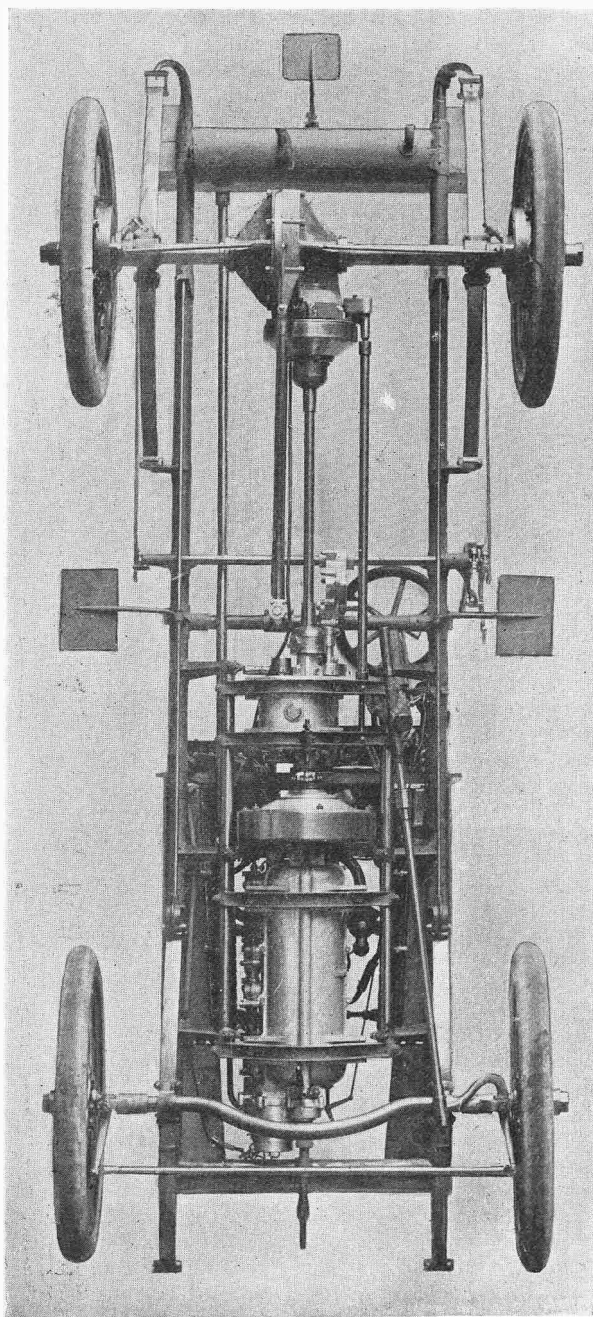
The whole of the engine and the change-speed gear is carried on a separate cradle of tubular construction, which is rigidly connected to the main frame, formed, as is also the cradle, of tubes $2\frac{3}{8}$ in. in diameter.

can be readily and delicately adjusted. This lever, of course, acts as an accelerator. In addition to this, the centrifugal governor takes effect upon a throttle valve in the induction pipe, so that there are really two distinct methods of governing.

The lubrication system of the motor is particularly



Top view of the 14 h.p. Renault chassis.



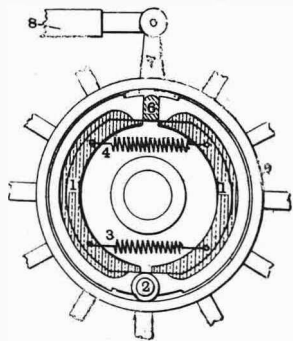
Underneath view of the 14 h.p. Renault chassis

The engine is governed by varying the lift of the inlet valves, the governor being located in an aluminium box, forming an extension of the crank chamber. The upper part of this is seen on next page. The tension of the governor spring is varied by means of a lever under the control of the driver, so that the amount of lift which the governor exercises

well carried out. The dipping of the cranks into the lubricating well throws the oil up into gutters formed in the crank chamber, from which the lubricant is distributed to the various bearings throughout the whole of the engine.

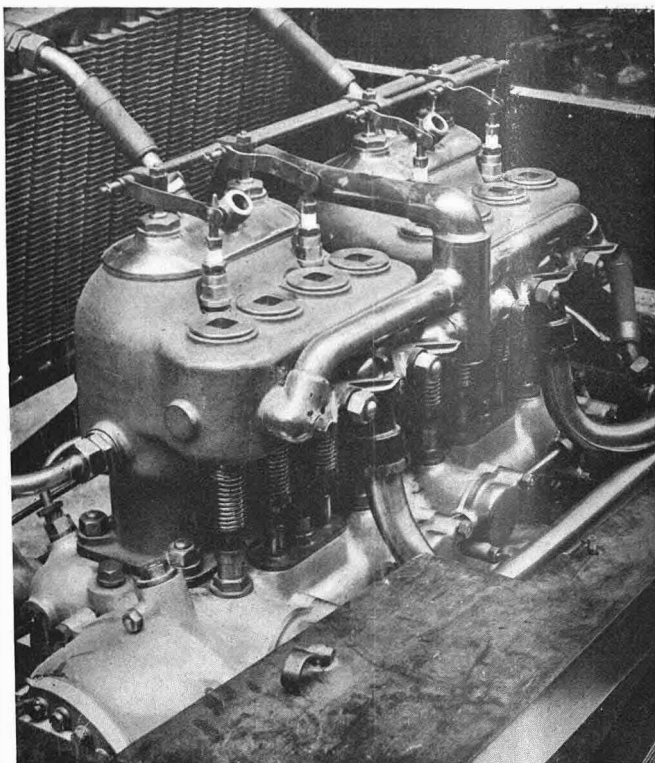
The transmission gear is on similar lines to that employed in the firm's first car, but, of course, many

improvements have been carried out in details. For instance, in the latest gear, when running on the top speed, the drive is direct from the engine, there being no gear wheels in mesh, excepting the bevel wheel drive on the end of propeller-shaft, the countershaft remaining perfectly stationary on the top gear. In the early part of the year M. Louis Renault took out a patent for the expanding segmental brake, a drawing of which is given herewith. The expanding segments, or shoes, are of metal, and are



Renault expanding segmental brake.

numbered 1 1. These are pivoted at their lower ends upon a spindle 2, which is fastened to the rear axle. Fastened to the axle spring is a bearing carrying a rocking spindle 6, which is provided on its outer end with a square block, the sharp corners of which are removed. This block rests between the free ends of the shoes 1 1. The spindle and block 6 are actuated by the lever 7, which is under the control of the driver through the rod 8 and the hand brake lever. It will be seen that when the lever 7 is drawn forward by the rod 8 the block on 6 is twisted lengthwise between the free ends of the shoes 1 1, so that these are expanded against the inner periphery of the brake drum 9, which, of course, is secured to the road wheel itself. Normally, the shoes 1 1 are kept from contact with the brake drum by the coil springs 3 and 4. This is, of course, a very efficient type of brake, and one which should require the least



Another view of the 14 h.p. Renault engine, which shows the spring connections to the sparking plugs and the box on the forward end of the crank chamber containing the governor.

possible amount of adjustment. The sole agents for these cars in this country are the Roadway Autocar Co., Ltd., Burwood Works, Burwood Place, Edgware Road, W., and they send out a particularly useful book of detailed instructions to purchasers or prospective purchasers.

Much thought is now being given to the comfort of ladies riding in autocars, particularly to the preservation of their coiffures and headgear generally from the too robust attentions of the wind encountered as the car careers along. In the case of high-powered vehicles, the fitting of glass screens, both to the dashboard and the back of back seat, is an effective protection; but in the case of open cars up to about 10 h.p. the resistance offered to the wind by such screens must be taken into consideration. There are many car owners who object to these screens on this account, and the fact that they do not lend grace to the appearance of the carriage is undeniable. In a way to take the place of such wind breakers, Mr. Alfred Dunhill has introduced small screens made after the style of the hand fire-guards used by our grandmothers to protect their complexions from the blaze. The frames of these screens are filled in with strong veiling material, and in some cases carry a panel of transparent mica in the centre. These can be held in one hand by the lady passenger, or, if this is thought to be too fatiguing—which it probably would be during a long journey—brackets are provided, by which the screens can be attached to the car, holding the device in any desired position.

In view of the virtual failure of the oil treatment of roads in this country and apparently also in France, the following extract from the *San Francisco Chronicle* may not be without instructive interest. Our contemporary says: "The crude oil used on the London and Aldershot Road proves to have had a paraffin base, which in itself explains the cause of its failure. Everything depends upon the base of the oil used. If paraffin is the base nothing but failure can be expected, for when the volatile substances contained in the crude petroleum evaporate, the residuum left is a brittle, greasy substance, which affords absolutely no protection to the roadway. The secret of the success of the oil treatment of roads in California lies in the fact that our crude petroleum possess an asphalt base, which leaves an asphalt covering on the surface of the roadway after the volatile elements have been evaporated by solar action. This asphalt covering is as complete a protection to the roadway as if its surface were paved with a coating of bituminous rock. And every successive oiling received in the treatment thickens the asphalt shield of the crown of the road, more thoroughly protecting the underlying foundation from the action of water, let it rain ever so hard."

A TOUR IN FRANCE.

By W. H. Goschen.



Ready to start after settling all preliminaries. The official number in position.

A complete independence of timetables is perhaps the great advantage of a touring car, and with this idea in our minds we left London a few weeks ago for Southampton and France. The day was fine, and the car—a 10 h.p. M.M.C., with a roomy tonneau—was running well, so that, lunching at Winchester, we ran on to Southampton in good time, and drove into the docks. Here the London and South-Western Railway took charge of the car, and after emptying the tank of petrol, a crane picked up the car by ropes attached to each axle, with spreaders to prevent the body being injured, and gently deposited it on the deck of the steamer, where it was carefully made fast under cover, without even a scratch on the paint. The boat sailed at 12 p.m., and the next morning soon after seven o'clock we arrived at Havre. As I happened to have friends in Havre who were used to dealing with the Customs authorities, I did not take advantage of the arrangements the Automobile Club have now made for their members, and an account of the necessary formalities may possibly be of use to others who may think of visiting France.

The Necessary Permits.

To drive in France, two permits are necessary—the *permis de circulation* or *carte grise* and the *permis de conduire* or *carte rouge*, as they are commonly called. The first affects the car, the latter the driver.

As regards the former, if the car is a French one, there is no trouble, as the French makers

supply the purchaser of the car with the necessary papers required by the authorities, and as the recognised French makes of car are known and registered by the Prefecture, no delay is experienced.

With an English car, if one makes one's arrangements in time, there need be no delay either.

My friends in France informed me what details were necessary, and put the matter in the hands of an excellent motor car agent and dealer—Monsieur Burton, of Havre.

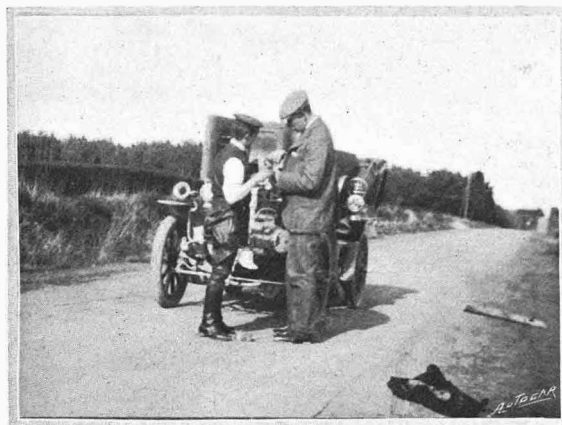
The Motor Mfg. Co. kindly furnished me with a complete specification of the car, and this I sent to France a month or so before I intended to start. It was then duly forwarded with the demand for the *permis de circulation* on properly stamped paper to the Prefecture at Rouen, with the result that on my arrival I found everything practically arranged. I understand that once the specification of a car made out of France has been registered by the authorities, other cars of the same maker, horse-power, and type, are granted the *carte grise* without any difficulty, especially if the applicant for the *permis de circulation* can refer to the number stamped by the Prefecture on the specification of the original car obtaining the licence.

At Havre.

On arriving at Havre the car was run off the steamer by hand, and there I found Monsieur Burton awaiting me with petrol, etc. After filling our tank and sending our luggage to the hotel, we left, accompanied by a Custom House officer and piloted

by M. Burton on a little Georges-Richard car, for the weighbridge, where the weight of the car was duly recorded, and then back to the Custom House, where the wheels were measured, the papers completed, and the necessary deposit made, the whole formalities not occupying more than half an hour.

M. Burton had arranged for an official of the Department des Mines to be available at ten o'clock



A sticky valve, the only roadside repair.

to grant driving certificates to myself and my man, so after leaving the car with him to be washed, he drove me back to the hotel. At ten o'clock he reappeared, and I shortly found myself driving a polite French official through the streets of Havre. He was apparently soon convinced that we could both manage the car, so that before twelve o'clock I found myself in possession of a provisional *permis de conduire* and the information that our definite certificates and the *permis de circulation* would be ready in Rouen, the head prefecture of the district, the next day.

I would strongly advise anyone intending to take a motor to France to instruct some reliable motor car agent or dealer in good time to make the necessary arrangements for him and to meet him on arrival. The fee charged is not large, and the comfort and saving of time are great. The local man has all the necessary formalities at his finger's end, and will from his experience and acquaintance with the French officials probably save any intending tourist much trouble, time, and possible annoyance.

We had not expected to be able to complete all the formalities so soon, so had originally intended to stay that night at Havre; but finding ourselves free to leave, my wife and I decided to start that afternoon, as, beyond the docks, which, of course, are very fine, there is not much of interest in Havre.

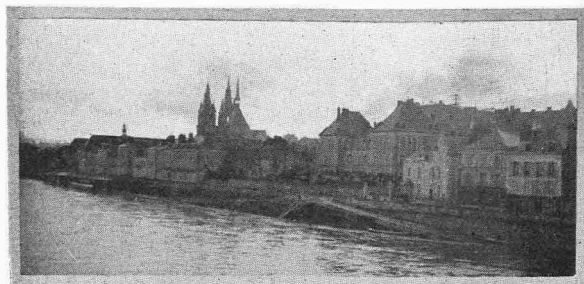
En Route.

From Havre to Rouen we chose the route *via* St. Romain, Bolbec, and Yvetot. There is a little *paré* as one leaves Havre, but one soon reaches the magnificent Route Nationale, and I then began to wish I had followed the makers' advice, and had larger sprockets than I used in England fitted to the car. I should imagine that any car that is of ample power for its size in England would on the fine French roads take sprockets with at least ten per cent. more teeth than one is accustomed to use here. We arrived at Rouen in good time that even-

ing, and the next day went at once to see about our certificates, etc. Here a Mons. Drance, a motor car agent, who had been recommended to me at Havre, rendered me great assistance, and although he could not get us the definite certificates that day, he was able to find out what number was allotted to us—a car in France must carry a number in front and behind—and have it painted for us by the afternoon, while we spent the morning in seeing part of the cathedral, etc. As we intended to pass through Rouen on our homeward journey, we left in the afternoon for Lisieux, M. Drance promising to forward us our *carte grise* and *carte rouge* as soon as they were signed. We had intended to take the route *via* Bourg, the Roulde, and Brionne, which is the shorter, but took a wrong turn; and, finding ourselves on a splendid road *via* Pont Audemer, decided not to go back, and after a lovely drive through a country sufficiently undulating to be picturesque, found ourselves at the Hotel de Normandie at Lisieux, which, in addition to being very comfortable, has, like most French hotels, every convenience, including a pit for motors.

After visiting the beautiful cathedral at Coutances, and one or two churches, we left for Mont St. Michel *via* Granville, a pretty little town built on two sides of a valley with a hill down into the town and one up the other side. Thence to Avranches, which is built on a hill celebrated as being the highest steep in Normandy, and the road up to it is a stiff ascent with an almost acute angled turn halfway up. It looked formidable, especially as the surface was greasy, and we had to face it from a dead stop at the bottom for a level crossing, but the car ran up it without difficulty, and we were soon at lunch at the Hotel d'Angleterre, where we again found an excellent garage and pit. There is a lovely view from the gardens here across to Mont St. Michel. Leaving Avranches there is a rather steep descent. At Pontorson the road turns to the right for Mont St. Michel. One can drive up to the rock itself along the causeway, but the car must be sent back to Madame Poulard's garage, which is situated at the beginning of the causeway about one kilometre from the hotel.

At Pontorson we made the mistake of taking a cross country road, which was curly, rather greasy,



Saumur from the bridge in the early morning.

and heavy from the rain, and we were glad to meet the main road again at St. Hilaire, from which place the going is all excellent to Domfront, Juvigny, Couptrain, Pré, and Alençon, and the country picturesque.

Beyond the church of Notre Dame we found little of interest in Alençon, and the next afternoon we

were on a perfectly straight road *en route* for Le Mans. Here the cathedral is well worth seeing, especially the view it presents from the market-place. From Le Mans there is a good road to Angers *via* La Flèche and Durtal, which is a lovely little place.

Our First Panne.

Soon after leaving Durtal, and finding we could get no power out of the car, we examined the carburetter, and finding the jet was clear, we were lucky enough to locate the trouble in the inlet valves: these were very sticky, owing, I think, to some new kind of petrol a man had persuaded me to try, and which I never came across again. We discovered afterwards it had a tinge of yellow in it, possibly due to impurities, which may have accounted for the sticky deposit it left in the cylinders. After this I never used anything but the well-known brands of "essence," which can be obtained in every town from the firms mentioned in the excellent book published by either the Automobile Club or the Touring Club of France.

The next morning, after exploring Angers, we followed the road skirting the right bank of the Loire. The view as one drives across the river into Saumur is superb. From this place one should follow the road on the left bank of the Loire to the quaint little village of Candé. Here we left the main road to see the Abbey of Fontevault, now a convict prison, where one can still see the cloisters and the chapel that contains the tombs and coloured effigies of Henry II. and Richard I. Returning to Candé by road, we ran through lovely scenery along the banks of the Vienne, and crossing this river, found ourselves in the pretty little town of Chinon. After staying here two days, we took the road on the right bank of the Vienne to Beaumont and Port Boulet, where we again met, and crossed the Loire. The road on the right bank of the Loire after passing the picturesque town and beautiful chateau of Langeais runs through lovely scenery along the river to Tours, where one crosses to the left bank.

The country round Tours is very interesting, and we spent two or three days in excursions to Chinon-ceaux, Loches, etc., and were always able to go and return by different roads. The drive from Tours to Blois *via* Amboise (where there is a lovely chateau overlooking the Loire, which is well worth seeing), and Chaumont is most attractive.

Ignition Troubles.

A few miles from Blois we experienced the advantages of a double system of ignition, for, finding there was something wrong, we lit our burners, and ran comfortably into Blois, where we found both the tremblers on the coil and the brushes on the commutator required adjustment. Two days were spent pleasantly at Blois and its surroundings, including a beautiful drive to the chateaux of Chambord and Cheverny, and back to Blois through the forest of Beaugard.

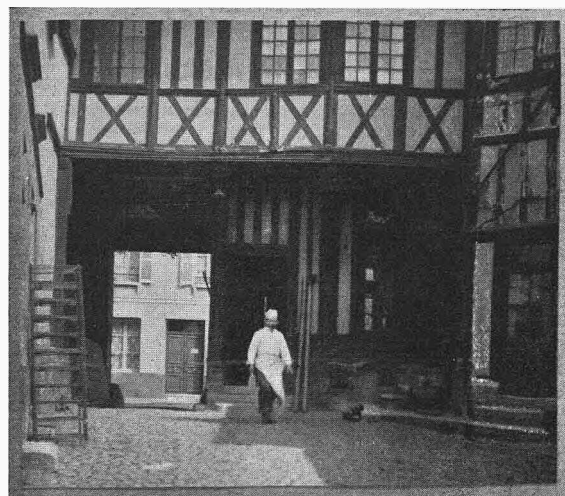
Should one visit Paris, it may be well to remember that the octroi on petrol is very heavy, and that, although a greater speed is allowed in the streets, twelve kilometres (= $7\frac{1}{2}$ miles) an hour is the official limit in the Bois de Boulogne.

From Versailles to a little beyond St. Germain-en-Laye, there are long stretches of bad *pavé*, in-

cluding a steepish hill, the condition of which defies description; but after leaving St. Germain, the road to Mantes (a pretty old town) is good. Here we crossed the Seine, and followed the road along the right bank through the forest of Vernon. There are several steep hills on this road, and after passing the ruins of the famous old chateau of Gailard, put up for the night at the sixteenth century hotel of Le Grand Cerf in Grand Andely.

The Return Journey.

We varied our route from Rouen to Havre by taking the far more beautiful road along the Seine *via* Caudebec (a lovely spot), Lillebonne, and St. Romain, arriving in Havre in plenty of time to complete the formalities for the return of our deposit at the Custom House before it closed at six o'clock. The car was put on board, and the next morning we drove back to London from Southampton thoroughly satisfied with our tour. We had been extremely lucky, for not only had we no trouble with the car, but during the 1,500 miles we ran



The Courtyard of Le Grand Cail.

while we were away, we did not have a puncture, although the tyres were not new when we started.

France is admirably adapted for a motor tour. The roads are good, and there are plenty of signposts. Further, at any cross roads of importance and in most villages there are boards erected by the Touring Club of France giving the direction and distance of the important towns. Warning boards are apparently erected at the top of every steep hill. All the hotels we came across had a garage of some kind, many of them a pit also; and essence, grease, and oil could generally be obtained from the man in charge. Indeed, one need never be afraid of running short of petrol in France, for there seems to be a stock in every village. Tarad's road maps are excellent, and the annuals of the Touring Club, or of the Automobile Club of France, afford one endless information about hotels and their prices, mechanics, depots of essence, oil, etc., together with many other useful details.

If the ubiquitous "Baedeker" and Hare's books dealing with the district one proposes to visit are also included, one has, I think, everything necessary, provided the weather is fine, for a complete change and a pleasant holiday.

THE BRIGHTMORE STEAM TRACTOR.

At the time of the Earl's Court exhibition, we dealt with and gave an illustration of the Brightmore steam tractor, which, as we then stated, is so designed as to be capable of attachment to any vehicle having a platform and back wheels strong enough to carry the increased loads it is intended to transport. The whole of the machinery proper is contained in the new forecarriage, the water tank

at the top of the fire box for drying or partially super-heating the steam. The working pressure is 200 lbs. per square inch. Coke fuel is used, and a supply is carried in bunkers at the end of the boiler, which will accommodate some $2\frac{1}{2}$ cwts. of fuel. Water is fed to the boiler by the usual plunger pump, a further fitting, in the shape of a Marsh steam pump, being also employed. Both pumps connect

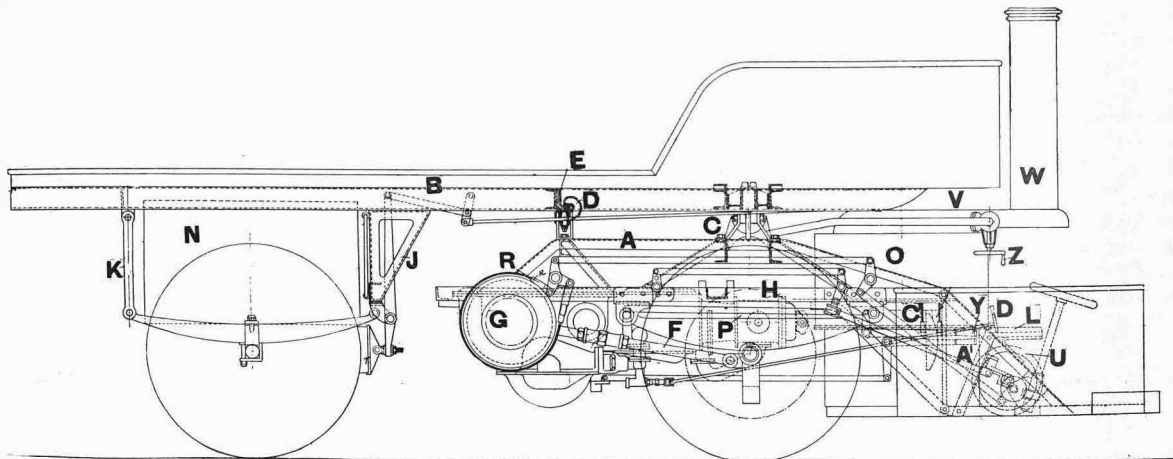


Fig. 1.—Side elevation of the Brightmore tractor.

A, tractor frame
B, platform for carrying the load;
C, pivot connections to B
D, bearing plates between tractor and platform
E, E, spring arms balancing B
F, tension rod from crankshaft bearings to road wheel axle
G, G and H, low speed gear

J, bracket for back wheel springs
K, rear swinging bracket for back wheel springs
L, driver's seat
M, fuel bunker
N, water tank
O, boiler
P, compound type engine
Q, Q and S, S, high speed gear

R, band brake on engine crankshaft
U, brake gear hand wheel
V, flue to the funnel
W, funnel leading the products of combustion away
X, steering wheel
Y, steering drums
Z, steam pipe and throttle valve
A¹, B¹ and C¹, controlling levers

The above reference also applies to figs. 2 and 3.

supplying the boiler alone being fixed to the platform of the vehicle. Referring to the side elevation of the tractor (fig. 1), the engine P behind the front axle is of the compound type, double-acting and reversing, the high pressure cylinder being 4in. bore and 6in. stroke, the low pressure 7in. bore, with the same stroke. The valve gear is so arranged that the compound cylinder may be used as a high pressure cylinder for use in getting the loaded vehicle out of difficult places, or in attacking specially bad gradients. The normal speed of the engine is

to the boiler by a combined plug and check valve, so that one pump may be shut off and examined while the boiler is under steam. The water tank, which is carried beneath the platform, has a capacity of 170 gallons. A water lifter is used to charge this tank. The platform B, carrying the load, is supported on the usual back springs, which in this case are considerably strengthened, and are connected to the tractor by a ball and socket joint over the front axle. The pivot connecting the tractor to its platform is provided with circular segments

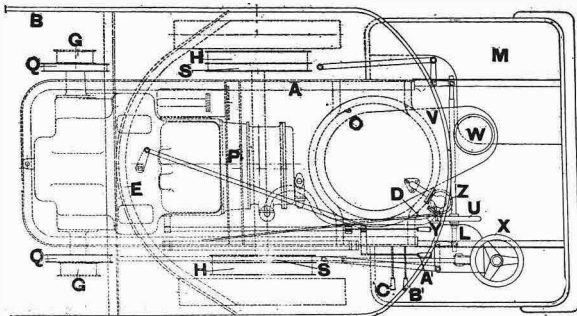


Fig. 2.—Plan of the Brightmore tractor.

450 r.p.m., and is capable of running up to 600 r.p.m. without increasing vibration. The boiler O, supplying steam to the engine, is of the fire tube type, having a grate area of 3.75 square feet and 108 square feet of heating surface. There are 342 tubes, each of $\frac{3}{4}$ in. internal diameter, and there is a space

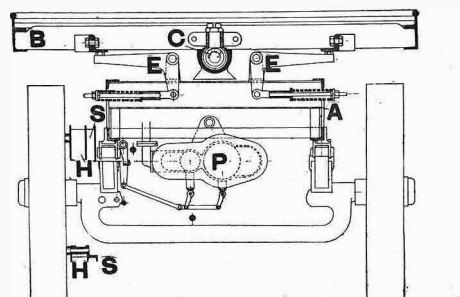


Fig. 3.—Front view of the tractor, boiler removed

upon which the end of the angular thrust is taken thus relieving the pivot of any such strains. The frame of the forecarriage is supported on the front springs by slippers, which permit of its sliding on them. The brakes on the steering drums Y are applied by levers carried by the cross-shaft, actuated

by the hand steering wheel X through a worm and toothed sector. When this shaft is turned in one direction, one brake comes on and the other is taken off, and *vice versa*, so that only one steering brake can be applied at the same time. The brakes for actually retarding the machine are provided both to front and back wheels, and are of the usual band type. The over-all length of the lorry, as shown in the engraving, is 18ft., the platform length being 16ft., breadth 6ft. 6in., and height 4ft. 6in., and the wheelbase 8ft. The diameter of the wheels is 3ft.

6in., with 7in. tyres on the front tractor wheels, and 6in. tyres on the platform wheels.

We are indebted to Mr. Brightmore for the loan of the drawings from which the accompanying engravings were made.

It must be mentioned that the vehicle was built to Mr. Brightmore's order by Messrs. T. Coulthard and Co., Ltd., of Preston, who used their patent compound engine in its construction. This is suspended from the framework of the vehicle by the spherical bearings.

CAMPING WITH A MOTOR CAR.

By T. H. Holding.

Since writing the former articles a request has come to me from a motorist to plan a tent which would take up very little room, and which could be used not only efficiently on a motor car, but be put

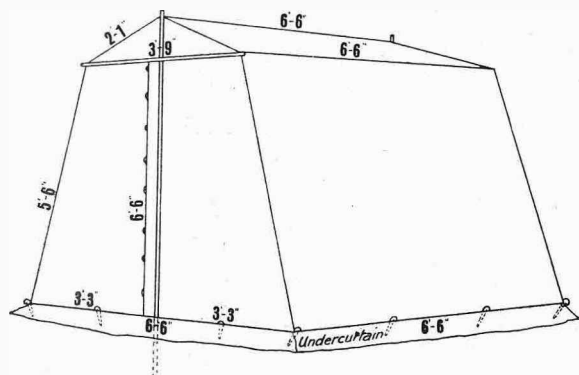


Diagram of the Gipsy tent giving the measurements.

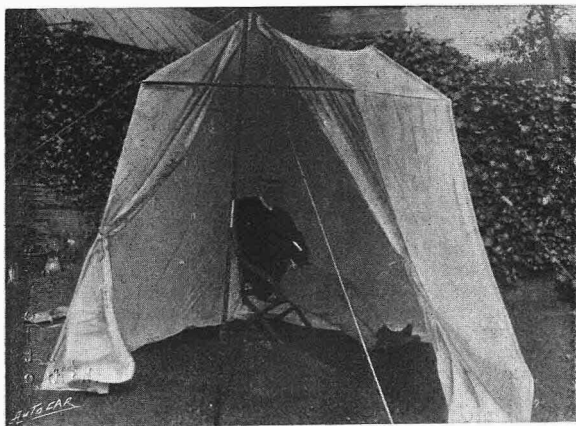
up on a beach in a few minutes for bathing if necessary, and which even could be carried in a pony trap, or, on a pinch, on a motor cycle. For the latter my well-known 2 lbs. twin tent would be preferable. I shall take up very little space, only as much as will describe the type of tent, of which a sketch and photo illustration are given. It is known as the "Gipsy." It has had three years' constant use and testing, for there have been something like a hundred made to this model, and used in different parts of Great Britain, but on a smaller scale. The best material from which to construct it I consider is linen. Owing to its size, a lighter fabric would not stand the work so well. Though it looks simple and fragile, I can give every assur-

ance that it is not so. The material is so tough that a strip of it an inch wide would bear a weight of about 150 lbs.

As for the poles they weigh but about 4 lbs., being made of bamboo, and are salmon rod fitted, of the highest quality and finish, and cost from 18s. to 20s. per pair.

The pegs are the usual thin galvanised iron ones, which take up but little room, and probably weigh 2 lbs.

The tent will sleep three very comfortably, and four if necessary. Its compass when packed in its bag is very small, being about 16in long and 5in. in diameter only.



The Gipsy-tent designed by Mr. Holding and described above. The novelty of Mr. Holding's Gipsy tent lies in the wide head-room without great elevation and without rows of side guys holding out the walls. It thus gives lightness as well as a picturesque tent. It enables men 6ft. in height to stand upright, and will admit of chairs inside. Hay or straw beneath the ground-sheet gives great comfort.

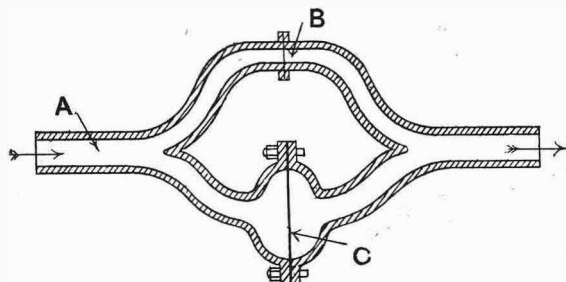
If, as Mr. Henry Campbell-Bannerman suggested on Tuesday night last, the Motor Cars Bill is not allowed to pass its readings in the Commons without lengthy discussion, it is highly probable that the Government will be obliged to drop the bill for the present session. We shall not altogether grieve if this is the case, as time will thereby be afforded to consolidate opposition to the objectionable features of the measure, and by further amendments to relieve the automobilist of the obvious injustices which must follow if the bill becomes law by passing both Houses in its present form.

Some time since we referred to and illustrated the 9 h.p. two-cylinder Clément belonging to Mr. Ean Cecil, and spoke of the excellent condition of the change speed gear and the gear shaft bushes. Just lately Mr. Cecil's engineer has taken down the engine of this car, to find the crankshaft and crankpin bearings in most excellent condition. If one holds the shaft in one hand and tests the bushes with the other no shake whatever can be detected, and when the latter are drawn off the shaft they come away with a suck. And this after hard driving for close upon 17,000 miles.

SPARKING PLUG PHENOMENA.

In the last issue of *The Autocar*, on page 128, Mr. A. J. Wilson referred to phenomena he had noticed in connection with the external spark gap fitted to a standard pattern De Dion sparking plug, and invited an explanation from some of our more scientific readers. Below we give three very interesting letters which have been received on the subject. One of our correspondents hardly agrees with the others as to the cause of the phenomena, but his letter contains many points of interest not mentioned by the other writers.

Sir.—The phenomenon to which attention was drawn in these columns last week by Mr. A. J. Wilson belongs to a class which is familiar to electricians, and is dependent on the existence in electric circuits of the property known as electromagnetic inertia, or self-induction. The effect of inertia where large pressures are suddenly applied is well recognised in mechanical matters. An explosive placed against the wall of a building, for example, will wreck the structure, although the gases developed in the act of explosion are free to expand into the open air. The comparatively small inertia of the air itself is sufficient in this case to oppose enormous resistance to the expansion of the almost instantaneously generated gases. The hydraulic analogy, so often useful in electrical matters, illustrates still more closely the point in question. Water flowing under steady pressure along the pipe A will take the path of least resistance, the whole stream passing through the



A, water inlet. B, branch pipe. C, diaphragm.

branch B. A thin metal diaphragm at C will act under these conditions as a perfect "insulator." Suppose now that the pipe A is put suddenly into communication with an hydraulic main carrying water at several tons pressure to the square inch. In the violent rush of water that will ensue not only will the diaphragm be broken down, but the tubes themselves may even burst, in spite of the free passage through the pipe B.

This is precisely what takes place in the disruptive discharge of electricity. Under the high pressure suddenly developed in the secondary of the induction coil when the primary circuit is broken at the trembler, the discharge takes place not only along the "line of least resistance," but also on any other line capable of breaking down under the pressure in question. The resistance to steady pressure is comparatively immaterial; the electromagnetic inertia overshadows it completely. The erratic course often taken by lightning when a building is struck is a further illustration of this principle. The discharge may pass through many feet of air or brickwork rather than take a somewhat longer course through a metallic conductor of infinitely lower resistance as ordinarily measured.

As a matter of fact, the action of the Panhard spark gap itself depends on this very principle. The external gap merely serves to ensure the sudden development of high pressure in the secondary which would otherwise be prevented by the damping action due to the leakage through the soot bridge. Once this pressure has been obtained, the gap is bound to break down, even though the soot bridge may offer comparatively small resistance to the discharge.

H. C. HAYCRAFT.

Sir,—The explanation of the phenomena which Mr.

Wilson has observed in connection with his sparking plug is very much simpler than that of the spark gap phenomenon itself. To commence with, it is a mistake to suppose that electricity keeps to the path of least resistance. That was the idea thirty years ago, when one would hear such expressions as "The current will never leave copper for iron," etc., etc. The fact is that a current of electricity is due to the presence between certain points of an electrical pressure sufficient to cause a current to pass, and though the phenomena of sparking are more complicated than those of simple currents, it may be taken that a spark passes across any gap, or between any two points, because an electrical pressure exists between the two points, or across the gap, sufficient to throw a spark across. And it may also be taken that wherever an electrical pressure exists between any two points electric currents will pass from the point at higher pressure to that at lower pressure by every path that is open to them, and usually there are at least two paths. The forgetfulness or the absence of the knowledge of this fact is the cause of a large portion of the troubles with electrical apparatus. Numerous cases occur with such apparatus, where a path is provided for the useful current through certain metals separated by certain insulating materials, and it is supposed that the current only passes through the metals. But a very small current also passes through and over the surface of the insulating materials, the surface of the insulator usually being the seat of a certain quantity of moisture, and this often leads to another trouble; dust collects upon the surface, which increases the current passing across, till suddenly a current passes, burning up the bridge of dust, etc., followed by a spark, and sometimes an arc, which may do a great deal of damage. It may be taken also that whenever an electrical pressure exists between two points, or two surfaces, sufficient to throw a spark across the distance between them, sparks will pass, and that no matter how many sparks may be passing across other gaps between other parts of the same apparatus. Also, the passage of sparks across gaps between certain parts of an electrical apparatus will very often lead up to the pressure between other parts of the same apparatus being sufficiently high for a spark to pass between them. The inductive accumulative effect which the writer described in his article on the spark gap is always going on whenever the conditions are favourable. The remedy for the trouble, if it is sufficiently serious, is to make the distance between the points across which sparks pass longer. This again may be taken as a rule in all electrical apparatus. Make the insulating path as long as you can. In this case lengthen the fibre plate and shorten the screw C.

S. F. WALKER.

Sir.—Referring to Mr. A. J. Wilson's observation of "A Sparking Plug Phenomenon," vide *The Autocar*, July 25th, I do not profess to be "skilled in the science" beyond my own observations as a motor repairman and engineer, but I think the explanation of this phenomenon is very simple indeed, and that Mr. Wilson may rest assured in the traditional faith that a current of electricity under normal circumstances does always take the "line of least resistance," and that that "line" was underneath his fibre plate when the spark jumped across there. The probable greater resistance in the circuit *via* the spark gap was probably due to grease or some semi-insulating dirt getting between the threads of one of the conducting terminal attachments to the fibre plate. If the gap was exactly as shown in sketch, of course the sparking plug terminal was out of the path of the current. Again, it does not follow that a piece of fibre is always a good insulator. I remember on one occasion sawing a similar piece of fibre with a hack saw which had only just previously been sawn through a piece of brass; the particles of brass between the teeth of that hack saw became embedded in the surface of the softer fibre, thus forming a conducting surface. If Mr. Wilson will try a piece of clean, dry, insulating fibre, and make certain that good metallic circuit exists, then the phenomenon will disappear.

I have often taken a sparking plug out of a cylinder and cleaned its thread, and also the thread in the cylinder wall, from accumulated semi-insulating dirt; the result has been a better spark.

W. E. CONCURT.

CONTINENTAL NOTES AND NEWS.

THE INTERNATIONAL AUTOMOBILE CONGRESS.

(Continued from page 135.)

Electric Motors.

Several reports were summarised and passed without discussion. M. de Rechniewski presented a report on electric motors for automobiles, in which he described the different types employed, and concluded by saying that, as the motors were sometimes called upon to develop as much as ten times their normal force in starting the vehicle, they should be constructed with a special view to these abnormal efforts, that the conductors of the armatures should be welded with large surfaces so as to withstand temporary violent currents without fusing, and that as the average charge is not very high the motors can be enclosed entirely without danger of overheating to protect them from the water on wet roads and when cleansing the vehicle. M. Paul Level dealt briefly with transmissions for electrical carriages, and described a very ingenious motor acting as differential, in which the field magnet and armature are each connected with a separate shaft, and turn in contrary directions according to the direction of the current. M. Level states that the system has been tried, but he is unable to say with what result. M. Perret described various systems of combinators; M. G. Faget dealt with transformers, including the Rouget-Faget apparatus, which attracted so much attention at the last Paris show; and a report was presented giving a detailed description of the recharging post, which was awarded the first prize in the competition carried out by the *Chambre Syndicale de l'Electricité*. This post is designed to be fixed up in the streets for the recharging of carriage batteries on the "penny-in-the-slot" system; though, of course, the amount prepaid varies according to the current required. These posts are very efficient and practical, and are doubtless destined to become a familiar feature in the Paris streets.

Petrol-electric Cars.

The subject of petrol-electric cars was introduced by the report of M. G. Lumet upon the Krieger "mixed" vehicle, of which the first took part in the *Circuit du Nord* race organised by the French Minister of Agriculture. In this car M. Krieger adheres to his well-known system of gearing the electric motors direct on the front wheels; but he has also fitted a $4\frac{1}{2}$ h.p. De Dion petrol motor, which drives a generator by means of an elastic coupling. The generator has a very close resemblance to the motors, except that the exciting coil is shunt wound instead of compound. The brushes of the dynamo are connected direct with the poles of the storage battery. The novelty of the system consists in the method adopted for enabling the petrol motor to run at a constant speed whatever may be the difference of potential at the poles of the generator. When connecting up the two parts of a battery in series or parallel for starting or slowing down, the potential may vary from forty-four to eighty-eight volts, and it will also vary considerably when the vehicle is running; consequently

something must be done to enable the petrol motor to develop its full power, despite the variations in the potential. M. Krieger has obtained this result by simply connecting the ends of the shunt coil with the poles of the generator. In this way the voltage at the poles of the shunt coil undergoes the same variation as in the battery. M. Krieger's vehicle is a true petrol-electric car, since the petrol motor recharges the battery when the vehicle is standing, and, when running, supplies energy in addition to that furnished by the battery. While the vehicle has all the advantages of the electric carriage, the petrol motor constantly develops its full power without the strains due to throwing in and out of gear and changing speeds. Including the battery of 400 kilogs. = 800 lbs., the weight of the car without load is 1,320 kilogs. = 2,904 lbs.

The Pioneers of the Mixed System.

Herr Louis Lohner, of Vienna, also treated the question of petrol-electric vehicles, when he summarised the results already obtained by inventors of combined electrical and mechanical propelling systems. As the list of vehicles given is the only one yet published, and is of some historical interest at a time when so much attention is being given to the petrol-electric car, we think that its publication will prove instructive, the more so as it shows clearly the manner in which inventors have been working up to their ideal, and the systems which are proving the most suitable. Herr Lohner classifies the cars as follows: Mechanical transmissions, with dynamo and auxiliary battery: Pieper, of Liège, in 1901, and Jenatzy in 1901 and 1902, all abandoned. Magnetic clutch in a mechanical transmission: Jenatzy in 1903, in actual use. Electro-magnetic clutch consisting of field magnet and armature, one coupled at a constant speed to the petrol motor, and the other at variable speed to the driving-shaft: Morrison, of Chicago, in 1898, abandoned on account of high cost and weight. "Mechanical accumulator," consisting of flywheel running at high speed, with electro-magnetic clutch: Hospitalier, under construction; Lesage, not yet constructed. Electrical change-speed gear in mechanical transmission: Panhard et Levassor, change-speed gear with the loose wheels always in mesh, and fixed by magnetic clutches, in use. Electrical change-speed gear, consisting of two field magnets and two armatures, connected mechanically, and working as a clutch without loss of power through slipping: Germain car, in use; Jeantaud et Level car, under construction. Electrical transmissions without mechanical gear between the petrol motor and the driving wheels (storage battery with auxiliary generator): Effstein and Co., England, 1896; Vedovelli et Priestley, Paris, 1899; Krieger, No. 1, 1902; A. J. Clark and Co., Philadelphia, 1903; Lohner and Porsche, No. 1, 1900—all abandoned. Electrical transmission with auxiliary battery: Charles Johnson, London, 1899; W. H. Patton, Chicago, 1899;

Sarrazin, Paris, 1901; Lohner-Porsche, No. 2, 1901—all abandoned; Fischer Motor Vehicle Co., New York, 1901 and 1903, and Milde, Paris, 1903, in actual use. Electrical transmissions without battery (except four to eight cells for ignition, excitation of dynamo, and starting petrol motor): Daimler, of Cannstatt, and Union Electrical Co., of Vienna, 1902, abandoned; Champrobert, Paris, 1901 and 1902; Krieger, No. 2; E. W. Hart, Luton, 1903; Lohner-Porsche No. 3, and Lohner-Porsche No. 4, with automatic regulator—all in actual use; and Ward-Leonard in America, and Mismahl in Germany, not yet constructed.

(To be continued.)

Correspondence.

The Editor is not responsible for the opinions of his correspondents.

THE COST OF LAW-BREAKING.

[3063].—Upon taking up the last issue of the *Reading Observer*, I was interested in acquiring the following information:

Mr. C. D. Rose, M.P., of Hardwick House, was fined £5 and costs for exceeding the legal limit upon his car on an unfrequented stretch of the Bath Road.

Mr. Edward Carter, of Highclere, was guilty of a similar offence, and was fined the same amount.

One of the Hon. C. S. Rolls's drivers shares the same fate, whilst Mr. Hampshire, of Slough, is fined £1 and costs for drawing a trailer at a speed exceeding six miles per hour.

All the offences apparently take place upon the same stretch of country road.

The same magistrates fine a man for being hopelessly drunk on the highway 5s., whilst gross cruelty to a horse is punished with a 10s. fine.

One deduces, therefore, the following interesting facts:

Mr. Rose, in driving at a speed exceeding twelve miles an hour, though nobody was even inconvenienced thereby, has committed an offence twenty times as heinous as though he had been found drunk in a ditch like the other defendant, and an offence ten times as heinous as though he had ill-treated a horse. The other cases work out equally creditably.

Against these unaccountably strange magisterial decisions, it is pleasant to be able to record the particularly unbiased attitude of the Reading police, who remain unruffled by the morbid prejudice of the anti-motorists, and direct the traffic of the town, whether propelled by hay or petrol, with politeness and impartiality.

CLAUDE A. P. TRUMAN.

THE MOTOR CAR BILL.

[3064].—Now that the new Motor Bill is before Parliament, and some most drastic and unfair clauses are proposed, I think that too much stress cannot be laid on two of the most serious points.

Firstly, the whole tenor of the bill is to put almost unrestricted power into the hands of the police, who are admittedly incompetent to judge correctly the speed of cars and to determine what is *driving to the danger of the public* or not, and the result will be to bring the police into great disrepute, and to weaken their authority by allowing them to use the powers of arrest, and to have their evidence accepted by fanatical and prejudiced justices, who are known to be hostile to their finger-tips to all who may be brought before them as motor drivers. The universal miscarriage of justice, which has now become a recognised and admitted custom in many districts, is sufficient, and more than sufficient, proof that the great and rapidly-growing industry and use of motors requires special care and protection. If the police are allowed much longer to annoy and persecute a respectable section of the public for their own profit and aggrandisement, we shall in a very short time have as corrupt and depraved police force as is to be found in some foreign countries, and all that respect, support, and friendly regard for what has hitherto

been a national glory—our police force—will be swept away by the many other abuses which must follow quickly in the wake of the new era and policy, which is being encouraged and fostered by those who should be the first to control and remove the temptations and influences calculated to corrupt the police or to allow them to trade on the public in any way.

Secondly, with regard to the condition of *driving to the danger of the public*, I maintain and sincerely hope some member of the Cabinet will see that it will be impossible for a member of the public to be thus arrested or summoned on the evidence of the police only. If it is a case of reckless driving and to the *danger of the public*, the police will have no difficulty in securing lay evidence to support their charge, but if no one save the police is present manifestly the *public cannot be endangered*, and a false persecuting charge brought against a defenceless driver, whose word will not be accepted against that of a policeman interested in securing prosecutions and fines justly or unjustly.

I have no sympathy whatever with motorists who drive at a speed which is either dangerous or annoying to other users of the highway, and will do all in my power to assist the police in bringing punishment on all such, but the friendly help and co-operation of the right-minded will be withheld if the police are further encouraged and empowered to abuse the rights of individuals. It must be borne in mind that a conviction rightly or wrongly under the contemplated terms of the new bill, if used to anything like its limits, will mean ruin and suffering to any deserving and careful drivers and their families. The bill therefore should provide not only for good and sufficient lay evidence, but in all cases of unjustified charges the defendants should be recompensed for their trouble and expense by those making the charge. This will have a restraining influence against false charges, such as is found in common law.

J. V. ELLIOTT TAYLOR.

THE PHENIX PARK SPEED TRIALS.

[3065].—With reference to Mr. Etherington's letter in your issue of July 18th, we beg to inform you that we have entered a protest to the Racing Committee of the Automobile Club concerning the manner in which these races were run off, particularly as regards the 16 h.p. Decauville we entered, driven by our Mr. Moffat Ford.

The plain facts of the case are that so many cars were entered for certain races, and it was given to be distinctly understood in the printed instructions to competitors that the winners of each heat would be run against the winners of other heats until the final heat decided the race. Upon this point I need only refer you to instruction 17 of the printed rules.

In Mr. Moffat Ford's case, his 16 h.p. Decauville was pitted against a 12 h.p. car of another make. The Decauville got away at once on the word being given to "go," and before the Phoenix statue had been reached its opponent was a good fifty yards behind. Having carefully studied the regulations, Mr. Ford saw no reason for demonstrating any extraordinary speed which his car might be capable of at that juncture, and merely kept, therefore, a certain distance in front of the other car. He did all that was necessary to win that particular heat. Judge of his surprise, therefore, when, upon returning to the enclosure by the "winners' road," in accordance with instruction No. 17, he was informed that it was not after all intended to run "semi-finals," but to run the two fastest cars in each class against each other to decide the event!

Another singular incident may here be mentioned with regard to the efficiency of the starters and starting arrangements. Preparatory to the word "go" being given, Mr. Ford was informed that a white line across the road was the finish of the course, and he was then to continue easily through the gates at the end of the road. He was not, however, informed of what the white line was constituted, whether of whitewash or tape. As a matter of fact, after going a certain distance, Mr. Ford came upon a white thread stretched across the road, and not unnaturally concluded that this was the white line to which the starter referred. His car having broken this white line, Mr. Ford proceeded even more easily down the road and through the gates.

The practical result of this combination of circumstances was that the time of the Decauville car made a very curious

show upon paper, and when Mr. Ford asked to be permitted to run down the course for a proper time to be taken, he was informed by a very officious official that he had made "a very foolish mistake," and would have to abide by the results.

It turned out that the white thread was not supposed to be a "white line," and had reference to some marvellous timing arrangement which was being exploited—the first white thread was at a distance of a mile—that there was even another white thread (which was not a "white line" within the meaning of the starter's phrase) further on; and that the "white line" the starter presumably had in his mind was nowhere to be seen, having been rubbed out by the wheels of the cars in preceding events; hence the "very foolish mistake" made by the driver of the Decauville car.

However, judging from the complaints now fairly universal as to the manner in which these races were conducted, we find that the Decauville does not seem to be the only car suffering from mismanagement, and so we are now pretty well resigned to the fate which befell our car. Perhaps, after all, it is too much to expect of a club which confesses its inability to convey Ducal invitations to luncheon to its members, to carry out whatever simple arrangements may be necessary for events such as those of the Phoenix Park races.

THE MOTOR CAR CO., LTD.

A LONG TOUR ON SMALL CONSUMPTION.

[3066].—Herewith are some particulars of a most enjoyable trip up to the Lake District which I, in company with my wife and Mrs. E. W. Cathie, have just taken. Of course we had a fair amount of luggage. My car is an 8 h.p. M.M.C., of gold medal type. Before I had the car I never dreamed it would be possible for a car with single cylinder engine to do what this one has done. Dover to London (89), Smethwick (119), Stafford (40), Southport (98), round about Southport (100), Kendal (81), Ambleside to Keswick circular tour (38), Windermere from Ambleside (14), Windermere Lake, Hawkshead, Coniston, Ambleside (28), Waterhead (2), Windermere (12), Patterdale, Ullswater via Kirkstone Pass (32), Barrow-in-Furness, Coniston, Ambleside tour (72), Grasmere (14), Arncliffe circular trip (55), Waterhead (2), Waterhead (2), Carlisle (73), Gretna Green, Longtown, Edinburgh (101), Berwick (58), Belford (164), Durham and Sunderland (75), Doncaster (130), London (164); total 1,415½ miles.

I have been most careful to keep a strict record of the petrol, etc., used, and the following is a list of my expenses on the road in respect of the car: Petrol, forty-four gallons, or 32.16 miles to the gallon; oil, two gallons; accumulators charged twice; grease, 2 lbs.; one inlet valve stem; and one pin in timing gear.

I am sure you will agree with me that the running cost is exceedingly reasonable. Although I have had the car a good time now, and know its capabilities, I did not expect to go round the Lake District and up the terrible hills there with such a low consumption of petrol. For instance, some of the hills round the lakes have gradients of one in six and one in seven. I have had several small cars of various makes, but not one of them comes up to this M.M.C. car.

CECIL G. CATHIE.

CLUB DOINGS.

Leicestershire A.C.

The committee of the Leicestershire A.C. in issuing their fixture card have wisely embraced the opportunity of circulating an appeal to members to adopt driving methods which will tend to counteract the antagonistic feeling existing at the present time. The fixture card asks members to proceed slowly through towns and villages, to drive (on the proper side) slowly round corners, at cross streets and roads, and other dangerous places, and to slow down to walking pace, or stop, when the meeting of restive horses renders this necessary. The idea is a good one, and worthy of emulation by other clubs.

Wolverhampton and District A.C.

On the 22nd July about twenty members of the Wolverhampton and District Automobile Club met at their club-

room for the purpose of making a presentation to Mr. Trevor Young upon the occasion of his marriage with Miss Lillian Davies.

Mr. S. R. Rhodes, the hon. secretary, in making the presentation, referred to Mr. Young as one of the founders of the club, and to his having very materially assisted in its prosperity, and to his devotion to the pastime of motoring, and handed him, on behalf of the members, a solid silver cigar and cigarette cabinet, bearing the club badge and suitably inscribed. The bride was also the recipient of a very handsome silver-mounted mirror. Mr. Rhodes said he felt sure Mr. Young would value the articles not so much for their intrinsic value as for the kindly feelings which had actuated the gifts.

Mr. Young thanked the donors, and said his connection with the club had been of the most pleasant character, and he fully appreciated the kindly feelings which had been expressed toward him.

After the presentation, although the hour was late, the members drove to Albrighton, a most enjoyable evening being spent.

Kent Automobile Club.

The members of the Kent Automobile Club had a most delightful picnic on Saturday last at Hothfield Common, the weather being very favourable. The meet was largely attended by both the members and their friends. The thanks of the club are due to Mr. Langley, the master of Charing Union, who kindly allowed the members of the club to leave their cars in the grounds, and who also supplied all the hot water necessary for tea making. On August 8th Mr. and Mrs. Bernard Arnold will kindly entertain the members and their friends to a picnic on their island in the Medway at Snoll Hatch, East Peckham.

Lincolnshire A.C.—Meet at Grimsby.

One of the most successful meets held by the Lincolnshire Club was that at Grimsby last Thursday week. Major Errington Josse had invited the club and friends to a meet at his place, Beechfield, and the invitation was widely accepted, though the members from the extreme south of the large county did not attend in large numbers. On arrival, the cars were parked in front of Beechfield, police officers being left in charge. When all had turned up, Major Josse led off with his Bardon, which, being driven much in France, was numbered, the whole party motoring down to the Royal Hotel, near the busy docks, where a first rate luncheon was prepared, a notable item on the table being a model of the Gordon-Bennett racer in ice.

After luncheon, the hon. sec., Mr. E. Cragg, M.D., expressed the thanks of the members for the enjoyable time they had had, and Mr. W. B. Jevons, in seconding the thanks, remarked that the Major had gone the very best way to remedy the lack of knowledge of the members he had been lamenting. In replying, Major Josse made the gratifying statement that in reference to the postcard sent out by the club secretary as to police traps over the county he had interviewed the Deputy Chief Constable of the County, and had been assured that that was not so. There had been a few complaints, and in the Grantham district there had been a little display of officiousness, which had been checked, however. (Hear, hear, and laughter.)

After the lunch, the Major led the way to Cleethorpes, and then on to Beechfield again, where tea was ready. This was certainly not hurried, and there was some very interesting chat over the tables. It was a most enjoyable gathering, and the arrangements were just perfect.

The Leicestershire Club visit Matlock.

Members of the Leicestershire Automobile Club had an enjoyable run to Matlock Bath and back on Saturday.

Starting from Leicester at 10.30 a.m., the journey lay through Mountsorrel, Quorn, Loughborough, Hathern, Kegworth, Shardlow, Elvaston, Derby, Ambergate, and Cromford.

The afternoon was spent in and around Matlock. The return run was commenced at 6.30, and was safely accomplished without any incident.

Flashes.

A correspondent very strongly recommends Mr. Kennedy, engineer and machinist, of Ashtown, Derbyshire, as a competent repairer. He tells us that Mr. Kennedy and his men worked from early on Saturday evening until late at night to make a new fork for his change speed gear. In the meantime Mr. Kennedy very kindly looked after the two ladies of the party, and did everything in his power to make them as comfortable as possible during the time the repairs were being effected.

* * *

We are informed by Mr. Hyde, of the Square, Stow-on-the-Wold, that he has opened a garage with all the latest fittings and accommodation at the address given, and also has facilities for charging cells for power or ignition. The garage is on the Fosse road, which is the main road between Warwick and Cirencester, also Banbury and Cheltenham.

* * *

Automobilists who are contemplating investing in any electrical testing instruments should obtain a copy of Messrs. Peto and Radford's supplement to their price list, in which a variety of instruments of this class are illustrated and priced. These range from the ordinary separate volt and amp. meters of the cheap type up to the better finished and more accurate instruments at a higher figure. A combined volt and amp. meter, accumulator chargers, pole finders, external spark gaps are listed. A speciality is Brown's patent high tension condenser. This condenser is inserted in the high tension wire, and has the effect of increasing the volume of the high tension current, and thereby adds to its effectiveness as a good igniter.

* * *

When called suddenly to board a car by a friend who turns up unexpectedly to ask one to drive, it is not always convenient to don all one's regular automobile outfit, even though the weather be chilly. A most useful garment at such a time is a leather-fronted woolbacked waistcoat, such as we saw the other day at Messrs. Holding and Sons' establishment, 7, Maddox Street, Regent Street, W. These delightfully comfortable vests are made in beautifully soft doeskin in two thicknesses and several tints. They are lined with fancy lining, and have long sleeves of Italian silk lined in their turn with chamois leather. When on the car these waistcoats, worn beneath an ordinary coat and an overcoat, button up close round the neck, but when the car is left for the house or the coffee-room the top of the garment can be turned in and buttoned to show the usual amount of shirt front. No automobilist should be without one of these doeskin waistcoats. They are so handy, and will avert many a chill.

During the Cowes yachting week the Lanchester Engine Co. will have several of their cars in the district, so that anyone interested in this particular car may have a trial drive by making an appointment with the Lanchester Engine Co., Armourer Mills, Montgomery Street, Birmingham.

* * *

One of the funniest accounts of the Gordon-Bennett race appeared in the Irish *Figaro*. Speaking of Jarrott's accident, it describes how Jarrott and Bianci were picked up quite dead and laid out in a barn, covered with sheets, and surrounded by candles, and there they lay waiting for the wake until Gabriel came along and blew his horn, whereupon they came to life again, and wanted to resume the race.

* * *

Both Mr. Robert J. Smith and Mr. T. M. Macintyre, of the Scottish Automobile Club, placed their cars at the disposal of the brigade officers at the Gales Volunteer Camp last week. Mr. Smith drove General Sir Arch. Hunter and the officers accompanying him on Wednesday on the occasion of the sham fight undertaken by the Highland Light Infantry Brigade. Mr. Macintyre drove them on Thursday, when the Argyll and Sutherland Highland Brigade were similarly occupied, and sent his car for the use of the Brigadier and staff officers on other days.

* * *

The Mors racer with which the Hon. C. S. Rolls made the record at Welbeck has achieved an enviable series of successes. The car itself is an old one of the Paris-Vienna type, but, notwithstanding this, has beaten a large number of this year's machines in the various competitions in Ireland, notably in the flying kilometre, when it finished second with three cylinders, winning the silver medal; in a special match with a 60 h.p. (1903) Mercedes, winning the £40 cup offered by the A.C.G.B. and I.; and the 60-guinea cup presented by the county of Kerry, and the cup presented by the Corporation of Cork.

* * *

The International Exhibition of automobiles, cycles, and sports will open at the Grand Palais, Champs-Élysées, on the 10th of December next, and will remain open until Christmas Day. All information as to space, etc., can be obtained from the secretary, M. Vauzelle, Hotel de l'Automobile Club de France, 6, Place de la Concorde, Paris.

* * *

The Motor Manufacturing Co. have lately been caused some annoyance by the circulation of a rumour that their engines, and particularly their 2 h.p. motor bicycle engines, are made for them in France. Such a statement is calculated to injure their reputation as British manufacturers, and the company are naturally indignant that it should have been made. We are able personally to substantiate their denial of this rumour.

"THE AUTOCAR" DIARY.

- July 31-Aug. 5.—Yorkshire A.C. Camp between Bridlington and Scarborough.
 Aug. 1-3.—Kent A.C. Drives to Folkestone and Charing.
 " 1-3.—Cheltenham and Gloucester A.C. August Tour Monmouth, Abergavenny, Usk, and Tintern.
 " 1-3.—Wolverhampton & District A.C. Week-end Tour. Shrewsbury and Llangollen.
 " 5.—Winton-Fournier Match, Cleveland.
 " 8.—Southern Motor Club. Drive to Oxford.
 " 8.—Lincolnshire A.C. Drive to Grimsby Park.
 " 8.—Wolverhampton and District A.C. Drive to Kinver.
 " 8.—Scottish A.C. (Western Section). Drive to Biggar.
 " 8.—Sheffield and District A.C. Drive to Matlock Bath.
 " 12.—Cheltenham and Gloucester A.C. Drive to Bourton-on-the-Water.
 " 12.—Southern Motor Club. Drive to Esher.
 " 13.—Leicestershire A.C. Drive to the Monastery via Loughborough.
 " 15.—Kent A.C. Drive to Sevenoaks.
 " 15.—Lincolnshire A.C. Drive to Skegness.
 " 15.—Southern Motor Club. Drive to Horley.
 " 16.—International Races, Switzerland.

We noted a 15 h.p. four-cylinder New Orleans car on the front of a southern watering place the other day. It was running with remarkable quietude, though as it was in traffic it was being driven slowly, and, consequently, was under the worst conditions for quiet travelling.

* * *

Automobilists, whether visitors or residents in Margate, will find Mr. J. W. Simpson, of Broad Street, a most capable, courteous, and painstaking motor engineer. His premises are opposite the Town Hall, and only a minute's walk from the front. He has excellent garage accommodation, and his staff give intelligent and prompt attention to all requirements, being capable of executing any repair however complicated. In fact, Mr. Simpson has practically rebuilt several cars, and more than one visitor from town have been so satisfied with his work that they have sent their cars to him for their annual overhaul.

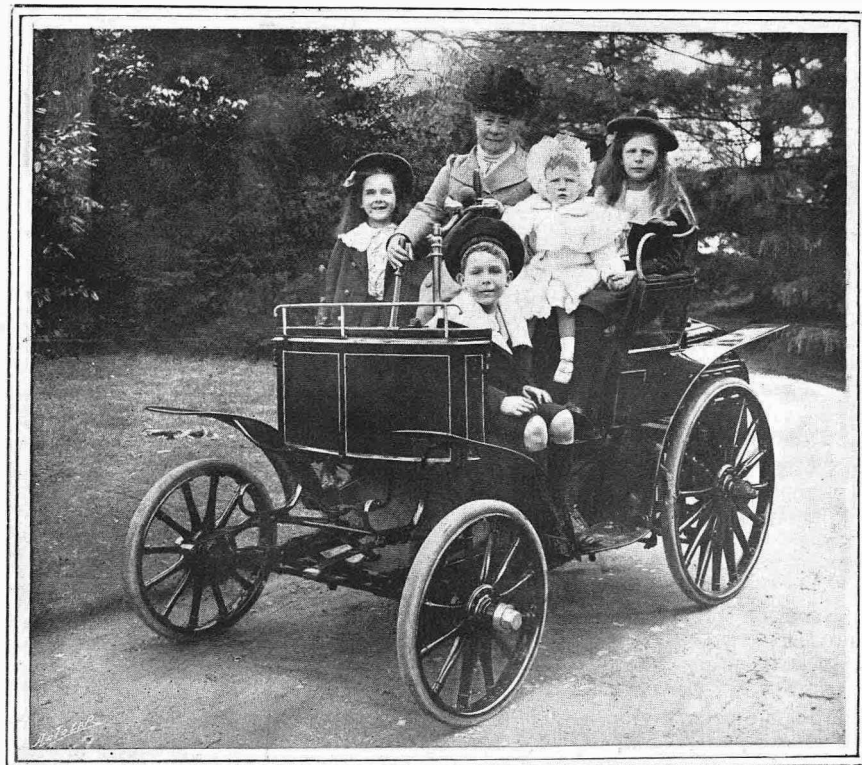
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Three of the leading medical men in Margate use motor cars for performing their daily rounds. Instead of having men of their own to keep the machines in order they have contracted with Mr. Simpson, the local motor expert, to maintain them in good running trim. Each morning his men look the cars over, and do any adjustment which may be required. For this the doctors pay a fixed sum per quarter. It strikes us as being an excellent plan, and one which is economical withal, for beyond renewals of worn parts the doctors can tell exactly what the cost of maintenance will be. Not only so, but they can be assured that their cars will always be in perfect condition for work any time of the day or night.

* * *

Last week we enjoyed a two hundred miles run on our 7½ h.p. Wolseley. Only two involuntary stops were made, one to renew an exhaust spring and the other to tighten a loose terminal. Neither derangement took a moment to diagnose, and the total delay did not amount to a quarter of an hour. The route included the climb from Redhill to Nutsfield, and the ascent of Charing Hill. Both these hills, which are over a mile long, and exceedingly steep and winding, were easily climbed. In fact, the first speed was too low, and the ignition had to be retarded to keep the robust little engine from positively racing. We cannot speak too highly of the reliability of the Wolseley mechanism. A good long drive without a mechanic enables one to realise how it is these cars have always done so well in reliability trials.

The rain and dust hood fitted to the Star cars is a good and practical device. It is so arranged that it can be easily unshipped and carried without inconvenience or unsightliness on the car. It affords complete protection from wet or dust to the occupants of the back seats, and keeps all the worst of the weather from those on the front seat. Of course, if entire protection for the front is desired, it can easily be secured by the use of a glass screen, or weather board, above the dash.



Mrs. C. A. Cubitt, of Eden Hall, Edenbridge, taken on her sixty-seventh birthday, on her Orient Express car which she habitually drives to and from London and about Kent. Mrs. Cubitt, who has four grandchildren in the car, claims to be the doyen of lady motor drivers in the kingdom, and only lately drove a Locomobile 180 miles. She has now had her Orient Express in constant use for three years, and has had little or no trouble with it.

The other day outside Maidstone the Clarkson steam omnibus passed us. We could not help being struck by its silent and steady running.

* * *

We are informed that the business of the Good-year Tyre and Rubber Co., Ltd., of 5, Singer Street, Tabernacle Street, E.C., has been taken over by the Goodyear Tyre Co., of Akron, Ohio, U.S.A., who will operate it therefrom.

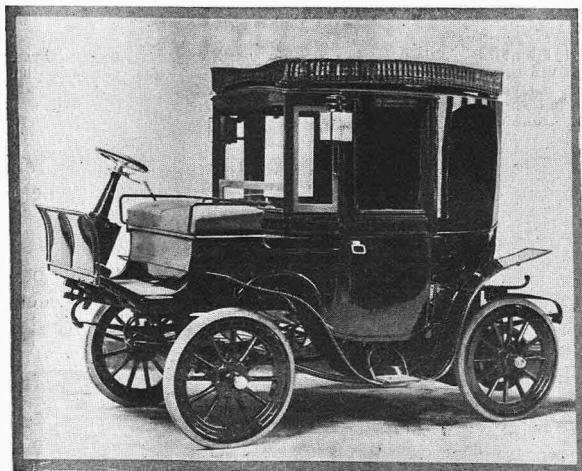
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Owing to the continued growth of their trade in motor cycles, the Civil Service Cycle Agency recently, with the permission of the Board of Trade, added the word "Motor" to their name, and they are now proposing to carry on the sale of motor cars in addition to the other branches of their business. The company's past success has been largely helped by the somewhat exceptional facilities they offer to customers, as they sell on deferred payments. The cash purchaser gets exceptional discounts. These principles, which have already been very successful as regards cycles, are now being applied to the sale of cars and motor cycles.

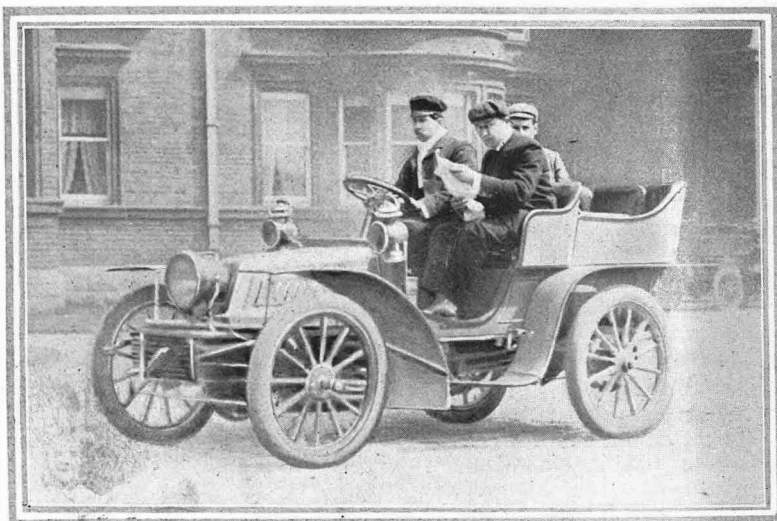
At a meeting of the Alnwick Rural District Council, held on Monday, a resolution was passed strongly protesting against any extension of the present speed limit for motor cars, and, in view of the reckless manner in which such cars were often driven, rendering the use of the highways for ordinary traffic absolutely dangerous, suggesting that no person be allowed to drive such a car without a licence, such licence to be forfeited on conviction for exceeding the legal speed limit, and in no case renewed within twelve months after such conviction. The law, it was also suggested, should provide for adequate means of identification of each car, and for increased penalties for a second or subsequent conviction, under the present law. It was agreed that a copy of the resolution be sent to the Prime Minister, the Local Government Board, the Board of Agriculture, the member of Parliament for the division, and the Rural Districts Council.

Among recent converts to automobilism is the Earl of Abingdon, who, we are informed, has just purchased a Daimler carriage.

The City and Suburban Electric Carriage Co. recently delivered from their works at Niagara, South Kensington, one of their electric vehicles to the order of H.R.H. the Prince of Wales. This carriage, as seen below, is of the brougham type, and affords four seats, the body being hung on specially low springs. The wheels are shod with Collier pneumatic tyres. The battery box, which in some of the earlier types of the company's productions formed a particu-



larly prominent feature, is very skilfully concealed in the royal vehicle, which is very much on the lines of the ordinary horse-drawn carriage. The storage capacity has been somewhat increased so as to afford more speed. It will easily average sixteen miles per hour. It is somewhat of a pity that this vehicle takes the form of the horse carriage, as the public look upon this type of machine as incongruous.

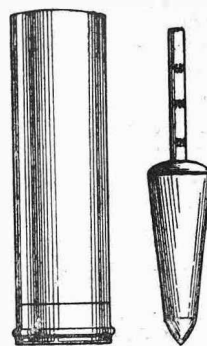


The 24 h.p. Georges Richard car which, driven by Mr. Overton, won the Glidden cup at Castlewellan.

The White Hart at Banbury is a comfortable old fashioned hotel, but the landlord knows how to blend the ancient with the modern, and has built a pit which is at the service of visiting automobilists.

One of the good features of the Wolseley engines is the fact that they are, as the French say, "robust." So far as our experience goes they are certainly far from sensitive, and will put up with the minimum of attention. As to petrol, they take what is available, and run as well on B as on A. In fact, it is a waste of money to buy A for the Wolseley.

There is no doubt that the continual breakage of the ordinary glass densimeter is one of the principal reasons why this useful little instrument has fallen into disuse amongst automobilists. It is always useful, and sometimes very necessary, to know the density of one's spirit. Yet continual breakage of the glass densimeter became so troublesome that its use had been largely discontinued. There is now no excuse on this score, as Messrs. Brown Bros., of Great Eastern Street, E.C., have brought out a densimeter which is made entirely of metal. This is shown in the accompanying sketch. The case serves as a receptacle for the spirit in which the densimeter is placed.



On the stem of the latter, the specific gravity marks are engraved, varying from .680 to .720, and they are just as easily read as on the more fragile instrument. A small cloth case fits inside the metal receptacle, and in this the densimeter is dropped, a cap put into position, and the instrument can then be carried in safety anywhere; but it would be inadvisable to carry it in the ordinary toolbox, as it would very soon lose its shape through being knocked about amongst the tools. The price is just about half as much again as that asked for the glass densimeter, and is certainly good value.

SOME REPLIES TO QUERIES.

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

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

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

REVERSING GEAR NECESSARY.

Will you oblige me with the following information? Is a "reverse" made compulsory by law after a certain weight, and, if so, what is the maximum weight permitted without it?—C. Y. H.

Under the Light Locomotives Act, 1896, any motor vehicle exceeding 5 cwt. unladen must be capable of being worked so that it can travel either backwards or forwards. This weight limit is of course extremely low, and only just covers the motor quadricycle, upon which it is obvious no reversing gear is needed. It is interesting to note that under this Act the extreme width of the vehicle must not exceed 6ft. 6in., and that the tyres must all be smooth, and where they touch the ground must be flat and of a given width according to the weight of the carriage.

BAD CONTACT AT THE TREMBLER.

(1.) I suffer from continual trouble with my Aster trembler blades and screws. They everlastingly require to be taken off, and the platinum surfaces smoothed; otherwise the spark fails. This is very detrimental to the life of the blade and screw—both genuine and imitation. Can you tell me if this is the fault of the coil? My batteries appear quite correct, and I have them charged at a good place. (2.) Can you explain what causes a disagreeable grating or grinding noise either in the gear box of my car or the clutch when running down an incline with the clutch out? Every part is well lubricated. When the change-speed lever is at neutral the noise ceases. The car is chain driven with Panhard type gear.—B.L.

(1.) The trouble with the platinum points of the contact breaker is in all probability due to your having the accumulator wrongly connected up. If you pass the current through the coil before taking it to the contact breaker it increases the voltage by self-induction in the coil, thus causing sparks at the contacts, which have a detrimental effect on those parts. (2.) The grinding noise is probably due to the fact that an opposite driving action is placed upon the gear when the car is running down-hill—that is, that under normal conditions the gear is driving the car, when running free down-hill the car is driving the gear, so that all the action on the teeth is on the opposite side to that to which it is usually subjected. Or it may be, and this is more likely to be the case, that the worry arises from the chain sagging on the top and catching some part of the car, and thus making a disagreeable noise.

TUBE TO ELECTRIC IGNITION.

I should be very much obliged if you would kindly advise me as to ignition. I have a 5 h.p. (really about 6 h.p. to 7 h.p.) Panhard with tube ignition, which gives absolutely no trouble, but the hills here are very stiff, and I want a little more power. The agent here is very keen on my getting electric ignition put in as well. He says it will increase the power. Other people say it will increase the speed. I do not care about the speed, but I do want the extra power. At the same time, I do not wish to risk spoiling a very reliable car, which gives no trouble, unless I get a decided advantage for the extra trouble. It governs on the exhaust, not inlet. If you can tell me the effect it will have I shall be very glad; also if there is any particular type that is preferable.—Nemo

You would find your motor give more power by fitting electric ignition. Therefore what your agent tells you is correct, while when others state that the speed will be increased they are also correct, as power increases in relation to speed. You would find that with electric ignition you would have far greater control over your

motor, but to run it economically the governor should act upon the inlet, and not upon the exhaust, as at present. With tube ignition this form of governing is highly satisfactory, but with electric ignition it is somewhat unsatisfactory. The most advantageous manner of running a petrol motor is to run with the least quantity of mixture and spark as far advanced as possible, so that one always has a reserve of power by opening the throttle valve and admitting more gas to the cylinder. When the speed drops in hill-climbing sufficiently to cause a knocking of the engine the ignition should be retarded, otherwise damage to the crankshaft bearings will follow, and possibly the connecting rod will be bent. There would be no risk of spoiling the car if the electric conversion were properly carried out. It would be necessary to fit a contact breaker on the two-to-one gearshaft, and to use a high-speed trembler coil wiring up with the best quality of insulated wire you can possibly get, so as to eliminate all possibility of trouble.

FIRING IN CARBURETTERS.

I have a Darracq 12 h.p. car, but am very much troubled with it back-firing into carburetter. I should esteem it a favour if you could advise me as to cause and remedy.—J. Newron.

The firing into the carburetter is most probably due to the inlet valves sticking. These should be taken out and all carbon deposit cleaned away and burnt oil removed by washing with petrol, so that the stem of the valve works freely in the guide. See that the inlet valve spring is not too weak, thus preventing the valve closing as quickly as it should do.

KNOCKING AND EXPLOSIONS IN THE SILENCER.

I was much interested in your answer to R.T.B. in *The Autocar* of July 18th, but may I ask how one is to prevent the sooting of the cylinders? In my own case (a 14 h.p. Daimler) there are no cylinder covers, and it is half a day's work or more to take off the cylinders and clean them. To what other cause than sooting and premature firing can knocking be attributed? I do not think that in my car it is due to sooting, as the plugs keep quite clean, and the spark is well retarded. Of course, the cylinders are not red hot. May I ask what causes explosion in the silencer when it is not due to weak springs and bad mixture or leaky valves? It frequently happens with me when throttling down, and when the car for a short time may consequently be over-running the engine, but this ought not to cause the explosion, seeing how many cars are run on the throttle. I thought at first it was due to the spring on the automatic air inlet, with which Daimlers are provided, being too weak, thus admitting too much air, and so tightened it up. This has remedied it to a certain extent, but not wholly. It is very difficult to find out the cause, as one cannot produce the noise at will, and car may run a whole day quite quietly.—N.W.

There are other reasons for a knocking in the engine other than those dealt with in the reply to R.T.B., but which, according to his query, do not apply. One is a worn or loose connecting rod, which is probably the cause of the knocking in your engine. This would be particularly noticeable when running on low speeds. The back firing in the cylinder is undoubtedly due to one of the cylinders misfiring. A live charge of mixture is expelled into the silencer, and is there exploded by the next charge of exhaust gas coming from the following working cylinder.

FRICITION CLUTCHES. By Prof. H. S. Hele-Shaw, LL.D., F.R.S.*

The friction clutch is a very old invention. It is, however, only in recent years that inventors have—in any great numbers—seriously attempted to overcome the defects of the ordinary cone clutch, and their attempts have been attended with such success as to lead to the introduction of a very large number of clutches of moderate power into machinery. The importance of the friction clutch, however, justifies a very careful consideration of the problem, and as to whether, in view of the modern developments of motive power, particularly in internal combustion engines and of high speed machinery of great power, there are not yet improvements possible in this direction.

The Use of the Clutch.

The object of a friction clutch is to impart motion from a piece of machinery in motion to another piece of machinery at rest, and thus the friction clutch differs in its object, in a very essential manner, from any ordinary form of coupling, or from the well-known jaw clutch. In the latter there is not, or should not be, any relative motion between the parts connected. Hence the strains involved are of a statical nature, and however great, do not involve a mutual action of the nature of a shock, whereas where two pieces of machinery, not having the same speed, have to be connected with each other there would be a shock due to inertia, unless the connection was made by means of a friction clutch, or some equivalent, such as a slipping belt, allowing the two pieces of machinery to come gradually to the same speed. This gradual effect is therefore the primary object of the friction clutch, and how important this object is will be realised when it is remembered that it is impracticable to start any machine instantaneously, for the magnitude of the stresses and strain caused when one machine is set in motion by another increases with the suddenness of the operation, and all appreciable shock can be obviated by allowing the action to take place gradually.

During the whole time that the two pieces of machinery are coming to one speed—which in the case of the friction clutch is caused by one starting another into motion, while in the case of a brake it is caused by one bringing the other to rest—during this time work is being lost at the surfaces where the slipping is taking place, and consequently heat is generated. The more gradual the action therefore the greater the amount of heat, which reaches its greatest amount in the case of the friction dynamometer, where slipping takes place the whole time, and all the work of the moving machine is converted by the friction into heat.

Stated briefly, the four conditions which seem to be involved in the problem of the friction clutch are:

- (1.) It must have sufficient gripping power.
- (2.) Undue wearing of the surfaces must be avoided.
- (3.) Provision must be made for conveying away the heat where there is much slipping contact in the clutch.
- (4.) Motion should be imparted to the driven shaft without shock.

Working Conditions.

We are thus met at the outset with the contradictory conditions which have made the problem of the friction

statement of inventors themselves the important fact mentioned in condition 3. but it certainly does account for the large number of instances in which friction clutches have failed to give satisfactory results for anything but the smallest powers.

Looking at the various clutches in use, they may be classified and represented diagrammatically as follows:

- (1.) The cone clutch (fig. 1), where considerable pressure between the surfaces is obtained by the wedge action of the cone.
- (2.) Various forms of rim clutch (fig. 2), in which the action is obtained by means of levers.
- (3.) Clutches with rings or segments expanding within a drum or annulus (fig. 3).
- (4.) The brush clutch (fig. 4), in which brushes of wire

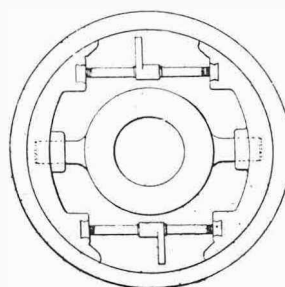


Fig. 3.—Expanding clutch.

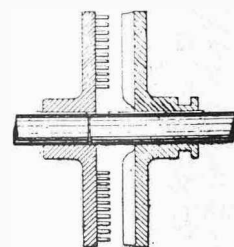


Fig. 4.—Brush clutch.

are thrust into a finely serrated or grooved plate.

- (5.) The coil clutch (fig. 5), in which a coil of metal or wire rope with blocks is employed to give great gripping power.

- (6.) The "Weston" clutch (fig. 6), in which the friction effect is produced by a number of circular discs connected alternately with the driving and driven machine.

There are numerous modifications in detail of all these clutches, but the inventions in connection with them relate principally to the mode of obtaining the requisite pressure between the friction surfaces.

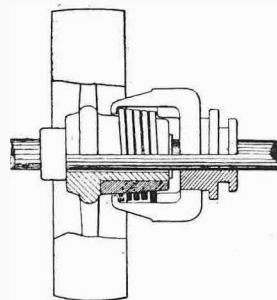


Fig. 5.—Coil clutch.

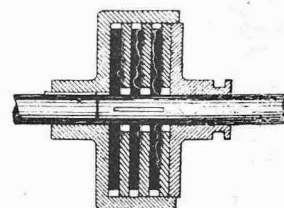


Fig. 6.—Weston clutch.

There are plenty of illustrations in mechanical science where it has hitherto been impossible to reconcile conflicting conditions, such for instance as the variable change speed gear, especially when required to be of high power and high efficiency, and it is an important question whether the present case forms another example or not. The author believes there is a way out of the difficulty, and this he proposes to bring forward in the present paper. It is quite possible that there are other ways, and if engineers consider the matter of sufficient importance, it may put them on the track of overcoming the difficulty by a way other than that which will be now described.

(To be continued.)

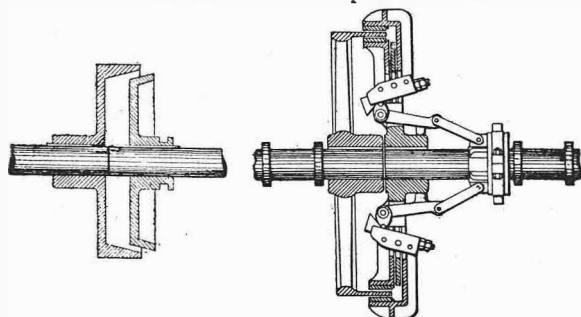


Fig. 1.—Cone clutch.

Fig. 2.—Rim clutch.

clutch such a difficult one. The author does not remember seeing in any previous writings on the subject or in the

* Excerpts from a paper read before the members of the Institution of Mechanical Engineers, at Leeds, on the 29th July.

Mr. Letts, of Chas. Jarrott and Letts, Ltd., informs us that Oldsmobiles are going quite merrily, and that their increased sale is due to the great improvements that have been introduced into these little cars since last year.

DYNAMIC FLYING MACHINES.

A paper read before the Aeronautical Institute by Herr W. Kress of Vienna.

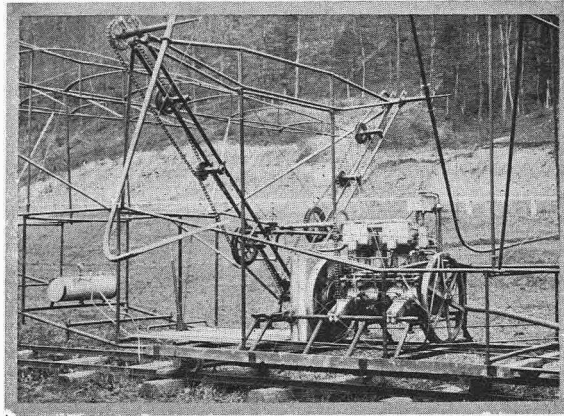
A general meeting of the Aeronautical Institute and Club was held in the large hall of St. Bride's Institute on the evening of Thursday last punctually at 7.45—the time appointed. Dr. Barton, the president of the club, mounted the platform, and introduced the lecturer—Herr Wilhelm Kress, of Vienna, who had come that evening to read a paper on the "Dynamic Flying Machine." The platform presented a somewhat weird appearance; a wire had been stretched across its length, from which were suspended numerous strange-looking objects—some seemed almost bird-like; it would be more correct to say bat-like at first sight. Closer inspection showed them to be Herr Kress's models. They were beautifully constructed, and were all driven by means of twisted elastic strands; their aeroplanes and rudders were made of light silk, and their general framework was made of cane.

Herr Kress then began to read his paper—one of the most interesting of the kind we have ever had the privilege of hearing. First he gave a very short history of the attempts to solve the problem of the dynamic flying machine, and mentioned that experiments had been traced back as early as the time of the middle ages, so attractive to the human mind was the idea of flying in the air like a bird. During the last century astounding progress had been made in locomotion over sea and land that even surpassed the phantastic imaginations of Jules Verne, yet the problem of aerial navigation was yet in its infancy, but now he hoped it would soon grow and prosper. Twenty years ago the chief scientific societies regarded dynamic

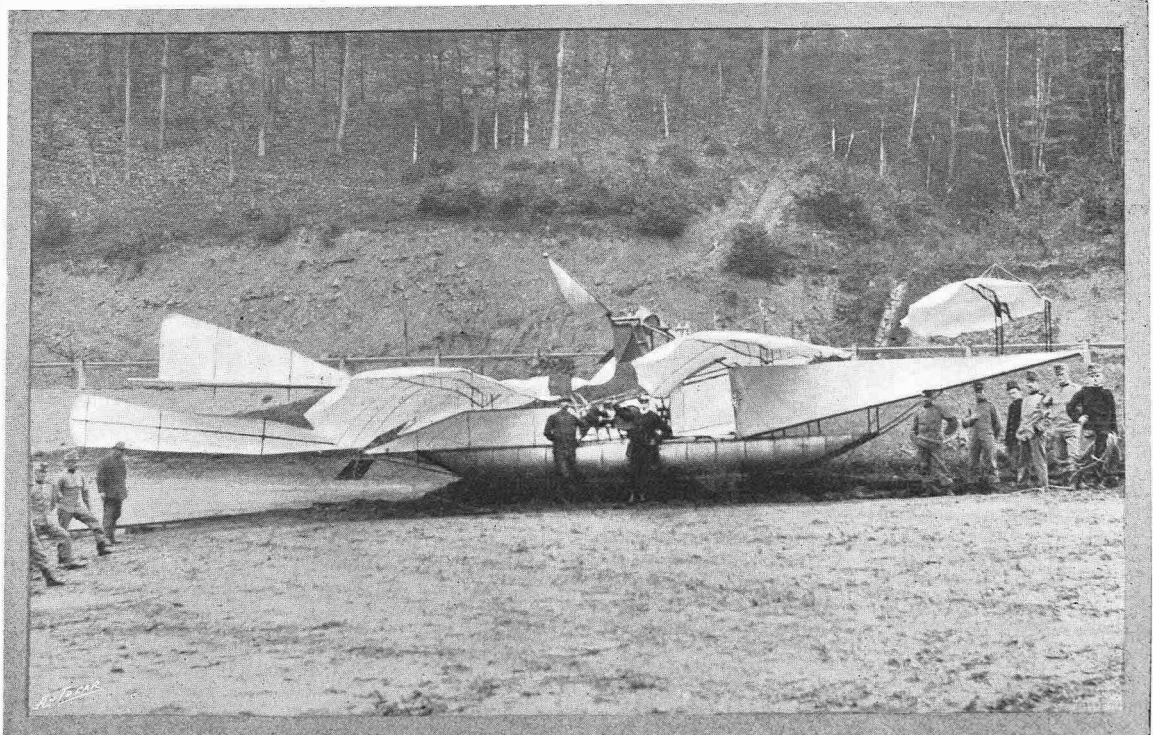
flight as a practical impossibility, and when on the 15th March, 1880, Herr Kress demonstrated, in the course of one of his lectures, an aeroplane—the first of its kind in the world—which left the table and flew horizontally in the air in a desired direction, his learned hearers, though they showed great interest at the time, did not take the matter seriously, but rather regarded it as a clever trick, because they still followed Weissbach's aerodynamic formula founded on the theory that the flight of birds was an unsolved enigma.

After mentioning details of the formulæ of Von Loessl, Lilienthal, and others, Herr Kress expressed his opinion that even after aerial navigation had become an accomplished fact these formulæ would still continue to provide material for discussion. He would only mention one or two items of importance, which until recently have not been properly appreciated in aerodynamics. If an object which presents a large resisting surface to the air falls vertically, its fall will be more rapid than if it is given a horizontal movement in fact, the faster the horizontal

movement is the less is there a tendency for the object to fall. Another important point to consider is the span of the wing, and another the resistance of the air. The motive power used on Herr Kress's models, as we mentioned before, is derived from twisted rubber strands; and, naturally, weighing, as it does, very little, it is an ideal source of power. This then clearly shows that the weight of a petrol motor to drive a flying machine must be as small as possible, and at the present time manufacturers



The frame and engine of Herr Kress's machine.



The machine prepared for launching.

have succeeded in turning out engines which weigh only six kilogs. per horse-power. Inventors constantly say that small models, though they may work successfully, show little, but in Herr Kress's opinion they are of real importance, for he himself would never think of starting to work on a large machine unless he had his theories verified by a small model. At the present time we may no longer consider the flight of birds an enigma.

Although the flight of the albatross seems almost inexplicable, as it sails in the air for days together without moving its wings, yet we are able to tell that the great bird is able to maintain its equilibrium by taking advantage of the varying velocities of the wind and altering the angle of its flight to suit them.

There are at present three systems which promise success to the solution of the aero-dynamic problem—namely, flying by flapping, by screws, and by means of the aeroplane. The learned lecturer was strongly in favour of the latter, as he had, he said, carried out exhaustive experiments in all three systems. He mentioned that the models he had with him were from ten to twenty years old, which served to prove that though in a somewhat imperfect manner they yet showed it was possible to imitate the flight of birds.

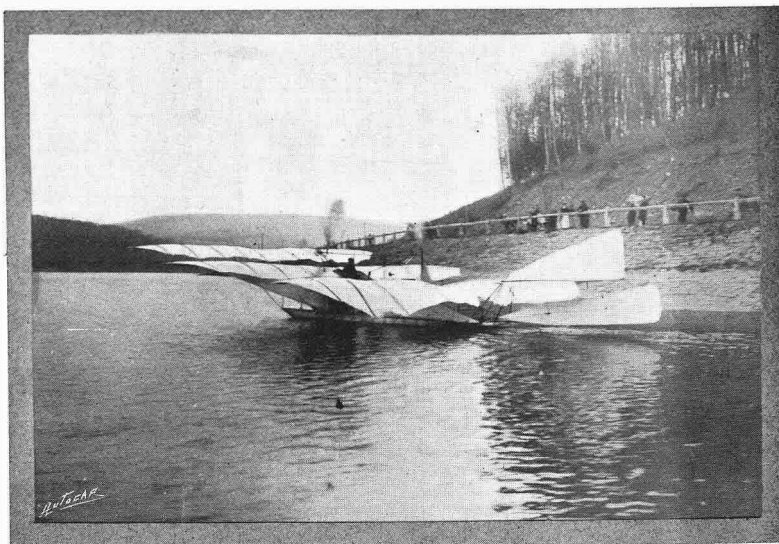
Let us first consider the air screw. The idea was not altogether a modern one. The earliest trace we can find of anyone who considered the use of an air screw was Leonardo da Vinci in the year 1500, and later Lounoy and Bienvenue in 1784. It is forty years ago since Herr Kress—then a young man—constructed the first successful air screw, having eventually found that the best results were obtained by using loose sails held by elastic frames, so that the sails swell when working, and the frames are enabled to adjust themselves to the correct angle, and it was found that a machine of this kind was capable of lifting thirty-seven and a half kilogs. per horse-power. Here the lecturer took a small model consisting of a framework supporting the apparatus for winding up the elastic strands (the whole being surmounted by a screw), wound up the elastic a few turns, released it, and it sailed up to the ceiling of the hall. Six years ago the Austrian War Department commissioned Herr Kress to construct a captive air screw. This consisted of a framework of steel tubing and an electric motor driving two screws in opposite directions. The results were even better than the inventor anticipated, attaining a lifting power of twenty-five kilogs. or even more per horse-power. Herr Kress then stated how much cheaper the captive screw was than the captive balloon, and by altering the angle of the screws it could be steered in any direction, and even a horizontal flight could be obtained, though not in a satisfactory manner. But as a propeller the air screw was all that could be desired. It can drive a steamer as well as one placed under the water, and was the only practicable method of driving a sleigh by mechanical means. This was shown by a working model, the little sleigh going gaily over the surface of the platform.

Disadvantages of Dirigibility.

The lecturer then proceeded to explain the disadvantages of the dirigible balloon over the aeroplane. As the motor of an airship must be pretty heavy to give the necessary power, so must the balloon be larger to lift it; consequently, the larger balloon gives greater air resistance, and so absorbs more power to drive it. Next we were shown a pretty little model of an aeroplane fitted with a screw fore and aft, each of these revolving in opposite directions, the centre of gravity being so placed that the machine could either ascend or travel horizontally. Herr Kress then demonstrated this by putting the model in motion, and after that turned to a strange-looking machine, which he took down from the wire, and proceeded to explain its working. This was the model of a flying machine designed to exactly imitate the flying of a bird. It is really more economical in power than the aeroplane, but it cannot rise from a stationary position any more than the latter can, nor yet can it attain the necessary speed on the level before it can leave the ground. More-

over, it is a practical impossibility to exactly follow the perfect mechanism of a bird's wings, as this would necessitate the use of many complicate joints. For all that, Herr Kress's model worked beautifully, and as soon as it left his hands it started flapping, and soared up to the ceiling like some huge vampire, and seemed quite life-like in its efforts to find egress through the plaster. The lecturer then continued to enumerate his reasons for preferring the aeroplane on account of its simplicity, its light weight, and the fact that, although it does need a running start, this can be effected by the motor, and quite a short run is necessary. What birds accomplish with the down stroke of their wings is effectuated by the air screws, while the upstroke is done by the kite-like surface of the aeroplane.

The large model is built on runners, fitted with two screws revolving in opposite directions, two rudders—one for directing the machine high or low, the other to steer it left or right—while the upper surface is covered by two aeroplanes. Unfortunately, the stage was a little too small to admit of this clever model being shown to advantage, but the idea was that, provided the machine could take a run of sufficient length, it would create enough draft under the aeroplanes to cause it to leave the ground



Herr Kress testing one of his machines on a small lake.

and rise in the air. Not having sufficient room for this the lecturer lifted a basket on the top of the table, and on it placed a short starting board, on which he rested the machine; and having started the screws, it left the board, sank gently downwards, gained speed rapidly, and swiftly rose to the top of the hall, taking a splendid flight.

Herr Kress's Labours.

Herr Kress then told the audience the years of labour and trouble these small models had cost him, and how much they had done to help him in his work on a larger scale. He much regretted how every attempt to try one of his machines was made public, although he took every precaution by erecting his workshops in an almost unknown valley in the Wienerwald; but in spite of his precautions his hiding place was discovered, and his work inspected by people who, to use Herr Kress's own expression, might have grown out of the ground.

He next mentioned his troubles with his large airship, which we illustrate herewith. The motor was made by a well-known German firm. It was to be of 35 h.p., and promised not to exceed 240 kilogs. in weight. To the intrepid inventor's horror, the motor weighed 380 kilogs., and only gave out 30 h.p. Consequently, all his calculations of stability were upset, and his hopes of taking a flight that season dashed to the ground. However, he determined to study the effect of the screws and rudders, and took several trips on the small lake near his workshops armed with a life belt, as with an over-weighted machine the risk of sinking was great. The precaution was no idle one, as one day on accelerating the speed the end of the lake was reached in half a minute; and to avoid running foul of the stone wall at the end, Herr Kress put about

quickly, upset the balance of the aeroplane, and she sank in 18ft. of water. She was hauled up three days afterwards a shapeless mass of steel tubes, the motor being the only part intact. Needless to say, those who do not agree that flight is possible with the aeroplane made much of this disaster.

Herr Kress then ended his interesting paper, expressing his hope that all present would like to see aerial navigation an accomplished fact.

Among those present at the meeting we noticed Dr Barton (president), Dr. Hutchinson, Messrs. F. L. Rawson, Wattel, Gaudron, Senecal, V. Leger, Holtorp, C. W. Beckmann, and O. C. Field (secretary).

MOTOR VOLUNTEER CORPS.

The Motor Volunteer Corps will play an important part in the coming great manoeuvres in the western counties. The commanding officer of the corps has been instructed by Lord Roberts to provide a large number of cars, to be driven by his officers and members, and to be attached to the four great camps. A number of motor cyclists are required for this period, i.e., September 5th to 12th inclusive, and as a sufficient number have not yet enrolled in the corps, motor cyclists are urgently called upon to enrol at once, in order that they may be ready for the manoeuvres. There are still a few vacancies for the enrolment of motor cars, and owners can enrol at the offices of the corps, 11, Tothill Street, Westminster, S.W.

On the 21st, Mr. H. S. H. Cavendish was on duty for Major-General L. Oliphant, general officer commanding Home District, in connection with the inspection of 3rd Battalion Grenadier Guards, and detachment 1st Battalion Irish Guards, and 5 and 11 companies Army Service Corps in London. On the 22nd inst. he drove General Oliphant to Caterham. On the 24th inst. he was on duty for General Oliphant at the inspection of 1st Battalion Scots Guards and 1st Life Guards at Windsor; and on the 25th inst. he was employed by the same officer, driving to Kneller Hall and Kingston.

On the 2nd, Messrs. H. R. Langrishe, F. A. Rodewald, and E. A. Miller were employed for Lord Grenfell and staff on inspection duty at Woolwich.



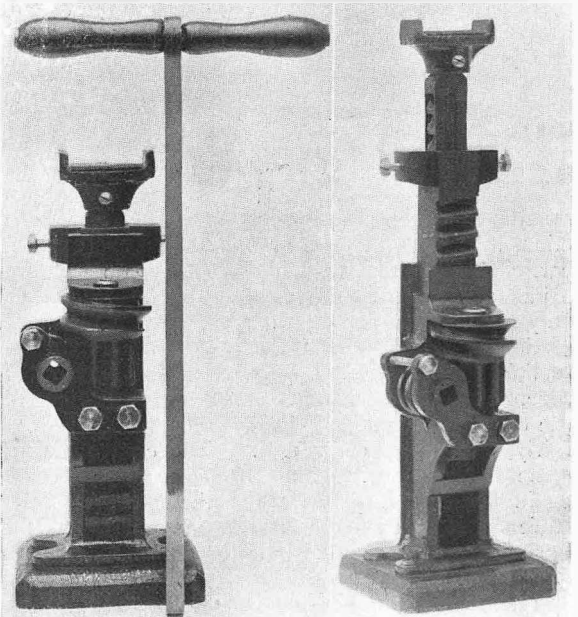
Midland Club's Hill Climb.
The new 16 h.p. Lanchester on the weighbridge. Mr. G. Lanchester
at the tiller.



Midland Club's Hill Climb.
This picture illustrates the means adopted to prevent cars running back in case of brake failure at the stops. A block and tackle were laid across the road and immediately tightened up after a car had passed.

A USEFUL JACK.

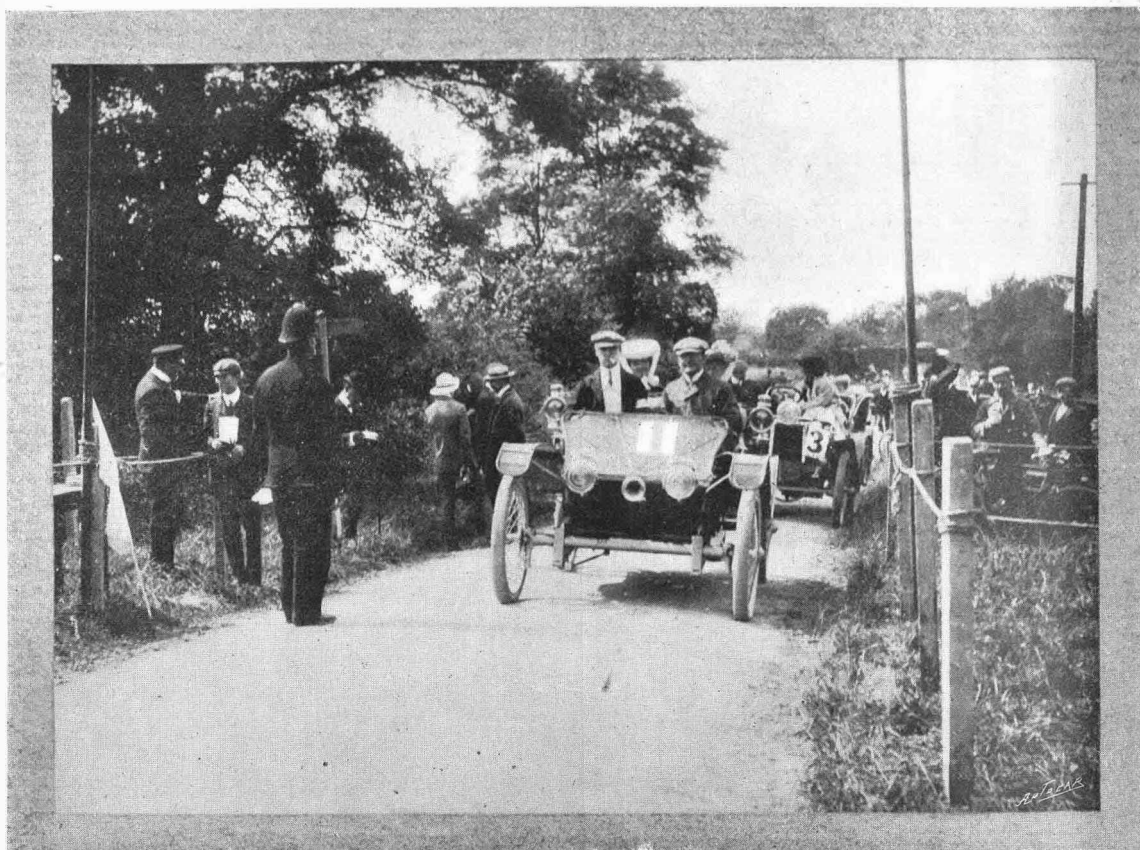
A really efficient jack is one of the most useful components of the automobilist's kit. To fulfil every requirement the jack must in the first place have a firm foothold, a firm base on which to stand, be readily adjustable by hand, be able to lift its load with the greatest amount of ease to the operator, and last but not least, have a handle long enough to enable the jack to be operated without the individual assuming acrobatic attitudes. These qualities will



be found in the jack illustrated above, which is known as the Duco, and is supplied by Messrs. Brown Bros., Ltd., of Great Eastern Street, London, E.C. Its comparative heights when open and when closed are shown in the illustrations, but we may mention that when closed the jack is 11in., and when fully extended 24in. Its capacity is one ton, so that it is capable of lifting any of the heavier touring cars.

THE MIDLAND A.C. HILL TESTS.

A FORMIDABLE HILL-CLIMB.



The scene of the start for the M.A.C. hill-climb and brake tests. Mr. Vernon Pugh has driven his 10 h.p. Lanchester to the starting point, and is awaiting the word "Go!" from Mr. Harry J. Swindley ("The Autocar"), the timekeeper at the start. The timekeeper's enclosure is on the left.

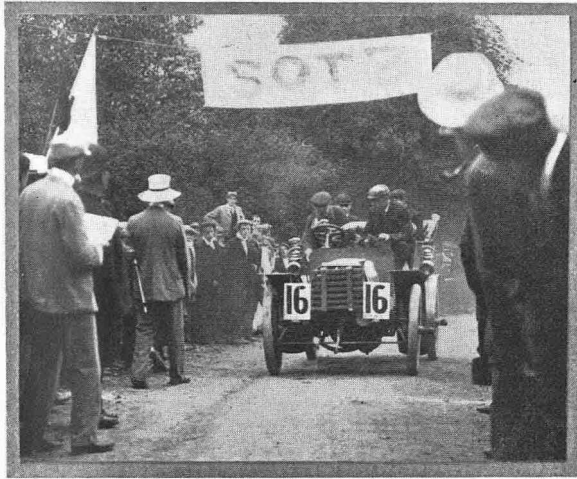
What is actually the hardest and most trying hill-climb that has ever been organised and successfully carried out was that held under the auspices of the Midland A.C. on Saturday last. In *The Autocar* of July 25th, pages 126 and 127, we gave a plan and section of Sun Rising Hill, Edge Hills. From the section of the hill as we gave it last week, the severest gradient is 1 in 6.43. The total distance of the course selected was 1,000 yards, starting on a fairly level piece of ground. The course took a somewhat abrupt rise, then the gradient fell off again for several yards, when the ascent of the steepest part of the hill was begun. This is just beyond Rupert Cottage, where the club had its headquarters.

The competition was exclusively for touring cars, with a full complement of passengers and their ordinary kit of tools, etc., on board. At a distance of 680 yards up the hill the cars were halted between two lines ten yards apart. The average gradient of the road on the first stopping point was 1 in 6.75, the grading being checked by Prof. W. Worby Beaumont. The cars had to pull up dead between the lines marked out, and stop for a period of thirty seconds, as timed by the official timekeeper, who, upon expiry of the half-minute, gave the word

"Go!" the cars being then required to start. A fearfully trying grade on the second turn on the hill had then to be negotiated, when the second stop, which occurred some thirty or forty yards below the finishing point, was reached. This showed an average grade of 1 in 6.25, and we were much interested in watching the careful manner in which Prof. Worby Beaumont carried out the grading, as the surface of the road was somewhat rough. Grades were taken in several positions, and the average struck worked out at the figure given above. It will be understood that a task set out in this form was a very formidable and somewhat daring one for the club to propose, as the mere fact of starting a loaded car on such gradients as those selected was a terrific strain upon the whole car, and one which would not be met with in the ordinary way. The details of the test were compiled by the president of the Midland A.C., Mr. J. Broughton Dugdale (the donor of the cup to be awarded to the winner), who rightly considered that any cars which could pass them successfully were really worthy of the highest recommendation one could possibly give them. No less than thirty of the members entered their vehicles as competitors, and out of the twenty who actually attempted the ascent, seven-

teen successfully accomplished the task.

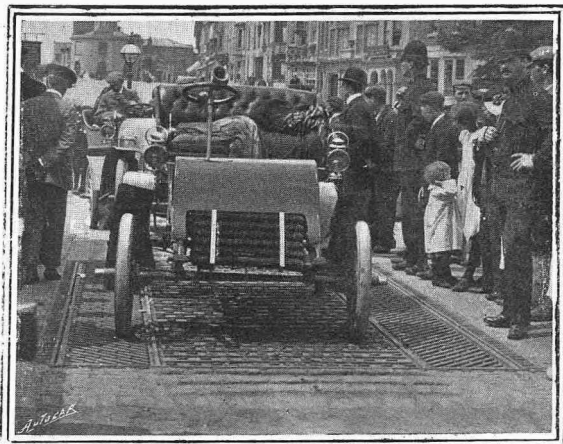
The cars were given the word to go by Mr. Harry J. Swindley, the timekeeper at the start, after the accepted French fashion, viz., by warnings at the half and quarter minutes, ten seconds, and then counting from five downwards. The flag-wagging to block and



Mr. George Iden bringing the 20 h.p. M.M.C. to rest.

clear the hill went a little awry at the commencement, but after awhile worked most satisfactorily.

Mr. Vernon Pugh driving his 10 h.p. Lancaester got neatly away, but Mr. Davies Traffic Manufacturing Car came to a dead stop within a hundred yards of the start and retired gracefully backwards. Mr. Holder on the 24 h.p. Panhard went smartly off the mark, but Mr. T. B. Browne on the 18 h.p. James and Browne was even quicker away—indeed, he was thought to have moved off quite the smartest until Cecil Edge loosed the 20 h.p. Napier, which took the steep foot in great style. Captain Deasy



The 6 1/2 h.p. Cadillac car, entered by the Anglo-American Co. This was the lowest-powered car which made an official ascent of the hill. Its total time was 5m. 12 1/2 s. The ease with which it started on the 1 in 6 1/2 s. grade was particularly noticeable.

on his 16 h.p. Rochet was slow—we fancy he kept his engine and lubricators running too long before he got the word to go—and Mr. Maudslay was even slower, stopping dead fifty yards off, though when he got at the hill the car quickly scaled it and was out of sight. In putting his 20 h.p. M.M.C. into

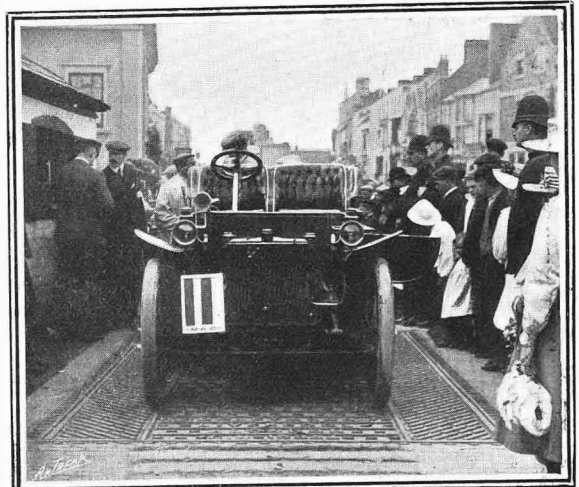
motion Mr. Iden ran back quite three yards, but quickly made up for it, and tackled the steep in fine style. Mr. Lewis on the 22 h.p. Daimler was slow in getting off, but made up leeway later as the times show. Mr. H. Luff Smith stopped thirty yards from the mark, both coils having fired through a



At the first stop. This illustration clearly shows the first sharp bend in the course.

short circuit of the low tension wire in the coil. The 20 h.p. Wolseley, driven by Mr. A. E. Crowdy, made one of the best starts of the afternoon, as did the 12 h.p. entered by Mr. Austin.

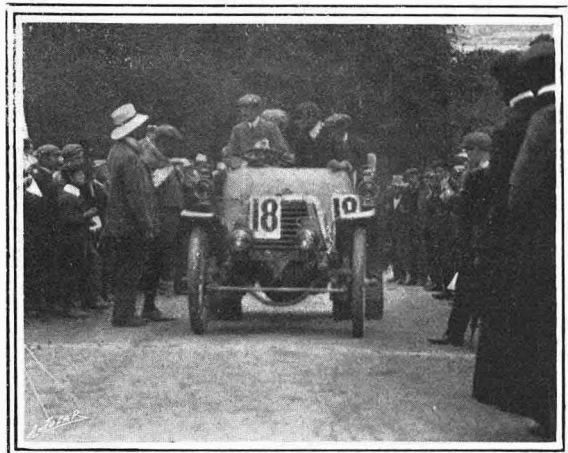
On the second stop the driver of No. 12 (15 h.p. Maudslay), Mr. C. C. Maudslay, misunderstood the rules, and as he stopped his engine by letting his clutch in too quickly when starting again, he ran back to the side of the road, and by so doing was disqualified. It was not until he had got his car clear of the course that it was explained to him that he was at liberty to start up his engine. Later



Capt. H. H. P. Deasy's 16 h.p. Rochet Schneider on the weigh-bridge at Stratford-on-Avon.

in the day the engine was started up, and the car surmounted the hill at a good speed. In the second case Mr. J. W. Cross attacked the hill with his 20 h.p. Humber, which performed so excellently in the speed trials in Ireland, with the same gear ratio as that which he used in the speed con-

tests. He made three gallant attempts to get the car away from the second stopping point, but the engine was stopped on each occasion, principally owing to the fact that the petrol tank being towards the rear of the car, the carburetter was not getting



The 22 h.p. Daimler with Mr. E. W. Lewis at the helm. The car is standing at the second stopping point, held by the back brakes only.

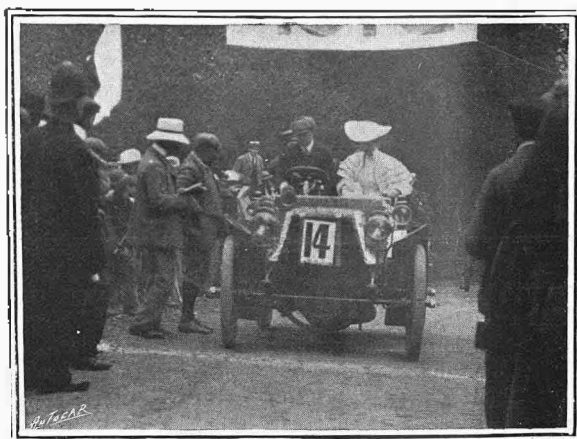
a sufficient quantity of petrol, so that it was not working up to its full power, and the high gearing employed was too much for it even to get a start. The contest was witnessed by a large number of automobilists, members of the Midland A.C., the A.C.G.B. and I., and many private owners, while the people from the surrounding districts gathered in great numbers. The event was timed to start at 2 p.m., but the first car did not get away until 2.35 p.m., the competition being closed shortly after 5 p.m. Interest was well maintained throughout the whole of the proceedings, which were accompanied by one or two of the usual lively incidents which occur on such occasions.

We believe we are correct in saying that protests were lodged against Mr. Edge's 20 h.p. Napier and Mr. Rolls's 15 h.p. Panhard, on the grounds, as to

the first, that the engine was much above 20 h.p., being, indeed, one of last year's Gordon-Bennett engines; and, as to the second, that its body was not a touring body in the generally accepted sense of the definition.

The principal officials in connection with the trial were: Starter, Mr. Siddeley; stopping judges, Messrs. J. Broughton Dugdale and Greaves; official time-keepers, Messrs. H. J. Swindley, A. Johnson, H. Sturmev, and C. Wheelwright. In addition, many gentlemen gave their services as signallers, marshals, etc.

At the conclusion of the official climb several visitors climbed the hill with their cars. A remarkably good performance was made by a 20 h.p. M.M.C. omnibus which, with a load of eight passengers, went up the hill in good style. Whilst on the second stop one of the new light 5 h.p. Humber car sailed gaily by with its two passengers up, as also did a 9 h.p. touring Argyll.



Mr. Cecil Edge on the 20 h.p. Napier at the second stopping point. The front seat is occupied by Miss Dorothy Levitt who, as usual, is accompanied by her dog.

OFFICIAL RESULTS OF THE TRIALS

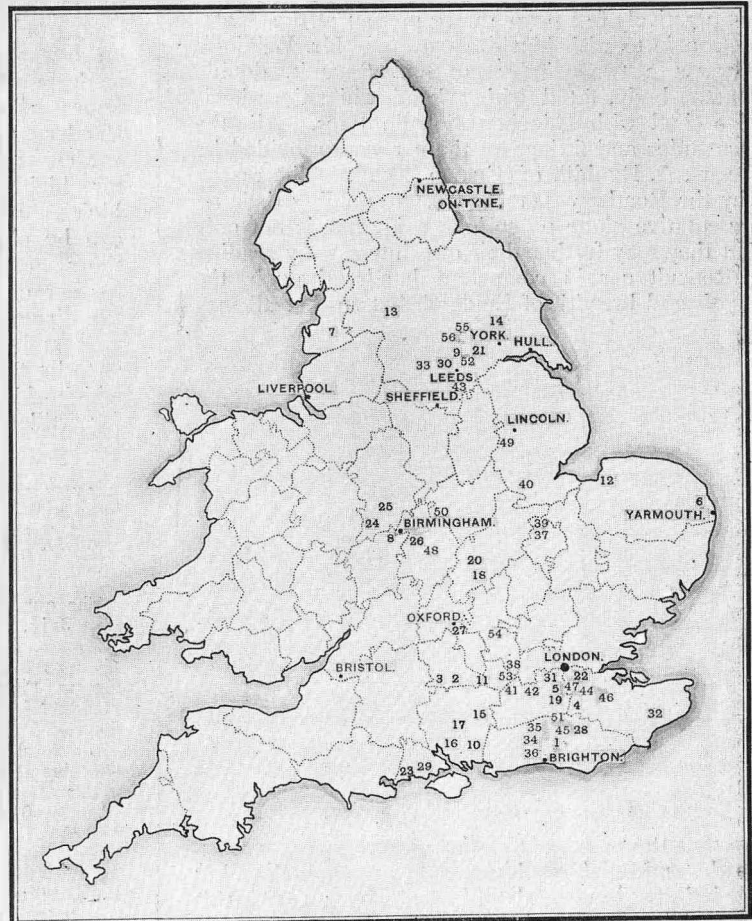
[BY TELEGRAPH.]

OFFICIAL NUMBER.	ENTRANT.	H.P. AND MAKE OF CAR.	TOTAL WEIGHT.	NETT TIME.	MARKS.
14	C. Edge	20 h.p. Napier	34 cwt. 1 qr. 24 lbs.	1m. 55½s.	599
19	J. V. Pugh	10 h.p. Lanchester	27 cwt. 1 qr. 18 lbs.	4m. 25½s.	854
4	A. Millership	20 h.p. Lanchester	27 cwt. 0 qr. 8 lbs.	4m. 24¾s.	866
23	A. E. Crowdy	20 h.p. Wolseley	32 cwt. 1 qr. 0 lbs.	2m. 45s.	913
16	George Iden	20 h.p. M.M.C.	26 cwt. 2 qr. 0 lbs.	2m. 21½s.	955
7	H. F. Hemmings	10 h.p. Lanchester	27 cwt. 3 qr. 0 lbs.	4m. 57½s.	957
20	F. S. Bennett	15 h.p. Cadillac	15 cwt. 1 qr. 0 lbs.	4m. 12½s.	962
1	C. V. Pugh	10 h.p. Lanchester	28 cwt. 1 qr. 10 lbs.	5m. 9½s.	972
27	Hon. C. S. Rolls	15 h.p. Panhard	27 cwt. 0 qr. 0 lbs.	3m. 14½s.	1028
11	Capt. H. H. P. Deasy	16 h.p. Rochet-Schneider	27 cwt. 1 qr. 0 lbs.	3m. 17½s.	1034
25	M. R. Lawrence	10 h.p. Lanchester	26 cwt. 2 qr. 0 lbs.	5m. 8½s.	1039
24	H. Austin	12 h.p. Wolseley	24 cwt. 1 qr. 0 lbs.	3m. 56½s.	1044
18	E. W. Lewis	22 h.p. Daimler	27 cwt. 1 qr. 0 lbs.	2m. 33½s.	1107
22	A. Callan	24 h.p. Wolseley	Doubtful.	2m. 55½s.	Doubtful
3	J. A. Holder	24 h.p. Panhard	25 cwt. 0 qr. 0 lbs.	2m. 32s.	1300
9	T. R. Browne	18 h.p. James and Browne	27 cwt. 0 qr. 0 lbs.	2m. 57½s.	1652

POLICE AMBUSCADES.

SINCE the publication of our first map of police ambushades in "The Autocar" of July 18, we have had many letters of approval from our readers, and have been furnished with additional information which we are incorporating in the map published on this page. From time to time we propose to repeat the publication of the map, as we have received more than sufficient proof that it is both useful and appreciated. Notification of new police traps or the withdrawal of old ones should be sent in to reach us by midday on Mondays, in order to be incorporated in the next map issued.

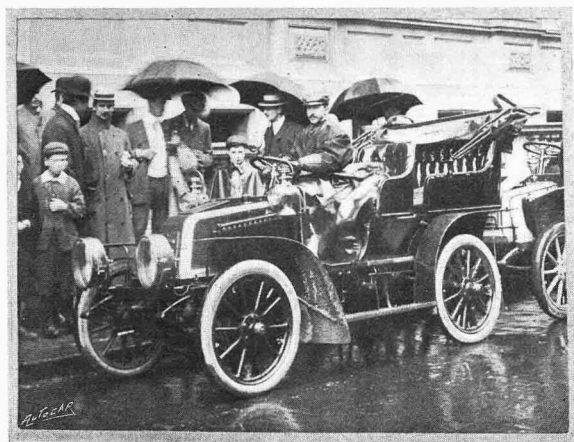
1. Near Newmarket Inn, 2½ miles on Brighton to London road.
2. Between Newbury and Thatcham.
3. Between Newbury and Hungerford.
4. Between the top of Godstone hill and Caterham.
5. Between Sutton and Carshalton from railway bridge to convent walls.
6. Yarmouth, Acle, and Blofield routes.
7. In and around Garstang.
8. In and around King's Heath.
9. 3 miles from Wetherby on the road from Boroughbridge.
10. Near Horndean, 62 miles on Portsmouth-London road.
11. Measured quarter-mile at Twyford from Reading.
12. Between Heacham and Snettisham, near Hunstanton.
13. Top of Buck Ha Brow on the Clapham side of Settle, and passing under railway bridge through Settle.
14. Four AIs publichouse, 6 miles from York; between the seventh, eighth, and ninth milestones; at Barton Hill; 1½ miles from Malton across Old Malton Lane.
15. Entrances to Alton, Hants.
16. "The Avenue," Southampton.
17. Numerous traps on entering Winchester—all sides.
18. Measured quarter-mile at Pottersbury, 3 miles north of Stony Stratford.
19. Measured furlong from Benhlilton Church into Sutton, Surrey, and a measured distance on Cheam Road.
20. Between Towcester and the first milestone towards Daventry.
21. Top of Acomb Hill to Acomb Schoolroom, Wetherby to York road.
22. Approaching Beckenham from all sides.
23. Ilford, Hinton, and Totton from Bournemouth to Southampton.
24. Half-mile, both entering and leaving Shifnal.
25. Entering Penkridge from Wolverhampton.
26. Near Wheat Sheaf, Sheldon, on the Coventry-Birmingham road.
27. All entrances to Oxford.
28. Near Crowborough, between Uckfield and Tunbridge Wells.
29. 2 miles from Lymington on the road to Brockenhurst.
30. Measured quarter-mile outside Burley, just past Malt Shovel, near Bradford.
31. 220 yards between entrance to Ranelagh Club and the Common, Barnes.
32. About 1 mile from Ashford, Kent, on Hythe road.
33. About 1 mile beyond Utley on the Keighley-Skipton road.
34. Lowfield Heath, 2 miles London side of Crawley.
35. Entering Epsom from the south.
36. Near Hickstead, about 10 miles from Brighton on London road.
37. "The Bloody Oaks," 6 miles N. of Stamford.
38. A measured furlong leaving Slough towards London.
39. A series of traps on the Great North Road between Stamford and Grantham, the positions of which are being constantly changed by the police.
40. The Newark side of Gonerby Hill, 2 miles from Grantham.
41. At Bagshot, entering from Camberley side, and level crossing at Sunningdale Station.
42. At Weybridge, traps laid daily.



43. At the bottom of John-o'-Gaunt's Hill entering Leeds.
44. Between Norbury and the tountain at Croydon, two measured quarter-miles.
45. Between the church at Horley and the Gatwick race-course.
46. On the Sevenoaks Road between Bromley and Green Street Green.
47. On the Addiscombe Road, Croydon.
48. Hill at Stonebridge approaching from Coventry; also between Berkswell and "George in the Tree."
49. On the road between Lincoln and Newark, several traps.
50. Between Atherstone and Lichfield.
51. At the foot of a hill between Merstham and Redhill.
52. From York to the New Inn on the Tadcaster Road (6 miles), a series of constantly changing traps; at Dringhouses, 2 miles from York, a measured piece at the corner of a by-road leading over the railway bridge.
53. In the straight which commences after leaving Old Windsor for Staines.
54. At Aston Clinton, midway between Tring and Aylesbury.
55. On the York to Knaresborough road, near Poppleton railway bridge, and along the wall at Allerton Park.
56. Numerous traps in the neighbourhood of Harrogate, Knaresborough, and Boroughbridge.

AN AMBITIOUS PROGRAMME.

A worse morning for a start for a tour of about 2,500 miles round the greater part of Great Britain could hardly be imagined. A steady, soaking, continuous downpour favoured London with its presence on Monday last, and things looked most miserable as Mr. H. R. Wilding prepared to make his start on his lengthy journey. So bad was the weather that comparatively few people were present at the Hotel Metropole to wish him *bon voyage*. Mr. Wilding's car was a two-cylinder 10 h.p. Renault, double phaeton body, fitted with a hood, while the wheels were shod with Clincher-Michelin tyres. All the accessories and fittings on the car were provided by Messrs. A. Dunhill, of Euston Road. The reason why the Roadway Autocar Co. are sending their representative alone on so long a journey is not only that they may further their own interests by sending a Renault car in competent hands through the length and breadth of England, but so that all may

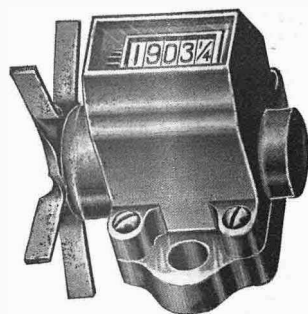


An unpropitious start on a long tour.

see that the motor car of the present day is a trustworthy and reliable vehicle. Thus not only they, but the industry in general, will reap a benefit from this tour. The route to be followed will cover an immense area. Starting from London, the first stopping-place will be Canterbury, then Margate, then along the coast, calling at all the principal towns to Portsmouth, then as far west as Plymouth, thence a north-easterly course is followed to Birmingham. The district round this important town is visited, and thence stops are made at all places of importance till Leeds and district are done with. Then Manchester and district, then Chester. Liverpool, etc., north to Carlisle, Dumfries, Ayr, Glasgow, Edinburgh to Leith—the most northerly point of the trip. A southward course is then followed, *via* Berwick, Newcastle and district, Harrogate to York, then north-east to Scarborough. Thence to Hull, Lincoln, Grantham, and Peterborough. Then to King's Lynn, Norwich, Yarmouth, Lowestoft, Ipswich, Cambridge, Bedford, Northampton, Buckingham, Oxford, Reading, and back to London. In all, about a hundred places will be visited. The duration of the tour will be ten or eleven weeks, and we hope to hear from time to time how Mr. Wilding is progressing. Three 10 h.p. Renaults were at the Hotel Metropole besides Mr. Wilding's.

VEEDER ODOMETER FOR HEAVY CARS.

The Veeder Manufacturing Co., whose agents are Messrs. Markt and Co., of 20, Chapel Street, Milton Street, E.C., are now putting upon the market their Odometer, form A, which has been produced for use on heavy cars. It is made on the well-known lines of the Veeder distance recorder, and is suitable for high-powered vehicles, and this form can be observed from the accompanying illustration. In placing an order for one of these instruments it is necessary to give the diameter or circumference of the wheel, make, year, and model of the automobile, and whether it is to be fitted to the front or rear wheel, and upon which side. It is also necessary to state whether for artillery or cycle built wheels.



AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND.

Quarterly Hundred Miles Trial.

The quarterly hundred miles trial was held on Friday, 24th July, when there were four competitors.

Messrs. James and Browne, Ltd., 342, King Street, Hammersmith, W., entered one of their 9 h.p. cars. Messrs. Frank F. Wellington, Ltd., 151 and 153, Wardour Street, W., entered a 14 h.p. Brooke. Mr. Harvey Ducros, jun., 132 and 133 Long Acre, W.C., entered a 12 h.p. Ariel. Mr. Mark W. Zambra, jun., Pontenoy, Finchley Road, Hampstead, entered a 10 h.p. Lanchester.

The James and Browne weighed without passengers 19 cwt. 0 qrs. 14 lbs., and with passengers 24 cwt. 1 qr. 12½ lbs., and consumed 3 gals. 2 qts. of spirit on the journey, giving a cost of .525d. per mile. The speed both on the outward and return journey was up to the legal limit. The speed on the steep portion of Dashwood Hill was 7.42 miles per hour, and on the mile including Dashwood Hill 9.04 m.p.h. The speed on Aston Hill was 10.2 m.p.h. Mr. R. W. Sprague, who kindly acted as honorary observer, reports: "Two stops; both caused by tyre trouble. Cause: (1) Inner tube nipped. (2.) Inner tube gave at join."

The Brooke car weighed 22 cwt. 2 qrs. 25½ lbs. without passengers, and 28 cwt. 1 qr. 27 lbs. with passengers. The fuel used on the journey was 5 gals. 2 qts., giving a cost of .825d. per mile. The speed both outward and return was up to the legal limit. The speed on the steep portion of Dashwood Hill was 6.45 m.p.h., on the mile including Dashwood Hill 8 m.p.h., and on Aston Hill 9.11 m.p.h. Mr. Donald T. MacNeill, who kindly acted as honorary observer, reports: "Car ran particularly well. She only worked on two cylinders from the thirty-second milestone to thirty-fourth, during which time Dashwood Hill had to be negotiated. It was an absolutely non-stop run."

The Ariel car weighed 19 cwt. 1 qr. 24 lbs. without passengers, and 25 cwt. 0 qrs. 11 lbs. with passengers, and consumed 5 gals. 1 qt. 1 pt. 13 ozs. of spirit, giving a cost of .81d. per mile. The speed both on the outward and return journey was up to the legal limit. The speed on the steep portion of Dashwood Hill was 12.3 m.p.h., on the mile including Dashwood Hill 14.51 m.p.h., and on Aston Hill 15.58 m.p.h. Mr. E. de Wilton, who kindly acted as honorary observer, reports: "One stop on Notting Hill for burst tyre—23m."

Owing to innumerable tyre troubles, the Lanchester car discontinued the run at Dashwood Hill.