

THE AUTOCAR

A Journal published in the interests of the mechanically propelled road carriage.
EDITED BY H. WALTER STANER.

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THE AUTOCAR.

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Notes.

The Future of the Gordon-Bennett Race.

No one for a moment questions the sporting interest of the Gordon-Bennett race, but, as we pointed out many months ago, this race, and, in fact, motor car racing in general, is not having the beneficial effect upon the development of the touring car that it might have with revised racing rules. In the beginning we had the 3½ h.p. racing car, and that was followed by machines only a little more powerful. The power and the speed, however, quickly increased, and at last we had monstrous machines of very high horse-power, nearly as powerful as the racing cars of to-day, but of enormous weight. Indeed, it was generally thought that it was impossible to build exceedingly powerful cars without making them excessively heavy. There-

fore, with a view to preventing the racing machine becoming an absolute monstrosity—a sort of main line express engine with pneumatic tyres—it was decided three years ago to permit no racing car to weigh more than 1,000 kilogrammes (19 cwt. 2 qrs. 16 lbs.), and at that time very few low-powered cars weighed less than this.

It was imagined that this rule would prevent the building of any more monstrously powerful cars. However, it did not. The first year of its operation machines of 70 and 80 h.p. were made within the new limit. They were rather unreliable but another year saw them with slightly increased power and a reliability at least sufficient to enable them to win great races. It will be seen from this that, despite the thousand kilogrammes limit, the improvements made in design, material, and workmanship generally were so marked that the motor engineers achieved in a few months what had been deemed impossible.

There are a few who regard motor racing as a sport and nothing more. They do not care much about what effect it may or may not have upon the touring car, and they are quite content with the racing vehicle as it stands to-day; but the majority of motorists are not satisfied that things should remain as they are. They do not want to hamper the sport of motor racing, but they want it to be conducted on lines that will still continue to teach valuable lessons in motor design and construction, so that the improvements introduced into and tested on the sporting vehicle may be later embodied in the touring type. We do not say that nothing whatever is learned by the construction and driving of 90 h.p. monsters, but we unhesitatingly state that much more would be learned if these machines were a third or preferably one-quarter the power.

The Need for Racing Reform.

There are some people who would like to abolish racing altogether, feeling that it is misunderstood by the public at large, and that its continuance is apt to foster prejudice. There is undoubtedly some truth in this view, but we do not think it is reasonable that so fine a sport should be suppressed when all that is required is reformation. As it is, the building of racing cars is such an expensive undertaking that very few manufacturers consider it, and it is a heavy tax upon the enterprising firms who do take the matter up. It is urged by some that these defenders of the sporting honour of the country from a motor point of view secure a wide publicity in return for their enterprise. They undoubtedly do obtain a certain notoriety, but it is not always of a useful kind; in fact, it is a question whether more harm than good is not done to their reputation should their cars fail in the contests, and in our opinion they stake a great deal and take enormous risks for which they should receive every credit, for without these enterprising makers England would be unrepresented in the great international event.

The real difficulty in reforming is abroad rather than at home. The majority of English motorists, from the time we first advocated new rules which should eliminate

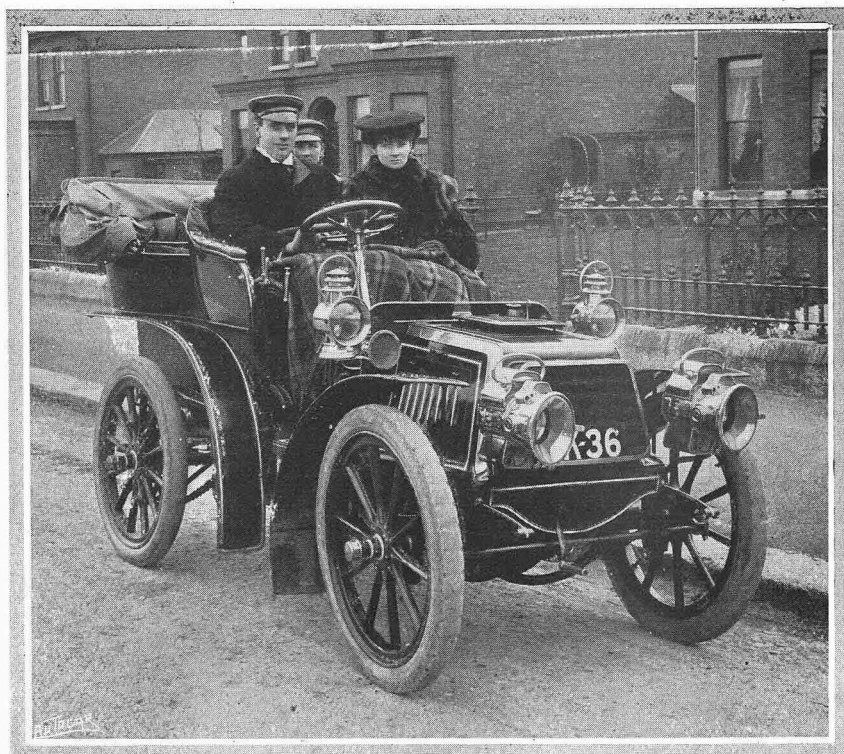
the monster, have endorsed our opinion; but while international races such as the Gordon-Bennett are held it is necessary that the national motor clubs of France and Germany and the other competing countries should agree. Our own Automobile Club will probably make the first move in the matter, and it is at least possible that if Continental clubs do not agree to restriction in the power of racing cars the English club will dissociate itself from international racing, as it cannot consistently take the responsibility for monstrous cars which are not fit for use on ordinary high roads, and at the same time pose as the champion of the law-abiding automobilist.

What is wanted is the cutting down of the power, and the fixing of a minimum weight, so that there will be no possibility of racing cars being made of an unduly flimsy character. We believe that, with a revision of these rules, racing would not only be still more interesting, but it would be much more attractive, and people who are entirely debarred from taking part in it to-day on account of the danger and responsibility involved, would take it up to the benefit of all concerned. The racing car, if it is to have its best effect on the development of the touring car, should be a vehicle which can be driven with pleasure at the legal maximum, and which by the substitution of an ordinary body and a lower gear can be used as a comfortable touring vehicle. This cannot be said of the 90 h.p. monsters.

Courtesies of the Road.

Long ago there was known amongst riders of the old high bicycle that which for lack of a better term was dubbed "the freemasonry of the wheel." It sprang from a feeling of *camaraderie*, provoked mainly by the prejudice and persecution to which the pioneer bicyclists were subjected the length of the country through, and it consisted in a feeling that each and every cyclist encountered merited salute, for the reason that he dared to use the hated wheel, that a man in trouble with a hot head, a detached tyre, or overtaken in a parlous state of physical exhaustion, must never be left on the road. The freemasonry of the wheel demanded and enforced that the lame duckling should be seen through by the limber, and it was often so. In the early days of automobilism—which we may date from so short a while ago as 1896, barely eight years—a similar spirit of mutual help and sympathy dominated all who travelled the road by spirit and steam. To leave even a motor bicyclist stranded by the roadside was an offence which cried to high Heaven, and an incident, if one there could have been found so mean and niding as to have been guilty of it, which would not have come to light in any reminiscently-inclined gathering of automobilists. How one stopped, took Brown's valves out, or stood by Jones in the small

hours of the morning, while he painfully dissected his gear, or laboriously traced and searched for a short in his over-profuse wiring, was quite part of the pastime. Thanks, or no thanks, to the greater reliability of cars and the increased skill and knowledge of drivers, such opportunities of mutual aid and sympathy upon the road grow fewer every day, and it may be that all but the pioneer veterans of the pastime have lost or have never acquired the kin feeling which moves one automatically to outclutch, slow down, and hail the arrested one with a proffer of aid. It is a courtesy of the road that should never pass, but, alas! is now more honoured in the breach than in the observance. The fact was brought closely home to us only during the recent holidays, when, feeling dissatisfied with the pulling of the engine, we stopped on the road between Worthing and Brighton to trifle with ignition and carburetter, with a view to improving. The bonnet was off, and on the ground, we had assumed an ever-useful working smock, and, maybe, looked in for a long job; but nevertheless, and though a score or so cars passed in both directions, they left only their dust and no offer of help. We felt as though some salt of grace had departed from automobile manners, and our thoughts went back to a time when we were discovered, in company with a broken gear fork, in the wilds of Sussex by Mr. Roger Fuller, who, driving a new 10 h.p. Panhard, not only brought us to civilisation, but felt that traditions were outraged because we refused to allow him to tow us some ten miles. It is regrettable that the dutiful feeling of mutual help between automobilists on the road should be allowed to wane. It is pleasant and soothing when stranded to hear the squeal of brakes, the cut-out of the engine, and the cheery hail. Is it serious? Do you want anything? as the strange car slows alongside.



A WELL-KNOWN IRISH AUTOMOBILIST. Sir Valentine and Lady Grace, who are well-known in Dublin society, are both enthusiastic users of the autocar. Sir Valentine has had an extensive knowledge of its use.

USEFUL HINTS AND TIPS.

Adjusting De Dion Gears.

Although the principle and action of the De Dion gear are known thoroughly by many owners, it is frequently a mystery as regards adjustment, except for the simple tightening up of the clutches when slipping. The other contingency calling for adjustment, namely, when the gear handle does not move equally on each side of its free position to engage the two speeds given at its extreme positions, is a somewhat more complicated business, and necessitates a certain amount of knowledge of the gear deeper than that involved by a comprehension of its principle. The cause of the handle moving further to one side than the other is evidently that one clutch has a greater distance through which to expand than the opposite clutch before it comes into contact with its box and grips. If this inequality of motion is to be righted, the one clutch must be expanded and the other contracted until both have to expand through the same distance to grip their respective boxes. To do this, the universal joint at the end of the rack outside the gear box, to which the gear-changing lever from the change-speed lever on the steering column is attached, must be dismantled and the spring catch lifted. (The catches vary in arrangement on models of different dates, but in all cases the action is the same, viz., that of a small bolt dropping into a keyway cut along the rack shaft.) Having lifted the bolt, turn the rack from right to left, *i.e.*, counter clockwise, *six complete turns*, and then, making sure that the keyway is beneath the bolt hole from which the catch has been drawn, pull the rack out as far as it will come. Note should previously have been made as to which way the handle moves too far, and, before dismantling the striking arrangements, the amplitude of the motion of the cap on either side of the line which will be found around the projecting spindle of the gear should have been carefully inspected. Having the rack pulled right out, it should be turned one way or the other, according to the direction in which the cap moves too far for a half revolution—if the difference is small, a full turn; if fairly large, or any amount that may be necessary, proceeding in half turns. The rack should then be pushed in again, *great care being taken to see that a keyway lies beneath the bolt hole*, and, when home, it should be screwed up *six turns*, and the bolt dropped in, and the rack then tried to see if the motion is equal on each side of the free engine line. If it is equal, but too great, the clutches can be tightened further in the usual way, and the striking gear then connected up again.

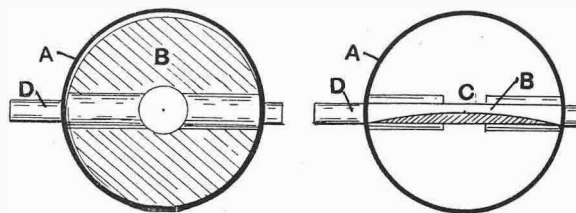
The Theory of the Adjustment.

The theory of the adjustment is briefly this: The rack consists of a right-hand screw or worm and a left-hand one of a fairly coarse pitch, and the two threads meet in a common point, which normally lies between the two clutches. The keyway is cut so that it is in a line with this juncture of the threads, so that, considered as a rack only, it is immaterial whether the thread is right or left-handed in this line. When the rack is turned through the *six revolutions*, its function as a worm comes into play, and the clutches are both contracted; by stopping with the keyway true with the bolt hole, the rack is in its true pitch portion, and may be withdrawn, the withdrawing action bringing both sets of clutch-expanding mechanism on to a single thread, *i.e.*, instead of one set of clutch pinions being on the right-handed portion of the rack and the other

set on the left-handed part, both are on the right-handed thread. When the rack is pulled out as far as it will go, and the adjusting turns given to it, the right-hand thread of the rack acts as a worm, and, gearing with the clutch pinions, revolves them, contracting one clutch and expanding the other. The rack is then pushed in, the clutches expanded by the six clockwise turns of the rack, and, if slack, are adjusted in the ordinary way by turning the rack to expand the clutches equally.

A Governor Improvement.

Under the heading of Governor Setting, we publish on our "Replies to Queries" page a query relating to a governor trouble and our reply thereto. This is one of the many which are replied to through the post, and our correspondent's report on the results following our advice is of interest to many car owners, so that



no excuse is needed for publishing it upon this page. The perforating of the butterfly valve with a small hole, as depicted in the sketch given, makes a wonderful difference in the running of an engine; in fact, in many engines the presence or absence of such a bypass for the mixture makes the difference between a satisfactory and smooth-running motor or a harsh, jerky, and noisy one. It will be noticed, on reading our correspondent's letter printed below, that we recommended a $\frac{1}{16}$ in. hole in the throttle valve, and that our correspondent first tried one a $\frac{1}{4}$ in. in diameter. The larger diameter hole would have been no detriment to the running of the engine, though it would have curtailed the range of action of the governor to a certain extent.

The Result of the Improvement.

The letter reporting the result of acting upon our advice is as follows:

Many thanks for yours of the 15th inst., *re* governor of my Aster engine. The remedy you suggested (that of making a hole in the butterfly throttle) has proved perfectly successful. You suggested a $\frac{1}{16}$ in. hole, but to be on the safe side I tried a $\frac{1}{4}$ in. first, and found that quite cured the jerky action of governor, and has made my car a far pleasanter vehicle to drive. Formerly the car was much inclined to run in jerks. First it would gain speed, then governor would close throttle and engine would be driven by the car for a bit, then throttle would open again, and so on. Now the running is practically uniform, and I can only just tell when the throttle comes into action. I am a person who is never content with any mechanical device unless it is working perfectly, and this governor heating used to annoy me very much.—J. E. L.

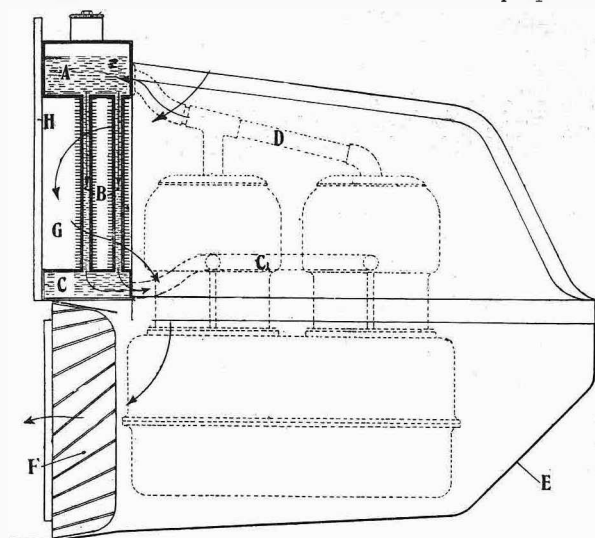
Celluloid Accumulator Cells.

If at the periodical inspection of the accumulator it is noticed that the plates are near or in actual contact with the walls of the celluloid cell, steps should be taken to have the plates reset, as otherwise they have a corrosive effect upon the cell.

THE NEW 14 H.P. RENAULT.

THE FOLLOWING DESCRIPTION DEALS PRINCIPALLY WITH A NOVEL ARRANGEMENT OF THE WATER-COOLING SYSTEM, IN THIS CASE OF THE NATURAL OR THERMO-SYPHON TYPE. THIS ARRANGEMENT HAS MANY PRACTICAL POINTS TO COMMEND IT.

An entirely new type of 14 h.p. car has just been turned out of the works of Messrs. Renault Frères. There are in its mechanism many important variations from the firm's earlier practice, the details of which are illustrated herewith. With regard to the framework and the like no material alterations have been made, and the same applies to the change-speed gear. The principal feature, and one that is entirely novel, is undoubtedly the new position of the radiator. The Renault firm were among the earliest autocar builders to use the thermo-syphon principle of cooling for the water circulation, and this is still retained, though the disposition of the radiator tubes has been very materially altered, as is depicted by the illustrations given herewith. From these it will be seen that the radiator is placed just in front of the dashboard, and apparently close up against it, but an examination of the drawing will show that there is a considerable space G behind the rear tier of tubes and the dashboard proper H.

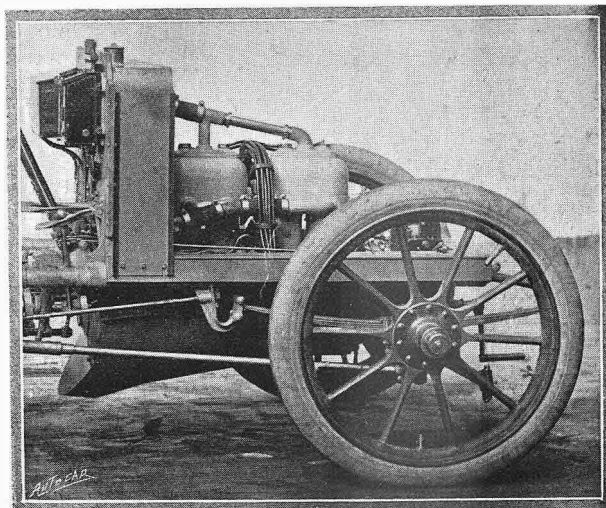


The Renault cooling system.

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| A, top water tank | E, sheet steel apron under the engine |
| B, radiator tubes | F, draught-inducing fan formed in flywheel |
| C, bottom water tank | G, air space behind radiators |
| C1, water delivery pipe to cylinder jackets | H, dashboard |
| D, water return pipe to the tank A | |

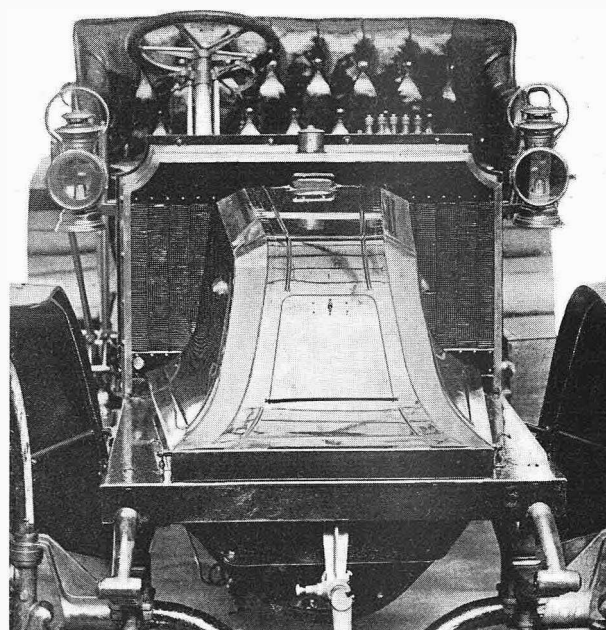
The radiator and water tank are combined, the upper tank A being connected to the lower one C by means of the gilled tubes B. From the lower tank C water is delivered to the bottom of the cylinder jackets through the pipe C1. The water in the cylinder jackets, becoming heated, is lighter than the volume of water which remains in the tank and radiator tubes, and, therefore, it rises from the cylinder jacket and returns to the upper tank A through the pipe D. In order to obtain the necessary draught to keep the air circulating around the gilled tubes while the car is standing, the engine is entirely enclosed by the bonnet as to that part of it which is above the frame, and by a sheet steel apron E as to those parts beneath the frame. The arms of the flywheel F are set at an angle so as to form a fan, the suction from which causes a vacuum to be created within the bonnet, so that the air rushes

in to fill the space from the sides of the radiator and out through the fan-shaped flywheel, as shown by the arrows. The new method for the disposition of the



The front of the 14 h.p. Renault with the bonnet removed showing the greater accessibility to the engine.

tubes now enables the whole of the engine to be readily accessible, as is shown by the photographic reproduction depicting the forward part of the chassis. This gives one of the most readily accessible engines at present constructed, and is a great improvement on the side-placed radiators as previously fitted by this firm. The opening of the inlet valves is regulated by means of a lever placed on the steering wheel, and



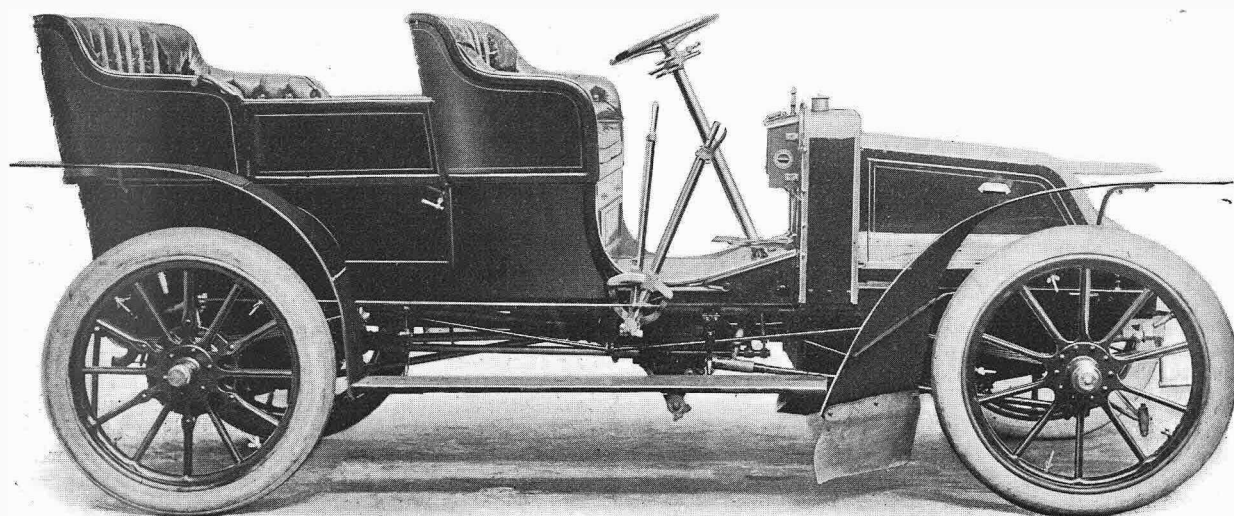
A front view of the car, showing the general appearance of the bonnet and radiator.

this the constructors claim to be one of the causes which contribute to the silent running of the car.

The ignition is by high-tension magneto, employing the usual type of sparking plug; but, in addition to this, the accumulator and coil are also furnished so that one always has a choice of running upon either system of ignition. For our own part we hardly see the necessity of the second ignition system now that the high-tension magneto has proved itself to be reliable and accurate in its functioning. The only advantage which can be claimed is that by the use of the accumulator and coil the engine may be started

by means of a starting switch instead of with the handle, as must be the case with the magneto system.

The new model car has a somewhat wider and longer frame than the former ones, this being narrowed in front in order to permit of the steering wheels having ample room for deflection. At the back the frame is raised and carried on a short transversely-placed spring in order to obtain a more easy suspension. This arrangement, while it detracts somewhat from the speed of the car, allows a great deal more comfort to the passengers, which after all, from the point of view of the majority of autocar users, is more important.



The new 14 h.p. Renault, with side entrance body. This illustration shows the greatly altered appearance of the front of the car.

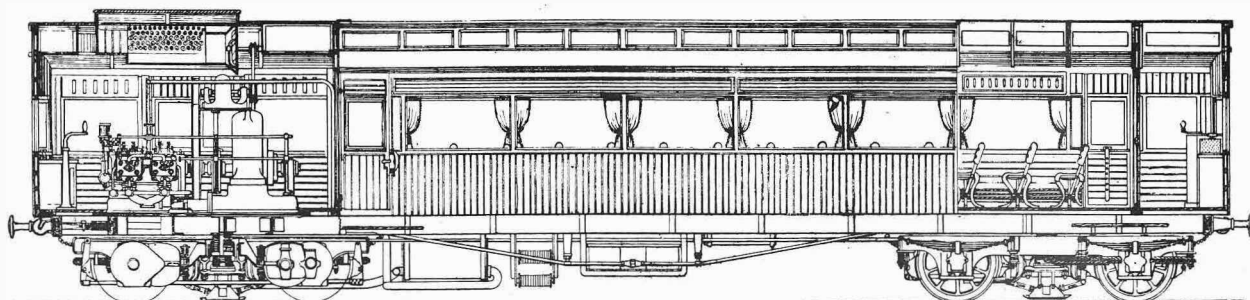
OCCASIONAL GOSSIP. By the Autocrat.

The opinion is often expressed that the average board of directors is not satisfactory for the management of any business which requires very special knowledge, unless a large percentage of the members of the board are practical men, and are acquainted with the particular business with which they are associated as directors. There seems to be a too general opinion that, because a man is, say, a successful lawyer, stock-broker, or merchant, he is qualified to direct the destinies of an engineering or some other undertaking with which he has no practical acquaintance. While I would be the last to even seem to speak disparagingly of commercial ability, I must say that the man who has been successful in one walk of life is, more often than not, a handicap to another business when he is given power in it. He seems to imagine that, because he is a successful man, his methods, which have been satisfactory in his particular line of business can be applied, in fact, must be applied, to every other undertaking, and he is so thoroughly satisfied with himself because he is regarded as a power in his own particular walk of life that he will not listen to anything which runs counter to his former experiences. I was thinking about this matter the other day, and then turned my thoughts to the motor world, and I must confess that if that is taken as an example the average board cannot be regarded as a successful or desirable institution. There are some exceptions, but speaking generally, the companies which have been least successful in the motor world have been those handicapped by a board

of directors, and the larger the board the more unsuccessful the companies have been. The kind of board which does well is the small one, so long as there is a clever capable works manager and a good general manager. If both of these are strong men and the board is not an obstinate one, with all sorts of old-fashioned ideas, acquired in other professions or businesses, the company is fortunate and likely to be successful.

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I am entirely in accord with Mr. Julian Orde's resolve to reserve the club garage on the 16th after mid-day solely to the Inspection and Weighing Committee and those gentlemen intimately connected with the eleven cars submitted for the eliminating tests. The club garage is by no means spacious, and what with some dozen and a half officials, the legitimate car people, and the cars, the weighing floor was quite sufficiently congested without a crowd of daily press representatives, whose presence certainly would not have expedited matters. If the leading lights of the A.C.G.B. & I. cannot be expected to carry out their duties honestly and intelligently without the aid and scrutiny of the press, then the sooner others are elected in their places the better. All but one representative of the automobile press concurred with Mr. Orde's resolve; but the remarks of the *Pall Mall* representative in the Monday issue of that usually reasonable journal would seem to suggest that the club officials would not be likely or anxious to detect empty



THE NORTH-EASTERN RAILWAY AUTOCARS. This illustration depicts the general arrangement of the N.E.R. Electric Autocar 3171. The Wolsley petrol motor is of the horizontal cylinder type giving 30 b.h.p. This is coupled direct to a dynamo giving current to the electric motors driving the bogie wheels. The control is similar to that of a tramcar, the motor driving the dynamo at a constant speed irrespective of the speed of the car. A smaller dynamo acts as an exciter for the larger one, and also gives current for lighting. Electro-magnetic brakes are used; the shoes which act upon the rails are seen in the drawing. The cars provide accommodation for fifty-two passengers, and are from the designs of Mr. Wilson Worsdell, the chief mechanical engineer of the N.E.R. Co.

gear boxes unless the *Pall Mall* man was handy to prod round with a stick. I have the greatest admiration for the enterprise of the daily press, but I think the inferences which are occasionally made therein when their reporters are refused admittance to some function are absurd. Privacy does not necessarily mean dishonesty.

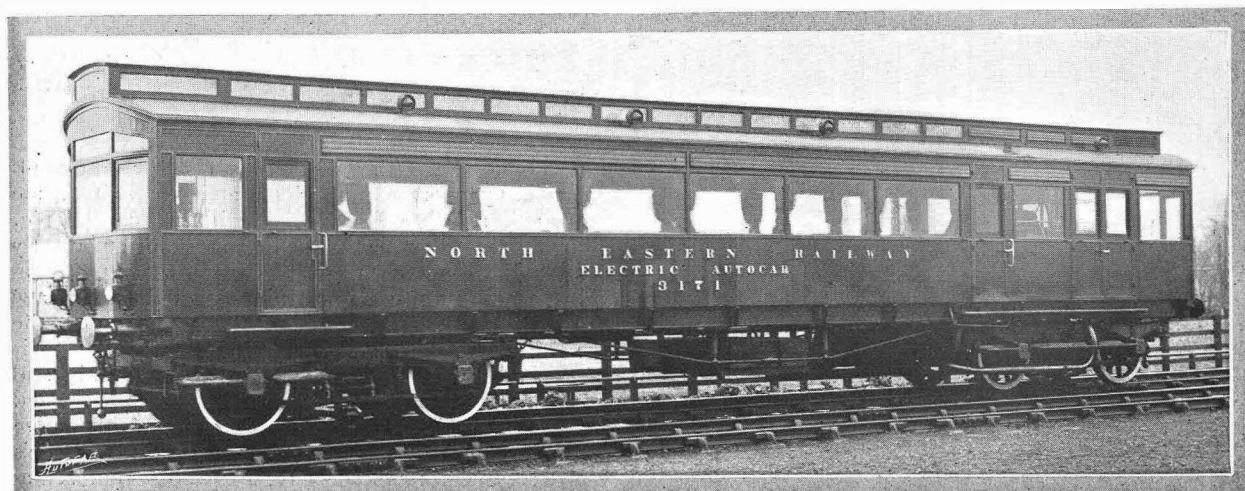
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I cannot understand why the Hon. C. S. Rolls is not given as one of the drivers of one of the Gordon-Bennett cars in the eliminating trials and the race itself. When one recollects the experience that Mr. Rolls has enjoyed in automobile racing on the Continent, it strikes one as curious that he should be passed over for men who have never been heard of in connection with speed events of the kind. As a matter of fact, Mr. Rolls was only debarred from driving in last year's Gordon-Bennett by a bit of hard luck, due to the unconsidered effect of the rules framed for the governance of the all too insufficient flying kilometre trials at Welbeck. These rules made the selection of the third Gordon-Bennett driver entirely dependent upon the behaviour of the particular car driver in the above mentioned scurries, and, altogether independent of his known and proved skill in handling crack racing cars. It will be remembered that Mr. Rolls did actually make the fastest downward trip at Welbeck, and the fastest time in the subsequent "top-o'th'mornin'" hill climb up Dashwood Hill; but, nevertheless, he and not the Napier car he drove was penalised for the time occupied

in putting in a fresh induction valve for one that was not quite satisfactory. It is well known that Mr. Rolls was asked to drive one of the Mercedes cars early last year, and might have been on the winning vehicle if the fire at the Cannstatt Works had not destroyed the cars in special construction for last year's race. The quaint part about the whole thing is that, although Mr. Rolls was ruled out by the rule, I believe I am right in saying that the car he drove in the eliminating trials started in the race itself.

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It is gratifying to learn that the club, spurred by the recommendation of the new Industrial Committee, is at last going to attempt something in connection with inconsiderate driving. If nomenclature goes for anything the proposed action should prove a considerable deterrent. Whenever any misbehaviour of the kind is reported to 119, Piccadilly, the matter will be taken into serious consideration by a court of inquiry, consisting of the chairman and the three vice-chairmen, who, after due examination of such facts as may be put before them, will report to the club committee upon the complaint laid or made. What the action of the committee thereafter may be remains to be seen, but in the case of club members, if the offence is not too flagrant, one warning should suffice. When non-members are concerned, and the case is a bad one, it might prove wholesome if the police were communicated with. Anyway something must be done before public indignation reaches fever-heat.



THE NORTH-EASTERN RAILWAY AUTOCARS. Vehicles which run upon rails are, generally speaking, outside the province of "The Autocar," but the vehicle illustrated above is particularly interesting to automobilists, as its prime mover is a petrol motor built by the Wolsley Tool and Motor Co., of Birmingham. The car is of the bogie saloon type divided into three compartments, the one end compartment containing the motor, dynamo, etc., the centre being the passenger portion, while the opposite end contains a duplicate control gear so that the car may be driven from either end.

THE ECONOMICAL DESIGN OF CARS.

By F. Strickland.

While there has been a great deal written about the cheapening of cars by making them in large quantities and standardising them, there has been very little discussion as to the effect of design on cost. Yet it is at least as important as the other, and if in future cars are to pay the manufacturer and sell at reasonable prices it will be necessary not only to make them in large quantities in well laid-out factories, but also to pay great attention to the design, so that it can be made conveniently in repetition machines and assembled with a minimum of hand work. This is a subject which is of certain interest to the buyer as well as to the maker, as it is evident that if one car is of a more expensive design than the other it will either have to be sold at a higher price or else the work in it will have to be of an inferior character. As most men's purses are more or less limited, this is a matter of consideration. If, for instance, such an extra expense makes the car worth more to the purchaser, it is all right, but, if not, then it is simply of inferior design.

So far the study of cars gives one the idea that there are very few in which this has been made a systematic study, as it is in the case of the older industries, and this is only natural. The industry is only in its infancy, and the makers who have constructed really successful cars have not had to consider the amount they cost very much, as they could sell them at good prices. This has been the case in other trades, such as the cycle and the electric trades, but some day there comes a time when there are a great many machines in the market, and it is only those who give their customers the best value for the money they can who survive. This is the stage that the motor car trade is coming to. There are now a great many firms which are putting on the market quite excellent cars at prices much below what was current for articles not so good two or three years ago, and the advance in design is shown by the very small prices which such cars sell at now, even when they are in quite good condition. Nevertheless, it struck me when at both the shows that there was a good deal to be done yet in the way of systematic study in this direction. If we take other machines that have got to their bearings, so to speak, we find that each individual part has been thoroughly thought out to see in what manner it could be possibly made cheapest to give the desired result. Everything has, so far as possible, been simplified, and all machine work has been arranged so as to come as convenient as possible to the machine, and so as to go together as far as possible without hand fitting. In order to do this, parts are designed over and over again in different ways to see if, say, ten per cent. cannot be saved in their cost, and leave them equally useful.

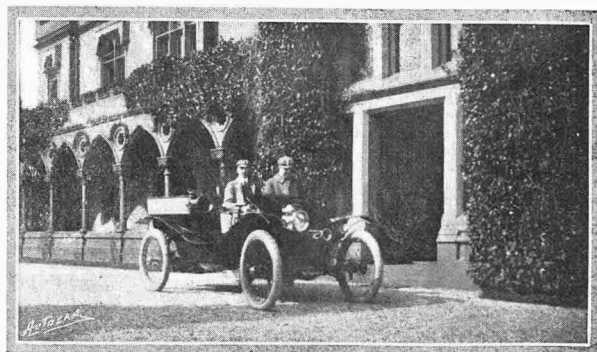
It is impossible in the limit of an article to go into all details, but one may mention a few instances. One great improvement in the chain-driven cars is the connecting the gear box with the motor by a flexible coupling, so that it is not a matter of such vital importance that the two shafts should be mathematically in line. This cheapens the erecting a great deal, as it is very troublesome getting the gear box and engine into line, and it is at the same time a better job, as it is always possible that the frame will give slightly afterwards. On gear-driven cars the plan used in the 12 h.p. New Orleans of connecting the motor and gear box with a faced connecting piece seems good, as this

can be machined right, and holds the two in line, both while being fitted in and afterwards.

In frame construction, there is a great diversity. Some frames seem to have as much work put into them as possible, and one does not see that there is the very slightest advantage in it to the customer whatever. On the other hand, the New Orleans, Benz, and Argyl frames are very simple and cheap to make, and appear to be at least as good as the more complicated ones—in fact, to my mind, better, as there are fewer joints to come loose, and, being simpler, they can be made more substantial for the same total weight.

In gear cases, there is a great difference in construction without apparently any advantages in the case of the more costly constructions. Darracq, for instance, does not split his gear box on the line of the shafting, thereby saving two machined faces and a joint. On the other hand, some gear boxes are split in two places or more. Now, each of these joints means two more machined faces, and, so far from being any advantage, in many cases it seems only an extra weight and chance of oil leakage.

In the motors themselves, the cost is made up of details and the arrangement of the parts for convenient machining. Some motors have a regular clock of gear wheels, with shafts running all about the place, each of which has to be turned and each wheel cut; some are much simpler. Some engines have a simple bedplate, with facings so arranged that they can be machined at a few settings; some, on the other hand, have facings at all sorts of odd angles, and little bits stuck on everywhere. One engine exhibited by Clément a year ago had, I believe, fourteen gear wheels in the engine and six countershafts. Yet it was not as satisfactory as other designs much cheaper to make. It is no excuse for an expensive design, "Oh, it only costs a few shillings more." Very likely; but the whole of a car is built up of bits no one of which costs more than a few shillings, yet the whole sells for several hundred pounds. Now, if we take a car that sells at, say, £500 without tyres and body, and by careful study can make each part that costs 5s. cost 4s., and so on in the same proportion all through, we reduce the cost of the car by twenty per cent., and can sell it at £400 and still make the same profit. This is a very substantial reduction. I do not the least say that the cheapest method of construction should always be followed, but care should be taken in the design to see that the best value is had for the money.



One of the new 18 h.p. water-cooled Lanchesters which was recently despatched to its owner, Capt. La Terriere, of Totton, Hants.

THE ACCESSORIES OF A MOTOR CAR.

By Lieut. W. Windham.

IN THE FOLLOWING ARTICLE I SHALL TRY AND DESCRIBE THE DIFFERENT PARTS OF A MOTOR CAR WHICH ARE ESSENTIAL TO ITS COMPLETMENT, BUT WHICH AS A RULE ARE LEFT BY THE MAKER OF A CAR FOR THE BUYER TO CHOOSE HIMSELF. AS THERE ARE SO MANY DIFFERENT PATTERNS TO SELECT FROM, I SHALL PICK OUT WHAT I CONSIDER THE BEST, AND GIVE MY REASONS FOR SO DOING.

Acetelyne Lamps.

The best lamps are those fitted with separate generators. They usually cost more, the reason for this being that if fitted separately the light usually burns much better, the generator is easier to clean, and if fitted to the dashboard the light can be turned out without alighting from the car, besides being much safer. The latest idea of a lamp, which is by far the best I have seen, is rightly called the "Alpha." It has a kind of "bull's-eye" glass in the centre of the lamp suspended by three brass stays. An ordinary thick glass is placed in front of the "bull's-eye," the idea of the two glasses being that the bull's-eye shall light up the path of the car and the other the sides of the road.

In choosing a lamp, do not buy one with numbers of nuts, bolts, rivets, pipes, handles, etc., as it is next to impossible to clean them. The "Alpha" has small brass legs to stand upon, which is very useful when taking it down to clean, etc., and it is one of the few lamps on the market so fitted.

The Bleriot (genuine pattern) I have found very good, only the cut glass projects slightly beyond the lamp, and is very likely to get broken or chipped. Generators, as a rule, give some trouble, and in most cases are very unreliable. That of the Bleriot is very good, but prepared carbide, as supplied by the makers, must be used, and it must be remembered that in order to keep this lamp alight special carbide must be used; then put a small piece of ordinary carbide in the

small box on the top, which acts as a condenser; and lastly, keep the generator clean.

Lamps should not project in front of the car, otherwise they are certain to get smashed sooner or later, especially if the car is used in traffic, as cabs, etc., have a habit of backing into them; also, if fitted low down, the chauffeur often uses them as a purchase to his unused hand when starting up the engine, instead of putting his hand on the front spring.

There are many ideas and places for fixing lamps. The best I find is on the dashboard, especially if the lamp is fitted with a pivot bracket and a handle which allows the lamp to be turned in any direction to see, for example, the name on a signpost, etc.

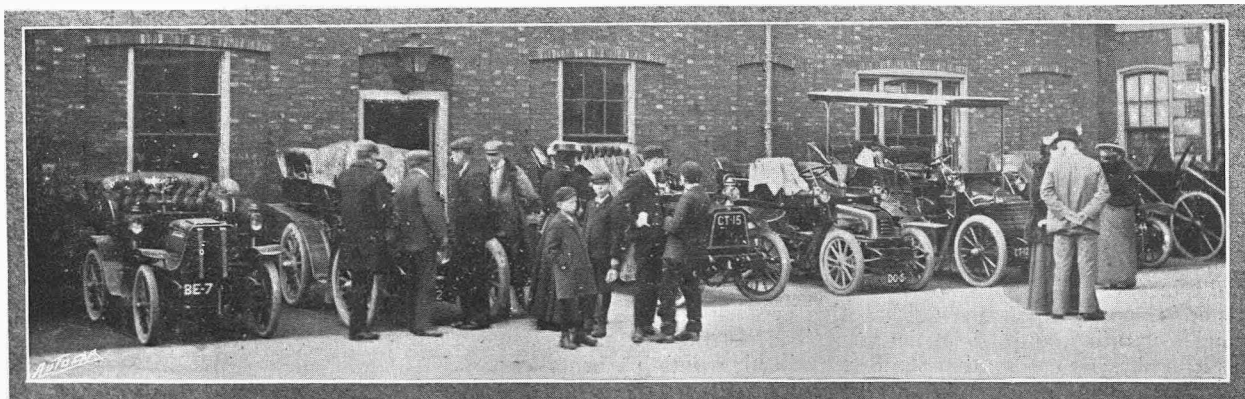
When fixing the generator, put it as far to the side of the car as possible and not under the seat, so that if it is inclined to smell the fumes will pass to the side of the car and not in one's face.

Side Lamps.

There are so many kinds of these used that it is impossible to definitely say which are the best. The Ducellier is largely used, partly because it is the cheapest. Personally, I do not know of a single good side lamp in the market! They all have the same faults, a few of these being: The glasses badly fixed, so that they break; usually they are too tight (which causes them to crack), or too loose (which causes them to rattle); the bottom part tumbles off from not having proper fastenings; the wicks shake down from the vibration; they are so small inside that it is im-



The Beaconsfield terminus of the Great Western Railway Co.'s Slough-Beaconsfield motor 'bus' service. A suitable shelter for one of the cars has been found at the Royal Hotel.



THE LINCOLNSHIRE A.C. MEET AT GRANTHAM ON APRIL 21st. Some of the cars outside the George Hotel.

possible to clean them properly; the lamps seldom fit the bracket without tightening screws, etc.; the glasses fitted are not powerful enough to give sufficient light.

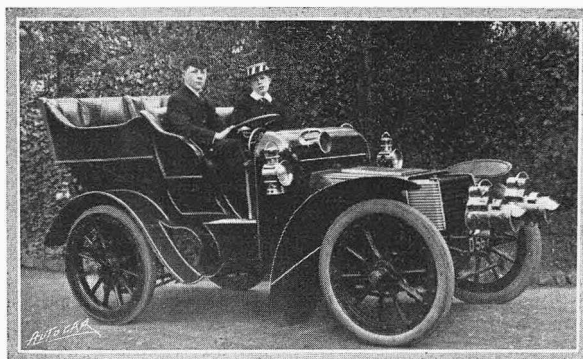
My own idea of what a lamp should be is one that is made without a separate oil well fitted, with two non-destroyable asbestos wicks, a hole with a screw cap fitted in the side of the oil well for putting in oil without taking the lamp to pieces, a lighting door to prevent opening the front glass, the glass to be made thicker so that the wicks, etc., cannot be seen from the outside, with a shade of about 3in. over the top of the glass and rim, round the side, the bracket and socket for fixing the lamp to be wedge-shaped without any nuts or screws whatsoever, and, finally, the length of the lamp to be at least 10in. from back to front, fitted with a handle for carrying purposes.

Petrol Funnels.

Great care should be used in choosing these. The gauze ought to be sufficiently fine to hold water! Many users of steam cars in these days use the petrol tins to carry water in; consequently the water finds its way into one's carburetter, if not detected. Also when raining the water settles on the top of the tin and runs in with the petrol into the tank, and from the

quality. I have found the Britannia Rubber Works, of Cannon Street, supply an excellent quality at a very reasonable price. It will look nice to have the mats whitened every morning with a little "Blanco"; this makes them look smart and clean.

I cannot lay too much stress on having the mats to fit close up to the dashboard. It not only helps to keep the wet from the electrical wires and machinery if raining, but prevents the wind blowing through the



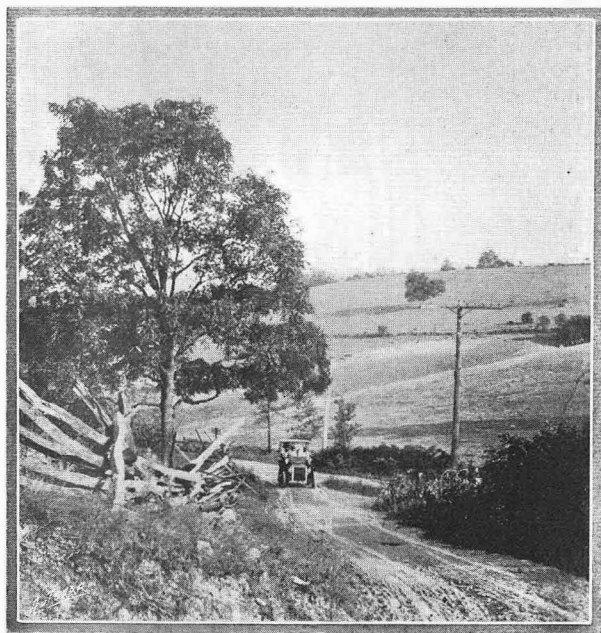
YOUTHFUL TOURISTS. During the Easter holidays, Masters R. and W. Woodward, of Marlborough College, and Tonbridge School respectively, accompanied by a mechanic, covered over 800 miles in a 22 h.p. Daimler, visiting the following counties during their tour: Kent, Surrey, Sussex, Middlesex, Wilts, Berks, Northampton, Warwick, Derby, Chester, Herts, and Lancashire.

various joints and holes, which tends to make the feet very cold, especially in winter. When sending paper patterns, be sure to remember to mark the side uppermost as the "top," as both sides of the rubber are not the same.

A strip of rubber may be fitted with advantage under the bonnet where it takes the wood. This helps to considerably deaden the vibration and the noise.

Jacks.

Every motorist should possess two jacks—one to carry on his car and one for the motor house. The sort I recommend to be carried is, for choice, made light. The body should be pretty solid, as it is not always an easy matter on a rough road to get the jack placed perpendicularly under the car. Some cheaper sorts I find, which are made of cast-iron and hollow in the centre, snap very easily, and are not to be trusted. The top should be made to revolve. The best sort for use in the motor house, for raising the wheels, etc., for



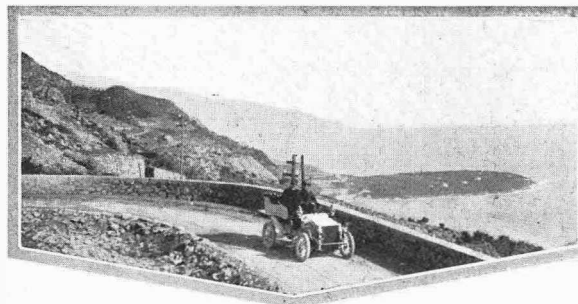
MOTORING IN AMERICA. A country road in the oil regions of Pennsylvania. The car about to tackle the hill is a White steamer.

water being heavier than petrol it runs straight into the carburetter. To prevent this, use a proper strainer to test it. Put half an inch of water in the strainer above the gauze; if it runs through it is no good, and should be discarded at once. Do not buy one with too thin a neck. The reason for this is that the mouth of the petrol tin has been made larger, but the petrol funnel remains unaltered. Cut off any of the spout part which is not wanted, as this is usually made too long.

Rubber Mats.

The mats on a car should be cut to fit exactly—not like most of the cars are fitted. The best way to do this is to make a pattern out of brown paper, cutting it so that it fits right over the flooring in one piece. Holes should then be made for any pipes, etc., with a slit to allow the pipe to be put into the hole.

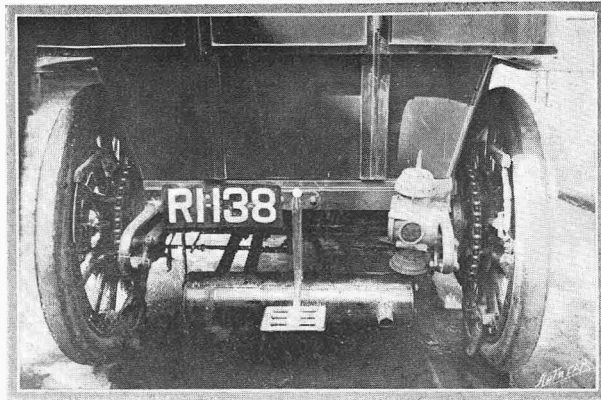
Rubber matting is sold by weight, according to the



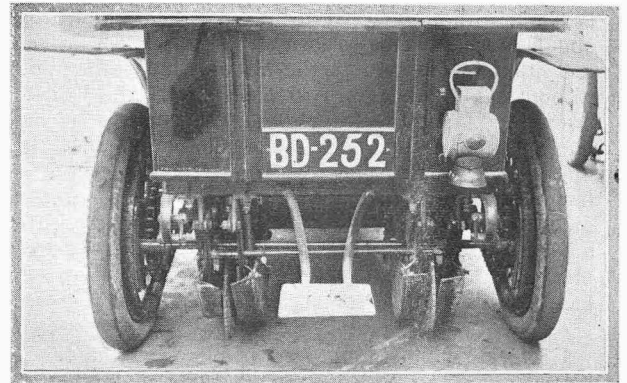
AN ITALIAN COAST VIEW. A drive along the Italian coast, not many miles from Rome. The car seen in this view is also a White steamer.

washing, should have a long handle, so that it will not be necessary to get under the car every time to place it in position. It should be made telescopic, so that it can be at once adjusted to any height before screwing it up. (To be continued.)

THE NON-SKID TRIALS.



The Nicholson anti-skid



The Hunt anti-skid,

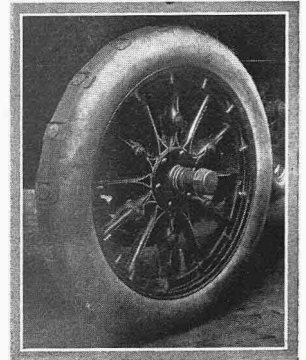
Before these words see the light all the cars entered with non-skidding devices, with the exception of No. 4 (Edwards) and No. 9 (Jenkinson)—the former not going out after the third day, and the latter stopping at Nottingham owing to trouble in its non-skidding fittings—will have completed a total distance of 850 odd miles, a mileage esteemed sufficient to test the wearing qualities of the devices. We are informed that the leather of the device attached to No. 4 car gave out in the early part of last week, while the copper wire fixing the leather cover of No. 9 was found to be failing and to have damaged the tyre itself, when the car reached Nottingham. No. 7 (Vivian) broke a crankshaft on Monday at Newbury at 12.30, but the driver and the car's crew had repaired by 1.30 a.m. the following day



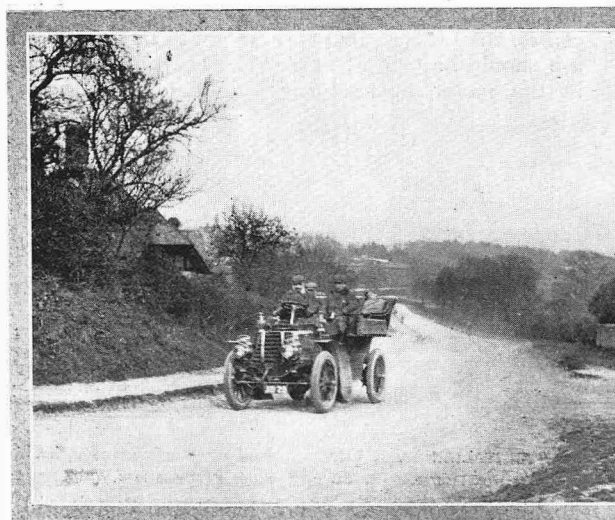
The Billet anti-skid.

(thirteen hours in all), and finished the trip by nine the same morning, being ready to start punctually for the next day's run. This was not the end of No. 7's misfortunes. On Saturday, when six miles from Kettering, a large dog, which was seen lying apparently asleep by the roadside, suddenly leapt to its feet and charged right on the car as the vehicle was passing, with the result that the steering wheels swung round, and the car turned over on its side with its wheels in the ditch, and two of the occupants underneath. Mr. Thomas Ry-

land, the honorary observer, who was travelling as a passenger, was rather badly cut, but the observer on duty stuck to the car the whole time. Mr. Hunt, an entrant of one of the devices who hails from Kettering,



The Butler anti-skid



THE SIDE SLIP TRIALS. One of the competitors at the summit of Hatton Hill, Warwickshire, between Warwick and Birmingham. This was on the fourth day's run to Birmingham via Banbury. The surprising descent of Edge Hill was avoided in favour of the Warrington route.



Climbing the hill out of Coventry on the old Leicester Road. Two of the "three tall spires" for which the place is famed will be seen in the distance. The car is a 10 h.p. Service vehicle, fitted with the Billet device—a detachable leather cover with steel studs.

and owns a motor establishment there, sent up a lorry to take back the damaged car, having previously most generously despatched lunch to those who stood by the vehicle until assistance arrived. Happily, no one was seriously hurt. The dog it was that died. On Thursday last the judges made an inspection of the various devices after their long trip, with a view to forming opinions as to the effect that 850 odd miles of give and take road had had upon them.

The absorption of power test was fixed for Friday, 29th, on a hill in the vicinity of London, and on Saturday, May 7, the actual side-slip tests for wood pavement, plentifully covered with "slurry," will be made at the Clément-Falbot Works, Ladbroke Grove. Admission here will be by ticket only.

Mr. W. Maitland Edwards explains in regard to his device (No. 4) that it so happened that his own car broke down at the last moment, and Mr. Eadie very kindly lent him a Royal Enfield car, which went through the trials admirably, but the tyres were smaller than the tyres for which Mr. Edwards had made his non-skids, so that he had to hurriedly rush through a pair of other covers to fit these smaller tyres in about three hours, with the result that they were so imperfectly constructed that they would not stand the wear and tear on the road that they were required to do. Thus, it will be seen that the reason of withdrawal was simply faults which could hardly have been avoided in the very hurried construction of the device, and had nothing to do with the design.



The competitors in the side-slip trials ready to leave the Locomobile Garage on one of their daily test runs.

A 2,000 MILES RUN.

On Saturday night last Mr. Cecil Edge left 14, New Burlington Street, at midnight, for a run to the Automobile Club, Piccadilly, *via* Land's End, John-o'-Groat's, and Brighton, on a 15 h.p. four-cylinder Napier. This drive is not being undertaken for simple reliability, as was Mr. Glidden's drive last year to the Arctic Circle, but is being undertaken specifically to try under the most severe conditions the new synchronised Napier ignition, carburetter, and the new system of building up a copper cylinder water-jacket by an electrical process. Mr. Cecil Edge will be relieved at the wheel from time to time by Mr. J. C. Cundy, but both will remain on the car throughout the journey. We are informed the trial is in no sense a speed competition, but purely one to test the various parts of the car in a

manner that if it is possible to make them fail they will do so. They will be run without attention from start to finish.

Up to the time of going to press we have received the following telegrams, which record the events of the journey:

Penzance, Sunday, 24th. 2.55 p.m. Land's End non-stop, no accident, weather lovely, everybody satisfied, hope to complete 550 miles before midnight.

Exeter, Sunday, 24th. 6.35 p.m. Land's End 1.15, two hours ahead of time. Exeter, return, 6.45, two and a half hours ahead. Non-stop throughout, no trouble of any kind.

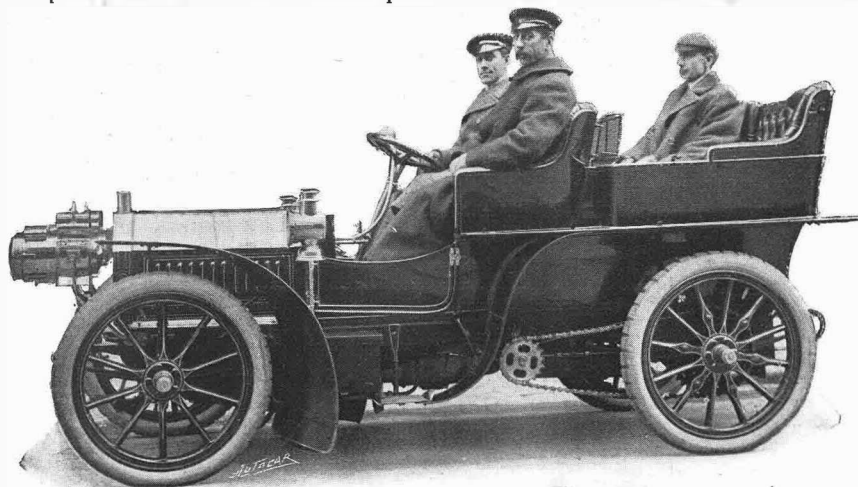
Warrington, Monday, 25th. 7.35 a.m. Six hundred and fifty miles non-stop, weather bad after Bristol, prospects improving.

Kendal, Monday, 25th, 11.39 a.m. Kendal 11.30, 722 miles non-stop.

Lanark, Monday, 25th, 6.7 p.m. Progress still good. Lanark 5 o'clock; engine never stopped.

Perth, Monday, 25th, 9 p.m. Perth 8.10 p.m., 1 hour 40 minutes ahead schedule, still running splendidly, hope to fetch Groat's same conditions, head-wind and very cold.

Wick, Tuesday, 26th, 2.22 p.m. Arrived Groat's 11.45 a.m. third morning. Run 1,091½ miles non-stop in 54 hours gross time. Land's End to John-o'-Groat's 45½ hours gross, 39 hours net; weather wretched, last part of road very bad, expect to reach London Wednesday evening.



Mr. Cecil Edge and Mr. F. G. Grundy (drivers), and Mr. Douglas Miller (observer) on the 15 h.p. Napier which is at the time of writing on its 2,000 miles journey.

CONTINENTAL NOTES AND NEWS.

The French Eliminating Trials.

Most of the powerful cars which we shall see struggling together on the 20th of May next have already been out on the road and made their first trials. The Georges-Richard-Brasier has been from Paris to Nice and back. The Gobron-Brillié was triumphant at the Nice races. The car which the

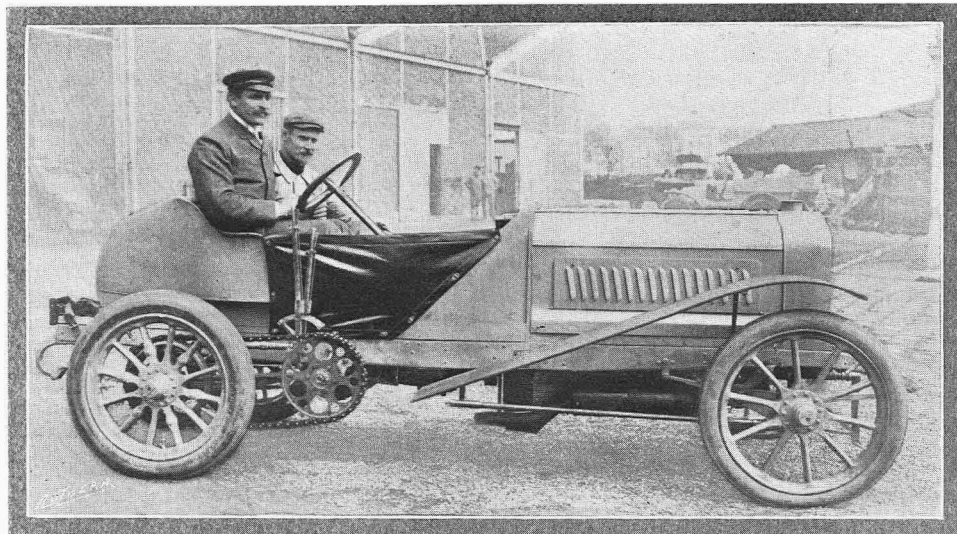
automobilists can go to see the start of the race: Vouziers is eight kilometres from it, Pauvres six kilometres, Bourcq three kilometres, Courcelles-Chaumont two kilometres, Reithel twenty-one kilometres, and Attigny ten kilometres. Those who do not care to see the start might sleep at Charleville, and from Charleville could go in the morning to Flize or to Boulzicourt, both of which are situated some eight kilometres from Charleville, the two stretches of road where great speeds should be attained.

At the last meeting of the Racing Committee of the Automobile Club, the report of M. Taupier on the arrangements to be taken for the eliminating trials was considered by the committee. It was also decided to increase the number of neutralisations according to the request of the Minister of the Interior. There will be an official timekeeper at each neutralised point, and therefore

it is probable that Belgian timekeepers will assist the French ones.

The Cup in Germany.

The German Automobile Club is going to erect stands along the route of the Gordon-Bennett cup race on the Taunus. The principal stands will be placed at the start and at the finish, and will be able to accommodate 3,000 people. There are boxes for four people and for six people, and also single places. The price

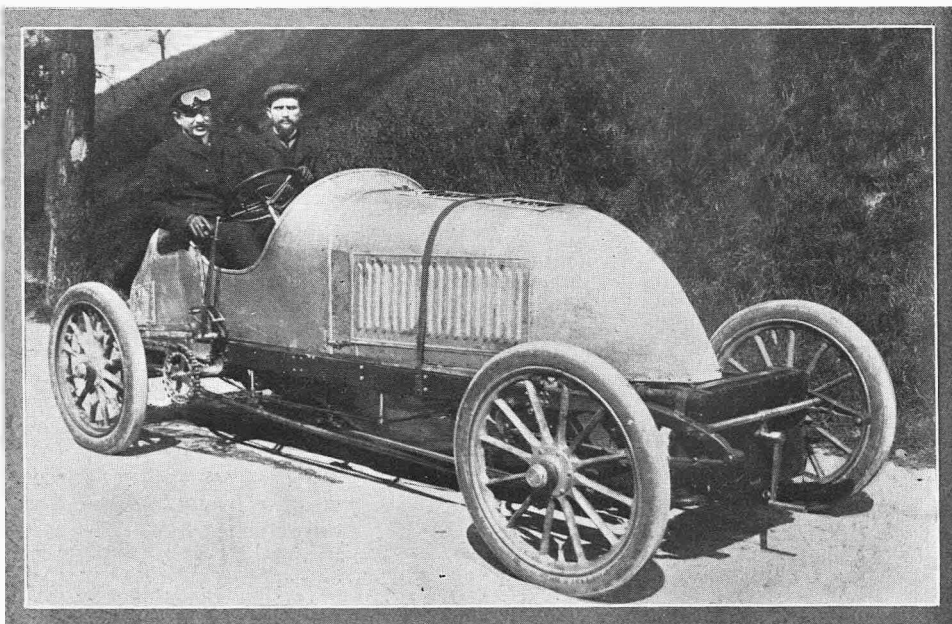


One of the Georges-Richard-Brasier cars to compete in the French Gordon-Bennett eliminating trials.

Hotchkiss Co. are preparing for the eliminating trials was on the roads last week, and if we are to judge of the first speed test to which it has been put, the Hotchkiss car will be a serious competitor in the race. It has a big four-cylinder motor of 100 h.p., which has actually given 106 h.p. on the brake. The car is built like a torpedo, with an aluminium bonnet and a radiator underneath it. The car is very long and measures 9.8ft. between the axles. The motor is well back. It is not placed in front of the chassis, but nearer the centre, and the driver is right over the back axle with a long inclined steering pillar. Speaking from a mechanical point of view, the chassis is really a marvel, the light and strong parts being combined in such a manner as to make it look quite rakish. It does not partake of the monster, and on its first run it started easily and ran at all speeds for a couple of hours without the slightest accident, under the able direction of Henry Fournier.

Where to see the Trials.

The following are some of the points where



M. Fournier at the wheel of the new 100 h.p. Hotchkiss car, built for the French Gordon-Bennett eliminating trials.

of each place has been fixed at fifty marks, approximately £2 10s. There will be further stands where the price will be twenty marks, and places beside the road which will be let for five marks.

The Panhard & Levassor G.B. Cars.

It seems that the Panhard and Levassor cars which are being prepared for the eliminating trials will be driven by live axles and not by chains. This is a great departure for the firm of Panhard and Levassor who have always been the apostles of the chain, but if this firm has instituted the cardan in this case, it is because the two chain pinions would have been of equal size, and therefore it is considered advisable to dispense with the chain, as the speed of the cardan shaft and the differential shaft will be the same, and there will be practically no loss in transmission.

The Touring Competition from Nice to Rome.

We have already spoken of a touring competition being organised by *La France Automobile* from Nice to Rome. The different stages covered are the following: Nice to Turin, Turin to Milan, Milan to Bologna, Bologna to Florence, Florence to Prouse, Prouse to Rome.

There have, unfortunately, not been many competitors in this trial. Before the trials commenced there was a trial of consumption and brake power, in which five cars presented themselves and started on a journey from Nice to Mentone and back, over eighty-four kilometres. The first hill-climbing trial took place on the Col de Brano, and the second on the Castillon hill, and the brake trial took place just by the Col de Nice.

The following were the results: In the consumption trial De Dietrich consumed 18 litres 400, Passy-Thellier 11 litres 350. Petrolelectric car 21 litres 480.

In the brake trial the following were the results: Gabriel (De Dietrich) stopped his car in 23 metres 30, Delétang (Passy-Thellier) in 18 metres, and Krieger (petrolelectric) in 24 metres.

There was a special competition for the short turning capacity of the cars with the following result:

	First turn.	Second turn
Gabriel (De Dietrich) ...	12m. 29	13m. 32
Delétang (Passy-Thellier) ...	10m.	11m.
Krieger (Petrolelectric) ...	11m. 50	12m. 55
Pineau (Barre) ...	10m. 17	11m. 82
Meons (Germain) ...	14m. 17	17m. 15
Chalanson ...	11m. 75	12m. 59

In this trial the competitors had to turn the car completely round, first in one direction and then in the other. Only three competitors left Nice for Rome on account of the bad state of the weather. Note.—One metre equals 3.280ft.

The Automobile Week at Bordeaux.

We have had the Cannes week, the Nice week, and the Monaco week, and now we are to have the Bordeaux week. Bordeaux is a great sporting centre, and many are the automobilists to be found there. They are holding in the beginning of the month of May competitions which will be of a certain importance if we are to judge by the different trials detailed in the programme, which is as follows:

First day (Sunday, May 8th).—Automobile boat races.

Second day (Monday, May 9th).—Touring competition and excursion to Médoc.

Third day (Tuesday, May 10th).—Touring competition and excursion to Sauternes.

Fourth day (Wednesday, May 11th).—Exhibition of cars and model flying machines.

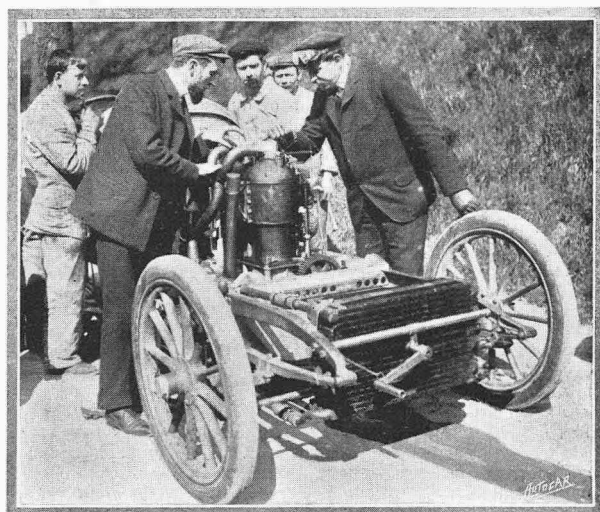
Fifth day (Thursday, May 12th).—Competition for aerostatic machines, kites, etc., and on this day ten balloons will make ascents.

Sixth and seventh days (Friday, May 13th, and Saturday, May 14th).—Trials of heavy vehicles, lorries, delivery waggons, and omnibuses.

The Alcohol Exhibition at Vienna.

Last week at Vienna the great international exhibition of alcohol was inaugurated. This exhibition has two sections which particularly interest us—the section for automobiles and that for fixed motors.

Every day brings some new improvement in the application of alcohol to motors and to automobiles. It will therefore be understood that this exhibition has its importance in the motor industry. Already in France the different alcohol competitions, the "Critérium de l'alcool," the "Circuit du Nord," and the race from Paris to Roubaix attracted great attention and showed that really interesting results can be produced with alcohol. No doubt the Vienna exhibition will help to popularise this new fuel, which proved so useful to Rigolly in his speed trials at Nice, where,



M. Henri Fournier examining his new 100 h.p. Hotchkiss engine

with alcohol as a fuel, he exceeded 150 kilometres an hour and made a world's record. It was useful also at the meeting of the motor boats at Monaco, where it obtained several brilliant successes.

There will be three competitions, namely, a consumption trial, a hill-climbing trial, and a competition for industrial waggons. Amongst the French firms exhibiting at Vienna are the following: C.G.V., Serpollet, Renault, De Dion, Mors, De Dietrich, Clément, Panhard and Levassor, Darracq, Chaboché, Peugeot, Krieger, Dupressoir, Brouhot, Gobron-Brillié, Tony Huber, and Dalifol.

The Paul Meyan Automobile Boat Cup.

At the end of the meeting of automobile boats at Monaco the Paul Meyan cup was competed for. It was reserved to boats of less than twelve metres. There were eight boats entered, but only two came up to scratch, and the victory was gained by the cruiser "Vas-y" (Delahaye motor), which beat the "France" and covered the 100 kilometres in 3h. 55m. 40s.

The Baron De Caters will attack the world's record at Ostend shortly on a 90 h.p. Mercedes, which will afterwards be shown in the Salon of Antwerp.

CORRESPONDENCE.

EDITORIAL NOTICES.

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

Letters of a personal nature will be withheld.

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

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

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

RECKLESS DRIVING.

[8720].—I think the sentiments of "M 404" re furious driving are felt by a large number of automobilists, and I quite agree with him that the treatment that motorists receive, not only from farmers but from gentlemen, is extremely aggravating.

In a great number of cases drivers of horses stop motorists simply to annoy them. Personally, I have been stopped many times by people whose horses showed no signs of fear, sometimes on a steep up gradient, and have received no word of thanks.

Again, as "M 404" states, the "horse lover" seems to think that motorists should not be allowed on the roads, and deliberately tries to drive them into the ditch. If "horse lovers" do not consider automobilists, I do not think that they themselves can complain if they are disregarded by a small number of motorists. EL 128.

[8721].—Criticising my account of our unfortunate accident with the dog on our ride from Land's End to John-o'-Groat's, Mr. Fred T. Jane writes that "common humanity would have made any decent person stop and assure himself that the poor beast was dead."

Now the account distinctly states that the dog fell lifeless. This being the case, it was absolutely unnecessary to stop and put it out of its misery. As a matter of fact, the dog was killed practically instantaneously, and never uttered a single sound indicating suffering. I fail, therefore, to see any inhumanity in our conduct. The accident was absolutely unavoidable, and Mr. Jane himself admits that no one can help running over dogs now and again.

Again, he writes, "Road hogs who kill and maim animals and rush on without pity or regret," etc. I presume that, though the term "road hogs" is quite inapplicable, he is referring to us, and I fail to see what right he has to assume that we felt neither pity nor regret. I do not think that any of us are hysterical sentimentalists, but I am certain that none of our party would have cared to inflict needless suffering on any living creature. R. H. CARLISLE.

[8722].—I am quite sure that the majority of your readers must agree with the remarks of Mr. Jane as to the clever (?) driving of the car which killed or maimed a poor dog. What a noble performance not to "swerve or slow up," and all for the sake of a few minutes in beating a record! These humane gentlemen are probably sorry by this time that they gave such wide publicity to their wonderful performance. Is this sort of thing likely to gain converts to the sport of motoring? There is enough prejudice against us now, and if many people adopt these methods who can wonder at it? MODERATION.

THE RATIONAL CAR.

[8723].—I am afraid "W.R." will have to wait some time before he gets his "rational" car, and the fault will not rest with the makers. "W.R." does not say the price he is prepared to go to, but as he speaks of £250 as a large sum, I presume £100 to £150 to be about his figure. That being so, why does he not buy one of several cars on the market to-day at about these figures? Doubtless he will say they are not what he wants, and that, being more or less new productions, he is not going to spend his hard-earned cash on someone else's experimental notions. But if these cars are not what he wants they are perhaps what other people want. If "W.R." could get a hundred other people to join him in giving an order for as many cars *all alike* in every detail, and give a very simple specification, he would doubtless be able to get somewhere about what he wants at a reasonable price, but the trouble is that directly a manufacturer puts a cheap car on the market he finds people want—or say they want—something else. They are not rational in their demands.

They will not go beyond a certain figure, but they will not accept a simple specification. Take "W.R.'s" own preferences. He wants 8 h.p. full, so he wants a fair-sized engine, and that means all parts must be strong enough to take this power. He wants his engine in front, which entails length in the transmission, and again greater strength in the parts, and almost certainly a number of additional parts to what would be required were he to accept the simplest and most mechanically correct correlation of engine and axle. Then again, he stipulates for "large" solid tyres, but even half

an inch added to the section of a tyre adds considerably to the weight, and not only must the wheels be stronger to support it, but the extra weight is all rubber, which costs, pound per pound, more than any other material used in car construction. He wants his seats detachable—more work for the coachfitter—and there must be nothing of second quality about the springs, frame, and construction generally, so that the manufacturer cannot economise on labour, and I have no doubt he would be very critical about the finish. Now "the best" of material and workmanship cannot be supplied at a low price, although by making parts in duplicate in sufficient quantity machinery can be advantageously used to reduce cost. But supposing some firm to have laid themselves out to produce "W.R.'s" car, what would be their experience? If I may judge from the past experience of the trade it would be something like this: "W.R." would buy a car, and perhaps one or two others, but Mr. A. would come along and want two cylinders. "Eight horse-power in a single-cylinder engine is quite out of the question." Next comes Mr. B., who "doesn't believe in horizontal engines," and asks for a vertical one. Mr. C. thinks magneto ignition should be fitted instead of the high-tension battery ignition employed. D. thinks the "plain, simple, leather cloth upholstery," which "W.R." was perfectly satisfied with, is not good enough. He is paying £—, "and surely for this sum the maker can put in real leather," whilst Mrs. D. wants pleatings and a "roll" along the top. Mr. E. wouldn't have a car without a honeycomb radiator and fan. Mr. F. thinks the painting finish is poor, and should be a lot better. Mr. G. wants pneumatic tyres and larger wheels, and "will it average thirty miles an hour and go up 1 in 8 at fifteen?" Whilst, in spite of the best quality of material and workmanship, Mr. H. and a host of others have no *proof* that it is reliable, and ask to be referred to customers who have used the cars for a twelvemonth; whilst Messrs. X. Y. Z. think the maker should throw in a first-class horn, a Bleriot headlight, and a few other items, and all consider that, as they are paying the—to them—large sum of £—, their requirements should all be met without additional charge, and as they cannot get what they want they leave the unfortunate maker with the parting shot that if he is not sufficiently "enterprising" some other maker will be, and will get the trade. And then that maker turns to follow the "demand," and he changes his single-cylinder for a double one, he fits magneto ignition, a honeycomb radiator and a fan, and he obliges Mrs. D. by the use of "real leather and pleating," and so on through the gamut, and as each and every one of these items costs money—and a good deal of it—over and above his costs on "W.R.'s" "plain, simple" vehicle, he finds himself next season selling, not the cheap simple workman's vehicle he set himself out to produce when he began, but a car listed at double the money, whereupon he finds that the critics for whose benefit his car has "grown" declare he wants to make his fortune all at once, and they will wait for the enterprising individual who will supply their needs, and Mr. Maker finds himself catering for a new class of customer, whose purses are longer, but many of whom are equally unreasonable in their demands, and before he knows where he is his "light car" has grown into a heavy one, and things are pretty much "as before"—i.e., before he entered the market to supply that "long felt want," the "really good car at a really cheap price." And so the game goes on. H. S.

NON-SKIDDERS.

[8724].—Having heard and read wonderful accounts of the See non-skidding band, on January 12th I had one stuck on to a specially selected 30in. by 3½in. Dunlop tyre. I put the tyre on the left hand rear wheel. My car is a White steam car, weight about 19 cwt. On April 16th, having run 1,085 miles, mostly in London, the band split about sixteen inches long near the studs. The studs are worn flat, owing, no

doubt, to the friction having softened them, and the leather is rotten owing to the wet. The cost works out to about 1d. per mile for one tyre.

On February 16th I put a Wilkinson tread on the tyre of the other hind wheel. The wires have worn smooth and there are some nasty looking holes, but the leather is still sound. The See is a good non-skidder, but a few days ago with the Wilkinson the car went round on its axis.

J. T. TROTTER.

[8725.]—I have recently had under observation a car fitted with the Parsons chains on one driving wheel only, and while I found that this arrangement was quite satisfactory in preventing side-slip. I was puzzled by the fact that it was the other driving wheel tyre which showed great signs of wear as compared with the "chained" tyre.

I first ascribed this to a difference in the quality of the two tyres, as I had been led to expect more wear on the "chained" tyre.

I think, however, that the following is the true explanation, and, if so, it means that using two non-skids will lessen wear instead of increasing it.

Suppose it is necessary to pull up suddenly, using the countershaft brake, on a car fitted with a single non-skidding wheel. This wheel will bite the ground, and not slip at all, and, consequently, if the brake drum on the differential be held firmly in the strap, the other wheel will be compelled to rotate backwards at the rate at which the momentum of the car is making the first wheel turn forwards. Hence the unprotected tyre will rub against the ground at double the speed at which the car is moving. This result is due, of course, to the construction of the differential gear.

If both driving wheels are non-skids, the required retardation of the speed of the car is obtained by a much lighter application of the brake than the absolute "blocking" required in the above case, and no rubbing of the tyre on the ground can take place.

F. C. HOUNSFIELD.

NON-SKIDS ON SOLID TYRES.

[8726.]—In reply to "G.B.," I have been using the Parsons chains on Sirdar solids with excellent results, being able, where the traffic permitted, to drive on the Old Kent Road on top speed without a sign of slip when the road was at its worst. I kept the skids on all the way to Folkestone without damage. The one thing necessary is to have the chains quite loose, otherwise the rim cuts the chains, as there is not much clearance between the rim and the road in these tyres. One non-skid on the near side is sufficient.

F.J.R.

MENDING COVER CUTS.

[8727.]—Mr. Maitland King will find Hermatic solution supplied by the Self-sealing Air Chamber Co., Hinckley Street, Birmingham, as good as anything. It dries very rapidly, and can, therefore, be applied in minute quantities, allowing each layer to become firm in turn.

Cuts must not only be clean, but, if reaching the canvas, the latter must be quite dry.

Covers do not mend well in damp weather. In patching tubes, this solution is very useful to finish edges of the patch, but does not answer for putting patch on in the first place.

MUD CUT UP.

[8728.]—I should be much obliged if any of your readers could tell me of a really effective compound for plugging bad cuts in tyres. I have used one of the best known compositions, but find that it is not sufficiently adhesive.

GORDON HALSWELL.

DARRACQ CARS.

[8729.]—I should be glad if any of your readers who drive the 1904 type 15 h.p. Darracq car can answer the following questions:

- (1.) What do they find the mileage of dry battery to be?
- (2.) Is it any advantage to fit "wipe contact" and trembling coil? and, if so, which make is most suitable?
- (3.) What do they consider the best distance for "break" between platinum tipped screw and trembler, and to what extent does the variation of this distance affect the life of the dry battery?
- (4.) What is the average number of miles to be got out of a gallon of petrol?

Correspondence.

(5.) Whether they have had any trouble through breakage of the four curved driving springs between clutch and gear box?

(6.) Whether they experience any difficulty in running the engine very slow on petrol of .700 or .710 specific gravity? Whether they are troubled by explosions in silencer when running slow, and, if so, what the cause is?

(7.) Whether they experience any difficulty in obtaining an intermediate speed of, say, fifteen miles an hour with governor throttle right down?

Answers to above questions will be esteemed by,

15 H.P. DARRACQ.

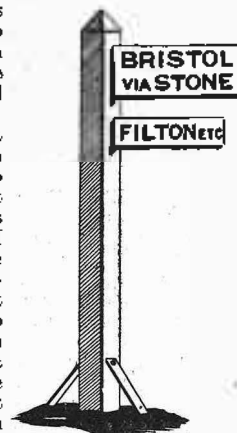
SIGNPOSTS.

[8730.]—As a touring motorist it has struck me many times on my way here (Bristol), by roundabout routes, how inefficient for modern day needs is the signpost system of this country.

The local directions to hole and corner villages are perhaps enough, but they seem limited to a radius of five miles. No account is taken of the greater distances within reach of a motorist. I would suggest signposts of two sized direction arms, thus: Open work cut letters in a light iron frame are better also than painted boards, as they can often be seen in the dusk against the sky line, and do not get obliterated with the weather.

Again, in many instances you get full directions at one road junction and then shortly after you come to a road fork without any signpost at all, and, of course, one always takes the wrong one of the two. I don't imply that this part of the country is worse than others, although the lettering of posts might be larger, but it has been brought to mind by travelling off well-known main routes, and I think it is a point the Motor Union might take up. Another point that will interest tourists is this: I came here with the intention of crossing the Severn by boat or ferry near the railway tunnel with the idea of driving up the Wye Valley to Tintern and Bournemouth, but find Gloucester is the nearest place for wheeled traffic to cross the river. Neither the Contour Book or Bartholomew's maps make it clear that this is impossible. In fact the Contour Book leads one to imagine the Severn Tunnel has a roadway.

A MODERATE MOTORIST.



SPARK GAPS.

[8731.]—Perhaps you can spare room for a few remarks on the above well worn subject.

I was speaking to a friend lately who has for a considerable time taken a practical interest in X ray and other high tension phenomena. He has photographs of sparks showing a direct spark from a large coil, and a spark of the same length with the addition of a spark gap, and these photographs go to prove that with the intervention of a spark gap a very much more intense spark is obtained.

But the coil used in these experiments was working at the time with a primary current of twenty volts four amperes (the spark as a matter of fact about eleven inches).

Now I have frequently made experiments with a coil giving at its best a half inch spark, but if the resistances in the circuit are great and the primary current weak. I find this: Though I carefully adjust the trembling make and break so that it shall act with the greatest possible easiness, that is to say, vibrate with a very low magnetising current, there are still conditions under which the primary current is quite strong enough to magnetise the core of the coil, and cause the trembler to vibrate, when the secondary circuit is short circuited, and even with a short spark occurring in the secondary, but lengthen this spark or in any way add resistance in the secondary circuit, and the result is this: the primary current becomes smothered, so to speak, by the increase of the induced resistance which it has to overcome: it fails to magnetise the core sufficiently to vibrate the trembler, or the vibration is so slow and weak that no appreciable current is produced in the secondary, and no spark is produced. I may point out that a spark may be still evident with a withdrawn sparking plug, but yet fail under a high compression.

Correspondence.

Now in the Panhard works, where a benefit from the use of a spark gap was first discovered and used, I think we may take it for granted that a good healthy current was fed to the coils used for testing purposes, and a small gap no doubt improved the intensity of the main spark, and the deadening effect on the primary current would have been quite negligible, but in many cars on the road the primary current is weak, and if resistance is added directly in the primary or indirectly, that is to say by way of the secondary (as in the case of an additional spark gap), your primary current says, I can't do it; I am taxed to my uttermost already. In fact, it is a case of the last straw.

JOHN H. JENNER.

ACCUMULATOR CHARGING FROM PRIMARY CELLS.

[8732].—The difficulties experienced by your correspondent "Oxon" in charging from primary batteries (Boron cells) cannot be due to the capacity of his accumulators.

Either his primary battery is not working properly and the voltage drops almost immediately under steady work, or his accumulators are in bad condition, and do not hold their charge.

As he finds that the battery charges the cells on his other car satisfactorily, the latter is most probable.

The fact that the accumulators register over four volts immediately after disconnection means nothing.

This would be the case with an almost empty accumulator after being "touched up" for a few minutes.

I should advise him to clean his accumulators and fill with fresh acid, as this may be the cause. Under the circumstances I doubt if the fault can lie with the primary battery.

H. M. WYATT.

BORON CHARGING CELLS.

[8733].—Referring to the letter [8706] in your issue of the 23rd, I was thinking of using these cells, if possible, both for charging accumulators and also for lighting, say, two ten or twelve candle-power lamps for possibly one or two hours in the evening while my car was being washed, etc.

Last autumn I found my late driver examining the engine with a common candle, although he had two different sorts of safety lamps, and his excuse was that the lamps (oil) would not give enough light for cleaning and examination. I am anxious to get enough light this year when from home during the autumn to make excuses impossible. From what Mr. F. Escourt says I should imagine these cells would do all I require.

CANTAB.

A TOUR IN THE HIGHLANDS.

[8734].—Should any of our fellow motorists be touring through the Highlands, now is the time to start if possible. The roads are at present perfection, and no dust. The lovely drives through Dingwall, either north or to Strathpeffer and on to Loch Carron, are well worth visiting. Petrol—Pratt's A—can be secured at Urquhart's at 1s. 6d. a gallon, and all motorists will receive every attention from that firm.

(Rev.) CHARLES PRODGERS.

TYRE TROUBLES.

[8735].—Replying to letter 8691 in your issue of April 16th, signed "Tyre-tired," I think his troubles would cease if he had his tyres fitted with the Wilton Cox puncture-proof device. From experience, punctures in tyres fitted with this device are almost an unknown quantity, the construction of the device diverting any foreign substance which would otherwise cause a puncture. In addition to the above, it makes the tyres stand up better, greatly minimising the risk of punctures.

W. B. ARKLESS.

DISCREPANCIES IN H.P.

[8736].—With reference to the letter of "C.H.M." I am quite prepared to accept the letter that he states he holds, subject, however, to his accepting mine, which I am prepared to show him.

The letter he owns denies mine I admit, but mine also denies his. I think, therefore, that very little heed need be taken of the statements made by either letter, as seemingly they are somewhat recklessly written, but I would suggest that "C.H.M." uses his own judgment, and I would ask him whether the 18 h.p., which is 5 mm. less bore than the 24 h.p., would give the same power on the brake? I think he will agree that there is a very grave mistake here.

In France the new so-called 18 h.p. is called 20-26 h.p., which is getting somewhat nearer the mark.

As regards the somewhat cutting remarks as to where

my firm get their Mercedes cars from, I would suggest to "C.H.M." that in all probability the cars that he is selling come through the same source, although he is not aware of it, and the friends with whom I have the honour of being in business probably hold more of the Mercedes stock than he cares to state, although he may know it.

I would suggest that "C.H.M." write to Monsieur Jellinek, and he will probably receive an answer to the effect that my statements are correct, and that the Cannstatt Company cannot deliver any goods until next autumn.

D.M.W.

BRAKES ON CHAIN-DRIVEN CARS.

[8737].—About a month or six weeks since a chain broke on my car and smashed the band brake, just as described by your correspondent, "R.D.C." Fortunately, it happened on almost level ground.

It has occurred to me that if internal expanding brakes were fitted instead of band brakes it would be impossible for the chain to damage them.

Can any of your readers tell us if they have ever come across an instance of damage to an internal brake in this way, and also whether they have found this form of brake as satisfactory otherwise as the other?

CANTAB.

DUST LAYING.

[8738].—As you have given prominence in your valuable paper to Westrumite as a dust layer, we feel sure you will permit us to note that Pyne Oiline is British made and effectually binds the dust. Most reliable proofs were given of this at the recent spring meeting at Epsom on four of the chief roads, and both the urban and rural surveyors (Messrs. Capon and Ware) can fully support this statement. Further, it is being used at Leicester, Nottingham, Birmingham, etc., etc., so we feel sure you will pardon our humble protest against leading everyone to think that British manufacturers must succumb to foreigners—at least you are too patriotic to wish it—hence our appeal for fair consideration.

HOPE AND SONS.

[We are extremely pleased to hear that there is a British rival to the German dust layer. If it can be proved that Pyne Oiline is as good or better we shall be delighted. As certain well known stretches of road much used by motorists have been treated with the German mixture, we would suggest to Messrs. Hope that they should treat the adjoining stretches, so that it may be seen at once which is the better dust layer. Had Messrs. Hope taken the same pains to bring their preparation before the notice of automobilists it would be as well known as Westrumite. We can only trust they will now display equal energy in bringing it before the notice of the road authorities.—En.]

CONSIDERATE DRIVING.

[8739].—I have read with the greatest interest many of the letters in your paper of late on reckless driving, and my sympathy is entirely with such letters as those of "16 h.p. De Dietrich" and Mr. Fred Jane. I certainly think that the way many of the motorists drive is a perfect disgrace, and the sooner it is put a stop to the better for us all. I think many motorists fail to remember that they have only an equal right with other users of the highway, and are not entitled to use the road in such a way as to make themselves a nuisance to other road users. I know I invariably slow down, and if I see any sign of a horse or other animal being inclined to be restive or, let us say, "stupid," then I stop. I think if motorists would just have a little "give and take" with other road users they would get on a great deal better. I can say that my own personal experience is that carters and drivers in most instances recognise an effort made to meet them, and I have many a time been greeted with "thanks" when the animal-drawn vehicle or animal met me and got safely past.

I know that to stop the car and not the engine often makes a great deal more noise than simply going on, but the law says we are to stop if required so to do, and if the driver signals to me to stop I always do so, and endeavour to quiet my engine as much as possible by throttling only, and not by actually stopping it completely.

I know that I shall have great pleasure in giving evidence against anyone whom I see acting in such a way as to do careful motorists harm, as it is this class of individual that does more real harm than anything else, and makes us one and all to be hated. I think that the idea of Mr. Jane to have a union with free admission to paid drivers is an excellent one, but do you think that it is possible to get the police to assist in the distribution of the "red star" he refers

Correspondence.

SUMMARY OF OTHER CORRESPONDENCE.

to? I fear not. It is certainly not part of their duty, and I do not think they would be likely to take part in what would probably often be used in a defence as an admission that the person who had obtained the "star" was to be relied on always. I certainly endorse most heartily Mr. Jane's strictures on the crew who killed the dog in the run referred to in *The Autocar* of 16th April; and as a great lover of animals, I can only add that I think it was not only inhuman, but little short of cruelty for which they might be brought within the pale of the law, as for anything they knew the poor animal might have hours to suffer before its injuries terminated its life. Certainly, it is a great nuisance to have a dog rush out at you, but an animal is not a human being; and, surely, it is not supposed to be able to reason as we do, and I think that being so we ought to try and be extra careful when we have dumb animals to deal with. M.M.C.

THE GORDON-BENNETT RACE.

[8740].—I observed in your issue of 16th April an illustration of the Darracq cars built in Great Britain to French designs, and it was stated in your issue of the 23rd inst. that Messrs. Marston had lent the services of one of their practical people to superintend their construction.

No doubt the committee appointed to superintend the eliminating trials will have satisfied themselves that only the design was French, and that French skilled workmen also were not sent over for the occasion to aid in their construction.

According to the description in your issue of the 16th inst., the cars are to be fitted with tyres "manufactured by Michelin and Co., London." I have made enquiries among my numerous friends, and looked in the directory, but fail to find where their works are situated. They have only been known till now as having a manufactory in France. It might also be well for the committee to satisfy themselves that these tyres were actually made in Great Britain by British workmen; also that French workmen were not specially sent over to this country to carry out their manufacture and return when that had been accomplished, as in such an event I assume that the tyres could not be held to be British made in terms of the fundamental conditions of the race.

ENGLISHMAN.

RECKLESS "DRIVING."

The committee of the Automobile Club have received and adopted the resolution passed by the Industrial Committee some few days ago which urged upon the General Committee the immediate necessity of taking some steps to check inconsiderate driving of automobiles. The committee have resolved that immediate action should be taken in arranging some scheme by which the club can act in this urgent matter. The chairman of the club and the three vice-chairmen will form a Court of Enquiry to enquire into and report upon any case of inconsiderate or reckless driving calculated to harm automobilism in any way, and will lay such report before the club committee. Members of the club will be asked to notify cases which may come under their notice by the car numbers to the secretary of the club, when immediate action will be taken.

Sir Thomas Freake, Bart., has just gone in for a 60 h.p. Mercedes, which he bought from the British Automobile Commercial Syndicate. He is having it fitted with a Shrewsbury phaeton body by Rothschild.

* * *

Those who are interested in the automobile side-slip trials should remember that they can inspect the devices in use by calling at the Locomobile Garage, Sussex Place, South Kensington, as the cars are stored here every time they come back to London till they have completed the thousand miles. We are given to understand that callers will be granted every facility for inspecting the devices.

THE PRICE OF PETROL. "X" informs us that he was charged 3s. 9d. for two gallons of petrol at the Railway Hotel, Bishop's Stortford, on the high road from London to Cambridge.

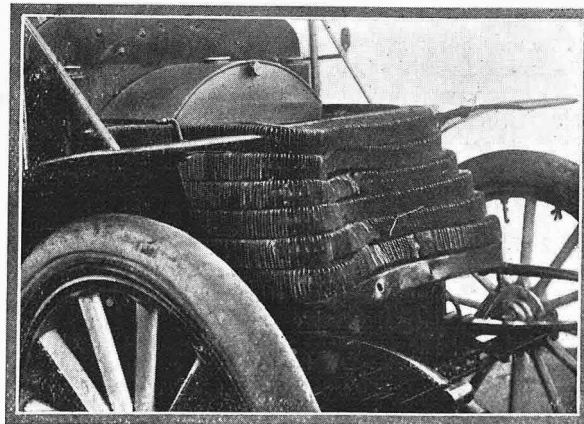
WHERE TO OPEN A GARAGE. "Perseverance" is anxious to know of a likely town in which to open a motor garage for the sale of cars and accessories, and also for the establishment of an efficient repair department. We insert this query, as it is of interest to automobilists generally, and we should be glad if any readers who know of localities in which there are at present no conveniences for the motorist would communicate with us, when we will forward to "Perseverance" the names of the towns suggested.

DE DION CARS. Messrs. De Dion-Bouton, Ltd., write that they observe announcements among "cars for sale" worded to represent them as De Dion cars, whereas they are only fitted with De Dion engines. They warn intending purchasers, therefore, when buying a car as a De Dion-Bouton, to see that it is of this make throughout. They add: "We are always pleased to advise anyone on the subject if they will send us the number of the motor; this number is stamped on each half of the crank case on the right-hand side when facing the timing gear."

CHAUFFEURS. W. F. Young, referring to "A Bas les Chauffeurs" letter on this subject, takes exception to the praise bestowed on the "razor-stropper" type of chauffeur, though he admits that the remarks about the driver-mechanic being dirty are right in some instances, as ladies and gentlemen strongly object to have their dresses and clothing spoiled. In regard to the varied duties expected of the motor mechanic and driver, he says: "I happened to apply for a situation a short time ago. I was offered the place if I would drive a motor car, run an electric light plant for the house, officiate as clerk to the parish church, dig graves, help in the house, also assist the gardener, clean windows—must be smart, clean shaven, temperate, etc., all for the princely sum of 25s. per week and live out. Of course, I declined with many thanks. I have no doubt many readers of your paper would be interested to know what make of car 'A Bas les Chauffeurs' owns, the distance it has travelled since he purchased it, the cost of upkeep, etc."

THE KING'S IRISH VISIT.

During the present visit of the King and Queen to Ireland several journeys will be made by motor car, and the members of the Motor Volunteer Corps, who are residents in Ireland, have been assigned the important and honourable duty of acting as a guard of honour and escort to their majesties, and of conveying their staff.



THE RESULT OF A SIDE-SLIP. This illustration shows the front of a 10 h.p. Wolseley which struck a patch of very bad grease unexpectedly and slipped badly, charging a wall. The radiators and frame suffered considerably, being forced inward some five inches by the collision. The steering pillar was bent and the head lamp flattened out of existence. After the steering pillar had been straightened the car proceeded on its way. The owner kept an appointment on it and then drove it over 100 miles to the works to have it repaired; no leakage occurred. The radiators seem to have acted as a sort of buffer and to have saved the car itself from more severe injury.

Flashes.

The Brush Electrical Engineering Co., Ltd., have opened a showroom in connection with their automobile department at 105, Bond Street, W.

* * *

From a highly fanciful description in *The Times* of India of a motor car drive by Ernest Esdaile, of the Pioneer Motor Co. of India, it would appear that an Argyll car is giving pleasure to at least one individual in that part of the British empire. As a specimen of the florid style adopted, the following may be cited: "Oh, but it is good to motor in India. Indeed, it is so almost anywhere; even in wet, foggy, cloudy, sloppy dear old England it is a sport full of charm, but out here it is simply invaluable." The drive was apparently from Bombay to Poonah, though in his ecstasy the writer omits to mention the point from which he started.

* * *

Last week Mr. Dugeld Clerk read a paper before the Institution of Civil Engineers on "Internal Combustion Motors." It was of a highly scientific character, and dealt mainly with gas-engines, though high-speed engines using petrol as fuel were also referred to at some length. Among points of special interest to motorists may be mentioned the author's opinion that the magneto would ultimately supplant all other modes of ignition. In referring to high compression, it was pointed out that this could not be as high as desirable on account of it resulting in pre-ignition, but it was stated this defect had been overcome in another way. That is to say, while reducing the clearance resulting in pre-ignition, high compression had been obtained without pre-ignition by injecting at the end of the suction stroke a further charge of air, so as to increase the pressure to seven or eight pounds per square inch above atmosphere before the compression stroke began. This, of course, resulted in higher compression, but not in the pre-ignition, which occurred when the pressure was obtained by reducing the clearances. The fact that it can be used at very high compression was also mentioned as one of the strong points in favour of alcohol.

* * *

Henry Hawes, an Ipswich butcher, in giving evidence against Mr. J. R. Egerton at the Ipswich Quarter Sessions, when the latter gentleman appealed from a conviction for excessive speed, gave a new definition of the term "ignition." He spoke of the ignition being "still on." The cross-examining counsel: "Will you swear you said anything about ignition before the magistrates?" Witness was a long time answering, but eventually said he thought he did. Counsel: "What does it mean?" Witness: "The light or the friction?" Counsel: "Which is it, do you think?" Witness: "The friction. I think." Had the compilers of the "Dictionary of Motoring" been aware of the existence of this luminous butcher, we have no doubt they would have enlisted his services in the compilation of that work.

Messrs. J. W. Brooke and Co., of Lowestoft, inform us that they are very full of orders for their new 15-20 h.p. cars.

* * *

An excellent feature of the De Dion brake which appeals very strongly to us is the provision made for adjustment. All motorists know that the main reason why the pedal brake is not kept in proper adjustment is because the work must be done with a spanner, and it is often a very dirty job, as it is by no means easy to get at the brake rod under the middle of the car. In all the 8 h.p., 10 h.p., and 12 h.p. De Dion cars this defect has been overcome, as they are now fitted with a double shoe brake, very much of the railway type. The adjusting rod of this brake has a handle permanently fixed to it, and the adjustment is held in deep slots by a spring. The arrangement allows the brake to be adjusted by the fingers from the side of the car in a few seconds, and it is a constructional point which we commend highly.

* * *

Motor boats will this season make their appearance on the Norfolk Broads.

The season opens on Whit-Monday with a regatta on Oulton Broad, and amongst other events will be one for boats propelled by internal combustion engines, not exceeding 30ft. in length. Mr. Mawdsley Brooke, of Lowestoft, has offered a trophy in this competition, and good entries have already been received.

* * *

The Sarum Town Council are not very favourably disposed towards motor cars, judging from remarks made at the last meeting of that body, and there is a disposition on their part to apply for the ten miles speed limit. It therefore behoves all

motorists passing through the old streets of Salisbury—with their frequent right-angled crossings—to be particularly careful. Complaints reach us that sufficient caution is not exercised by some motorists, especially in the main, though narrow, thoroughfare, Winchester Street.

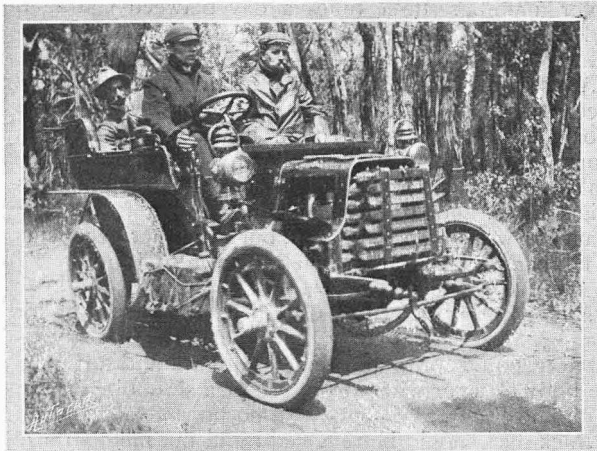
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So much is made of the recklessness of some few motor car drivers that it is gratifying to be able to notice the care and consideration shown by others. A case in point occurred on Thursday last week at Coventry, where Mr. William H. M. Burgess, of South Norwood, in order to avoid running over a girl who darted immediately in front of his car, turned off the road on to the footpath and down an embankment. Fortunately, a hedge and some posts and rails prevented the car from going far down, but it was some time before the vehicle could be extricated. It was found that the only part of the car—a Clément-Talbot—that had suffered was the steering, which was thrown somewhat out of alignment, though not sufficiently to prevent its being driven away. The damage that motorists do to their cars in avoiding accidents to other persons is a matter that they are seldom, if ever, given credit for.

THE "AUTOCAR" DIARY.

April 30.—A.C.G.B.I. Parade of Motor Delivery Vans, Thames Embankment, 3.0.

- 30-May 12, Antwerp Salon.
- 30.—Leicestershire A.C., run to Rugby and Daventry.
- 30.—Sheffield and District A.C., run to Snake Inn.
- 30.—Yorkshire A.C., run to Boroughbridge.
- 30.—Reading A.C. meet Surrey A.C. at Oldham.
- 30.—Lincolnshire A.C., run to Brigg.
- 30.—Wolverhampton and District A.C., run to Worcester.
- 30.—Burnley and District, run to Sawley.
- May 1.—Carburettor Trials, A.C. de France.
- 1.—St. Louis Autocar Show opens.
- 1.—Gloucestershire A.C., run to Nailsworth.
- 1 to 12.—A.C. Bordelais Automobile Fortnight.
- 7.—Non-Skidding Tests, Ladbroke Grove.
- 7.—A.C.G.B.I. 100 Miles Quarterly Trials.
- 7.—Scottish A.C. (W. Sec.), run to Troon.
- 8.—Kzelburg Hill-climb (A.C. Austria).
- 10.—Gordon-Bennett Eliminating Trials, Isle of Man.
- 12.—Perigueux Hill climb (A.C. Dordogne).
- 14.—Nottinghamshire A.C. Hill-climb.
- 19-20.—Glasgow to London Non-stop Reliability Trial.
- 20.—French Gordon-Bennett Eliminating Trials.
- May (or July 25).—A.C. Belgium Circuit des Ardennes.
- June 11.—Ranelagh Club Motor Car Races.
- 17.—Gordon-Bennett Can Race.
- 21-23.—Midland A.C. Whitsun Tour to Bettws-y-Coed.
- July 30.—British International Cup for Motor Boats.



MOTERING IN AUSTRALIA. A 10 h.p. M.M.C. car travelling through a Western Australian Jarrah forest. This car is the property of Mr. F. Wittemoon, and has travelled hundreds of miles of such tracks as that depicted above without giving the slightest trouble.

The danger of outbreaks of fire at motor car works from the inflammability of petrol vapour when care is not taken in the use of the spirit was exemplified last year by the great fire at the Cannstatt works. As is well known, water is quite useless as an extinguisher for burning petroleum, but the jet thrown from chemical engines, if charged with carbonic acid gas, is very effective, and recently at Finchley a burning motor car was saved by a Merryweather chemical engine, and we now learn that the Daimler Works at Coventry have recently been provided with these appliances, which are also held ready for use at the Automobile Club garage, Down Street, Piccadilly.

* * *

The Baron de Caters, always kindly remembered in this country for his chivalrous conduct in the matter of Jarrott's accident in the Irish Gordon-Bennett, will shortly attack Rigolly's Gobron-Brillie kilometre record, when a speed of 94.6 miles per hour was attained.

* * *

A portion of the Fair Mile on the Portsmouth Road, also at Cobham Street, have been treated with Westrumite to allay dust. The surface of the road in Cobham for some distance before and after the brewery has also been given a top dressing of tar, but this does not appear so successful in preventing dust as Westrumite. The latter material has already been used on Barnes Common between the cross roads and the foot of the railway bridge ramp, with excellent results, and we understand the Westrumite Co. is about to treat half a mile of the Castelnau from the Boileau Arms to the south-west as an object-lesson.

Flashes.

A few days since we saw for the first time Mr. Liddel's new 22 h.p. M.M.C., with side entrance, double phaeton body, and front bucket seats, all in aluminium—one of the most luxurious and comfortable cars we have inspected for a long time. Mr. Liddel, who will be remembered as the plucky defendant in the Kingston case, when Inspector Marks's watch received its quietus, and Inspector Marks's evidence was turned inside out by the brilliant cross-examination of Mr. Staplee Firth, has now run his new M.M.C. over 1,000 miles, and speaks in the highest possible terms of its performances.

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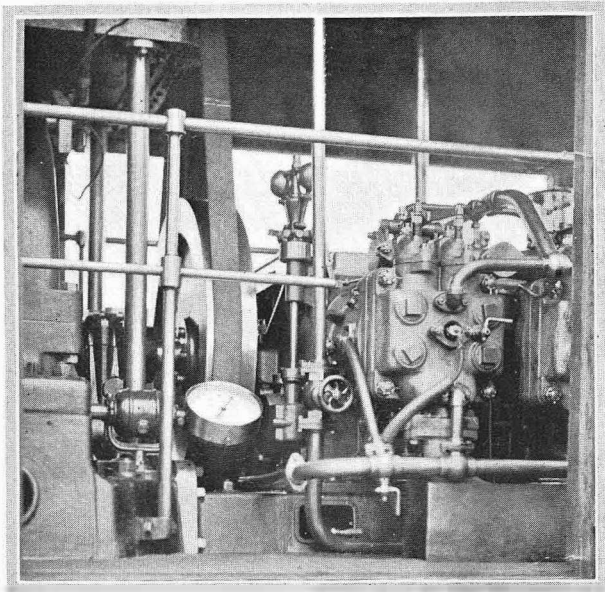
The Hut Hotel, which stands on the right-hand side of and well back from the Portsmouth Road between Cobham and Ripley, opposite that delightful piece of fir and sedge fringed water, known topographically as Boldermere, but colloquially as Wisley Hut Lake, is becoming quite a motor thronged resort for lunch and tea, but particularly tea, which is served, and well served, in the terraced garden overlooking the mere, and makes quite a delightful break in any home returning run from the south-west. On Sunday last, between four and five p.m., there were no fewer than twenty-five cars massed on the ample space in front of the hotel, and these, with their occupants, and the stream of cars continually passing and repassing, make a bright, lively, and interesting picture. At present, the hotel elevation is a trifle bare, and the management of the Surrey Hotel Trust, Ltd., who own it, would do well to arrange for fast growing creepers to be planted both at the ground level and on the balconies.

* * *

Earl Russell was fined £5 and costs at Winchester on a charge of recklessly driving a motor car. A cyclist who complained was described as a "nervous wobbler."



AN UP-TO-DATE CARRIAGE. This vehicle is a 15 h.p. Ariel, belonging to Mr. H. A. Christy, of Brecon. We need say nothing about the four-cylinder high-speed Ariel engine, as its smooth running and durability are well known, so that the interest of the car largely centres on the body. It will be seen that side entrance is provided without an exceptionally long chassis, as the sliding door is used. The front seat is of the semi-divided type, and the back gives comfortable accommodation for three people side by side. The canopy is entirely detachable. When the side curtains are dropped it completely encloses the occupants of the back seats. It is also built sufficiently strongly to carry luggage, so that the vehicle is in every way suitable for touring in all weathers, though when it is being used for home drives in fine weather it can be quickly transformed into an open vehicle. It will be noted too that the glass screens at the back and front are both independently detachable. Gradually the art of making a car suitable for use in all varieties of weather is being acquired.



THE NORTH-EASTERN RAILWAY AUTOCAR. A view in the interior of the engine room. The breech of one of the cylinders is seen on the right of the picture; the cylinders are 8½ in. x 10 in., and the normal speed of running is 420 r.p.m., with acceleration to 480 r.p.m. The cylinder cooling is, on the same principle as that on a car, Clarkson radiators are fitted in the roof, and the draught is created by a Blackman fan driven from the exciting dynamo. This is seen in the illustration.

His Majesty the King and the Prince of Wales are having Collier tyres on their new Daimler cars.

* * *

Glasgow to London Reliability Trial. Under the special conditions applicable to late entries, a 12-16 h.p. four-cylinder Renfrew (No. 30) has been entered for the above trial on May 19th and 20th by the Scottish Motor Garage Co., Ltd., of Glasgow.

* * *

Kingston to Odiham, via Richmond Bridge, Twickenham, Staines, Egham, Bagshot, Blackwater, Hartford Bridge Flats, and Hartley Wintney, on fourth speed, save only for the steepest portion of Egham Hill, is an excellent performance, and one which our 12-16 h.p. Clément-Talbot, with three up, performed most satisfactorily last week. This car has been consistently and occasionally very hardy driven since last July.

* * *

Since the start of the Liverpool School of Motor-ing over two years ago, we are informed, some three hundred pupils have been taught the art of driving. These, including many ladies, are now driving their own or other people's cars in various parts of the kingdom. We are assured that a large proportion of the pupils go on the recommendation of those who have formerly passed through the school, thus showing that the methods of instruction are successful.

* * *

When calling at Messrs. Charles Jarrott and Lett's at 45, Great Marlborough Street, Mr. Jarrott gave us a practical demonstration of the Pompeii—the handy apparatus which we lately illustrated and described, and which can be attached to the frame of an automobile, and actuated by the exhaust, with the engine running light, will pump up an 820 x 100 motor tyre well under four minutes. This we saw done at the time of our call, and all automobilists who do not mind a little expenditure for refinements will do well to consider the purchase of this convenient little instrument.

Mr. W. Rees, of Newcastle Emlyn, is about to run a motor omnibus three times a day between Cardigan and Newcastle Emlyn—a distance of ten miles.

* * *

A motor car accident, which further emphasises the necessity for unremitting attention to brakes—a point upon which we have so often insisted—occurred on Monday last between Seaford and Alfriston. The brakes failed to act when the descent of a steep hill was being made, and the car dashed against a tree. The chauffeur was seriously injured, but two other occupants of the car were able to go back to town by train.

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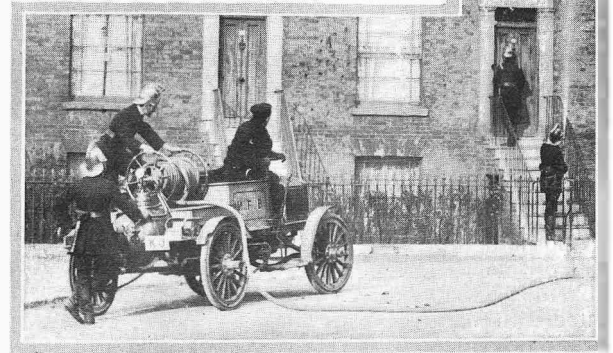
A preparation known as Catkin has been sent us for trial by Messrs. Kay Bros., of Stockport. It is prepared in liquid form, and removes grease and dirt from the body of a car without the use of a scrubbing brush, soap, and water. Of course, we do not mean that mud or thick dust should be removed by it, but merely those markings which will not come off with the usual washing. It removes all dirt and finger-marks, and leaves a smooth glossy surface.

* * *

The agricultural motor is making headway by degrees amongst farmers who wish to avail themselves of the latest methods in land cultivation. Mr. R. Bannister, of Upper Stoneham, near Lewes, has lately installed an Ivel motor to take the place of horses in certain farming operations, and he invites any persons who may be interested in the matter to visit his farm in order to witness its performances.

* * *

The following notice has just been put up at each end of Kensington Palace Gardens: "No motor cars or motor cycles allowed in this road, or tradesmen's carts propelled by steam, petroleum, or electricity. By order."



A PETROL MOTOR CHEMICAL FIRE ENGINE. Our illustration shows one of the latest applications of the petrol motor applied to fire brigade work. The machine, which is fitted with a four-cylinder 20 h.p. motor, has three forward speeds and a reverse. At the rear is carried a fifty gallon tank which is charged with carbonate of soda and water, into which, when required, sulphuric acid is mixed, producing a liquid heavily charged with carbonic acid gas under pressure for fire extinction. The hose is wound on a revolving reel which has a hollow spindle connected to the cylinder so that the jet can be thrown with all or any part of the hose still on the reel. The jet produced can be thrown to a height of about forty feet, and one charge will maintain the stream for ten to fifteen minutes. Extra charges are carried in boxes on the engine, and arrangements are provided for refilling the cylinder from street hydrants, or where these are not available, buckets can be used and the cylinder filled through an opening in the top. Artillery wheels are fitted with solid rubber tyres, and the machine can travel twenty to twenty-five miles per hour on the road. Duplicate ignition gear of the high tension system and very efficient lubricating arrangements are provided. Petrol sufficient for ten or twelve hours running is carried in a tank behind the driver.

SOME QUERIES AND REPLIES.

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

When advice concerning different makes of cars is sought, each vehicle should be given an identifying number. Letters should be addressed The Editor, "The Autocar," Coventry.

DISTRIBUTION OF WEIGHT ON A STEAM LORRY.

I have a steam lorry with a wheelbase of thirteen feet. The boiler, which weighs about one ton, is over the forewheels. The engine, gear, and water tanks are thrown as much as possible on the hind wheels. The lorry goes fairly well, but the general impression given is that there is too much weight forward. I cannot alter the position of the boiler with regard to the forewheels, but I could shorten the base two feet and bring the forewheels and boiler two feet nearer the hind wheels, thus reducing the wheelbase to eleven feet. Can any correspondent tell me if this would throw more of the weight of the boiler on to the hind wheels, and, if so, about how much; also whether this would improve the running? The boiler would still remain directly over the forewheels.—STEAM LORRY.

ELECTRIC CARS.

Will you please tell me the amount of current taken by each motor of an electric brougham when it is starting and when it is running full speed? Also the voltage and weight? The power transmitted must be smaller when running fast than it is when running slow, because of the opposing electro motive force. Why is not a dynamo driven by the engine and a motor driving the differential gear used more than it is? It is heavy, but it is the same as a variable speed gear.—VOLTS x AMPS.

The current taken at starting by an electric brougham carrying four passengers is about fifty amperes. When running at about twelve miles per hour the current taken is about thirty amperes. The voltage is usually given by forty-four cells connected in series. Therefore, as each cell when fully charged should give a reading of 2.2 volts, about ninety-six volts is obtained at the brushes of the motor when the cells are connected with them in series. The weight loaded with four passengers is about 30 cwt. It will be seen that the electrical horse-power developed at starting is higher than when running at speed, by the ratio of fifty to thirty. As there are 746 watts to a horse-power, and a watt is the product of a volt by an ampere, therefore $96 \times 50 = 4,800$ watts

are taken at starting, i.e., $\frac{4800}{746}$ horse-power = 6.4 horse-power.

At twelve miles per hour watts = 2880, and horse-power = $\frac{2880}{746} = 3.8$ horse-power. The combination you

mention is at the present time being experimented with by several firms, and there is no doubt great possibilities in the direction of its adoption when thoroughly developed. It is hardly feasible to adopt it on a light car, owing to the weight of the dynamo and motor and the stronger staying required to adapt it to a frame, and although it can be used very successfully as a change speed gear the cost is very high. For heavy cars and haulage work it may in time be adopted in a number of cases.

GOVERNOR SETTING.

I have read your hints on governor setting in *The Autocar* with great interest, as the governor on the engine of my car is rather given to hunting. The engine is a two-cylinder 10 h.p. Aster, and when moderately accelerated the governor works well enough. Here are bad and crooked roads; I usually wish to run at a very moderate speed, and I find if I advance the spark moderately without accelerating the governor the running becomes very uneven and jerky. The governor gradually closing the throttle valve till it finally shuts it completely, then when the speed has greatly fallen off, it opens to the full extent with a jerk. The only spring in connection with the governor is one on a rocking lever working in a groove

in the governor sleeve, and its tension is controlled by a lever on the steering pillar. It seems to me that the uneven action of the governor is caused by the fact that the spring, while offering a good deal of resistance to the separation of the governor weights, has but little power of closing them again, unless considerably compressed. I have thought of making a hole in the butterfly throttle valve, so as to prevent its quite cutting out the engine, but am not quite sure what size it should be. I also thought of fitting a small pneumatic buffer or dashpot to the rod controlling the throttle, which, while offering slight resistance to the governor, would render its action slower in opening and closing. Do you think either of these plans would be successful?—J.E.L., Cork.

The uneven running of your Aster engine is primarily due to the governor spring being rather too weak for its purpose. It is a very difficult matter to obtain a number of springs of exactly equal temper, and the one on your engine may have lost its range of action by becoming somewhat extended. When you advance the spark slightly, and allow the governor its full play, the speed of the engine causes the governor to shut the throttle valve, so as to prevent mixture being passed to the cylinders, and so the speed of the engine drops to such an extent that, when the valve again opens and admits a charge to the engine, the sparking occurs at a period too far in advance of the piston speed. That is to say, the spark occurs before the piston has reached the top of its compression stroke, and causes a tendency to force the piston down again before the crank has turned over the dead centre on its downward stroke. If the speed of the engine were such as to compress the charge so rapidly that the piston was on its dead centre when the charge was fired, then smooth running is obtained. If when the spark is advanced the accelerator is also put up, this jerky running is obviated, as the speed of the engine is always maintained by a charge being continually passed to the cylinders. You will find that the substitution of a slightly stronger spring, or the perforation of the butterfly throttle valve will overcome the trouble. We should advise you to adopt the latter method in preference to the former, as, generally speaking, it gives much better results. The hole in question should be about 5-16ths inch in diameter. The dashpot would not materially assist in the quiet running of the engine.

ELECTRIC LIGHT FROM IGNITION SYSTEM.

Can you tell me if an electric lamp can be used from a high tension magneto ignition, and, if so, what candle-power lamp should be used?—H. HEWERTSON.

As the current delivered from a magneto ignition machine is of high voltage but of small amperage, it is unsuitable for lighting purposes.

NOISE IN THE SILENCER—DRIVING.

- (1) I have occasionally a curious hammering noise in the silencer, just as though someone was giving it smart taps with a hammer, or as if there was a loose stone inside. Then, again, when I start the engine in the motor house what appears to be petrol leaks out of the silencer. Does this show that the carburettor is giving too much petrol?
- (2) In descending hills I do so on the top speed with the clutch out and governor and ignition retarded, and when I reach the bottom I let in the clutch and gradually give more gas and advance the spark. Is this right, or should I descend with free engine and governor and ignition retarded, and then when I reach the bottom should I put in a lower gear, say the second speed? What I want to know is whether I am doing my engine harm by letting in the top speed at the bottom of a hill and allowing the engine to pick up? (3) What is the best way of cleaning the outside of the engine? I have been told to use paraffin put on with a brush. (4) What is the lowest rate of speed you can travel on the top speed without hurt-

Some Queries and Replies.

ing your transmission or engine? I find when it slows down that the car jolts a great deal. When I retard the governor, should I also retard the spark accordingly, or is it not necessary to do so? I refer specially to slowing up to take a corner, or going through a village. Any advice you can give me on driving I shall be very much obliged for.—W.B.M.

(1.) The noise in the silencer is in all probability caused by sound waves in the silencer at some particular speed of the engine. The outlet from the silencer is not sufficiently large to admit of the exhaust gases being passed freely to the atmosphere when the engine is running at high speed. The result of this is that a resistance is set up by the remaining gases, and the outcoming gases meeting those which remain in the silencer is the cause of the noise which you mention. The liquid proceeding from the silencer when starting the engine is water, this being one of the products of combustion, and is that portion which remains from the later discharged exhaust gases before the engine has been stopped.

(2.) In descending hills the clutch should be taken out and the governor allowed to function. This, we take it, is what you mean by using the word "retard" in connection with the governor. At such times when the engine is not actually doing work the ignition should be retarded. Before reaching the bottom of the hill, when the car is travelling at a speed equal to that on the top gear when running on the level, the spark should be advanced first and then the clutch let in. No damage would be done to the engine or the gearing so long as the clutch is not put into engagement with the engine when the car is travelling at slow speed and the top gear is in operation. In cases where a reduced speed is necessary, it is better to drop the second speed before letting the clutch in, at any rate until such time as the extended use of your car enables you to judge of the necessity for changing gear or not.

(3.) The most satisfactory way of cleaning the outside of the engine, gear box, and other metal parts, is to remove the dirt by the aid of a paint brush and paraffin, afterwards wiping the parts as dry as possible with a clean cloth, thus preventing the adhesion of dust.

(4.) With a two-cylinder engine and a car weighing about 14 cwt. the slowest speed, generally speaking, at which one can travel on the top gear is about ten or twelve miles per hour, but this varies according to the ratio of the gearing to the engine speed. From your queries we take it that you habitually drive with the accelerator down, so that the governor is not functioning excepting at such times as the accelerator lever is retarded. This is bad driving. The accelerator lever is only intended for short bursts of speed and for use in hill climbing, when a high engine speed is desirable to enable the motor to drive the car over hills which would otherwise necessitate the changing of gear, or, in any case, an earlier changing of gear. If the spark is advanced as far as possible the engine speed will be as high as the governor will permit. This will regulate the amount of mixture admitted to the cylinders, so that when the governor is acting a small charge of mixture is used in the cylinder and is ignited at an earlier period. This conduces to the development of the normal power with a low consumption of petrol.

BRINGING A CAR FROM FRANCE.

Kindly give me the best route with cost and particulars for bringing a motor car purchased in France and driven to the coast across to England. It would be necessary for the four people on board car to travel across with it, and as no crate would be used, a suitable provision for embarking and disembarking would be necessary. What is done with regard to the petrol in the tank, and is there any difficulty in filling it up at the harbour on this side?—G.H.

Mr. Roger H. Fuller, who read a paper on Continental touring before the Automobile Club, on the 10th March last, favours the Havre-Southampton route above the other three. Mr. Fuller suggests that the shipment of cars should be placed in the hands of the S.W. agent, Mr. N. Longstaff, Grand Quai, Havre. He will do all that is necessary in the matter, in a most excellent manner, and will present you with a small bill to cover the cost. The cost of transport is £27s. 6d. for cars weighing below a ton, and below thirty hundred-weights £31s. 3d. We have no experience of the requirements of the Southampton authorities, but it is generally requested that the car be removed from the dock before the tanks are filled.

BROKEN EXHAUST VALVES.

Whilst driving up a fairly steep hill there was a sudden loss of power in my 12 h.p. Darracq, and I pulled up to examine, but could find nothing visibly wrong with the plugs or wiring, which I suspected. I re-started the engine, and it made a fearful noise, so I stopped it immediately. On taking out the inlet valve of the back cylinder I found that the head of the exhaust valve had broken off short and gone right through into the cylinder. There was nothing to do but take off the cylinder, and on withdrawing the piston I found that the valve head had smashed right through the piston head, and gone into the crank chamber with the bits of the piston head. There were only three of us—myself and two ladies—but we replaced the piston, stopped the induction pipe to the cylinder, re-arranged the water circulation, and ran the car back home (twelve miles) on the single cylinder. Of course, it would only crawl on the second speed, but the country round Edinburgh is not flat, and we felt very pleased to have got home at all. Now I am waiting for a new piston head, but I would like to know what there can be about that back cylinder that causes the valves to go. The inlet valve to the back cylinder has a smaller lift than that to the front one. The engine has been working very well indeed, and I have had nothing to trouble me with it. I think if the car had been one of the new twin-cylinder type (and not as it is two separate cylinders) it would have been much harder to get it going again as we did.—S 18.

There is no doubt that the breaking of the exhaust valve in the rear cylinder of your engine is due to insufficient water cooling and to the shortened lift of the valve. As the arrangement stands at present the circulation is principally through the front cylinder, the water around the rear cylinder being in a very sluggish state, and therefore tending to make the rear cylinder run considerably hotter than the front one. The result of this is that the exhaust gases leave the cylinder at an extremely high temperature, and burn away the stem of the valve immediately beneath the head. This reduces the diameter of the valve stem; and, further, has a deleterious effect upon the metal at this point, which in time results in its breaking off close underneath the head, and so causing such troubles as are specified in your letter. This, unfortunately, seems to be a somewhat common complaint with this make of engine. The only practical remedy is to have the exhaust valves constructed of a metal which will stand a high temperature. There is no doubt that the separate cylinder design facilitates the inspection of any given cylinder, as it does not necessitate the dismantling of a cylinder or cylinders which do not require attention. Taking it all round the balance of advantages lies with the use of individual cylinders from the user's point of view.

TYRE TROUBLES.

I have had a lump come on the hind wheel tyre of my car. Is it caused by the inner tube being weak, and pressing upon the outer cover? What is the best step to take—change the inner tube and discard it, or can it be repaired or strengthened, as there is not a puncture yet in it? Or does the trouble come from a weak outer cover? If so, what can be done? as it is very little worn; has done about two thousand miles, I think. The inner tube, when I was once trying to find a leak in it, as I thought, in a tank of water, swelled out like a football in one place, and I just saved it bursting by getting the valve undone in time.—H. L. D.

The lump or boil on your cover is not due to any weakness of the air-tube, but is caused by some of the threads of the canvas lining of the cover being stretched or broken. The way to repair it is to get from the makers a special canvas patch. These patches are made of several thicknesses of canvas, and are shaped to fit the curvature of the cover, inside which they are solutioned. You should do this at once, as threads will keep on breaking in the cover around the weak spot, and before long it will burst—that is to say, all support will be removed from the air-tube. If you have no experience in tyre repairing it is best to take the cover to some good repairer in your locality who does tyres well, or, better still, send it to the makers and have it done thoroughly. You ought to have a spare cover by you now, and it would be a good opportunity for getting it. By having tyres repaired in good time their life is greatly prolonged.

THE ELIMINATING TRIALS.

As is well known, May 10th is set down for the trials of the cars from which are to be selected the three vehicles to take part in the actual Gordon-Bennett race. The trials will practically occupy eight hours from the time of the start of the last vehicle. On May 11th the hill-climbing test of the competing vehicles will be made at Machrel, a place close to Ramsey, where a two miles uphill climb will be set the crack racing cars. Upon the 12th speed trials for the Gordon-Bennett cars will be held at Douglas, after the manner of the Southport trials. It must be understood that no competitions are open to any vehicle but those engaged in the trials. Mr. Julian Orde, the secretary of the Automobile Club, is anxious to have this as widely understood as possible, as an idea seems to have got about that events other than those for testing the Gordon-Bennett trial cars are to be held in the Isle of Man. This is not so!

The Manx population is full of the eliminating trials, and people living in the outlying districts are as keen as those in the towns, and have already made up their minds at what particular point of vantage they will place themselves on the day of the trials. Most of the chief hotels have made special arrangements for storage

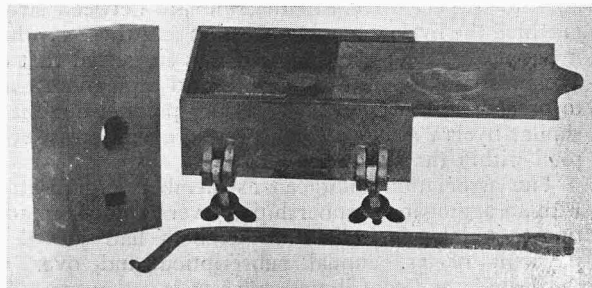
of cars, and at Douglas the local Hippodrome and Drill Hall will be utilised for this purpose. The Manx roads are being repaired where required throughout the course, while on the front at Douglas long stretches of asphalt are being laid in preparation for the special trials which take place after the long-distance tests. The roads seem to dry very quickly after rain, especially in the hillier region of the island.

Owners who are contemplating taking their cars over to the Isle of Man will be glad to know that the loading trays which the London and North-Western Co. had made for the Irish traffic last year will be used both at Liverpool and Douglas, so that the cars are not likely to be damaged.

The interest of the islanders as a whole in the event is purely a sporting one, as it will not benefit the great majority of them. The people who will do well out of the affair are mainly the hotelkeepers. Lodging house-keeping may, without offence, be looked upon as the staple industry of the island, and the lodging housekeepers will not benefit very greatly, as the vast majority of the visitors will patronise the hotels.

A PORTABLE VULCANISER.

The vulcanising of patches to the air tubes of motor car tyres has hitherto been considered as a most complicated operation, involving intricate apparatus and a skilled operator; but the County Chemical Co.,

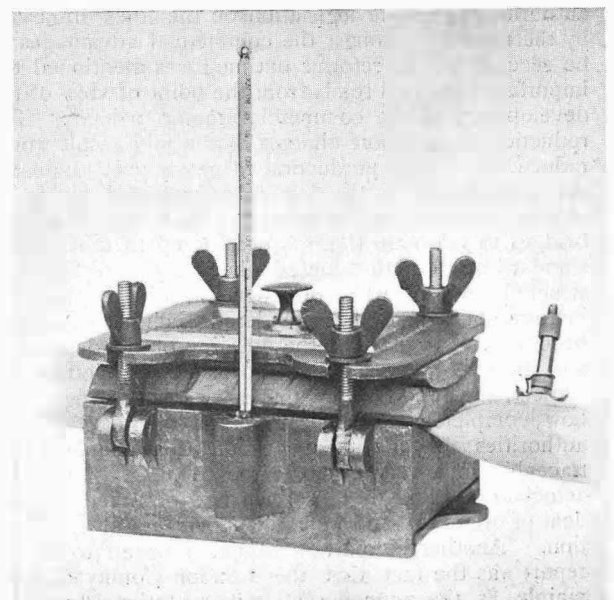


The component parts of the County Chemical vulcaniser.

of the Excelsior Works, Birmingham, are now placing a new vulcaniser on the market which is both simplicity and effectiveness itself. It resembles nothing so much as an old box iron such as laundresses used to employ, and consists of a cast-iron box with a sliding lid, into which a mass of iron previously heated to dull redness in an ordinary fire is inserted. The sliding lid is put on and the apparatus inverted, a thermometer being inserted in a lug cast on the box so that the temperature can be watched. The face of the box is concave, and whilst the heat from the mass of iron is being conducted to the box, the patch to be attached is put on the tube, being affixed by a special sulphuretted rubber solution prepared for vulcanisation. The thermometer indicating a maximum temperature, and having just commenced to fall, the tube is laid across the concave face of the vulcaniser with the patch downward; a thick rubber pad is placed on top, then a wooden block, and lastly the cover, which is screwed down as tightly as possible by means of four thumbscrews. The apparatus is left for ten minutes, when the operation is complete,

and the tube may be removed. We illustrate the apparatus dissected in the first photograph, and in operation in the second.

This is the first vulcaniser we have seen which can be utilised by both amateur and professional alike without special skill or facility, and we venture to predict that it will form an item in every motorist's outfit, since spare tubes can be carried to repair roadside tyre troubles, and on a halt being made the iron can be heated and the burst tubes repaired in a few minutes. The apparatus is handy and fairly light, whilst it is to be sold, with all accessories, at a very moderate price.



The vulcaniser in action.

THREE OR FOUR CYLINDERS?

It is interesting to learn that, although their latest pattern car has a four-cylinder engine, Messrs. Brooke are still firm believers in the three-cylinder engine which they were the first to introduce into motor construction in this country, if not in the world. They do not maintain that a three-cylinder engine is better than a four, but they claim that the difference between a two and three-cylinder is infinitely greater than that between a three and four-cylinder; in fact, they tell us that on some of the latter three-cylinder cars they had often had experienced motorists, who, not knowing that the engine was a three-cylinder one, have thought that the car was being driven by a good four-cylinder engine. This is particularly interesting, as it comes from constructors

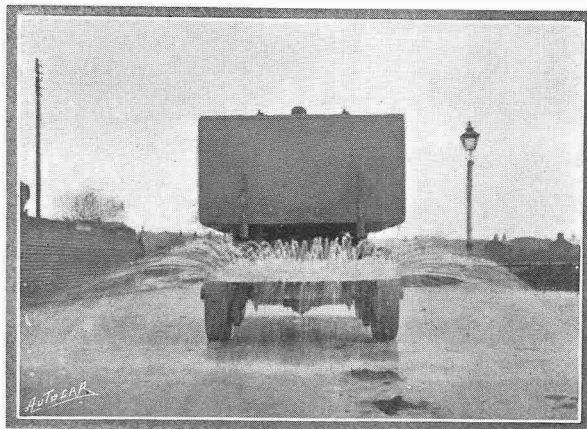
who have made a special study of the three-cylinder engine. There are many who believe that the three-cylinder engine will, if it has not already done so, be made to equal the four-cylinder engine. When it is considered how much more experience is available concerning four than three-cylinder engines, this belief is not altogether unreasonable, particularly, as the three-cylinder engine provides a better balance of the reciprocating and revolving parts than the four. On the other hand, we must admit that while we have tried three-cylinder engines, which run with the same smoothness as a good many four-cylinder engines, we have not sat behind a three-cylinder which was as good as the best four-cylinder engines. However, there is no reason why the three cylinders should not be further improved.

THE ROADS IMPROVEMENT ASSOCIATION.

The annual report of the Roads Improvement Association, presented at the meeting on Wednesday, at the Westminster Palace Hotel, stated that during 1903 the movement for wider and better roads had made considerable progress, a Government committee, which was appointed to enquire into the matter, having presented a report endorsing the main contention of the R.I.A. that the existing system with its multiplication of highway authorities was fatal to efficiency and economical administration. In order to secure unity of administration for the trunk roads, they suggested that such roads should be called national roads, and that the State should contribute towards the cost of maintaining them, and exercise supervision over the authorities entrusted with their maintenance. Equally satisfactory were the recommendations that provision should be made for the construction of bypass roads round cities and towns for the through traffic, and that building operations in the suburbs of such towns should be conducted on a general plan, so as to provide alternative trunk roads. Following up the advantage thus gained, the association has taken the necessary steps to bring pressure to bear upon the authorities to secure legislation on the lines indicated by the report. Amongst the commercial advantages to be secured by the reforms outlined was mentioned the importance of good roads from the point of view of the development of the commercial motor vehicle. The reduction in transport charges that would result would reduce the cost of production in nearly every industry. An amendment in the law was suggested giving to county authorities power to require the owners of private bridges to maintain these structures up to the original standard of strength adopted when they were first constructed, and even to strengthen the bridges where the increase of traffic has rendered such strengthening necessary. In regard to the question of London traffic, and the appointment of the Royal Commission on the subject, the report stated that it was interesting to see how completely changed was the attitude of the authorities towards this question, this change being traceable in a very great degree to the efforts of the association. The dust problem had occupied a good deal of attention, and was still under careful consideration. Another important matter referred to in the report was the fact that the London County Council, mainly as the outcome of representations from the R.I.A., proposed to adopt a new byelaw for the regulation of slow-going traffic in London. The Home

Secretary on being communicated with in regard to the proposed byelaw, expressed the opinion that, "following precedents set by Parliament," the byelaw should not apply generally, but be restricted to certain streets in which the obstruction caused by slow-going traffic was most felt. The honorary secretary of the association, on being informed by the County Council of what was being done, pointed out that a byelaw limited in its operations to particular streets would not be nearly so effective as one of general application, for this reason ---that both horses and drivers of slow-going traffic were largely creatures of habit, and it was desirable to take steps to induce them to habitually keep close to the kerb on the near side of the road. It was unreasonable to expect drivers to discriminate between streets in which the byelaw was in operation and those in which it was not. As an alternative, it was suggested that the byelaw should operate along bus and tram routes. As to precedent, the honorary secretary pointed out that a similar byelaw at Nottingham was in operation in every road within that city.

The association embraced as members organisations with an aggregate membership of over 113,000, in addition to which 362 individual members had joined on payment of 5s. annual subscription, and over 300 individuals had contributed sums of less than 5s. The income of the association was £366, and the expenditure had been kept well within the income. At the end of the year the balance in hand was £283 8s. 4½d. --- none too large considering the work to be done.



A Leyland motor water cart in operation.

A GREAT MOTOR TOURIST.

Mr. Chas. J. Glidden interviewed.

The name of Mr. Chas. J. Glidden as an enterprising and intrepid automobilist is already well known to British automobilists through our columns by reason of the long journeys he has made by flood and field on his various Napier cars. Mr. Glidden is now in London prepared to set out on the fourth and last section of his round-the-world drive, and we were happy to find him at the Carlton Hotel early this week prepared to chat about his intended journey as calmly and as unconcerned as though he were about to drive round Hampstead Heath.

Mr. Chas. J. Glidden, of Boston, U.S.A., is an old friend of *The Autocar*, for we had the pleasure of welcoming him in England in 1901, upon the completion of his very first trip on his first Napier.

"I'm very glad to see *The Autocar*," remarked this hearty, most un-American-looking American, as we entered his comfortable sitting-room. "*The Autocar* was my first love in automobile papers, and I still remain constant to it. It is a great paper, sir, and I, who during my twenty years of commercial life had the placing of \$50,000 worth of advertising per annum, tell you that in my opinion, in the interest and production of your advertisements, you are unapproached."

We suggested that advertisements were not in our line, and asked Mr. Glidden when he was leaving, and where was his pushing-off point.

"I shall quit here—this hotel—on the 5th prox."

"Do you go on a new car?"

"Oh, no; my 24 h.p. four-cylinder Napier, which took me within the Arctic Circle last year, will do duty again. I have had it fitted with the hydraulic governor and the new Napier high-tension current distributing ignition, with sundry attentions from the body-maker, in the shape of paint, and it is ready to go anywhere."

"Do you go alone, Mr. Glidden?" we asked.

"Oh, dear no. I shall be accompanied by Mrs. Glidden (who leaves New York to-day on the *Kaiser Wilhelm der Grosse*) and Miss Martha Waldron, the well-known American actress, who has just completed a most successful engagement with Henry Miller and Margaret Anglin in New York. My mechanic, Chas. Thomas, who has been with me on the three previous occasions, will also be along. I took him from Mr. Edge when I first came over, and he knows a Napier inside out."

"Where do you make for first, Mr. Glidden?"

"Well, I want to complete my cathedrals, and shall for this purpose visit Peterborough, Ely, York, Durham, and Norwich, running across to Liverpool for the Isle of Man and the eliminating tests, and then harking back again across country to Harwich, where I shall ship the car for the Continent. But before doing that I shall visit Boston, Lines, for the purpose of viewing the parish church there."

"Oh, Boston Stump," we interjected.

"Is that what you call it?" returned Mr. Glidden, somewhat doubtfully. "Well, a Bostonian has left

money for the erection of a replica of your Stump in Boston, Mass., and I want to look at the original."

"After Harwich, Mr. Glidden?" we queried.

"Oh, through Holland, the Rhine, and to Homburg to see the Gordon-Bennett; then back to Southampton *via* Antwerp, sailing on June 24th for New York, and leaving Boston, Mass., on July 25th with the New England Division of American Automobile Tourists for the St. Louis Exhibition, *via* Niagara Falls and Chicago—1,500 miles in all—arriving at St. Louis on August 15th, with all the automobilists gathered on the route—about 2,500. Biggest thing yet done! The week after will be known in St. Louis as Automobile Week, and all the cars will be garaged in the exhibition grounds. Then on September 1st away across the American continent to San Francisco—only two cars ever crossed before, and they had at times to drive over canvas—ship car to Hawaiian Islands, then on to New Zealand, Australia, the Philippines, China, Japan, Malay Peninsula, Borneo, Sumatra, and Java."

"Sultry places?" we suggested.

"Yes. In Sumatra I shall drive my automobile across the Equator—there are only three points in the world where this can be done—and shall bring my fourth section to an end in the Asiatic Archipelago."

"Is that the end altogether?" we asked.

"Oh, dear no. I shall then ship my car to Colombo, and return to it there in 1905, drive there, and continue driving in India, Egypt, Palestine, Greece, Turkey,

Hungary, Italy, Sicily, Tunis, and Algeria. There I shall drive into the desert and visit several of the oases."

"Through the sand?" we asked.

"Why not?" replied Mr. Glidden, as if the surface of the shifting, burning desert were a turnpike road. "A Napier will go anywhere. Then on through Spain and Portugal, France, and England, which I hope to reach on July 1st, 1906, thus completing an automobile engirdlement of the earth."

"With ramifications," we added.

"Oh, yes—with ramifications!"

"How about fuel and oil, and spares and things?" we queried.

"All arranged for, my dear sir—all arranged for. I've been in correspondence with officials in all the countries *re* duties, etc., and with oil merchants over all parts of my proposed route. My petrol will be ready and waiting at arranged points from the word Go!"

"And spares?" we asked.

"Spare! What for—the car?"

"Yes," we replied.

"Well, I guess the car won't want any spares; it hasn't yet, anyway, and the ice country tried it."

"And when you're quite through, Mr. Glidden, what will you have done?"

"Just about 40,000 miles," was the reply.

"Well," we said, "we hope you'll enjoy it, particularly the desert, with the petrol transported in the camels' No. 2 stomachs."



Mr. and Mrs. Chas. J. Glidden.

POPULAR MOTOR CARS.*

By Mervyn O'Gorman.

Public favour has not yet been expressed with such spontaneous unanimity as to justify the title of my paper, but if a car is made sufficiently cheaply, and is designed so as to preclude it from becoming notorious, it is tacitly assumed to be popular on one further condition—rightly or wrongly, it must not be called a "freak." Ingenuity, which may escape unpunished in a detail like a carburettor or unseen in a lock-out, is unpardonable in the general design. And so we find a dummy bonnet containing a tool-box (or a suit of overalls), a tiller steering disguised with a hand wheel, six-hole lubricators of which only two are operative, side chains without distance rods, back axles having one loose wheel but ornamented with an empty differential box, undished "artillery wheels" whose spokes can never be in compression or rims in tension, "balanced" brakes which are thrown out of action if the

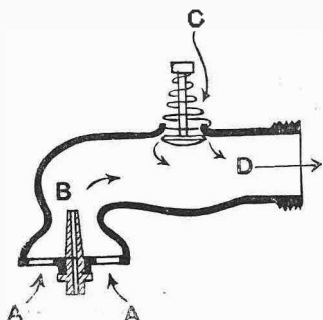


Fig. 1.—An automatic carburettor. The air is drawn in at A, and takes up petrol from the nipple B. Extra air is drawn in at C as the speed of the engine increases. The combustible mixture passes to the engine through D.

carriage springs pass over a bump in the road, and latterly "automatic" carburettors which ensure a faulty mixture at all times. What matter the defects if fashion merely requires the vendor to embody in his story some of the mystic words—"Mercedes bonnet," "wheel steering," "direct drive," "sliding gear," "three speeds and reverse," "cardan transmission," "artillery wheels," "long wheelbase," etc., etc., together with such other catch words as have become fashionable in the catalogues if he is to sell a car at all? This is a regrettable state of things.

In the matter of shapes and words, fashion is the hand-maiden of the advertiser. If we hear a property claimed with sufficient iteration we presume it to be worth claiming, and a determined preference is thereupon evinced for features which on the great racers are doubtless a means to an end, but many of which must lose their merit in their adaptation to 5 h.p. or 10 h.p. cars. It is like using Carlyle's diction without sharing his intellect and temper, or Meredith's style without his wit.

Debatable matters on which the public has fixed views may be tabulated as follows:

- I.—Multiple v. single cylinders.
- II.—Vertical v. horizontal engines.
- III.—Small enclosed v. large flywheels.
- IV.—Racing bonnets and cellular radiators v. unobtrusive bonnets and gilled tubes.
- V.—Valves in pockets v. valves in cylinder head.
- VI.—Spray carburettor v. surface wick and others.
- VII.—Induction supply of gas v. pressure supply.
- VIII.—Side chains v. direct drive, live axles (this fashion has lately received the order of right-about turn).
- IX.—Four-speed sliding gear v. two-speed of any other type.
- X.—Governing by throttling the inlet v. throttling exhaust bit and miss altering mixture, etc.
- XI.—Long wheelbase v. springs properly damped.
- XII.—Heavy v. light cars (here the turn is coming).
- XIII.—Ornate carrosserie v. simple and smooth bodies.
- XIV.—Wheel steering v. tiller steering.
- XV.—Racing results v. reliability trial results.

In comparing these competitors for public favour it may be useful to premise—

- I.—That the following remarks are entirely restricted to popular as distinct from high-powered cars.
- II.—That they do not indicate a preference for any existing manufacture, but are the results of experiments on a car built from stem to stern in a private laboratory.

III.—That it is useful to consider particularly the less fashionable alternatives because the others do not lack supporters.

The Engine.

Ask the ordinary man what he wants from his engine, and he will answer (if he is a wise-ordinary man), "not to be bothered with it." But it will bother him—

- I.—If it wastes the seating and luggage space of his car; it should not occupy half the front of the frame.
- II.—If it does not give power and speed from the least amount of iron; it should be a fairly high-speed engine.
- III.—If it fails to go a long way with the least amount of fuel; it should have full compression at all speeds, and no valve pockets, etc., etc., so as to be efficient.
- IV.—If it is not simple to make and mend, cheap to buy, and if its troubles are not easily traced; it should have a single-cylinder only.
- V.—If it joggles and shakes him; it should have a large flywheel, long connecting rods, and the carriage-work be mounted on springs.
- VI.—If it requires much gear reduction and refuses to travel slowly as well as fast, say from two to twenty miles an hour without gear change.
- VII.—If it does not start easily (which is a question of ignition, carburettor, and valves).
- VIII.—If it does not run silently; it should have a perfect silencer at will, and normally use no gear reduction.
- IX.—If it upsets the car on turning corners; its weight should be low as in a horizontal engine.
- X.—If it fails to supply itself with lubricant, water, and fuel, and do its own repairs; not want any or a minimum.
- XI.—If it is not completely accessible for attention.

Single Cylinder.

A friend who owned a big car asked at the last exhibition about getting a new one. He had but one stipulation, "It must have only one cylinder. If that cylinder does not start I do not go out, and therefore I do not get caught, and if it

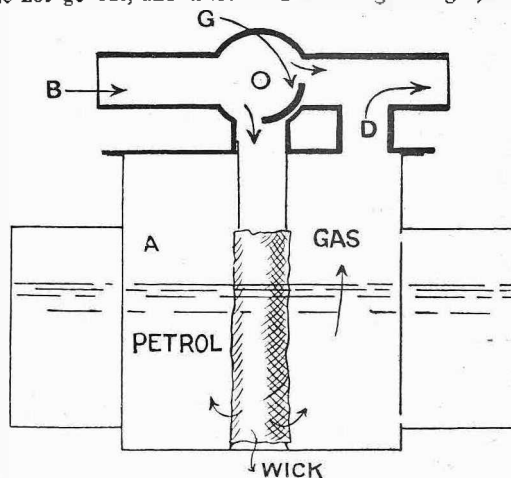


Fig. 2.—Pressure feed carburettor. The air under pressure enters at B, and the major portion passes down the vertical pipe and through the wick bubbling up through the petrol. The vapour-laden air then passes through D to the engine, it being mixed with a sufficiency of pure air passing the cock G.

misses fire on the road I know at once where to look for the trouble. It ought to be a good sized cylinder, though," he added as an afterthought.

I found that he did not want a popular car, and I did not agree. For the cheap car when there is no question of starting on the spark one cylinder wins the day the more easily that all appreciable engine vibration can be eliminated without perfect engine balance.

Horizontal Cylinder.

Having, as I would suggest, rightly preferred the cheapness and simplicity of one cylinder, a compromise must be made.

*A Paper read before the Society of Arts on Wednesday, April 20th.

between the claims of the various engine positions to minimise the "bothers" of the ordinary man, and an investigation does not so markedly favour the vertical cylinder for popular cars as current usage would indicate. In some things the vertical engine cannot favourably compare with the horizontal, thus: In facilitating the use of long connecting rods, large flywheels, in securing a low centre of gravity, economy of seating space, and slow running (with a view to approaching the direct drive), which means efficiency.

Flywheels.

Tabulating the opportunities of the horizontal position, we find that—

- I.—It allows more easily of large flywheels, thus obviating the intermittent effect of a single cylinder.
- II.—And, therefore, admits of slower running, thus economising in the weight of the gear the increased weight of flywheel.
- III.—It allows of diminishing the obliquity of the connecting rod by using long rods and eccentric cranks.
- IV.—And this without raising the centre of gravity.
- V.—The horizontal position does not *per se* limit the engine speed.
- VI.—But facilitates the selection of any convenient place for the engine.
- VII.—Incidentally, it makes one more step towards a true, direct drive from an engine rotating in the same plane as the road wheels (I will return to this later).
- VIII.—And allows of putting the water jacket low enough to make a failure of the water pump less important than if the cylinder were above the radiators.

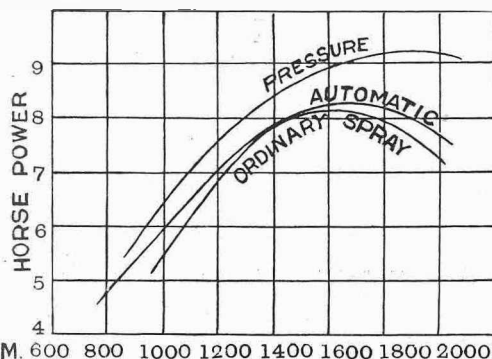


Fig. 3.—Diagrams showing the results of using different carburetters. It will be seen, that at about 1850 r.p.m. the pressure feed type gives about 5½ h.p., which rises to 9 h.p. at 1,850 r.p.m., or nearly 1 h.p. higher than is given by any other type of carburetter.

- IX.—The horizontal engine may be stored almost entirely under the car frame so as to give great latitude for variations of the carriage-work.

Bonnets.

- X.—Without any waste of space by a prodigious bonnet.
- XI.—The horizontal position generally gives easier inspection of crank-pin bearings, and does not preclude perfect freedom of access to the valves and head (though the grave neglect of accessibility in the past is the chief cause of the disappearance of this type of engine).

I may say that I believe this disappearance to be temporary, and can quote the Wolseley, Siddeley, James and Browne, Roots, Alldays, Duryea, Winton, Oldsmobile, Cadillac, and others amongst the persevering minority.

Valves in the Head.

This title at once recalls a malady of the modern motor, which is at the moment spreading a good deal. It is well recognised that the less the inside surface of the combustion space the less is the waste of heat; and in our motoring childhood, when we were free from fashions' fetters, we would have preferred the dome of minimum surface with the valves working in it. In our De Dion days one small pocket was added for convenience of inspection of both the valves, but now since then the excellent plan of opening the inlet by a cam has come into vogue we have without excuse abandoned the thermal efficiency of the old design in favour of a purely ornamental symmetry. An engine is no better for having a

Popular Motor Cars.

flat head and two thin flat pockets of small capacity and large inside surface, while the evil is aggravated by fitting each pocket with an uncooled inspection plate. Such a design precludes high compression, and conduces to self-firing. The loss of heat may be surmised from the increased area of the combustion head exposed to explosion temperature indicated in the figure.

It is a pleasure to note that the engines designed by Mr.

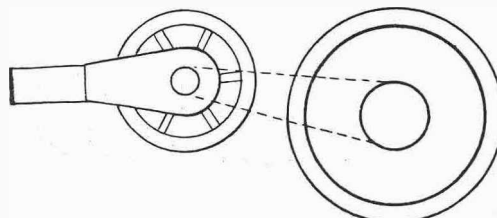


Fig. 4.—85% efficiency is given by a direct drive.

Craig, as well as the Duryea, the Clement-Garrard bicycle engine, and a number of others are rejecting this innovation.

Automatic Spray Carburetter.

It is with hesitation that I touch on any experiments on carburetters, because with marked regularity each week produces a new automatic carburetter. Be it noted, however, that no seeker for truth and unpopularity has produced and sold a meter for measuring the degrees of "automaticity." Pictures of carburetters mostly disclose a constricted air passage, into which an ever-increasing jet of petrol is drawn in proportion to the increasing vacuum which results from the increasing rapidity of the stroke of suction as the engine goes faster. Three evils result from this—

- I.—That more petrol is wasted than need be (which does not much matter).
- II.—That a less total of mixture gets into the engine, so that not only its output, but also its compression and efficiency, are diminished.
- III.—That what mixture does reach the engine is incorrect (and too rich with a further resultant inefficiency and extra heating of the engine head).

Two or three cures present themselves—

- (1.) To make a leak into the partial vacuum by a valve. This is the automatic carburetter.
- (2.) To blow more air in at the entrance.
- (3.) To avoid having any constriction in the air inlet and to supply at each stroke the quantity of petrol required either as a liquid, or a dust, or a vapour, or even up a wick.

Partly because the high price paid for certain cars—notably racers—warrants the expenditure of time and care in accurately adjusting the spring and movement of the "leak" valve, and partly because there is no means for the owners of cheaper cars knowing whether such adjustment has been made properly, the leak valve plan having well started will run its course. It is a delightfully ingenious and simple device, which deserves success, and which I think the world owes to an Englishman—Mr. Pidgeon. Nevertheless, it has to be calibrated to work correctly, and in the absence of any instrument for so doing (other than taking at all speeds brake horse-power of the engine to which it is to be fitted) the appliance as issued on cheap cars is liable to be worse than useless.

Even when the right proportions have with care been got throughout the range of engine speeds from 200 to 2,000, I

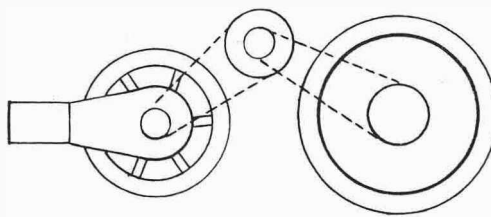


Fig. 5.—72% is the efficiency when a countershaft is introduced.

am not aware that any correction has been attempted for the great variation in density of both air and petrol with ordinary temperatures. Furthermore, any device that draws the petrol by suction out of its nook must be rigidly limited as to the weight of fuel taken in per stroke by the pressure of supply, which is atmospheric pressure. This limitation is unfavour-

Variable Speed Gear.

It has often been said that since the explosion engine has been improved to run slowly the large range of speed for each position of the speed lever removes all need for a continuously variable gear. This is wrong. If the argument were applied to a suggestion for increasing the number of steps from three to five or seven it would be right, because the existence of steps introduces a human difficulty of estimating whether the engine will under the conditions of the changed gear ratio develop more or less horse-power than it did before the change. If a man is driving for maximum speed—as sometimes happens—he can when provided with a gear which is infinitely variable without unclutching hunt about for the best position (just as one does with the spark lever); and, luckily, the best position is easy to determine from the very fact that it is a maximum, or a place where small errors on either side of the correct position are unimportant. But even this advantage is as nothing to the fact that such a "variable gear" can (without even the mechanical complication of a couple of flybobs) be made to automatically keep for every gradient the position of either of most efficient engine speed

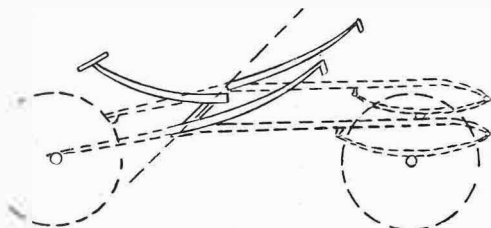


Fig. 9.—A suggested method of springing.

or of greatest engine output. I happen to know that one of our most ingenious experimenters is close upon producing this device, which will be of the utmost utility to cheap cars whose engines are on the verge of being too small for their work. With a view to this development, as also for more important reasons, I should like to see a revolution in motor car racing—racing with fuel efficiency as part of the competition, racing where moderate speeds and small efficient engines are necessitated by the limitation of the fuel allowances, and racing where the winner may be going dead slow for fear that his quantity of petrol will run out before he reaches the winning post. Under these conditions I think that the same intense excitement and sport might be obtained, the same call made for skill from the driver, the same credit be due to the designer of the winning car, but a more practical advance made on the occasion of each great race than is obtained even now in the competition for the Gordon-Bennett cup.

Long Wheelbase.

A long wheelbase is not an object in itself, because most of, if not all, its merits can be obtained by other means. Its advantages are:

- (a) The spring effect of the long girder first as to road shock, and second as to engine vibration.
- (b) Accommodation for a roomy tonneau or body with side entrance without placing any part of the engine, etc., under the passengers.
- (c) Diminution of side-slip.
- (d) Steady running (to avoid "bouncing twice in one hole," as it is called).

The drawbacks are:

- I.—Increased difficulty in rapidly turning.
- II.—It does not sufficiently cure side-slip to render non-slip devices undesirable.
- III.—It is more liable to distortion than a short frame with evil effect on the gear.
- IV.—It adds to weight.
- V.—It adds to cost of purchase and stable accommodation.

We often forget that a good share of the advantages can be got without the drawbacks, and that a long wheelbase is not the only means to the advantages.

(a) The spring effect and a slow period of vibration, as compared to the frequency of road shocks, are obtainable by the easy means of coach springs on condition they are prevented from bouncing either by a friction damper or an air damper. Resiliency is the bane of spiral springs, which are cheap, but much too efficient, and until air springs have left the experimental stage, coach springs are our best resort as affording plenty of friction between the leaves, which thereby help to dissipate the energy of the blow. All springs waste energy and increase the resistance to travelling, as has, I think, been

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proved by experiments on ordinary vehicles when it took more tractive force to move a ton on a well-sprung carriage than on an unsprung cart, but no enthusiast for a long wheelbase suggests doing away with springs to save power, so it remains for the designer of a popular car to study the alternative methods of avoiding being personally bounced as a means of expending the energy stored in the springs.

I have made an attempt to secure this result by supporting the entire carriagework of a car from one line in the chassis, so that the chief movement to be dealt with under these conditions is a movement of pivoting or rotation about that line, and it would appear that this rotation can be easily controlled or damped. I have not by this means obtained with a 6ft. 9in. wheelbase and a half-ton car the comfort of a 9ft. wheelbase with the inertia of 20 cwts. on the springs, but the road shocks are unquestionably modified into a very pleasant undulating movement. Considering the great difference between the weight of a light car and that of a couple of passengers, and remembering at the same time the small expense of a separately sprung body, it is surprising that so little has been made of this arrangement, which gives, amongst other advantages, a means of concealing the irregularities of a single-cylinder engine.

If it is legitimate to promulgate a new catch word in a paper directed against them I would suggest "separately sprung body" for the consideration of the buying public.

(b) The accommodation obtained by a long base can be got on a short one by an economy of bonnet, though as I am disposed to the belief that the really popular car should have its springs and running gear designed for the weight of two persons only with an emergency space for a third or for luggage behind, thus abandoning the tonneau, with its need for a side entrance, as inappropriate to a £200 car.

(c) In this type of car, which may often be tended by its owner, easy access to the engine is imperative; and, as I have said, this can be got without any waste of space.

(d) The diminution of side-slip, which is rightly claimed for the long girder construction, loses all its importance when we remember that both long and short cars must in any event fall back upon anti-side-slip devices, many of which effect a remarkable cure for this evil, and combine it with protecting the tyres, adding to the efficiency of the brakes, and for speeds under twenty miles per hour, with which at present we are alone concerned, causing little appreciable loss of power.

Should we succeed in transferring these advantages to the short car we can add to them the advantage which shortness itself ensures—that of easy handling and rapid turning, for in-

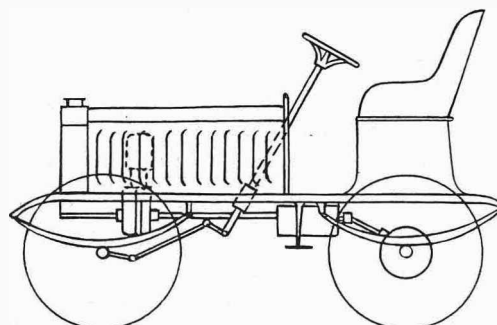


Fig. 10. A conventional design for a light car with "Gordon bonnet."

town we often require to turn within a circle of less radius than a car length, just as a hansom does, whereas long cars cannot usually turn without backing in any road whose width is less than 30ft.

Light Weight.

Apart from ease of control and simplicity of steering, gearing, and repair, the popular car can and should have one undeniable superiority over all other cars in its lightness, yet by an unfortunate oversight no claim is made on this score by the makers, no advertisements declare it, the assistants at the exhibits can hardly ever give a correct weight, and usually do not even trouble to invent one. Yet the number of hours to be spent on the roadside are chiefly determined by this, and the number of pence per car mile is dominated by this item.

Perhaps weight cutting is fraught with danger unless the high-class makers take the lead, and without looking forward to the time when the word featherweight will come to us from the bicycling world, I think that with skill the judicious

Popular Motor Cars.

cutting out of useless metal may be carried a very considerable way with advantage on cars whose top speed is strictly limited to twenty miles per hour.

Tabulating the advantages at the risk of repeating a very old story, I would say that by reason of its lightness a car required—

- I.—Less fuel for any journey.
- II.—Less power for any hill or for any speed.
- III.—Cheaper tyres, and wears them less.
- IV.—Less expensive parts; but
- V.—Very careful design.

The problem of how to get lightness is peculiar. One would be tempted to suggest the great cure to be a high-speed engine, but practice proves that this is not the case—in fact, in small cars the brake horse-power per hundredweight of the car is independent of the speed of the engine, which shows that the additional weight of gear has outbalanced the economy of weight on the engine. In the very cheapest class of cars high-speed engines show some superiority, but in

larger cars the slower speed of 800 revolutions is about the usual practice.

Body Work.

With regard to bodywork, general design, and appearance, one would have supposed that the newness of the motor car would have given the most perfect freedom for ingenious design where each detail would be considered in the light of its utility alone. Yet, with the exception perhaps of the Lan-chester, this is not the case. The popular car, which must face mud, dust, and rain, and be soured once a day with a hose, should have as sleek and simple an exterior surface as the deck of a yacht. But we do not find any provision for washing, and a cover to the underside of the machinery is looked on as a luxury limited to the *élite* of cars.

I must not fail to publicly thank the Wolseley Motor Car Co., the Ariel Motor Car Co., and the Humber Company for the tests they kindly gave me, showing the rise and fall of horse-power of their engines with increasing speed.

CLUB DOINGS.

Oxford and District A.C. Hill-climbing Competition.

The second annual hill-climbing contest of this club took place on Saturday, April 16th, on Dashwood Hill. The weather was fine and the roads in good condition. The course selected was from the cross roads at the bottom of the hill to a gate at the summit, a distance of 930 yards, with an



THE OXFORD A.C. HILL-CLIMB. Mr Biscoe's Gladiator coming up Dashwood Hill when the Oxford club held its hill-climbing competition.

average gradient of one in eleven, and in the steepest portions of one in eight. A flying start was allowed and the moment of ascent signalled by a white flag. The cars were divided into two classes—those selling at under £250 and those selling at over that figure. The results were:

Vehicles not exceeding £250: 1, Dr. W. J. Turrell (6 h.p. Eagle runabout), 2m. 10½s.; 2, Mr. Biscoe (6½ h.p. Abingdon), 3m. 52½s. Cars at over £250: 1, Mr. Biscoe (11 h.p. Clement), actual time, 2m. 47½s.; 2, Dr. Daly (12-16 h.p. Gladiator), 3m. 2½s.; 3, Mr. Rippon (10-13 h.p. M.M.C.), 3m. 40½s. After the competition the members and their friends repaired to the Lambert Arms Hotel, at the foot of Stokenchurch Pass, for tea.

Lincolnshire A.C.

A successful meet of the members of this club was held at Grantham on Thursday at the George Hotel. The day opened cold and dull but brightened up later. Among the cars present were: Mr. Garnett's 8 h.p. M.M.C., Mr. G. Linnell's 10 h.p. Wolseley, Mr. W. B. Jevons's 9 h.p. De Dion, Mr. A. A. Padley's 6 h.p. De Dion, Mr. Ben Smith's 12 h.p. Richardson, Mr. G. J. Wilkinson's 3½ h.p. Ariel tricycle, Dr. Beauvais's 7½ h.p. Daimler, Captain C. Lycett's 7 h.p. Panhard, Mr. C. V. E. Parker's 10 h.p. Panhard, Mr. W. E. Stanton's Royal George motor bicycle, Mr. C. Holland's 8 h.p. Peugeot, Mr. F. Richardson's 8 h.p. Wolseley, Dr. Sharp's 12 h.p. Richardson, Mr. C. Nelson's 4½ De Dion, Dr. W. Gilpin's 8 h.p. Peugeot, Mr. H. C. Tryon's 10 h.p. Pick, Dr. Benson's Royal George motor cycle, and Colonel Harding's 12 h.p. Darracq.

Berkshire A.C.

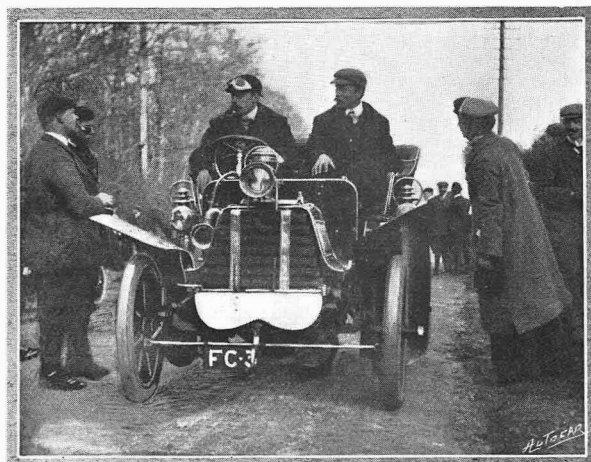
At a general meeting of members of the newly-formed Berkshire Automobile Club, held recently, Sir Gilbert A. Clayton East, Bart. (chairman), presiding, the rules as drafted in committee were approved with slight alterations.

Wolverhampton and District A.C.

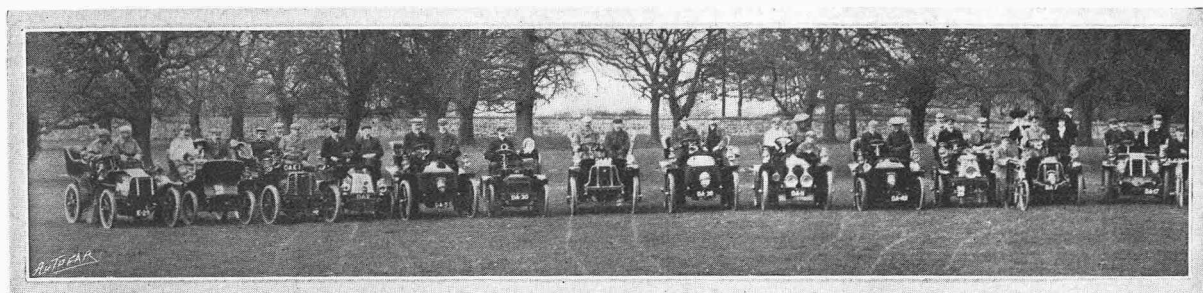
The opening run of the season of the Wolverhampton and District A.C. was made to Newport, Salop. The members first visited Wrottesley Park, where the cars—28 in number—made a fine show, as will be seen from the photograph on page 603. The cars comprised: A Gladiator; 7, 12, and 18 h.p. Stars; 8 and 12 h.p. Sunbeams; 4½, 6, 8, 6½, and 8 h.p. De Dions; 16 h.p. Ariel; 7½, 8, 10, and 24 h.p. Wolseleys; 20 h.p. M.M.C.; 7 h.p. Panhard; and 5 h.p. Humberette. On arriving at Newport tea was taken at the Royal Victoria Hotel. The roads were in splendid condition. The rule of the club to reduce speed in meeting and overtaking other vehicles, in passing through villages, in approaching cross roads, and in rounding corners, was strictly complied with.

Scottish A.C.

The opening meet of the present season took place at Callander on Saturday last. Both Eastern and Western Sections were represented, and there was a large muster of cars, over fifty in all arriving during the early afternoon at the Dreadnought Hotel, where the members and their friends to the number of about two hundred took lunch together. The roads, in spite of heavy rain the previous day, were in first-class motoring condition, and the weather was all that could be desired. Fully twenty different types of cars were in evidence, including Darracqs, Wolseleys, Daimlers, Albions, De Dietrichs, Panhards, Napiers, Arrol Johnstons, Argylls, Humbers, Progress, Clements, Benz, Mors, Peugeots, De Dions, Renfrew, St. Vincent, Beaufort, and Victrix.



THE OXFORD A.C. HILL-CLIMB. Mr. Claud Rippon, the President of the club, arriving on his 12 h.p. M.M.C. car at the top of Dashwood. We are indebted for this and the other club photographs to Mr. C. V. Peel, of Oxford.



Nottinghamshire A.C. Hill Climb.

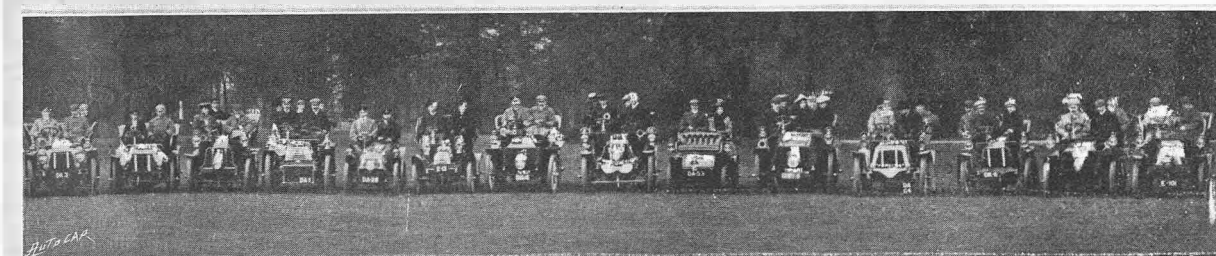
On account of so many members of the Notts Club having intimated their intention of being present at the Gordon-Bennett eliminating trials in the Isle of Man on the 10th of May, the committee have decided to alter the date of their next hill-climb from the 14th to the 28th of May.

Yorkshire A.C.

A general meeting of this club has been held to make certain alterations in the rules. As amended the rules would certainly serve as a good model for new clubs, and automobilists who may be contemplating the formation of clubs in districts as yet without such organisations would do well to communicate with the honorary secretary of the Y.A.C., Great Northern Hotel, Leeds.

A Driving Request.

Motorists cannot be too often reminded of the necessity for careful driving, and the example of the Wolverhampton A.C. in printing upon the back their fixture card the following notice is deserving of general imitation: "Members are respectfully requested to drive through the town at a rate not exceeding eight miles per hour; also to travel slowly in meeting and overtaking other vehicles, in passing through towns and villages, in approaching cross-roads, and in round corners, and especially upon dusty days to reduce speed as much as possible in meeting or overtaking traffic, and in populous places. The exercise of self-restraint and the extending to other users of the highways the utmost possible consideration will result in a better understanding between the public, the police, and motor car drivers."



The two illustrations given above are reproduced from a photograph of the Wolverhampton A.C. in Wrotesley Park, where it assembled on Saturday last on the occasion of its opening run to Newport (Salop), as mentioned under Club Doings.

HORSE ACCIDENTS.

Since the beginning of the year, when on January 9th (page 36) we published the last returns of horse accidents, we have continued our enumeration, with the result shown herewith. During the three months ended March 31st we have discovered from the newspapers, reports of 793 accidents, causing injuries to 532 persons and the deaths of 56 others. These, added to the totals for the period extending from August 29th, 1902, when our enumeration was commenced, to the end of last year, bring up the totals to 6,046 accidents, 4,450 persons injured, and 569 persons killed during the nineteen months covered by the returns, or an average per month of 318.21 accidents, 234.21 injured, and 29.94 people killed. The fatalities so far for each month this year have been below the average, but this may be due to lack of vigilance on our part, many reports having escaped our attention. This may seem a strange thing to say, but it will be readily seen that there is some excuse for missing the records of these occurrences in the daily press when it is remembered that very often even fatal accidents are summarily dismissed in a few lines. Here, for example is a specimen of the manner in which the *Manchester Courier* of February 11th, 1904, reports one of these fatalities:

Walter Andrew (25), carter, of Hyde, was killed through his horse bolting and he being thrown off his seat.

This is all that was said about the matter, and it was in very small type, without heading of any kind. Had the poor man's death been caused by a motor car the public would have been nauseated with harrowing details in every paper throughout the kingdom, from the leading London daily to the meanest local sheet.

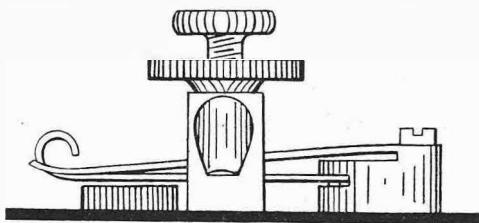
All the accidents here enumerated are due entirely to the uncertainty or unreliability of the horse, and do not take account of any others, though horses may have been mixed up in them. Thus an accident caused by any constructional defect in a vehicle would not be counted; nor would such an occurrence as that of a person being injured by falling off a cart. Nor is any account taken of the many accidents due to tramcars, which in their way are quite as dangerous as horses.

The following table shows the details:

Brought forward from <i>The Autocar</i> of Jan. 9th, 1904, covering the period from Aug. 29th, 1902, to Dec. 31st, 1903 (nineteen months)				Accidents.	Persons injured.	Persons killed.
...	5,253	3,918	513
Horse accidents during	Jan., 1904	298	...	200	13	
"	Feb., "	251	...	163	16	
"	Mar., "	244	...	169	27	
Totals for period extending from Aug. 29th, 1902, to March 31st, 1904				6,046	4,450	569

AN IMPROVED COIL.

It is often remarked, with reference to electric ignition, that as long as there is a spark at the plug, all that can be desired is obtained. That this is not altogether true, we have just proved by changing over from a coil with a system of double contact points to a newer make of E.I.C. coil with the high-speed trembler, which we illustrate. With the older coil no actual misfiring



took place, as was proved by closely watching a spark gap, but high engine speeds were impossible. With the newer type of vibrator the engine possessed new vigour, and it was possible to run it at far higher speeds than was expected. In construction, the new vibrator is simplicity itself, no pitting taking place, and the contact points never sticking together—at least during the period that we used the coil.



Our illustration is reproduced from a photograph sent us by Mr. Owen H. Bayldon. It shows most graphically the primitive method of road mending which obtains in Devonshire, the photograph in question being taken between Teignmouth and Newton Abbot. This is not a lane but a main road which carries a lot of traffic, but despite this there is not room at the side of the road to avoid the enormous boulders.

ROAD REPORTS.

We shall be glad to receive reports from correspondents under this heading as to the condition of the roads—good and bad—in various parts of the country.

On the left bank of the Dee Estuary, between Chester and Rhyl, the roadway along the Flintshire coast is in places in a most dangerous condition, owing to the broken glass scattered over the surface.

About three-quarters of a mile north of the foot of Bury Hill on the way to Pulborough, automobilists should beware when arriving of a small bridge crossing a ditch which causes an awkward bump in the road, where high speed might result in grave disaster. Lately I experienced a very violent shaking when passing over this spot at a good speed.—H.P.W.

The Glamorganshire main roads are for the most part in very good order. The least satisfactory are the roads in the immediate neighbourhood of Cardiff, where heavy motor dray and traction engine traffic is greatly on the increase, and also the road from Dowlais Top to Rhymney Bridge, where motor dray traffic is excessive.

POLICE TRAPS.

Now that fine weather has come and the roads are again in a first-class condition, automobilists will be well advised to be on the alert for the detection of police traps. We shall be pleased to receive early intimation as to the exact locality of such traps as may be noticed by our readers, so that we may give timely warning of their existence.

As was to be expected from the criminally thoughtless manner in which a miserably few automobilists have used the roads of Richmond Park at week ends, police traps thereon have resulted. We know for a fact that there is a measured distance on the level between the cross roads beyond White Lodge and the crest of the descent to Ham Gate.

New Patents.

This department is conducted by Mr. G. Douglas Leechman, consulting engineer and registered patent agent, 18, Hertford Street, Coventry, 32, York Street, Dublin; and 9, Exchange Chambers, New Street, Birmingham; from whom any further information respecting patents, designs, and trade marks may be obtained.

The following specifications were printed and published on April 21st, 1904. All notices of opposition to the grant of patents on the several applications should be filed not later than the 7th June, 1904.

1902.

- 28,514.—C. Jenatzy. Non-slipping tread for tyres.
28,827.—D. Clerk, H. W. Bradley, and H. N. Bickerton. Internal combustion motor with scavenging and charge dilution.

1903.

- 4,389.—R. Chauvin and R. Arnoux. Auto-trembler.
7,537.—B. Musgrave. Six-cylinder two-stroke cycle engine with pumps.
7,620.—G. J. and E. C. Ihrig. Silencer.
7,685.—S. Z. de Ferranti. Fluid pressure turbine.
7,747.—P. C. Noble. Heavy oil motor.
7,822.—G. T. Hilton and J. W. Faulkner. Two-seated motor tricycle interchangeable to motor bicycle.
10,723.—J. S. Raworth. Controlling mechanism for electric cars.
10,954.—C. T. B. Sangster. Means for coupling a cycle to motor cycle.
11,719.—E. Roux. Motor bicycle with driving gear in the wheel.
11,723.—A. Soames and W. Langdon-Davies. Disc type of friction clutch.
11,849.—E. A. Beard. Mechanically-operated carburetter of the disc type.
27,209.—J. Wyss. Means for varying lift of mechanically-operated inlet valve.
28,273.—H. J. E. Hennebutte. Carburetter for fuels of varying density.

1904.

- 1,577.—T. A. Silverwood. Wheel with solid rubber tread and air tube bedded in the rim.
4,009.—H. C. Brasier. Automatic float-feed carburetter.
5,014.—M. Miller and J. A. Bunnell. Non-slipping and non-puncturable tread for tyres.

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