The Motor

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ENGINE PROGRESS.

THERE is something peculiarly fascinating in the onward march of the motorcar engine. It is so entirely free from any suspicion of monotony. Whatever for the moment its prevailing form may be, there are always evident signs to indicate the probable direction of further progress.

Certainly the road to perfection seems at times unnecessarily circuitous, swinging from one extreme to the other, but this only adds to the eternal interest of the story. Besides, it displays the whole-hearted determination of seekers after knowledge to extract all possible virtue from any chance development that may occur. It is only by following an unfamiliar principle to its extreme limit that its true worth is to be estimated, and the point fixed beyond which it ceases to be beneficial.

Multiplicity of cylinders, high engine speed, high compression, long stroke; these are features which have been introduced, conscientiously carried far past the stage where their advantages ceased, and are now embodied in a modified form in present design, or have been entirely abandoned.

Just now there is quite a number of possible directions in which alterations (and what, as yet, can only be called alterations) may take place. No doubt each idea will in turn be twisted, distorted and reshaped, until its precise value is known, and it is either adopted or thrown aside. The "finality of design" stage seems to recede rather than come nearer.

In mustering any collection of impending departures, the question of valves at once forces itself into prominence.

The tappet valve is not merely threatened, it is attacked, and its disappearance would seem to be but a matter of time. Its displacement is not to be deplored, for, in the writer's opinion, as a system it has nothing specially to recommend it but its age. In comparing it with its successors, a little licence will allow the tappet valve to be considered as a door opening on a hinge, forced sometimes to open against pressure and shutting with a bang at no particularly definite moment. The new systems—whether sliding sleeve, rotating sleeve, separate pistons, rotating plate—all are to be likened to sliding doors opening and shutting positively and accurately, and not detrimentally affected by cylinder pressure. These sliding doors also do not depend for their efficiency upon a narrow surface of contact which is periodically exposed to the scorch and scouring effect of the exhaust gases. It is on this count, and that of indeterminate closing at high speed, that the new valve systems are ousting the old. Certainly something is also promised in the way of flexibility, but this is probably quite unjustifiable.

Leaving valves, another point which is receiving a lot of attention is that portion of the cylinder interior which is alternately the compression space and the combustion chamber. It is about time something was done for this much-neglected region. The main portion of the cylinder, docile under the ministrations of the piston, is (each in due season) full of piston, full of cool gas, full again of piston, and finally contains for a space the flames of combustion. The compression space, on the other hand, is always more or less of an unknown quantity as regards its contents. At moderate speeds, and with the carburetter behaving nicely, it may be as full of gas at the end of the charging stroke as it theoretically should be; but there is always a doubt. It may, if speed has been high and throttle open, be all besprinkled with glowing particles of carbon, which will shortly be giving uncalled-for assistance to the sparking plug. Or it may be partly occupied by inert gases spent after combustion, but never swept out, because not pursued far enough by the rising piston. If this latter is the case, then not only does the

AERIAL REFORMS No. 4.

Another of Algy's brilliant notions. "You can put back your hood now, dear boy, it has stopped raining spare parts."

ENGINE PROGRESS.—Contd.

intruding body of waste gas cheat the engine of an equivalent bulk of its life's breath, but it will in many cases (depending on the shape of the cylinder head and the position of the sparking plug) occupy the space round where the igniting spark occurs, and so delay combustion after ignition has taken place. It also retains with it in the cylinder an unwholesome amount of heat, which tends to reduce the weight of the incoming charge by prematurely raising its temperature.

Wise brains, then, have been busy devising means whereby it may be definitely known just what is in the cylinder when each charging stroke is finished. The particular engine which has brought the matter prominently before motorists lately has as its peculiarity the fact that it puffs a charge of fresh air into the cylinder at the end of each firing stroke. The aforesaid puff is impelled by crankcase pressure, and is thus positive in its movement. Its cooling effect must be very valuable, but yet, in the writer's opinion, of far less benefit than the complete scavenging of waste gases which it ensures.

There is another method by which this positive filling of the entire cylinder may be arranged for, and that is by using a forced feed for the fresh gas instead of depending on the downward travel of the piston to fill the cylinder. Curiously, the engine referred to above as using a scavenging draught also, when maximum output is required, makes use of crankcase pressure to augment the charge of gas at the end of each suction stroke. As this "augmentation" takes place when the piston is about to commence its compression movement, and after the inlet valve proper is closed, its virtue for the displacement of waste gas is nil, and for this reason the system compares unfavourably with some other of the positive feed devices which have been introduced from time to time. It is to those means whereby the fuel is fed to the cylinder through the ordinary inlet that resort must be made for useful scavenging, whether, as in the case of the two-cycle engine, the charge displaces the gases of combustion at the end of each firing stroke or, as in the four-stroke cycle, when the fresh gas enters the cylinder with sufficient force to ensure the dislodgement of impurities from the neighbourhood of the spark plug to where their presence will be less prejudicial to combustion.

The inadequacy of atmospheric pressure as a means of filling the cylinder during the charging stroke does not require much pointing out. Doubtless the adoption of something better will now be not long delayed, for the positively-operated slide-valve lends itself particularly well to the requirements of a pressure feed.

Just at present there does not appear any immediate probability of an expurgated edition of the two-cycle engine coming forward to compete with the established Otto types. And this is the more to be wondered at because it has noteworthy advantages from the motorist's point of view, while its so-called "inherent" bad points do not appear ineradicable. The arrival of an engine giving at least one power stroke per revolution is not less certain because it is delayed.

Mention of power at every stroke rather suggests that somewhat worn-out fallacy—flexibility, apropos of which the "gearless" car possesses no longer its power to excite enthusiasm. On the contrary, the gearbox is healthier than ever, and its vogue may surely be regarded as increasing when the prevalence of four-speed boxes is borne in mind. Is it possible that modern practice is tending towards an internal-combustion engine run at a fixed speed and having the character of its load tempered to its peculiarities by a wide range of gear ratio? Whether such a movement has actually begun or not, a survey of all the facts seems to support the idea that such an ultimate development is inevitable unless in the meantime a radically different form of prime mover forces the present internal-combustion engine into disuse.

It is a consummation heartily to be hoped for, is the one-speed engine. One speed of crankshaft revolution (the highest that efficient working demands), one speed of magneto rotation (no slow-speed sparking being required), one compression ratio (the most advantageous, of course), one ratio of bore to stroke, one ignition point (as many simultaneous sparks as are beneficial at the speed of piston prevailing), valves opening and closing at the exactly correct times, one speed of flow of air through the carburetter, for no throttle would be admissible, hit-or-miss governing being preferable in such circumstances.

Here would be saving all round. The carburetter, for instance, a part of the car which threatens to become the most expensive and complicated item of the installation, would instantly be reduced to absolute simplicity. There would be saving in first cost, saving probably in weight and bulk, saving certainly in fuel consumption, for the uniform-speed engine would be the acme of exactness in timing and proportion.

J.B.

The Sequel to a Story. *By Henry Sturmey.*

SOME eighteen months ago, in an article on the backwardness of British capitalists to support sound business propositions, although ready enough to go into any wild-cat scheme that was "popular" at the moment, I related the story of an American tramway engineer who, recognizing the value of South America as a field for motorcabs, failed entirely to get British support for the scheme, but readily obtained all that was necessary in France, with the result that his order for £20,000 worth of cars went to France.

The sequel to this story is now to be told. The company which was so formed proved to be a striking success, bearing out all the assertions of the organizer. As a matter of fact, on its first year's trade it turned in net profit sufficient to pay for the entire fleet of cabs, and this in spite of many troubles and difficulties and breakdowns with the cars supplied by the French makers. These difficulties, however, proved so trying to deal with that the organizer, Mr. W. H. Cole, at the end of his 12 months' engagement, resigned his position of manager, with the object of establishing another company in another town, this time, if possible, with British capital and British-built cars, and he further saw the possibilities of the country for general commercial motor contracting.

He selected the Brazils as his field of operations, with Rio Janeiro as the objective point. His efforts to obtain capital in this country, however, a year ago were equally unavailing, although French capitalists came to him with the money, metaphorically, in their hands, and were most anxious to do the work. As this, however, entailed the use of French vehicles, of which Mr. Cole had already had enough, he declined the offer, and, returning to Brazil, formed a small company with local capital, and for the last six or eight months has been running eight vehicles, four lorries, two cabs, and two char-à-bancs.

The results of working these vehicles have been phenomenal. His cabs have been netting 35s. per day. His lorries have been fully employed under regular contracts by large commercial houses, at prices sufficient to pay for themselves in six months, and his char-à-bancs have been taking £5 to £6 per morning trip. The eight vehicles have, in short, during the period they have been working, earned gross profits, after paying all working expenses, equal to £8,000 per year! With these facts and figures to prove the value of his concessions and the scope for motor traction in South America, Mr. Cole has been once more in this country for some little time, and, as the saying has it, "the third time pays for all," for he has now succeeded in interesting British capital, with the result that the British-Brazilian Motor Transport Co., Ltd., is now in course of formation, with the object of taking over the business and increasing the fleet by 50 cabs, five char-à-bancs and 50 three-ton lorries.

It is unnecessary to say that, after Mr. Cole's experience of foreign vehicles, those used by the company will be all of British manufacture, the makes selected being Straker and Squire for the lorries and char-à-bancs and the Lotis for the cabs.

Transmission of Power to Road Wheels.

IF one were to ask the average motorist, "How many systems are there of transmitting the drive from the gearbox to the road wheel?" a reply given on the spur of the moment would probably be rather limited in the variety quoted, and might be typically answered thus: "Oh! I suppose about four or five. Let's see: there's the ordinary bevel drive, side chains, the worm, and the—er—oh, yes, of course—the de Dion—and the—er—well, that's about all, I should think!" and, though such a list is very far from being complete, the number which we depict in this issue of our series of "Comparisons of Styles and Methods," is certainly rather surprising in its magnitude.

Of course, there is a considerable difference in the popularity of the various types, but, on the other hand, practically every system illustrated is not only manufactured and fitted to cars at the present time, but every one has its devotee, who claims his own particular drive to be the "one and only really efficient, thoroughly sound, and scientific," etc., etc., ad lib., in the persuasive vernacular of the salesman. Therefore, any remarks in the way of criticism, which may be contained

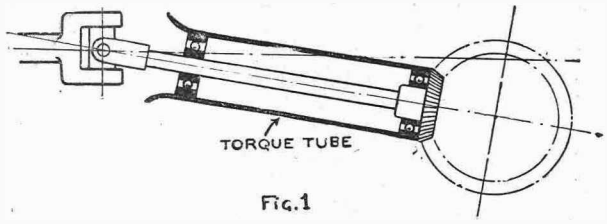


Fig.1

in this article, must be taken preferably as merely a differentiation between the "pros." and "cons.," rather than as being derogatory to any special type, as, in most cases where questionable types are adopted, the manufacturers will have probably selected the description of car wherein the faults, or alleged faults, are least pronounced. In this way a system which may work in an irreproachable manner on a light car might cause endless trouble if fitted to a heavy one, even though the proportions were suitably increased.

It may be stated, without fear of contradiction, that the prevailing type to-day is what is usually termed the "live axle," fitted with a bevel driving pinion and crown wheel. In this there are two leading types, respectively with the single and the double "Hooke's joint" tail shaft. (This is very generally termed the Cardan joint, though the appellation is probably erroneous.) In the first case there is a universal joint at the rear end of the gearbox shaft, the tail shaft then continuing, to end up with the bevel wheel keyed on it, the respective axes of the tail shaft and bevel wheel being in the same line (Fig. 1). In this case the torque is generally taken by the tube, as shown, with a bearing for the tail shaft at each end, and thus, in conjunction with the fore ends of the springs, conveying the torque to the frame. The chief objection to this system is the additional thrust put upon the pins of the universal joint, whilst the simplicity of the arrangement is a factor on the other side of the balance. Again, glancing at the diagram, it will be seen that, as the axle rises or falls in accordance with road irregularities, the distance between the centre of the Hooke's joint and the axle centre must vary a little, which variation has to be allowed for in the design.

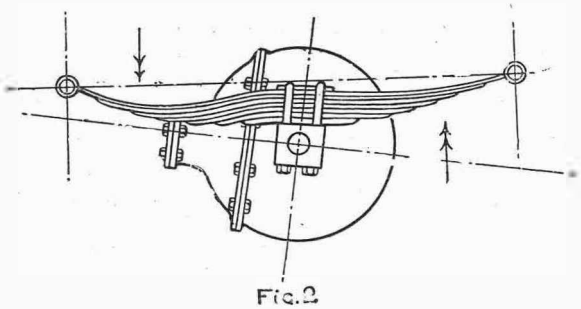


Fig.2

The second type has two universal joints, one at the front and one at the rear end of the tail shaft, the final driving shaft again being subject to a considerable divergency of constructive detail, sometimes being at a small angle to the gearbox shaft, as instanced in the ordinary bevel drive, or at other times parallel, or nearly parallel, to it, as in the worm drive. In either of these cases the bearings for the final shaft are contained in extension housings of the back-axle casing, the torque being accounted for either by duplicated radius rods, or, in some cases, the casing which covers the tail shaft constitutes the torque tube, and is generally attached by a spherical bearing to a cross member of the main frame. In the cases already alluded to, some makers allow the torque to be taken entirely by the front halves of the rear springs, so that forward driving tends to buckle the front half downwards (Fig. 2), and the rear half upwards, which divergent stresses have to be allowed for in the design besides the mere weight which has to be carried. Of course while reversing the car the stresses are just the opposite, decreasing the load on the front half of the springs, whilst increasing it on the rear. It is claimed that taking the torque through an efficiently loaded spring

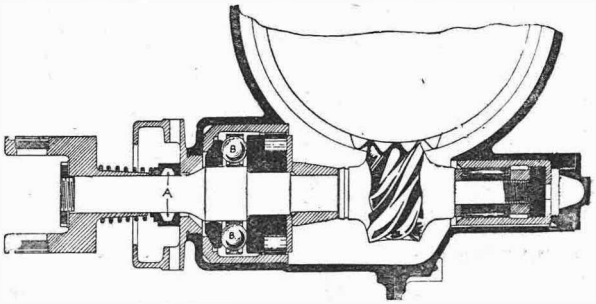


Fig. 3.—Lanchester transmission.

medium tends to increase the life of the tyres, and it may be that there is some foundation for the assertion.

The worm drive has certainly increased in popularity during the last year or so, and, as already pointed out in a previous issue, there seems to be a reasonable likelihood of its becoming more and more general. Two distinct types of this are in common use, the worm being positioned either above or below the worm wheel. Possibly the percentage of usage is slightly in favour of the top drive, though several leading firms, such as Lanchester, Daimler, Napier, etc., place it below. The advantage of having it underneath is, of course, perfect lubrication, the disadvantage being a lessened road clearance and the possibility of the oil leaking through the worm shaft joint, the said joint, however, being generally fitted with an adjustable packing gland, whilst in some

TRANSMISSION OF POWER.—Contd.

cases it also necessitates the tail shaft driving at a greater angle.

A common construction is to make the worm in hardened steel and the worm wheel in phosphor-bronze. The cost of production is approximately the same as a bevel drive, when once the right machinery is installed, which, however, is a very important proviso. To design a sound worm gear is not so very difficult, but to find the machinery to make it accurately is by no means as easy as might be imagined. Considered purely as a manufacturing problem it has other advantages, but perhaps they are extraneous to the purchaser's point of view. A good idea is obtained, in Fig. 3, of the Lanchester construction, in which the spring-fed packing gland (A) and the generously-proportioned ball-thrust bearing (B) will be noticed.

Turning attention now to driving by side chains, there is not very much room for comment in this respect, as the strong claims for consideration, which a correctly-arranged chain transmission undoubtedly possesses, are very generally admitted, and if really sound chain cases had been designed some years ago, and makers had arranged their gearboxes so as to enable equal-sized sprockets to be fitted, it is very doubtful whether the live axle would have supplanted the chain to the extent that it has done. The large difference in the diameter of the driving and the driven sprockets, so generally indulged in, was responsible for more wear and tear than is commonly understood, as by the up-and-down action of the road wheels (due to surface irregularities) the wheels which carried the driven sprockets were subjected to a variable velocity, whereas the velocity of the driving sprocket might be considered as being constant. Thus each road inequality encountered by the rear wheels meant a fractional variation in the velocity of the driven sprocket, which also means a momentary relaxation in the tension of the chain, and that, of course, has then to be taken up suddenly, the result being a series of small "jerks," instead of the constant pull which is so preferable.

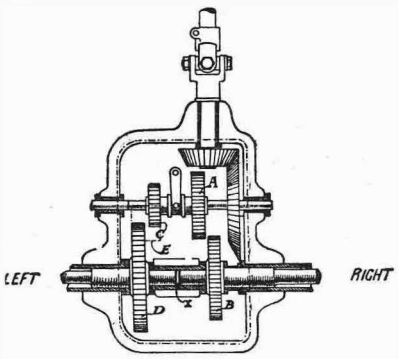


Fig. 4

Again, these self-same road inequalities, which are the bugbear of anything and everything "motoristic," cause the rear sprocket to momentarily assume a position out of the vertical line, so that a pull is exerted on the side of the teeth. Equal-sized sprockets, of carefully-selected diameter, and with correctly-proportioned centres, are far preferable, as they tend to nullify the evil effects caused by this variable velocity.

Going farther afield in the question of rear-axle transmission gear, we come now to what might be termed the junior group, that is to say, speaking relatively to the number of manufacturers who adopt the various types dealt with. Primarily, of course, is the de Dion, whilst in the Pilain a similar method of drive is adopted. In these is offered the advantage of really floating driving shafts, the weight being taken entirely on a separate axle provided for the purpose, and the driving shafts can adjust themselves to suit practically any road irregularity. It is sometimes alleged against this type that the driving axle is unprotected from mud, etc., but the "business ends" are always covered, and long practice and experience have not disclosed any trouble in this respect.

Then there is the Chenard-Walcker, in which a shaft parallel with the rear axle drives a small pinion which engages an annulus attached to the road wheel. This system of drive is largely used for heavy traction work, wherein its advantages are rather more pronounced than when used on light cars. In this arrangement it is, of course, essential that the centres of the pinion and the annulus remain constant, whilst the degree of variation in the velocity ratio is dependent on the point of, and method adopted for, the driving shaft suspension.

The *à devers* back axle, illustrated in the "Comparisons," is the one formerly fitted on S.C.A.T. cars, the differential gear being mounted externally to the casing proper, the object attained being the additional strength in the rear-axle construction, due to the splayed or arched formation which is rendered possible by the adoption of this design. Of course, the same result can be obtained in several ways, as, for instance, in the Crossley or in the Sheffield-Simplex.

The single chain drive, as exemplified in the Phœnix and Riley, is not so much in vogue now as it used to be, or is it, perchance, that we do not see so many of the light American cars as we used to?

It certainly has the advantages of simplicity and economy in construction, though, no doubt, its detractors would say that it is hard to protect from mud, and awkward to replace when it has been taken off for "washing," although both these items are fairly easily accomplished in up-to-date practice. The chief thing which can be urged against single chain drive is the fact that the pull is centralized in one point, tending to bend the axle in a horizontal plane, whilst the weight is operating vertically, though in the illustration given of the Phœnix it will be noted that this pull is well provided for.

It is a simple step from the single chain drive to the single wheel chain drive, an example of which is the V.S. Runabout, described in our issue of the 23rd of November last. In this little car the drive is taken from the gearbox to the outside of the frame by means of bevel gearing and a shaft, but only on the near side, so that no differential gear is required, the off-side rear wheel being mounted loosely. Of course, it is obvious that a considerably larger proportion of tyre wear must take place on the single driving wheel, but the car is quite light, and the simplification obtained may balance the objections which might be raised to this system of propulsion.

A somewhat similar construction applies to the Waverley, which, however, has its top speed drive on the off-side wheel, and the slow speed and reverse on the near side. The gearbox (Fig. 4) is mounted on the live axle, which is split in the centre (x), and runs in a bearing common to both halves, the gear wheel (A) engaging another gear wheel (B) fixed to the right-hand half of the axle, whilst C engages D on the left-hand side for the slow speed, an extra pinion (E) being brought into action to effect the reverse movement. Here, again, the differential gear is eliminated. The illustration is only diagrammatic, the ball bearings, etc., being eliminated to simplify the illustration.

Some manufacturers favour the provision of two direct drives, and a simple way of accomplishing this is plainly visible in the illustration given, among the "Comparisons," of the Cooper, wherein two pairs of bevel and crown wheels are provided with different ratios, the one pair or the other becoming operative according to the position of the dog clutch. There are many other ways in which this has been done, but unfortunately space prohibits dealing with them all. Of course, the advantages obtained with this construction are too palpable to need further comment, while the retort of those who do not agree with the provision of two direct drives is that in most cases one should be able to do 90 per cent. of one's ordinary driving on top speed, and that, therefore, it is rather superfluous to add a second direct drive for an approximate 7 per cent. of one's remaining work. In any case, if it is a superfluity, it is on the right side.

A type standing out entirely alone is the Humphris transmission gear, in which the drive is conveyed by what might be termed conical pins, operating in holes machined to receive them, which are cut in a large disc. The chief advantage in this lies in the fact that all the speeds are direct, whilst the efficiency of a right-angle drive is stated to be nearly 97 per cent. This transmission

TRANSMISSION OF POWER.—Contd.

reminds one of the Lloyd Cross-Roller gear, which was shown at Olympia some time back, though whether it is in use at the present time we cannot say.

Many cars have been arranged with friction drive with varying degrees of success. There are three leading divisions to this system, viz., belt, frictional pulleys, and variable gears. The first is, or was, typified in the Charrette, the second in the Duryea Buggyaut, and the third by the Fouillaron. Of course, there are others in each type, but, speaking in broad terms, frictional drive is not considered to be entirely suitable for motorcars, except, perhaps, for light vehicles. The Buggyaut drive is depicted on the page of "Comparisons"; the belt drive needs no illustration, so that we are left with the variable gear drive. The number of variable gears, or so-called variable gears, is legion, but for motorcar application probably half-a-dozen types would cover those actually tried. The most favoured is the expanding belt pulley, wherein the diameter of one pulley is enlarged synchronously with the reduction of the other. This is exemplified in the Fouillaron infinitely variable transmission gear, which was exhibited at the Paris Salon for so many years. Other types are the hydraulic, electro-magnetic, integrating disc, etc., etc., and we are not sure that an infinitely variable gear has not been constructed entirely with gear wheels, employing absolutely no clutch slipping movements, or other frictional means, to obtain the desired result.

From a perusal of the foregoing, and an examination of the illustrations of "Comparisons of Styles and Methods" in this, the seventh of our series, it will be seen that the subject of rear-axle transmission gear is in reality considerably more expansive than it appears to be at first sight. Even then there are many more, and in conclusion we give in Fig. 5, still another variety of drive, which may be taken as typical of one of the multitudinous variations from common practice. In this particular instance, however, it is necessary to point out that it is a front axle drive, so that in point of fact it

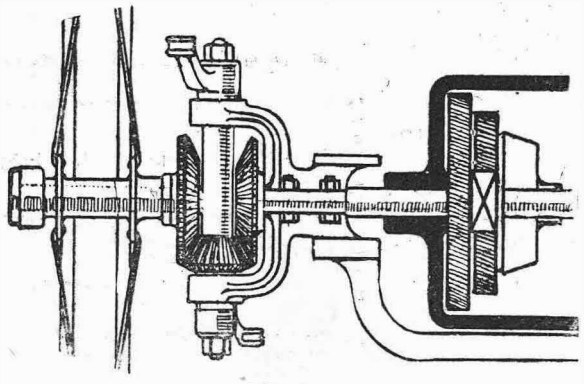
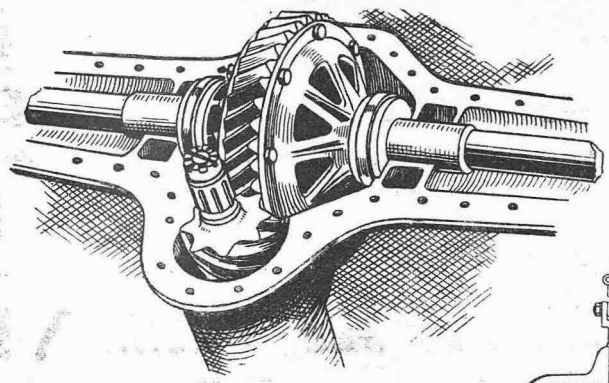


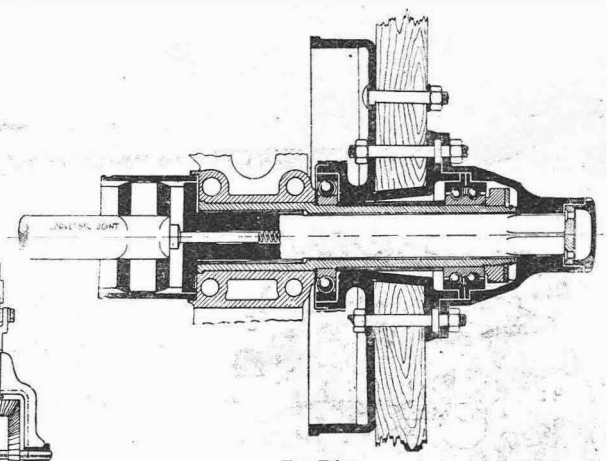
Fig. 5.

does not come under the heading of this article, but it is included in the hope that it may help to extend the field of thought on the subject of transmission gears in general.

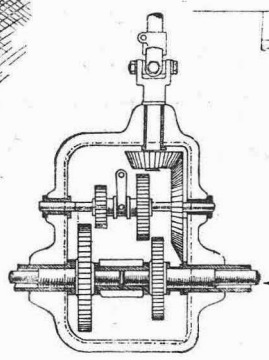
NORMAN.



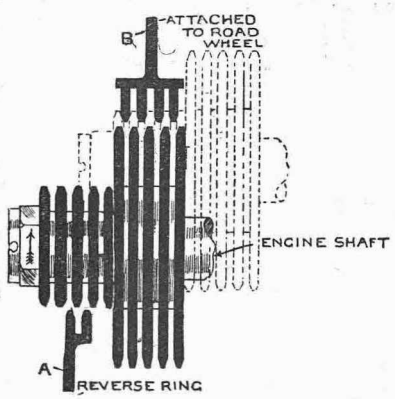
Lanchester.



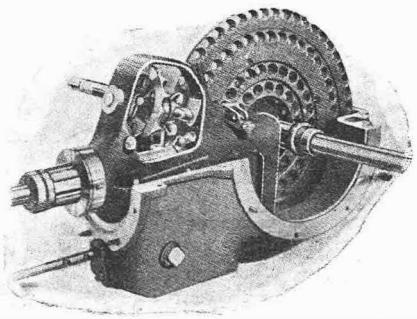
De Dion



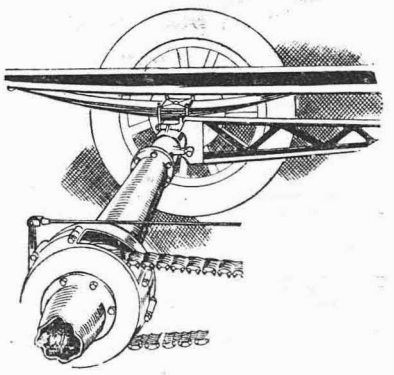
Waverley.



Duryea Buggyaut.



Humphris.



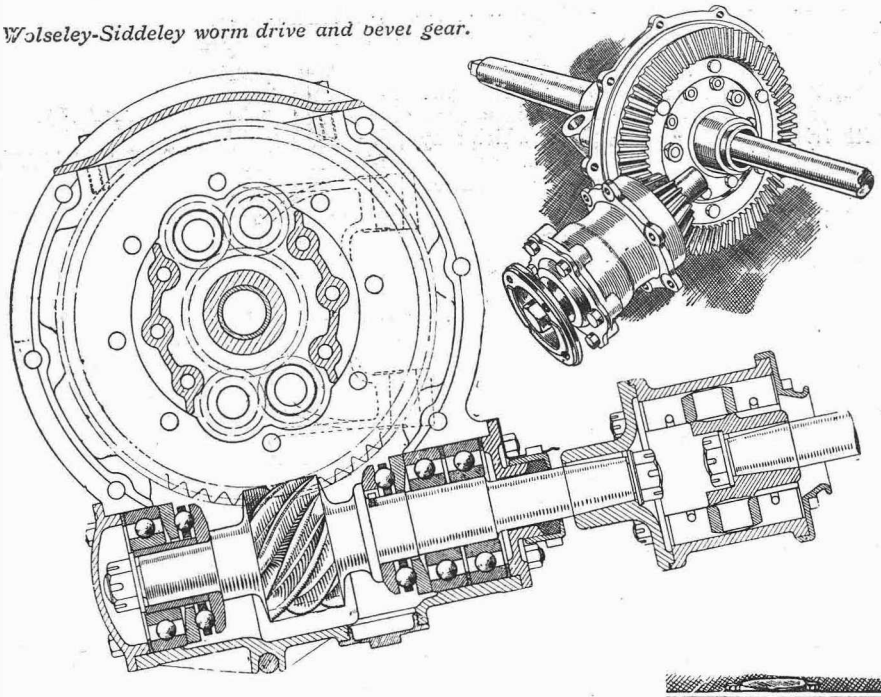
Phœnix.

Comparisons of Styles and Methods: No. 7.—Rear Axle Transmission Gears.

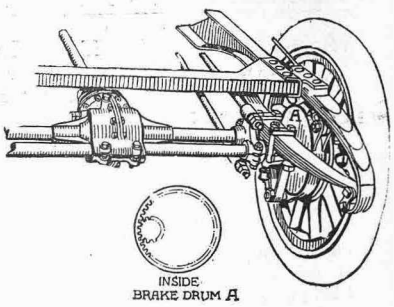
Note.—Further illustrations for this group are given on the next page, and descriptive matter on page 799.

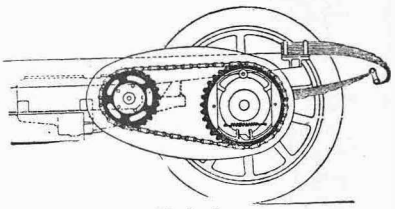
c3

Wolseley-Siddeley worm drive and bevel gear.

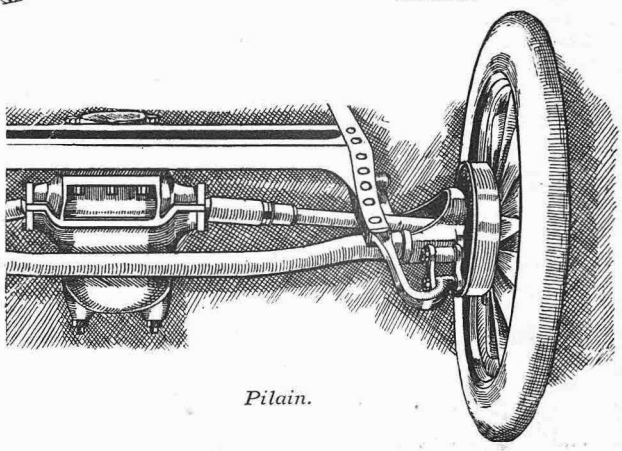


Chenard-Walcker.

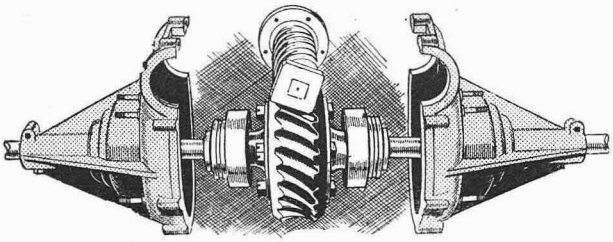




Daimler.

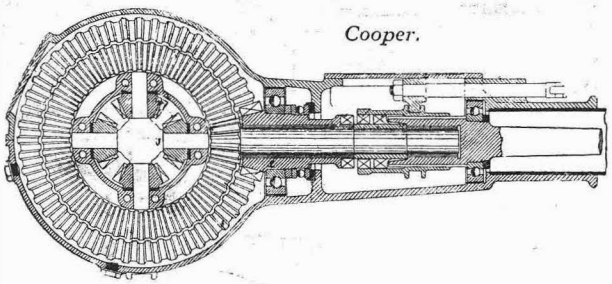


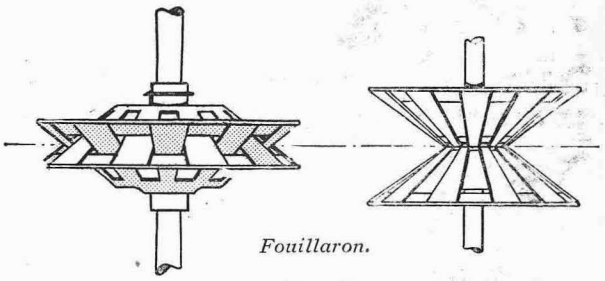
Pilain.



Dennis.

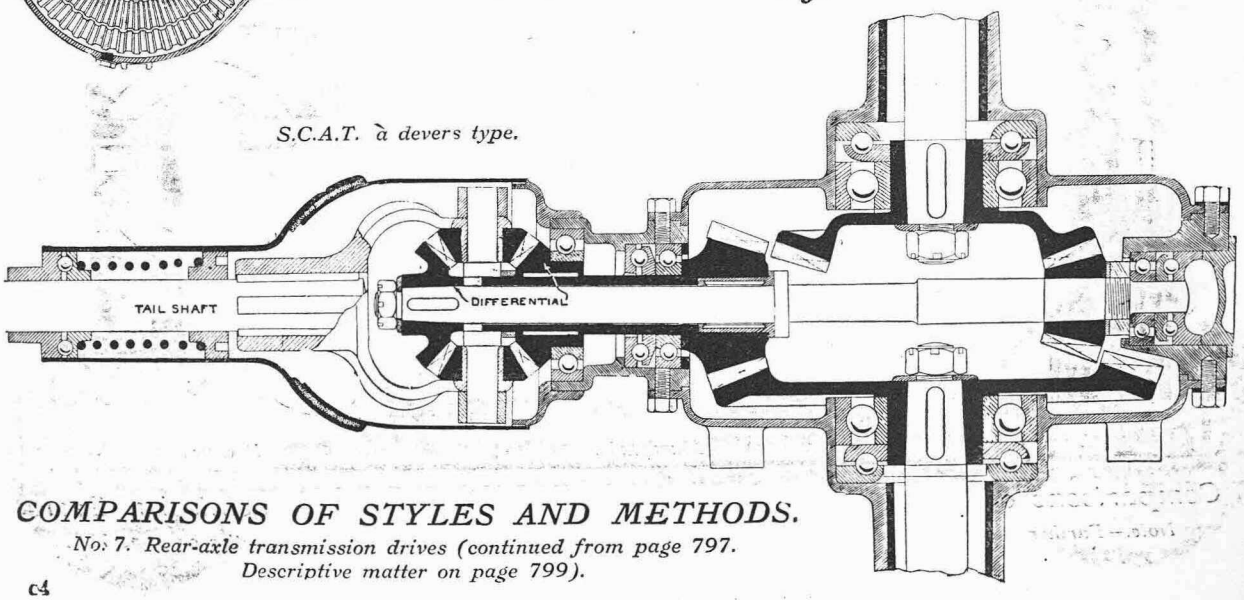
Cooper.





Fouillaron.

S.C.A.T. à devers type.



COMPARISONS OF STYLES AND METHODS.

No. 7. Rear-axle transmission drives (continued from page 797. Descriptive matter on page 799).

THE AERO CLUB DINNER.

Mr. J. T. C. Moore-Brabazon Receives the "Daily Mail" £1,000 for the First All-British Aeroplane Mile Flight.

THE annual dinner of the Aero Club of the United Kingdom stepped last year into an unwonted degree of importance, owing to the practical achievements in the domain of aviation during the preceding 12 months, and this year the gathering, which was held at the Whitehall Rooms, Hotel Metropole, London, on Wednesday last, could have been considerably larger than was the case, the demand for seats being in excess of the accommodation available.

The Duke of Argyll, K.T., the president of the Club, occupied the chair, and he was supported by his Serene Highness Prince Francis of Teck, Admiral of the Fleet Sir E. R. Seymour, Lord Kinnaird, Mr. Roger W. Wallace, Professor J. Harvard Biles, Colonel J. E. Capper, Mr. Edward Manville, the Hon. C. S. Rolls, Mr. J. T. C. Moore-Brabazon, Mr. Kennedy Jones, Mr. Vere Ker-Seymer, and many notable in the worlds of aviation and motoring, including a number of ladies.

Immediately following the loyal toasts, the chairman called upon Mr. Kennedy Jones to present to Mr. Moore-Brabazon the £1,000 prize offered by the "Daily Mail" to the first British aviator covering one mile in circular flight on an all-British aeroplane.

At Mr. Moore-Brabazon's request this prize, besides a cheque, partly took the form of a magnificent silver cup, the contour of which, with the handles, bore a strong resemblance to the folded wings of a bat.

Mr. Kennedy Jones said that the achievements of Mr. Moore-Brabazon with a British machine did not rank as high as some of the more notable achievements abroad, but, as it is the beginning that counts, the first step deserves to be commemorated. As Mr. Jones said, that which is said to-day by those who do not believe in the future of aviation or the practicability of the flying machine, was said 80 years ago about railways. Although what has been done on this side of the Channel is still small, he pointed out that what the French had done is only a very little way on a very long road, and that the Britisher has the curious knack of starting slowly, but, when once started, of doing things quickly and well, so that he had every faith in the Britisher catching up with his foreign rivals.

Mr. Moore-Brabazon was very heartily received, and in a bright and happy speech, acknowledged receipt of the prizes, saying that he was sure that the "Daily Mail" was glad when the £1,000 had been won, for, as one of the conditions of the prize was that a representative of the "Daily Mail" should be present when the flight was made, the paper very nearly had to stop publication because so many of its staff were called upon to be present at places all over the country where men who were nearly on the point of flying were conducting their experiments. Mr. Moore-Brabazon paid a very graceful compliment to Mr. Horace Short, the designer of his aeroplane, and Mr. Green, the designer of the engine, saying that to them was largely due the credit of his achievements.

Mr. C. S. Rolls was called upon to receive the trophy offered by Sir David Salomons for the first British aviator to fly half a mile and the Aero Club's prize for the first member to fly 250 yds. on the Club ground. In acknowledging the receipt of his prizes, he said it was one thing to get a machine that would fly, and quite another to build one that would fly.

The Duke of Argyll, in proposing the toast of the Club, suggested the formation of a secret committee to receive suggestions for new machines, and to build models and make experiments. He thought there were many uses from the military and naval point of view to which flying machines could be put, and he said that the French Government had spent a quarter of a million of money in experiments with flying machines, whilst the German Government has spent probably a million and a quarter. He did not think it was altogether a wise policy for the British Government to do nothing but watch other people. We might be able to start where others left off, but he considered that the training of the staff was a vitally important matter.

Mr. Wallace suitably replied, and said that the Club now had over 900 members, and that the thousandth would no doubt be reached by the end of the year. Not only had the aeroplane been studied, but work of considerable importance in connection with spherical balloons had been conducted in the past by members of the Club. He considered that as the whole of the British Empire depended on the security of Great Britain for its existence, it would be a fatal thing if this country should be caught unawares.

Admiral Seymour, in proposing the toast of the visitors, said that the probable passing of aeronautics into practical politics was not very far off. He still held to his opinion that the flying machine could do little or no harm to the units of a fleet, but admitted that they could work destruction on dockyards. Until it was seen that they could be armed practically with some weapon of offence, he regarded the flying machine as being chiefly useful for scouting purposes.

Prince Francis of Teck replied for the visitors, and first congratulated the Club on its disciplinary move in connection with the infraction of its decisions by foreign aviators at Doncaster, and he said that the Royal Automobile Club would continue to give all the support that was necessary to the Aero Club, whilst in no way encroaching upon its domain. He said that he fully expected to receive an invitation for himself, as chairman of the Royal Automobile Club, for the committee of the Club and its secretary from Mr. Rudyard Kipling to spend a Saturday to Monday in visiting New York by flying machine. He said that he would have very great pleasure in accepting the invitation for the committee and the secretary, a saily which seemed to immensely please Mr. Orde.

Comparisons of Styles and Methods: No. 7.—Rear Axle Transmission Gear.

A good example is given in the illustration of the Wolseley of the type most favoured at the present time—the ordinary bevel gear live axle. Some of the leading manufacturers of the motor world—Daimler, Napier, de Dietrich, Mercedes, Benz, etc., still fit the well-tried chain drive to some models. Something like 15 or 20 English firms are at present fitting the worm drive, the percentage being slightly in favour of placing it on top of the axle like the Dennis, Standard, etc., though again some leading makers fit it below, as exemplified in the Lanchester, Daimler, Napier, etc. In the Waverley the top-speed drive is on the right-hand wheel, the left being responsible for the slow speed and the reverse, so that no differential gear is necessary. An example (not shown) wherein one wheel does all the driving is obtained in the V.S. Runabout, minus a differential. A direct drive on two speeds is evinced in the Cooper design, which has a double set of bevel and crown wheels. In the Phœnix the single-chain drive is clearly seen, and a similar description is applicable to the Fouillaron expanding pulleys. Internal and external views of the cardan shaft drive are supplied respectively by the de Dion and the Pilain. The example of the *à devers* type is the axle which used to be fitted on S.C.A.T. cars, in which the differential gear was mounted externally, and the axle splayed. A similar arrangement, but with the differential gear inside, is fitted on the La Buire cars. The pinion and annulus drive adopted on Chenard-Walcker cars is readily understood by reference to the drawing, whilst the Humphris gear is also self-evident. In the Duryea-Buggyaut friction drive the small or large roller discs are respectively pressed against the external ring for the slow or high speed, and the small roller the internal ring for reversing. There are, of course, several other friction drives.

(See illustrations on two preceding pages, 797 and 798.)

MAGNETO'S-POINT-OF-VIEW

Specially Compact Four-cylinder Engines.

AN engine that has been placed on the market recently, and which was described on page 717, issue of 30th November, is to my thinking specially interesting as showing what can be done by adopting a comparatively little known arrangement of the cylinders, namely, that each pair of cylinders are in the same plane, but with a very small angle between them. As nearly as possible it forms a square block of four cylinders, which is obviously the most compact arrangement possible; it is only half the length of the usual four cylinders in line and "en bloc," and it is very much narrower than a four-cylinder V engine. Strictly speaking, it is a V engine, but as the angle is so small—only 7 degrees—and all the cylinders are surrounded by a common water jacket, it is impossible to tell from exterior appearance that it is not a vertical two-cylinder single-block casting. The crankshaft is practically identical with a two-cylinder of the standard 180 degrees types.

The puzzle as to how each crankpin does for two connecting rods is easily solved, when it is understood that one connecting rod end is forked, whilst the other one comes in between the forks, the latter working over the bearing of the former. There is another peculiarity in the construction of this engine, which is that the piston ends are backed off or cut away to some extent on adjacent sides. The reason for this is to allow the pistons moving in the same plane and approaching at the cylinder ends to clear each other.

Aluminium v. Steel.

The question raised by a correspondent as to the possible deterioration of aluminium recalls to mind the fact that this metal is being less used for important parts in car construction than formerly. Whether it will always be used to a limited extent time alone will show. Many engineers have come to the conclusion that its chief and favourable characteristic of lightness is more than counterbalanced by its want of reliability when used in places where it is likely to be subject to vibration or stress, hence the not infrequent fracture of gearbox and crankcase hangers.

The use of pressed steel in place of aluminium is likely to extend as the great strength of this material and its consequent reliability commend it to designers. On the score of increased weight there is very little to complain of. Even by using a special aluminium alloy, the cross section of the casting has to be so considerable that the advantage in lightness over pressed steel cannot be of much account. Regarding crankcases, the trend appears to be in the direction of using a cast steel or malleable cast-iron top half and a light steel base, which has only to serve as an oil container.

Cast-iron is now being used for gearboxes in place of aluminium, and it is probable that pressed steel will come into favour for this part before long. It is significant that many leather clutches also now have the internal cone made of pressed steel, which gives an equally light and much stronger construction than aluminium formerly used. The field for this latter metal will, in my opinion, be limited to small fitments and accessories, for which it certainly is well adapted. At one time it seemed to me that it would be exclusively used for carburetters, but its use for this component has almost died out. One rarely sees a carburetter made of anything but brass. Why it went out of favour is not very evident. I have heard it contended that petrol acts upon aluminium, forming deposits which cause trouble, but I never found this the case, and I used an aluminium carburetter for a long period.

Locating a Misfiring Cylinder.

The question is occasionally asked as to the most convenient method of locating a faulty or misfiring cylinder when the engine is running on magneto ignition. My experience is that the fitting of earthing switches on the plugs is the simplest way of cutting out three of the plugs simultaneously and leaving one firing. If the plugs have snap-on terminals, of course the cables can be disconnected and the current left to shunt itself through the safety gap of the machine.

Another plan is to disconnect at the plug sockets of the magneto, although it is not every machine which has this convenient form of connection. In some cases ordinary terminals are used, which, obviously, one could not unfasten with the machine running, or at least not temporarily switched off. At one time there was a rather ingenious device sold which had for its object the detecting of a cylinder missing fire owing to sparking defects. It consisted of four small glass tubes exhausted to a high vacuum and containing two platinum electrodes. A tube had to be connected in the circuit of each plug, and the whole set were mounted in a darkened case with sight apertures. Each time a spark passed at the plug the vacuum tube glowed brightly, so that it could easily be seen if a current was passing along each cable to the respective plugs.

The obvious disadvantage of this device was that it would not show infallibly whether any of the plugs were actually defective; for instance, if the plug points were short-circuited with carbon deposit, as often happens, a current would be passing through the plug without a spark actually occurring. The vacuum tube in this case would only prove that the magneto was working perfectly. Of course, if a plug were missing fire through the gap being too wide, the tube would not glow because of the current being shunted through the safety gap, so it would in this case be useful. It would not be difficult to fit such an indicator on the distributor cover of a magneto, although it would require to be specially designed.

An Accumulator Case Repair.

A simple and effective repair to an accumulator case which I made recently may be worth describing and may save an otherwise useful cell from being scrapped. The accumulator in question is a small one, 10 ampere hours, and had forced both tops upwards and broken the seams. This was obviously the result of the plates not having sufficient room allowed for expansion. To make a repair with the ordinary celluloid cement was out of the question, as there were gaping slits at the seams to be filled up. I had recourse to a remarkably useful material, viz., "Chatterton Compound," an elastic and tough cement, which is sold in sticks, and which one heats in a flame and then applies to the part it is desired to repair. It is quite acid-proof and does not chip or break off. Of course, the surface it is applied to must be dry and clean, otherwise there is nothing specially to be observed in applying it.

I have also used it for temporarily curing leaks in petrol and oil pipes. Damaged insulation on high or low-tension wiring can be made as good as new with it. Most of the leading accessory houses keep it, although at one time it was difficult to get outside the electrical trades.

What is known as "marine glue" is something like Chatterton Compound, but nothing like so effective as a cement for anything not subject to heat.

THE SQUIRE'S CONVERSION.

TOLD BY HIS FAITHFUL CHAUFFEUR.

YES, this is the old Squire's car, sir; and it's all very large and prime;
And the Squire is a convert to petrol- but I can remember the time
When he was as mad agin it as the Budget is mad agin pubs;
When the sight of a tyre
To our good old Squire
Was gall and Wormwood Scrubbs.
His conversion was short and sudden- it was done in a single night,
And was due to exhilaration, and partly due to fright.

"The Squire was a terror."

Time was when the Squire was a terror on the magisterial bench,
And his fancy for fines
On exhaustive lines
Was a thirst no fines could quench.
You see, he was all for horses. And he somehow seemed to think
That chauffeurs were black, while horsemen were a beautiful hunting pink.
The Squire had a lovely daughter—*Miss* Dorothy, she was *then*—

"I'll cut you off with a shilling."

And the Squire said, "My chuck,
If you have any truck
With these terrible motor men,
I'll cut you off with a shilling" — and the Squire had many a bob -
And, knowing Miss D. was in league with me, I didn't quite like my job.
For Miss D. had a taste for petrol; and all unknown to the Squire
She indulged in her whim;
And often to him
I played the reluctant liar.
In the town she kept her motor. I had bought it in my own name.
And when I had learnt to drive it, I taught her to drive the same.
And while the old man was hunting, Miss D. took the motor out
On the strictest q.t.,
Sub rosa, with me
As chauffeur and trusted scout.
That wasn't the worst of it, neither. For the Hon'rable Nevermindwho
Fell in love with the dear young lady—for his tastes were petrol, too.
We were hung-up one day with trouble, when the Hon'rable N. drives by,
And he stops and inquires
If the car is the Squire's—
I was going to tell a lie,
When Miss D. owned up as the owner, and begged him to not tell "Par."
And they held a consultation, while I crawled beneath the car
To look for the crankshaft trouble—it was Cupid's shaft, I guessed,
That revolved Miss D.,
While the Hon'rable, he
Had a gear-change in his chest.
When the old Squire heard that his daughter was in love with a motor man,
He fed her on bread and water, and on exits placed a ban;

"I taught her to drive the same."

For he locked her up in the turret, where she pined on tears and hope,
And she scorned her food
Through a feed-pipe crude,
And the programme was then, "Elope!"

* * * *

The night was dark and rainy when I helped her to escape,
And smuggled her into the Hon'rable's car 'neath the hood of the Cart of Cape.
And they drove away in the darksome night. I was breathing a sigh of relief,
When up rode the Squire!
He was snorting fire,
And declared he would catch the thief.
So the Squire on his favourite hunter set off on the midnight chase
He seemed to think that a gee-gee could beat a car in a race.
I, wishing to see the sequel, set off in my lady's car,
Yes, I followed *him*
In the midnight dim,
And he followed *them* afar.

"It was Cupid's shaft."

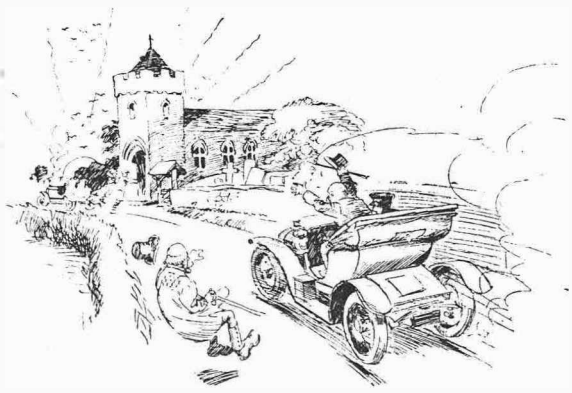
THE SQUIRE'S CONVERSION.—Contd.

Some twenty miles we had travelled, when I heard a wayside groan
From the Squire, who was puffing and blowing—his horse was already blown—
And, seeing me, he says, "William, that surely isn't you
In one of those swift,
Vile motors adrift?"
I answered, "Yes, Squire, it's true."
Says he, "You're a scoundrel, William! but I'll let you off scot free

"Set off on the midnight chase."

If you'll catch those miscreants, William." This fairly flummoxed me.
To which should I do my duty? To the Squire? Yet I was loth
To play it unfair
On the motorcar pair.
You see, I was fond of both.
The Squire was my legal master; so I said, "Jump in, sir!"
"Drive," Says he, "like the Day of Judgment!" And I drove—at forty-five.
Then the Squire says, "Was that lightning? Or a glow-worm's gleam, perhaps?"
Says I, "You can bet
That that *alumette*
Was one of these nightwork traps!
We are in it, Squire, for exceeding. That's a night-trap. It's a cop.
The police have got our number. Shall we stop?" Says he, "Don't stop!"
So we drove through the rain and the darkness, and the Squire said still, "Drive on!"
From that moment his mind
Was petrol-inclined,
And his taste for horseflesh gone.
We caught the eloping couple not far from Gretna Green.
In the early dawn at a village church we arrived at the wedding scene.
And the Squire was so converted that he gave his daughter away.
But the best of the sport
Was the scene in Court
On the Petty Sessions day.
For the Squire, as a peaceful justice on the local bench, was put
To practise the old-world proverb of "The boot on the other foot."
And he said to his brother bigwigs that he didn't see the crime
Of going the pace
In an urgent case—
He had done it himself one time.

FRED GILLETT.



"We caught the eloping couple."

Calcium Chloride and Dust.

Amongst the methods employed for minimizing the dust nuisance the least known and least understood is the calcium chloride treatment. This in its most effective form costs about £8 per mile for a 15 ft. road, and the report of an official test made by the Roads Improvement Association was favourable to it.

Calcium chloride is produced in large quantities as a by-product in the ammonia-soda process of manufacturing common washing soda and in certain other chemical processes. It may be obtained in a number of forms varying in composition only according to the amount of water contained therein. By strong heating it may be obtained free from water. In all these, and in intermediate states, it has the property in a marked degree of absorbing moisture from the surrounding atmosphere, and if left exposed to damp air it eventually becomes a thick syrupy liquid through the absorption of moisture. If it is then exposed to a dry atmosphere it will gradually part with some of this moisture and re-absorb moisture when again exposed to a moist atmosphere. It is on this property of absorbing large quantities of moisture that the utility of calcium chloride for laying dust on roads depends. The salt as supplied by the entrants for the "dry" method of treatment was in a granulated form and contained about 70 per cent. of true calcium chloride and 30 per cent. of water. The effect of spreading this salt on the road is that it rapidly absorbs moisture from the atmosphere, the granules thus soon becoming soft moist globules, which ultimately liquify by further absorption of moisture and are then absorbed in the pores or interstices of the road-surfacing material.

On a dry, hot day it will become drier, but will never in the conditions in this country pass beyond a certain stage in which it is still a syrupy substance having more or less binding action due to its viscosity on the road material in which it has been absorbed. On the other hand, when the humidity of the atmosphere is increased, as is commonly the case at nightfall in this country, even on dry days, the calcium chloride absorbed in the road will take up moisture from the atmosphere and thereby render the road material moister than before.

The Carriage Waits "Without."

"The carriage waits without, my lord."
"Without what, gentle sir?"
"Without the left-hand running-board,
Without the French chauffeur,
Without a drop of gasolene,
Six nuts, the can of oil,
Four pinions, and the limousine,
The spark-plug, and the coil;
Without the brake, the horn, the clutch,
Without the running-gear,
One cylinder—it beats the Dutch
How much there isn't here!
The car has been repaired, in fact,
And you should be right glad
To find that this much is intact
Of what your lordship had.
The garage sent it back, my lord,
In perfect shape throughout;
So you will understand, my lord,
Your carriage waits without."

HARVARD LAMPOON.

CYCLOMET'S CAUSERIE

A VERY Happy Christmas to each and every one of my readers. May business cares diminish and motoring joys increase for all of us! And let us hope that motoring at Christmas may not only be possible but enjoyable.

Powerful Headlights.

The opportunity did not serve to refer in my last week's notes to the extraordinary arguments that appeared in the case against Lord Curzon, to have been advanced against the use of acetylene lamps. I can claim to have had a very extensive experience of acetylene lamps, for when the first case of these lamps came to England from America, a cycle lamp was included among a number of table lamps, and that cycle lamp was placed in my hands for testing and, curiously enough, it was the unconsidered trifle in the consignment that proved the most successful of all, for it was soon discovered that the good results that I obtained on the road could not be obtained with the table lamps, which over-heated for lack of the cooling draught of air. From that day, acetylene gas has been as familiar to me as lubricating oil, and has presented, if anything, fewer mysteries.

Acetylene lamps of all powers, from about 50 c.p. to about 3,000 c.p. (using the term as it is generally expressed), have been through my hands, and I have never had any genuine complaint levelled against them. Nor have I ever felt that I was "hogging" in using the most powerful headlamps, or felt carried away by their brilliance to such an extent that I must drive fast. On the other hand, powerful lamps have enabled me to avoid all sorts of dangers, and the absence of them on at least one occasion momentarily put me in a tight corner. For my ordinary oil side lamps failed to pick out, until the last moment, a cyclist who was riding close to the kerb. As I swerved round him, a big car was overhauling and passing me, and, in imagination, I felt our axle caps meet and grind to powder. It must have been a matter of a few millimetres between the two cars and of inches between me and the cyclist, and it was pitch dark. How we all escaped a smash has always surprised me.

This was in my little car days, before anything in the way of speed was possible, but even when I have had ample power in the engine and an abundance of light from powerful lamps, I have discovered no extra incentive therein to fast travel at night, although the pedestrian and the cyclist are quicker at night-time to take their right position on the road, showing that the warning conveyed by light is more impressive and more rapid in its action than a warning by sound.

In my opinion, cyclists suffer more distress than any other class of road user when meeting a pair of car lamps, particularly if those lamps be of the earlier patterns, which illuminated a wider area than it is customary to illuminate now that the searchlight type of lamp has affected lamp design. The cyclist sits low (as compared with the occupants of other vehicles), and, having allowed himself to be temporarily blinded by the approaching lights, he becomes erratic in his steering, and swerves out of his original course after passing the car, and thus frequently comes to grief. And it has always interested me to observe that the cyclist, having two eyes, never seems to dream of closing one, thus keeping it unaffected by the light, opening it only when he is level with the car. Nor does he avert his head when approaching the car: instead, he stares into those lights as if mesmerised, although I recognize that the vision of the average person will, unfailingly, be drawn towards a light, as can be seen in the smoking carriage of an unlighted train passing through a tunnel. The light from a smoker's match will draw every eye in the compartment and hold it until it is extinguished.

But I fail to understand such a mishap as was referred to by my colleague, Mr. Sturmey, recently, where a motorcyclist passed a car showing powerful lights and ran into a cart and was killed. If the car was travelling at normal speed and had overtaken the cart, the latter could not have been right close behind. If it had been, the curving course of the car as it passed the cart must have been ample indication to the unfortunate motorcyclist of the presence of the cart on the road. And if the cart were going in the same direction as the motorcyclist, then, in my opinion, the driver of the car was at fault, for, if he had used his head, he must have realized that the cyclist would be in danger, and he should, seeing the cyclist's light ahead, have slowed down, so that the car lamps illuminated the cart for the information of the cyclist, or he should have put out a warning hand to him.

For some time I have been a strong advocate of the use of anti-dazzling mechanism on all powerful headlamps, and if I say little about them on this occasion, it is because I have said so much in the past that I fear to be thought a bore on the subject. So I will content myself with saying that my new car (to be bought, by the way, when I have saved sufficient to replace the amount represented by depreciation on my last car!) will be equipped with lamps having this useful attachment.

The Use of Automobile Clubs.

I was much interested in the resuscitation of our old contributor "Automan" at Show time, and I sincerely hope that his notes "At Random" will be less casual and fortuitous than his grumblings. To deal briefly with one of these grumbles, he says he finds himself, at the end of the season, called upon to pay a guinea to his local Automobile Club for membership that has been unproductive of benefits to him. "Automan" shows that he is what I call a bad or negative member of his club, and, lest he should feel hurt at this remark, let me add that I consider myself a negative member of some half-dozen or more clubs and institutions. Why I retain membership of some passes my comprehension, unless it be an innate objection to severing old associations. A negative member is one who brings nothing into a club, who does not perform his share in the creation of club life. Imagine a group of friends formed on paper and then nobody doing anything to enable the group to enjoy the fruits of friendship: the result would be nil, whereas if each brought his moiety how vastly and extraordinarily different would be the effect.

I have a strong belief in club life when it is constituted of friendly associations and social intercourse, and then the man who takes an active part in that life has a new group of friends to sweeten life and to keep the cobwebs and rust away. But each one must do his share, for that is the fuel that sets the machine going. And the really clever secretary is the one who gets from each member his share. Then, a club meet, or dinner, or social evening is something to look forward to and enjoy.

And for the present, and till we get reasonable legislation, I think that the organisation of motorists into clubs and associations is a matter of vital importance, and that the man who does not do his share is very nearly a traitor to the cause, for it is wrong to say that the time has come when co-operation is no longer necessary against prejudice and against unfair administration.

The Motor

The sale of "The Motor" to the public through ordinary trade channels is claimed to be the largest of any motor-car journal in the World.

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Greetings!

CHRISTMAS will have come and gone before another issue of THE MOTOR appears, and the Editors desire to extend their very hearty greetings to every reader far and near. We wish all a very happy Christmas, and hope that the best of good fortune and happiness may be the lot of the thousands of readers of this journal in all the days of the year that is to come.

The Effect of Solid Tyres on Chassis.

THE question of solid tyres, spring wheels, and other patent wheels shod with solid tyres and not with pneumatics, continues to present an always interesting problem, and there can be no doubt but that, to many motorists, the use of such devices would appeal considerably. They hesitate to adopt them, however, largely because they have heard of the unfortunate experience of those who used solid tyres in the years gone by, who, after 3,000 or 4,000 miles running, had serious troubles with breakages, and they are not unreasonably inclined to ask how their chassis would be affected now? But, curiously enough, the apprehensions of most motorists, when considering this question, are not in relation to those parts which are most seriously affected, but are directed entirely to that part of their car which is least affected by the use of solid tyres. Men ask how their *engines* will be affected by the use of anything other than pneumatics, and never appear to think about their axles and frames, which are the parts most liable to injury if the wheels are lacking in resiliency. When an unyielding wheel, such as a solid tyre in a rigid wheel, is employed, and particularly when any speed is indulged in, the result is a series of heavy sharp shocks upon the axles. The springs intercept the shocks above the axles and pass them on to the chassis in greatly diminished form, so that, whilst the axles are likely to suffer severely if of insufficient strength to stand up to the shocks imposed, the effect upon all other parts of the chassis, including the engine, is vastly less. As a matter of fact, in the old days, the troubles which followed the solid-tyred car were those of broken axles and broken springs, and, occasionally, a broken frame. It was not the engine which suffered to any appreciable degree, so that if a device is embodied in a wheel which will relieve the axles and springs from excessive shock, a motorist can be reasonably assured that his engine will not be likely to be deleteriously affected thereby.

Facilities for Foreigners Touring in Great Britain.

THERE came into force just recently the new Act which "enables Orders in Council to be made for the purpose of giving effect to any convention for facilitating the international circulation of motorcars." As the outcome of recent conventions between the touring bodies of the various countries, the new Act will put an end to a condition of affairs that was never contemplated when the registration of motorcars and the licensing of their drivers was decided upon in 1902. The rigid enforcement of the registration acts (which, according to our observation, has not been relaxed in any part of the country) means that a barrier is raised against bringing motorcars into this country by persons resident abroad and intending to make a brief or temporary stay here, for instance for the purpose of touring and seeing the beauty spots and the interesting places in these islands. On the Continent, there has been slightly more laxity and also a desire to facilitate the entry of foreigners desirous of touring by motorcar, and, as that means the circulation of money, it is obviously to the interests of even so wealthy a country as Great Britain that every possible encouragement should be given to foreigners to bring their cars over here, to see our islands and our people, and thus to come into closer contact with us and our methods, aims, and ideals. This must, inevitably, make for a better international understanding, helping to increase commerce and to ensure peace. In the working of the Act, authority will be given for granting and authenticating certificates or travelling passes, so that persons resident in Great Britain and Ireland, taking their cars abroad, may receive such facilities as are offered under the terms of the International Convention, the authorities on this side, for their part, modifying the provisions of the Motor Car Act of 1903 in respect of the registration of cars and the licensing of motorcar drivers, in the case of cars brought here for a temporary stay.

The Dangers of Petrol.

A SAD fatality occurred last week, which once again draws attention to the dangers of the incautious use of petrol, although, in this case, the explosion occurred under conditions which would, on the face of them, appear to have been safe enough. Two mechanics were altering the petrol tank of a car, to make it serve as a water tank. They had emptied out the petrol and made several holes in it for the purpose of the alteration some little time previously, and they naturally concluded, as most people would be likely to conclude, that the thing was safe enough to handle, and then they proceeded to braze on the fixings for the water tank. They had just finished putting two of these on and were congratulating themselves upon having done a good job, when the tank exploded and both men were badly burned, one of them fatally. The explosion, indeed, seems to have been very largely unaccountable. At the inquest, the survivor stated that they put out the spirit lamp with which they had heated their soldering iron, directly the iron was heated, so that it seems quite a mystery as to how the contents of the tank caught fire. Apart from this, it is quite as difficult to understand how, in the circumstances, an explosive mixture could have been in the tank at all. The supposition is that a few drops of petrol remaining in the seams of the tank had evaporated and mixed with the air. It is this point, i.e., the ability of a mere trace of petrol to make an explosive mixture, which serves to impress upon us the special need for caution.

The Andover Fatality.

THE fatal termination to the recent accident, in which the Hon. Archibald Gordon's car, travelling on the Andover main road, came into collision with another car that emerged from a side road, is greatly to be deplored, chiefly because of the extinguishing of a bright young life and of the grief that has been caused to the parents and relatives. The district in which the accident occurred has not, for a long time, been popular among motorists, because of the traps that have been set in the

EDITORIAL.—Contd.

neighbourhood of Andover, the large sums of money that have been collected in fines from motorists going to swell the funds at the disposal of the local authorities, none of which, so far as we are aware, having been used to render travelling on the highways safer than it is. The principle of fining motorists for alleged technical infringements of an out-of-date speed limit, of using the money to the relief of the rates and of allowing danger spots to exist is a bad one, for not only are the motives underlying it selfish and bigotted, but the evil that results may be almost beyond measure. The junction of the roads where the accident occurred is obscured by high hedges, and there is insufficient room for manœuvring when a collision is seen to be imminent.

Throughout the country there are hundreds and hundreds of similar places: yet the extraordinary thing is that, although the traffic conditions of the highway have totally changed during the past ten years and that more intelligence in highway administration is, in consequence, required, little or nothing is done to improve the existing dangerous state of the roads. For our part, we think that the inaction of the highway authorities (except in a few bright particular instances) is little short of criminal, and we could only wish that their negligence could be brought home to them in such a way that they would feel it acutely.

Motorists and the General Election.

THE decision of the Royal Automobile Club, announced in our last issue, to take no action in connection with the General Election has been followed by similar decisions on the part of the Automobile Association and the Motor Union. Every right-thinking man will agree that, when the interests of the nation are at stake, the claims of a section, however important, must stand on one side. The motoring section is gradually living down the prejudice that arose on the introduction of a mode of locomotion that brought new conditions into force, and custom, which is stronger than law, is effecting the modifications of tone and temper and reconciling the malcontents with the passage of every year. Hence, delay in the alteration of the existing law dealing with motorcars is no great disadvantage, for the longer the delay the fairer will be the next enactment. And, as the next Act will, perforce, have to hold good for some time, the fairer it can be made the better. In these circumstances, and considering the importance of the issues before the electorate in the forthcoming General Election, the individual motorist may well be left free in the matter of lending his car or assisting the candidate whose political opinion he favours. For this reason we like the idea put forward by the Automobile Association of obtaining from the hundreds of thousands of voters who will ride in motorcars to the polls an expression of opinion that drivers of motorcars should enjoy the same privileges and be subject to the same penalties as other users of the King's highway. The phrase is so tactfully and carefully worded that we hope it will in no wise be departed from. And we suggest that each motorist, in offering the use of his car for the election, should endeavour to extract the same opinion from his candidate. With many thousands of signatures to such an expression of opinion, Parliament would have a guide to the views of the public when next the subject of motorcar legislation comes up for discussion.

Transmission Gears.

WE are inclined to wonder whether very many of our readers would have been able to give such an exhaustive list of the varieties in transmission gears as are described in the article relative to the subject, and illustrated in the seventh of our series of "Comparisons of Styles and Methods."

We think we may claim that this article will prove very interesting reading, whilst the number of congratulatory letters we receive assures us of the popularity and general appreciation of the series in general. The essence of the idea is, of course, that we are able to give our readers a comprehensive and discriminating selection of the various designs adopted by different manufacturers for making a similar article, the compilation and choosing of which entails a very considerable amount of time and work, whereas the result is presented in an epitomized form, by means of illustrations.

Next week we are dealing with shock absorbers, another subject wherein (colloquially speaking) there is more than meets the eye.

It has come to our knowledge that a game called "The Motor-car Race" is being sold. On the lid of the box the words "The Motor," as embodied in the full title, are an exact facsimile of the title of this journal, and as many who know THE MOTOR might be induced to purchase under the impression that the game is issued by us, we desire to say that we have had nothing whatever to do with it. We have purchased the game with the object of getting into communication with those responsible for it, but as no name whatever is given with it, we are compelled to make this statement in our columns.

The year 1909 will in all probability figure in history as the one in which the most remarkably rapid progress has been made in aviation. We have prepared for the next issue a most interesting résumé of the year's aerial records, which will be illustrated by some novel comparative charts. One of these will show how possible is a flight from London to Manchester in view of recent performances.

We wish to point out that the Christmas holidays will make no difference with regard to the publication of THE MOTOR. Next week's issue will appear on Tuesday as usual.

EDITORIAL NOTICES.

"THE MOTOR" is published in London every Tuesday morning. All editorial communications and copy must be addressed to "The Editors," and, to ensure insertion, should reach the office, 7-15, Rosebery Avenue, London, E.C., by first post Saturday. Important items of late news are received up to first post Monday morning.

Contributions, literary and artistic, are invited, and will be accorded careful consideration, on terms set out on the first page of the Sale and Exchange section at the end of the book, to which readers are referred for other notices.

INDEX TO CONTENTS.

FINANCE & BUSINESS

As we anticipated, business has been quiet during the week, but, in spite of this, prices have been well maintained, and, as a general rule, are all higher than those ruling last week. Rovers have been buoyant, the quotation improving to 13s. Swifts and Stars have also been good markets, the price of the former improving to 19s. 6d., and the latter ordinary to 6s. 6d., preference 15s. 6d. The bears of Daimlers are getting nervous, the price hardening to 39s. 6d. There are few shares on offer, and the market generally is firm. Darracqs have been inquired for at 15s. 6d., Preferred 14s. 3d., Stepneys at 24s. 3d., and Triumphs are firmer at 20s. There is practically no alteration in Dunlop issues, Rubbers being steady at 10 7-16, and Deferred at 18s. Deasys have changed hands at the lower price of 7s. 6d., but are buyers at that figure.

We know of an opening with a first-class car manufacturing company for a traveller to call upon motor agents throughout Great Britain. Applications should be addressed to the Editors of this paper (the envelope bearing the words "Finance and Business"), who will pass them on. If desired, the application may be sealed in an inner envelope. The applicant must be of sufficient age and of good class, and he must know the trade: no others need apply.

A letter from Messrs. Vauxhall Motors, Ltd., informs us that the rumours in circulation, to the effect that a severance is impending of the connection of Messrs. Percy C. Kidner and Leslie Walton with the company, have absolutely no foundation. As a fact, they have recently increased their share holding to such an extent that they hold practically the whole of the shares. As those purchases include the shares that had been held by the Vauxhall and West Hydraulic Engineering Co. and the nominee of that company has retired from the Board, the rumours may have arisen from these facts.

The balance-sheet of the Societe Française des Cycles Clement and Gladiator just issued now deals almost exclusively with the cycle manufacturing business, for the realization of the motor stock is nearly completed, the manufacture of Clement and Gladiator cars being now in the hands of the two companies concerned with their sale in this country. The company shows a profit of £4,807 for the year.

Mr. Robert L. Jefferson, who has been connected with the Rover Co., Ltd., since 1895, has recently resigned his position as foreign and colonial representative of the company, his relations with his employers being of the friendliest possible description, and his resignation having been received by the Board with regret. Mr. Jefferson has travelled extensively and is well and favourably known in motor circles in three or four continents.

The prospectus of Messrs. Rose and Hollebone, Ltd., is announced, the company being formed to carry on the business of dealers in cars and accessories and garage proprietors, in Brighton. On nine months working to 30th September last, and on a turnover of £6,208, a net profit of £121 is shown, and the directors are confident that this is capable of being considerably improved, the recent addition to the garage accommodation being in a good district and already showing good results. Extensions of the company's operations are contemplated. There are now offered for subscription 3,001 preference shares of £1 at par and £5,000 of first mortgage debenture stock bearing interest at 5½ per cent. per annum.

Mr. J. H. Hall applied to the courts last week for an interim injunction to restrain the Stepney Spare Motor Wheel, Ltd., under the provisions of the Patent Act, from threatening him with infringement proceedings in respect of the Hall's spare wheel. Counsel for Mr. Hall said that his client was prepared to meet the Stepney Co. in court on an action for infringement. Counsel for the Stepney Co. explained the reasons for the proposed amendments of their patents, and said that the company was in a position to bring an action, and that it was acting with due diligence. On undertaking that the writ for infringement should be issued that day, the application was allowed to stand over generally. We learn from Mr. Hall that a company is to be incorporated to-day (Tuesday) with a capital of £30,000, but it is, of course, yet too early for a public issue.

The directors of Phœnix Motors, Ltd., have again declared a dividend of 15 per cent. for the year, after carrying over a fourth of the net profits to reserve, and writing down certain assets and extinguishing the item of patents. The reserve fund now equals more than a fourth of the issued capital. Consistent improvement and steady progress are the watchwords of the directors, and, by keeping these before them, the directors are building up a very sound concern, one that will, without doubt, expand in due season.

Figures just issued on the French motor industry show a slight increase in exports for the first 11 months of the year, compared with the corresponding period of 1908. The total increase is £585,240, of which amount England is responsible for £71,480. Other nations having increased their purchases of French motorcars are Russia, Belgium, Switzerland, Italy, Spain, Austria, Argentine, and Algeria. In all other countries there has been a decrease. Although total exports have increased, imports have also increased to the extent of £28,720. The most important item on the import list is that of England, who has doubled the value of the motorcars sold to France. Other nations having increased their motor business with France are Belgium, Switzerland, America and Spain. Italy has lost trade with France.

"THE MOTOR" SHARE LIST.

The Prices recorded in the end columns are those ruling on the Stock Exchange at midday on Monday last, 20th December.

All the shares are fully paid except Alldays £5 ordinary shares and Rolls-Royce.

SHARES.		NAME.	Dividend.		Previous Prices. 1908.		Previous Prices. 1909.		Prices 20th Dec.	
Issued Capital	Paid Up.		Last.	When payable.	Highest.	Lowest.	Highest.	Lowest.	Buyers.	Sellers.
£										
45,000	£3	Alldays & Onions...	6%a	Mar./Nv.	3⅞	3	3¼	2⅞	3⅛	3¼
50,000	£5	,, Cum. Pref. 6%	6%	Mar./Nv.	5⅜	4	5½	5	5⅛	5¼
203,802	10/-	Argylls, Ltd.	—	Nov.	—	—	—	—	4/-	5/-
97,938	£1	Belsize Motors	6%	Nov.	11/-	9/-	18/6	9/-	17/6	18/6
75,000	£5	Brampton, Cum. Pref. 6% ...	6%	Oct.	4¼	3⅛	4¼	3⅛	3⅜	3⅝
100,000	£1	J. B. Brooks & Co.	5%	Mar./Nv.	21/6	19/6	24/-	20/-	22/6	23/6
100,000	£5	,, ,, Cum Pref. 5%	5%	Mar./Nv.	4¾	4¼	5⅜	5	5⅛	5¼
100,000	£5	Brown Bros., Cum. Pref. 6% ...	6%	Ap./Oct.	5¼	3⅞	4⅜	3⅞	4⅛	4⅜
381,000	£1	Charron Ltd., Par. Pref. 7%...	—	—	12/6	7/6	10/6	7/6	7/6	10/6
200,000	£1	Daimler (1904)	nil	Nov.	49/-	19/6	51/9	25/6	39/3	39/9
76,300	£1	,, ... New Pref. 6%	6%	Nov.	20/-	13/-	20/-	12/6	18/3	19/3
275,000	£1	Darracq (1905)	7½%	Apr./Nv.	35/-	21/9	24/9	14/6	15/6	16/-
375,000	£1	,, Pref. Ord. 7%	7%	Ap./Oct.	18/6	13/6	18/-	13/3	14/-	14/6
98,787	£1	Deasy Motor	nil	Oct.	9/-	2/6	10/6	4/-	7/-	8/-
168,263	£1	De Dion-Bouton (1907)	4%	May/Nv.	14/6	8/6	9/-	5/-	7/6	8/6
220,000	£1	Dunlop Rubber Co.	100	Nov.	7⅛	5⅞	10⅞	7⅛	10⅝	10⅞
319,614	£1	,, ,, (French Inv. come Stock)	—	—	—	—	—	—	20 3	20/6
624,996	£1	Dunlop Tyre, New Cum. Ordy., 8%	8%	May/Nv.	17/-	15/-	19/6	16/-	19/3	19/9
904,000	£1	,, ,, Cum. Pref. 5%	5%	May/Nv.	16/3	14/6	17/6	15/3	17/-	17/6
499,962	£1	,, ,, New Deferred	8%	May/Nv.	16/6	12/-	18/9	13/10½	17/10½	18 1⅛
75,000	£1	Priswell (1906)	10%	Jan./Au.	¾	¾	¾	¾	¾	¾
50,000	£1	,, ,, Cum. Pref. 6%	6%	Jan./Au.	¾	¾	¾	¾	¾	¾
—	£1	Humber (New)	—	—	—	—	9/3	9/9	7/-	7/6
—	£1	,, Cum. Pref. 6% (New)	—	—	—	—	10/9	5/9	9/-	9/3
100,000	£5	J. Lucas, Cum. Pref. 5%	5%	Feb/Oct	5¼	4⅝	5⅜	5	5⅜	5½
62,806	14/-	Rolls Royce, Pref. 6% (part paid)	6%	Jan.	8/-	4/-	15/-	5/-	14/6	15/6
134,668	£1	Rover	nil	Nov.	22/9	6/3	13/-	7/3	13/-	13/6
62,000	£1	Spare Motor Wheel of America	— b	—	29/6	5/-	8/3	1/6	2/6	3/-
70,000	£1	Star	nil	—	5/6	3/-	5/3	2/6	5/6	6/9
50,000	£1	,, Cum. Pref. 7%	nil d	—	11/-	6/6	15/-	8/-	15/9	16/3
87,550	£1	Stepney Spare Wheel	20%	Nov.	31/9	20/6	25/6	23/-	23/3	24/6
40,000	£1	Sunbeam M.C. Co. ...	nil	—	27/6	16/-	19/6	14/-	17/6	18/6
80,000	£1	Swift	6%	Apr./Nv.	26/6	13/6	21/3	13/3	19/6	20/-
100,000	£1	,, Cum. Pref. 6½%	6½%	Apr./Nv.	18/3	15/6	17/6	14/9	16/6	17/6
148,500	£1	Thornycroft, J. I. & Co. ...	nil	May	¾	⅝	¾	⅝	⅝	¾
199,000	£1	,, ... Cum. Pref. 6%	—	May/Nv.	1	1	1 1/8	—	—	—
80,000	£1	Triumph Cycle Co. ...	10%	Nov.	—	—	—	—	19 3	19 9
50,000	£1	,, ,, Cum. Pref. 5%	5%	Nov.	—	—	—	—	14 9	15 6

a Plus 5% bonus, making 10%. b New Company. c In arrears since Sept., 1904
d In arrears since March, 1901. e In arrears since May, 1906.

Restoring Power by Cylinder Grinding.

THAT an engine must have good compression so as to be able to develop its rated power is a well-understood axiom. Engines that have seen a good deal of service very often prove deficient in this respect, as the result of the cylinder bore not being mathematically true.

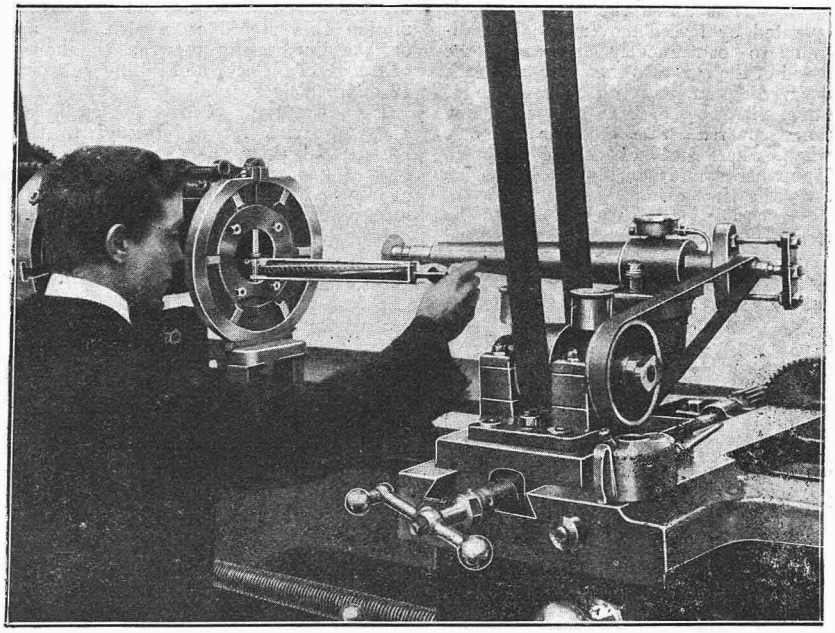
Some time ago we visited the works of Acer Ltd., 66, Grosvenor Road, Hanwell, London, W., and had an opportunity of seeing the extensive plant they have installed for the work of restoring accuracy of bore and good compression in engine cylinders. They have, in fact, specialized in this class of work, with the result that they are recognized by most leading repairers as the firm to whom it is best to entrust this special and difficult operation. At the time of our visit large numbers of engines of all sorts and sizes were having the cylinders trued up.

The photograph on this page shows one of the company's cylinder-grinding machines, by means of which bores can be trued, without removing enough metal to weaken the walls. The carborundum wheel, which may be noticed at the end of the tapered gun-shaped arm, is the sole tool employed. This can remove as little as .001 in. (one-thousandth of an inch) at a cut. Running at 6,000 revolutions per minute, it passes slowly down the bore of the cylinder, a shower of sparks illuminating the interior and marking its progress. When the wheel has reached the end of its travel, the grinding arm is removed to the position shown, and the operator verifies his work by means of a Craig cylinder gauge.

After the cylinders have been finally tested and passed by the inspector, they are handed over to the operators, who finish the new pistons. Here, again, grinding machines are employed to get a perfect fit, although the pistons are first turned in a lathe in the ordinary way, until within a few thousandths of an inch of the finished size.

A clearance, rising from .002 in. to .006 in., according to the diameter of the piston is the rule, but it should be mentioned that the crown end of the piston is still further reduced to allow for expansion.

From the machinists the cylinders and pistons pass to the fitters. Here the pistons are furnished with rings, which are cut to suit the bores of the cylinders without any gap being visible. Feeler gauges are employed to test the joints of the piston rings. These gauges are thin steel blades, rising from .002 in. in thickness, and any joint in which a blade .003 in. will enter is not passed by the inspector. The final operation is the lapping-in by hand of the pistons and rings into the cylinders, until each ring shows marks of bearing all round. No emery powder is permitted to be used by Messrs. Acer, Ltd., in the operation of lapping, the material employed being very fine glass powder.



A cylinder grinding machine.

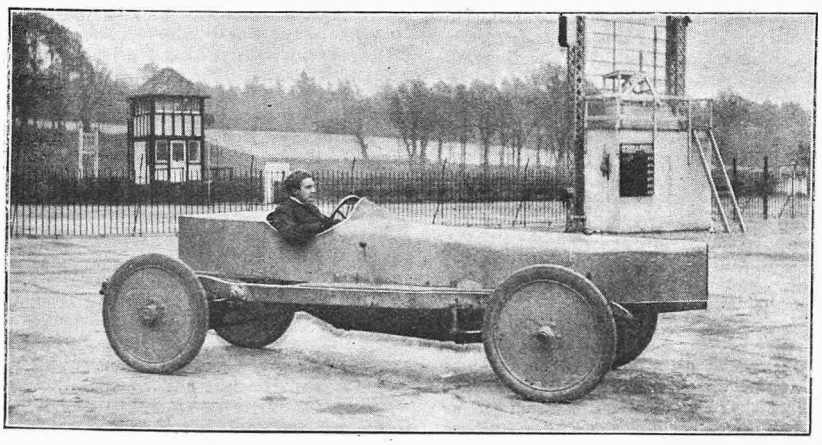
Records at Brooklands.

The accompanying photograph illustrates the 20 h.p. standard Vauxhall chassis, in racing trim, on which Mr. A. J. Hancock made such marvellous times at Brooklands on 14th December last.

Mr. Hancock has established two 21 h.p. (R.A.C. rating) class records, his car having covered a half-mile (flying start) at a speed of 88.618 miles per hour, which constitutes the "short" 21 h.p. record, and ten laps of the Brooklands track at a speed of 81.33 miles per hour, the "long" record.

In these performances this standard 20 h.p. Vauxhall chassis has made faster times than both the "short" and "long" records of the 26 h.p. class, and has made better time than the "long" record of even the 40 h.p. class.

In addition to setting up two new records, as stated, Mr. Hancock made a very fine run over the flying kilometre, which he covered at the rate of 88.260 miles per hour.



The Vauxhall in racing trim.

Co-operative Trading.

A meeting of the General Committee of the R.A.C. was held on Thursday last to consider and discuss the question of the advisability or otherwise of associated clubs identifying themselves in any scheme of co-operative trading. The meeting was thoroughly representative in character, there being present representatives of the Royal, Scottish, and Irish Automobile Clubs, the Auto-Cycle Union, and of the provincial clubs generally. A full discussion of the subject took place, and subsequently the following resolution was passed unanimously:

> "That the General Committee of the Royal Automobile and associated clubs, while considering that the question of adopting co-operation in any way is one on which every associated club is perfectly free to take whatever action it thinks best, is of opinion that it is undesirable that any club in the association become directly or indirectly affiliated to or officially connected with any trading association, co-operative or otherwise."

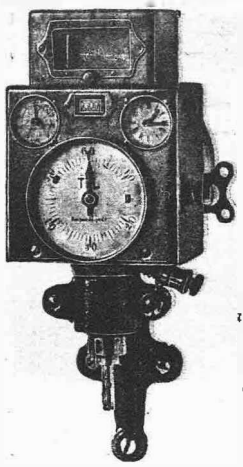
Our next issue will contain a remarkable article dealing with aero records.

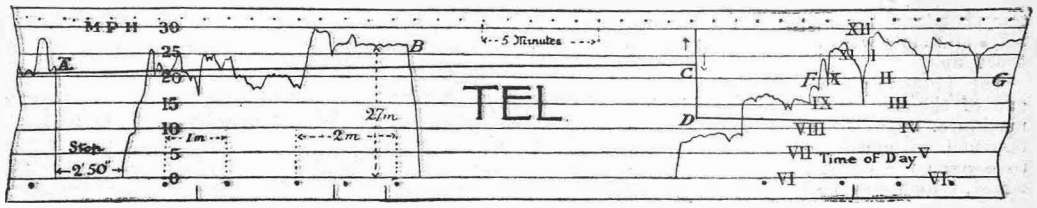
A TELL-TALE INDICATOR.

A Device Which Indicates Speed of Car, Records Speed at Any Point, Distance Covered, Time of Running, How Long Stopped, etc., etc.

AN interesting speed indicator and recorder is introduced by Messrs. Elliott Bros., of 36, Leicester Square, London, W.C. It is called the "Tel," and is operated by forced movement; in addition to continuously indicating the speed of the car, also the time, it records on a diagram strip all movements of same, viz., the speed at any point, distance covered, time the car is out, when, where and how long it stopped. It further records on the same diagram strip the time of day.

The casing of the instrument and the frame to which the mechanism is fitted





The "Tel" indicator, with a specimen chart, showing how it records.

are of brass. A large dial indicates the speed in miles per hour continuously, a small dial to the right shows that of an ordinary timepiece, from which is worked the needle recording the time of day on the diagram. The small dial on the left indicates the trip mileage (0 to 100 miles), the hand of which can be turned back to zero. The total mileage counter is placed between the two last-mentioned dials, and records up to 100,000 miles.

The diagram is enclosed in the case at the top of the instrument, which has a glass front. This paper is unwound at the rate of 3 mm. per minute by a clockwork movement (distinct from the timepiece of which mention has been made above), and this is automatically wound up by the rotation of the driving shaft of the instrument. This clockwork runs down if the car is at a standstill for more than 10 minutes.

The paper is graduated in miles per hour (the scale corresponding to that of the indicator dial), and, as the needle recording the speed is keyed on to the axis of the indicator needle, their movements are simultaneous. Immediately above the maximum mileage graduation line punctures are made at uniform intervals of one minute, and below the zero mileage graduation line punctures are made every mile.

The diagram-box is fastened by a spring catch, and when this is pressed, in order to open same, a puncture is made on the lower extremity of the paper, thus recording at what time and where the diagram box was opened. A further record is made on this diagram, viz., time of day.

A needle, worked off the timepiece, moves vertically up and down the width of the paper, which is equivalent to six hours, the spaces between the successive mileage graduation lines each representing one hour. While the car is in motion this record is shown by an oblique line, rising between the hours of 6 and 12 o'clock, and falling between 12 and 6 o'clock.

The advantage of this device is at once apparent, for a reference to the record will show the car owner where he was and what speed he was making at any particular hour of the day or night. As mentioned, when the car has been at a standstill for 10 minutes or more, the paper feed stops, so the time of day records continues, and is made vertically, recording long stoppages without waste of paper. The two needles recording speed and time of day run on separate guides in order to prevent their fouling, the latter needle being always 3 mm. (one minute) in advance of the former.

The diagram rolls are 14 m. long, and as the paper feed is 3 mm. per minute, each roll lasts 77 working hours approximately. It should be observed that all the records made by the Tel instrument are permanent, being either punctured or scratched on the surface of the chrome paper.

The casing of the Tel instrument is water and dustproof. Its total length is 6½ in. by 4½ in. wide, and it weighs about 8 lb.

The principle of the instrument differs, it is claimed, from that of practically all other types of automobile speed indicators, which are operated by centrifugal force, inasmuch as the speed is measured by a conjugate movement. A great advantage of this conjugate movement is that it indicates and records high and low speeds with equal accuracy. Further, its working is uninfluenced by variations in the tensions of the springs and changes of friction in the axle bearings. The indicator needle thus gives an exceptionally steady reading. The power required to drive the instrument is small, the maximum number of revolutions which the driving shaft makes for the maximum speed graduated on the dial being only 180 per minute.

The driving shaft of the instrument should be lubricated regularly, and for this purpose a forced lubricator has been provided, situate on the right-hand side of the instrument. It is sufficient to turn the cap of this two or three times a week. The lubricant can be renewed by unscrewing this cap and filling same with vaseline.

The drive for the Tel instrument is taken either (1) from the front wheel, or (2) from the cardan shaft. In either case, the ratio for the gear-wheels in the gearbox is calculated on the mean diameter of wheel, which is obtained by measuring the exact distance covered by 10 revolutions of the wheel when the car is normally loaded.

In the case of front wheel fitment, a toothed crown is fitted to the front wheel, gearing with the spur wheel of the gearbox, which gears down the speed of the flexible shaft so that same makes 180 revolutions per minute for the maximum speed on the dial. A coupling sleeve connects the flexible shaft (which should be enclosed) with the driving shaft of the instrument.

In the case of rear-wheel fitment, a grooved pulley is fitted to the cardan shaft, a second pulley taking the place of the spur wheel on the gearbox. The first pulley transmits the motion to the second by means of a spring belt.

The A.A. and the General Election.

The Automobile Association Committee does not propose to attempt to influence members in the matter of lending or declining to lend their cars for the assistance of candidates. That subject is, in the committee's opinion, entirely one for each motorist to decide for himself, according to the measure of his interest in politics.

The Association, however, will take advantage of the forthcoming election to obtain an expression of opinion from the hundreds of thousands of voters who will undoubtedly ride to the polls in motor-cars. The Association will bear the whole expense of supplying, collecting, and collating the plebiscite cards, after signatures have been obtained from passengers by the owners or drivers of cars.

Members, and motorists who are not yet members, are cordially invited to assist in the work, which should commend itself to all reasonable owners and drivers, of whatever shade of political opinion. Cards will be sent on application by telephone to Mayfair 1430 (five lines); Manchester, 7505 Central, Glasgow, 6861 Royal; by telegram to "Fanum," London, Manchester, or Glasgow or by postcard to the Automobile Association Whitcomb Street, Coventry Street, London.

Specimen of Plebiscite Cards.

The undersigned voters in the Parliamentary Division of
are of opinion that drivers of motor-cars should enjoy the same privileges and be subject only to the same penalties as other users of the King's highway.

Sent in by .....

Name of car owner .....

A NEW SHOCK ABSORBER.

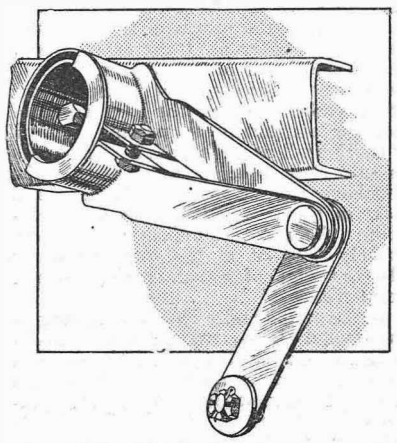
A Device which it is Easy to Attach to any Make of Motorcar.

THE Foster shock absorber is a device which has been taken up by Messrs. Brown Bros., Ltd., Great Eastern Street, E.C. It is an exceedingly neat contrivance, as the illustration on this page will show, and it is claimed to entirely eliminate all excessive spring action set up when driving over rough roads. Its object is to absorb all vibration without destroying the resilience of free central movement of the car springs.

An oval-shaped steel cup ¼ in. longer than wide, forms the stationary base of the absorber. This cup is encircled by a one-piece band of flexible spring steel faced with leather specially prepared, being very hard and firm, and absolutely noiseless, which bears against the outer surface of the steel cup.

The amount of resisting force exerted is governed by an adjusting lock nut and can be regulated and set as desired. The oval-shaped cup gives a free central movement, which can be varied from 1 in. to 2 in.; therefore, the spring acts free for a corresponding distance.

As the arm of the absorber moves off the centre the flexible steel band changes shape and conforms to that of the oval cup, thereby creating a gradual increasing friction, which stops the excessive upward and downward action of the springs; however, if desired, the cup may be placed so as to cause the absorber to act either on the upward or downward stroke only.



Under ordinary road conditions only about one spring vibration out of every thousand is severe enough to require a shock absorber to check it, therefore, the free central principle causes the absorber to work only when needed, which reduces wear to the minimum, and makes very little adjustment necessary. The absorber will operate from 15,000 to 20,000 miles before it is necessary to replace the leather friction band. The friction cup is dustproof and all bearings are case-hardened to ensure durability.

The Foster shock absorber is easy to attach to the car, makes no noise, and once fitted will last for years.

No. 1 absorber, 2⅞ in. by 3⅛ in. cup, suitable for cars weighing under 2,200 lb., per set of four is sold at £7 10s.

No. 2 absorber, 3⅜ in. by 3⅝ in. cup, suitable for cars weighing over 2,200 lb., per set of four is sold at £10 10s.

German "Exhibition Weariness."

Count Sierstorpff, vice-president of the Imperial Motor Club, has opened his heart to an interviewer on the refusal of the leading makers to support an automobile show in Germany next year. The Count insists that there is as much need of exhibitions to-day as ever before, Germany having several extensive districts—for instance, Pomerania and other provinces east of the Elbe—where the automobile is more or less an unknown quantity, and where a motor show would re-act favourably on the industry. Touching the question of expense, which has been brought forward as a reason for postponing an exhibition sine die, Count Sierstorpff thinks that makers might attain the real object of a show without erecting costly stands and vying with one another in ostentatious decoration. But, however the Imperial Motor Club may regard this matter, it is, apparently, quite powerless to counter-balance the antagonistic majority in the Association of German Automobile Makers and their strong following amongst the firms making automobile accessories. Many of the smaller automobile houses would gladly exhibit, especially those turning out voiturettes, for which the German market offers a large field. But some show opponents have no interest in the voiturette class, and would seem to be actuated by a dog-in-the-manger policy—a policy all the more easily carried out, as they themselves have so many orders booked for high-powered cars that a show would be practically useless to them.

The fifth annual dinner of the Bradford Automobile Club took place on the 8th December. There was a large attendance, and the dinner was a big success. Many happy speeches were made in the course of the evening, and the chairman of the Yorkshire Automobile Club, in proposing "The Bradford A.C.," drew attention to the fact that the membership of the latter had increased phenomenally during the past 10 months, viz., from 90 to 225—an increase of 150 per cent.

"Accidents Reconstructed."

["His Honour expressed a desire to visit the spot and have the circumstances of the occurrence illustrated. This was done. A taxicab was procured and was backed in the way described by the witnesses. So realistically was this carried out that the seat, which was fixed in the ground, was again knocked down."—"Daily Telegraph."]

As a rule I should hardly consider
An accident worth "reconstructing."
If a motorbus, not a non-skidder,
I was driving, or even conducting,
And it swerved to avoid a street organ,
Knocking down Marble Arch and Hall Caine,
I should say, quoting William de Morgan,
"It never can happen again."

But suppose that his Honour, ahem-ing,
When my case came along at New Bailey,
Before summing up and condemning,
Suggested, while nudging me gaily,
"I'm sorry to trouble you, really,
But the facts of this case are not plain;
We must see all the incidents clearly;
Might I ask you to do that again?"

Then, suppose, for the Court's satisfaction
Of my accident's bumping and boring,
Once more to Hyde Park's big attraction
I drove with intent of encoring
The mishap, it would be so silly
En passant to smash the wrong fane,
Say the church of St. James, Piccadilly,
Instead of M. Arch and H. Caine.

Then, still on my way to the spot of
The accident mentioned *imprimis*,
I re-skid and spill quite a lot of
Ex-viceroys, ask what the time is,
Yes, pleasantly say, "Have you got the
Right time, I am catching a train."
And they answer by asking me, "What the—
Time is?" should I ask them again?

No, I think all such crude demonstrations,
Though tending to justice's clarity,
Would lead to undue complications,
And plunge us in needless barbarity.
If rehearsals of skids are conducted
And accidents encored, it's plain
Half London would be reconstructed,
And *can* London happen again?

FRED. GILLETT.

Merrie Aviation.

Mr. S. F. Cody made a picturesque guest of honour. Warren Bell sang "White Wings." C. P. Sisley sang a parody on "Hi! hi! Up he rises!" George Edgar sang "The Fly and the Flu." G. L. Stampa drew, a la Phil May, a picture of Father Time, and called it "Flight." A. Carruthers Gould made remarkable flying machines carved out of dessert. St. John Adcock sang "Billicks the Aerobusman," and A. J. Gough recited "Are Horses Still Alive?" Mr. Piffard, the only other aviator present, gave a demonstration—of step-dancing! Edgar Wilson's impromptu pageant of "The Blue Blurred, or the Aviation School where Children Don't Rule," was remarkable. George Beaufoy recited "A Motor Melodrama." All this took place at a modest little Bohemian club called "The Merrie Men," at Burke's Room, Villa Villa.

The annual general meeting of the Midland Automobile Club was held at the Grand Hotel, Birmingham, on the 10th December, when some interesting business was discussed. Hearty votes of thanks were passed to several members of the club for their kindness and hospitality. After the dinner which followed the meeting, a smoking concert was given.

The reservoir of a motor lamp was picked up in Worcester a week or two ago by Mr. J. FitzHugh. By applying to this gentleman, at South View, Comer, Worcester, giving a description of the missing reservoir, the owner may have it returned to him.

Will readers please note that the Christmas holidays will make no difference to the publication of THE MOTOR, which will appear next Tuesday as usual.

NEWS FROM PARIS.

The Voiturette Trials—Results—Some Causes of Breakdowns—Aeronautical Programme—Recent Flights—Minerva-Knight Engine Campaign.

(BY OUR PARIS CORRESPONDENT.)

Voiturette Trials.

As only 300 miles remain to be covered in the French reliability trials, it is safe to assume that those cars having reached the present stage without penalization will be able to continue with a clean score to the end. Out of the 29 starters, 16 now remain with a perfect score.

Alcyon heads the list with a full team of three cars, all having satisfied the conditions. The little four-cylinder vehicles are excellently produced, and have had the further advantage of being in the hands of drivers who understood what was required of them in a reliability trial. Delage and Demeester, who each entered one car only, have covered all the stages without trouble. Gregoire, Corre-La-Licorne and Rolland-Pilain have each lost one out of their full team; Doriot-Flandrin and Barré have each lost two out of three; Turicum and Hurtu have each lost one out of two, and Zenith, with only one starter, has been obliged to withdraw.

The trials required that the vehicles should cover 15 daily stages without any other attention than filling tanks, lubricating and tightening nuts or cleaning spark plugs. The winter months were selected for the trial in order to put the vehicles to a more severe test. As the weather, however, has been dry and frosty throughout, the additional strain has been more severe on the drivers than on the cars. It is true that the roads in the neighbourhood of Paris are anything but good, but, thanks to the weather conditions, they were never really heavy, and a driver who was satisfied with the speed limit imposed ought not to have had any real difficulty.

Some Causes of Breakdown.

The causes of breakdown are varied, but all of them of a superficial nature. There has been but a single case of engine trouble, and none of ignition breakdown. This latter is significant in view of the fact that every car had high-tension magneto, without a single storage battery as a stand-by in the whole group. If nothing else has been demonstrated, the trial has certainly proved that a single ignition by magneto gives every guarantee of security.

Ill-luck naturally played a part in the competition, and more in the Sizaire-Naudin team than in any other. On the first day, Georges Sizaire, who was driving a 12 h.p. double phaeton, was penalized by the breakage of one of the clips on the front transverse spring. Sizaire being one of the very few French race drivers knowing how to treat a car in an endurance test, the breakage cannot be attributed to passing over a "caniveau" at high speed. The piece is subjected to so little strain that the breakage can only be attributed to a flaw in the metal, unnoticed in assembling. Four days later the car was definitely put out of the competition by the breakage of a ball-bearing on the front wheel.

A second Sizaire-Naudin, having a two-seated body, was stopped by a seized exhaust valve stem on the eighth day. The valves on the Sizaire-Naudin being superimposed, the driver proceeded to dismount the inlet in order to work more conveniently on the exhaust. The valve was shot into the air, and on falling to the ground received such damage that it had to be changed.

De Marne's four-cylinder Gregoire was put out of the competition by reckless driving. A rough road, cut by a series of gullies, proved too much for one of the leaves of a rear spring. The two other Gregoires were equally abused in the matter of speed, but managed to come through without mishap. One of the drivers, however, was such an offender that he had to be cautioned by the jury, who considered that he was a danger to the other competitors. The same thing applied to the Rolland-Pilain four-cylinder semi-racing type of cars. Instead of an average of 15½ miles an hour, their drivers maintained an average of about 35. There was a sudden call to pull up, the road was greasy, and in a second the Rolland-Pilain No. 32 was minus a wheel.

A Corre-la-Licorne had the misfortune to fill up at the end of one run with poor quality petrol. Next morning it took the driver three hours to discover why his engine would not start, and when the right brand of petrol had been obtained, it was too late to continue. A four-cylinder Hurtu was penalized for the breakage of a petrol pipe; a four-cylinder Barré was penalized by the fan belt jumping off the pulley; a second car from the same factory collided with another vehicle, damaged its radiator, and came in late. The driver of a single-cylinder Fouillaron was not sufficiently smart. He was so slow filling oil and petrol tanks, tightening up nuts, and looking over his car that, when he ran into the garage, he found he was five minutes too late to be received. One Doriot-Flandrin driver had ill-luck with tyres and abandoned in disgust, and a second lost his position through a leaky radiator. A Turicum had to tighten up nuts on its friction disc, broke brake rods in a collision, and, later, failed to keep to the route.

Lax Conditions.

It would have been better if the organizers had more thoroughly copied their model in introducing the English idea of a reliability trial to the French industry. Several competitors are convinced that mechanics entered the garage and worked on the cars during the night. It would doubtless have been better for the malcontents to have kept silent on this point, unless absolute proof could have been furnished. But it would have been still better for the organizers to have sealed the doors of the garage from the beginning, and not at the middle of the competition. Better still, two policemen might have been paid to remain on duty all night in the outer court.

The rule under which the tightening-up of nuts was allowed was certainly too vague. Although it was obvious that the intention was to allow the tightening-up of nuts holding all accessories, some drivers wished to see in it an opportunity to work on the mechanical organs.

Nevertheless, the trials have been followed with interest and are valuable in drawing the attention of constructors to detail improvements more particularly interesting the owner-chauffeur. In their desire to produce speedy vehicles, French constructors are apt to overlook these points. It is declared that the trials will be repeated next year, on which occasion it will be a "sealed bonnet" affair, of the type dear to Americans.

FRENCH VOITURETTE TRIALS.

Demeester I. arriving at Rambouillet. *Delage arriving at Rambouillet.*

NEWS FROM PARIS.—Contd.

Close of the Trials.

Paris, Sunday.—The French voiturette Reliability Trials came to a close this afternoon with 16 cars without penalization. The successful vehicles are Alcyon (3), Gregoire (2), Rolland-Pilain (2), Corre-La-Licorne (2), Delage, Hurtu, Barré, Doriot-Flandrin, Turicum, Demeester, and Sizaire-Naudin.

After being fine and frosty, the weather during the last two days of the run was exceedingly wet, thus making the going very heavy. Notwithstanding, no penalizations were incurred during the closing days of the Trials. Altogether, the successful cars have been on the road 15 days, and covered a distance of 2,000 miles without any other attention than the filling of petrol and oil tanks.

Aeronautical Programme.

An attempt is being made to draw up a programme of aeronautical events in the same way as has been done for several years for motor races and demonstrations. The first list has been sent in to the International Aeronautical Federation by the Aero Club of France, and comprises all events in which the club is interested. The dates selected will not be made definite until 10th January. Organizers not having selected a date by that time will be obliged to choose one that will not clash with those included in the calendar. The list furnished by the Aero Club of France is as follows:—

6th to 13th February.—Heliopilis, Egypt, meeting; prizes, £8,480.

2nd to 11th April.—Biarritz meeting; £8.000.

3rd to 10th April.—Cannes meeting; prizes, £3,200.

15th to 25th April.—Nice meeting; prizes, £9,600.

7th to 9th May.—Croix d'Hins, Bordeaux, meeting; prizes. £1.600.

14th to 22nd May.—Lyons meeting; prizes, £6.000.

5th to 12th June.—Vichy meeting; prizes, £1,200.

3rd to 10th July.—Elimination race for Gordon-Bennett Cup.

4th to 11th September.—Croix d'Hins, Bordeaux, meeting; prizes, £8,000.

23rd to 30th September.—Havre to Deauville and Trouville, across mouth of Seine; prizes, £8,000.

The above list, although not complete, and only comprising meetings organized by public bodies having no desire to make money out of aeronautics, makes a total of £54,080 in prize money. Notable omissions on the lists are the Paris-to-Brussels race organized by the Automobile Club of France, and the Rheims meeting, the prize money for which will doubtless be £16,000.

Recent Flights.

Mr. Maurice Farman, who a week ago made an excellent cross-country flight from Buc to Chartres, has decided to continue as far as Orleans, and from that point fly back to his headquarters at Buc. The journey from Orleans home would be the longest single trip ever made across country, the distance being approximately 70 miles. Weather conditions have made a start impossible this week, for when a calm arrived it brought with it rain which so soaked the ground that on attempting to rise the machine was damaged and cannot be repaired in less than four or five days.

During the week an interesting flight of 1 hr. 1 min. has been made by M. Chateau, the engineer in charge of the Voisin school at Mourmelon. The flight was made on a standard Voisin machine fitted with an eight-cylinder Wolseley aviation motor. M. de Baeder, the owner of the aeroplane, and Wolseley agent in Paris, followed this up by a flight of 25 min. across country.

Hubert Latham's latest exploit is to fly with a cinematograph operator on his Antoinette. The machine was placed in such a position that the operator was able to take views while in the air. The most pleasing feature of the performance is the weight carried, the operator weighing 10 stones and his instrument about 8 stones.

A Minerva-Knight Engine Campaign.

Interest has been aroused in the Knight sliding valve engine by an active campaign commenced this week by the Paris agent of the Minerva-Knight. A very prominent showroom display is being made, and, in addition, demonstrations are being given on the road and on some of the steepest hills around Paris of the flexibility and hill-climbing ability of the motor. In addition to the Belgian engine, the Daimler-built Knight is making no small stir. Merely to judge from the number of Daimler-Knights seen on the streets of Paris, the British car has already become very popular. The attitude is remarkable when compared with that of three years ago, when a Daimler was shown at the Grand Palais, but failed to excite any interest whatever. I have it on very good authority that there will be several Knight engines among the Panhard models at the next Paris Salon. It is declared that only the large models will be fitted with the Knight engine, the smaller motors being built with poppet valves. Other makers have inquired into the various slide valves now on the market, but, so far as can be learned, no one has decided to adopt them.

The Automobile Club of France has appointed a special committee to organize its town-to-town race next year. The members are Marquis de Dion, Ernest Archdeacon, Edmond Chaix, Commandant Ferrus, G. Gobron, Rene de Knyff, Georges Longuemare, A. Loreau, Comte Recope, G. Rives, Ed. Surcouf, Comte de Vogue, G. Lumet (as technical secretary), and M. Du Bousquet (as general secretary).

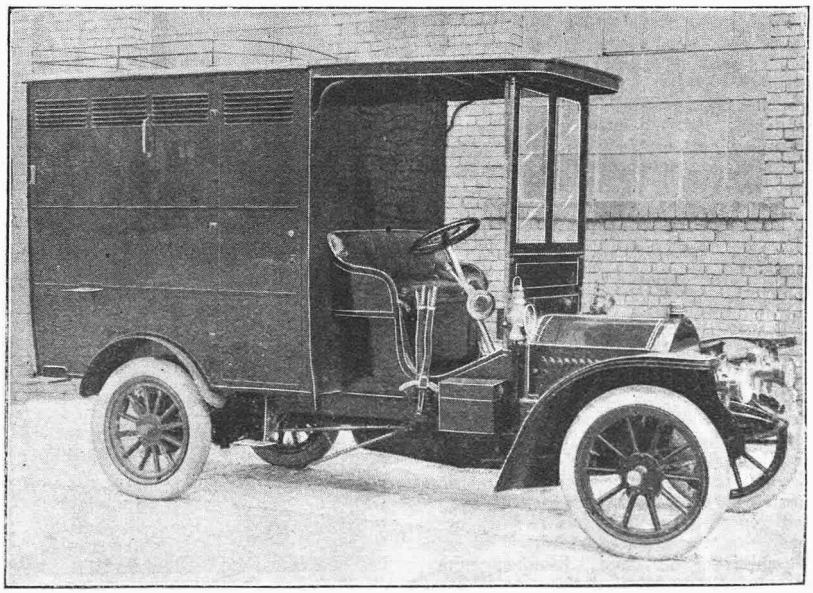
Count Jacques de Lesseps, son of the French engineer, Ferdinand de Lesseps, has made the longest flight ever recorded at Issy-les-Moulineaux, and established a record for the small Bleriot cross-Channel type of aeroplane. Starting at 3.45, he remained in the air for 90 minutes, the end of his flight being accomplished in darkness, only broken by the light of the headlamps on the motorcars drawn up on the ground.

A German "Black Maria."

Mannheim rejoices in a self-propelled "Black Maria"—probably the first of its class ever seen in Germany—and its initial passages through the streets of this city caused no little sensation. But although Mannheim, as a law-abiding community, rejoices in the application of the internal-combustion engine to the furtherance of retributive justice, so much cannot be written of the law-breakers, who were quite content with horse traction, and, at the bottom, bitterly resent being hustled off to jail at nearly double the speed attainable under the equine dispensation. The chassis acquired in the interest of Justice is a Benz, with a four-cylinder engine developing 18 h.p., and turns the scale at 850 kilo.

All four road wheels are shod with pneumatics—features which, ensuring, as they do, a remarkably comfortable and joltless transit, may help to mitigate any resentment felt by the "cargo" at the extra speed. The body, it will be noticed, possesses a lateral entrance, and four sets of louvre windows high up on each side. German prison vans being painted green, what we call the "Black Maria" is familiarly termed the "Gruener Wagen" (green van) in Germany.

Major von Parseval, of German dirigible fame, has accepted a "chair" of aeronautics at the Charlottenburg Technical College.



A motor prison van for Mannheim.

NEWS AND NOTES.

The Motor Union and General Election.

The Motor Union has had under consideration the policy to be adopted by motorists at the forthcoming General Election. After carefully weighing all the circumstances, the Motor Union is of opinion that the issues before the electors are of such importance that it is not desirable, in the interests of the movement, to attempt to force the motor question into prominence by requiring pledges on motoring questions as a condition of support.

The motorcar will undoubtedly play an important part in the election, and, without asking for pledges, motorists can well point out to those candidates whom they assist the convenience and national value of this means of transport. If this be systematically done, the Motor Union is of opinion that gratitude for services rendered will be more likely to engender a sympathetic feeling towards motorists on the part of Parliamentary candidates than would any attempt of organized motorists to secure promises which, in the present condition of affairs, would probably cause irritation and resentment instead of gaining support.

After the election, the Union will address a letter to the successful candidates, drawing their attention to the legislative requirements of the motoring and aviation movements.

Motorcar Dispute.

Messrs. S. F. Edge, Ltd., were the defendants in an action which was brought in the King's Bench last week by the well-known art dealer, Mr. Asher Wertheimer, in which the latter sought to recover from Messrs. Edge the sum of £120, alleged to be the price of putting a motorcar purchased from them into proper repair. The defendants denied that they were liable, inasmuch as the three years' guarantee to make good any defects due to faulty material or workmanship, which was given to plaintiff on his purchasing from them a six-cylinder Napier car in 1906, did not extend to defects caused by wear and tear, nor to any chassis which had been repaired by other people without their consent in writing, and that the damage to plaintiff's car in 1908 was not, as stated by him, due to faulty material or workmanship. After a mass of evidence of a technical nature had been called on both sides, the jury eventually returned a verdict in favour of the defendants.

The "Ellan Vannin" Disaster Relief Fund.

Many who visited the Isle of Man in connection with the motor races will be familiar with the lost steamship "Ellan Vannin," which sank at the mouth of the Mersey with all hands on the morning of 3rd December. This boat carried to the island many of the cars that participated in the races, and as there is a considerable amount of distress among the dependents of the lost crew, Lord Raglan, the Governor of the island, has opened a relief fund, to which a prompt and generous response has already been made. The number of widows is 19, and of children 69, and, besides, many parents of members of the crew need assistance. Any contributions from motorists will be very thankfully received, as a large sum will be needed, and they should be addressed to the Relief Committee at the Government Offices, Douglas, Isle of Man.

Proposed Motorcycle Show.

The council of the Society of Motor Manufacturers and Traders had before them the question of the cycle and motorcycle exhibition. The views of the sub-committee on the question of the exhibition at Olympia suggested by the C.M.T.A. in November next, which had been expressed to the C.M.T.A. committee, were approved, and it was resolved to place the matter before an extraordinary general meeting of the members of the society, to be held on 30th December, in order to obtain their sanction to carry out the proposal.

Star v. Vauxhall.

The difficulties that have cropped up in connection with the projected race on 12th November, at Brooklands, between the 15 h.p. Star car, which ran in the October races at Brooklands and in the Wolverhampton Automobile Club's hill-climb at Harley Bank, and the 20 h.p. Vauxhall car, which won the O'Gorman Trophy, at Brooklands, in August, have now been cleared up, and the postponed race will be held at Brooklands track today (Tuesday), the contest taking place about midday. We have been favoured with a copy of the correspondence between the two companies, which has a most friendly and sportsmanlike tone throughout, and we hope that the contest will be productive of a fine series of races.

The Christmas Holidays will make no difference with regard to the publication of "THE MOTOR," which will appear next Tuesday as usual.

The Daimler Gesellschaft purpose putting on the market 45 h.p. cars, with cardan transmission, in addition, of course, to the other cardan types already on sale.

International Trials and Competitions.

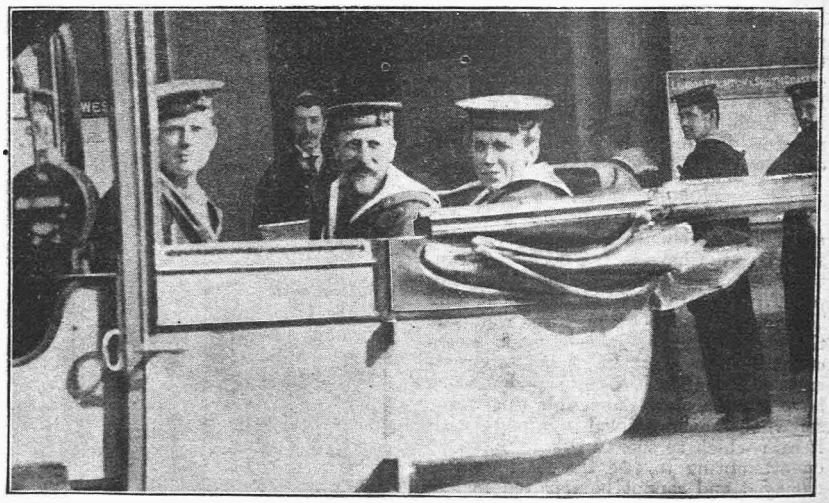
The suggestion has been adopted by the R.A.C. that, if it is possible to carry out the arrangements, the Club should be represented on those committees of the Automobile Club of France and other countries dealing with trials and competitions, these countries to be represented in the same way on similar committees of the club. It is desirable that this principle should apply to all international motoring events, in order that each country represented in such events should have the right to nominate a representative, who would act as one of the recognized officials. Such a system as this would strengthen the international character of such meetings, and would cause them to be viewed with greatest interest by all.

R.A.C. Legal Department.

Application was made to the Middlesex Quarter Sessions to state a case for the opinion of a higher court in connection with the recent conviction of Mr. Pelissier, who, whilst sitting at the back of his car, was found guilty as an aider and abettor, and convicted as a principal of driving at a speed dangerous to the public. The justices have, however, refused to state a case, and the R.A.C. is unable, therefore, to take the matter further. It is hoped that if any motorist is summoned in similar circumstances in the future he will at once place the facts of the case before the Legal Department, so that they may take the necessary steps for having the matter decided by the highest tribunal.

Cape Cart Hoods.

Messrs. Morgan and Co., London, write as follows:—"We notice in your issue of the 14th inst. an article on 'Cape Cart Hoods,' page 771, from which it would appear that the writer is not aware of the Brock's patent extension, etc., a self-acting hood (that can be easily opened and closed by the occupant from the inside of car) we put on the market some time since, and of which we have sold a very great number, with which every user is well satisfied."



When Jack has got his pay and his leave he indulges in the luxury of a taxi-cab. Photo shows sailors arriving at Portsmouth station en route for home.

THE WAY OF THE AIR.

To fly successfully at the first attempt on a new machine of one's own design is, I should think, a record in aviation. Yet this was Mr. John Moisant's, a Chicago inventor's, experiences last week at Issy-les-Molineaux.

He had been, it is true, making various adjustments from breakfast time to four o'clock in the afternoon, so he had a right to expect some sort of result. Actually, when the machine rose after a run of barely 15 yds., he was so astounded that he cut out the ignition after flying about 200 yds., and so made an awkward landing, breaking the flexible tail-plane, which is one of the chief novelties of his monoplane, the construction of which is almost entirely of aluminium.

The other day Mr. A. V. Neale is said to have flown the whole length of Brooklands. Yet he came and sat in the chair next the door of the Motor Club smoking-room just as usual without saying a word to a soul about it. The precedent thus established is distinctly novel.

Mr. Colin Defries achieved the first flight in Australia last Thursday on a modified Wright biplane, and will make a tour of the principal towns in the Commonwealth, giving flight exhibitions, both on this Wright machine and his Bleriot, for which make he has obtained the sole agency for Australasia. This flight is said to have taken place on a racecourse near Melbourne. Which one is not stated. Flemington, Marybyrnong, Moonee Valley, Caulfield, Oakleigh, Elsternwick, Epsom, Williamstown and Aspendale racecourses all lying within 10 miles of Melbourne General Post Office—and incidentally all affording excellent facilities for flight. Mr. Colin Defries certainly had a choice of ground such as falls to the lot of few aviators. One hears, too, that he is greatly to be congratulated on his choice of a partner—for life.

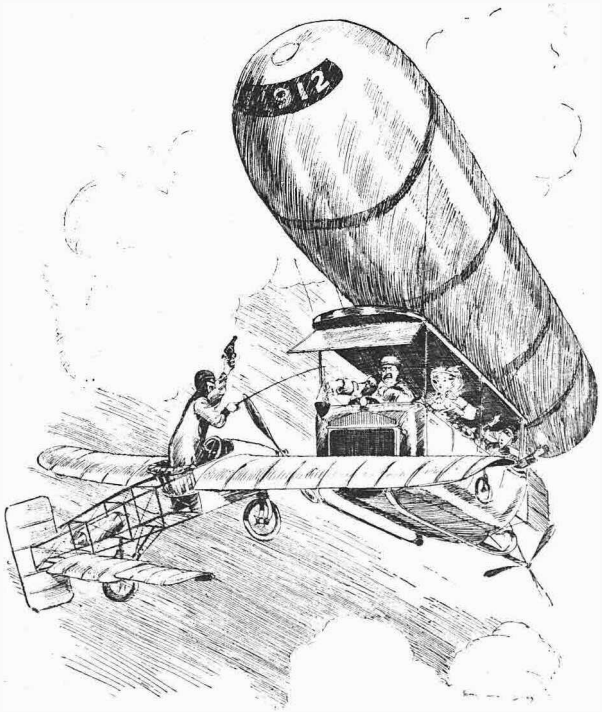
Not content with building an aeroplane for two—in which he has already made several flights with passengers—and going to the Marquis de Polignac's shoot at Berru on another Antoinette, Mr. Hubert Latham has had a third fitted with a small machine gun. But a 40-knot gun-platform hardly sounds like making good practice, even against a Zeppelin. And shrewd military critics say that the inability of an aeroplane to fly slowly, or at any speed but one, seriously lessens its value for scouting or any other military purpose. The most urgent problem before inventors, therefore, is to devise some means of making an aeroplane vary its speed, or, rather, to invent one that will hover and poise as well as fly at varying speeds. The Friswell prize for a poising aeroplane should help to pay expenses. And doubtless there are others. Still, in the midst of all the talk about the Teutonic mastership of the air on the dirigible, current aeroplane development seems sufficient to justify the French military authorities in their alleged abandonment of the dirigible.

At Pau aerodrome, too, Mr. Grahame White's recent performances have been of the most convincingly brilliant order. His best took place some 10 days ago on his Bleriot, when he made a non-stop circuit of five turns round the Pau aerodrome at an altitude of over 200 ft. He was, however, compelled to stop to replace a faulty sparking plug, after which he performed several striking evolutions. Unfortunately, however, after setting off to the far end of the ground later on in the day, he turned somewhat too short, and came down hard, smashing his propeller undercarriage and left wing, but by good luck and careful control escaped without the least injury. His earlier flight was nevertheless pronounced to be the best ever made by an aviator who is hardly more than a pupil. Mr. Grahame White has already sold four Bleriots to different officers in our own Army, and even on present performances might well apply for the post of official instructor to the Service. That has been due, it is said, on slighter credentials before to-day. Still, it may well be a contingency of the future.

What with Mr. J. T. C. Moore-Brabazon, Mr. Charles Rolls, Mr. Grahame White, Mr. Colin Defries, Messrs. A. V. Neale and Roe, Mr. G. H. Cockburn, and one or two others who have actually achieved sustained flight, British aviation hardly seems so backward as pessimists make out. There we have seven, at least, against the Farman brothers, Mr. Hubert Latham, MM. Bleriot, Delagrange, Le Blon, Molon, Paulhan, Sommer, and ——? Nine only of any note that one remembers, and three of them of British blood at least, although domiciled in France.

Among British aviators who are practising on—or over—their native soil, Mr. G. H. Cockburn's performances appear the most noteworthy; indeed, such as to put his qualifications as an aviator beyond question. For, apart from the regular daily flights over Salisbury Plain, which he has continued as long as the cold would allow him, from his shed, which is situated two miles beyond Amesbury, he is said to have flown round that town and back to the shed on several occasions, besides taking up several passengers on different days. His shed-partner, Mr. Barber, is also having a monoplane built of novel design, which he expects to have down at Amesbury before long.

Mr. A. V. Roe is again moved on, with M. Oeuille, from Wembley, the directors' objection being that the wheels cut too many divots out of the turf, which seems rather inconsistent, considering their alleged willingness, some time ago, to cut down irreplacable trees for the sake of aviation. However, Mr. Roe recently made several excellent flights displaying perfect command of his triplane—as far as the ground would permit; that is to say, about half-a-mile.



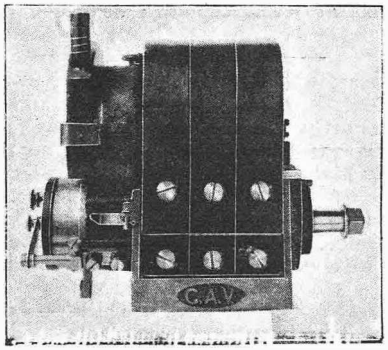
Flights into the future: The up-to-date airwayman.

NEW DUAL IGNITION SYSTEM.

MESSRS. C. A. VANDEVELL and Co., of Acton Vale, London, W., have introduced their improved dual ignition system for 1910, of which we are able to give the leading features along with a number of photographs.

The magneto is a standard high-tension machine, with extra powerful magnets, these being six in number. The armature is doubly-wound and runs on large ball bearings, as also does the distributor.

The condenser is now mounted on the armature, also a new form of contact breaker is fitted, which, in combination with the new distributor and method of securing same, renders all the contacts very accessible for cleaning and adjusting purposes without the use of either spanner or screwdriver.



(1) Side view of complete machine, showing distributor and contact breaker, with spring clips.

A disadvantage which has hitherto been inherent to certain self-starting dual machines—in that when the "starting button" is pressed the spark jumps from the high-tension distributor brush to the nearest segment, unless the engine happens to have stopped on contact—has been overcome in a simple and effective way in the C.A.V. by arranging the high-tension distributor to rock in unison with the contact-breaker sleeve, thus ensuring that even with a very wide range of advance and retard the brush is always making contact when the spark occurs. This also enables the wide range of advance and retard necessary for the coil ignition to be given to obtain equal speed and power on either coil or magneto. Hitherto, in order to obtain the extra retard on the coil ignition for very slow running, it has been necessary to effect a compromise and sacrifice the efficiency of the coil at high speeds.

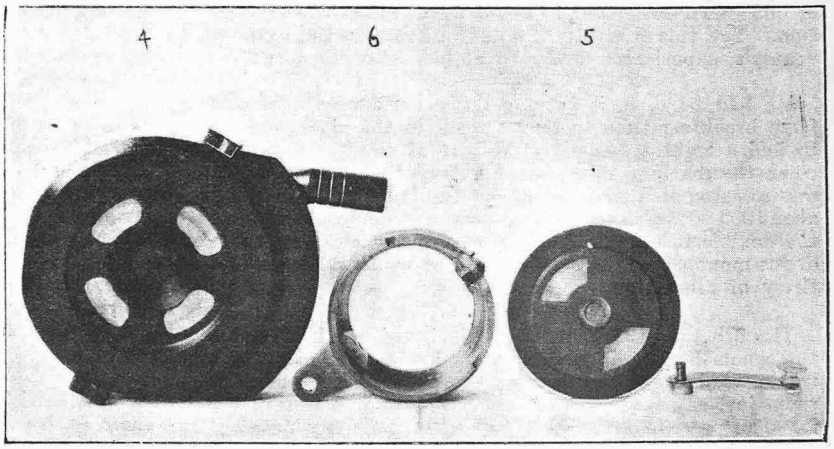
The standard coil and high-tension switch are contained in a neat cylindrical brass case, although the one illustrated is a special form as used on a leading make of car. It is worth noting that the coil is so designed that it can be used for continuous running without overheating the windings. The magneto being also an entirely independent and self-contained high-tension machine, the C.A.V. system gives a true double ignition, and not a starting arrangement only.

The contact maker for the coil consists of two metal segments embedded in the cover of the magneto contact breaker, contact being made by a small carbon brush, which is carried round by the revolving contact breaker. Permanent wire connections are soldered to the brushes to ensure perfect contact.

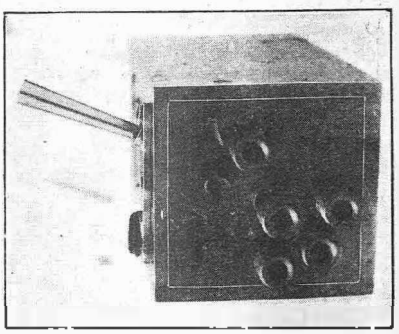
These contacts are very accessible for cleaning, and the timing of the coil ignition can be varied independently of the magneto by simply moving the insulated cover backwards or forwards, slots being provided for the purpose.

The wires are led to insulated plugs, which fit into sockets in the coil base, and as all these plugs are different sizes, no mistake can be made when replacing the wires if taken out; each plug can only be fitted in the corresponding socket.

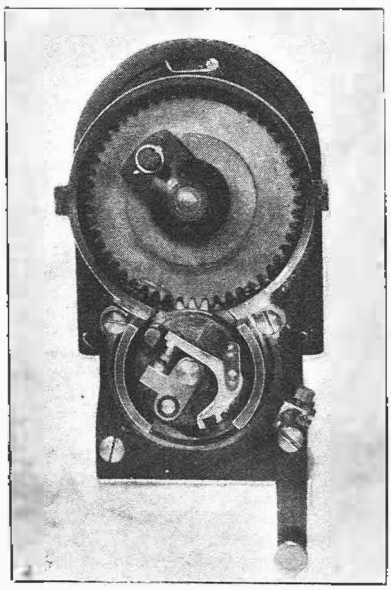
Only one movement of the switch is required to switch on to "accumulator," "off," or "magneto" positions, no push button being necessary for self-starting. The magneto gives a very efficient spark at low speeds, owing to the extra strong magnetic field provided, and the engine can nearly always be started with a half-turn on magneto only. Every part of the machine is made dust-proof, and the distributor cover is held secure by a spring clip.



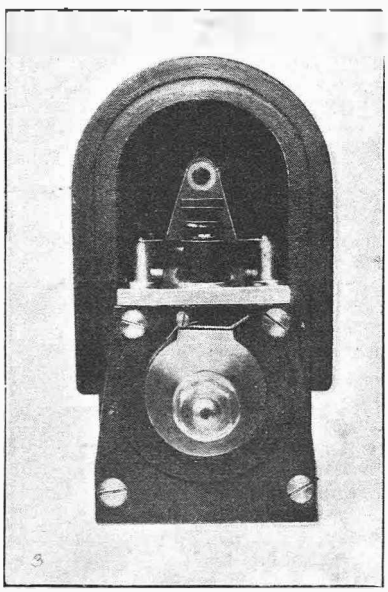
(4) Cover of distributor, showing contact pieces. (5) Cover of contact breaker, showing contact pieces for coil circuit: the carbon brush on contact maker, in Fig. 2, presses on these contact pieces. (6) Outer ring of contact maker, with arm for advancing.



(7) End view of coil, showing connecting plugs and sockets.



(2) Distributor and contact breaker end of machine, the covers removed and showing details.



(3) Driving end of machine, showing safety spark gap and high tension carbon holder.

MY WAY OF THINKING

By HENRY STURMEY

Early Pneumatic Tyres.

MY random jottings of early recollections in regard to pneumatic tyres have brought me two very interesting letters this week. One is from Mr. C. A. Smith, of the White Lion Hotel, Cobham, who tells me that he has one of the Pennington motors still standing in his garage and that the Beeston tyres appear, even now, to be in good condition. He tells me that this machine was running about Cobham district in 1897, and was always breaking down, which, indeed, was the chronic behaviour of Penningtons at that time.

The other letter is still more interesting, and it is from Mr. C. McRobie Turrell and fills in one or two omissions which occurred in my recent notes. As the letter is very interesting, I make no apology for printing it in full. It runs as follows:—

"I read your article on the early days of the pneumatic tyre with a considerable amount of interest, and while generally you are surprisingly accurate, yet you fall into one serious error. Old No. 5, driven by me in the Paris-Marseilles race in September, 1896, was shod with Michelin pneumatic tyres. I have a distinct recollection of driving you in this identical car subsequently, and it is very interesting to remember that this set of tyres was perfectly satisfactory. In the early part of 1897, you will remember that the Coventry Motor Co., Ltd., under my direction, turned out a considerable number of voiturettes on the Bollee pattern, all fitted with pneumatic tyres of English manufacture—all built by hand, as you suggest, and all prone to burst, for the reason given. At the same time, you will remember that the French Bollee machines, fitted with Michelin tyres, gave no trouble in this connection." [I made no reference to the Bollee machines, as they were really tricycles.—H.S.] "In the same year, 1897, the British Motor Co. purchased a Hurtu car, weighing 15 cwt. or 16 cwt. and shod with Michelin tyres. It is definitely within my recollection that these tyres gave no trouble. During the whole time I was in Coventry, in 1897-1898, I endeavoured to persuade the English tyre companies to study the pneumatic tyre problem, pointing out that they were obviously then on the wrong lines, inasmuch as their productions were never satisfactory. I still vividly remember the characteristically English attitude of the people concerned, and you will recollect well enough that the time came when it was impossible for the leading English tyre companies to ignore any longer the fact that England had lagged hopelessly behind in this particular matter, entirely by reason of want of enterprise. That this was the only cause, is proved by the fact that at the present moment the English productions are equal to any in the world. The devotion of the tyre specialists of last century to the 'wired-on' principle, in face of the success achieved by Michelin with the 'beaded' type, was always a source of wonderment to me, although, looking back, it is amusing to realize the extraordinary fondness we all showed for our own particular notions."

A Suggestion to the A.A.

In regard to the recent trouble which the Automobile Association has had in regard to its scouts, the Association appears to have pretty well got over the difficulty, and it seems that it will be all right so long as these scouts do not warn the motorist when actually in the trap and exceeding the speed limit. There is nothing, I take it, to prevent the A.A. man going down the road for half a mile and giving the approaching motorist the tip from there. I have, however, often wondered why the Automobile Association has never undertaken to check the police times over one of these traps. Of course, I know it might be difficult to locate the exact points at which the traps begin and end, but these distances are measured by the police—I have seen them measuring them out myself—so that it seems to me it might be quite possible for a couple of scouts, competent to hold watches, to station themselves at either end of the trap and simply time the cars. Very possibly in a great number of instances, as these men would time openly, the sight of the watch would act as a deterrent to the speeding motorist, but whether it did this or no, the A.A. would have the exact times made by the different cars which passed along that road at least as accurately as the police could give them, so that they would be in a position to give confuting evidence should the motorist not have been exceeding the limit, and they would at any rate be gaining some useful information as to the accuracy, or otherwise, of police timing. I throw this out as a suggestion which might possibly produce good fruit.

"Things About."

"Things About" is the heading of a new series of disconnected jottings which has lately commenced to appear in THE MOTOR, and I confess that the idea appeals to me considerably. The descriptions and illustrations generally which are published really touch at the very essence of touring. The attractions of motor touring are not to be found in the mere passage from place to place, in the mere covering of any given number of miles, or in the mere rapidity of travel. But it is in the seeing of new sights, the observation of new country and the visual and mental recreation of seeing, observing and commenting upon the very sort of things which are brought so prominently to our notice in "Things About," and such quaint things, oddities and interesting items are very often unobserved by the tourist, from sheer ignorance of their existence. The more attention which can be called to such exceptional objects of the country-side, or of provincial towns and villages, the more attractive can our touring be made. Indeed, in many cases, they may provide the particular objective of a drive, and I have no doubt they will be appreciated to the full by those whose interest in touring is real.

A Belfast Improvement.

Belfast has set an example which could well be followed by other and less enlightened towns. It has decided to move the electric cable standards of its tramway system from the centre to the sides of the road. As a matter of fact, central standards should never have been tolerated, but they provide the cheapest means of carrying the wires, and the contractors, not unnaturally, desired to construct their roads at the lowest outlay possible, and short-sighted local authorities permitted them to do so. The reason for the alteration which Belfast has now decided to make is the very tangible one of obstruction of the highway. And what a waste of road space and hindrance of traffic these central standards are wherever they exist! Although they are not continuous, but only occur at intervals—short intervals, it is true—they cut the road in two. Motorists and others using the road are not permitted to pass on the wrong side of the standards, even where it is not dangerous for them so to do, with the result that, even with the rapid acceleration which is possible with the modern motorcar, the distance is too short for a crawling horsed outfit in front to be overtaken and passed

MY WAY OF THINKING.—Contd.

sufficiently to the rear to make it safe to take its ground before the next standard is arrived at, with the result that the fast vehicles, which could go by and be out of the way in short time were there no obstacles in the way, are constantly hindered and held up by the slower traffic and the driving rendered both difficult and dangerous. The sooner central standards are swept away from the whole of the roads of Great Britain, the better it will be for everyone.

To Keep Order.

A very practical pronouncement was made last week in a contemporary, when it said that, "to keep order"—in other words, to restrain motorists from indulging in excessive speed—"the police must show themselves." No truer word was ever written, for no more effective check exists than the presence, in full view, of a policeman. The hiding of uniformed men behind hedges and generally out of sight has no restrictive effect upon speed whatever, but the sight of a man in blue will bring the throttle lever back quicker than anything I know. If the two or three policemen who are usually employed in working a trap were to scatter themselves down the road which it was desired to protect from furious driving and perambulate in full view, with, perhaps, a note book in hand, they would not perhaps secure those convictions which, I understand, go towards advancement in "the force," and which enrich the coffers of the district authorities, but they would certainly find that the speed of cars generally would be vastly reduced, and with policemen, apparently, round every corner, the driving on that road would be circumspect and unobjectionable.

The Splaying of Wheels.

Of late there has seemed to be a great tendency in the building of cars to the splaying of wheels, and, seeing one or two makers so building their vehicles, the unthinking motorist may very easily be led to think it is the right thing, but I certainly cannot agree with him. I have seen rear-wheel axles canted so as to give the back wheels an outward splay, the idea being, apparently, that when the weight is on, it will tend to straighten up the wheels, but if it does this it is palpable that the axle is not strong enough for the work of carrying the car. Cart wheels are splayed, not for this purpose, but because they are dished, and the canting of the axle brings the under spokes, which have to carry the load, into a vertical position. Then, as regards front wheels, the splaying here is more frequent, and it is done to assist the steering by bringing the lines of the steering centres more nearly coincident with the point of contact of the wheel. This, in itself, is a highly desirable feature, but the canting of the wheel is not the right way to carry it out. It can be much more easily and much more accurately secured by sloping the steering centres, as is done on the Metallurgique, and as used to be done in England, and is still done in America upon the Duryea cars. At the recent Show I noticed several cars in which something of a compromise had been effected, that is to say, the wheel was canted a little and the steering centres were sloped a little, the two lines thus converging at the point desired.

Caution in Jacking.

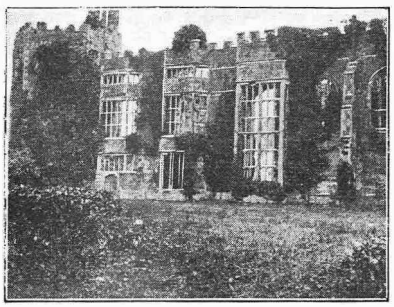
A mishap to a motorist was recorded last week, which serves to draw attention to a point in which many often are careless. I refer to the inefficient and improper use of the jack. In the particular case in question, the car was fitted with detachable wheels, and was jacked up for the purpose of a change. It was apparently not very securely supported, for in getting the spare wheel off its fixings, the chauffeur disturbed the stability of the jack, with the result that the unfortunate car dropped over on to its axle end, which was promptly bent, with the result that the spare wheel would not go on. This, no doubt, was due to carelessness, either in not placing the jack true, in carrying out the work on a sloped road, or in neglecting to put on the brake before taking off the wheel. This last is a very important point. Of course, if a wheel is merely having its tyre changed, a drop off the jack is not a serious matter, but it is a very different thing where detachable wheels are used, and care should be taken first to bring the car on to level ground; secondly, to apply the brakes and lock the wheels; and thirdly, to see that the jack itself is squarely bedded on the ground and also placed true beneath the axle or spring by which it is supporting the car. And whilst on this question, let me utter another word of warning in regard to the unfair treatment which jacks often experience at the hands of drivers who are too lazy to operate them properly. The chauffeur must work the jack properly to raise the car, but many have found that it is possible to simply push the car off the jack, instead of letting it down by the screw or lower it in the proper way. Such treatment is absolute abuse, and jacks are not constructed to stand up to it. It is true they will do so frequently without giving way, but the time comes when conditions vary slightly and the stresses imposed on the jack in so doing are increased to the breaking point, with the result that the jack is ruined. I have seen very many such cases, and the result to the owner is generally 15s. or a sovereign for a new jack, which might have been saved by a little ordinary discretion. It may be taken as an axiom that under no conditions should a car be pushed off the jack.

Glass Screens.

Readers of THE MOTOR, I think, pretty well know my views in regard to the use of glass screens. Whilst recognizing their value, my objection to them has been mainly on two grounds: one, the excessive back draught caused by their use, with the result that, instead of getting a fresh and healthy breeze on one's face, one experiences a cold blast down the back of one's neck, and the other on account of the danger arising in the case of an accident in which the glass screen gets smashed. Remove these objections and my objection to the screen vanishes at once, and my object in raising the objections as I have done has been to draw attention to the grave defects of the system, with a view to securing the elimination of such defects and so enabling a useful invention to be employed without the attendant and serious drawbacks referred to. Improvements in the direction indicated are steadily and surely being made, and on the score of back draughts it has, I think, to-day been proved that, whilst they exist and are very present and very objectionable where a flat high screen is used, they are eliminated, or reduced to a minimum, when the screen is sloped or curved to a suitable angle, and I believe it is a fact that such screens as the County, with its sloped and curved glass, and the Auster, with its adjustable rake top, are practically free from this annoying defect. It is further possible, too, that we may, ere long, be in possession of screens of unbreakable glass, for a few days ago I read an account of a new invention in the glass line which has been made on the Continent, resulting in the production of a perfectly transparent glass of such an intense hardness and toughness as to be even bullet proof! If this invention turns out to be all that is claimed for it, then, in combination with a sloped construction, the glass screen would be no longer objectionable, save, perhaps, for another peculiarity attendant upon its use, which, I regret to see, was the cause of a fatality recently. I refer to the fogging over, or dimming of the glass by contact with moisture, thus interfering with the clearness of view of the driver. In the case referred to, indistinctness of vision thus caused resulted in the car being driven over a large stone, which deflected its course into a ditch, with fatal results to one of the occupants. But some screens are made to-day which are adjustable as to height, and, of course, the adjustable slope of the Auster screen works to the same end, so that in weather when the screen is inclined to fog, it can be adjusted so that the eyes of the driver just clear it. In this connection, too, it may be noted that a remedy is supposed to be at hand in a cake of dry Castile soap, which, if rubbed over the surface of the glass and then polished off with a dry silk handkerchief, is stated to have the effect of preventing the deposition of moisture on the surface for some considerable time.

THINGS ABOUT.

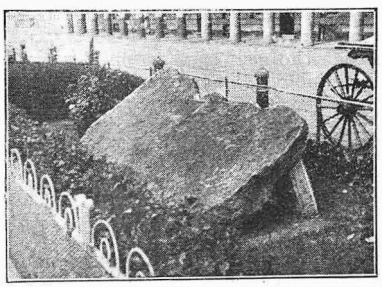
A more delightful bit of road than that between Petworth and Midhurst, in Sussex, cannot be imagined. It passes through Cowdray Park, wherein stands the ruins of Cowdray Castle. This magnificent building, now represented by a few crumbling walls, was burned down in the 18th century, the fire raging for two days. No sooner had the conflagration subsided than the place was ran-



Cowdray Castle.

sacked by crowds of looting rustics, who bore away everything of value that had survived the flames. Amongst the treasures which perished in the flames were the Coronation robe of William I. and the sword he carried at the Battle of Hastings.

By the roadside between Bexhill and Hastings is a huge slab of stone, tilted on its side and bearing a brass plate, the inscription on which informs the passer-by that William the Conqueror dined thereon when he landed at Bulverhythe



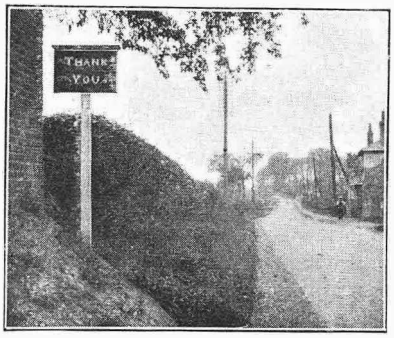
The Conqueror's table.

in 1066. There is also a very old tradition that the body of Harold was buried near the spot on the seashore where this stone lay for many centuries, and antiquaries assert that there may be truth in the story, as the stone has all the appearance of having been rudely shaped to form the covering of a tomb.

Truly there is nothing like politeness. Illustrated is a board which a resident near St. Albans, whose house abuts on the main Coventry and Holyhead road, has placed at the boundary of his garden, in order to minimize the annoyance of noise and dust from rapidly-driven cars and motorcycles. About 200 yards further on, where the property ends, is the board shown in the other photograph, which expresses thanks to drivers for their consideration. The two notices are placed back to back, so that, no matter from what direction they are approached, they are read in their proper sequence. It

Courteous boards.

may be said that the polite request is almost invariably observed and the thanks deserved.



A singular piece of statuary stands in a field by the road near Kettering, and depicts Cain in the act of slaying Abel. It is hundreds of years old, and is said to be on the precise spot where the tragedy was perpetrated.

The photograph shows a remarkable old drinking vessel which is preserved at an inn on the Dover Road, near Dartford. It was the custom in this part of the country some years ago to sell beer by the yard, although the art of drinking

Cain and Abel.

it was very difficult, as when the stem was emptied, the contents of the bulb came with a sudden rush and dashed all over the drinker's face.

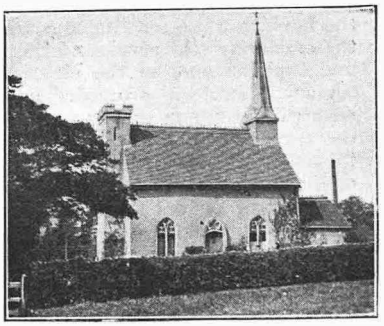
Newport Arch, Lincoln. This was built about A.D. 42, and no mortar or keystone was employed in its construction, yet it has stood the ravages of time for more than 1,800 years.

Drinks by the yard.

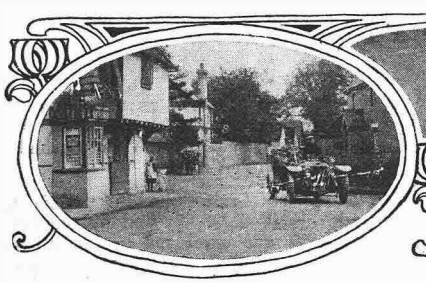
Trick buildings are not so common in England as across the Atlantic Ocean. There is a "freak" villa near Bexley, in Kent, which looks like a church, but is not. It is a private residence, and is deemed one of the most curious bits of domestic architecture in the Home Counties.

Newport Arch. The only remaining Roman gateway in England.

[No section of The Motor has produced more interesting photographs than this. We shall be glad to consider photos of really interesting features of the roadside, whether submitted by amateur or professional photographers.]



Not a church.



At Random
By Automan

Of the Cow that Walketh in the Darkness.

A RECENT case in the Law Courts has served to bring prominently before the public some of the relative advantages and disadvantages pertaining to the use, abuse, and non-use of headlights, more or less powerful. Personally, I hold there can be no two opinions on the matter, and that the man who drives after dark without at least one head lamp sufficiently powerful to illuminate the road for at least 100 yds. ahead is a mug of the first water. Unpleasant things to meet, certainly, but an absolute necessity.

The momentarily blinding effect which is experienced just previous to coming abreast of a car with a powerful white headlight is occasioned in exactly similar manner in the case of the ordinary acetylene lamp carried on most push bikes, and is one of those evils that just have to be put up with, in the interests of both public and private safety.

In my own case no stronger argument in favour of the imperative need for powerful lamps when driving at night can be urged than the fact that, in all my years of driving, I have only twice (touch wood!) met with accidents, and that both of these were solely and directly attributable to attempting to "get home" on the side lamps alone. The second and most recent unfortunate incident occurred about a month ago.

As frequently happens at the time of year when the days "draw in," I dallied over a shopping expedition to a neighbouring cathedral city until after lighting-up time, but with an early and nearly full moon anticipated no difficulty in safely accomplishing the well-known stretch of road to be traversed on the homeward journey. The shadows were a bit patchy, and so was the herd of cattle that I cannoned into, and fetched up against a bank with all brakes on and a vivid tableau of the Bovril advertisement order framed in the windscreen. Of course, the drovers in charge were several hundred yards behind their beasts, and I think that both my companion and myself did justice to our powers of expression in the exchange of compliments which followed.

Vague mental speculations on the current price of prime beef in bulk had succeeded the impact, for we were both quite undamaged, and there was nothing to interfere with calm contemplation of the mischief wrought. It was somewhat of a relief, therefore, to find that not one of the bovines was even limping, which speaks volumes for the solidarity and shock-resisting capacity of the breed, and explains some of the virtues of cow-hide. The contingent, therefore, proceeded on its way rejoicing—this time with one man some way in front, and at the side of the road. We had small cause for rejoicing on our part, for an inspection of the car revealed a burst tube on one of the front wheels—caused by the violent slewing of the fore part of the car wrenching the bead out of the rim—and a badly bent steering arm, rendering further progress under power impossible.

Fortunately, the village blacksmith was near at hand, and while my friend went to fetch that worthy and his horse, I busied myself rigging up the Stepney and dismantling the damaged gear. Soon after we were ensconced in the train, which subsequently deposited two sadder but wiser motorists within reach of home and very considerably late for dinner, and the following morning the excellent smith quickly remedied the damage.

In Praise of Electric Headlamps.

All this bother arose from leaving the headlamps at home, and the consequences might easily have been very much more serious and expensive than was actually the case. But it is quite likely that, even had the acetylene lamps been on the car, I might have been tempted by the bright moonlight to dispense with their aid, as they are bothersome contraptions, and their preparation for action is invariably accompanied by a series of disappointments and much loss of time. So this incident of the cow taking me by the dumb-irons determined me to take the bull by the horns, and I put the acetylene outfit on one side and have "installed" the correct word to use in connection with anything electrical—a set of electric lamps on the car. The headlamps have 12-volt bulbs in them, and I unhesitatingly say they are simply immense. Of course, I take care to keep the accumulators frequently "refreshed," and the convenience of obtaining a sufficiently brilliant illumination to satisfy the requirements of any reasonable man in the matter of projection and speed, merely by snicking a switch, has only to be tried by those who have not experienced it to be appreciated.

I don't say the beam is as long as that projected by the most powerful of the acetylene lamps, but it is quite as good as that of any acetylene lamp which is not an unnecessary nuisance and a terror to all who meet it.

I know that many are prejudiced against electric lamps for cars, and argue that the risk of short circuits, wires fusing, and so forth are liable to leave one "in the soup" on occasion. I have had some considerable experience of their use, and have never yet been "hung up," which is more than I can say for either paraffin or acetylene.

A Lamp Experience.

Only a little while ago I was fetching home a second-hand car for a friend who had bought it, and was overtaken by darkness somewhere in the wilds of Buckinghamshire. The car had paraffin side and tail lamps, and a single acetylene headlight supplied by a generator on the footboards. There was a rather high wind blowing, and I only had one box of matches, and in such circumstances it is a sleight of hand feat to introduce the match to the wick and get the latter to burn up and then shut the door before it blows out. I commenced operations on the side lamp, tried first one and then another. Several times I got the wick alight, only to be disappointed as the snapping-to of the door promptly put it out again. Meanwhile the road was becoming plentifully strewn with dead matches. I had spent some twenty minutes at the game, and not a soul hove in sight to provide hope of a further supply. I came to the last match, and, after mature consideration, decided to stake everything on the tail lamp. This, on inspection, proved to be a "Dependence," which cheered me up and put a more hopeful complexion on the chances of success. Moreover, it was detachable, which the side lamps were not (at least with the implements I had at command), and, to make a long story short, the last match triumphed, and, carefully nursing the tail lamp, I eventually succeeded in lighting the others with the aid of sundry rescued matches from the pile of "dead."

AT RANDOM.—Contd.

I quite admit I may be a perfect fool in these matters, but do not write to the Editors and explain an infallible method of making sure of a light under such circumstances by introducing a pocket-handkerchief to the petrol tank, etc., etc. These heroic measures do not appeal to me; if a lamp cannot be lighted in the ordinary way known to the ordinary man, it in no wise comes up to my idea of what a lamp should be.

Another Experience.

On another occasion, earlier in the year, I accompanied a friend home on his new car from the coachbuilders. We had a long day's run of some 200 miles, and with a late start it was not surprising, therefore, that lighting-up time found us with still some 60 miles to cover. The car had run perfectly, and all had been merry and bright till we found that the side lamps, which burned quite nicely as long as the car stood still, quietly and with unfailing certainty eclipsed themselves immediately the car moved. Eventually we had to give them up, and it was fortunate the headlights behaved properly and enabled us to reach home in comfort, though even these we had to recharge en route, which is not an amusing occupation at dead of night and when they are of the "diving bell" variety, and you have to blunder about in search of water.

So I am a decided convert to electricity, and the next thing I am going to try is one of these dynamo outfits, to run from the engine and keep the accumulators continually charged. Without something of this sort I admit the batteries may be a source of anxiety to those who have not good facilities for recharging, and, of course, with a dynamo on the car it is not necessary to carry such a large or heavy battery, though I have not found mine inconvenient, and it is carried in a box slung inside the frame under the "tonneau" footboards, which relieves the running footboards of the weight, and is equally convenient for access.

The American Motor Industry.

Interesting Views of Kommerzienrat Opel on his Return from a Visit to the United States.

KOMMERZIENRAT WILHELM OPEL, of the great automobile firm at Russelsheim, declares, on the strength of observations made during an eight-week tour in the United States of America, that the American and German industries now stand on the same level, Germany having "advanced with seven-league boots in the last 15 years."

He was astonished at the motor traffic in New York, and ventures to predict that within the next decade the horse will have disappeared from the streets. Owing to the absence of suitable roads, the automobile was practically unknown in the country districts.

He noticed that most car owners dispensed with chauffeurs and drove themselves, a fact due to the high price of labour in America, which had also been the chief factor in producing those wonderful American tool machines that help to replace labour. As to these machines, he anticipated that, sooner or later, Germany would be able to do without American productions, home firms being then in a position to satisfy home demands.

Herr Opel discovered none of those factories alleged to be equal to turning out 12,000 vehicles a year. He says: "The nearer I got to these works the more the proud figures dwindled. In every city where I stayed they were a thousand fewer, until I learnt on the spot that it was a matter of 4,000 vehicles in all. Still, there are two or three factories that produce from 8,000 to 10,000 cars annually. But production as we understand it does not come into consideration, these factories making only subordinate automobile parts, and drawing on other firms for most important units, such as the engines, change gear, and steering contrivances. Hence, they do nothing else than 'assemble' automobiles and suffer them to go out into the world under their own flag."

"The German maker is too conscientious and too careful of his reputation to take a risk of the kind."

Asked whether there was, in his opinion, any danger of a wholesale importation of American automobiles into Germany, Herr Opel replied:—

"I cannot think so. American makes have never been able to secure a foothold here. On the other hand, so far as I know, our American exports in such articles as crankshafts, cylinders and springs, that is, in goods that lay claim to quality, and in the production of which wages play a part, are tolerably considerable."

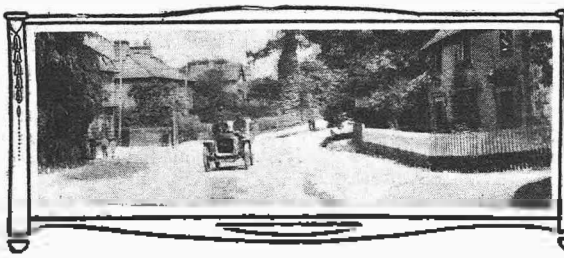
But, given an American attempt to "flood" the German market, he questioned its success, as the best German makers could easily compete. As at present constructed, American cars were too light for German roads outside metropolitan areas.

At an inquest in the city recently, the foreman of the jury suggested that a bar should be placed in front of the radiator so that a person run into could clutch it. The idea is capable of further development in the directions indicated above.

The Societe Anonyme des Automobiles Peugeot inform us that owing to an error in translating francs into pounds the tariff price of their 12-16 h.p. four cylindered Peugeot car has been quoted by them at £352, whereas the price of this car is really £10 less, viz., £342. We are further informed that this company has made arrangements whereby old Peugeot cars can be sent to them at 46, Knightsbridge, S.W., for overhauling and repair under the personal supervision of the manager and his assistants.

With regard to the illustration of the latest K.T. pneumatic tyre which appeared in our issue of 30th November, the wheel to which this tyre was fitted was a Rudge-Whitworth detachable wire wheel.

Advertisers are requested to note that owing to the Xmas holidays we have to prepare our next issue for press much earlier than usual. The latest time for receiving change of matter is first post to-morrow (Wed.) morning.



OTHER PEOPLES VIEWS

NOTE.—These columns are set apart for the discussion of motor topics by bona-fide readers of THE MOTOR, and trade letters containing veiled advertisements are not admitted. The Editors are not responsible for opinions expressed by correspondents in this section. Correspondents are asked to keep their letters as short as possible.

Concerning Freaks.

Mr. Sturmey's articles are always interesting and to the point, but his article which appeared some time back concerning "Freaks," was particularly good. I merely want to accord the writer my hearty appreciation. The word, as it occasionally "crops" up, seems to "stick in his gizzard," as it has so often done in mine. Anything that is out of the ordinary and foreign—particularly American—seems to be at once condemned. For a long while I have watched the progress and evolution of both motorcycle and motor (remembering with pleasure and profit articles on the light-weights), and felt convinced that an air-cooled engine with simple drive would eventually fill the bill of the average man who wanted a cheap conveyance; and, in my opinion, the Americans have solved this with their "Buggy-auts" and "Holsman's" high-wheelers, or what the conservative Britisher would dub "freaks." Some Holmans have been in use three to four years in New Zealand, and from personal observation, they have proved most useful and economical conveyances, and are becoming more inquired for every year. Many medical men use them in and about country townships, and the writer knows several who swear by their cars—winter or summer. I ran one for eight months, and then parted with it for what it cost me—to be further up-to-date in the same brand—and I derived the greatest pleasure and had practically no trouble. Its simplicity was indeed "golden." I read Mr. Sturmey's account of a run in a "Buggy-aut," and I congratulate him on having recorded his true impressions. I always pictured him a big, broad-minded man—a regular John Bull—with a straight-out opinion, even if in the foreigner's favour; for a man with pinched and cramped mind won't see any good in a commercial rival, and when Mr. Sturmey mentioned his "weight" as carried by the buggy, I was sure I had correctly sized up the man. INS152.

Invercargill, New Zealand.

Overhauling Cars at Cost.

With regard to your criticism of my suggestion for the overhauling of cars at cost, I must say I had not in mind firms who would have possibly 10,000 cars on the road, none of which were more than three years old. Such firms, I take it, should be capable of looking after themselves without holding out any further inducements to the buying public. Still, it would be interesting to know how the cars of a firm having the enormous annual output you suggest are in fact overhauled. One is led to the conclusion that a very large proportion receive no annual overhaul, and that the remainder are dealt with by the combined resources of the manufacturer, his agents and local repair shops. My suggestion was intended rather for the smaller firms, who yet have a good car to sell and are not indifferent to gaining the patronage of the buying public. I still think that for such as these my scheme would be feasible, but, of course, to carry it out the agents for these cars would have to be induced to fall into line. However, I should be glad if anyone else could suggest a scheme by which owners could be protected from the often excessive charges for overhaul. I am, of course, speaking from the point of view of an owner, but I cannot help thinking that many buyers would be influenced in their choice by some sort of reasonable overhaul contract in place of an elusive guarantee. L.M.S.

Early Recollections of the Pneumatic Tyre.

I observe that Mr. Sturmey, in his remarks concerning the early life of the pneumatic tyre, in a recent issue, states that none of the vehicles which ran in the 1,000 miles trial were so fitted. Surely this was not so. I remember the following, which certainly had:—Two Panhards (one an 8 h.p. run by Mr. Mark Mayhew, I believe, formerly the property of Mr. Rolls, the other Mr. Rolls's 12 h.p.), Mr. Phillips's "Petit Duc" Mors, the Peugeot driven by Sir Charles Friswell, the Lanchester, a Georges Richards (if I remember rightly), and also, I think, but am not quite sure, that Mr. Harmsworth's (Lord Northcliffe's) Parisien Daimler, driven by Mr. Langrishe, was also on pneumatics. There was, of course, the Sinums Motor-wheel, which, perhaps, could hardly be classed as a car; I, personally, was driving a Bollee tricycle so fitted, all over Connemara, in March, 1898. C. DAWSON, Col.

Hints on Tyre "Stopping": Brake Linings.

In reply to Mr. George Fitzgerald's query on tyre stopping, I think his non-success is due to want of proper adhesion of the stopping preparation to the sides of the cut. If he will make a small hardwood tool like a paper knife, dip it into ordinary rubber solution, insert the point into the cut in the tyre, and work it about so as to ensure thorough wetting of all parts of the cut with the solution, he will probably find that the smaller cuts will close themselves when the solution dries. In the case of larger ones any good tyre stopping may be applied when the solution has become nearly dry, and if pressed in with a similar tool the tyre will be ready for the road the following day. I have used this method with considerable success, and after about 3,000 miles running have had no punctures, and the tyres appear to be fit for fully as much more mileage.

With regard to the question re brake linings raised by "E.R.," I would strongly recommend Balata belting in place of leather. My first motor was a tri-car with band brakes on all wheels. These were lined with Dick's Balata belting, and during the four years I ran the machine they gave absolutely no trouble: either set could be relied on to

Group of Aboriginals and a Talbot car, taken at Tabulam, Australia.

O.P.V.—Contd.

control the speed on the steepest hills. Three years ago a friend had a 10-12 h.p. car whose brakes were lined with red fibre: in less than four months these had worn down to the bare metal. My friend and I re-lined the brakes with Balata belting, and the car has since run somewhere about 10,000 miles and the linings are still good. My present car had similar linings, which gave out after about 1,500 miles, and I have now fitted Balata belting, which has not yet had time to show what it can do, but it has already lasted for as great a distance as the red fibre did, and it shows absolutely no sign of wear.

I trust these experiences will be of use to your correspondents, especially as I have derived great benefit from the experiences of practical motorists through your columns, particularly our friends "Magneto" and "Cyclomot." SN31.

Trade Stupidity.

Having read Mr. Sturmey's article on "Trade Stupidity," we venture to think that the article will do a great deal of harm, owing to the far-reaching effect of your journal. In fact, if true, it would hit the self-respecting agent, undeservedly.

In these days of competition we are judged by results, and where is the motorist who will deal twice with an agent, let him ever so dimly suspect that this agent's advice follows the road where least trouble and most profit will accrue to him; he is bound to be exposed in the long run—*quo facto*, the business changes hands.

Our personal experience is that the thinking trader learns and hears all he can. Should he be caught napping, let him confess, and if he is really 'cute he will qualify his repentance with " . . . but I am going to look you up to-morrow, and promise to know more about it then than the makers themselves," but, for goodness sake, do not let him experiment with new goods on his client, as your able contributor hints.

DRESSER AND GARLE.

Removing Carbon Deposit.

In recent issues the question of removing carbon deposit has been raised. In the past I have frequently stated that I have never known of an authentic case where any of the so-called decarbonisers have been of use. It has been imputed that, connected as I am with an oil firm, I in some way have an axe to grind in condemning these decarbonisers. This is of course quite absurd, because, however good an oil may be, it is never entirely free from the tendency to carbonise. There is only one method that I have heard of so far which seems really to be of use in getting rid of carbon deposit without taking down the engine, and that is one recommended by a certain well-known firm of oil-engine manufacturers, and its efficacy has been confirmed to me by another firm of oil-engine makers. The advice given by the firm is as follows:—

> "A good cleaning mixture to keep in the engine house is made by adding a packet of Hudson's or soft soap to a gallon of soft boiling water. Pour a little of this from an oil feeder into the auxiliary valve (a small stream but not sufficient to stop the engine) for the last two minutes before stopping. This will clean the cylinder and save taking apart."

My experience shows that if an alkaline solution, preferably containing a little fatty matter, such as soap, is brought into contact with carbon deposit at high temperatures, the deposit is disintegrated. What the action is I do not pretend to understand.

I hope some of your readers will try this method, and give their experiences.

A. DUCKHAM.

A seasonable scene: by the side of the Heath, Bushey.

O.P.V.—Contd.

Waterproofing a Cape Hood.

I am much obliged to "J.P.S." for the interesting letter which appears on page 757 of a recent issue.

It would appear as though "J.P.S." gives a repetition of the recipe given by Mr. Peter Macdonald in your issue of the 9th ult., i.e., a recipe for waterproofing a Cape hood with black dressing.

My letter, on page 691 of your issue of the 23rd November, is, I think, clear that a dressing was required for a brown or tan-coloured hood, and if "J.P.S." could give information that would be suitable for re-waterproofing a hood of this colour, I should be very much obliged.

E. G. Arnold.

[A method of waterproofing a tan-coloured hood by means of a solution of rubber in naphtha was given in our issue of 14th December, page 790. Any alternative methods our readers can suggest we shall be pleased to find space for.—Eds.]

Car Experiences.

In reply to Dr. H. Mason's inquiry about the Bedford car, I can, from experience of the car, endorse the favourable opinions formed of it. It is light and well sprung, easy on tyres, and does 28 miles to the gallon (I use Ross spirit). The control, I find, is very simple, and the epicyclic gear is refreshing to one used to the unmechanical sliding gears. I use it in my practice in a very hilly district, and over bad roads, and I find that I have more than ample power for the conditions prevailing. The company and their agents treat their customers in a very satisfactory manner, and this, to my mind, is a very important desideratum to the owner of any make of car.

B. A. O'Flynn, M.D.

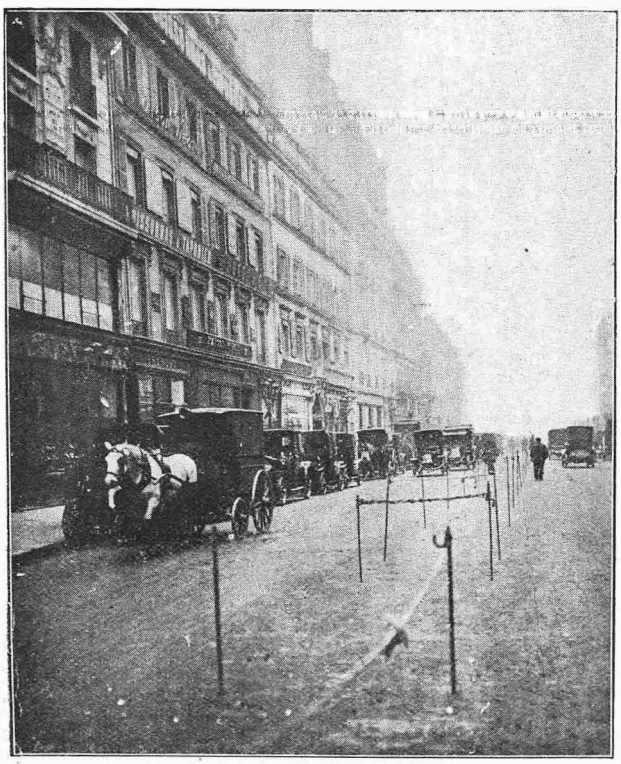
Londesborough House, Manorhamilton.

Fitting New Carburetter to 1903 Mors Car.

We read the inquiry of "Saxon King," in The Motor of 30th November, and should like to inform him that the Zenith carburetter is especially suitable for the Mors cars, having been adopted by the makers for all their types of cars this year. It is very economical, efficient, and is easily fitted. It is heated from the exhaust pipe, and not by water. Before, however, we are able to supply these carburetters, we need the following particulars:—Number of cylinders, bore and stroke, diameter of inlet pipe, and also a diagram of present carburetter fitted, so as to be able to supply a type that will give the least trouble to fit.

Eyquem's Patents.

10, Dean Street,
Oxford Street, London, W.



The soldiers have now been removed from the Rue de la Paix in Paris, and the obstructions shown in the above photograph have been introduced to part the traffic.

Motor-house Heating.

With reference to "Bromley's" inquiry re motor house heating, in your issue of the 7th inst., I think a Hatton's patent copper boiler would about fill the bill. I can testify to the efficiency of these gas-fired boilers, and to the remarkably small amount of gas required to maintain the heat in the range of hot-water pipes or radiators.

I send you a sectional descriptive sketch of the boiler in question, and "Bromley" can no doubt get all the particulars re price, etc., from the sole makers and patentees, E. Hatton and Co., 110, Sackville Street, Manchester.

Sel.

Referring to Bromley's letter in The Motor "O.P.V." of 7th December, we beg to say we are makers of a special gas-heating radiator, which we claim has a number of advantages peculiar to itself. Our claims are:—No attention is required after once lighting for the whole winter, no water used, therefore no periodical replenishing, no smell, no smoke, absolutely safe from fire. Gas consumption is exceedingly low, as the radiator tends to retain the heat. We think this is what your correspondent is requiring, and shall be pleased to give any further information.

Joseph Thompson.

Townhead Street, Sheffield.

Replying to "Bromley's" inquiry, I have just had fitted a gas-fired water radiator to my motor house, and find it very satisfactory. It is one of Fletcher, Russell and Co.'s (of Warrington) make, and cost about £7. The gas company fitted it up free of cost. I have the heater or boiler in the dwelling house, the basement of which it heats very efficiently, and the pipes run to the motor house, in which is the radiator.

Motorist.

Rear Axle Breakage.

I have a 10-12 h.p. two-cylinder car, 1906 type, in which the rear axle both drives and takes the weight of the car. Some time ago the axle broke on the road, and by the merest chance the wheel did not come off, otherwise an accident of a serious nature might have occurred. Could any of your readers suggest some arrangement which would not cost a very great deal whereby the wheels could be made to run on axle casing, the drive only being done by axle (as in most cars of present day), or some device which would prevent the wheel coming off should the axle break.

D.L.B.

Front-wheel Brakes.

Now that the matter of front-wheel brakes is engaging public attention, we would like to point out that the first provisional patent specification for front-wheel brakes, dated 13th October, 1903, was lodged at the Patent Office by our Mr. van Hooydonk. The complete specification was lodged 12th August, 1904, and accepted in the following October.

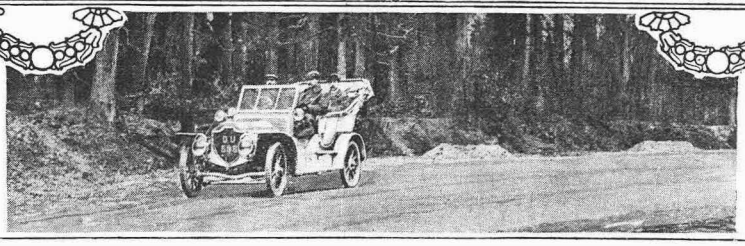
Phœnix Motors, Ltd.

Hotels and Motorists.

The letter of Mr. Charles Manners in this week's Motor is very true. I think it is time that the R.A.C. and M.U. looked into the hotel question. Why cannot a chop be obtained in a country hotel at the same price as in London? Will hotel managers please answer, as I asked the question in a previous letter, but up to now have not seen a reply? Then why subscribe to the R.A.C. and M.U. when these so-called motor authorities do not attempt seriously to emancipate the motorist from injustice as regards fines, etc., etc., and oppressive taxes? In 1910 I shall subscribe only to the A.A., and reserve my savings to pay the extra taxes.

Motorist Since 1900.

INFORMATION BUREAU



SPECIAL NOTICE.

We are at all times pleased to answer any queries put to us by our readers, or to receive correspondence from them upon any motor topic. In consequence of the large number of letters received, however, we must insist upon the following simple rules being adhered to:—

1. Plain writing. Type-writing for preference.

2. All letters to be written on one side of the paper only.

3. Questions to be clear, terse, and to the point, without tedious preamble.

4. Should an immediate reply be required, an envelope must be enclosed bearing a penny stamp, and the name and full address of the sender. NOT a stamped undirected envelope.

5. Questions cannot be answered on the telephone.

H.J.—We recommend you to see our latest "Manual." All the steering systems you want to know about are fully described and excellent illustrations given.

A.B.—The acetylene system you inquire about is quite safe and satisfactory. The gas is not compressed or liquefied, but is dissolved in a special way.

E.R.M.—(1) If the connecting rod end dips into the oil ⅜ in. it should answer A few trials will show if it is too much. (Note if exhaust smokes; if so, reduce depth of oil.) (2) The question of relative length of stroke does not affect the firing point.

E.M.—(1) The metal clutch on your car would probably work better if you cleaned it out with paraffin and re-lubricated it. (2) The overheating may be due to faulty carburation. The carburetter should be set to give a weaker mixture than at present.

E.G.C.—(1) Better to take the cylinders off and clean out thoroughly. Pre-ignition is most probably the cause of the "catch" or jerk when driving. (2) Yes; a good lubricant, judging from all accounts we have heard of it. (3) In view of the very small engine, a hood would slow the car too much (reason is increase of weight and extra wind resistance) (4) An extra air valve would be useful. These are sold by leading accessory houses. (5) The silencer might be repaired, but there are several good patterns advertised in our columns from time to time if you wish to fit a new one

Broken Crankshaft and Ignition Defect.

A.E.B.—Q.—I was very interested in your reply to "J.S.P.," re "Ignition Circuit," in a recent issue. I have a 16 h.p. leading make French car, a late 1907 type, chain drive, which broke a crankshaft without any apparent cause. A new one was fitted, which again broke in the same place (close up to the flywheel). The engine, flywheel and gearbox were tested, and found all in perfect line; otherwise undue wear would have shown on bearings and there would have been a certain difficulty in cranking engine over. There were no apparent defects. The ignition was not too far advanced; no back-firing took place. I came to the conclusion something was wrong with the ignition, and a spark occurred at the wrong place in one of the cylinders, and fired one against the other. The fracture in the shaft is of the nature of a twist The coil and magneto are both used; more generally the latter. I should feel obliged if you would tell me whether the magneto could cause this spark in any way.

A.—It is quite possible for such a fracture to happen through a defect in the magneto distributor, such as a short-circuit or spark leakage between two adjacent sectors, or even the cables of same, say, cylinders 1 and 2, the firing of which follows in sequence. If a spark passed at both plugs simultaneously, No. 1 piston, say, being a short distance on firing stroke, No. 2 would be on the compression stroke, and if this charge fired, obviously it would cause a severe shock to the crankshaft, such as might result in fracture. We did hear of an instance of this occurring with coil ignition, one section of the coil inducing a current in the adjacent section, which resulted in an extra spark occurring in a cylinder on its compression stroke.

Valve Timing.

L.H.W.—Q.—I shall be glad if you can give me information on the following. My car has been running badly lately, and I notice that a quantity of oil finds its way out through the inlet valves (mechanical), and if the engine is given much oil the car runs very badly. I tested the valve timing, and find the exhaust valve closes about ¼ in. to ⅛ in. before the completion of the exhaust stroke, and the inlet valve opens at the commencement of the inlet stroke, and closes at the end. I find, on referring to the "Motor Manual," that this is not correct.

A.—The exhaust timing is not much out. The slightly earlier closing of the exhaust valve may be due to a small amount of wear of the cam, or the tappet not being adjusted quite close to the valve stem. Moreover, when running fast, the valve does not actually close so soon as it appears to do when moving slowly. The inlet timing might, with advantage, be set to open and close a little later than at present. The oil trouble is probably due to piston rings being worn and rather slack fitting, and resulting in too copious lubrication of the cylinder walls.

Ignition Problems.

W.P. (Rangoon, Burma).—Q.—(1) I am much obliged to you for inserting my query as to cause of a spark passing from a plug to a wire held in the hand. I regret that I did not state clearly *how* the wire was held. The wire in question was not one of those connecting the plug terminals with the high-tension distributor; in fact, it had no connection with the car, but was an ordinary spare piece of insulated low-tension wire, about 4 ft. long, which I held in my hands. If I hold this piece of loose wire with one of its ends ⅛ in. distance from one of the sparking-plug terminals through which the current is flowing, the other end of the wire being held right away from the car and not touching it or my body, or in connection with the earth in any way, a stream of sparks flows between the end of the wire and the plug terminal. I imagine that the sparks are produced by a current induced in the wire by the high-tension current flowing from the distributor to the plug; but would not have thought this of sufficient voltage to produce such a powerful induced current. Likewise, I imagine that the explanation of the sparks jumping to one's finger is that the proximity of the body to the current flowing from

BUREAU.—Contd.

distributor to plug induces a current in the body, as the car is insulated from earth by its tyres, and, consequently, the body is not in circuit. These are really electrical problems, but I shall be obliged if you can answer them. (2) When a 4-volt accumulator is fully charged, what voltage should it show? Mine shows 4.2 immediately after charging, but after being in use for a short time the voltage drops to 3.8, at which it remains till the accumulator requires re-charging.

A.—(1) The explanation is a simple one. There is sufficient leakage through the insulation of the low-tension wire, and thence through the body to earth, to cause a spark to pass. The voltage of the current at the plugs is extremely high, hence it will make a circuit to "earth" if it possibly can. Of course, if you held a piece of heavily-insulated high-tension cable, that is, by means of the rubber covering, you would find no spark would pass. (2) It is probable that the acid is not the correct strength. You may have weakened it unduly in restoring the level after evaporation. The correct voltage for a fully-charged cell—tested some time *after* charging, and not immediately—is 2.25 per cell. After a certain amount of use, the voltage will fall to 2, and the cell will continue in good working condition until 1.9 volt is registered. This is an indication that exhaustion point is near; this is 1.8 volt per cell.

Water in the Silencer.

H.H.P.—Q.—I have a 14 h.p. four-cylindered car in use, and find, on starting up from cold, that a very small quantity of water comes out of the end of exhaust pipe, and engine misfires when throttle is fully opened. Could you tell me if the water is caused by (1) a slight leak in cylinder water jackets; (2) water in the petrol; (3) water condensed in silencer and exhaust pipes?

A.—It is more probable to be condensation from the exhaust. If the cylinder jacket leaked, the water would collect in the cylinder on the engine stopping, and prevent starting up. It is not likely to be in the petrol, as this would result in continual misfiring. Moreover, if you strain the petrol through a set of fine gauzes no water will pass through.

Timing of Exhaust Valve.

C.H.L.—(1) If you set the timing wheels so that the exhaust valve quite shuts on its seat by the time the piston has reached the top of the exhaust stroke, it should be approximately correct; but you may find the engine pulls better by giving the valve more "lead" on the firing stroke and closing slightly earlier. (2) We estimate that the jet aperture should be one-hundredth for a trial. You can then very gradually enlarge it till you get it correct. Use a very fine broach or rimer for this purpose, and work from inside the jet.

S.W.—Judging from the fact that the engine back-fires only when on steep hills, it looks very like carburation trouble. The probability is that the petrol does not reach the carburetter properly, the firing-back showing that the mixture weakens. There may be an obstruction in supply pipe, or a vapour lock in same. Look carefully to the automatic air valve spring of carburetter—it may be weak, and readjust it if necessary.

A26

Alcohol Non-freezing Mixture.

H.B.—Q.—Would you inform me what percentage of methylated spirit should be added to water circulation as an anti-freezing mixing? I have an idea that about 30 per cent. will resist considerable frost. I have heard that it is often used, and is much cleaner and cheaper than glycerine, though, perhaps, less cooling. In any case, my engine is a phenomenally cold one. The pump is aluminium, therefore I bar calcium chloride.

A.—A 20 per cent. mixture of alcohol will resist an average frost. The disadvantage in using it is that the spirit evaporates quickly. Otherwise it is better than glycerine, being cleaner and flowing more readily through the system.

O.K.—The best method you can adopt is to charge the cells through lamps in the usual way. You can purchase a suitable charging board from any of the leading accessory houses. The variations in the circuit you refer to will not affect the charging adversely. It does not follow at all, because the dynamo has to meet sudden variations of load, that the voltage on the lamps will be disturbed appreciably.

E.J.D.—Q.—I use an accumulator for the ignition of my 6 h.p. De Dion two-seater car. As the plates were not covered with acid, on returning from being charged, I added a small quantity of dilute hydrochloric acid by mistake (for sulphuric acid). What damage to the accumulator have I done (if any)? What had I better do to rectify the error?

A.—We advise cleaning out the cells and filling up with fresh acid. It is not probable that any permanent harm has been done.

C.F.—The following h.p. formula would suit:—

$$\frac{(\text{Bore} + \text{Stroke})^2 \text{ in. mm.} \times \text{No. of cylinders.}}{6.500}$$

This assumes an average emplosion pressure.

H.B.—We advise trying the effect of reducing the spray nipple by one or two notches (solder them up). You really require a much more sensitive type of carburetter, as now made, to run the engine slowly.

J.M.—You are evidently experiencing some throttling at the silencer. This ought to be cleaned out. Take it apart, and remove all the carbon deposit. This will probably cure the overheating.

A B.—Both driving wheels should run quite true unless the axle ends have been strained or the keyways are worn. Have the wheels examined.

Amongst snow and pine on Surrey Hills.

Fierce Clutch.

R.W.—Q.—I have an 8 h.p. single-cylinder car with a very fierce clutch. Collan oil seems to have no effect; washing with paraffin gives a fair result, but it has to be used frequently, and I am told that it injures the leather. The makers of the car sent me some springs to put under the leather, but there is not enough clearance between the inner and outer portions of the clutch for me to use them. Can you suggest any other dressing? I shall be grateful if you can, for I have quite used up three tyres on the back wheels in running about 3,000 miles, and I think the damage to the covers may be partly due to the clutch.

A.—A mixture of black lead and glycerine applied to the leather often effects a cure. Try it, and let us know the result. Possibly the clutch spring could be eased off with advantage. To be able to fit the springs under the leather, you may have to cut a series of shallow slots in the cone.

Oiling a Clutch Leather.

V.H.—Q.—I wish to soak clutch leather of my car in oil. Can you please tell me how long it ought to be soaked and in what kind of oil?

A.—The best plan is to dress the surface of leather with castor oil. Brush it on and let it soak in 24 hours. There is no need to remove the leather from the cone. In case it is a new leather you are fitting on, you can, of course, soak it in the oil.

Owing to pressure on our space a large number of replies are unavoidably crowded out. We are always pleased to reply, almost by return of post, to inquiries, when a stamped addressed envelope is enclosed. During the past week we have posted replies to 110 readers.

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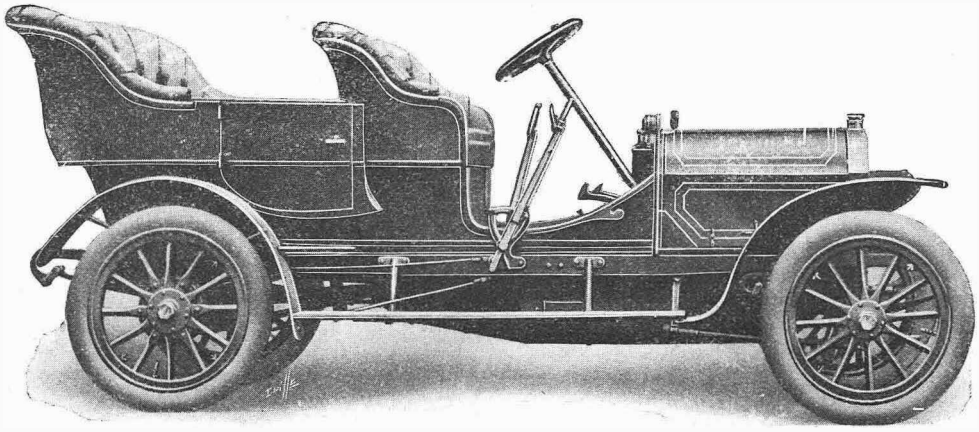

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MISCELLANEA

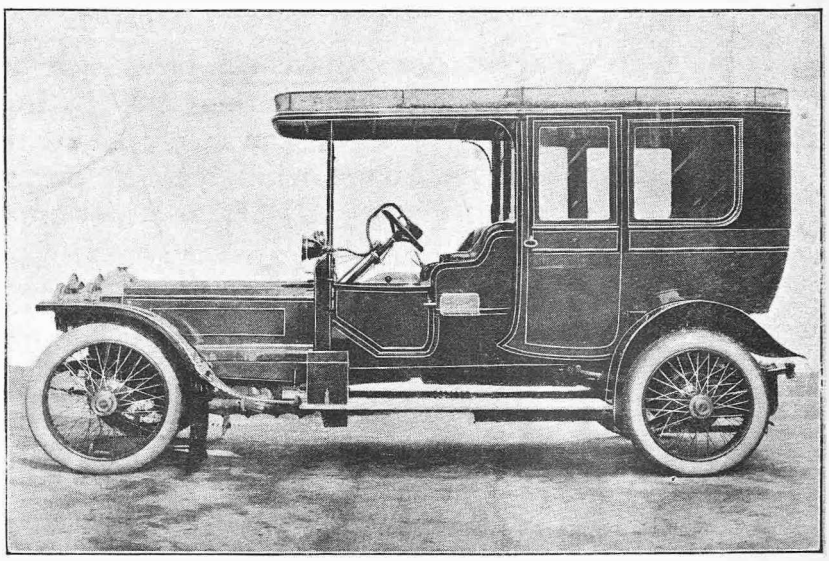
The dates of the Stanley Show of 1910, at the Agricultural Hall, London, are announced as from 18th to 26th November inclusive.

The demand for the 12th edition of "The Motor Manual" is greater than ever, showing that the enlarged and revised edition is greatly appreciated.

We have received an interesting explanatory booklet from the Peter Union Tyre Co., which deals fully with every kind of tyre manufactured by them. Many well-known omnibus and carriage companies bear testimony to the satisfactory results obtained by the use of these tyres; and it is stated that over 500 motorbuses running on the London streets are equipped with the Peter Union.

The shortest and quickest route between London and Brussels for the forthcoming Brussels Automobile Salon is via Dover and Calais. There are three services a day leaving London at 9 a.m., 11 a.m., and 9 p.m. Turbine steamers of the South Eastern and Chatham Railway run in connection with the 11 a.m. service from Victoria. The Ostend route is cheaper, and there are three services a day, leaving Charing Cross Station at 9 a.m., 2.20 p.m., and 9 p.m. Return tickets will be issued available for 30 days.

"A friend in need is a friend indeed" was proved to the hilt by one of ours on Barnet Hill only recently, when the ubiquitous J. A. Wilding, of Wilson Street fame, arrived on the scene, and a pair of seized brakes ceased from troubling and our representative was at rest. A further acquaintance with Messrs. Wilding's repair works at Wilson Street, which, by the way, are perfect hives of industry at the present season, placed our man's car in perfect running condition at the expense of a few hours in the hands of one of Messrs. Wilding's intelligent mechanics.



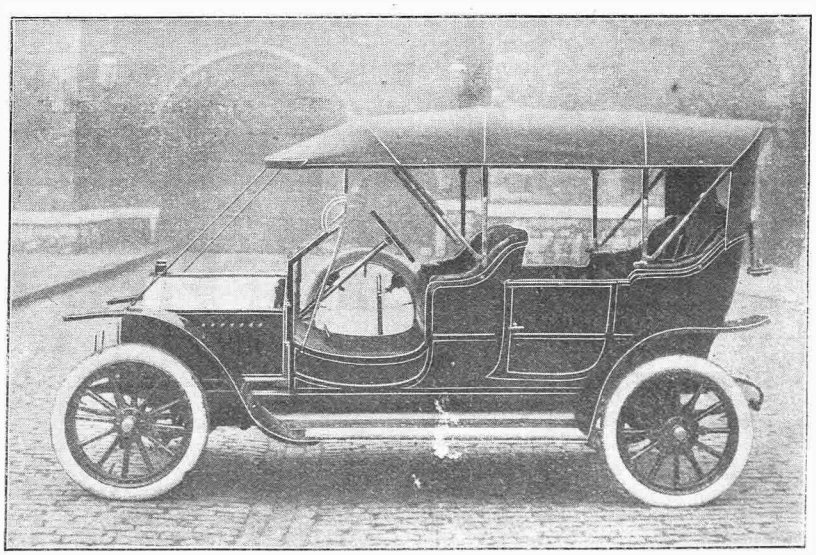
Sir Gilbert Greenall's 57 h.p. six-cylinder new Daimler car.

MISCELLANEA.—Contd.

Guarantors of the International Aeronautic Exhibition at Frankfort-on-the-Main have had their Christmas holidays spoiled by the lugubrious information that, owing to bad business, they must "stump up" to the extent of 10 per cent. of the sums guaranteed. Unfortunately, the guarantors belong mainly to the class of people who can ill afford to meet the claim; although it is not quite clear what men of this class were doing in the Frankfort "galère," since an aeronautic show was hardly calculated to draw the masses, and a financial fiasco might have been confidently anticipated by anyone who carefully weighed the chances. The "surplus" of the show was to have gone partly to the Frankfort Aeronautic Club and partly towards the foundation of an airship museum.

Many motorists have reason to regret having given their names and addresses to manufacturers and dealers because of the persistent manner in which circulars and price lists are subsequently sent them. It becomes such a nuisance that they hesitate to apply for particulars of various accessories, even though they may wish to have details. In addition to the annoyance caused the recipients, there is also the considerable waste of postage and clerical labour incurred by the senders. There is undoubtedly a large amount of interesting printed matter which is of service to the car owner, if he could only obtain it without running the risk of being bombarded by repeated circulars. It has remained for the enterprising firm of Harvey Frost and Co., Ltd., to discover a way out of this difficulty. A means has been devised whereby the books published by this company may be obtained without any subsequent annoyance. The company have issued a complete list of their publications arranged numerically on a postcard, and if the applicant puts marks in the spaces provided, he can rely upon getting such particulars as he requires, and those only, and at the same time will avoid the risk of repetitions. We recommend readers who are interested in every detail regarding the choice, care, and repair of tyres to apply to the company, at 27, Charing Cross Road, for a list of the H.E. publications, and to make their own selection.

The Warwick Tyre Co., Ltd., recently applied to the courts for an injunction to restrain the New Motor and General Rubber Co., Ltd., from using the word Warwick in connection with motor tyres, and succeeded.



14-16 h.p. Darracq sold to Mr Frank Ree, general manager L. & N.W. Railway.