THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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Notes.

New Racing Rules.

The discussion of the new racing rules should be taken up at once. Now the Gordon-Bennett race is a thing of the past, and practically all the great speed events are over or forbidden, it is time that the new regulations for the limiting of power should be considered. As the French Club does not appear to have moved in the matter, perhaps the A.C.G.B. and I. will give a friendly hint that something should be done and an international congress called for the sole purpose of coming to a settlement of the matter. It appears likely at the moment that Germany will permit the Gordon-Bennett race, whatever may be the style of machine used—whether it be of the monstrosity type or not; but the Gordon-Bennett event is only one of several, and if it is desired to continue racing, the limitation of power should be considered immediately.

Next Year's Gordon-Bennett Cars.

The discussion of the racing rules naturally brings one to consider the Gordon-Bennett race from a national point of view. Neither English nor other makers can consider designing next year's cars till the new rules have been settled; but it is practically certain that, if power is restricted, British manufacturers will be more likely to desire to take part in the event, and that, instead of two firms qualifying for the eliminating trials, and a third being ready to participate therein had the rules permitted it, we shall have quite a number who will be desirous of building machines to represent Great Britain. We are assuming that the limitation of power will be sufficient to ensure that the racing machines shall not be monsters, and that they will be likely, therefore, to afford very much more instructive results than those which can be obtained at present; for, as we have already said, the average English manufacturer does not believe in the construction of monstrosities from which little can be learned in comparison with more reasonably-powered vehicles. It is to be hoped that some more satisfactory way of testing the machines will be available than that of the present year, as the kilometre dashes and a sprint up one hill were not, as winners and losers alike agreed, satisfactory tests of a car designed to maintain high speed for 350 odd miles. Therefore, it would appear that the rules for the national representation in the Gordon-Bennett race are almost as urgently in need of revision as those governing the construction of racing cars generally.

The Reliability Trials.

We think it has been very plainly shown by the recent speed and hill-climbing trials in Ireland that classification by price, though undoubtedly necessary for the reliability trials (as it would be absurd to run all machines from £150 to £1,500 in one class), is not in itself sufficient. There is a rule to the effect that any machine which the judges consider likely to develop over 30 h.p. shall be excluded from these trials, and this is a very good rule indeed; but it seems to us that it no longer goes far enough, and that the bore and stroke should not only be stated in each entry, but steps should

be taken to verify the engine dimensions. For instance, last year machines were entered as of, say, 20 h.p., though the engines were quite equal to giving within a fraction of 30 h.p. on the brake. In other words, the horse-power—the nominal horse-power as stated by the maker, often means nothing. It is literally nominal, and by those who know is always accepted as such, but something more definite is required for reliability trials; and it would heighten the value in every way and prevent unfairness in many respects if the bore and stroke of the cylinders were taken, and the cubical contents of each engine worked out, and set by the side of the other particulars given by the club in its official returns. We make this suggestion in no carping spirit. Year after year the club trials become more valuable, and it is impossible with machines of various powers to eliminate disappointments and heartburnings; but anything which will tend to effect this, and at the same time to enhance the value of the trials, should be done if possible, and the suggestion we make is essentially a practical one, and easily put into effect. It entails a little extra trouble on both competitors and judges, but it is worth taking. As an instance of the discrepancies which arise without definite information as to the capacity of the engine, we have only to assume that two cars both of a nominal 10 h.p. but of different makes are entered in the same class. It will be found that one of them climbs its test hills at a very much higher speed than the other. If the size of the engine of each car was known and proved, there would be no doubt as to the reason. As it is, the student of the trials does not know whether it is due to a more powerful engine, or more efficient transmission, or some other cause. Engine particulars will not explain everything, but they will go a very long way towards so doing.

The Motor Car Bill.

The above Bill, with all its imperfections and grave possibilities of injustice and tyranny, has passed committee in the House of Lords, and is to be sent down to the Commons this week. It is, therefore, in the Lower House that the champions of automobilism will have to gather their forces round them, and endeavour to the utmost to mitigate the many terms of the measure, which, becoming law as they leave the peers, will bear so hardly upon automobilists when compared with the statutes under which other and more dangerous forms of traffic use the King's highway. Lord Balfour of Burleigh's amendment, giving a person whose licence has been suspended power to appeal to Quarter Sessions, is a form of appeal which will not recommend itself to those most vitally interested in and affected by the measure. It is a resource that we have heard frequently condemned in strong terms by Mr. Staplee Firth as being after all an appeal from Philip in one place to Philip in another. Our friends in the Commons must bestir themselves to obtain some more equable arrangement than that proposed by Lord Balfour of Burleigh. Lord Kelvin, who might have been expected to have taken a very different view of the whole matter, appears to desire that the police, or some other authority, shall have power at any time to order tyres to be detached and horse-power at the road wheels tested, on mere constabulary suspicion that things are not what they seem, or are alleged to be beneath the motor bonnet or elsewhere. The penalty clause was not referred to in last Tuesday night's debate, so that the efforts of

Mrs. Neville Copland on her 12 h.p. four-cylinder Clement on which she has already travelled several thousand miles. The car is a particularly smart vehicle, with body in pale cream picked out bright lemon yellow, and upholstered in light fawn-coloured biege cloth, brass mountings and brass lamps. The car owner and the car make a particularly smart pair, and are admired whenever seen on the road.

the Automobile Club to secure amendments to the Bill in this regard should be urged to the utmost. The club suggests that the maximum fine for the first offence should not exceed £10, for the second £20 or one month, and for the third £50 or a three months' imprisonment. If these are secured, it will of course be a distinct advantage, but without going into the question of what Parliament would or would not grant, there is no doubt that the resolution passed by the Cheltenham and Gloucester Automobile Club is much more nearly in accord with the requirements of reasonable automobilists. It will be remembered that the resolution referred to was to the following effect: "That fines for excessive speed should be proportionate to the horse-power of the motor vehicle, and that the present limit of a fine of £10 is excessive for persons of moderate means." There is no doubt that this meets the requirements of the situation admirably. It is fair in every way, but the one objection to it is the question of horse-power. It would really be a matter of very small difficulty for this to be systematised, so that nominal horse-power should not be given, but a definite formula could be prepared by the authorities which would settle the question, and the makers themselves could be put under some penalty if they made false returns in this matter. In fact, it could be very easily settled if it were not for the rooted objection which every Government has to the passage of any law which necessitates any technical knowledge on the part of its administrators. This attitude on the part of the authorities is scarcely creditable to a great engineering country, though it may be contended that objections of this kind are generally based on fairly good grounds, but the penalty clause is of such very great importance, if serious injustices are not to be perpetrated, that we think every effort should be made to obtain some progressive system of punishment, such as that suggested by the Cheltenham and Gloucestershire automobilists. For a digest of the Committee proceedings in connection with this measure, we would refer our readers to our synopsis published elsewhere, in which the actual effect of the Lords' deliberations on this bill is given. Why the austere peers should rejoice over this measure, upon which hangs the future of the trade and industry in this country, is what no one can understand.

USEFUL HINTS AND TIPS.

Fierce Clutches.

Some drivers are troubled by having a too fierce clutch on their car. This is in its way as bad as a slipping clutch, if not worse, as unless the clutch can be put in gently and the car moved off gradually, great strains will be thrown on both the engine and the gear, which in a short time will begin to show the effects of such treatment in very marked manner. A fierce clutch may be due, and chiefly is due, to one of two causes. First, too strong a spring, and consequently too fierce a grip between the male and female portions of the clutch. Again, there is a third reason which occurs with some cars, and that is a badly-designed clutch. By this we mean a clutch in which the conical angle is too acute, so that a sudden and big wedging action occurs when the one-half of the clutch is put into engagement with the other. In the latter case there is no real remedy, except an entirely new clutch. The remedy of the first-named cause is very obvious, but when slackening off the spring, one should be very careful not to get it too slack, but by trial and error adjust it to the greatest nicety. It is even permissible to allow the clutch to slip very slightly when ascending hills on the lowest speeds, as this enables the engine to maintain its momentum. In the second place a dressing of oil, preferably Collan oil, will cure fierceness.

The Trembler Coil.

Many of our readers would be glad to have an explanation of the reason why a trembler coil is necessary with a wipe contact, and the difference between an ordinary coil without and the coil with a trembler. If those of our readers who are interested in the matter will refer to the article we published on the induction coil in *The Autocar* of March 28th, page 387, they will find the full reason for the trembler coil given. To summarise this, it is necessary to break up the primary circuit of the coil rapidly—that is, the current which flows from the source of electrical energy through the coil. This interrupts the lines of the magnetic field, and intensifies the power of the induced current, for the quicker the make and break at the trembler the more effective is the spark, or, rather, the shower of sparks, at the plug, such a shower being much hotter than those of lesser density produced by a slow vibrating trembler. That is why, as a rule, the magnetic trembler is much more effective than the mechanical trembler, for the latter cannot work up to the speed of the former. If a plain coil be used in conjunction with a wipe contact, there would be no disruption of the primary circuit; but one uninterrupted flow of current would pass through the primary winding of the coil. This, of course, would produce a spark at the plug, but it would simply be a single spark and of such an attenuated form as to be incapable of igniting the cylinder charge.

Driving with Slack Chains.

It fell to our lot a short time ago to drive a light car having side chain drive. These chains were so loose as to cause some anxiety, for there was every possibility of their leaving the sprockets. This eventually happened, but luckily gave no great trouble in replacement. It was found that the stretcher bars had been lengthened out to their utmost, and therefore there was no chance of giving the chains the necessary adjustment; and being well on into the night, it was hardly a pleasant task to start taking a link out of both chains. To prevent further possibility of the chain coming off, we religiously stuck to the second gear for the remainder of our journey—some sixteen or eighteen miles—*and drove on the brake when descending hills.* The object of this was to keep the chain taut on its top side, with the engine throttled down and the brake just applied sufficiently to retard the car to keep the chain in the desired position, and this prevented all further troubles.

THE DE DION TWO-SPEED GEAR FOR 6 H.P. AND 8 H.P. DE DION CARS.

Owners and intending owners of De Dion cars will no doubt be interested to have some particulars of the two-speed and reverse gear now fitted to the 6 h.p. and 8 h.p. De Dions, sold by Messrs. De Dion-Bouton, Ltd., in this country. Thanks to the courtesy of Messrs. De Dion-Bouton, Ltd., we are able to give these particulars in detail.

In fig. 1 we have a vertical section of the aluminium gear box A A A A, the rear or right-hand portion thereof forming the forward half of the case enclosing the bevel gearing P P and P^1 P^1 and the differential gear. Running through the upper part of the gear box is seen the primary gearshaft B B, rotating in its double ball bearings B^1 B^1. Outside the case, on the left hand, is one half B^2 of the universal joint, by which the primary shaft B B is connected to the propeller-shaft, which is attached at its other end to the crankshaft of the engine. The primary shaft B B is formed with feathers thereon, to allow of the lateral movement of the sleeve carrying the high speed driving pinion E E. On the shaft itself is formed the reverse driving pinion F, and just to the right of the left-hand ball bearing is seen the low speed driving pinion D D, which is keyed fast to the shaft B B. Immediately below the primary gearshaft B B is the secondary hollow gearshaft C C, also running in double ball bearings lettered C^1 C^1.

Commencing from the left-hand side, just outside the gear box, this shaft is seen to carry the brake drum O, and within the box the low speed clutch box G G, to which is attached the low speed gear wheel D^1 D^1, which is free on the shaft C C. The grooved collared sleeve L L, to which is attached the reverse speed clutch box I I carrying the gear wheel F^2 F^2, which is rotated by the intermediate pinion F^1 F^1, this latter pinion being located in the middle of the gear box (see fig. 2). Further to the right the shaft carries another grooved collared sleeve LL, upon which is mounted the high speed clutch box H H, carrying the high speed driven gear wheel E^1 E^1. Beyond its right-hand ball bearing the shaft C C carries the driving bevel wheel P P, which meshes with the bevel wheel P^1 P^1 shown in the partial horizontal section below the figure.

Within the hollow of the shaft C C is placed the rack, which moved one way or the other serves, by means of the pinions K K K K, to expand one or other pair of the fibre-covered segmental expanding clutches, one pair of which is shown in fig. 2, and marked I^1 I^1.

Now to detail the manner in which the low and high ratios of drive are conveyed through the shaft C to the bevel wheel P P.

The low speed driving pinion D D on the primary gearshaft B B is always in mesh with the low speed driven pinion D^1 D^1 attached to the low speed clutch box G G. The movement of the gear-striking lever to the low speed position gives the rack M M a movement which rotates the pinions K K within the clutch box G G, so as to expand the segmental clutch within that box and lock the same up to the shaft C C. The same movement has similarly withdrawn the expanding clutch from contact with the inner surface of the high speed clutch box H H, so that the drive can only pass to the bevel wheel P P through the gears D D and D^1 D^1, clutch box G G, and the shaft C C, and thus the slow speed is obtained. To put in the high speed, the speed lever being moved to the high speed position, a reverse

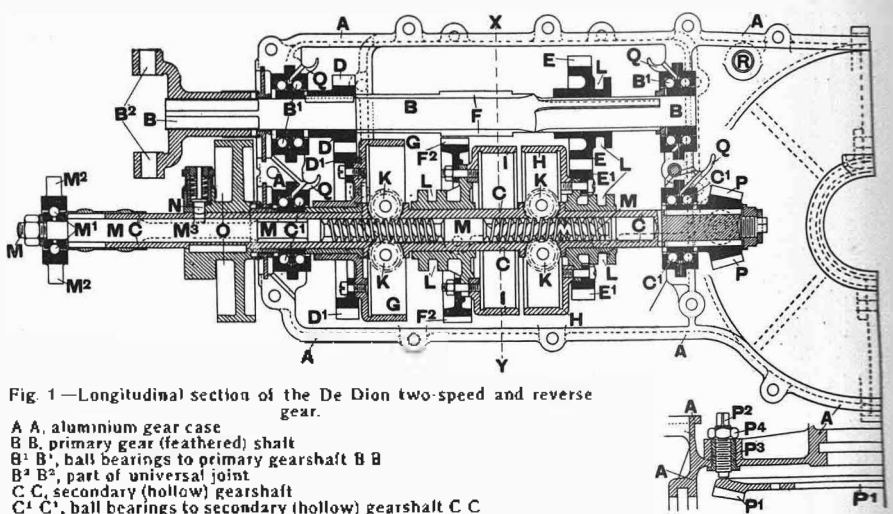


Fig. 1.—Longitudinal section of the De Dion two-speed and reverse gear.

A A, aluminium gear case
B B, primary gear (feathered) shaft
B^1 B^1, ball bearings to primary gearshaft B B
B^2 B^2, part of universal joint
C C, secondary (hollow) gearshaft
C^1 C^1, ball bearings to secondary (hollow) gearshaft C C
D D, low speed driving pinions
D^1 D^1, low speed driven pinion
E E, high speed driving pinion
E^1 E^1, high speed driven pinion
F, reverse driving pinion formed on shaft B
F^1 F^2, reverse pinion driven by intermediate wheel (see F^1, fig. 2)
G G, low speed clutch box
H H, high speed clutch box
I I, reverse speed clutch box
K K, pinions expanding clutches
L L, grooved collars shifting clutch boxes and pinions
M M, rack, expanding clutches. This rack adjusts as well as expands clutches
M^1, ball bearing to rack
M^2 M^2, pivots for draw link
M^3 M^3, grooves in rack to take locking stud N
N, locking stud
O, brake drum on shaft C
P P, driving bevel wheel
P^1 P^1, driven bevel wheel on differential gear.
P^2, stud supporting P^1 P^1
P^3, bush tapped to take P^4
P^4, locking nut to P^2
Q Q, oil channels
R, oil inlet to gear box
X Y, section lines

movement is given to the rack M M, which has the effect of withdrawing the clutch within the clutch box G G from contact therewith, and expanding the clutch within the high speed clutch box H H, until the latter in its turn is locked up to the shaft C C. The engine drive then passes through the primary shaft B B, the high speed driving pinion E E and the high speed driven gear wheel E^1 E^1, which is attached to the high speed clutch box H H, already locked up to the secondary shaft C C by the expansion of the clutch within it. And so the high speed drive accrues. Now we come to the reverse, which is obtained in a particularly neat and ingenious manner. The gear-striking lever is moved to the free gear position, the rack M M being thereby so actuated that both expanding clutches within the clutch boxes G G and H H are withdrawn from contact with their respective clutch boxes. Then, by pressing a pedal with the right heel, the

small arm T (fig. 3) is actuated in such wise that by means of the link $T^1 T^1$ the striking forks attached to the sliding sleeve $S^1 S^1$ sliding on the shaft S S (fig. 3), which forks engage with the collars L L L L L (figs. 1 and 3), cause the high speed driving pinion E E and the clutch boxes H H and I I, with all they carry, to slide together sufficiently to the right to bring the clutch box I I over the expanding clutch shown within clutch box H H in fig. 1. The same clutch is then expanded by the requisite movement of the rack M M, and the reverse

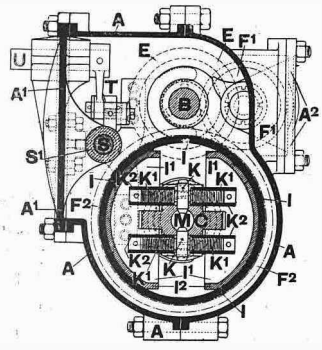


Fig. 2.—End section of the gear.

A A, aluminium gear case
A^1 A^1, inspection lid
A^2 A^2, plate carrying brackets supporting intermediate pinion of reverse
B, primary gear (feathered) shaft
C, secondary (hollow) gearshaft
E E, high speed driving pinion
F^1, intermediate reversing pinion
F^2 F^2, reverse gear wheel driven through intermediate pinion F^1
I I, reverse speed clutch bar
I^1 I^1, expanding clutch
I^2 I^2, vulcanite fibre
K K, pinions expanding clutches
K^1 K^1, extended threaded spindles of pinions K K
K^2 K^2, tapped sleeves forming parts of expanding clutch I^1 I^1
M, hollow portion of C C accommodating M, fig. 1
S, shaft carrying sleeve S^1
S^1, sleeve carrying striking forks
T, lever moving sleeve S^1
U, rocking spindle carrying lever arm T

speed clutch box I I is thereby locked up to the shaft C C. Now the intermediate pinion $F^1 F^1$ (see fig 2) is already in mesh with the pinion F on the primary shaft B B, so that the drive now passes from the shaft B B through the pinion F, the intermediate pinion F^1 (fig. 2), and the pinion F^2, attached to the clutch box I I, which, as we have already shown, is locked up to the shaft C C by the expanding clutch over which it has been moved. The expansion of this clutch has already been described in detailing the high speed drive. The whole of the gear within the gear box is served by dash lubrication, and the four catch channels, with the leads to the four ball bearings, are plainly shown in fig. 1.

Fig. 4 is a reproduction of a photograph of the De Dion clutch gear with the clutch box, etc., having the low speed gear wheel F_1 drawn off the shaft A and turned with its inner face outwards. This figure has been added with the view to making

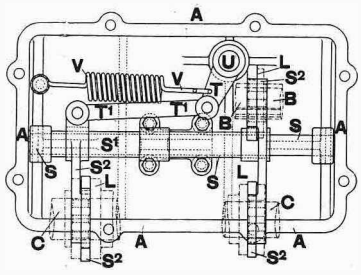
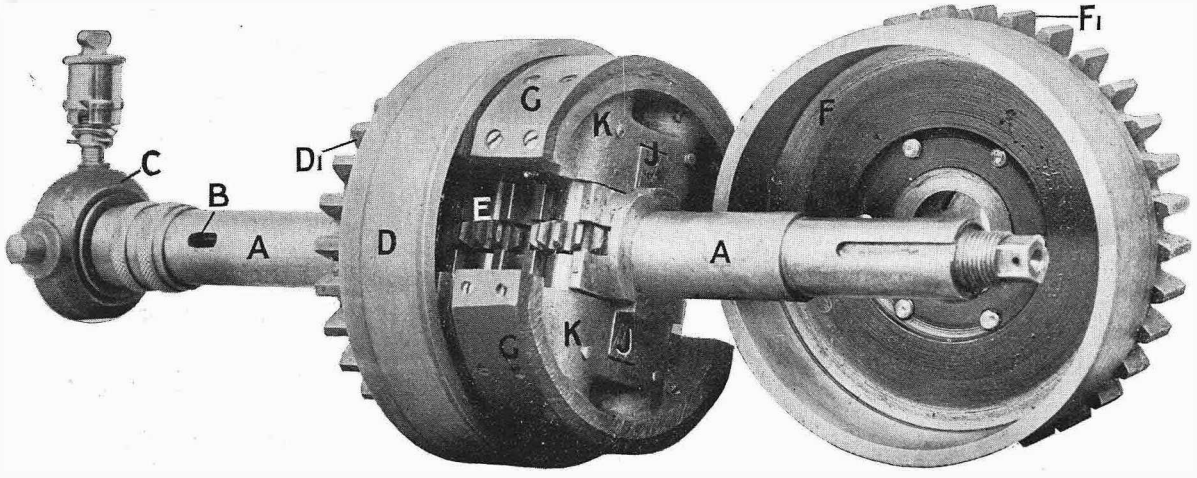


Fig. 3.—Details of reverse gear.
AA, aluminium gear case
BB, primary gear (feathered) shaft
C C, secondary (hollow) gearshaft
S S, shaft on which sleeve S^1 slides
S^1 S^1, sleeve carrying striking forks
$S^2 S^2 S^2 S^2$, striking forks
T, lever moving sleeve
T^1 T^1, link connecting T and S^1
U, rocking spindle carrying lever arm T.

V V, spring drawing back the arm U
L L L, grooved collars shifting clutch boxes and pinions

clearer to those who are unaccustomed to reading mechanical drawings the import of the diagrams accompanying the foregoing lettered description. The illustration plainly shows the position of the pinions expanding the clutches, which pinions, as has already been explained, are rotated by the rack M (fig. 1). The manner in which the fibre segments G G are attached to the metallic portions of the expanding clutches K K can also be plainly seen. A careful comparison of fig. 2 and fig. 4 will, we think, materially aid those who have not the gift of easily reading mechanical drawings in arriving at a full comprehension of this ingenious and effective gear-changing device.

To dwell upon the material, finish, and workmanship of this neat and effective gear is quite unnecessary. We can only hope that this description, together with the illustrations, will serve to convey an idea of the construction and operation of this gear to owners and intending purchasers of these well-designed and soundly-constructed vehicles.



The De Dion two-speed expanding clutch gear.

A A, secondary shaft
B, locking bolt slot
C, ball bearing to internal rack
D, high speed clutch box
D^1, high speed gear wheel
E, pinion actuating expanding gear to D
F, low speed clutch box
F^1, low speed gear wheel
G G, expanding clutch
H, pinion actuating G G
J J, arms on the casting carrying pinions fixed to A
K K, metallic part of the expanding clutches G G, actuated by the pinions working on J J.

OVER HONISTER PASS ON A 10 H.P. GLADIATOR.

A Succession of Strenuous Climbs.

The following account of a three days' trip to and about the Lakes will give an idea of what a good motor car can do. I write from a motor point of view, leaving scenic description to others.

The car was a standard 1903 10 h.p. two-cylinder Gladiator with tonneau body. The load consisted of my wife and myself, with luggage and a six gallon spare tin of petrol—equal, say, altogether to three passengers.

We left Darlington on Tuesday, June 30th, and the first day's journey was a real test for a car. We went by Witton-le-Wear up the Wear Valley over Killhope, where the road attains an altitude of 2,050 feet above sea level, to Alston. Then another climb of five miles to the summit between Alston and Penrith, which is over 1,900 feet above sea level. From Penrith we went straight on to Pooley Bridge, along Ulleswater to Patterdale and over Kirkstone Pass, down by Troutbeck as far as Bowness, and then back to Waterhead Hotel, Ambleside, for the night. There was heavy rain at times during the day, and the road up Kirkstone was very heavy. The summit, unfortunately, was clothed in clouds, and so we missed the view.

The engine and machinery never made a falter all day.

The Second Day.

The second day was a day of experiences. It began tamely enough, from an engine point of view, by a drive *via* Skelwith Bridge and Yewdale to Coniston and along the east side of the lake to its south end. Like many of the roads in the Lake District, it would be just a toss up in many parts whether two vehicles could pass, but we did not have to try. I dare say some of the hills between Skelwith Bridge and Coniston would be called steep, but they were nothing to what we had before us. We made a detour by Elterwater as far as possible, up Langdale, and on returning turned up the hill at Chapel Style for Grasmere, a very steep ascent, but nothing to the descent of Red Bank Hill, which the C.T.C. roadbook warns cyclists is "quite unrideable," and "should on no account be ridden." The Gladiator slid down over a hundred yards with wheels locked. I drove close to the wall, and the back mudguard occasionally scraped when the car slipped round a bit. The speed was perhaps two and a half miles an hour. The hill was very slightly wet at the top portion, but the wheels still slid over the dry part. A *char-à-banc* passed us just after we reached the bottom. While we were looking at what we had come down, a passenger on the *char-à-banc* evinced interest as to the make of car which could come over such a road. We followed the vehicle, and the driver pulled to one side at a wide place and stopped for us to pass him. Throughout the drive I found the drivers of public conveyances in the Lake District most obliging. We passed them in all sorts of places, and it is a pleasure to record also what skilful drivers they are.

The Ascent of Dunmail Raise.

Dunmail Raise proved a mere nothing to the motor. From Keswick we went by Lodore, where, after looking at the falls, the natives told us we could not possibly get over Honister Pass. Well, if we could not, it would only be a case of coming back. At Seatoller we heard of a car which had tried a few days earlier and failed. The contour roadbook was also decidedly depressing. It says: "After Seatoller the road is simply a mass of loose stones."

The Gladiator took the first steep out of Seatoller all right, and got a long way up the second steep before the first stop. It was encouraging to be told this was a great deal higher than the last car—of

H.R.H the Prince of Wales is at present making an extended tour in the south-western counties, in which his 22 h.p. Daimler is playing a prominent part, as is also that of Lord Falmouth's, which is shown in rear of the royal vehicle in the above illustration. The cars have been used to visit many historic spots in Cornwall in which H.R.H. is very interested, he holding the Duchy of the county and being also the Lord High Steward. When the photograph from which our engraving was made was taken, the party were passing through Mullion for Poldhu

12 h.p.—had got after three attempts. Here I dropped the car back across the road, so as to get a good start, one hind wheel resting against the huge boulders which form the boundary of the road, and behind which is a steep drop to the stream. We then unloaded the car, and the next effort took it up the rest of that precipice. I think there were four steep portions, the top one perhaps the worst, as the surface got looser and softer all the way up. The stopping and dropping across the road would be r peated perhaps four times altogether. There is then about half a mile of fairly level road, and then a final stiff pull to the summit.

Honister Conquered.

Four sporting inhabitants of Seatoller were as keen on seeing the car go up the pass as we were. They carried the luggage up, and gave a good push at the critical moments. In return I gave them a ride along the easy part, and they then walked to the summit to see the finish, while I went back for the luggage, which was left at the top of the steep portion. We stopped at the Hause to celebrate the event in ginger beer, and were again informed by the keeper that no other car had ever got up. It was one thing to get up ,and another to get down the Buttermere side. The surface was just loose scree, the road very narrow, no protection at the sides, and a steep bank to fall down. The gradient in places was something like one in three, and with the recollection of our slide down Red Bank Hill, it was a fearsome-looking venture.

There is a deep furrow and loose stones down one side of the road, and with the offside wheels in that, with a view to keeping the tail from swinging round when sliding, the descent was slowly and safely accomplished, and we finished an exciting day at the Victoria Hotel, Buttermere. There they told us of a car which had tried to go over by Newlands to Keswick that morning, and failed.

The Third Day.

The third day we drove back to the End of Buttermere, then returned to the Victoria Hotel, afterwards proceeding along Crummock through the wood to Scalehill, and by the side of Loweswater, returning by Lorton to Keswick, and so by the prosaic main roads *viâ* Penrith and Brough to Darlington, arriving about 8 p.m.

Fortunately, notwithstanding the stony roads driven over, there were no punctures, though the tyres are badly rubbed with the sliding down the hills, nearly through the tread in places. We had plenty of time to enjoy the scenery, driving at six to eight miles an hour in the prettier parts, with many stops at beauty points. I was agreeably surprised to find the hotel charges most reasonable. Petrol consumption was twenty and a half miles per gallon, which, considering the long distances driven on second and lowest gears, was, I think, very good. There is no doubt that the 1903 10 h.p. Gladiator is a really excellent car, and very good value indeed at the price charged for it.

CHARLES F. DIXON.

A NEW MOTOR 'BUS SERVICE.

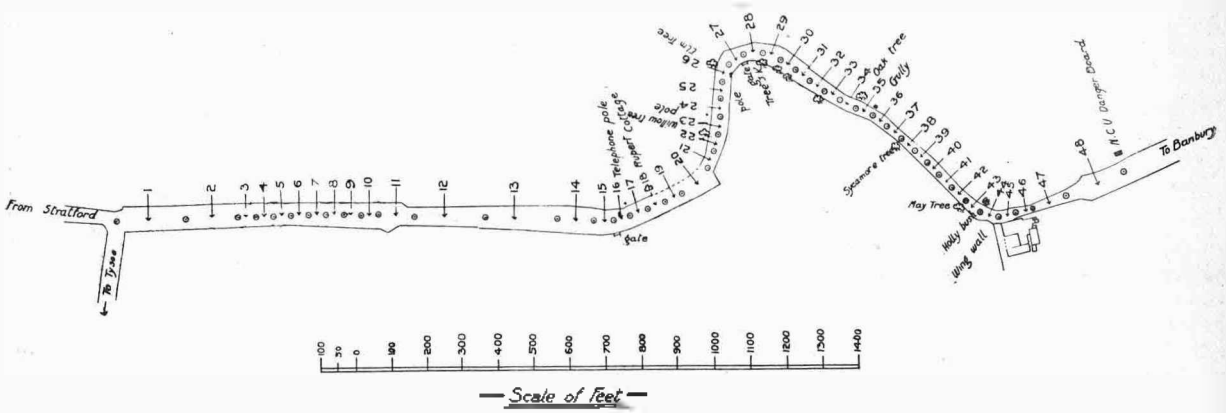
Torquay is instituting a motor 'bus service after considerable discussion as to how and what is the best method of public traffic suited to the requirements of the town. As the outcome, several gentlemen have formed themselves into a private committee to establish a motor 'bus service, and in the event of this proving a success, the concern will be offered to the public in the form of a company. The choice of the committee fell upon a steam 'bus manufactured by Messrs. Clarkson and Co., of Moulshaw Works, Chelmsford, who have been given an order for three of these 'buses. The makers have already sent down a trial vehicle to run over the route, so that they may know the actual requirements of the road. No difficulty whatever was experienced in negotiating any of the severe hills which abound in the neighbourhood. The cars have been specially designed for the requirements of the service, and have an overall length of 17ft. 6in. The interior of the 'bus is very spacious, and gives good accommodation for sixteen passengers. The whole is covered by a corridor roof, and the windows at the sides are made to slide into each other, so that plenty of ventilation may be obtained during the summer months, while wind and rain are excluded during the winter months. The seats in front will have a circular shield with glass windows. The first of the omnibuses ordered is expected in about a month's time, and the others very shortly afterwards. No difficulty is anticipated in running the service, and as regards the flotation of the company, it is not proposed to issue more than 700 shares (£3,500), of which more than half have already been bespoken before the prospectus is issued, which shows that locally there is great confidence in the future of the service.

MOTOR VOLUNTEER CORPS.

Mr. J. S. Goodhart was employed on Sunday, the 12th inst., by Major-General Sir W. F. Gatacre, K.C.B., D.S.O., the general officer commanding the Eastern District, to make an inspection of a proposed manœuvre area in the eastern counties near Bawdsley. On the 14th inst. Mr. F. A. Rodewald was on duty for Lord Grenfell, general officer commanding the Fourth Army Corps in connection with the inspection of volunteer brigades in London. On the same date Mr. H. S. H. Cavendish drove Major-General L. Oliphant, general officer commanding home district, to Guildford on inspection duty. On the 15th he drove the same general officer at the inspection of the Royal Horse Guards and "X" battery Royal Horse Artillery, and on the 16th inst. he was employed by General Oliphant driving to Hounslow for the inspection of the 7th and 57th Regimental Districts and the Second Battalion Middlesex Regiment. General and staff officers appear to appreciate travel by car.

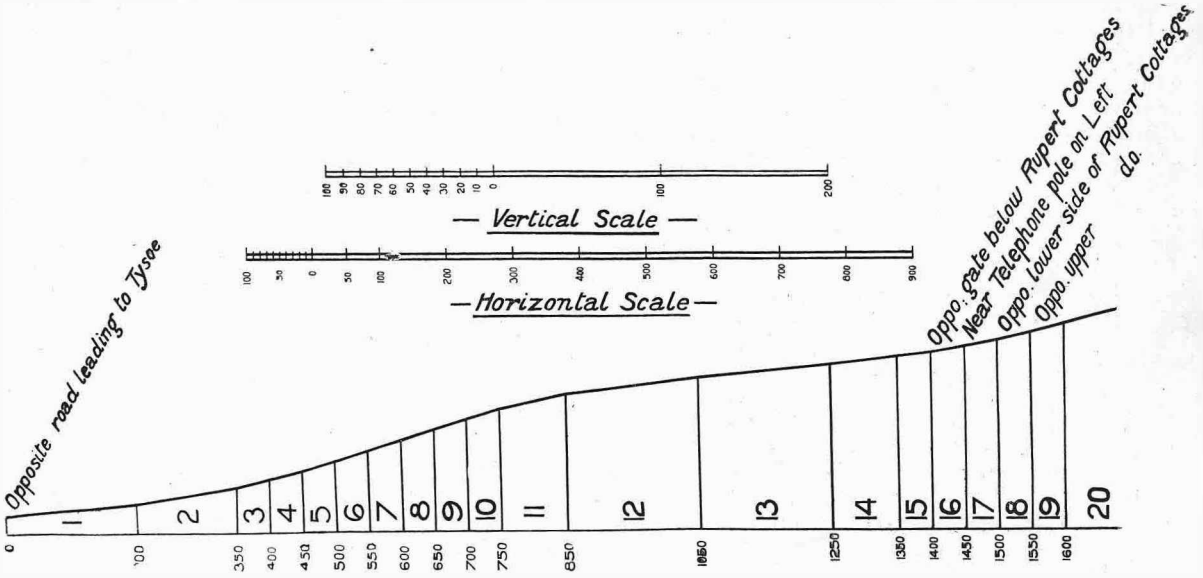
THE SUN RISING ASCENT OF EDGE HILL.

The Scene of the Midland A.C. Hill-climb.

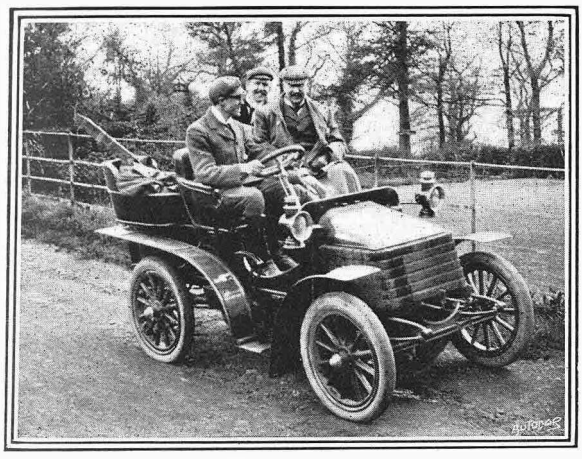


Plan of Sun Rising Hill, Edge Hill.

Although diversified throughout by hill and dale, Warwickshire only boasts one really steep range of hills—the Edge Hills—and these are on the extreme borders, only just escaping inclusion in Oxfordshire. The summit of Edge Hill is over 700 feet above the sea level, and it is easily attained by the Warmington ascent. The Kineton ascent—a mile further to the south—is steeper, but the severest climb is the third road, known as Sun Rising. All three of these roads become one before Banbury is reached. Warmington is on the Warwick-Banbury road *viâ* Gaydon. Kineton is approached by Warwick, Wellesbourne Hastings, and Kineton; but Sun Rising is on the main road from Stratford-on-Avon to Banbury *viâ* Upper Eatington and Pillerton Priors. It is rather over ten miles from Stratford to the foot of the hill, and the gradients are more or less against the car for a good part of the way. We give these details, as people who do not know the district well are apt to speak lightly of Edge Hill, having climbed up Warmington and not realising the difference between it and the Sun Rising ascent. It is true that the middle road by Kineton is very severe; but the steepest portion is straight, and it is altogether a less trying incline than Sun Rising. As Sun Rising is over 1,400 feet long, we have found it impossible to get the entire section sufficiently plain without breaking it, so it will be seen that it commences at the bottom of this page, and is continued across the next page. Further than that, we should explain that to make the gradients perfectly clear, we have cut the hill up into forty-eight parts. These are numbered on the section, and by reference to the table of gradients, the steepness of any particular part of the hill can be ascertained in a moment. It will be noticed that the most severe section is the fifty feet numbered 44, which is 1 in 6.43; but there are in all 350 feet which are steeper than 1 in 7, and 800 odd feet which are steeper than 1 in 8. It will be recollected that the steepest part of Westerham, the crux of the Automobile Club's reliability trials, is 1 in 7.8,



Section of Sun Rising Hill, Edge Hill.



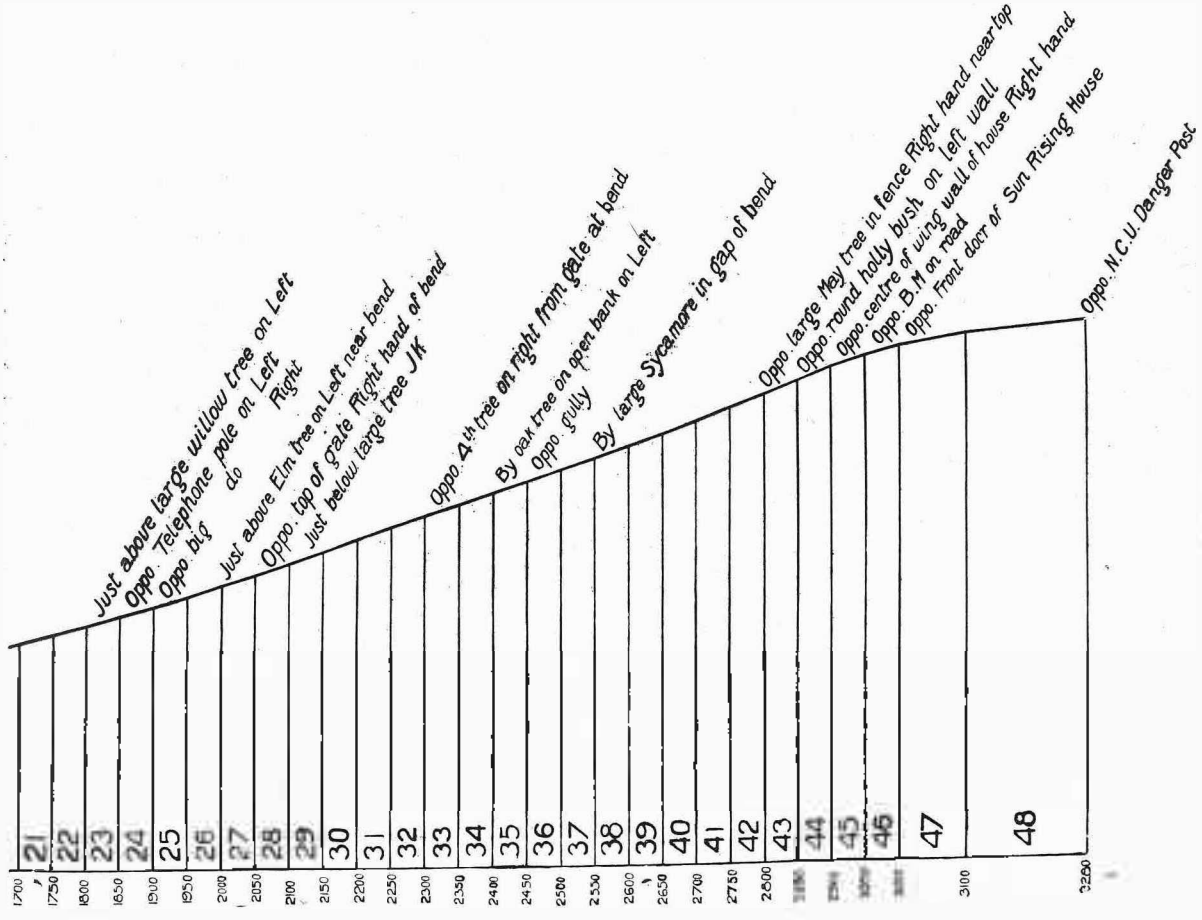
"The Autocar" surveying party on the 7½ h.p. Wolseley, after grading Sun Rising Hill.

and this will enable one to realise the extreme severity of Edge Hill, particularly, as it will be noticed from the plan that the hill is very far from straight, the curves being distinctly severe; and the second one, which is much the sharpest, is also exceedingly steep, the gradients round the bend reading from 24 onward, varying from 1 in 9 to steeper than 1 in 7. In fact, Edge Hill is distinctly dangerous, and anyone who is not sure of the climbing abilities of his car should see to it that his brakes will hold backward, or that he is provided with a sprag decidedly more efficient than the average fitting. On this hill the Midland A.C. hold a hill-climbing competition to-day (Saturday, 25th).

Table of Gradients.

1.	=	1	in	30.67	25.	=	1	in	8.71
2.	=	1	in	15.62	26.	=	1	in	7.88
3.	=	1	in	9.86	27.	=	1	in	8.57
4.	=	1	in	10.10	28.	=	1	in	7.87
5.	=	1	in	8.41	29.	=	1	in	6.89
6.	=	1	in	7.97	30.	=	1	in	6.81
7.	=	1	in	7.92	31.	=	1	in	7.09
8.	=	1	in	7.41	32.	=	1	in	7.58
9.	=	1	in	7.93	33.	=	1	in	7.86
10.	=	1	in	8.62	34.	=	1	in	7.75
11.	=	1	in	11.31	35.	=	1	in	7.42
12.	=	1	in	21.23	36.	=	1	in	7.53
13.	=	1	in	25.70	37.	=	1	in	7.69
14.	=	1	in	21.27	38.	=	1	in	7.46
15.	=	1	in	19.15	39.	=	1	in	7.45
16.	=	1	in	15.52	40.	=	1	in	6.79
17.	=	1	in	12.88	41.	=	1	in	6.57
18.	=	1	in	10.33	42.	=	1	in	6.54
19.	=	1	in	9.92	43.	=	1	in	6.45
20.	=	1	in	9.70	44.	=	1	in	6.43
21.	=	1	in	8.86	45.	=	1	in	7.41
22.	=	1	in	9.68	46.	=	1	in	10.37
23.	=	1	in	9.63	47.	=	1	in	14.77
24.	=	1	in	8.86	48.	=	1	in	27.60

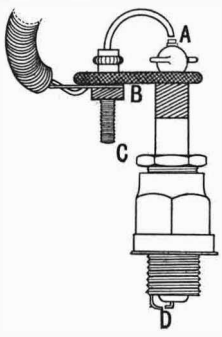
The numbers on the left correspond with those on the contour, and the figures on the right give the steepness of the hill between each pair of vertical lines.



Section of Sun Rising Hill, Edge Hill (continued from opposite page)

A SPARKING PLUG PHENOMENON. By A. J. Wilson.

I was recently using an external sparking gap appliance with a view to ascertaining the cause of missing in one of the four cylinders of my car, and I observed a phenomenon which is so contrary to all my preconceived ideas of the behaviour of the electric current that I describe it and invite explanations from readers more skilled in the science. The sketch illustrates a standard De Dion sparking plug, with the outside gap attached between it and the high tension wire terminal. The horizontal hatched line represents the fibre plate by which the terminal is insulated from the sparking plug, and the gap at A is where the current should jump across. As a matter of fact, the current did jump across in a continuous stream of sparks directly the accumulator was switched in to the circuit, and the stream of sparks displayed a pleasing brilliancy; but, to my surprise, I shortly observed a spark jumping across *underneath* the fibre plate, from the terminal to the brass mount of the sparking plug, the gap between the two metallic points, where I have marked the sketch B, being quite five times as long as the gap at A. This took place intermittently to the extent of perhaps one spark at B every two or three seconds upon an average. Sometimes a long series of sparks would thus jump at B, and then there would be a long interval without, whilst all the time the shorter spark was jumping at A. Not only so, but occasionally—at greater intervals—a spark would jump across from the bottom of the brass screw of the gap appliance, across the still wider gap at C, on to the iron body of the plug. What is the explanation of the current thus departing from the traditional "line of least resistance," I cannot imagine. The accumulator was not excessively charged, the maximum current shown being 4.1 volts. I thought that perhaps there might be internal resistance through the sparking ends of the plug being foul at D, and upon unscrewing the plug from the cylinder I found that it was sooted, although not very badly so, but when I had brushed off the soot and cleaned the points at D, and replaced the plug in the cylinder, I could not detect the slightest difference, the phenomenon proceeding as before.



A, insulated pole of sparking plug and external spark gap
B, vulcanite bridge.
C, terminals for high tension wire.
D, sparking points.

THE MOTOR UNION. The Advantages of Membership.

It is not convenient, desirable, or even possible for every automobilist in the United Kingdom to become a member of the Automobile Club of Great Britain and Ireland. Such membership would not serve the purposes or suit the pockets of a large majority, notwithstanding the desire to strengthen any protective association just now, when automobilists have every man's hand against them, and certain of the leading journalistic organs of the country have thrown wide their columns to suggestions that they should be shot on sight or summarily disposed of by other violent means. When a section of the community, perfectly law-abiding for the greater part, are threatened by the prejudiced and ignorant in high places, the time is indeed opportune for the closest form of protective co-operation. High and low, gentle and simple—all, indeed, who adopt in any wise the modern method of road locomotion—should toe the line, and aid in showing a united front to the foe. We hear our readers asking how this may be done, with the Automobile Club left on one side, and we answer unhesitatingly that *membership of the Motor Union* most satisfactorily fills the gap.

Much too little has been heard for a long time past of this body, which was instituted in order to enable those who do not wish to become members of the A.C.G.B. and I. to support an association which should stand towards automobilists very much as the Cyclists' Touring Club stands towards cycling in general and its own members in particular. The Motor Union has already performed much good work on behalf of automobilists, not only in defending, and aiding in the defence of, the victims of police traps, etc., but of obtaining the reduction of harsh and absurd tariffs imposed upon automobilists and their vehicles, such, for instance, as the late toll demanded for crossing the Thames by Maidenhead Bridge.

At the present moment, the Motor Union sheiters beneath the ægis of the Automobile Club, and is administered by the club officials; but if properly and thoroughly supported by the automobilists of this country, it should very shortly be rendered capable of standing alone and fighting the battles of self-propelled traffic, parliamentary and judicial, *à outrance*. The strength of a body like the Motor Union depends very largely upon the energy and personality of its secretary, and a secretary entirely of its own it has hitherto lacked. To-day it has the benefit of the services of Mr. W. Rees Jeffreys, who has already earned his spurs in connection with the excellent and valuable work he has carried out in the interests of all road users as the secretary of the Roads Improvement Association. Evidences of his connection with the Motor Union are already to hand, and because this association now appears to be taking form under its own specially-appointed officials we do now specially press the urgency of immediate membership upon every automobilist who is not already a member of the A.C.G.B. and I. or its affiliated clubs. A man who can afford a self-propelled vehicle, from a motor bicycle upwards to a 60 h.p. car, can and should afford a guinea for membership of the Motor Union. Such membership will afford him the following advantages:

(1.) The consideration of any claim for financial and legal assistance in respect of actions at law either civil or criminal in connection with automobiles.

(2.) The right to be consulted on general questions affecting the rights and privileges of automobilists, including legislative questions.

(3.) Information free of cost with regard to the best routes from place to place at home or abroad, and assistance in planning tours.

(4.) Information and assistance as to customs formalities and duties, and advice as to the purchase of suitable maps, guides, etc.

(5.) Admission to such functions organised by the Automobile Club of Great Britain and Ireland as may be prescribed from time to time by the committee of the club.

(6.) The occasional use of a committee room at the Automobile Club for the purpose of meetings, discussions, etc.

(7.) The benefit of a hotel system now being organised to secure suitable accommodation for automobilists and their cars in all towns in the United Kingdom at a moderate cost.

(8.) The benefit of a system now being organised to inform automobilists where they can secure, when on tour, proper garage accommodation, adequate supplies of petroleum spirit, and the services of competent repairers.

(9.) A copy weekly post free of the Automobile Club *Journal*—the organ of the Automobile Club of Great Britain and Ireland and of the Motor Union.

(10.) Information and advice generally in connection with automobile matters.

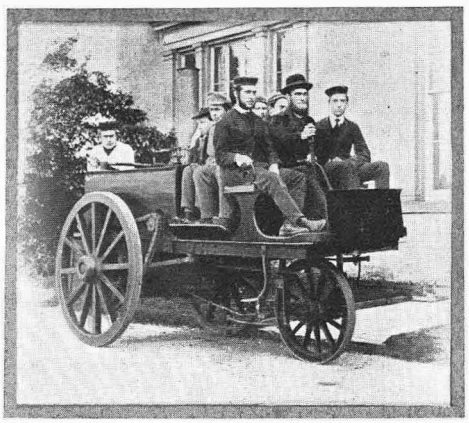
(11.) The right to wear the badge of the Motor Union.

(12.) Apart from these personal advantages, automobilists, by becoming members of the Union, help an organisation ever alert (a) to protect its members against the imposition of illegal bridge tolls and excessive charges for the conveyance of motor vehicles by rail; (b) to negotiate with local authorities for the improvement of the roads and the removal of dangerous corners; (c) to oppose public and private bills introduced into Parliament, and local byelaws embodying proposals restrictive of automobilism; (d) to improve hotel accommodation throughout the country; and, in short (e), to undertake that necessary public work on behalf of automobilism which can only be discharged by a strong and united body representative of all automobilists within the United Kingdom.

We think it should need nothing more than what we have stated above to persuade every automobilist to send along his guinea to Mr. Rees Jeffreys at 16, Down Street, Piccadilly, London, W., this being all that is necessary to ensure membership of that useful body the Motor Union.

A PIONEER VEHICLE.

The earlier efforts of engineers in the automobile direction are always interesting, and the illustrations which accompany this short description of one of these earlier vehicles will form, we are sure, a means of comparison between the ideas of the pioneers



A front view of the vehicle showing the passengers' seating arrangements and the steering lever.

in the movement and those of the present day. The steam carriage was made by Messrs. Rhodes, of Leeds, for the Rev. E. E. Mountfort, of Farnah Hall, near Derby, and used by him and his engineering pupils in 1868 and the following years. Various alterations were made in this curious vehicle from time to time in his own workshops, this being found necessary owing to the heavy wheels which were used. Most of the work in connection with the illustrations was carried out by Mr. Richard Muirhead, M.E., at that time an assistant mechanical instructor in the workshops and now a well-known engineer in matters relating to automobile construction. The power was supplied by a two-cylinder steam engine, the cylinders having a bore of 3¾in. and stroke 7in. Upon the crankshaft of the engine were carried two sprocket wheels, which connected up to the rear road wheels by means of chains. There being no balance gear, only one driving chain was used; but when they came on to a straight piece of road of any length, the other chain was put into action. The boiler was built of Low Moor iron, and was fitted with eighteen "Field" tubes. This was frequently worked up to a pressure of 100 lbs. to the square inch; but a lack of steam space and the jolting of the vehicle gave a tendency to prime very badly. Eight passengers were usually carried, and it is interesting to note that it was sometimes necessary to carry even more in order to obtain sufficient grip for the driving wheels upon the road to enable the vehicle to surmount the hills. Without the extra weight, there was not sufficient adhesion for the wheels, which used to fly round upon the road, throwing out showers of sparks and dust. The total weight of the vehicle was about

The engine, boiler, and tender of the steam vehicle.

30 cwts. The front steering wheel was operated by a vertical lever. The highest speed which the car ever attained was about twenty miles per hour, and this only over a short distance.

THE USE OF BRINE SOLUTIONS FOR COOLING PETROL ENGINES.

By S. F. Walker, R.N., M.I.M.E., etc.

Freezing mixtures and brine solutions are two entirely different things, though the freezing mixture usually becomes a brine solution after it has melted. A freezing mixture is a solid, and is a mixture of either snow or ice with some salt. The mixture is at the temperature of ice, and therefore below that of the atmosphere of the object to be cooled. The absorption of the heat by the freezing mixture first causes the ice or snow to melt, and to pass from the solid to the liquid state; and in so doing to absorb a certain quantity of heat—142 heat units for each pound of ice or snow melted. Ice is very often used without any addition, and its cooling power is then confined to the quantity of ice present. When the ice or snow is melted, it remains still at the freezing temperature, 32° F., until all is in the liquid state. Where only ice is employed, the temperature now rises, still cooling the surrounding atmosphere, but not to so great an extent; only, in fact, to the extent of the specific heat of water or one heat unit for every rise of one degree of temperature for every pound of water present.

Freezing Mixtures.

But when other substances are present, those known as being used in freezing mixtures, such as common salt, chloride of calcium, chloride of ammonia, hydrochloric acid, and other substances, a further action takes place, which lowers the temperature of the liquid finally formed still more. The ice or snow having been transformed into the liquid state is now able to dissolve the salts which are mixed with it. But the act of what we call solution is now known, in the light of the recently-developed science of chemical physics, to consist of the transformation of the solid which is dissolved into the liquid state; and for it to be able to accomplish this the necessary heat has to be found from somewhere. In all these cases, as is well known, heat flows from a higher to a lower temperature, and any substance requiring heat to accomplish certain transformations will take it from itself and from surrounding bodies, wherever the conditions necessary are present—that is, wherever a higher temperature exists. Hence the temperature of the solution is lowered by the quantity of heat necessary to convert the solid substance which is mixed with the ice to the liquid state. The heat necessary to transform the solid into a liquid represents a certain number of heat units. These are taken from the general mass of the liquid, and result in a lowering of its general temperature.

"Entropy."

It is here that a study of the word which has been so much squabbled about in the engineering papers lately would come in. "Entropy," the term in question, is the quantity factor where heat is the physical agent, the source of energy. The total quantity of energy in the form of heat present in any body is measured by the product of temperature and "entropy." When heat is delivered to a body, it may be expended in raising the entropy, in raising the temperature, or partially in both. Similarly, when heat is demanded from a body, the entropy may be lessened, or the temperature, or both. When the ice melts, the temperature remains constant; the heat delivered all goes to increase the entropy. When the solid passes into solution, it is the temperature which suffers, as the entropy cannot. Hence the very low temperatures obtained by freezing mixtures—as low as —91° F. Freezing mixtures are used in cold storage work for small services, such as the maintaining the temperature of small cold stores at a certain figure.

The Freezing Points of Solutions.

One method of making ice is to fill a number of ice cans, of the form the block of ice is to assume, with distilled water, and to immerse the cans in a tank which is filled with a brine solution. It is evident that one qualification of the brine solution must be the ability to remain in the liquid state after the water in the ice cans has been all transformed into ice, and hence its freezing point must be below that of pure water. The freezing points of brine solutions vary with the quantity of the salt in solution. Common salt and chloride of calcium are the two solutions commonly employed in refrigerating work, and of the two chloride of calcium is used very much more than common salt. In fact it is unusual to find common salt used for the purpose now. Taking the freezing point of pure water at 32° F., that of water with one per cent. of common salt is 31.8°, with five per cent. 25.4°, with ten per cent. 18.6°, with fifteen per cent. 12.2°, and so on. One per cent. of chloride of calcium reduces the freezing point to 31° F., five per cent. to 27.5°, ten per cent. to 22°, fifteen per cent. to 15°, twenty per cent. to 5°, and so on. But where these brine solutions are employed for cooling, another property must be taken into account. As the freezing point goes down, so does the specific heat, though not in the same proportion. Thus, taking the specific heat of pure water as 1.0, that of water with one per cent. of common salt is 0.992, with five per cent. 0.96, with ten per cent. 0.892, and with fifteen per cent. 0.855. With chloride of calcium a one per cent. solution has a specific heat of 0.966, a five per cent. solution 0.064 a ten per cent. solution 0.896, a fifteen per cent. solution 0.860, and a twenty per cent. solution 0.834. This means that, approximately, with a twenty per cent. chloride of calcium solution, while the freezing point is lowered to 5° F., or 27° freezing, its ability to carry off heat from the cylinder is reduced by about fifteen per cent.; or, in other words, if a brine solution is used in order to ensure that the cooling liquid shall not freeze, where provision has to be made for approaching these temperatures, an additional quantity of the cooling liquid must be circulated round the cylinder, other things being the same. Where large engines have to be cooled, it might be worth manufacturers' while to consider the possibility of cooling from a freezing mixture. Proper precautions would be necessary to prevent the very cold solution from approaching the cylinder; but the presence of a certain quantity of a freezing mixture, if it can be practically applied, should add to the possible mileage of the car.

CONTINENTAL NOTES AND NEWS.

The Ostend Meeting.

The programme of the Ostend meeting was a sort of "linked sweetness long drawn out" with each day set apart for a single event on the new automobile road skirting the canal between Nieuport and Snaeskerke, or else a tour through the old-world country of Flanders, or a driving competition on the Wellington hippodrome. The whole proceedings could have been got through comfortably in a couple of days if necessary, but the organisers were bent upon keeping the visitors at Ostend long enough to enable them to appreciate the charms of this holiday resort, and the automobilists who went to Ostend for the meeting certainly had no reason to complain. It was an enjoyable holiday, and the sport was interesting. The results of the ten kiloms. trial were given in our last issue. On the following Monday the five kiloms. trial from a standing start for touring vehicles took place, the cars being classed according to their price. No matter whether he started in the tourist or speed trials, the victory of M. Willy Poege on his 60 h.p. Mercedes seemed to be a foregone conclusion. In the one case he had his vehicle stripped, and in the other it was transformed into a comfortable tonneau; and, except on one occasion, when an amateur mechanician clung to his arm in fright, Mr. Willy Poege always came out triumphant. In the tourist trial he covered the five kiloms. from a standing start at a speed representing nearly sixty-five miles an hour.

Cars costing more than £720:
Willy Poege (Mercedes), 2m. 50⅘s.
Hautvast (Pipe), 3m. 39⅖s.
Stead (De Dietrich), 4m. 4⅘s.
Jean de Crawhez (Pipe), 4m. 4⅘s.
Meyan (De Dietrich), 4m. 22s.

Cars costing from £600 to £720:
Huet (Peugeot), 4m. 43⅘s.

Cars costing from £400 to £600:
Elskamp (Gobron-Brillié), 4m. 26s.
Declercq (Renault), 4m. 26⅕s.
Delesalle (C.G.V.), 5m. 2s.
Langlois (Vivinus), 5m. 6⅘s.
Tydgat (Pipe), 5m. 38⅘s.
Servais (Germain), 5m. 40⅘s.
D'Aubreby (Pipe), 6m. 2s.

Cars costing from £240 to £400 (four seats occupied):
Caillois (Gardner-Serpollet), 3m. 35⅗s.
De Liederkerke (Vivinus), 4m. 57⅗s.
Franchomme (Corre), 5m.
De Ridder (Gladiator), 5m. 6s.
Hombach (Vivinus), 5m. 21⅕s.
Poncelet (Vivinus), 5m. 22s.
Van de Velde (Vivinus), 5m. 27⅖s.
Blanc-Garin (Brouhot), 5m. 30⅕s.
Briffault (Vivinus), 5m. 44⅖s.
Joostens (Clément), 5m. 52⅕s.

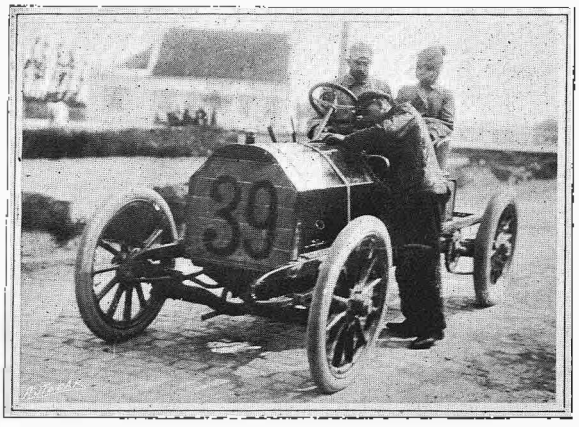
Cars costing from £240 to £400 (two seats occupied):
Legras (Passy-Thellier), 4m. 37s.
Montigny (Renault), 5m. 21⅕s.

Cars costing from £160 to £240:
Baras (Darracq), 6m. 25⅘s.

Cars costing less than £160:
De Liederkerke (Vivinus), 6m. 3⅘s.
Motte (De Dion-Bouton), 6m. 55⅖s.
Benot (De Dion-Bouton), 7m. 4⅕s.

The Third Day's Events.

The third day's meeting was devoted first of all to the reception of members of the A.C. du Nord, who had come by the new automobile route from Menin. There were nearly seventy vehicles composing this caravan. A lunch was given in their honour, when complimentary speeches were delivered extolling the Belgian Minister of Finance, who, with the active support of King Leopold, had constructed the great artery which was destined to facilitate automobile traffic between the two countries. In the afternoon was held the *concours d'adresse* at the Wellington hippodrome. It must be confessed that, so far, the general public had taken little interest in the speed tests, partly because the course was too far out of the town, and more particularly perhaps because it had not been sufficiently advertised. On the Wellington track, however, the fashionable crowd fully made up for their abstention from the purely sporting part of the programme. They took a huge delight in the embarrassment of the competitors, who found that the situation was not quite so enjoyable to them as to the spectators. It was the most worrying experience



Willy Poege on the winning 60 h.p. Mercedes. He covered the standing mile in 2m. 50⅘s.

they had ever gone through. First of all they had to steer in and out of an awkward maze with very sharp turnings, and then, after winding in and out of sticks stuck in the ground, they had to climb a bank with an incline of twenty-two degrees. Many of them had to make several attempts, falling back time after time, amid the uproarious laughter of the spectators. Once on the top they had to stop and test the brakes, and then continue over a winding course, when the competitor had to do a lot of things, such as catching a ring on a cane, avoiding explosible balls which went off as soon as they were touched, ringing bells, and crossing ditches on a couple of planks. Dummy figures on wires danced about in front of him, and had to be avoided, and finally he had to reverse on a most perplexing course with all sorts of turns and windings. Any forward movement was scored against him. The big cars with long wheelbase had not the slightest chance in such a test, where they had to be repeatedly turned in their own length, and the only competitor to come

out with a clean sheet was Baron Pierre de Crawhez, the winner of the Ardennes Circuit, who drove a small 8 h.p. Panhard car. The maximum number of points granted was one hundred, and he also secured the ten added for the fastest time, thus making one hundred and ten in all. The next best was De Beukelaer (on a 16 h.p. Vivinus), who scored ninety points, and then came De Liederkerke (Vivinus), Joostens (Clément), Jean (Pipe), and Huet (Peugeot), all with eighty-five points; Vernyet (Panhard), Baras (Darracq), and De Ridder (Gladiator), with eighty points; Teste (Panhard), with seventy points; and Rivierre (Pipe), Guders (Pipe), Motte (De Dion), Simon (Vivinus), and Beriot (De Dion). The procession of decorated cars was a great success, some of the floral designs being remarkably striking, the most noteworthy being the Panhard of Baron T'Serclaes de Wommersom, which was covered with orchids and red and white roses, while the motor bonnet was enshrouded in lilies. He shared the first award with M. Van de Velde and Demester, and Madame Van de Velde's car was also greatly admired.

The Mile Speed Test.

The mile test from a standing start between Nieuport and Snaeskerke was remarkable for the performance of Rigolly on his 110 h.p. Gobron-Brillié car, which started surprisingly well for such a huge machine. M. Willy Poege competed in the speed trials with his Mercedes, when he was stopped by his mechanician clinging to his arm, and then went back to Ostend to have a tonneau fitted, returning in time for the tourist competition. Stocks competed with his Napier, and tied with a De Dietrich for the fifth place in the category of big cars. The results for the standing mile were as follows:

Big cars:

Rigolly (Gobron-Brillié), 58⅘s.
Augières (Mors), 1m. 4⅖s.
Le Blon (Gardner-Serpollet), 1m. 7⅘s.
Amblard (Mors), 1m. 9⅗s.
Stocks (Napier), 1m. 11⅗s.
De Brou (De Dietrich), 1m. 11⅗s.
Hautvast (Pipe), 1m. 17⅗s.
Coppée (Germain), 1m 18⅘s.
Guders (Pipe), 1m. 20s.
Jean de Crawhez (Mors), 1m 35s.

Light carriages:

Baras (Darracq), 1m. 3⅗s.
Béconnais (Darracq), 1m. 4⅕s.
Hanriot (Clément), 1m. 9s.
Tavenaux (Gobron-Brillié), 1m. 15⅗s.

Voiturettes:

Villemain (Darracq), 1m. 21⅘s.
D'Hespel, 1m. 31s.

Touring cars costing more than £1,200:

Willy Poege (Mercedes), 1m. 7⅕s.

Cars costing from £720 to £1,200:

Hautvast (Pipe), 1m. 21⅕s.
Stead (De Dietrich), 1m 32⅕s.
Paul Meyan (De Dietrich), 1m. 42⅕s.

Cars costing from £400 to £600:

Langlois (Vivinus), 1m. 34⅕s.
Declercq (Renault), 1m. 39⅗s.
Mulders (Clément), 1m. 51⅕s.
Rivierre (Pipe), 2m. 9⅕s.
D'Aubreby (Pipe), 2m. 25⅗s.

Cars costing from £240 to £400:

Caillois (Gardner-Serpollet), 1m. 26⅕s.
De Liederkerke (Vivinus), 1m. 55⅘s.
De Ridder (Gladiator), 1m. 59⅕s.
Hombach (Vivinus), 2m. 0⅕s.
Brilfault (Vivinus), 2m. 0⅘s.
Franchomme (Corre), 2m. 5⅗s.
Van de Velde (Vivinus), 2m. 8⅗s.
Poncelet (Vivinus), 2m. 11⅘s.
Blanc-Garin (Brouhot), 2m. 19s.
Joostens (Clément), 3m. 23⅕s.

Cars with two seats:

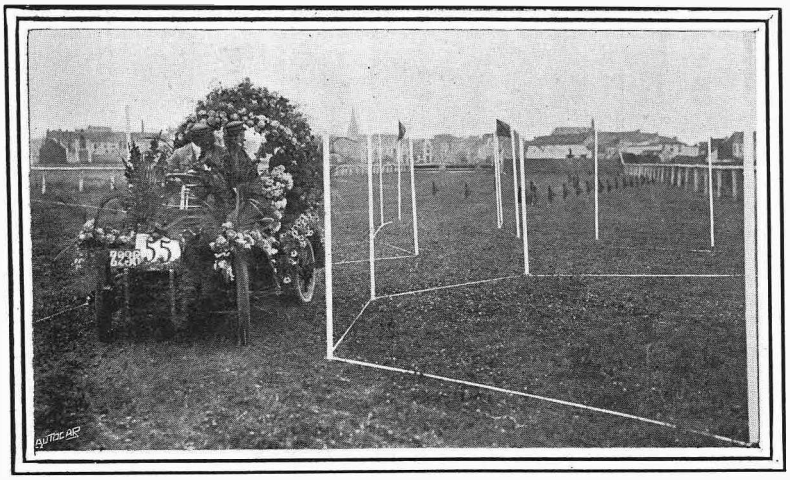
Legras (Passy-Thellier), 1m. 46⅖s.
Montigny (Renault), 2m. 5s.

Cars costing from £160 to £240:

Baras (Darracq), 2m. 35⅖s.

Cars costing less than £160:

De Liederkerke (Vivinus), 2m. 19⅕s.



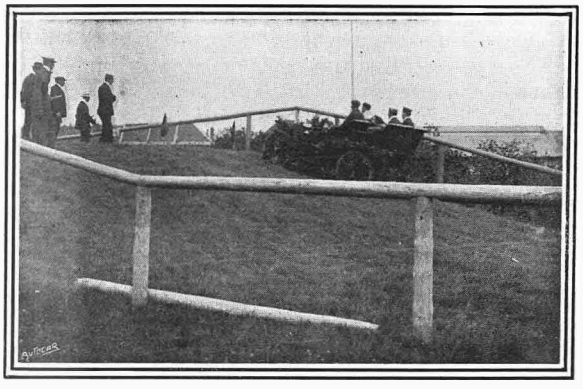
The gymkhana at Ostend. Driving backwards over a difficult course marked out by white sticks and flags, seen in the background.

The Flying Kilometre.

The Ostend meeting terminated with the flying kilom., when three world's records went by the board—one by Rigolly on his big Gobron-Brillié, and the others by Pilette on a De Dion tricycle in 43 2-5s., and by Sauvenière on a Clément bicycle weighing more than fifty kilos. in 32 4-5s. Rigolly's time of 26 4-5s., representing an average speed of nearly eighty-three and a half miles an hour, is one-fifth of a second outside Baron de Forest's record at Phœnix Park, but it is claimed here that this was done on a slight down grade, so that it is doubtful whether the record will be officially accepted. The record beaten by Rigolly is 29s., made by Fournier and Augières on Mors cars at Dourdan. The following are the results of the flying kilom. competition:

Big cars:

Rigolly (110 h.p. Gobron-Brillié), 26⅘s.
Duray (Gobron-Brillié), 28⅖s.
Jean de Crawhez (Mors), 29s.
Augières (Mors), 29⅖s.
Poege (Mercedes), 31⅕s.
Stocks (Napier), 31⅖s.
Amblard (Mors), 31⅘s.
Le Bron (Gardner-Serpollet), 32⅜s.
De Brou (De Dietrich), 33⅖s.
Hautvast (Pipe), 37⅘s.
Coppée (Germain), 38⅜s.
Guders (Pipe), 40⅜s.



One of the most difficult feats which the competitors in the Ostend gymkhana had to perform was to climb a very stiff graded bank of turf. Much amusement was caused to the spectators by the many failures which some of the competitors experienced.

Light carriages:
Béconnais (Darracq), 30⅘s.
Baras (Darracq), 31⅖s.
Hanriot (Clément), 34⅗s.
Tavenaux (Gobron-Brillié), 37s.
Théry (Decauville), 38⅗s.

Voiturettes:
D'Hespel (Corre), 48s.
Villemain (Darracq), 1m. 1⅕s.

Touring cars costing above £1,200:
Willy Poege (60 h.p. Mercedes), 33s.
Hautvast (Pipe), 38⅘s.
J. de Crawhez (Pipe), 44s.
Stead (De Dietrich), 44⅗s.
Meyan (De Dietrich), 52⅕s.

Cars costing £600 to £720:
Huet (Peugeot), 52⅗s.

Cars costing £400 to £600:
Langlois (Vivinus), 42⅗s.
Mulders (Clément), 49⅗s.
Declercq (Renault), 53⅗s.
Tydgat (Pipe), 1m. 8⅘s.
D'Aubreby (Pipe), 1m. 13⅗s.

Cars costing £240 to £320:
De Liedekerke (Vivinus), 57s.
Blanc-Garin (Brouhot), 1m. 20⅗s
Poncelet (Vivinus), 1m. 4s.
Van de Velde (Vivinus), 1m. 5⅗s.
Hombach (Vivinus), 1m. 7⅗s.
De Ridder (Gladiator), 1m. 7⅘s.

Cars with two seats:
Legras (Passy-Thellier), 59s.
Montigny (Renault), 1m. 9⅗s.

Cars costing £160 to £240:
Baras (Darracq), 1m. 19⅗s.
Trentelivres (Deschamps), 1m. 47s.

Cars costing less than £160:
De Liederkerke (Vivinus), 1m. 12⅗s.

The general classification was obtained by adding the times of the standing mile to those of the flying kilom., which gave the first dozen as follows:
Rigolly (Gobron-Brillié), 1m. 25⅗s.
Augières (Mors), 1m. 33⅗s.
Baras (light Darracq), 1m. 35s.
Béconnais (light Darracq), 1m. 35s.
Sauvenière (Clément bicycle), 1m. 40s.
Le Blon (Gardner-Serpollet), 1m. 40⅗s.
Amblard (Mors), 1m. 41⅗s.
Stocks (Napier), 1m. 42s.
Hanriot (light Clément), 1m. 43⅗s.
De Brou (De Dietrich), 1m. 45s.
Lamberjack (Griffon bicycle), 1m. 50⅘s.
Tavenaux (Gobron-Brillié), 1m. 52⅗s.

The De Laffrey Hill-climbing Trials.

After the inderdiction of the climbing test of La Turbie, it was considered very doubtful whether permission would be obtained for running off the other hill trials which are such an important feature in the season's programme. Fortunately, the A.C. Dauphinois are able to announce that they have secured sanction to organise their annual trials on the De Laffrey mountain road near Grenoble, which will take place on August 9th. The speed cars will be divided into the usual four categories, and the touring vehicles into three categories, with engines of one, two, and four cylinders, and carrying two, three, and four passengers respectively. These cars will have to be driven by their owners, who must be members of recognised clubs. There will also be a class of omnibuses carrying fifteen passengers or their equivalent, representing a load of 900 kilogs. A certificate will be awarded for each vehicle climbing the gradient in less than twenty minutes, representing an average of nineteen kilometres an hour. The programme will include the kilometre climb for the De Cater's cup, which, it will be remembered, could not be competed for on La Turbie, and it has been transferred, therefore, to the De Laffrey meeting.

THE INTERNATIONAL AUTOMOBILE CONGRESS.

(Continued from page 103.)

Cylinder Cooling and Lubrication.

In their report upon the cooling of explosion motors MM. Grouvelle et Arquembourg said that it was necessary to the understanding of this question to consider the causes which may increase or diminish the quantity of heat transmitted by the gas to the cylinder walls. In the first place, this quantity varies according to the dimensions of the cylinder, the volume of gas being constant. The loss of heat is practically proportionate to the area of the cylinder walls divided by the volume. There is, however, no proportion between the loss of heat and the number of explosions, since with the increased speed the gas is not so long in contact with the walls and is not cooled to the same extent. All things being equal, a compression which raises the temperature, without the temperature of the cylinder walls being augmented at the same time, means a greater absorption of heat by the cylinder. There are other causes of absorption, such as bad carburation and the existence of scale or fur in the cylinder head. This latter is often due to insufficient cooling, and should be particularly avoided. In radiating the heat from the cylinder it should be remembered that there is an interest in keeping the temperature as high as possible without decomposing the lubricating oil. The oils generally employed cannot stand a temperature of more than 350 degrees Cent., and experience has proved that this point is not exceeded by keeping the water at a temperature of 80 to 100 degrees. This is, unfortunately, not the case with the valves, which work best at a low temperature, when they allow of the admission of a larger volume of gas. This seems to imply that the water should enter the jacket around the valves so that these latter would get the benefit of the low

temperature. Some makers have even suppressed the jacket around the cylinder and merely circulate the water around the valves. The same result can be obtained by varying the dimensions of the jacket, but care should be taken to ensure a circulation of water as active and regular as possible. Moreover, the same water should be used over and over again as a means of preventing the formation of scale or fur, and for this reason the radiator should be designed to avoid any loss of water. MM. Grouvelle et Arquembourg then described the systems of circulating water, and gave a preference to the rotary pump, which they think should be driven by gear for low speed pumps and by friction for high speeds. In considering the radiator, the authors of the report state that their efficiency depends upon the difference between the temperatures of the air and water, the speeds of the water and air, and the form of the cooling surface. To fulfil these conditions they use radiating tubes of copper, to which the ailettes are either welded or pressed on to secure a perfect contact. This contact between the ailettes, or flanges, and the tubes is absolutely essential to their efficiency. In conclusion, they refer to the honeycomb radiator, which they say has a greater cooling power than the older form of flanged tubes, but its construction is very delicate, and while it is almost impossible to avoid leakages, it is very difficult to repair them.

Some Cooling Experiments.

M. Forestier said that some experiments had been carried out with cooling engines at the laboratory of the A.C.F., and they found that when the water entered cold at the bottom of the cylinder there was less power than when it entered at the top. He also remarked that at the last Automobile Show one maker exhibited a motor in which the cylinder was cast with a great mass of metal, the inventor claiming that the metal radiated the heat quite as efficiently as water. This was so paradoxical that the judges regarded the invention as something of an absurdity. The motor, however, was taken to Vincennes, when it ran for several hours, and its behaviour was in every respect satisfactory. We may remark that in 1900 Herr Pollak suggested that the water jacket with its complication of tank and radiator might be avoided by casting the cylinder with a great mass of metal, but at that time it was supposed that the mass of metal would be inconveniently great, so that any advantage it might gain in simplicity would be counterbalanced by the weight. Continuing the discussion, M. Arnaux said that logically the water should enter the cylinder at its hottest part, that is to say, around the exhaust valves, which are always bathed, as it were, in very hot air. The cooling of the valves had a great influence upon the running of the engine.

M. A. Loyal presented a note on his new radiator, which may be described briefly as consisting of two large tubes or collectors connected by a large number of small vertical tubes with the usual corrugated ailettes or flanges. The object of this arrangement is to offer as big a cooling surface as possible by means of the small tubes, while any friction due to their small diameter is avoided by the use of the collectors.

Beconnais breaking record for light cars on a Darracq. He covered 10 kilometres in 5m 23s. See "The Autocar" of July 18th, page 100.

Various Motors.

M. Gerard Lavergne reported upon the various kinds of motors utilising compressed gas, liquid air, carbonic acid, ether, and acetylene, and gave his reasons for believing that they had not the slightest chance of ever being made suitable for road vehicles. He advised inventors not to waste their time upon experiments with these different engines in the hope of adapting them to automobiles. He described in detail the Diesel petroleum engine, which he believed would in time be modified to allow of its being used for automobiles. In the discussion that followed, M. Arnaux said that one of the causes why the Diesel engine has not been adapted to the automobile is that it needs a great flywheel, and requires a great initial effort at starting. M. Forestier thought that these objections could be overcome by using a four-cylinder motor.

Electric Vehicles.

The subject of electrical vehicles was dealt with by the second section under the presidency of M. Hospitalier, when the proceedings were opened by the report of M. Lavezzari upon lead accumulators. Taking as his text the resolution of the previous congress urging the necessity of "carrying out an enquiry as to the advisability of employing heavy and durable accumulators or light batteries which deteriorate more rapidly," M. Lavezzari said that nothing had been done to solve this question, since the carriage builders themselves had not provided sufficient room in their vehicles for heavy batteries. Consequently, the light accumulator was in almost general use. Then summarising the progress made during the past three years, M. Lavezzari said that in the report of M. A. Bainville at the congress of 1900 the minimum of weight of lead batteries per kilowatt hour was stated to be sixty-five kilos. At present the batteries used by one of the Paris cab companies weigh only 55·3 kilos. per kilowatt hour, thus showing a diminution of fourteen per cent., and another claims even better results with a much lighter battery of greater durability, but as M. Lavezzari did not have time to control the figures they were not given in the report. Another point in M. Bainville's report of three years ago was his advocacy of light and relatively slow charging batteries. His opinion was generally approved

of by the congress, though M. Pollak thought that it would be preferable to employ heavy rapid charging batteries. The batteries to-day are all slow charging, because nothing but lead accumulators are employed on carriages. For a battery weighing ten kilos per cell the charge usually begins at twenty amperes and terminates at five amperes, and the discharge rate is thirty ampères. The results as regards capacity are not very good, and this is due solely to the fact that the batteries are too light for the work. As rapid charging is not possible on account of the restrictions imposed upon the makers of accumulators by the carriage builders, the only other point remaining in the suggestions of M. Pollak is the rapid charging of batteries, but here again the fault rests with the carriage builders, who have paid little or no attention to facilitating the removal of batteries.

The Durability of Batteries.

As to the durability of batteries, M. Bainville said in 1900 that batteries not exceeding thirty per cent. of the total weight of pleasure carriages and thirty-five per cent. of the weight of cabs and industrial cars, which represented sixty-five kilos per kilowatt hour, were capable of supporting seventy discharges. Experience has shown that the batteries constructed nowadays only lose twenty-five per cent. of their capacity after one hundred discharges. This may be taken as the average. In the very light batteries the positive plates will only stand eighty to ninety discharges. It is found that the negative plates will last three times as long as the positive plates, but with each change of positive plates the capacity of the battery diminishes. The upkeep of accumulators then claimed the attention of M. Lavezzari, who said that the mechanical manufacture of plates had a great influence upon this question. A workman can prepare 700 plates by mechanical means in eleven hours, whereas by hand he can scarcely turn out eighty in the same time. It is easy to imagine how this difference in the cost of manufacture affects the maintenance of accumulators. The directors of two electrical carriage companies in Paris state that the daily expense does not exceed 4.50 francs a battery. M. Lavezzari thinks that this is rather low, but his experience with a large number of vehicles over a long period shows that the daily cost certainly does not exceed 5 francs or 5.20 francs even under the most unfavourable conditions, always supposing, of course, that the batteries receive proper attention. In conclusion, M. Lavezzari said he did not think that the plates had undergone any notable improvement during the past three years, except in the sense that they had profited from a greater skill and experience in their preparation. Some makers had endeavoured to augment the capacity and solidity of the plates by increasing the porosity or improving the method of fixing the peroxide to the grids or enclosing the peroxide in a porous envelope. They claimed that this last device gave excellent results, but the users found that the batteries of this type very soon lost a good deal of their capacity. Nevertheless, M. Lavezzari was convinced that the electrical carriage in its present form fulfilled all the requirements of a town service and also for country residents, and for these purposes he considered that it was preferable to the petrol car.

The Cost of Upkeep.

In the discussion that followed, M. Lavezzari insisted upon the importance of mechanically preparing plates, as he believed that the cost could be reduced to such a figure that the upkeep of an electric carriage would ultimately be much less than that of a petrol vehicle. It was upon this that depended the future of the electrical carriage. Herr Pollak said that the carriage-builders ought to give more attention than they did to the designing of vehicles which would allow of plenty of space for the batteries, and also provide means of facilitating their removal. He thought that something should have been said about the economy of regenerating batteries, as this was done with no other cost but the current. M. Lavezzari replied that, unfortunately, in Paris the current was dear.

Types of Accumulators.

M. Georges Rosset presented a long report upon "Electric Couples," in which he dealt theoretically with the different types of accumulators. He said that he had himself succeeded in preparing a special oxide of lead, which gave to the accumulator more than three times the capacity obtained with ordinary oxide. The manufacture of accumulators necessitated the purest oxides, which could only be procured from very pure lead in furnaces heated with wood. It should not be confounded with minium and litharge. The grid had received a great deal of attention from makers, who had tried to secure the greatest possible lightness, some of them by employing aluminium coated with lead; but this gave unsatisfactory results, owing to the facility with which the coating of lead was eaten through by chemical reaction. The forms of the grids were also of infinite variety, most of them being particularly suited for special purposes; and for this reason it was not possible to have one standard type of grid for all conditions of work. In conclusion, M. Rosset had something to say about the loss of power through transmission from the electric motorshaft to the driving wheels. Owing to the relatively small capacity of the batteries, it was highly necessary to economise the energy as much as possible, and when experiments showed that from eight to ten amperes were consumed in turning the wheels of an electric carriage raised from the ground, it was evident that there was plenty of room for improvement in this direction.

M. Hospitalier regretted that M. Rosset was not in a position at that moment to give fuller details concerning his accumulator, for the results claimed to be obtained by the new method of preparing lead oxide were remarkable. He could only hope that something more would be heard about the new accumulator before long. M. Arnaux remarked that there could be no doubt that pure lead was best; but it should be compressed so as to mitigate the saturation of the plate when it is peroxidised all the way through. Herr Pollak pointed out that there was a tendency to roll or compress plates, but he had tried this and every other possible device to overcome the objections to lead, and had failed to get satisfactory results.

It would seem that Prof. Worby Beaumont's statement that "discovery and not invention" is what is required still holds.

(To be continued.)

Correspondence.

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

THE ABUSE OF THE MOTOR HORN.

[3053.]—Would you open your columns to a complaint which, I think, has not been considered fully enough by the powers that be? I refer to the motor horns, occasionally very powerful, used on a large number of ordinary bicycles. This use causes such callousness on the part of the public that it is becoming a crying evil, for people expect a motor when they hear the horn, but instead a bicycle passes (with some youth of fifteen riding it probably), and when a car does come along no notice is taken of it. In France this has become such a nuisance (*i.e.*, the abuse of the motor horn) that legislation is being considered to prohibit the use of the horn by any vehicle except a motor car or motor bicycle. As new legislation is promised for motors over here, could not this point be raised? It seems to me to be somewhat important. I am a user of a motor car, a motor bicycle, and an ordinary bicycle.

7 H.P. PANHARD.

A ROADSIDE INCIDENT.

[3054.]—The enclosed photographs were taken during a recent tour in North Wales, and their explanation may be of interest to you.

I had just arrived at the summit of a long and somewhat steep hill about three or four miles out of Dolgelly on the Aberdovey road on my 9 h.p. Renault, and was waiting for Mr. William E. Moss (honorary secretary of the Liverpool Self-propelled Traffic Association), who was ascending the hill slowly behind me on his Baby Peugeot, when an old farmer passed me driving his wife into town. Although my engine was running, the horse did not even so much as look at the car as it passed by me, and great was my astonishment at seeing the farmer as he passed by Mr. Moss stand up in his cart and slash furiously at him with his whip, though, fortunately, without doing him any harm.

Such an unprovoked assault, however, was not to be passed by unnoticed, and I immediately jumped down from my car and ran after the man, followed at a short distance by Mr. Moss, and summoned him to stop, but instead of doing this he merely treated us to a sample of strong language.

We therefore determined to leave the "Baby" in a field, and run back to Dolgelly on my Renault for a police officer, knowing that our man could not very well escape us.

In the first photograph will be seen the superintendent of police of Dolgelly seated beside me on my car, and delighted with his first spin on a motor car; and in the second our honorary secretary and the superintendent endeavouring to impress upon the farmer that even though he were "afeared of his life and of his wife's life, and was of opinion that one should not ride in those ——— things" (to use his own words), this does not, in the eyes of the law, constitute a defence for an unprovoked assault.

The menace of a police court summons soon brought the farmer to his knees, for he turned out to be a well-known person in the neighbourhood, and was not at all anxious to appear in court in answer to such a charge; and on his offering, at the instance of the superintendent, to make a handsome apology and give his word never again to molest a motorist, Mr. Moss, with great magnanimity, consented to withdraw the summons.

It is interesting to note in the second photograph the manner in which the horse is calmly grazing at the roadside, although the engine of the car was left running to prove to the superintendent how unprovoked the assault was.

VIVIAN A. SIMON.

A CORRECTION.

[3055.]—We have had our attention called to a slight inaccuracy in our letter of the 11th inst. by Messrs. The Gas Lighting Improvement Co., Ltd. The word "American" should be omitted, as, of course, petroleum spirit is obtainable as a distillate from oil wells in several other parts of the world.

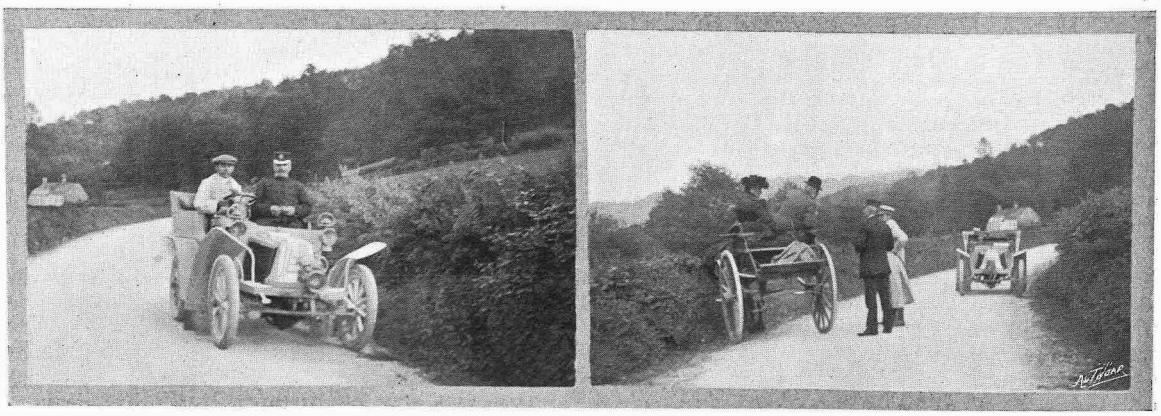
THE LANCHESTER ENGINE CO., LTD.

DIRT IN PETROL.

[3055.]—Before using my last car we had the tank well washed, first with a weak solution of carbonate of soda and after with clean water. The soda has the effect of neutralising and dissolving any acid that might remain after the soldering. I never found the smallest trace of rust coming from this tank. I do not attach much importance to this experiment, as the tank may have been exceptionally clean to begin with. Ammonia should not be used to neutralise soldering acid in a tank, as it may form double salts, which are more or less insoluble.

Some tanks are comparatively clean. I did not cleanse the tank of my bicycle in any way, and I have only found exceedingly minute quantities of verdigris to come from it—not sufficient to affect the carburation in any way. The nozzle of the carburetter is, however, somewhat larger than usual. A friend bought a motor bicycle and he had so much trouble on account of rust coming from the tank that he sold it and purchased another. He says he strained the petrol carefully. A short time ago he brought his bicycle to my house and it was found that the petrol tube was choked. The tube was coiled in a vertical plane in the centre. It was impossible to pass a wire without straightening the tube. The tube was held in the gas for a few seconds until the coil was nearly red hot. When cool I blew through it and it was all right. I never could understand why petrol tubes are coiled vertically. The coil forms a splendid trap for collecting sediment where it cannot be conveniently removed. When we got the Argyll it had the usual large coil in the petrol tube. My son straightened and shortened the tube. I have a great dislike for superfluous matter which is of no earthly use and is only in the way.

Fine linen makes very good filter when placed over the carburetter and when the head of petrol is fairly high, but it should not be used under the carburetter when the petrol



A roadside incident. Police to the rescue. See letter above.)

has to pass up through it. Linen has a greater affinity for moisture than it has for petrol. Petrol purified contains a very small trace of moisture. The linen filter after being in use for a few days becomes saturated with moisture, and a film of water envelops and stretches between the threads, the surface tension of water being very high when brought into contact with petrol, and the consequence is the film of water prevents the petrol blowing upwards in a regular and constant stream, and the carburation is erratic and unsatisfactory. The linen when first used, or after being dried, may act all right for the first few days, and the motorist may have some difficulty in finding out the cause of the mischief.

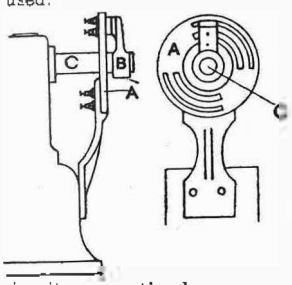
The firm in London who delivered the wrong machine to my son poured into the tank two gallons of dirty petrol, and the inevitable result followed. It is rather surprising that at that time dirty petrol was being sold in London at one and sixpence and clean petrol retailed in Dublin at one and threepence. It is hardly necessary to say that petrol, though apparently clean, should always be poured into the tank through a suitable strainer, and the strainer or tundish ought to be kept in a clean box and not exposed on a shelf where it would be liable to collect or scoop up dust.

J. B. DUNLOP.

AN OLD TYPE ELECTRIC IGNITION.

[3057.]—In the article on the Goodson igniter Mr. Dolnar mentions the Lenoir engine as having flame ignition. This is not correct so far as it relates to the Lenoir engine made in England at the then Reading Ironworks.

In this engine electric ignition by means of primary batteries and a rotating wiper circuit make and break were used.



A flat annulus A of vulcanite about ¼in. thick surrounded the engine crankshaft and was carried by a bracket fixed to the engine bed plate. Upon this were segments of brass to which binding screws were connected. Upon the end of the crankshaft C was a boss B with a short arm faced with vulcanite and a wiper of brass. This completed the circuit across the brass segments twice at each revolution of the engine which was double acting like a steam engine.

I was engaged in the construction of these engines during my apprenticeship, and remember very well many of their features and ignition troubles, and also the practical jokes played by means of the batteries upon the unsuspecting labourers when picking up harmless looking tools left purposely on the floor—with wires attached.

Some of the smaller details of the ignition coil and ignition plugs I cannot now recall, although I could probably recognise them, but it is a long time since I saw any of them—in 1866-7.

W. WORBY BEAUMONT.

THE SAFETY OF TURNING CORNERS.

[3058.]—It is often observant to me that many fellow motorists do not recognise wherein the main factor of danger and safety come into calculation at the turning of sharp corners in country roads. I venture to suggest that a few comments in your columns upon this subject would serve a useful purpose.

It should first be recognised that the main feature of turning a corner is the camber of the road, viz., the amount of rise the surface of the road has at the centre; upon this largely depends the limit of safety and freedom from excessive strain to the frame and wheels of the car.

For example, take a sharp curve to the right with the car traversing the left-hand side of the road; this necessarily means the maximum of strain, hence a necessity to slow down. This is felt on the steering wheel by a hard drag of the road wheels inclining in themselves to take a reverse direction.

The inexperienced or thoughtless driver feels this, and steers against it, but it often happens that he only feels it when too late, when he has too much speed and momentum on the car for the rotundity of the road, whereas an observance and understanding of the incline of the road would cause him to anticipate the curve as he approached it, and control his speed accordingly, thus avoiding the strain and risk he unknowingly runs into.

To maintain a good speed round such a curve gives two alternatives—the first to see his way clear and cut close in, thus keeping the high surface of the road at the outside of the circle, and the drop of the road at the inside, which lends itself to the laws of gravity and minimises risk and strain. This, however, is bad form, as it is against the rules of the road, and should not be practised.

The other is, to run into danger of straining wheels, axles, and frame, the first of which strain comes upon the tyres, hence the quick turning of right-handed corners whilst traversing the left-hand side is courting disaster. This, quite apart from the risk of collision or annoyance to approaching traffic.

As to left-handed curves with a good surface fall of the road from the centre to the sides, giving the car a lean towards the centre of the curve, a fairly good speed can be maintained with the minimum of risk or strain.

I think such of your readers as may be interested in this subject will do well to notice the incline given in ratio to curves on all well engineered railroads, and to apply this to their driving of cars. The circular bicycle track, for instance, prepared for speed, and the natural incline that a bicycle takes in rounding a corner which is now common knowledge to everybody, is the ideal incline for a motor car or other vehicle, and its shortcoming of this in practice should be compensated for by the slow rate of speed.

Not only does this apply to safety, but also to durability and life of a motor car in general, and in its component parts.

You will doubtless recognise with me that it behoves all drivers of cars to use good clear judgment of the individual conditions of every corner, and to manipulate their clutches and steering wheels accordingly, which will be a source of great comfort and satisfaction to parties, both in the car and on the road, and will conduce to less frequent accidents whilst turning corners.

WM. ROPER.

WHAT IS WANTED.

[3059.]—We note on page 93 of your last issue, embodied in an interesting article entitled "What is Wanted," some very practical comments upon the advisability of using very strong tyres for cars, and making up for loss in resilience in the tyres by using softer springs to the road axles, and also fitting springs to the cushions and to the backs of the seats.

We are particularly interested in your remarks, as we have been ourselves working in the same direction, and have from the first fitted heavy car tyres, very soft springs, and springs to the seats and backs.

We may say that we feel amply justified by the results, the cars being most comfortable to ride in.

J. R. RICHARDSON AND CO., LTD., LINCOLN.

THE L.A.C. AND AFFILIATION.

[3060.]—As a member of the Lincolnshire Automobile Club I have read with interest the letter of our energetic secretary in last week's issue of *The Autocar*.

The majority of our members, I am assured, consider with me that the only objects of the L.A.C. are (1) to further the cause of automobilism and (2) to give opportunities for social meetings where questions that interests automobilists alone may be discussed.

For these objects many of us object to pay a subscription of more than one guinea, and if the A.C.G.B.I. takes half of this it leaves our finances so crippled that it is impossible for the club to carry on its work properly.

The Automobile Club Journal we would willingly do without. It appears to me to be an excellent advertising medium for certain firms that build "racers," but to the ordinary motorist it is useless. When will automobilists see that it is racing on public roads that more than anything else upsets the peace of mind of the poor old "British Public"?

I hope the provincial clubs will come into line and get the parent body to accept lower terms for the so-called privileges of affiliation, otherwise I feel sure many clubs will cut themselves adrift from the A.C.G.B.I., and if our own club does not many of the members have assured me they will be compelled to resign their membership.

W. F. MILLER, M.B.

LEGISLATION: SOME PERTINENT QUESTIONS.

[3061.]—What is there about motor cars and motoring which appears to deprive those who do not drive or own a car of that level-headedness which they usually possess or may reasonably be expected to possess? From Lord Rosebery, through magistrates, county councils, and law courts, down to the humble policeman, any reasonable and fair consideration of the question of motor legislation seems unattainable. Why is this? If the motor car is the infernal machine its opponents suppose, scattering death, damage, and danger in its headlong uncontrollable course, surely the police or some other department has a record of accidents, fatal and otherwise, due to it; and if so, why does no one demand the production of such records? If a car is not what its enemies paint it, then let us authoritatively know it. Knowledge of the truth, whichever side it may be on, is both desirable and necessary.

There seems to be very few real grounds for this opposition. One is undoubtedly fear, arising from ignorance. The general public picture a high-powered car as a terrible engine which is bound to run over and probably kill them if they happen to be on the same road with it, being quite ignorant that it is a far more controllable machine than a fast and high mettled horse or horses. The alarm of the horn (which, by the way, is rarely blown soon enough) completes their confusion, and if an accident does happen, although they have themselves to blame, everyone knows upon whom in nine cases out of ten the blame is saddled.

Fear, too, is the cause of many of the accidents and troubles with those driving horses. In the first instance, the driver thinks his horse *must* shy, and dropping his usual style of driving with the reins on his horse's back, he suddenly catches hold of his horse's mouth, and if not in a "funk" himself tries for once to *drive* his horse past the motor. But he has already alarmed the horse and the car does the rest. Many people with cars have expressed their desire to lend their cars for horse training purposes in their own neighbourhood, but their offers have almost without exception met with no response on the part of horse owners! Is this also reasonable?

Dust is another ground of opposition, and it must be admitted to be a real one. Motor owners have no monopoly of the road any more than have horse owners, and so long as our roads are what they are, motorists ought not to assume the right to make themselves a nuisance. But this is obviously a matter which can hardly be put right by statute law, as roads vary every few miles and every day.

What is the remedy for these things? Well, I confess I do not think there is any remedy by legislation which will prove effectual. You cannot make people bold or competent horse drivers by law any more than you can make some motor drivers gentlemen by law. Yet that is the real root of the matter. Unfortunately, the worst offenders are the professional motor drivers (call them what you like), and taking them all round they do not seem to be at present a very desirable class. But why do their employers permit them to drive as they do?

Now, as regards the present and proposed legislation, why cannot, or should not, motors be treated the same as horse carriages with such modifications as are reasonably required? It may be quite right to register and mark (but *not* conspicuously and ugly) each car purely for purposes of identification, but it is quite unreasonable to ask that private carriages should be destroyed by conspicuous numbers or marks painted in the most obvious place. It is quite absurd to suppose every car is going to make a bolt of it when summoned to stop. Here is where that absence of level-headedness comes in of which I complain, as it also certainly will with the policeman when conspicuous numbers are compulsory, and as it certainly is now with a great many magistrates before whom these cases may come.

It may be right also that one in charge of a horse should have the right to stop a car by holding up his hand, but it would be reasonable also to compel horse owners to break their horses to motors. In nine cases out of ten this can be done, and the tenth case must find other work if it cannot be done. If a man buys a hunter and finds his purchase cannot gallop or jump, or is a nuisance in the field, that horse has to find more suitable employment and does. Why not with the harness horse and motors? Every horse owner knows the nuisance bicycles were when they first became so common, but now no horse pays the least attention. The same thing will no doubt happen with motors as they get more numerous.

It cannot, however, be right to impose such monstrous limits to the fines for reckless driving. There must be some reason for such action, but certainly none has been given. What has the wealth of the car owner got to do with it? It used to be the boast of Englishmen that the law is the same for all. What is this but a law against the rich? All motor owners are not wealthy—far from it. I maintain that unless a good case can be made out from actual facts of past experience to show that motors are more dangerous than horse vehicles, they should be classed as one with horse vehicles in the matter of reckless driving. It is all very well to say these are the *maximum* penalties, but if anything is certain it is that experience has shown, first, that policemen are keen on motor cases, true or false, and, second, that many magistrates when they get a motor case lose their balance and inflict as near the maximum penalty as possible—at any rate, a far greater penalty than would have been inflicted in the case of a horse vehicle. Why is this?

Licensing professional drivers is, I think, not unreasonable, with the penalty of endorsement or withdrawal, but it is to be hoped magistrates will be careful in accepting evidence, for if it were to be a matter between a policeman and a driver without corroboration it would go hard with the driver in the meantime. But if there is to be no test of skill, what is the object of licensing private drivers (call them amateurs if you like)? A man may start a coach and team without knowing a horse from a cow, why not a motor? He may, if he likes, kill himself and his friends foolish enough to go with him, and in both cases he knows what will happen if he kills anyone else. Surely the penalty good for the one should be good enough for the other.

What is wanted is more considerateness on the part of motor drivers, which you will not get by Act of Parliament, and more level-headedness on the part of legislators, magistrates, police, and horse owners.

A. MELVILLE WHITE.

THE MOTOR LAUNCH RACE.

[3062.]—I am amused to see Messrs. Simpson-Strickland's letter in last week's *Autocar*. They may be able to build a boat quicker than any other builder, but why did they not send their 30ft. launch to Cork if, as they say, she is the fastest boat of her size that has ever been built?

I should very much like to see their boat *average 23.6 miles* for half-an-hour, or practically the time it took to cover the course at Cork.

No doubt their boat might be the faster for *one mile*, but I am quite sure Mr. F. A. Beadle will be only too pleased to race his boat after he has got her tuned up against Messrs. S. S. and Co.'s boat. I have heard that Mr. Cross's objection to racing at Cork was that he was not allowed to carry three men.

I had the pleasure of steering Mr. Edge's launch in the race, and Mr. Linton Hope tells me the *average speed works out at 21.4 knots*, which I think is an excellent result for an experimental boat which had only been run five or six days before the race. The "Napier" ran over the course eight times in all, and at the finish of every heat I turned her at full speed and ran back to the start, keeping her going as hard as she could possibly go, and the motor was practically running full speed for *four hours*, and nothing was touched all the time.

Now I want to see Messrs. S. S. and Co.'s launch run *full speed* for even *one hour*.

E. CAMPBELL MUIR.

Flashes.

"Shaitan gharry" is the Indian appellation for a motor car.

* * *

A peculiar case was recently heard at Chichester in which the driver of Mr. H. J. Preston, of Brighton, was charged with driving a motor car to the common danger of the public. It was proved that the car had broken down, and had only been patched up sufficiently to get it home at the time a horse collided with it, and it was shown that it could not possibly be driven at more than five miles an hour. After witnesses had testified to speeds of forty odd miles, the magistrates very properly dismissed the case.

* * *

A patent has been taken out in England, America, and on the Continent for a two-stroke petrol or paraffin motor by Mr. T. Kelley, of Sutton Road, Southend-on-Sea. Mainly, the motor is constructed on the same lines as other internal combustion engines, the principal exception being the absence of the exhaust valve, the functions of which are performed by the piston itself. The operations of the motor are as follow: When the piston is at the top of its stroke, air is taken into the crank chamber on the down stroke through a non-return valve. This charge of air is compressed, so that it passes through to the cylinder, where it is mixed with petrol or paraffin injected into the combustion chamber past a needle valve by the air pressure in the crank chamber. On the up stroke of the piston this charge is compressed and fired. Before the piston reaches the end of its travel it uncovers a port through which the burnt gases escape. Then, directly the gases are approximately clear, a fresh charge is passed into the cylinder and the operation repeated. There are several engines running on this principle in America, the only point of difference between the Kelley motor and these being the manner in which the fuel is injected. Using an engine with a 4in. by 5in. cylinder, and running at 500 revolutions per minute, Mr. Kelley obtains 4½ h.p., which is capable of being increased up to 1,500 revolutions per minute, which, we are told, the engine will stand easily. One special feature which we should mention is that the engine may be converted to a four-cycle type by the single movement of a lever. If the two-cycle engine is superior to the four-cycle type, why make it convertible?

* * *

The British Motor Fittings Co. have opened an office and showroom at 23, John Bright Street, Birmingham, and placed the same under the management of Mr. F. W. Carpenter. There, samples of their various manufactures, engines, gear cases, steering gears, side levers, wheels, etc., can be seen.

"THE AUTOCAR" DIARY.

July 25.—Wolverhampton & District A.C. Drive to Stafford.
" 25.—Winton-Fournier Match, New York.
" 25.—Midland A.C. Hill Climbing Competition at Sun Rising Hill.
" 31-Aug. 5.—Yorkshire A.C. Camp between Bridlington and Scarborough.
Aug. 1-3.—Kent A.C. Drives to Folkestone and Charing.
" 1-3.—Cheltenham and Gloucester A.C. August Tour Monmouth, Abergavenny, Usk, and Tintern.
" 1-3.—Wolverhampton & District A.C. Week-end Tour. Shrewsbury and Llangollen.
" 5.—Winton Fournier Match, Cleveland.
" 8.—Lincolnshire A.C. Drive to Grimsthorpe Park.
" 8.—Wolverhampton and District A.C. Drive to Kinver.
" 8.—Scottish A.C. (Western Section). Drive to Biggar.
" 8. Sheffield and District A.C. Drive to Matlock Bath.
" 12.—Cheltenham and Gloucester A.C. Drive to Bourton-on the Water.
" 15.—Kent A.C. Drive to Sevenoaks.
" 15. Lincolnshire A.C. Drive to Skegness.
" 16.—International Races, Switzerland.

The Southport speed trials which were to be held on the 24th and 25th of this month, have been postponed until later on in the year, as, unfortunately, these dates clashed with the Liverpool summer race meeting, and also there is the club quarterly one hundred miles trial for one of the days in question.

* * *

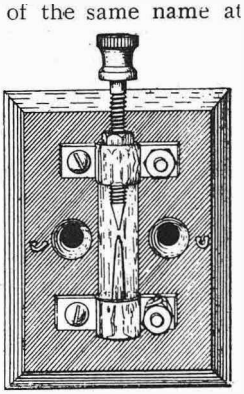
The managing directors of the Grand Hotel at Bournemouth have just completed a motor garage, which has cost nearly £6000. Mr. H. J. Preston informs us it is fitted with every up-to-date improvement, that accumulators can be charged, and that a mechanic is always in attendance. We must congratulate him and his co-directors on their enterprise and foresight. Of course, it is only a matter of time before every hotel is fitted with garage accommodation the same as each now is with stabling for horses; but those who recognise this early deserve every credit.

* * *

The following cutting from a Consular report upon Italy should be of interest to British manufacturers: "Motor cars are gradually superseding the ordinary means of conveyance in Rome. The only difficulty which seems to retard the general adoption of this more modern and expeditious system of locomotion is the high price of the machines. Up to the present motor cars have been mainly supplied by France, Belgium, and Germany; but if a fairly good British car could be placed on the market, costing not more than what is now paid for the same article originating from the above countries, a permanent market might be secured."

* * *

The accompanying drawing illustrates a neat little spark intensifier known as the "Intensicator," and manufactured by a syndicate of the same name at 473, Battersea Park Road, S.W. The instrument consists of two brass caps, a piece of glass tube, and an adjustable screw. The glass tube is held between the brass caps, which are screwed to a baseboard, and are further provided with terminals for the high tension wire. In the bottom cap is fixed a pillar carrying a platinum point, while the top cap is provided with a similarly tipped adjusting screw and lock-nut. The whole is covered with a wooden box cap, into which a square hole has been cut opposite the sparking gap, so that the spark is always under the driver's notice. It is impossible, of course, for anything to catch fire with the spark so well enclosed.



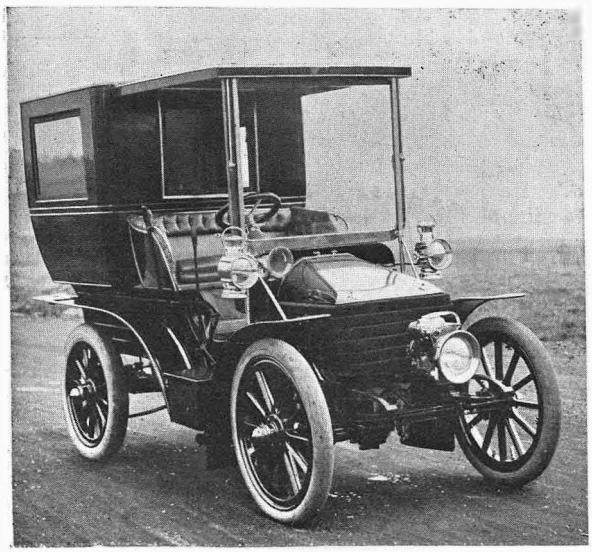
The War Office has just ordered from Messrs. Stirling Motor Carriages, Ltd., of Granton Harbour, Edinburgh, two 24 h.p. Stirling petrol lorries to carry three tons each.

* * *

The Leeds Corporation Tramways Department, which appears to be a most progressive section of the corporate government of that city, have used a motor car for the last eighteen months for the transport of their tramway inspector and manager. Being desirous of acquiring another motor vehicle, they have tested several well-known types of cars, and have ultimately pared their selection down to three carriages. After having given each of these cars a month's trial, their choice for ultimate purchase has fallen upon a 12 h.p. Clément car, and the order for the vehicle was placed a day or two since with the Northern Motor Co., who are the Leeds agents for the Clément cars.

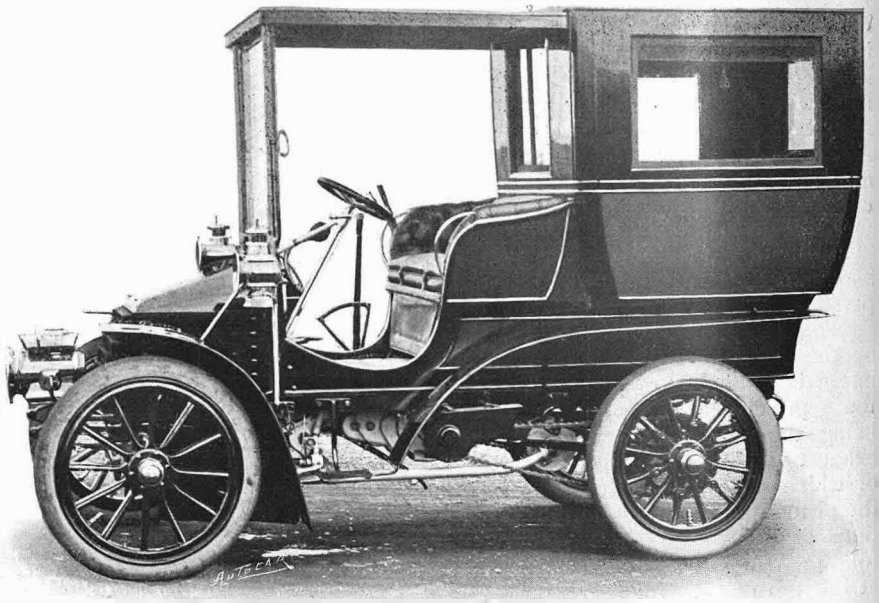
* * *

Mr. O. H. Bayldon, who bought an 8 h.p. Siddeley car at Easter, tells us that he has driven it well over 2,000 miles without a single roadside stop, except for three punctures. He has added mechanically-operated valves to the engine, and has put a De Dion inlet valve on the air supply, which was formerly closed. This gives more air when the engine is running fast, as the extra suction opens the valve. There is no doubt that the car pulls excellently, as it was driven from Bath to Shrewsbury with five on board as well as luggage on four gallons of petrol at a good telling average speed. Our correspondent uses Bowley's spirit of .700 specific gravity, which he finds very satisfactory.



H.R.H. Prince Louis of Battenberg's 10 h.p. Wolseley.

Mr. Jas. Fryer, of High Street, Kington, Herefordshire, has a new motor garage and repair shop. There has undoubtedly been a real want for convenience of this kind both for tourists and local owners, Kington being upon the main road from London to Aberystwyth, and a long way from the centres of motor manufacture.



H.R.H. Prince Louis of Battenberg's 10 h.p. Wolseley. The illustration below gives a front view of the same vehicle which is of standard type except for the body. The back and front portions are detachable so that it can be used either as a closed, half closed, or entirely open carriage.

We have received a copy of the new Ducellier motor lamp catalogue from the sole agent, Mr. André A. Godin, of 9, Little Jane Street, Gray's Inn Road, London, in which the various fine motor lamps by this well-known maker are beautifully illustrated and described. We are also informed that from the 1st of July Mr. Godin became the sole and exclusive agent for Dinin accumulators in the British Isles and Colonies, and that owing to the large demand for these well-known accumulators in this country, a branch of the Dinin business is now open in London.

* * *

Apropos of the difficulty experienced by a correspondent in obtaining less than two gallons of petrol at Brighton, which we announced could be overcome by applying to Mr. Hammond, of 3, Waterloo Street, Hove. The manager of the Old Ship, Brighton, to which no less than three separate garages are attached, writes us to the effect that he is willing to supply Pratt's or Carless spirit in any quantity from a pint upwards, and makes a point of affording facilities in this direction to motor cyclists. The three garages attached to the Old Ship Hotel will accommodate altogether sixty cars, and are provided with two inspection pits 12ft. × 10ft. long and 5ft. × 4ft. 6in. deep respectively, fitted with electric lamps. The garages are also provided with charging apparatus for accumulators. Petrol, oils, and accessories are stocked, and attendants are on duty day and night. The Old Ship is the headquarters of the Automobile Club of Great Britain and Ireland, and the Automobile Clubs of France, Belgium, and Germany.

The Bristol Automobilia, of Victoria Street, have opened a new establishment in a central position in that city.

* * *

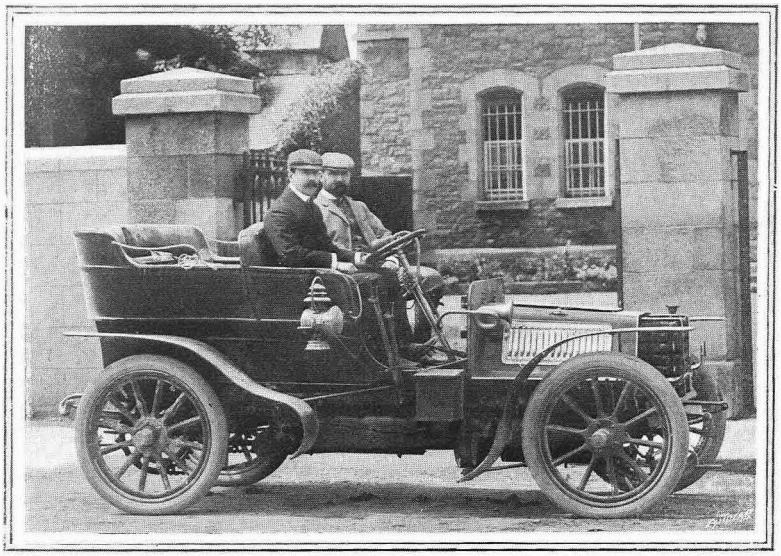
One of the latest purchasers of Lanchester cars is the Marquess of Anglesey, who is very pleased with his new carriage, and is at present touring with it.

* * *

The defence was successfully raised at St. Neots that agents of the Crown, when acting as such, could not be proceeded against for furiously driving motor cars.

* * *

Some consternation was caused in Lincolnshire on Friday, when it became known that the county police were to take action against motorists. As this is so contrary to the broad-minded spirit hitherto observed by the Lincolnshire police, our Lincolnshire representative made careful enquiries, and as a result we are pleased to say that it is only in flagrant cases that action will be taken. Speed up to twenty miles an hour on open roads will not be objected to, but known offenders must expect attention. Complaints have been made from certain districts, notably the Newark Road, and the unfortunate record attempt by a fast car near Lincoln appears to have at last roused the authorities to action. Those who drive carefully and with consideration have little to fear, but the one or two reckless ones may expect trouble if they do not alter their ways. It is therefore to be hoped that this warning will result in the spirit of the law being kept, and then the letter of the law will be disregarded. It is, of course, of no use insulting the police by telling them that the legal limit is not exceeded, for they know better, and the man who tries to make them believe that he does not exceed the same may expect trouble. So far as we can learn there were no traps on Saturday on the occasion of the meet of the Lincolnshire A.C. at Asgarby Hall on the invitation of Mr. G. Godson, and probably the notice sent out by the honorary secretary—Mr. E. Cragg, M.D.—had an effect.



Mr. Alfred Burgess on his 20 h.p. M.M.C. car which took part in the Irish Fortnight. Photographed outside the Court House, Naas.

The Lanchester Engine Co. ask us to draw attention to the fact that they are in no way connected with the Lancaster Garage, of Lancaster Gate. The great similarity in the names will probably lead to some confusion, and to avoid mistakes it is well to point out that one is spelt "Lan-chester" and the other "Lan-caster."

* * *

The Golden Fleece. On a recent Saturday the Reigate County Bench turned an honest penny by conveying £43 plus alleged costs from motorists who had ridden within the R.C.B.'s jurisdiction. A few days after the Newbury Bench, apparently noting the ridiculous ease with which substantial sums could be secured in their special line of business, managed to net about £80 from the same source.

* * *

We are informed that the judges have discovered an error of ten seconds in the timing of Mr. Scott Montagu's 22 h.p. Daimler car in the Castlewellan hill-climbing trial. It appears that the time should read 53 1-5s., in lieu of 63 1-5s., which will thus place Mr. Scott Montagu's car at the head of its class. We are somewhat concerned to know how "judges" came to discover errors of timing. Such errors surely should have been discovered by the timekeepers. In sporting circles other than those connected with automobile events, judges do not interfere with timekeepers' duties.

* * *

It is reported that the makers of the Oldsmobile are declaring ten per cent. monthly dividends, and that they have paid off seventy per cent. of the capital stock to shareholders during 1903. It is also stated that the total output for the twelve months will be 12,000 vehicles. We give these figures with reserve, particularly the last, as 1,000 cars a month, even if they are small ones, take some building. In any case, there is no doubt that the firm is prospering.

* * *

Owing to the military manœuvres which will be in operation on the dates originally set down for the 1,000 miles trials, these have now been postponed a fortnight, and will now take place on Tuesday, 15th September, to Friday, 25th September. The manœuvres above mentioned will necessitate the absence of a number of the judges, and many military gentlemen who had expressed desire to attend the trials as possible purchasers and observers.

* * *

Automobilists who are interested in steam propelled vehicles should not fail to obtain a copy of the catalogue of the Chief British Depots of the Chaboche, Gardner-Serpollet, and new English Serpollet steam cars. This is a very interesting compilation, and deals with several parts of the cars in detail. It also shows many types of the finished cars. The catalogue can be obtained by addressing a postcard to the Chief British Depot, 94, Victoria Street, Westminster.

The three-wheeled 10 h.p. Duryea which took first prize in Class C in the Pœnix Park speed trials.

His Majesty King Edward VII. is taking over to Ireland with him both his 22 h.p. Daimlers, upon which he is expected to make several short tours during his stay in that country. The Daimler Co. are just forwarding to Lord Londonderry at Castle Stewart a large 22 h.p. Daimler fitted with waggonette body. It is also expected that this car will play a part in the tour.

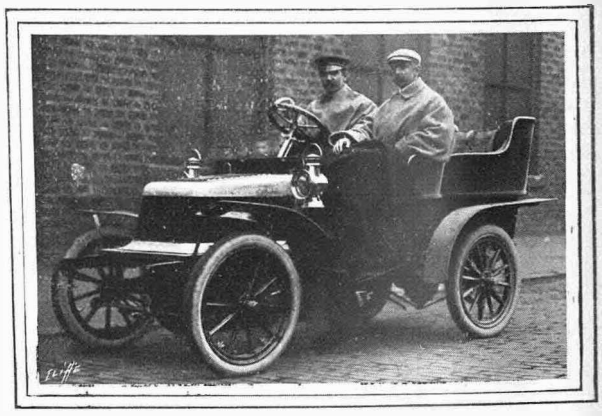
* * *

We learn that the cars of the American team competing in the Gordon-Bennett contest were fitted with the Goodrich Clincher tyres, the only double tube tyre of this make used in this country. As the Dunlop patent has not yet expired, these tyres were permitted to be used for the race and speed contests only. Directly the Dunlop patents expire the Goodrich Co. intend putting their tyres upon the market. They have been manufacturing them for some time past, and a large proportion of the cars now running in the United States are fitted with Goodrich Clincher tyres, which, according to reports received, give great satisfaction.

The Motor Car Depot, of Liverpool, inform us that the illustration appearing on page 100 of *The Autocar* of July 18th depicts Professor Hele-Shaw driving a 24 h.p. Darracq up the hill at Castlewellan, and not the car stated.

* * *

The Royal Lancashire Agricultural Show, which is to be held at Manchester from July 30th to August 3rd, will not be without interest to automobilists, as Messrs. Joseph Cockshoot and Co., Ltd., of Manchester, are showing there the Northern Silent petrol car, the Stanley steam car, Velox, Rex, and Clément cars.

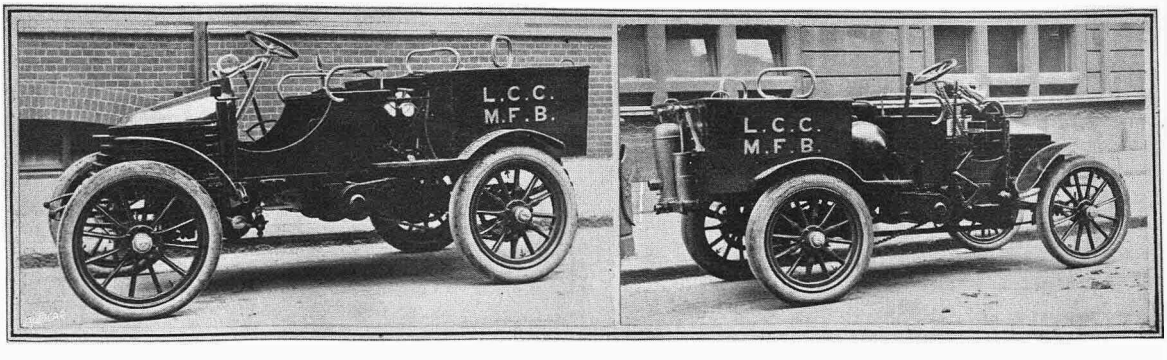


Mr. Alex. Govan and Mr. E. Hall Brown upon the 10 h.p. Argyll car which was erected under the novel circumstances detailed in "The Autocar" of the 4th inst., page 24.

CLUB DOINGS.

Yorkshire A.C.

The committee of the Yorkshire A.C. are making arrangements for a camp on the East Coast of Yorkshire, between Bridlington and Scarborough, for week-end extending from July 31st to August 5th. It is intended to erect large dining-room, drawing-room, kitchen, motor car store, and also bell tents for sleeping. Accommodation is being arranged for ladies as well as gentlemen, and during the stay a gymkhana will take place, and runs and tours will be arranged to various places of interest in the locality. The field occupied will run quite up to the cliffs, and, if possible, bathing tents will be provided for gentlemen who may wish to make use of them. The firm which undertook the catering arrangements during the recent visit of the club to Ireland will also be responsible on the occasion referred to.



"First aid" motor fire engines. These were first introduced to the public by Capt. Wells at the Metropolitan Fire Brigade's annual display on Clapham Common. The engines are of the carbonic acid gas type, and are fitted to standard 10 h.p. Wolseley chassis. In addition to the chemical engine the equipment includes scaling ladders, hose, and other details. Owing to the speed at which the machines can travel they will be despatched immediately on receipt of a "call," as they can easily distance either the ordinary steamer or the escape. The vehicles, of course, are finished in "fire engine" red.

THE SOCIETY OF MOTOR MANUFACTURERS AND TRADERS.

A meeting of the members of the Society of Motor Manufacturers and Traders was held in the Chapter Room of the Hotel Cecil at 5.30 on Monday evening last. As a very short notice was given very few members put in an appearance. Mr. Simms, who at six o'clock took the chair, after expressing his regret at the slender number of gentlemen present, mentioned that as they were all without doubt aware that a new bill was proposed—the intention of which was to improve the lot of motorists in general, especially if the bill were supported by influential people in favour of the automobile movement, among whom he especially mentioned Lord Mayo—motorists might hope for better treatment. The Chairman also expressed his opinion that the speed limit should be entirely abolished, and though England was a free country, cars should carry numbers, as some restriction should be brought to bear on reckless drivers. Mr. Simms, continuing, said that there were undoubtedly some objectionable clauses in the proposed bill to which he must draw his hearers' attention; a memorial had been drawn up to be presented to the Prime Minister, Lord Balfour of Burleigh, and Mr. Walter Long, which plainly showed the feelings of the society in the matter. In conclusion he was happy to be able to state that the financial position of the society was good—if they had to fight they had the means.

As soon as the Chairman had finished speaking, those present discussed the wording of the memorial among themselves, and the meeting was continued in quite an informal manner. At the close of the discussion, the members agreed to forward the memorial.

THE MOTOR CARS BILL.

The House of Lords went into committee on the Motor Cars Bill for the first time on Friday evening, the 17th inst., and continued on the following Tuesday. The Earl of Morley was in the chair.

Reckless Driving and Registration.

Notwithstanding the number of amendments proposed and the lengthy discussion ensuing, clauses 1 and 2 referring to reckless driving and registration were passed as framed.

Licenses.

Lord Balfour of Burleigh moved that licenses should be granted only to persons residing in the area of council granting same. Amendment agreed to. Earl Rosslyn's amendment that council should have power to withhold or cancel driver's licence if *in their opinion* applicant or owner had no practical knowledge of the method of driving a car was, after some childish remarks on the part of certain noble lords, defeated by 52 votes to 37.

Appeal.

The amendment of the proposer giving right of appeal to Quarter Sessions on the part of persons whose licenses had been suspended was agreed to.

Driver's Duties.

The Earl of Camperdown sought to make it obligatory upon the driver of any motor car to stop and give such assistance as he could to a passer-by or his horse or vehicle to whom an accident had happened. The noble earl failed to set out whether such accident was due to the motor car or not. Lord Balfour of Burleigh suggested that this was making the path of the good Samaritan statutory. Amendment withdrawn.

Horse-power.

Lord Kelvin desired regulations to prevent the use of dangerous motor cars on the public roads whether their danger consisted of imperfect mechanical construction or excessive engine power, but Lord Balfour contended that it was impossible to make this proposal effective, and that though Lord Kelvin suggested the removing of the tyres of the car and the application of a special brake to determine the horse-power, and looked with horror on the prospect of the public being deprived for a single month of the present slight protection, the amendment was withdrawn.

Speed Limit.

Apropos of Lord Tweedmouth's amendment that the speed of a car in populous places should not exceed twelve miles an hour, Lord Balfour agreed to accept the following words on the understanding that they should be modified if it appeared necessary after consideration: "Section 4 of the principal Act (which relates to the speed of motor cars) is hereby repealed, provided that within any limits or place to which that section is applied by regulation made by the Local Government Board with a view to the safety of the public, on the application of the council of any county or county borough, the speed of any motor car shall not exceed ten miles an hour." Carried.

Motor Bicycle and Trailer Attached.

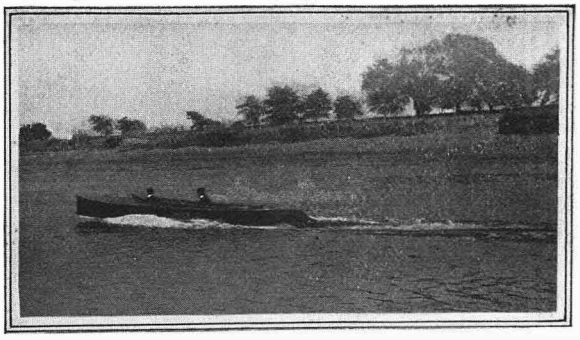
It is proposed that the Bill shall be made to cover vehicles of this class.

The Bill was then passed through committee and reported to the House, Lord Balfour of Burleigh intimating that it was desirable that the measure should be sent to the House of Commons this week.

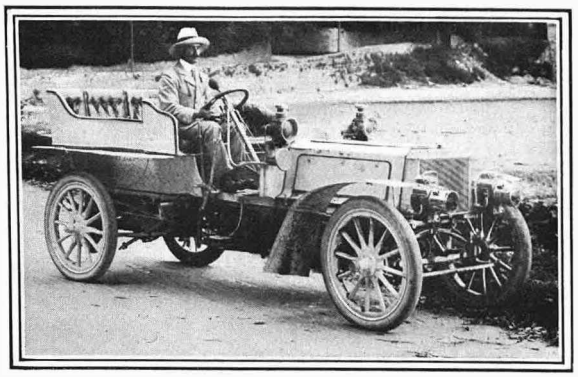
POLICE TRAPS.

Since the publication of the map in our last week's issue, showing police traps in various parts of the country, we have been advised by readers of the following, which will all be indicated on our next map:

A measured furlong leaving Slough towards London; a series of traps on the Great North Road between Stamford and Grantham, the positions of which are being constantly changed by the police; the Newark side of Gonerby Hill, two miles from Grantham; at Bagshot, entering from Camberley side, and level crossing at Sunningdale Station; at Weybridge, traps laid daily; at the bottom of John o' Gaunt's hill entering Leeds; between Norbury and the fountain at Croydon, two measured quarter-miles; between the church at Horley and the Gatwick racecourse; on the Sevenoaks Road between Bromley and Green Street Green; on the Addiscombe Road, Croydon; hill at Stonebridge approaching from Coventry, also between Berkswell and "George in the Tree"; on the road between Lincoln and Newark, several traps; between Atherstone and Lichfield; at the foot of a hill between Merstham and Redhill; from York to the New Inn on the Tadcaster Road (six miles) a series of constantly changing traps; at Dringhouses, two miles from York, a measured piece at the corner of a bye-road leading over the railway bridge; and in the straight which commences after leaving Old Windsor for Staines.



The 30ft. racing launch, built and engined by John J. Thornycroft and Co., Ltd., of Chiswick, which won the "Yachtman's" cup and came in second in the "Harmsworth" cup race at Cork. Below we give a sectional elevation of the boat showing its general arrangement.



Mr. J. W. Cross on the new 20 h.p. Humber, with which he won the speed trial in Class E in the Phoenix Park trials.

RELIABILITY TRIALS.

Tandem Tricycles and Quadricycles to be included.

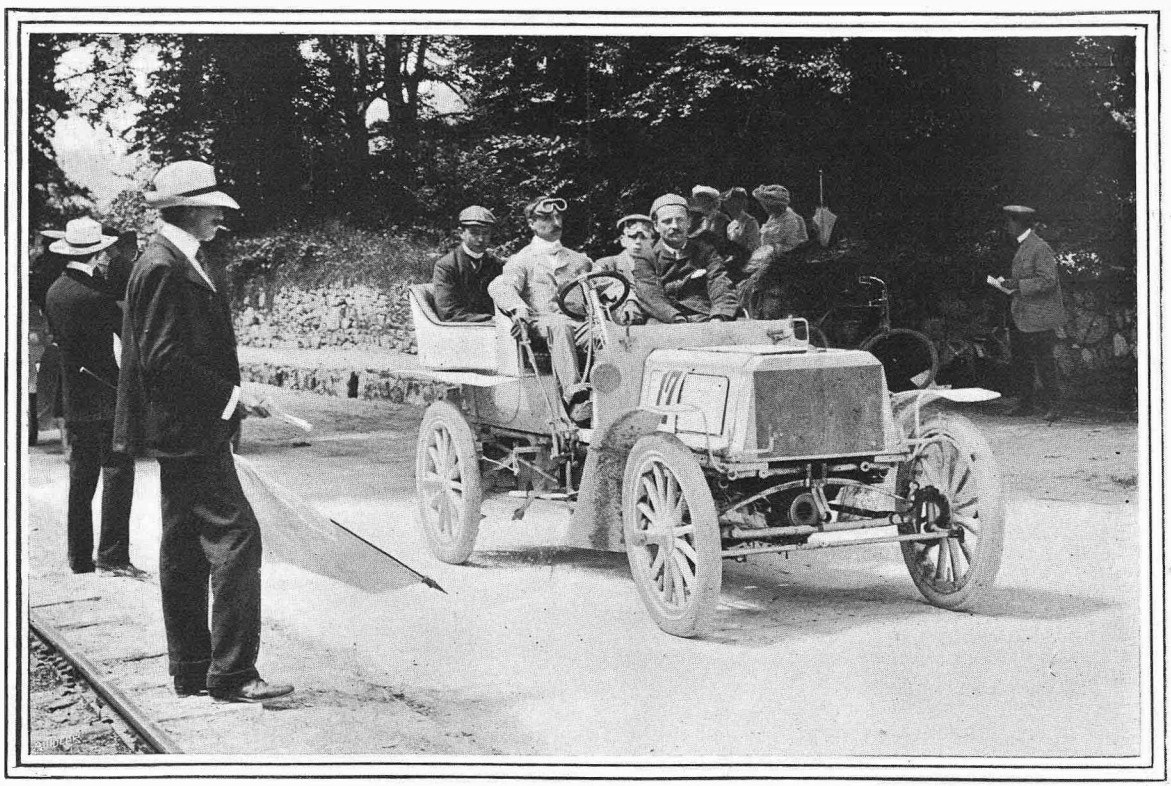
It has been decided to institute a new class in the forthcoming reliability trials for cars to be held from September 15th to 26th next. This will be known as Class A1, and all machines exceeding the 170 lbs. weight limit, such as tandems and quadricycles, and similar two-seated vehicles, will be eligible for this section. These are debarred from the motor cycle trials in August on account of weighing more than 170 lbs. The class A1 will not be restricted to tandem and quads, as the definition to qualify for it is weight not to exceed 7 cwts., and price not above £160.

THE GERMAN AUTOMOBILE CLUB AND THE GORDON-BENNETT RACE.

The following tribute to the excellent arrangements made by the Automobile Club for the Gordon-Bennett race has been received by the chairman of the club from Prince Ratibor, president of the German Automobile Club:

"I have already taken the opportunity to express by telegram our pleasure and thanks upon the occasion of the Gordon-Bennett race, and I now take this further opportunity to do so in writing and to give renewed expression to them. Thanks to the excellent arrangements and organisation of your club this important event has been brought off quite smoothly and without hitch; and, if we and in particular the German industry, look back with pleasure and pride upon our victory, this is to a very great extent due to the excellent arrangements and valuable work which you, Mr. President, and your members have carried out.

"Our esteemed patron, Her Imperial Highness the Grand Duchess Anastasia of Mecklenburg-Schwerin, has particularly entrusted me to send you and all your collaborators her most sincere thanks. I join in this in my own name, and in that of the whole of the German Automobile Club, and at the same time express the hope that in the future it may often be our pleasure to co-operate with you and your club in our mutual aim—the furthering of the automobile sport and the automobile industry."



The 20 h.p. Humber on which Mr. J. W. Cross won the Henry Edmonds cup in Class E, of the Phoenix Park speed trials. The above illustration depicts Mr. Cross about to start in the speed trials at Cork.

SOME REPLIES TO QUERIES.

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

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

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

CUBIC CONTENTS.

I should be glad to know what this term means in regard to the cylinders of motors. I take it that it is arrived at by getting the bore and stroke of the engine, but do not quite understand its real significance. Please explain in the simplest possible manner, as I am not a mathematician or an engineer.—J.G.

Perhaps the simplest explanation of the term may be given in the following manner. We will assume that the maker of an engine is told that the cubic content of his cylinder shall not exceed one pint, *i.e.*, that when his piston is at the bottom of the stroke there shall be only room for a pint of liquid in the cylinder, or rather the portion of the cylinder swept by the piston in each stroke. This means that only so much explosive mixture (petrol, gas, and air) can be got into the cylinder at each suction stroke of the ordinary four cycle engine. If the piston were a pump it would displace one pint of liquid at each stroke. But while we say to the maker, the cylinder shall not hold more than a pint we leave it to him as to whether he will have a tall thin pint, *i.e.*, a long stroke engine with a small bore, or a short fat pint, *i.e.*, a short stroke engine with a big bore. A regulation of this sort applied to any competition between motors leaves it to the individual maker to adopt whichever type of engine he prefers, and it would of course tend to settle a question which is not at present by any means definitely decided, and that is the best all round ratio of bore to stroke. The consensus of opinion at the moment, so far as automobiles are concerned, may be said to favour the equalisation of bore and stroke, or a stroke only slightly greater than the bore, but there is another school which believes in the bore being very much greater than the stroke, and still another which considers the possibilities of the long stroke, small bored engine have not been properly exploited.

WIRING AND STARTING TROUBLES.

(1.) In testing an accumulator on a motor bicycle we find that it gives four volts, but when testing at the contact breaker it only shows 3.8. Does this show resistance from bad connections, or is there a leakage? (2.) I can easily start my own car when it is cold, but after driving for a bit when it gets hot it is most difficult to start. I have got a Longuemare carburetter, and no matter how rich I make the mixture I find great difficulty in getting it to start. What would likely be the cause of this? (3.) If an accumulator on a small De Dion car was fixed under the back seat near the engine and gears, it would do away with wires to the front of car, but I want to know would the heat do the accumulator any harm?—P. and S.

(1.) The difference in voltage between the accumulator and the contact breaker shows a high resistance in the circuit. See that all the terminals and connections are perfectly clean and then test again. No more than one point should be lost in resistance if everything is in order. If after cleaning the terminals the voltage still shows 3.8 it must be concluded that the wire itself is bad, and this should be replaced with other wire of ample dimensions and particularly good insulation. (2.) The difficulty in starting the car after having run it some time is probably due to slight sticking of the inlet valve if this is automatically operated. It would not in any degree be a question of the quality of the mixture, but is either due to the before mentioned cause or to the spark not being effective, *i.e.*, that after having worked for some time and then having stood for a few minutes, the thick lubricating oil, being in a liquid state through the heat, is liable to run over the contact points of the contact breaker and to cause trouble at that point. If after cleaning the contacts the engine is still difficult to start it may safely be put down to the inlet valve. (3.) It is always as well to carry accumulator and coil as near to the engine as possible, as this shortens the lengths of wires used, but on no account should they be placed sufficiently close as to be affected by the heat of the engine. A distance of four feet is quite safe, but inside that radius is likely to be attended with bad results. This is not always the case, as if the coil were placed low down on the dashboard within 18in. of the engine it would not harm, as the heat naturally rises and, therefore, does not reach the coil.

A BUYER'S QUESTION.

Recently I purchased a foreign car from the London agents (who were foreigners domiciled in London) for the machine for cash. I had a trial run, and was much pleased with the running of the car, but questioned the newness of the tyres. The vendors assured me that they were quite new, with the exception of one, which they would change before delivering the car. On arrival of the machine I again closely questioned the firm's representative, as I noticed that the tyres had been solutioned over, but I was reassured in the presence of witnesses that the tyres were all right. Within three and a half weeks, after having run about 340 miles, one of the tyres burst, and on examination it was found to be old and absolutely rotten. I then looked at all the tyres, and found that they were absolutely worthless. Is such a case actionable at law?

From the facts contained in your letter we should say that you have a good case for action. Your position is stronger because you made enquiries at the time the car was delivered, and the misstatements of the vendors, or their representatives, threw you off your guard and concealed the latent defects, but even if this enquiry had not been made we think the vendors would be held guilty of fraudulent concealment, as you relied upon their statements, and they must have been cognisant at the time the car was sold of the state of the tyres. Even if they were not they are certainly responsible for selling them in the condition you state.

RESETTING THE COMMUTATOR.

I have a four-cylinder 12 h.p. Panhard and the timing wire leading to the commutator has broken. Will you please tell me how I can time the spark so as to get the explosion in each cylinder exactly as the piston has compressed the vapour to its utmost?—H.E.

To reset your commutator so as to get the connecting wire the correct length you should put the commutator as far back as possible. Then put the lever down and connect up the controlling wire. The connection being made, start up the engine. It may be that the commutator is retarded so far that the spark is occurring so late that the engine will not start. If this is so, advance it little by little until you get the engine to start away easily and without getting any back kicking on the starting handle. With the commutator in this position, lower the ignition lever again to its bottom limit, then shorten the wire sufficiently to establish a connection between the two parts in their known position. You will now know that when the lever is at the bottom the spark is correct for starting and that you have the greatest range of advancing ignition possible.

ANTICIPATION!