THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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THE AUTOCAR.

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COLONIAL AND FOREIGN EDITION.

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Notes.

The Petrol Question.

We have received a number of letters from automobilists both in town and country referring to the above subject, and elsewhere we publish a few of them. Not the least remarkable fact to be noted, and it is one on which we may say several correspondents comment, is that not only have the users of the heavier spirit been unaware that any increase in the density had been made, as it has in no way affected their engines, but there are instances in which an increase of power was noted, this being particularly the case with a manufacturer who was making a series of brake tests of a new motor. On the other hand, there are letters equally positive, in which the writers state that their engines will not start, or when started fire intermittently on account of the heavier spirit, and from our knowledge of the writers, we are able to say that they are not novices or people who would be likely to attribute the wrong cause to a given effect. This leads to the conclusion that while some engines will take the heavy spirit without difficulty others will not. In fact, so far as the letters we have had can be generalised, it would appear that little difference is made to the working of most slow running engines, but that those which revolve at over 1,200 a minute are more or less seriously affected. The carburetter, too, has much to do with the question, and there are other factors of importance to be considered. The few instances in which increase of power was obtained should be carefully investigated, as they may lead to valuable knowledge being acquired. In any case there is little doubt, now that a knowledge of the heavy spirit is general amongst automobilists, there will be the perfectly natural tendency to attribute every symptom of poor running to the petrol. The distributers of Pratt's spirit inform us that until the warning was published in our columns they had had no complaints about the heavier spirit. They show every disposition to investigate the matter thoroughly, and while they absolutely deny that any spirit of over .700 has been issued, they admit that .700 has been sent out for some time, as they claim that they have found it more suitable for general use, and further, they point out that specific gravity is not the only factor in the production of the best carburating agent. This, of course, is perfectly true, as all who are acquainted with the distillation of spirit are well aware that a fictitious specific gravity can be obtained by mixing two separate "cuts," so that the actual specific gravity desired is obtained, but the heat value of the mixture is not the same as if the spirit had been of the same consistency throughout. Another point which should be borne in mind is the temperature at which the density is taken. This is always commercially declared at 60° F.—for instance, at 60° F. .680 spirit is registered, and at 70° F. the same spirit is .675. In other words, as the temperature decreases the gravity increases. The point about which most users of Pratt's spirit feel sore is that they should not have been advised of the change, as till lately the quality of the spirit has been so uniform that no one has thought of attributing any shortcomings in the working of their engines to this cause. In fact,

as we pointed out a fortnight since, the densimeter was positively unknown to many whose automobile experience commenced only two or three years back, while veteran motorists had long since ceased to test spirit as they bought it.

The Club Journal.

For some little time there has been a feeling among members of the Automobile Club that the *Journal* was not always conducted in a manner best calculated to advance the interests of the club as such or the development of the movement which the club has done so much to foster. We are well aware that it is easy to find fault, but we are afraid no doubt exists in the mind of the most lenient critic that the legislative campaign was not conducted with strict impartiality so far as the presentation of the arguments for and against it were concerned. We called attention to this matter at the time, and we have had no reason to alter our opinion since. There was too often a tendency to impute foolish, if not positively bad, motives to those who differed from the policy laid down in the club organ, and this tendency did not apply to legislative matters alone. It was even inferred in connection with criticisms of the club trials that if any other journal gave publicity to certain complaints that such paper could only be actuated by sordid motives, and in another instance it was stated in effect that the participants in the trials were not to be trusted. That some unscrupulous firms took part in the trials is possibly true, but to infer that all who did so were dishonest was far too sweeping to say the least of it. This, however, was some months back. The critics of the club organ now complain that an undue amount of space is devoted to recording the acts of certain individuals, and that other equally interesting narratives of the doings of people who are perhaps not quite so well known are not published. As to this, little can be said without knowing what particular items of news have been denied publication, and we have no intention of expressing an opinion without further knowledge of facts, though it may not be out of place to point out that neither the *Automobile Club Journal* nor any other paper can select the people who shall make history. If certain members of the automobile world or club are more active than others—do more, say more, and drive more—the record of the history they make must of necessity be greater than it is in the case of less energetic though possibly more retiring men. In any case, it would perhaps be better under the circumstances for those who have felt strongly on the matter to wait a few weeks to see whether the new editorial arrangements which have been made in connection with the club *Journal* result in it more fully representing the membership as a whole. If they do not the matter should be fully ventilated, but definite instances should be given. General complaints carry little

The steam motor fire engine "Jumbo," belonging to the Hartford, Conn., U.S.A., fire department, travelling at 25 miles per hour. The horse-drawn tender is seen driving at full gallop in the rear. This engine was built at the Manchester Locomotive Works, Manchester, U.S.A., in 1889. The above picture is reproduced from a print made from a negative used in a cinematograph. The print was sent by Mr. Warren A. Ranch, of New York, to Mr. Crowden of Leamington, to whom we are indebted for it.

weight. What is required if any change be necessary is specific detail. In the usual way, we should regard the discussion of the policy of another journal as outside our province and uninteresting to our readers, but we do not look on the club *Journal* as a contemporary in the accepted sense of the term journalistically applied—we recognise it as the organ of the society which represents the movement, and which, in the interests of automobilism at large no less than of the club itself, should represent that movement in the best possible manner. Our criticism is not intended to be destructive but helpful, and we desire any who feel constrained to continue the subject to look at it in this light.

Railway Rates.

Recently we recorded the action of the Scottish Automobile Club in approaching the North British railways with the view of obtaining more reasonable rates of carriage for automobiles when taken by train. It has since been announced that after twenty-five years of almost continuous agitation, the governing bodies in England and Scotland, representing the interests of cyclists, have succeeded in obtaining not only a reduction of fifty per cent. upon the railway charges for carriage of their machines, but also much needed consideration in the way of acceptance of responsibility for damage or loss by the carriers. Before the reduction was made, motor cyclists were charged at double the old rates, and it was assumed that when the new rates for pedal cycles came into operation those for motor cycles would be similarly reduced; but this is not the case, so that users of even the lightest form of self-propelled vehicle have not benefited in any way by the concession. As this is so, it will be necessary for the Automobile Club to give the matter attention. It would undoubtedly have the support not only of the Scottish club, but of all the affiliated clubs throughout the country. It is a matter which cannot very well be hurried; in fact, is better for being cautiously proceeded with. At the same time, there is no doubt it is a very important matter to many automobilists, as in the majority of cases those who would be glad to avail themselves of the railway do so with the view of saving time; and, speaking broadly, those to whom time is of importance are those who cannot afford to ignore the present prohibitive charges of the railway companies.

Mendacious Mechanicians.

In our correspondence columns to-day a letter appears dealing with some of the wiles of the paid driver or mechanician. Unfortunately, some of these men, no doubt, are very far from honest, but at the same time we should be exceedingly sorry if the impression got abroad that all of them were dishonourable, as there are many who take a real interest in their work, and who do their very best to give their employers satisfaction, and to keep the car or cars which they have in their charge in the pink of running condition. At the same time, there is no denying the fact that, owing to the remarkable innocence of some owners, the mechanician, unless he be thoroughly well principled, is tempted to add to his income in some such way as that indicated in the letter we have previously referred to. At the present time, motors are regarded by quite a large percentage of those who own them as mysteries, and the men very soon find out that they can tell their masters almost any ridiculous tale about the engine or mechanism. Perhaps, in the first instance, they merely do it to save themselves the trouble of a drive on a bad day. Then the thing grows, and they find that by a little lying and effrontery they are able to make some money. Till such time as knowledge of motors becomes much wider spread than it is at present, it would appear that the evil can only be stamped out by the makers or repairers reporting to the employers when any such attempts are made by their servants. But this is out of the question in many cases, particularly in the provinces, where there are some unscrupulous repairers who are quite open to make common cause with a dishonest mechanician. Undoubtedly there has been a tendency on the part of automobilists to engage men without particular reference to their character; they have merely considered their knowledge. It does not seem to have struck them that it is as necessary for a mechanician to have a good character as any other person in their employ. Not only so, but those who would have been more careful have known from experience that if they were too particular they would have to wait for some time before a man who was trustworthy as well as capable offered himself. Undoubtedly those who have the time and inclination to look after their own cars, with the help of an odd man or boy to do the rough washing, are the best off.

The Club Racing Track.

Some months since we announced that the Automobile Club was conducting negotiations with regard to obtaining a track on private ground within a convenient distance of London. These negotiations have now been completed, and it is announced that arrangements have been made in respect to a tract of land at Purley, on the Warlingham side of the Brighton Road. The club has secured the right to hold meetings on forty days in the course of the year. It was originally intended to obtain a circular course, but this has been found impossible. The track, however, will have two long straight stretches, and the circuit will be seven miles in circumference. We are glad to say it is not a mere speed ground, but is diversified by hill and dale, one of the gradients being one and a quarter miles in length, and varying in steepness from 1 in 20 to 1 in 7 (the steepest part of Westerham Hill is 1 in 7.8). At the same time the long straight stretches will present good opportunities for purely speed trials, and it is stated there is an absolutely level kilometre with plenty of room for starting and stopping. The track itself has yet to be constructed, but this is not expected to be a very heavy work, and the surface will probably be gravelled like the Bexhill track. Later on, a grandstand, clubhouse, running sheds, and other buildings will be constructed, and it is hoped within the next four months that the opening meeting will be held. The ground can be easily approached from South, South-west, and West London. When this track is once in working order, there is little doubt that motor racing as a sport will take its proper position in this country, and it will be but a question of time before other tracks are laid out for the convenience of dwellers in the North and Midlands.

USEFUL HINTS AND TIPS.

Spare Wire.

If any car owner has wire connections of any kind to his accelerating apparatus, we would recommend him always to carry a spare length or two, particularly if the wire is of the stranded steel description found on many French cars. This is often most treacherous stuff, and breaks when least expected. The best thing to do is to remove it altogether, and replace it with a length of Bowden wire.

Some Tyre Tips.

It very often happens that a false alarm of puncture is raised through a tyre suddenly going down. It is well, therefore, always to make sure that it is a puncture before commencing to detach the cover; very frequently it will be only the valve at fault. This is particularly the case when a tyre has gone down gradually, and not with the sudden hiss that betokens the incursion of some intruding obstacle. It is decidedly aggravating, after you have taken the trouble to open a tyre in search for a supposed puncture, to find that both cover and tube are sound, and that the deflation was caused solely by valve failure.

A fruitful source of leakage with Dunlop valves—Woods pattern—is the unduly tight fit between the shoulders of the plug stem and the slots cut to receive them in the valve body. Perhaps the shoulders were good enough fits until it became necessary to put a new rubber tube on to the plug, and this new rubber tube, being perhaps a trifle thinner than the previous one, requires the valve to be screwed up closer, but the shoulders being too wide for the slots do not allow the plug to be screwed far enough in, so that an imperfect air seal is the result. To obviate this, it is well to test the easy fit by inserting the plug in the body before putting the rubber on to the plug, turning the plug round so as to see that the shoulders fit interchangeably. Should they not slide freely into the slots, their edges must be filed down. On emergency we have performed this operation successfully, in the absence of a fine file amongst our tools, by the aid of a file from a lady passenger's manicure case.

During a recent tour we had an obstinate case of a leaky valve which caused a tyre to deflate slowly, and at last we adopted the expedient of buying some common putty and completely encasing the valve in a jacket of it, around which we bandaged some rags to hold the putty on, and by this means the leakage was prevented and the tyre reached home hard.

Oiling the Clutch.

In many cars it is necessary to take up the floor boards for the purpose of oiling the clutch boss where it slides against the pressure of the clutch spring on the squared portion of the clutchshaft. Frequently, too, there is no lubricator fitted to the clutch boss, but merely a hole drilled therein, into which but little oil can be introduced, and that little is flung out again by centrifugal force as soon as the clutch starts revolving. For this reason this part of the mechanism requires very frequent attention in many cars, and this it does not get for the reasons above given. We draw attention thereto, then, because, unless some trouble is taken in this respect, the pedal work is apt to become laborious. Good machine lubricating oil should be squirted into this hole, and the clutch pedal worked vigorously up and down. The collar, too, in which the clutch-striking fork works must also be kept thoroughly well lubricated to ensure easy clutching, declutching, and the saving of friction. Some means of automatically lubricating these parts should be fitted to all cars; but until such is the case, those whose driving economy is as we have sketched it must take up the floor boards and see to the matter.

Again, if the car owner will examine his fly-wheel he may find a hole about $\frac{3}{16}$in. in diameter drilled through from the outside of the rim. This is for the purpose of introducing a softening agent to the surface of the clutch leather, and very useful it is. We have only come across one such convenient refinement; but the necessary treatment can thereby be afforded the clutch leather with much greater comfort than squirting whatever is used for the purpose through the narrow space between the two coned surfaces. The hole in the fly-wheel rim is also most useful for the introduction of petrol to the leather of a slipping clutch. When applying either the oil or petrol, the clutch should be held out just clear, and the engine turned round from time to time to get the dressing well distributed all over the leather.

Accumulator Treatment.

No car owner, if he values his own comfort, should be without one or two spare accumulators. And what is more, he should see that they are kept charged. It is the best practice to carry two sets of accumulators connected up to a two-way switch, marked No. 1 and No. 2 respectively, so that the driver may always know off which set he is firing. The spare set should be switched in from time to time just to encourage them; but no accumulator should be allowed to stand for more than a fortnight without having current drawn from it. Also any accumulator left standing for any length of time should have the terminals smeared with a little vaseline, which will prevent sulphating, and difficulty in getting the terminal screws undone when the accumulator is required. Wherever the accumulators are carried, the cases in which they are set should have firm and secure lodgment. The best way to set them is in a wooden case made with tongue springs projecting inwards, which, when the accumulator case is thrust down into its holding box, will press against it, and hold it firmly without shock. If similar springs are set in the floor of the case, the accumulators will seldom, if ever, suffer from shorting due to the paste shaking down.

Cars are frequently sent out with stranded connecting wires just twisted round all the terminals, and there held by the screwing up of the terminal screw. We would strongly advise any automobilist who finds his new car wired in this careless and shiftless fashion to get proper terminals soldered on without delay. It will save both time and temper in the long run. Moreover, from frequent bending round the terminals, the stranded wire breaks, and one often gets nasty painful pricks in the fingers therefrom, which smart and are sore for some time. There can be no sort of excuse for sending out cars wired up in the slipshod way we have referred to, and the purchaser of a car should see that it is put right.

A NEAT VOITURETTE.

A car admirably adapted for the use of men of actual and not hypothetical moderate means is to be found in the handy voiturette known as "The Traveller," made by Messrs. Allday and Onions, of Birmingham. This little machine has now been on the market for some time, and has been thoroughly well tested for reliability. To those who closely follow the subject of automobilism, it will be remembered that we gave a short description of this machine in our report of the Crystal Palace Show (see *The Autocar*, February 7th, page 153), accompanying which was a photograph of this little car.

The frame A with its cross members is of tubular construction, it being rigidly fixed to the rear live axle B B. The forepart of the carriage is mounted upon semi-elliptical springs C. As to the springing of the body, this is mounted upon plates D D and the cee springs D^1 D^1. The motor E is of the usual single-cylinder high-speed type, the cylinder having a bore of 3⅜in. and stroke of 3¼in. The flywheels are enclosed in the crank chamber, and form part of the built-up crankshaft. The engine develops its 4 h.p. at 1,500 revolutions per minute. A water-cooled head is provided to the motor, the circulation being on the thermo-syphon system. The water tank and radiators are combined, and go to form the sides of the rear seat of the vehicle. The sides of these tanks are deeply corrugated with a large number of ribs, so as to get as large a surface as possible exposed to the air. The cylinder itself is ribbed with the usual radiating flanges. The carburetter F is of the usual float-feed spray type, while the ignition is on the high tension principle. The engine propels the car through a change-speed gear, giving two speeds forward and reverse, driving from the second shaft of the gear through a pinion on to a spur wheel upon the live axle, this surrounding the usual balance gear. The change-speed gear box is lettered G and the spur wheel box G^1, the balance gear casing being lettered H. Enclosed in this box is a band brake, acting, of course, upon the rear live axle, this being actuated by the side lever J. A secondary brake K acts upon the countershaft of the gear box through the medium of the pedal. The change-speed gear is of the simple sliding type, and its action will be easily comprehended by reference to fig. 3. The motor drives the first shaft A of the gearing by means of the usual conical clutch, which is actuated by the pedal L. Above the shaft A is a square shaft B, upon which are mounted two spur wheels C and D. The third wheel E, shown in the end elevation and on the left of the section, gives the reverse on the first speed by being interposed between the pinion D^1 and the spur wheel D. This gearing gives the reverse speed, while when the intermediate pinion E is withdrawn, it gives the slow speed forward in the usual manner. By sliding the gear wheels along the square shaft, by means of the fork and collar F, the gear wheel C is brought into mesh with the opposite gear wheel C^1, this giving the high speed. The whole of the gearing is enclosed in an aluminium gear box G G, the band brake H upon the secondary shaft being seen on the right, while the pinion J engaging with the spur wheel upon the

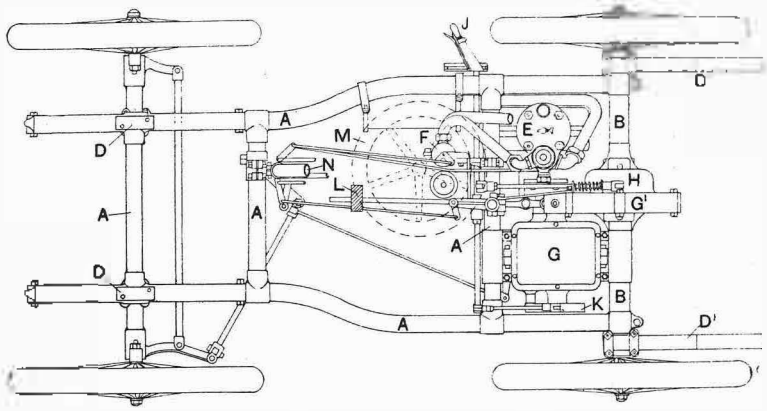


Fig. 1.—Plan of the Traveller voiturette.

A, tubular frame
B B, live axle
C, semi-elliptical springs
D D, body fixing plates
D^1 D^1, cee springs
E, 4 h.p. motor
F, carburetter
G, gear-box
G^1, spur wheel box
H, balance gear box.
J, brake lever
K, countershaft brake
L, clutch pedal
M, steering wheel
N, steering column

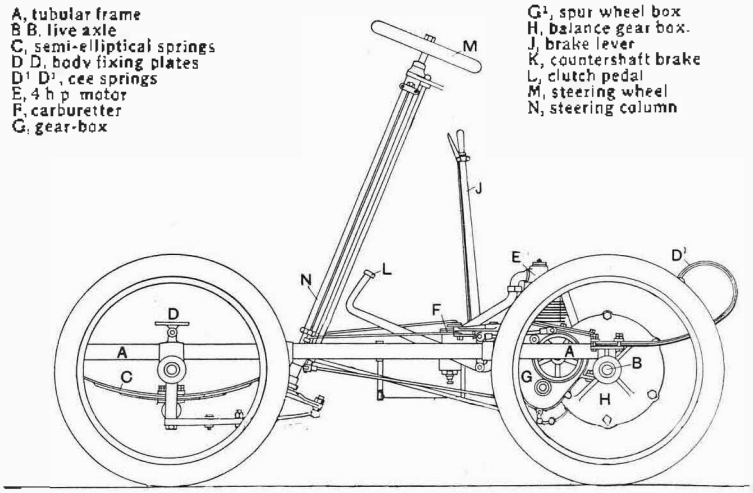


Fig. 2.—Elevation of the Traveller voiturette.

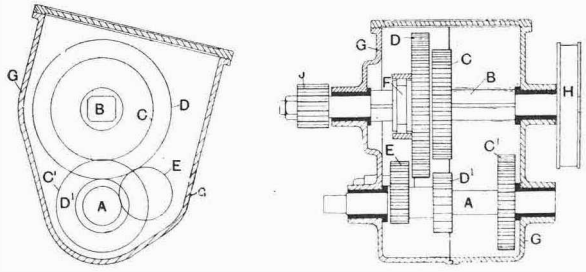


Fig. 3.—End elevation and longitudinal section of the change speed gear

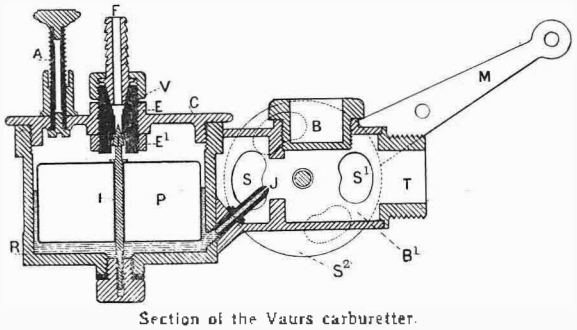
A, primary gearshaft
B, secondary gearshaft
C, C^1, high speed gear wheels
D D^1, low speed gear wheels
E, reverse pinion
F, gear changing collar
G, aluminium gear box
H, band brake
J, pinion engaging the spur wheel upon the live axle

live axle is seen on the opposite end of this shaft. By means of the throttle to the engine and advance sparking, the variations of speed are very broad, ranging between three and twenty miles per hour, while with the engine fully accelerated, the little car can attain a speed of even twenty-five miles per hour over level stretches. The steering is by the usual wheel M through the steering column N, upon which are mounted the levers controlling the carburetter and the ignition.

This light and speedy little vehicle is provided with two or three types of body, giving accommodation for two people side by side or tandem fashion, the second seat being placed forward of the driver. One feature which will commend itself to those who are looking out for a small car of this type for short or long journeys is the amount of space available for the storage of luggage, while it also commends itself particularly to commercial men, as a neat box arrangement can be made to take the place of the second seat, holding a large quantity of goods, and transporting the driver from one town to another at a good speed and at a low cost. Further, it is at the owner's immediate call directly he has finished business in a particular town. The machine is thoroughly well constructed, and is a good investment at the moderate price asked for it. The total weight of the car is between 5 cwts. and 5½ cwts. The weight of the whole is so well distributed that it is easy for a moderately strong person to pick it up by the back of the body, and turn it completely round, if necessary.

THE VAURS CARBURETTER.

The construction of this very neat form of float feed carburetter can be easily comprehended by a glance at the accompanying illustration and its lettered reference. It will be seen that it consists of a float feed chamber or reservoir R, which contains a hollow cylindrical copper float P, actuating a needle valve I, which upon the rising of the float P closes the coned aperture formed for the purpose beneath the petrol feed pipe F. The fitting of the float P permits the level of the petrol to rise in the float feed chamber R almost to the point of the jet J. B^1, into which the jet J protrudes, may be called the mixing chamber, as in other forms of carburetters. Air is admitted to this mixing chamber through the apertures S S^1, which are wholly or partially uncovered by the outside disc shown, which is connected to the lever M, and by it rotated about its centre. Air is drawn into the mixing chamber through the holes S S^1 by the sucking action of the engine piston on its charging stroke. That which enters by S travels across the jet aperture and draws petrol from the float feed chamber, atomising it as it leaves the nozzle, the quantity of petrol so induced being exactly proportioned to the quantity of air drawn in through this aperture. The air induced through the aperture S^1 is obtained in just the proportion to make a perfect mixture. Once the due proportion of petrol vapour and pure air for its proper dilution to the best firing proportions has been calculated, and this never varies, no matter what the position of the lever M, or the speed of the engine. This is because the amount of petrol to be drawn through the jet J depends entirely upon the amount of air obtaining entry to the mixing chamber through S, and whether this be great or small the aperture S^1 is by the same movement of the lever M varied in due and proper correspondence. Therefore it is claimed that this arrangement of the Vaurs carburetter serves entirely the purpose of the throttle, and that the speed of the engine can be more delicately controlled thereby. In carburetters serving car engines, the governor may be connected to the lever M, which will then absolutely follow every change of speed, the proportions of mixture the while remaining unaltered. Viewed academically, it certainly appears to us that the Vaurs carburetter should exert very much the effect of a Krebs or a Germain carburetter in a particularly simple manner. This neat and ingeniously thought out fitting is being handled in this country by F. W. Carpenter, of Moseley, Birmingham, from whom these carburetters, suitable for all engines from 1¼ h.p. to 40 h.p., can be obtained.



Section of the Vaurs carburetter.

A, flooding plunger
B, inspection cap to mixing chamber
B^1, mixing chamber
C, cap carrying float adjustment
E E^1, lock nuts
F, petrol feed pipe
I, needle valve
J, jet
M, air regulating lever
P, float
R, float feed chamber
S S^1, air inlets to B^1
S^{11}, disc having apertures corresponding to S S^1. See dotted lines

AN AMBITIOUS TOUR.

Last year we recorded the 4,000 miles tour which Mr. Charles J. Glidden, of Boston, made on his Napier car. We now hear that he proposes a still more ambitious run this year; but instead of roaming southward, he will turn to the north. He will, as was the case last year, start from London. Thence he will run to Holyhead *viâ* Land's End and North Cornwall, witness the Gordon-Bennett race, and take part in the subsequent tour. From Belfast he will take steamer to Glasgow, cross Scotland, take the steamer to Christiansund, and then drive northward to Bergen, and from Bergen still north to Trondhjem; and will only turn southward when he has gone within 2½° of the Arctic Circle. He will return by Christiania, Stockholm, and Gottenburg, cross to Denmark, and run through a portion of Germany and Holland to Amsterdam. In all, the tour will be nearly 4,500 miles, and forty-five days are allowed for the shore portion of the trip, an average of one hundred miles per day.

GORDON-BENNETT ITEMS.

The Autocar BALLOON.

TO FACILITATE our report of the Gordon-Bennett race, and to command as extensive a view of the course as possible, we have arranged to have a captive balloon at a convenient place upon the course. It is our intention—if circumstances permit—to arrange the signalling of cars as they pass given points upon the course, so that spectators in the immediate vicinity may be warned of their approach. As such a scheme is dependent to a very large extent upon climatic conditions, we do not propose at the moment to give any details of our plan of working, as the date of the race is yet some ten weeks ahead.

Messrs. Spencer Bros., the well-known aeronauts of Highbury, London, N., are responsible for the balloon part of the programme, and are most enthusiastic in their work. They are constructing a balloon specially for the purpose, which will be christened "The Autocar." The balloon itself will be 36ft. in diameter, its capacity being over 21,000 cubic feet, and the car will carry three passengers.

The American Champions.

The greatest secrecy has been preserved in the United States with regard to the machines which have been built with a view to representing the nation in the Gordon-Bennett race, but at last a Reuter's cable gives the information that the two champions, in addition to Mr. Alexander Winton, whose portrait was published in *The Autocar* of Feb. 28th, 1903, have been selected. They are Messrs. Louis Mooers and Percy Owen. A trial of the cars was held between Westbury and Merrick, Long Island, on Monday, April 20th, and with characteristic enterprise the fullest details of this which have been published in Great Britain were given in the *Daily Mail* of April 21st. It appears that hundreds of motorists were present and the greatest enthusiasm was displayed, but the race or test was scarcely worthy the name, as none of the other expected competitors put in an appearance and only Messrs. Owen and Mooers came to the mark. They contented themselves by running over the course. Owen covered the six miles in 7m. 22s., while Mooers's car, after running four miles at a moderate speed, stopped owing to some derangement. Messrs. Winton and Owen will drive Winton cars and Mooers a Peerless. Like the Peerless touring car this machine follows accepted European practice in general design. The frame is of pressed steel tapered at the end, and 28in. artillery wheels running on ½in. ball bearings are used. A bevel drive with some original features is employed, but no details are at present available. The four cylinders are 6in. bore by 6in. stroke, the same dimensions as those of the Star car, and both the inlet and exhaust valves are mechanically worked. There is little doubt that had the eliminating test been held at a later date some other competitors would have put in an appearance, including at least one monster with 7in. by 7in. cylinders. No details are at present available of Winton's racer. It is stated that his own staff, with the exception of those actually engaged upon the construction of it and the sister vehicles, are unaware of the special features. However, particulars will no doubt be available before Messrs. Winton and Owen sail for England on May 30th.

The Eliminating Tests.

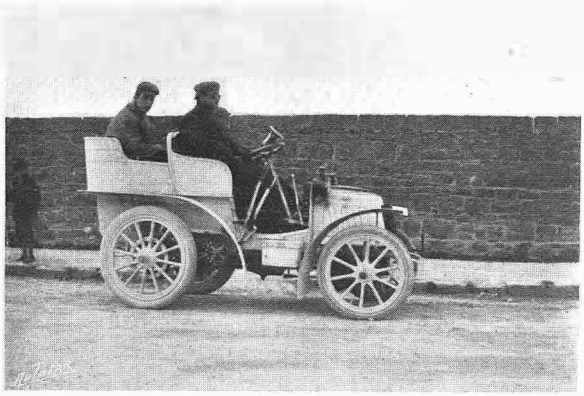
The series of tests for speed and hill-climbing between the Napier and Star cars will take place on the Duke of Portland's estate at Clipstone Park, near Mansfield, to-day (Saturday). The tests, as decided by the club, when it was settled that two Napiers should be nominated to represent this country in the race, while the third representative machine was to be one which came best out of the test, were as follows: A number of trial trips will be run against the watch by each car separately, and the times totalled. These times will be divided by the number of trips made and the mean speed worked out. Three ascents will be made of the hill, and the car which covers the total distance, which with speed and climbing tests will amount to sixteen miles in all, in the shortest time will be the winner and the selected vehicle. Nottingham was selected as the headquarters for Friday night, and most of those participating in the trials as well as those who hope to see them are staying at the Great Central Railway Co.'s Hotel at Victoria Station, Nottingham. Mansfield is fourteen miles from Nottingham, and Clipstone is less than three miles away, but care must be taken in Mansfield to take the right turning, otherwise the motorist may go miles astray. The tests are officially timed to commence at eleven o'clock in the forenoon, and are expected to occupy the major portion of the afternoon.

Vice-Regal Patronage.

The Lord-Lieutenant of Ireland, who requested Mr. Roger Wallace and Mr. Orde, the club secretary, to wait upon him during their recent visit to Ireland, in order that he might be fully acquainted with the details of the arrangements for the Gordon-Bennett race, intimated that on Saturday, July 4th, the day of the speed trials at the Phœnix Park, Dublin, and two days after the Gordon-Bennett race itself, he intended to give a garden party. All this will help to render the Gordon-Bennett race and subsequent events a success. As is well known, His Excellency is a most enthusiastic automobilist, his first tour round the country after taking office being made by autocar.

The First Reserve.

Lieut. Mansfield Cumming's 50 h.p. Wolseley, which we illustrated last week, has been appointed as first reserve for the race in the event of anything happening to one of the other cars which would make it impossible for it to compete. Of course, the Wolseley is not yet thoroughly tuned up, but its owner and the makers are leaving no stone unturned to get the vehicle into the very best form. We had the opportunity of examining the car a few days since, and we must say that it is a really splendid specimen of workmanship; and, so far as design is concerned, it is one of the handsomest-looking racing machines which has ever been constructed. One or two minor alterations are now being made. For instance, the silencers are being brought further away from the ground, and the carburetter put in a more sheltered position, and at the same time easily accessible from the footboard.



The Hon. C. S. Rolls on his 7 h.p. Panhard waiting at Athy for the other cars to come up. In the tonneau, Mr. J. Moore Brabazon, who has kindly placed the snap shots in these pages at our disposal, will be noted.

A Warning to the R.I.C.

We foresee a possible great danger that may arise unless the high officials of the local constabulary are duly impressed with the circumstance that they themselves, as well as the public, must keep off the route. It will never do to have half a dozen chief police officers patrolling the course on horseback in the majestic grandeur customary when routes have been cleared for ordinary processions. The bicycle is the only permissible vehicle for officers to use, and even bicycle-mounted officials will do well to throw themselves and their machines over the nearest stone wall when a car comes along.

The Conveyance of Cars to Dublin.

Intending visitors who will drive their cars to Holyhead by road will do well to note the following particulars of the arrangements made by the London and North-Western Railway for the conveyance of cars to Dublin. During the month of June the boats will be leaving Holyhead at 6 p.m., 2 a.m., and 6.40 a.m. respectively. For the 6 p.m. boat the car should reach the station not later than 5 p.m., for the 2 a.m. boat not later than 11 p.m., and for the 6.40 a.m. boat not later than 5 a.m. On arrival at Holyhead a car should be driven on to the horse-loading bank, where it will be run on to a truck. This truck will then be taken to the boat by a shunting engine, and the car will be slung direct on board the steamer by hydraulic crane. The passage from Holyhead to Dublin occupies about four and a half hours, and the charge for each car is £1 15s. Upon arrival at Dublin the car will be landed at North Wall immediately, upon request. On returning from Dublin the corresponding boats leave North Wall at 10.30 a.m., 2 p.m., and 8 p.m., and the fare is the same. The mail boats to Kingstown do not carry motor cars. Passengers who cross to Kingstown by the mail boats will find railway trains waiting for them on the pier, by which they will be conveyed to Dublin immediately after the arrival of the boats. The landing stage at North Wall is less than a mile from Sackville Street, and within a couple of miles of St. Stephen's Green, where the best hotels are situated. The road from the landing stage to Sackville Street is very bad.

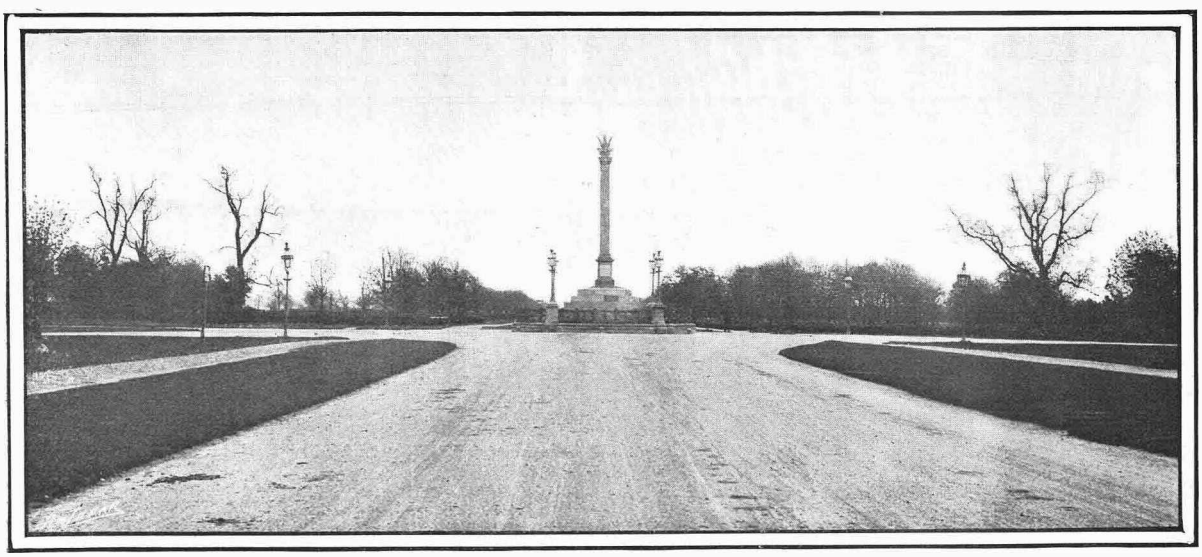


Photo. *Lafayette, Dublin.*

The Phœnix monument, which stands in the middle of the central road through the park on which the speed trials will be held two days after the Gordon-Bennett Race. After passing the finishing point the drivers will have to exercise the greatest care in pulling up so as to get round the monument if necessary.

SNAP SHOTS OF THE COURSE AND THE KILOMETRE RUN.

Maganny Bridge, between Carlow and Athy, with a dangerous turn to the left over bridge.

A sharp turn to the left off the main road between Stradbally and Maryborough. Cars at corner show the turn.

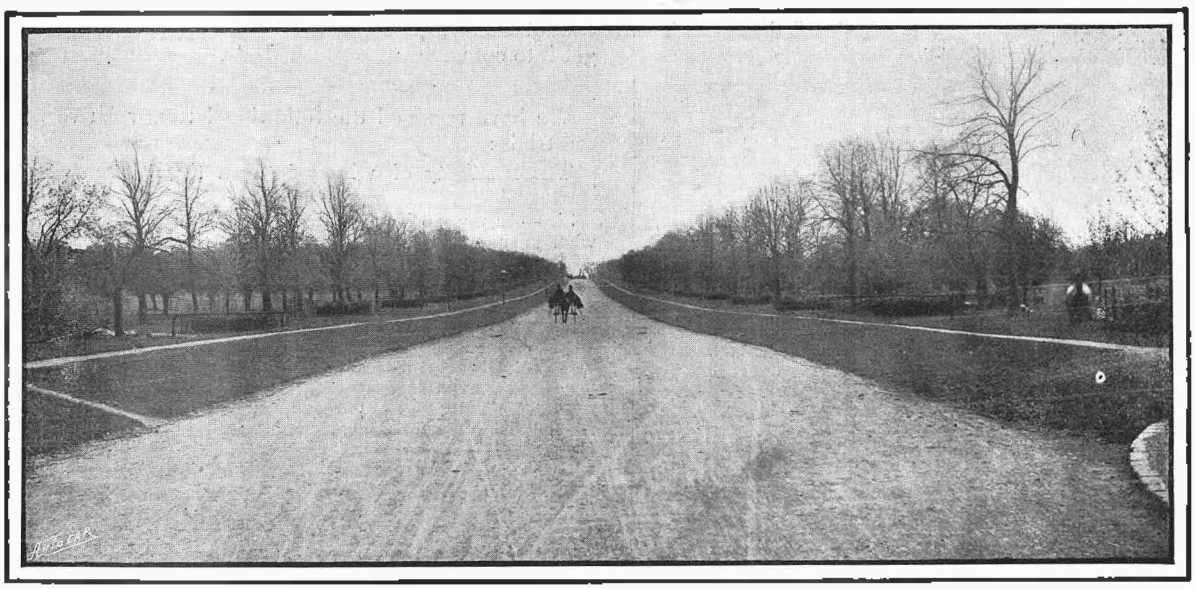
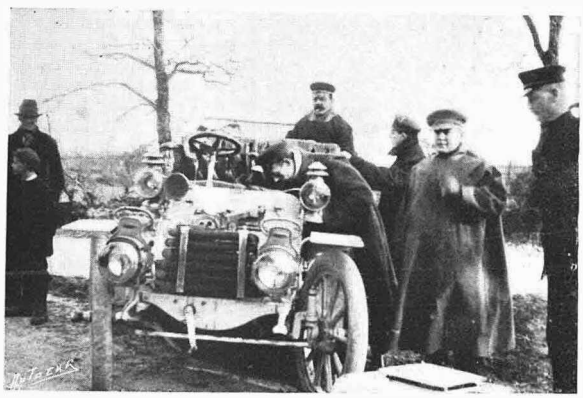
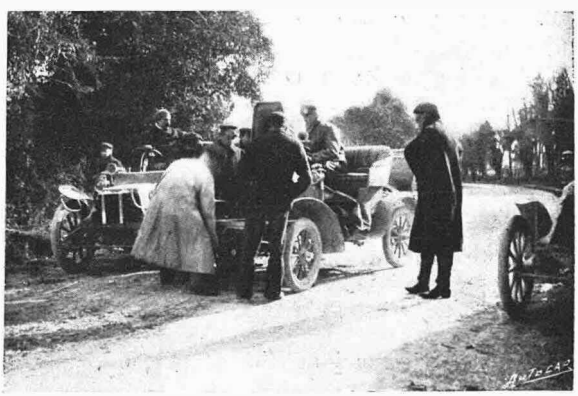


Photo. *Lafayette, Dublin.*
The road in the Phœnix Park, Dublin, over which the flying kilometre race will be run. Looking towards the Phœnix monument from the Castleknock gates.



At the Ballyshannon cross roads: Mr. Percy will be noted in the Parapluie in the foreground, and Messrs. W. and H. du Cros further back.



Waiting for the other cars to come up, during the Easter inspection of the Gordon-Bennett course. The leaders waited at intervals so as to keep the party more or less together.

Keeping the Course.

Although it is early to make any definite statement, there would appear a likelihood of a shortness of honorary officials for keeping the course. The Automobile Club estimates that some seven hundred will be wanted for the complete girdling of the course. Those who have made arrangements to be in Ireland for the race period should communicate with the club at once. Not only so, but at the present time, while comparatively few have come forward and volunteered, it is possible for the man who offers his services to pick a good place on the course, so that he will be able to see plenty of the race himself.

Benefitting the Industry.

Not the least of the benefits that the Gordon-Bennett race confers is the encouragement it gives to the home manufacturers of motor accessories. In this particular we may mention that the United Motor Industries, Ltd., have supplied Castle accumulators for all the British Gordon-Bennett cars. It will be remembered that last year's winner used these excellent accumulators.

A puncture repair

Gymkhana Prize.

In connection with the Phœnix Park gymkhana, Miss C. M. Lloyd, of Addington, has offered a twenty guineas cup to be competed for by ladies in any race or test of skill, the conditions to be arranged by the Automobile Club.

Who Suggested the Course?

We have several letters from various correspondents discussing the question as to who originated the suggestion that the Gordon-Bennett race should be held in Ireland. It will suffice to summarise them by saying that they are of no interest whatever except to the writers, except, perhaps, in the case of F. H. H., who, dealing with hearsay, suggests that Mr. W. R. McTaggart was the first to suggest it. However, we do not think this matters very much; the point everyone is interested in is in the successful holding of the race, and not in any discussion as to who was the first to think of it. The probability is that it struck a good number of people simultaneously, as is the case with most ideas of this kind. The only ones who appear really anxious about the matter are those who, everyone knows, did not originate the idea, and who are consequently seeking credit for that which they never did.

Hotel Accommodation.

There is already a great scarcity of hotel accommodation in Dublin for the days preceding the race, while exorbitant prices are being asked for the few remaining rooms scattered along the route. As regards Dublin's environs, there is still plenty of accommodation to be had in the smaller hotels and in private rooms. The districts of the North Circular Road—one route to the Phœnix Park—Cabra, Glasnevin, Drumcondra, Clontarf, and Dollymount, on the north side of the city, still remain more or less unexplored by intending visitors; while the south side, which is certainly the most pleasant, offers Ball's Bridge, Donnybrook, Merrion, Black Rock, Kingstown, and Dalkey, all of which are within easy reach of the city—Dalkey being about seven miles out—and all on the coast. Inland there are the Ranelagh, Rathmines, Terenure, Rathfarnham, and Rathgar districts. Messrs. Battersby, house and estate agents, of 39, Westmoreland Street, Dublin, are making a speciality of securing accommodation for visitors during the Irish fortnight, and those who cannot make a personal trip to secure rooms should get into communication with them.

We have received the following letters relative to the trials:

The Possibility of a Race between the Napier and Wolseley Cars.

Sir,—As my position in the matter seems to be somewhat misunderstood, I will try to make it clear.

When the Automobile Club suggested the latter end of June as a suitable date to test the cars for the Gordon-Bennett race, this thoroughly met with my approval, as it seemed to me that it was in the interests of English automobile industry that the greatest possible number of cars should run for the trial, and I thought myself that having this relatively later date gave the club an opportunity of having more approved drivers and approved cars for this test than for the earlier date insisted on by the Star Company. As, however, the Star Company insist on standing on their rights in the matter, I can do nothing more, but I certainly feel that if the Napier car is lucky enough to win the eliminating race—which, unfortunately, though the best test that can be given in this country to the cars, is from my experience over the Gordon-Bennett course quite an unsuitable one to test the best car for the race itself—I should be only too pleased to welcome a test between best drivers and cars and myself that were ready and willing to run for the Gordon-Bennett race, subject, of course, to reasonable conditions and the approval of the Automobile Club. Whilst naturally I would prefer to see a Napier car win the cup, next to that I should like it to be an English car. At the same time, however, it must not be forgotten that the Star Company and ourselves have risked a considerable sum of money in entry for the eliminating trials, and it would not be reasonable for other manufacturers to run in them without either paying or risking something. Mr. Mansfield Cumming, however, can feel quite assured that if my car wins the eliminating test he can have an opportunity of driving against me to see whose car is the best for the Gordon-Bennett race.

S. F. EDGE.

Sir,—As it seems doubtful that the Wolseley car will be allowed to enter for the eliminating test, would it not be a good plan to run it over the same course, say, a day or two after the test; and then, if its record was good enough, the A.C.G.B. and I. might reconsider the matter of it being allowed to compete in the race? If the Wolseley is the better car, it certainly should not be kept out for any reasons that can possibly be overcome, for what would be the feelings of automobilists in this country if England were to lose the cup and the Wolseley win the Paris-Madrid? Such an event is perhaps not probable, but it is at least possible.

F. H. HARRIS.

SOME 1903 DEVICES AND FITTINGS.

(Continued from page 464.)

The Gobron-Brillie Inlet Valve.

To avoid the vexatious breakage or displacement of the inlet valve spring pin or cotter, which so often happens, an extremely neat and straightforward device is used on the Gobron car, illustrated in fig. 3. It is one of those devices rather difficult to convey to the reader, but which, if the article were in his hand, would be perfectly apparent. To explain, however, the usual pin or cotter is banished entirely, and on the valve stem are cut two flats opposite each other, otherwise the stem is as usual. The

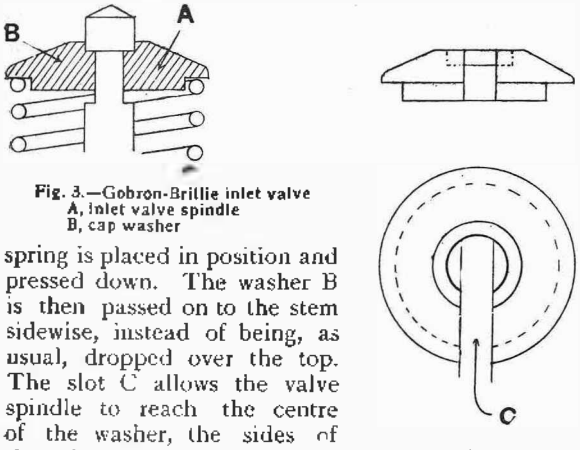


Fig. 3.—Gobron-Brillie inlet valve
A, inlet valve spindle
B, cap washer

spring is placed in position and pressed down. The washer B is then passed on to the stem sidewise, instead of being, as usual, dropped over the top. The slot C allows the valve spindle to reach the centre of the washer, the sides of the slot engaging with the flats above-mentioned on the spindle A. On the spring asserting itself, it bears around the outer edge underneath this washer B, pressing the latter up and causing the circular part of the valve stem immediately above the two flats mentioned to sink into a register formed for it in the top of the washer. So long, therefore, as the washer is pressed up, it cannot release itself from the spindle. It will be seen what a very strong and simple combination this makes, and one entirely devoid of frail pins and cotters which may come out or sheer off.

A New Sparking Plug.

A form of spark plug which has appealed to more than one investigator of the problems involved in its manufacture is that containing what might be called a ring gap, or, stated otherwise, the edges of two circular members fixed the regulation distance apart, and between which edges the spark or sparks may jump at any point around the circle. In one or two forms of this type of plug which we know have been tried, certain difficulties presented themselves, which appear to have been overcome in the case of the Luthi plug. This consists of the usual plug body containing the insulator, and having at the inner end, which when in position is in the combustion chamber, a cup-shaped head to the centre conductor, whose edge can be fixed at a determined distance from the body of the plug. Between the two edges thus formed there is a ring gap, so that the current may jump at any point, and, as a matter of fact, as shown in operation, there were frequently quite a dozen sparks at different points in the circle, and continually changing positions. The end of the plug in the combustion chamber is by this construction perhaps a little larger than usual, but doubtless not so much so but that it is suitable for standard types of engines.

A Good Constructional Feature.

Usual practice provides steel forgings for the brackets necessary to carry the ends of the springs on which the car frame rests. A pleasing variation, forming apparently a lighter and stiffer job, is found

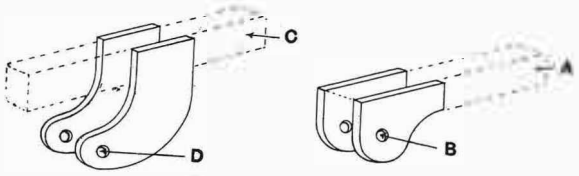


Fig. 4. Argyll spring brackets
A and C, frame members B and D, spring pins

on the Argyll car. A pair of plates (fig. 4), similar in all respects, are fixed one on either side of the frame member, and shaped suitably to bring the spring pin holes where wanted. The plate is a little refinement showing a spirit of design which approaches problems from an original standpoint, and does not follow precedent.

To Hold out the Clutch.

A method of holding out the clutch is introduced on the Langdon-Davies car, appearing in fig. 5. This device is attached on the dash in front of the driver, and consists in raising or lowering a footpiece F,

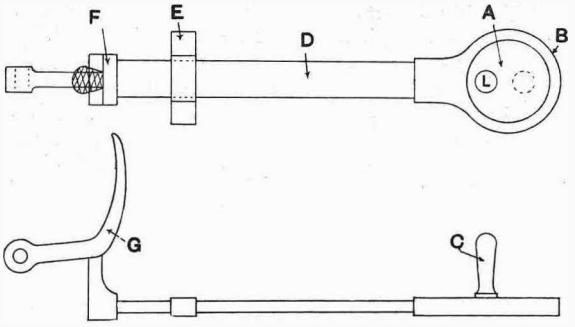


Fig. 5.—Langdon-Davies clutch action
A, eccentric
B, eccentric strap
C, handle
D, leather strap
E, bracket
F and G, clutch pedal

which either checks the return of the cluch pedal G or not, according to its position. The clutch pedal G is specially shaped to bear against this footpiece F, as sketched, which latter is raised or lowered by an eccentric sheave A and strap B. By moving round the handle C, motion is transmitted to the footpiece by a leather strap D passing through a bracket E.

An Irreversible Steering Gear.

Messrs. Selbach are introducing a sample of the M. and B. irreversible steering gear, which is interesting by reason of the fact that with a constant rate of turning of the steering wheel the rate of turning at the front wheel pivots increases with the angle instead of being regular throughout the travel, as with a rack and pinion or screw and nut. Although not quite new, a brief description would be that a special shaped side cam bears upon the short end of the bell crank found upon the steering gear.

(To be continued.)

THE HARMSWORTH INTERNATIONAL LAUNCH RACE.

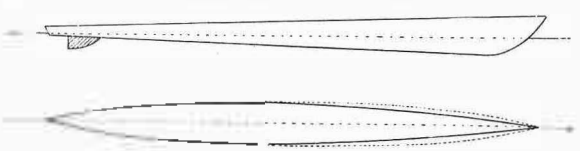
By Captain C. C. Longridge, Memb. Inst. Mech. Engineers.

At least three racing launches are in course of construction in this country for the international cup presented by Mr. Harmsworth. Messrs. Thornycroft, it is believed, have entrusted the design of their hull to Mr. Strickland, of Teddington. Messrs. Napier, Ltd., have engaged the services of Mr. L. Hope, while the Liquid Fuel Co., Ltd., are probably the designers and constructors of their own hull. Of the several boats, no particulars, so far, have been disclosed; and as the racing rules prescribe nothing beyond an over-all length of forty feet as a maximum limit, there is ample scope for originality in both hull and machinery. As regards the hulls, it may safely be said that they will be carvel-built; and as the frictional resistance of smooth metal, such as copper, is 25 lbs. per square foot at six knots, while that of smooth varnish* is 33 lbs., the material will be either sheet metal or hard wood highly polished. In the matter of material, little novelty can be introduced to diminish surface friction, of which the amount, varying roughly as the square of the speed, can be closely estimated. In one direction, however, skin friction is subject to design, inasmuch as, for the same area of wetted surface, a narrow deep hull is held to have a slight advantage over a broad and shallow boat. The engine power being great, and a certain draught necessary for the efficient running of the powerful screw, there is choice between a narrow, fairly deep hull, and a broader, shallow bottomed boat, in which the propeller alone is given a deeper immersion. More important than skin friction, from a designer's point of view, are three other forms of resistance, which will now be considered. All of these resistances are due to wave formation, and, though more or less unknown quantities, their influence at the high speeds likely to be attained will be of the utmost importance. It is, in fact, in dealing with these causes of speed loss that the skill of the designers will come into evidence, and the greatest novelty is likely to appear. The moment at which wave resistance comes prominently into action, rapidly increasing the general resistance beyond the square of the speed, is usually assumed to be when the speed becomes equal to the square root of the length of the vessel: for a 40ft. boat, therefore, at about 6.3 knots per hour—a speed evidently far below that which will be attained by the cup racers. Wave resistance, therefore, is obviously the "knotty" point for the hull designer. The simplest of the resistances in question is that due to the "bow" or "translation" wave the fold of water that is seen rolling away, in opening fan-like sweep, on either side of the bow. For any given form of bow, the ratio of increase of resistance from bow wave is practically constant. It depends on the length and angle of entrance, and, naturally, is a minimum with a bow formation of minimum resistance. But what is the formation of least resistance is not quite certain. In this country there is a tendency to consider it a curve of versed sines, from which it is further calculated that the length of the entrance should be .562 of the square of the speed required. Continental builders, however, dispose very summarily of the versed sine theory, and the forthcoming race should throw light on the question of bow curves for high speed. The second form of resistance to be noticed is the "transverse" wave due to the bulk of the craft itself, and clearly visible, as it rolls fore and aft alongside the boat, at right angles to the course. The amount and variation of the resistance arising from this cause is not at all clear; but there is no doubt that it is the most variable and, at high speeds, the most formidable factor in the general resistance. It is largest at the bow, and diminishes towards the stern. It is greater with deep than with shallow vessels, and it is largely governed by the section of the vessel. The last form of resistance to be considered is the "following" or "replacement" wave pursuing the vessel, seeking to fill up the cavity left by the advancing hull, and, as it closes in behind the stern, pushing the latter forward on its course. Its influence, therefore, would be beneficial, were it not that a certain retardation in speed and a certain insufficiency in volume tended to leave the cavity unfilled, and thus left imperfectly realised the stream line theory, whereby the retarding force expended in driving up the bow wave should be restored by the propelling pressure of the water closing in round the stern. It is this imperfect fulfilment of the reciprocal action that constitutes a resistance by defect. To reduce this to a minimum the designer has two objects in view. First, to make the run or after body such as to give the easiest flow to the following water. Theoretically, the area of each successive after section should be reduced in a ratio represented by the replacement wave at that point; or to put it otherwise, the area of any vertical section in the after body should be the area of the midship section less the area which the swell of the replacement wave supplies at that stage of its formation. That is to say, what is wanting in wave volume at any point (for the replacement wave is not fully formed till the stern of the vessel is reached) must be made up by the body of the boat at that point. Some designers consider that this requirement is satisfied if the run is formed as a trochoidal curve, and the length of the after body is made two-thirds of that of the entrance. There is, however, an increasing tendency to add to the length and fineness of the run, in view both of the easier filling of the caviety and the greater efficiency of the propeller in less broken and denser water. The second point to which the designer will give attention is a provision that, at the speed required, the crest of the transverse wave shall coincide with the hollow of the replacement wave, thus helping to fill the stern cavity and give denser and fuller water on to the screw. From the length and fineness of the entrance and run, follow as corollaries, that there will be no straight length of middle body, and that the displacements of the fore and after body will be fairly evenly balanced. To resume the above. As regards surface friction,

* Smooth varnish, rubbed down when hard with powdered pumice stone and oil, gives a good surface.

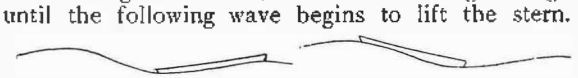
the launch with the lightest hull, machinery, and gear, and, therefore, the least wetted surface, will be the best off; but with equal displacement, the narrow, deeper vessel will have some slight advantage over the broader and shallower craft. The launch with the lengthiest and finest entrance will suffer least from bow wave; but in a 40ft. boat it may be necessary to sacrifice some of this advantage in order to make full provision for the more important requirement of long and easy run, or after-body. Wind resistance will no doubt be met with low freeboard, and safety be provided by light turtle-back decks.

On the question of wave resistance, Mr. H. J. Dartnall, late chief draughtsman to Messrs. Day, Summers, and Co., writes: "From a commonsense point of view, it has always struck me, on seeing fast launches or photographs of same, that the almost universal rise of the bow and drop at the stern must be very detrimental to speed; and dealing with this and the bow and replacement wave in a boat 40ft. long and of 100 h.p. will tax the originality of the designer to the utmost. . . . This lifting at the bow, etc., occurs in the 18ft. racing skiff. The recovery after the stroke of the oars, with sliding seat, of course, increased this, and some boats nearly stopped between the strokes. I have found by placing the rowlocks, seat, and, therefore, weight, more forward, and thus making the boat draw more by the head when at rest, she ran much better between the strokes. It always seemed to me that the fastest and easiest-driven skiff, either in smooth water or head to sea, and especially running with a following sea, was a boat something as shown. As you have no doubt observed, in running



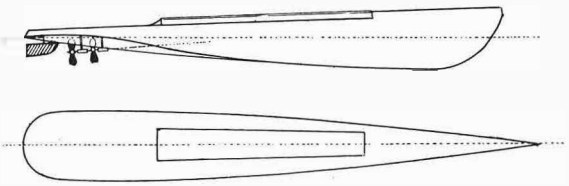
The dotted lines show the water line and centre line of the launch. A metal fin is placed at the stern to keep the boat straight when running.

with a following sea a short boat almost stops dead when rising on a wave, and does not begin to go until the following wave begins to lift the stern.



In fact, in coast racing one never attempts to pull with the bow rising the wave. It is on the run down the slope, as it were, that the sharp high bow is a distinct advantage over lower freeboard. As the stern lifts, the bow is depressed, and the low freeboard boat runs the canvas which covers the bow under water. The same thing is found with the 30ft. racing four-oared galleys which travel for short distances, nearly at a pace of twelve miles an hour. The oar-driven skiff has a high speed for its length, and I should say that what applies to the skiff would to a certain extent apply to the fast launch, remembering, of course, that the one has a constant force exerted to drive it. I have seen the experimental runs with models in the tank at Haslar, and the resistance-recording dynamometer and the making and cutting of the models (from drawn lines) in paraffin wax; and here I would suggest the man with a theory and a model, say, one-third size

$\frac{40}{3}$ = 13.33ft., would get something reliable to work on. I should much like to get a model something like the sketch below, viz., all entrance and all run, tried."



The dotted lines show the water and centre lines. The deck is cut down at the stern to reduce weight, while the propellers work in a part tunnel so as to keep the shaft up to allow large propellers.

As motors, engines of close on 100 h.p. are spoken of. The petrol motors will probably be direct driven or the clutch locked to the fly-wheel during the race. Ball bearings are likely to be much in evidence. Apart from the increase in weight, there might be some advantage in dividing the power, say, into three motors with three propellers—two at the sides and one at the stern. Less immersion would be needed, and the screws would work more efficiently in the less broken water. If one screw is used, the Yarrow hinged tunnel system will probably be employed, since this, in shallow draught boats, enables large propellers to be fitted. Thus, in a boat drawing 1ft., propellers of 2½ft. diameter have been adopted, and in one drawing 2ft, the diameter of propellers has been increased to 4½ft. and 5ft.

On this point Mr. Dartnall writes:

"I see that your view has been met in a fast 55ft. 120 h.p. launch illustrated in the December (last) number of the *Rudder*. From the photographs showing the boat running at twenty-three miles an hour (?) the boat appears to have a good freeboard, round stern, open well, and is steered from right forward of same. The stern shows two holes above water line, from which it appears both water and the exhaust are pouring. From this and the one shaft, I suggest that the propeller or, more likely, propellers are worked partly in a tunnel."

THE 1903 RELIABILITY TRIALS.

Last week at a meeting of the Trials Committee the following gentlemen were appointed judges: Mr. W. Worby Beaumont, M.Inst.C.E., Professor C. Vernon Boys, F.R.S., Mr. Dugald Clerk, M.Inst.C.E., Mr. E. H. Cozens-Hardy, A.M.I.E.E., Col. R. E. Crompton, C.B., R.E., Professor Hele-Shaw, LL.D., F.R.S., Lieut.-Col. H. C. L. Holden, R.A., F.R.S., Major F. Lindsay Lloyd, R.E., Hon. Scott Montagu, M.P., and Mr. Lyons Sampson, M.I.Mech.E.

With the universal use of the motor car, which we are told to expect in the very near future, writes Mr. Henry Norman, we shall be able to live three times as much in the same span of years, our horizon will be extended, and our lives will be wider and more interesting.

SOME INTERESTING LEGAL QUESTIONS.

During the hearing of a recent action against an automobilist several legal points cropped up which are of interest to readers of *The Autocar*, and we give them below in the form of questions as they were submitted to a legal authority on the subject, together with his replies:

Q.—(1.) What constitutes being in control of a horse? When the control is manifestly dual, as by a person on foot at the horse's head and one in the driver's seat holding the reins, to which of these should the motorist look for an indication of what is required of him? Supposing these indications to be contradictory, which should he follow?

A.—The points raised do not appear to have been decided, consequently we can only express our opinion on general grounds. By Regulation 8 of Article 4 of the Light Locomotives on Highways Order 1896, made by the Local Government Board under Section 6 of the Locomotives on Highways Act, 1896, it is provided that the person driving or in charge of a light locomotive, when used on any highway, shall, "on the request of any police constable, or of any person having charge of a restive horse, or on such constable or person putting up his hand as a signal for that purpose, cause the light locomotive to stop and to remain stationary so long as may be reasonably necessary." Any breach of this regulation may be punished by a fine not exceeding £10. This regulation is worded differently from the provisions relating to locomotives on highways other than light locomotives. Every ordinary road locomotive must be stopped on *any person with* a horse or carriage putting up his hand, but as regards light locomotives, the only person, besides a constable, entitled to the benefit of the Local Government Board's regulation is the person *in charge* of a restive horse. We do not think the Court would hold that a person assisting at the horse's head would be in charge while the coachman still retains the reins. It is a well-known maxim of the law that a penal statute is to be strictly construed, and the regulation ought not to be held to include any person who has only partial charge. At the same time, until a case comes before the Court it would be wise, of course, to stop the car at the request of any person who appears to have the slightest charge of the horse.

Q.—(2.) Does paragraph 8 of article 4 contemplate any distance as being a reasonable one in which to require a car to stop, or is a summons invariably absolute and peremptory, however short the distance at which the signal is given? (In the case in question the car was within three yards of the horse before a signal was given.)

A.—It will be noticed that in paragraph 8 no distance is stated. The car must be stopped as soon as possible after the signal is given. If it be impossible to stop the car before it reaches the horse it must still be stopped as soon as practicable, and remain stationary so long as may be reasonably necessary.

Q.—(3.) If the latter construction in question 2 is to be understood, would the motorist under any circumstances whatever be justified in endeavouring to avert an imminent accident which might be caused by—

(a) Skid, following instantaneous pulling up on a greasy road;

(b) Halting the car, before the engine could be stopped, immediately to the front of or beside or just behind a restive or uncontrollable horse,

such accident being avoidable by quietly slipping by?

A.—The regulation of the Local Government Board must be strictly complied with. As regards skidding, we do not think it is intended that the motor car driver should pull up instantaneously, but if the car is unable to be safely stopped within a reasonable time, then there would be a breach of Regulation 1 of Article 4, as the driver would be going at a greater speed than is reasonable. As regards point (b) we are afraid the opinions of the justices would vary so much that it is very little use expressing our own.

Q.—(4.) Is it invariably obligatory on the motorist to stop for an appreciable interval even after passing such a horse should the car have run on past the obstacle before it could be pulled up, and the horse is no longer restive?

A.—Yes. This would certainly be necessary in order to comply with the regulation.

On his recent visit to the Hon. Percy Wyndham's seat in South Wilts, Mr. Balfour made the whole journey from Downing Street to Clouds in his autocar.

* * *

A service of steam motor cars is to be established between Stratford-on-Avon, Shipston-on-Stour, and Brailes, fourteen miles in all. The Earl of Camperdown is at the head of the company formed to control the project.

* * *

Amongst the most recent garages which have been established are the following: Messrs. Edwards and Armstrong, 8, Welsh Back, Bristol, open every day and night, electrically lighted, and with complete repairing equipment; Mr. H. Garner, cycle agent, Welsh Row, Nantwich, accommodation for forty cars and every convenience for washing and repairing. This garage is also open day and night (Sundays excepted).

The new law in New Zealand forbids the emission of smoke by automobiles, a white light must be carried in front, and the car must sound an alarm of its approach.

* * *

The new automobile boat ordered by the Sultan of Morocco from a French maker has just been delivered at Tangiers. It is in cedar wood, with a motor of 8 h.p. Its length is about 19ft., its width nearly 5ft., and its depth about 2ft. It can travel fifteen and a half kiloms. an hour.

* * *

A good story is told of a too hasty and generous motorist. Driving at more than regulation speed he overtook a man and a dog. The man moved, but the dog was killed. The motorist stopped, pressed three sovereigns in the man's hand, and fled. The man gazed after him, and then at the money. "He is very kind," he said, softly, "but I wonder to whom the poor dog belonged."

CONTINENTAL NOTES AND NEWS.

The Autocar in Russia.

Though automobilism continues to lag behind in Russia on account of the absence of good roads the movement is, nevertheless, beginning to show a good deal of vitality, and it is also receiving encouragement from the Government, who are paying considerable attention to the employment of automobiles for military purposes, and have for some time past been projecting some extensive improvements to the highways. Meanwhile, the A.C. of St. Petersburg is doing some useful work in the way of popularising the autocar, and it is now reported to be on the point of amalgamating with the A.C. of Moscow, with a view of creating a vast automobile federation throughout the Empire. The first result of this projected combination is the organisation of a race from Moscow to St. Petersburg, which will take place in June, and it is now proposed to approach the A.C. of France in the hope of arranging a race from Paris to St. Petersburg next year. It will be remembered that the idea of this race was first mooted three years ago when the A.C. of France sent a commission to Russia to prospect the roads, but the report was so unfavourable that the project was abandoned and replaced by the race to Berlin. If the roads have since then been sufficiently improved to allow of racing, St. Petersburg will still find rival claims next year in favour of Rome, as the A.C. of Italy has already broached the question of organising a race from Paris to the Italian capital.

Trials of Touring Cars.

As racing is being placed under such severe restrictions that there is little chance of long distance speed contests being carried out in the future unless organised by the A.C.F. or by manufacturers in the interests of the trade, so the various provincial clubs which have always made racing a feature of their meetings find themselves under the necessity of modifying the character of their programmes, in which they now give special attention to the touring vehicle in contradistinction to the racing car. The result is the organisation of trials of a very practical and highly instructive character. One of these was carried out last week by the Automobile Club of Touraine, which had selected two circular routes from Tours, one of seventy-nine and a half miles and the other of ninety-seven and a half miles, and to complete the trials a kilometre speed test and a hill-climbing competition were included, though, as the Government refused to authorise these events on the public highways, the A.C. of Touraine had to run them off on private property. Points were given for the various factors as follows: One point per 1,000 francs of the list price of the car; one point for each minute's stoppage due to derangements other than tyre troubles; one point per ten kilos of dead weight per passenger; ten points per kilometre below thirty kilometres an hour over the entire course; two points per kilometre below thirty kilometres an hour on an up grade of five to ten per cent.; one point per kilometre below seventy kilometres an hour over a level flying kilometre; comfort, nought to five points: elegance, nought to five points: ease of driving and accessibility of motor and gear, nought to five points. The weather had a very wintry aspect with falls of snow on the previous days, and during the trials the cold and wind were anything but agreeable to the tourists. Nevertheless, there were twenty competitors, comprising eighteen cars and two motor cycles. On the first day the course lay from Tours to Château-la-Vallière, Gizeux, Borgeuil, Chinon, Azay-le-Rideau, and back to Tours, a distance of seventy-nine and a half miles. All the vehicles covered the course with great regularity, but the judges decided to disqualify the Peugeot driven by M. Cuchelat, because he refilled his tank on the road, the judges arguing that a proper touring car ought to be able to cover the entire course without replenishing supplies. This was due solely to a misunderstanding, since M. Cuchelat employed the small tank he used in a recent consumption test, and he thought he was offering a greater guarantee of accuracy in using this special tank instead of fitting one of the usual dimensions. On the second day the cars took a longer course from Tours to Château-renault, Amboise, Loches, Saint Maure, and back, the distance being ninety-seven and a half miles, and once more the majority of the vehicles went through the test without the slightest incident, only one or two losing time through mechanical troubles, and as regards reliability and regularity of running the trials were most convincing. The consumption for the two days, over a total distance of 177 miles, were as follows:

H.P.	Car.	Weight in Kilos.	Consumption of Petrol in Litres.
15	Brouhot	1026	57·855 (alcohol)
10		1076	48·92
15		945	37
20		1165	45·6
16	Delaugère	1469	34·25
12	Delahaye	858	37·01
16	Georges Richard	892	45·88
20	Sage	1210	47·9
12	Delahaye	864	40·55
14	Renault	965	35·32
16	Darracq	755	35·66
20		850	64·4
4	Prunel	525	27·4
8	Ader	710	29·72
8	Delahaye	634	29·87
15	C.G.V.	1305	59·160
2	Bruneau Motor Bicycle		5·75
2	F.N.		6·25

Kilometre and Climbing Tests.

In the kilometre speed trial, organised by the A.C. of Touraine, the competitors were under the disadvantage of having only about 300 yards in which to get up speed before crossing the line, and they had, moreover, to drive against a strong head wind; nevertheless, the results were very satisfactory, even the little voiturettes travelling beyond the legal limit of speed. The best performance was accomplished by the 20 h.p. Brouhot, driven by M. Tourand, who covered the kilometre in 59.16s., which is at the rate of about thirty-eight miles an hour. The 20 h.p. Darracq, driven by Clément, was second in 1m. 1.66s.; followed by a 14 h.p. Renault in 1m. 5.62s.; a 14 h.p. Georges Richard in 1m. 5.64s.; the 16 h.p. Delaugère omnibus in 1m. 7.50s.; the Bruneau motor bicycle in 1m. 13.30s.; the 15 h.p. C.G.V. (Madame Knowles) in 1m. 14.36s.; the 16 h.p. Darracq in 1m. 15.29s.; and the F.N. motor bicycles in 1m. 16.14s. and 1m. 16.68s. respectively. The hill climb took

place from a standing start on a gradient with an average incline of five per cent., the distance being 500 metres. The 20 h.p. Darracq, driven by Clément, did the best time in 55⅗s.; followed by Brouhot (Tourand) in 59⅕s.; 14 h.p. Georges Richard in 59⅗s.; C.G.V. (Madame Knowles) in 1m. 5⅛s.; the 14 h.p. Renault in 1m. 6⅕s.; and the Delaugère omnibus in 1m. 10s. With one exception all the cars climbed the gradient in less than two minutes. In connection with the trials a test of automobile lamps was carried out, when forty-seven lanterns were presented by eleven firms. The trials lasted three or four days, the lamps being first of all subjected to a test of illuminating capacity when the cars were reversed during the night along the road and the rays measured by a photometer. The lamps were then filled and allowed to burn until extinction to ascertain the time during which they would burn without attention. The following were the totals of marks with which the cars were penalised during the two days' trials: 14 h.p. Georges Richard, 73.28; 14 h.p. Renault, 75.54; 15 h.p. Brouhot, 78.24; 20 h.p. Darracq, 81.63; 16 h.p. Delaugère omnibus, 86.65; 15 h.p. Brouhot, 96.75; 8 h.p. Delahaye, 99.01; 12 h.p. Delahaye, 102.74; 10 h.p. Brouhot, 103.63; 8 h.p. Ader, 104.57; 15 h.p. C.G.V., 114.07; 16 h.p. Darracq, 115.21; 10 h.p. Brouhot, 124.32; 6½ h.p. Prunel, 124.33; 12 h.p. Delahaye, 138.21; 20 h.p. Sage, 157.37. Motor bicycles: 2 h.p. Bruneau, 85.02; 2 h.p. F.N., 92.38. The first prize of a gold medal, offered by the A.C.T., and twenty-five per cent. of entrance fees were awarded for the Georges Richard car, which came out with the lowest number of points, and Renault Frères secured a gold-plated medal from the A.C.T. and another from *La France Automobile* for the most silent motor, as well as fifteen per cent. of the entrance fees. M. Tourand obtained for his 20 h.p. Brouhot car a gold-plated medal from the Touring Club de France, a silver medal from the A.C.F. for the best performance in the kilometre test, and a gold medal from the Continental Tyre Co., as well as ten per cent. of the entrance fees. Darracq and Delaugère also received ten per cent. of the entrance fees and medals, while the Brouhot car running with alcohol was awarded a gold medal by the Société d'Agriculture de France. Delahaye received a bronze medal from the T.C.F. for economy of consumption, and medals for consumption also went to the Ader and Brouhot, while the C.G.V. car had the first prize for comfort. Bruneau et Cie., of Tours, secured the gold medal for motor bicycles, and Bourdeaux was awarded a silver medal for the F.N. bicycle, each receiving at the same time a proportion of the entrance fees.

The Ardennes Circuit.

The Automobile Club of Belgium has decided to run off the Circuit des Ardennes on two days—June 20th and 21st—the first being devoted to voiturettes, motor cycles, and touring cars, and the second to light carriages and big cars. Two separate courses have been selected, the motor cycles, voiturettes, and touring cars running from Arlon to Bastogne, Champlon, St. Hubert, Recogne, Semel, Neufchâteau, Longlier, Leguse, Habay, Etané, and Arlon, which will be covered twice without neutralisations, thus bringing up the total distance to 168.9

The Thornycroft waggon we illustrate above is owned by the Barberton Traction Co., of South Africa, and is employed by them for transporting mealies, coal, dynamite, and general stores to the mines in Moodie's concession. The district is generally admitted to be one of the worst in South Africa, so far as the roughness and general vileness of its tracks are concerned. It is impossible to call them roads. The waggon, which is of the special Colonial type built by the Thornycroft Steam Wagon Co., of Chiswick and Basingstoke, is shown in our illustration carrying a load of four tons of gold concentrates, which it has brought down from the mines to the railway. Messrs. Thornycroft now have a number of these special four-ton steam waggons running in India, Mauritius, and other parts of the globe.

miles; while the light carriages and big cars will run on the second day over the same course as last year, that is to say from Bastogne to Martelange, Habay-la-neuve, Longlier, and Bastogne, and will cover this route without neutralisations six times, which will make a total distance of 318.2 miles. On the first day the vehicles are classed as voiturettes weighing less than 400 kilos, motor cycles of from 50 kilos to 250 kilos, motor cycles of 50 kilos and less, and touring cars with four seats occupied weighing less than 1,000 kilos, though in this weight will not be included the carriage body for the third and fourth passengers, or the mudguards and other accessories. The touring cars, however, must run with all the accessories complete. The entrance fees are 100 francs for the voiturettes and touring cars, 50 francs for the big motor cycles, and 25 francs for the light cycles. On the second day the vehicles will be classed into light carriages weighing from 400 to 700 kilos, and cars weighing from 700 to 1,000 kilos, each having two places occupied. The entrance fees are 200 francs for the light carriages and 300 francs for the big cars. All the entries and fees must be sent to the Secrétariat, Automobile Club de Belgique, 5, Place Royale, Brussels, by May 1st, after which time the fees will be doubled.

Correspondence.

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

THE WILY CHAUFFEUR.

[2927.]—We have been considerably interested in the letters appearing in your correspondence columns in regard to the demanding of ten per cent. commission by chauffeurs on parts supplied or work done for their masters. This is distinctly a curse to the trade, and a continual cause of annoyance and trouble. We have had many instances, however, of much worse practices than these. On declining to give commissions of this sort, we have frequently been met with such requests as to invoice "ten gallons of petrol and supply six gallons, giving me the difference," or "invoice three inner tubes, giving me two and paying me the difference." Matters have proceeded much further than this. It is a matter certainly of weekly occurrence that we receive visits from chauffeurs whose masters have previously inspected cars at our showrooms, and who demand of us a commission varying from five to fifteen per cent. on the price of the car, under the threat that if same is not given they will report unfavourably on the car selected. Worse, however, remains untold. In at least three cases where the cars have been actually purchased and taken away by the purchaser, we have subsequently had visits from the chauffeurs of these clients, who have demanded sums varying from £10 to £50, under the threat that if their requests are not acceded to they will "jolly soon make the car so that the 'guv'nor' is dissatisfied with it."

Another glaring instance of right-down blackmail that occurs to our memories as one of our almost innumerable similar experiences is the following: We received a letter from a wealthy and greatly-valued client, addressed from his country seat, stating that he was extremely dissatisfied with his car, and that he was sending his chauffeur with it to our depot to be put right, further stating that although he was willing to pay for the work, he was put to considerable inconvenience by not having his car to use, as well as loss by the paying of his chauffeur whilst the car was not in use, and also his expenses whilst in London. The car duly arrived: and, according to custom, was immediately tested by a responsible member of our staff, who, to his amazement, could find nothing wrong with the car. On returning to the depot, the following conversation ensued:

Staff: "Why, chauffeur, what is wrong with this car? She seems to run perfectly, and I can detect no fault."

Chauffeur: "Oh, there's nothing the matter with it. We had a glorious run up from ———."

Staff: "Why then is your master so dissatisfied, and why does he write us that you report the car must come here to be overhauled?"

Chauffeur: "Oh, it is too d——d slow at ——— for anything, and I meant having a week's holiday in London."

Staff: "But why say the car wants overhauling?"

Chauffeur: "Well, you've no need to touch the car, and you can send in a good bill. I told the old man it would cost £30 to £40, and you can give me half of it."

It will probably not interest you or your readers to state the course we adopted, but it will suffice to state that the suggested "bill" was not sent in, that the chauffeur had his holiday, but he did *not* receive one-half the amount of the bill, and that his holiday extended considerably over one week.

Another case of the cupidity of chauffeurs that recurs to our memory is the following: Two chauffeurs were in the depot—one having charge of a car with tube ignition, and the other of one fitted with both tube and electric ignitions. "Tube Ignition" is overheard to say to his *confrère*, "Nothing ever goes wrong with my car, and I get no chance of buying spare parts and getting my bit of com." "Oh," says the other, "you don't know how to work it." "Don't I," replies 'Tube Ignition,' "well how would you work it?" *Confrère log.*: "Oh, work the platinum tube game for one thing." "Tube Ignition": "What do you mean; say my tubes have burst?" *Confrère:* "Yes." "Tube Ignition": "That won't work with my guv'nor; he wants to see the old tube." *Confrère:* "What does that matter, you can buy a crushed tube for about twenty-five bob, and you can show the guv'nor that, and kid him you gave £2 10s. for a new one; you'll then make twenty-five bob." "Tube Ignition": "Good egg."

In yet another case a chauffeur, whose master kept him well supplied with spare parts, permitting him to have just what he asked for, to our knowledge sold another chauffeur two platinum tubes for £2 each, the purchaser reporting to his master that he had a breakdown on the road, and had had to buy two platinum tubes from a *confrère*, whom he met on the road, at £3 each, and whose receipt for £6 he produced. He deliberately smashed two platinum tubes to make his tale good. The purchasing chauffeur pocketed £1 for himself, and the selling chauffeur pocketed £5, well knowing that his master would never miss the loss of two tubes from his well-supplied kit, more especially as he never ran his car on tube ignition.

One more instance may be given of the cupidity of the wily chauffeur: Early one evening a car arrived at the depot after having had a slight collision with an omnibus. The total damage done was one front wing wrenched off and one paraffin dash lamp and bracket demolished. The owner was not in the car at the time of the collision, and the car was a new one delivered only two days before the occurrence. The car was insured, and the omnibus driver acknowledged the blame rested with him, and this was supported by a police witness. The damage did not amount to a sufficient sum to claim from the insurance company. The chauffeur departed from the depot to inform the owner of the damage, and in addition to the actual damage, also reported that a costly acetylene gas lamp had been smashed. On his return to the depot he told us that he had done this, and that his master would claim for it; he therefore asked us to send the owner an account, including the acetylene lamp, and calmly requested us to hand him the cost of the lamp.

By the exercise of our memories, we could find very many similar instances of sheer robbery, but probably the above will suffice, but an entirely different form of peccability occurred only the other day. A chauffeur deliberately placed a bolt in his gear box and smashed up his gear solely to obtain a holiday and to draw his commission on the repair. On finding that the first establishment he visited refused to give him the desired commission, he transported the car to a neighbouring depot, where, possibly, his wishes were acceded to, and where also probably he did not acknowledge, as he did at the first establishment, that he had wilfully caused the damage. Notwithstanding, this chauffeur no longer works for the same automobilist.

As some amount of correspondence has taken place in regard to advertising of the names of firms and cars in your correspondence columns, we content ourselves with enclosing a voucher of our *bona-fides* and subscribe ourselves.

NEC TEMERE, NEC TIMIDE.

BRITISH CAR DESIGN.

[2928.]—"Looker On" asks me to state whether my engines on "Sir Charles," of 1,000 miles fame, have solid cylinder heads or water joints.

My cylinder heads are solid, cast in one piece. The only water joint my engines possess is that outside connecting the head to the cylinder.

In your issue of 18th April, Mr. Weigel asserts, most dogmatically, that no Napier car was constructed before the end of 1900. As I happened in the autumn of 1899 to have given Mr. Napier his first order for a motor car, it being delivered to me on the 24th April, 1900, I think Mr. Weigel, before accusing my friend Mr. Jarrott of being ignorant of dates, and "of talking utter nonsense," while grinding with so much zeal and so little courtesy his foreign axe, should be more careful of the charges he prefers against others EDWARD KENNARD.

[As there appears to have been some doubt about the date of the head without water joint it will not be out of place to refer to patent No. 24,727 of 1899, in which Messrs. Edge and Napier state, "One of our improvements relates to the water jacket to the working cylinder or cylinders in which the explosion chamber is made separately and is connected thereto by screw bolts or other suitable fastenings. The present improvement consists in providing the water jacket of an explosion chamber and the water jacket of the cylinder or cylinders with external lateral protuberances, having passages therein from the said water joints, so that when these protuberances are brought together in the fixing of the explosion chamber to the cylinder or cylinders the said passages will coincide and provide an external communication between the water jacket for the circulation of the cooling liquid from one jacket to another." This is plainly shown in the drawing fig. 1 accompanying the specification. In the provisional application the advantages in the way of overcoming leaking into the cylinders are mentioned. In fig. 6 a method of opening up the inlet valves by the removal of one nut was shown, but this was apparently regarded merely as a matter of design, as it is not described or claimed. Altogether this specification is an interesting one.—ED.]

[2929.]—I have little to reply to Mr. Henry Sturmey for the reason that I agree pretty well with what he says.

My one purpose in writing on the above subject was to show the absurdity of stating that the Continental builders had ever copied the American or English ones. It is perfectly true Mr. Sturmey did not make that statement himself, but as he wrote in support of somebody who did, his real meaning could easily be misunderstood.

Now, Mr. Sturmey's idea is quite clear: not only did he not say the Continental makers copied the other ones, but he thinks it "most improbable" they should have done so, for the very reason I gave in my letter which appeared in *The Autocar* for March 7th.

So that I have to thank him for the support he gives me, and I very much hope the result which has been arrived at through that correspondence will not be forgotten by the pushing persons, who ought for the future to reserve their ill-advised statements for the advertising pages of this excellent magazine.

Now the question of "merit" as touched by Mr. Sturmey is a very complicated one. I myself contend that there is no such thing as "merit": everyone of us does what he is born to do, and has no choice in the matter. Still, I don't object to Mr. Sturmey's theory, though I could oppose it by saying that the little houses, being always open to other people's inventions and ready to *borrow* them, have an advantage over the big firms that are very much prejudiced against outside ideas and only make use of the ones they have themselves.

Before bringing my letter to a close, I should like to dissipate the belief, which seems to have some currency in England, that the French confine their attention to one type of machine: I have only to name the firms Ader, Gobron-Brillié, Bardon, Gillet-Forest, Hautier, and Delahaye to prove the fallacy of that idea.

And I believe it will interest your readers to know that Lenoir, the inventor of the internal combustion engine, built and drove a motor car in Paris some forty years ago, which was propelled by his well-known electrically ignited two-cycle engine. I got this information from Mons. Baudry de Saunier.

May I be allowed a few lines more to congratulate you upon your paper, Mr. Editor? I like it very much, and, though a French motor writer myself, I must admit that your accounts of the French events are very often better than the ones we print in our own *journaux*.

D. YZELEN.

DE DION CLUTCHES.

[2930.]—After running a De Dion car for a few weeks I find that the clutches are beginning to bind, that is to say, it is impossible to find a neutral position for the clutch handle, so that the engine is put quite out of gear.

If one of your readers will kindly tell me what is probably the matter I shall be immensely obliged.

NOVICE.

THE CLUB JOURNAL.

[2931.]—Knowing your columns are invariably open to queries of general interest, and as this week's issue of the *Automobile Club Journal* has again aroused my wonderment, I venture to think that replies to the following questions would afford considerable interest and information to automobilists generally and club members particularly:

(1.) Is the Automobile Club's *Journal* run for the benefit of members generally, or for that of a clique?

(2.) If for the latter, what are the necessary qualifications for membership of this inner ring?

(3.) What is the charge for "puffing" in the "Club Topics" paragraphs (*a*) an individual, (*b*) a car in which one or more members of this coterie are financially interested?

(4.) Can the "operators" see their way to providing a weekly column for announcements of births, which are of peculiar interest only to the proud progenitors?

(5.) Is there any other members' journal (save the mark!) which persistently refuses to publish letters written "from the other point of view?"

I should like to take this opportunity of expressing as strongly as possible my entire disapproval of the manner in which the *Automobile Club Journal* is conducted.

In my humble opinion the *Journal* should not make any attempt to compete against the recognised automobile press, which caters very well, *and impartially*, for the public.

It appears to me to be only fair to the members of the club, who are not in the inner circle, that their views on debatable subjects should be allowed to appear in the pages of their own *Journal*. I and others are under the very strong impression that letters containing any criticisms or remarks that are not quite acceptable to the club press censor are almost invariably refused publication.

I trust that members of the A.C.G.B. and I. will now combine and insist that their *Journal* shall be henceforth conducted in a proper manner, and that impartiality *and dignity* will be no longer lacking.

A MEMBER OF THE CLUB.

A WARNING.

[2932.]—While driving my car, April 11th, on the Crawley road, I came across two gentlemen with a motor quad. They were repairing a tyre. I pulled up and asked if I could be of any service to them. They then told me that certain small boys had deposited tacks point up along the road. I myself had seen boys apparently adjusting something with great care in the road, but nothing dawned upon me as to what they were doing until I came across these gentlemen. I may add that no less than five tacks were extracted with difficulty from the tyre. One of the gentlemen said a table knife had also been laid blade up across the road. But luckily they saw it in time and swerved off. What amusement it causes to these little devils I cannot conceive. If ever I come across anything like it again I shall summon the parent or guardian who is supposed to control the child, and I hope that the magistrates will deal fairly between us, and give him a sound flogging and make him pay for a new tyre or make good the damage done. H. HUGHES.

A TESTING ROUTE.

[2933.]—The route from Lancaster to Clitheroe hardly pretends to be a main road. The road from Ilfracombe *via* Parracombe, Lynmouth, and Porlock is a main road.

It is described in route 791 of the Contour Book as the worst main road in the South of England. It has a gradient of one in five, and several of one in seven, and contains "the most dangerous hill" in the country. It would be interesting to know whether any car has ever travelled from Lynmouth to Parracombe with its full or partial load; whether any worse *main road* exists in the United Kingdom; if so, where, and with what gradients? With the advent of higher power on touring cars hill climbing becomes interesting. GRADIENT.

THE PETROL QUESTION.

[2934.]—I notice several letters in your last issue complaining that the density of petrol has risen from .680 to .720.

I find that Pratt's motor spirit sold in Coventry is .720, and, not only this, but that the price has been raised 2d. or 3d. a gallon, but I was not aware from the actual running of either a motor cycle with surface carburetter or small car (Oldsmobile) with jet carburetter that any change had been made. V. A. HOLROYD.

[2935.]—I think it should be as widely known as possible that motor spirit having a density of .720 or more is not adapted for use in motor cars; although some engines can be run with this spirit at reduced power, others will not start at all. Spirit, therefore, should be tested by densimeter, and if of specific gravity of more than .680 to .685 should be rejected. Carless, Capel and Leonard, and Lee of Glasgow, supply spirit of this density.

C. D.

[2936.]—Probably many of your readers, like myself, have been suffering from the recent increase in density of the motor spirit supplied by one of the leading firms. A sample tested the other day showed .725, and with spirit of this density it is almost impossible to start, particularly when the weather is cold. The difficulty in starting is accentuated when the car has been standing long enough to have thoroughly cooled. Obviously this heavy spirit should be avoided, but to those who are unfortunate enough to find themselves obliged to use it I would recommend that a little boiling water be slowly poured over the outside of the carburetter before starting—this will generally vaporise the perol and enable the engine to be got under way at once. Heavy spirit, however, will be found not only to cause trouble in starting, but also to give rise to missing, particularly where the engine is slowing on a hill, and, moreover, it also causes an objectionable sticky deposit in cylinders and on valves. A. H.

[2937.]—Knowing your interest in all matters pertaining to automobiles, I think it right to inform you of a very curious trouble which I have of late been experiencing.

During the last week my engine has been continually missing; it would, for instance, take the beginning of a hill in splendid style, and then all of a sudden it would miss two or three times, necessitating my dropping to a lower gear, which when all goes well is quite superfluous. I tried everything—ground in the valves, overhauled the ignition, etc., etc.—but all to no avail. The other night I compared notes with two friends who drive different makes of cars, and they both informed me that they had not been able to move, as their engines had been continually missing, and all their efforts had been of no avail. One of them then tested his petrol (Pratt's) and found it .720; he then put in some Carless, Capel, and Leonard, which test showed to be .685, and he came home from Worthing without a single miss. In case other motorists have been similarly troubled it might be of interest to record the above facts in your valuable columns. It seems extraordinary that the Anglo-American Oil Co. should suddenly and without warning supply motor spirit of .720 density. A. E. COHEN.

[We have received a number of other letters dealing with the same subject; also copies of letters which the American Oil Company have sent to correspondents who have complained of the heavier spirit. In one of these it is stated that the spirit of the lighter density has become so scarce as to be hardly obtainable even at an advance of 2d. per gallon, and that if consumers are determined to have it, it will probably be advanced another 2d. per gallon and may then be scarcely obtainable.—ED.]

DOGS.

[2938.]—I think I am correct in saying that, practically, the law-abiding Britisher has to allow himself to be killed or maimed, or his machine damaged, by a dog before he can legally take any action, satisfactory or otherwise, with a view to the preservation of his life or limb, or to the safety of his machine, from the deadly dog. Dogs dangerous to bicyclists are not labelled, and the casual traveller can never know when he is going to meet one. Obviously the only sensible method is to be no longer law-abiding, but to risk legal proceedings and ensure safety to life, limb, and machine by going for the dog. A small pistol, firing a few pellets of shot, is the most effectual safeguard a bicyclist can have, and *one* experience of it usually suffices for the dog. If all bicyclists would adopt this recommendation we should soon hear no more of the deadly bicycle dog. Furthermore, if all motor car drivers would drive steadily over any dog which deliberately attacks their car, the education of the uncontrolled dog, in the matter of cars and bicycles, would be soon perfected. I never hesitate to drive my car over dogs which *persist* in getting in my way, and so far with complete success. I admit it is very hard lines for the dog that he should have to suffer for the selfish carelessness of his owner, but so long as the police allow dogs to wander about the roads in uncontrolled freedom there is no help for it. The law *is*, I believe, sufficient to protect bicyclists against dangerous and unmanageable dogs, but the police will do nothing to enforce it; so the only way is for each bicyclist to act for his own safety as occasion demands.

ERNEST AYLWARD.

CHANGE SPEED GEAR AND DRIVING CERTIFICATES.

[2939.]—*Re* the remarks of your correspondent "Monty" in your issue of the 7th March, where he says: "For racing cars with expert drivers, sliding gear may give better results; but even experts at times miss their gear, while in the dark and to find the notch on quadrant is by no means an easy matter":

What kind of an "expert" driver would you call the driver who was guilty of missing his gear at all, and in the dark it should be as familiar to the touch as in daylight.

That is the kind of driver to whom I would refuse a driving certificate when he applies for one. It is, I fear, a class which I see every week end as the year grows older serpentining down the Ripley Road, to the terror of others, and creating agonising noises when he changes his gears. I maintain that that class of driver would be promptly found out under the examination for his driving certificate, and would be promptly refused one till he learned to know better.

And on this subject of driving certificates, surely, sir, this should be the reply of the Hon. J. S. Montagu to Mr. Long: Abolish Clause 2, Article 4, of the regulations, *i.e.*, the twelve miles per hour limit in exchange for the compulsory certificates, the standard for which shall be appointed by the Automobile Club. I am told the argument against this is that some amateurs would never get the certificates.

Surely, then, they are better off the road, and until they can attain proficiency they certainly ought not to be on it.

You would hear fewer growls about frightened horses if you had drivers who had had a lot of road experience, fewer side slips from experience of how to drive over different kinds of grease, etc.

Months ago I made application for a driving certificate from the A.C.G.B. and I.; but I have heard nothing, so presume the matter has not been taken seriously by the club.

If some advocates would only keep in touch with French automobile topics, they would know that numbering in France is a hideous mistake—the right man seldom is captured—and numbering in England will never be accepted. This should, in my opinion, be a complete answer to the numbering proposals.

Certificates, not numbers, is the solution to the speed limit. SPLIT PIN.

LICENSE PLATE is thanked for his letter, and asked to send his name and address, as the Editor would like to communicate with him.

Flashes.

A garage for the accommodation of about thirty autocars has been provided at the Hotel Cecil.

* * *

Messrs. Crampton and Co., the well-known electrical engineers, have now removed to new premises at 73, Queen Victoria Street, E.C.

* * *

Just too late for inclusion in our last issue a reader kindly informed us that the police are setting traps between the "King's Head," Albourne, and the bottom of Dale Hill on the Brighton Road.

* * *

Recently we referred to the motor vans ordered by Messrs. Broadwood for their piano business. A Liverpool correspondent, writing under the pseudonym of "An Eye," mentions that Mr. William Lea, of the Church Street music warehouse in Liverpool, has had two motor vans running in and around the city district for over two years. Our correspondent tells us they are most satisfactory, as they not only compass as much as three times the work which was done in the old style, but they are looked after by Mr. Lea's old drivers.

* * *

Messrs. Mann and Overton, Ltd., inform us that, owing to the large demand for Georges Richard cars, they have taken up the agency for the voiturette of the same make. They tell us that during the last three years Messrs. Georges Richard have sent out nearly 1,000 of these little cars in France. They use them themselves in the works for running errands in Paris, for fetching odds and ends, and for general use, and the machine has always given satisfaction. It is driven by a 5½ h.p. water-cooled engine, with three speeds forward and reverse, and will run up to twenty-five miles an hour. Two brakes are fitted and inclined wheel steering with the change-speed lever on the handle-bar similar to the Darracq. It is fitted with a two-seated body, and with wood or wire wheels, and it is an extremely handy little vehicle. It also had a good test in running trials, as it obtained the gold medal for low consumption in the 1901 alcohol trials, and two of the make ran the whole way from Paris to Berlin in the tourist section without any sort of trouble.

* * *

A service of steam omnibuses will shortly be started in France between Mont de Marsan and Dax, while a service will also be inaugurated between Oloron and Bedous.

* * *

The Marquis de Vogué, president of the Society of Agriculturists in France, has just informed the president of the French Automobile Club that he will give a prize of £80 to the first alcohol-driven car which gets in from Paris to Madrid.

Steam motors are now frequently to be seen about three o'clock in the morning puffing along Piccadilly with towering loads of vegetables behind them.

* * *

The autocars used by the military authorities are driven by specially enlisted and most experienced drivers, who are enrolled on the strength of the Army Service Corps.

* * *

Up in Harlem, the part of New York above 110th Street, it is common for many children to shout, "Git a horse," as one passes with an automobile. The latest is "Baby in a high chair."

* * *

The Bavarian Government has authorised a society to furnish the material for a service of automobile omnibuses in the Bavarian Highlands. One line of these modern conveyances will connect Garnisch with Scharnish, and another Garnisch with Imist, passing by the Col de Fern.

* * *

The Union of German fishermen is making experiments on a large scale for the application of motors to fishing vessels. Petroleum will be used in preference to alcohol. Benzine is considered too dangerous. The German fishing fleet is estimated at 18,000 boats.

* * *

The Graphic Motor and Engineering Co., Ltd., were summoned by the London County Council on the 17th inst. for contravening the Petroleum Act. Mr. Schiller, who appeared for the defendants, said the point raised was of great importance to the motor industry, as it was impossible to carry out the repairs of motor cars without having a certain quantity of petrol on the premises. If the contention of prosecutors was correct, it would appear that petroleum could not even be kept in the tank of a car if it were in a workshop. The petrol found by the inspector was only for putting into the tanks of motor cars which were going out to customers, and there was no concealment. Since 1901 the inspector had been perfectly well aware of what was going on at the company's premises, and there was never any suggestion that the regulations were being infringed. The Secretary of the company had given notice to the Council each year that petrol was used on the premises, and that which the inspector saw, which had not been on the premises half an hour, was required to fill two cars waiting to be sent away. However, a fine of 20s. and three guineas costs was imposed.

* * *

The German Society of Agriculture, which has its headquarters at Berlin, is organising an automobile test for the carriage of heavy material by automobile. The competition is for machines driven by alcohol. The Emperor has offered a "prix d'honneur," and, moreover, has added the sum of £310 to the amount at the disposal of the committee.

"THE AUTOCAR" DIARY.

April 24.—Lecture "The Motor Car of To-day." By Mr. Eric W. Walford, at City of London College
" 24.—Automobile Club of G. B. & I. Quarterly 100 Miles Trial.
" 25.—Eliminating Race for Gordon-Bennett Cars (British).
" 25.—Scottish A.C. Meet of Eastern and Western Sections at Dreadnought Hotel, Callander.
" 25.—Manchester A.C. Run to Alderley Edge.
" 25.—Sheffield and District A.C. Run to Normanton Inn.
" 27.—Society of Arts. First Cantor Lecture. "Mechanical Road Carriages," by Mr. W. W. Beaumont.
" 30.—Lincolnshire A.C. Run to Brigg.
May 2.—Manchester A.C. Week-end Run to Leasowe.
" 4.—Society of Arts. Second Cantor Lecture.
" 8.—Westminster Lecture. "The Motor Car." By Mr Mervyn O'Gorman.
" 9.—Circuit National, A.C. de Belgique.
" 11.—Society of Arts. Third Cantor Lecture.
" 13-14.—Scottish A.C. (Western Section). Glasgow to London Non-stop Trial.
" 15.—Last date of entry, at double entrance fee, for Paris-Madrid Race, at A.C. de France and Royal A.C. of Spain.

Last Wednesday's issue of *The Motor Cycle* contained a good deal of interesting information about that very popular combination, the motor bicycle and forecarriage.

* * *

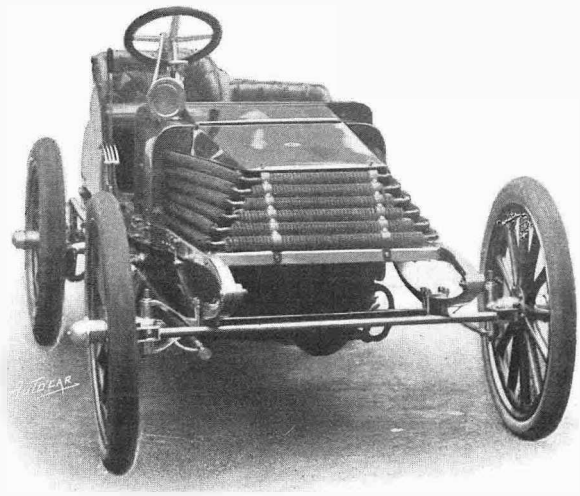
Among British entrants for the Paris-Madrid race not previously announced are the following: In the large car class Lord Carnarvon and Mr. Arthur DuCros, while among the motor cycles there are "Ormondes" and two "Humbers." So far, the total number of entries is 277: but by payment of double fees they can still be made up to the 16th May.

* * *

Mr. Allen Hickman writes informing us of an unpleasant experience which he had at a garage in the Midlands. He recently put his car up at this establishment, in which he is the holder of a season ticket, and upon calling for the vehicle—a 19 h.p. Vinot—he found the manager coolly starting out for a run on his car and taking a friend with him. This was without any permission from Mr. Hickman. It is hardly necessary to say that he will never patronise this particular garage again.

* * *

Motor repairers in the West are none too plentiful at present, so that it may be valuable to some of our readers to know that Messrs. Kimber and Son, of 9, Albert Road, Devonport, have had their premises altered so as to enable them to satisfactorily undertake motor car repairs.



A front view of Lieutenant Mansfield Cumming's 50 h.p. Wolseley racing car. Last week we published a side view of this vehicle and this in conjunction with the front view will enable those who have not inspected the vehicle to realise that it is one of the best looking high-speed cars that has ever been turned out. The position of the motor enables the weight to be kept down and further back than usual, and arrangements have been made so that the engine can be got at from the footboard very easily by a capable mechanic when the machine is travelling.

Among those to whom Messrs. C. S. Rolls and Co. have supplied Panhard cars are the following: The Right Hon. Lord Willoughby d'Eresby, Lady Beatrice Rawson, Captain Christie-Miller, Sir Swinfen Eady, and Mr. Tangye, of Birmingham.

* * *

One day last week we understand that Mr. J. H. Adams succeeded in climbing all the hills between London and Guildford on the top speed of a 6 h.p. Rigal car. This third speed runs direct, and it is evident from a performance like this that the drive is efficient.

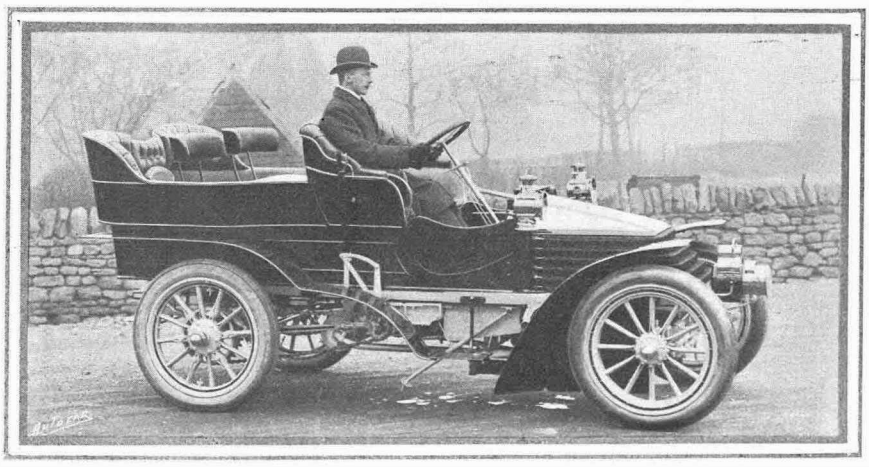
* * *

The Automobile Agency, of 3, Cope Street, Percy Place, Dublin, inform us that they have made special preparations to garage cars during the Gordon-Bennett period. They have room for over one hundred vehicles, and have an efficient department for repairs. They are close to two of the leading hotels, and several important roads converge on their depot.

* * *

Mr. Mervyn O'Gorman, M.I.E.E., will deliver a lecture upon "The Motor Car: its most economic use, its construction, and the immediate future probably before it," on May 8th, at Caxton Hall. This is one of the series of Westminster lectures. If this paper is as interesting as the one which Mr. Mervyn O'Gorman read before the Club on motor cycles it will undoubtedly have the result of making further converts to the cause.

* * *



Captain Bennett Stanford's 20 h.p. four-cylinder Wolseley. This car has particularly roomy arrangement of seating, the footboard is wide with comfortable doors, and the tonneau gives ample seating accommodation for four, all facing forward, and with plenty of room between the seats

Mr. J. A. Brodie, the city engineer of Liverpool, whose name is well known in connection with the heavy van trials, has now become an automobilist, and has selected a 10 h.p. M.M.C. car.

* * *

Recently we described and illustrated the Clipper Continental non-slipping tyres for cars. These are now being made in smaller and lighter sizes, suitable for motor cycles.

* * *

A printer's error crept into the list of purchasers of 10 h.p. Panhards in our last issue, page 477. Captain Lutwych's name should have been given as now printed.

Lord Hastings has ordered a 14 h.p. Brooke car from F. F. Wellington, Ltd.

* * *

County Court Judge Adams, of Limerick, expresses the opinion that autocars are the greatest curse Ireland has known since the first batch of English arrived.

* * *

In the main street of Dartford, Kent, the other day, we passed a motor van on which was posted this searching question: "Have you tried Auborn and Heaviside's motor cream toffee?" We must confess we have not.

* * *

The Société Decauville of Paris, whose agents are the Motor Car Co., Ltd., inform us they have been studying the question of the carburetter for their new 16 h.p. car very thoroughly, and they will shortly place upon the market one which they consider a great advance upon any hitherto produced, not excepting the famous carburetter of Commander Krebs.

* * *

Mr. Myron E. Vance calls our attention to the difficulty experienced by motorists in obtaining petrol on Sundays. Our correspondent's experience has been mainly in North Wales, and here, he tells us, he has often been absolutely refused. This is a matter which time alone will settle, as it cannot be expected that the vendors of petrol will, in many instances, keep their premises open on the chance of selling a few gallons of petrol. This is on the assumption that they have no other scruples, but we think that in the majority of cases a very little foresight on the part of the automobilist would enable him to dispense with purchasing petrol on the first day of the week, as comparatively few of those who buy petrol on Sunday have such small tanks or make such long runs as to exhaust their supply if they had the foresight to replenish it on the Saturday. Not only so, but most cars have the capacity for carrying one or two two-gallon tins over and above the supply in the running tank. As motoring spreads, spirit will undoubtedly be kept at the majority of hotels. It is already to be obtained at quite a large number.

While out motoring on Sunday last, one of the wheels of Queen Margherita's car failed, but Her Majesty and the three members of her suite who accompanied her suffered no injury, and they completed their journey by train.

* * *

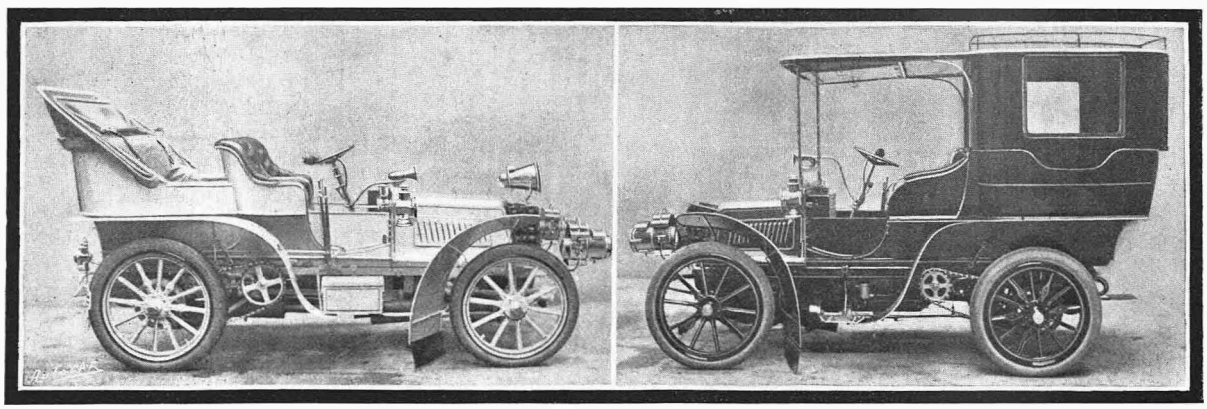
M. Lovet, who had a three-cylinder motor in the last Paris Salon, is now making a 70 h.p. racing car with six cylinders. An original type of change-speed gear is fitted to the Lovet machines, and this was described and illustrated in *The Autocar* of January 24th, page 77.

* * *

The date of the second hill contest on the Mont Cenis is fixed for Sunday, July 5th, and will be organised this time by the Automobile Club of Turin. The exact length of the hill Suse-Mont Cenis is twenty-three kilometres. The difference of level is 1,500 metres.

* * *

In referring to a couple of Coventry chains which have been run some 7,000 miles within the last seven months and are still in perfectly good condition, Mr. J. M. Gorham draws attention to the fact that very few attempts have been made to protect the chain. This is certainly somewhat remarkable, as, while it is a rather difficult matter to make satisfactory chain covers, it is by no means out of the question to turn out a thoroughly satisfactory and practical chain case. At the moment we only recollect two firms which have given this matter attention, the first being the makers of the Maudslay, who have separate cases for each of the side chains, and the three-cylinder Belsize car, which has its single central chain entirely protected. Of course the design of the back chain sprockets has been altered somewhat, so that the sides of the case can come between the road wheel spokes and the chain ring but this is easily arranged. Not only so, owing to the up and down motion of the road axle upon the springs of the stationary countershaft, provision has to be made for this motion also. There is no denying the fact that despite the exposure and altogether unfair treatment which chains receive they stand work and wear in a remarkable manner.



The vehicle on the right is a 16 h.p. Napier which has just been built for Earl Cadogan, while the other car is a 20 h.p. of the same make built for Mr. John R. Hargreaves of Templecombe, Somerset. This is an exceedingly fast touring car capable of very high speeds indeed. It has been built for rapid driving on the Continent, and is a type of car which Messrs. S. F. Edge, Ltd., find most popular with Americans, who seem to want very fast cars for Continental touring. It is a model which will probably not be used much in England, save by those who want to make high speed ascents of all hills they meet. At the same time it is as easy to drive as a 12 h.p., and although so powerful it is quite as quiet in running. The photograph from which our illustration is made is not so good as we could wish, and it scarcely does the car justice, as it is a most imposing looking carriage, painted cream with green upholstery and green mouldings.

In June next a motor exhibition will be held at Frankfurt, in the fête hall which has been specially erected for the great singing tournament of the German Choral Societies, on which occasion the Kaiser will be present. This event immediately precedes the motor show. Should any British firms contemplate exhibiting, we can place information at their disposal which will be of service to them.

* * *

The directors' report and balance sheet of the Simms Manufacturing Co., Ltd., is an interesting document. The capital is £25,000, and 20,900 odd shares have been issued. On these a dividend of five per cent. will be declared for the year ending December 31st last. It is stated in the report that Messrs. Ransomes, Simms, and Jefferies have taken out a sole licence for the Simms agricultural motor tractor, and also that a number of the best known makers of gas engines such as Messrs. Crossley and Messrs. Tangye have adopted the magneto ignition. This is, of course, in addition to the Singer Cycle Co. and other well known motor cycle and motor car makers. The new departure of the company, the frame department, in which they make complete chassis, as shown at the recent Crystal Palace Show, is also referred to; in fact, the prospects of the undertaking appear to be extremely bright.

* * *

After every holiday season there is an outcry in the gutter press against motor cars and cyclists, owing to accidents which are the inevitable outcome of the abnormal use of these means of locomotion. Accidents will happen, and before rashly condemning the motor car or attributing unfortunate calamities to its existence, it should be remembered that thousands now take this form of locomotion where but a few years since it was patronised by a small number. Though we readily admit the responsibility of drivers and the necessity for every precaution when driving through crowded boroughs, we would emphasise the fact that it is none the less the duty of foot passengers to avoid indiscretions and carelessness which make accidents inevitable. To this latter cause, no small number of the Easter accidents are due, but in giving them undue prominency in their columns the papers have in not a few instances ignored this important factor. We have looked in vain for the same publicity with regard to the accidents which invariably follow the patronage of the waggonette Jauggernaut by a section of Easter trippers, and which, being noted only in the localities where they occur, are not given the wider publicity reserved for every event connected with automobilism.

Messrs Rolls and Crompton outside the Talbot Hotel at Kildare. From a snap shot by Mr. J. Moore Brabazon, during the recent inspection of the Gordon-Bennett course.

THE SELDEN INVENTION.

A United States Master Patent.

The patent laws of the various countries in which patents are worth taking out differ in a more or less conflicting manner, and no better example of this can be found than the celebrated United States patent, the Selden, No. 549,160. This was applied for in 1879, but by one delay and another such as is perfectly legal under the United States patent laws resulted in what is equivalent to the completed patent not being taken out till 1895. In other words, the interval between provisional protection and completion, which is fixed at nine months in Great Britain, has been legally prolonged in the case of the Selden patent for sixteen years. This is possibly due to the fact that the patentee, George B. Selden, is a patent agent at Syracuse, N.Y.

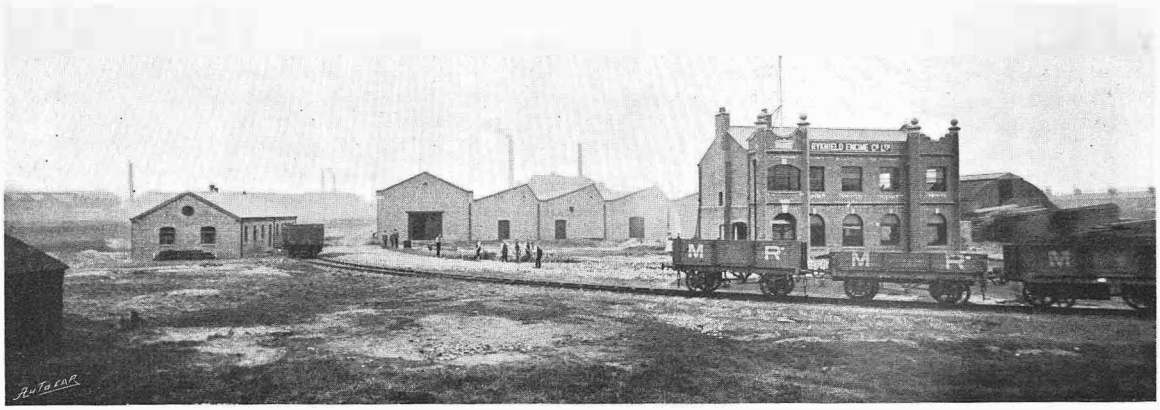
In 1899, the Electric Vehicle Co., of Hartford, Connecticut, secured the exclusive license of the Selden patent. In the early days of automobilism, this company was known as the Columbia and Electrical Vehicle Co., and was referred to as such in our pages. Having obtained the sole right to the patent, the Electric Vehicle Co. commenced action against the Winton Motor Carriage Co. in 1899, and on March 20th last a decree was given against them. The judge held that the patent was valid, and consequently that the Winton Co. had infringed it. The Selden patent is what is known as an omnibus patent. It covers the general principle of the motor car driven by an internal combustion or petrol engine, and practically all machines other than those driven by electricity or steam are infringements of it. Luckily, it affects only the makers in the United States, as no British equivalent of the Selden patent exists.

The Present State of Affairs.

As the Winton action progressed, those who had been disposed to regard the patent as of little worth were convinced to the contrary, and eventually an association of licensed automobile manufacturers was formed, the members being seventeen of the most important makers of cars. This association pays a royalty to the licensees of the Selden patent, but in its turn takes action against all who are outside the ring. It is stated that there is no intention of forming a trust or of refusing to allow reputable firms to manufacture under the Selden patent; but it would appear that small people will have very little chance of getting into the charmed circle. This association of licensed makers has also gone a step further, as it has acquired a large number of other patents, and some of them are said to be extremely valuable. So far as can be seen at the moment, its action appears to be somewhat similar to the old British Motor Traction Co., only, instead of the few makers being arrayed against the many, the conditions are reversed. Those who are interested in the Selden patent will find an illustrated abridgment in *The Autocar* of June 30th, 1900, page 638, and July 7th, 1900, page 659.

Feminine foresight as advertised: "A lady is willing to instruct ladies in the art of motor car driving. She thoroughly understands the mechanism of various makes of cars, and is now disengaged.—Apply," etc.

THE RYKNIELD MOTOR WORKS.



View of the Ryknield Motor Works taken from the railway. The building in the foreground comprises the general offices and showrooms; to the left are the engine house and men's mess room. In the background are the machine shops.

If an ample amount of capital, well laid out in the shape of an excellent site, close to a station, well designed buildings containing all the most modern of up-to-date tools and appliances, coupled with a young and energetic board of directors, and last, but not least, a capable and experienced works manager, can command success in the manufacture of motor vehicles (both petrol and steam), we think this should be the case with the Ryknield Engine Co., of Burton-on-Trent, at the opening of whose works we were present last Thursday week.

To take things *seriatim*, the site, close to Burton Station (from which it has a siding), has any amount of room for expansion. The showrooms and drawing offices are contained in a plain but handsome (at least in its usefulness) building, in which the necessary feature essential to both purposes—plenty of light—has most rightly and evidently been considered the main objective.

The engine-house contains an excellently designed cross compound engine by the well-known Lincoln firm of Ruston and Proctor, its power being transmitted to the machine shops by shafting running on Kynoch's patent roller bearings.

The machine shops, of girder corrugated iron and brick construction, are made up of seven bays, on one level and under one roof, and the great importance (from the point of view of economy and speed) of allowing the work to flow steadily forward from the smiths' shop until it reaches its finality in the erecting shop has evidently been most carefully and successfully studied by those who laid out the plan of the buildings in question.

As regards the machinery, when we state that the turret and capstan lathes are by Alfred Herbert, of Coventry, and the radial drills, milling, and horizontal and vertical boring machines, screw-cutting lathes, etc., are by such well-known makers as Wm. Muir and Co., Webster and Bennett, Dean, Smith, and Grace, and the Brown Sharpe Manufacturing Co., U.S.A.; self-contained smiths' hearths, by Alldays and Onions, with Roots blowers by same makers; also one of those most necessary of tools in an up to date motor works, in the shape of a very fine fully automatic gear cutter by Messrs. Ludw. Loewe and Co, of Berlin, we think we have said enough to convince those "in the know" that if good motor vehicles are not turned out by this company, it will not be the fault of the appliances provided; and we have every reason to believe that the reverse will be the case. As to the vehicles themselves, we say nothing at present, except that the designs are completed, as they have long since passed the experimental stage, the testing-shop having been built before the works were started, so that the standard patterns are entirely settled, and we hope shortly to describe them, giving at the same time the necessary illustrations.

View of entrance to erecting shop and temporary running shed.

SOME REPLIES TO QUERIES.

Under this heading we insert a few selected replies, as space permits, to letters containing queries received from correspondents which are likely to be of general interest.

The bulk of questions dealt with each week are of interest only to the senders, and these are replied to by post direct, and are not published.

We are always pleased to reply to queries, even if they be of an elementary and untechnical description, our object being to help the novice as well as the more experienced automobilist. Correspondents will kindly note that queries should be plainly written upon one side of the paper only, and each question should be separately numbered, *i.e.*, two distinct questions should not be asked under the same number.

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

A stamped addressed envelope should be enclosed, in order that a reply may be sent direct through the post, in addition to any reply which may be printed.

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

TUBE IGNITION.

I should be glad if you would tell me why tube ignition seems to have died out. I know it was dangerous in careless hands, but there are a good many who would like to avail themselves of it as a stand by even now, and if their experience is similar to mine they will find it is practically impossible to get it fitted to the majority of the best makes of cars. It appears to me that designers have taken the line of least resistance. They have found it easier in many ways to fit electrical ignition than to endeavour to perfect the lamp type.—F.O.E.

The principal reason why tube ignition has died out is because the time of firing the cylinder charge was not variable at the hands of the driver, therefore the motor had not the wide range of speed which the electric ignition has given it. The time of firing by tube ignition was regulated by means of a nipple and by increasing or decreasing the orifice of this nipple so the moment of ignition was advanced or retarded. It was so arranged that ignition took place at or about the moment at which the piston had reached the top of its travel, and, consequently, the compression was at this time at its highest point and forced sufficient of the combustible charge into the hot tube to cause it to ignite the bulk of the charge, the combustion was not so rapid nor so complete as that given by the electric spark. Another means of advancing or retarding the ignition was by heating the platinum tube closer to or further away from the cylinder. As you say, there was a great deal of danger attached to the use of the tube, as, of course, it necessitated the use of a lamp of the Bunsen burner type to keep the tube hot, and, in some cases, there was some difficulty in keeping the lamp alight when the wind caught the car in certain directions. Further, this affected the running of the car, as when the wind caught it in a certain position the flame of the lamp was deflected from the ignition tube, which cooled down to a sufficient extent to cause the charge to fire late, and if this happened upon a hill were power was most needed it was sometimes of serious consequence, and was in many instances the cause of cars stopping upon a hill and running back, though the drivers were not aware that this was the case. This, again, is another point in favour of electric ignition.

There is no reason why tube ignition should not be fitted as a standby to the majority of the present makes of car, even though no provision has been made for such an arrangement, and if the car be taken to any first-rate motor manufacturing or repairing firm they will be able to fit a supplementary ignition and at the same time make it perfectly safe when not in actual use.

MISFIRING.

I had an experience with my car lately which I cannot explain and should be glad if you could assist me. My car is a two-cylinder 7½ b.h.p. car, with horizontal opposed cylinders and Longuemare carburetter. Ignition is by accumulators and induction coil, the high tension circuit being completely insulated and not earthed at all. We turned out all right in the morning, but after a while noticed some misfiring. After stopping for about a quarter of an hour we could not get the engine to start—it would fire very irregularly. After a while the back cylinder began to fire, but with every explosion there was back-firing, smoke issuing from the air pipe to the carburetter. After a few explosions, of course, it stopped. We then examined the induction valves, but could detect nothing wrong. While we had them out we noticed there was a good spark in each cylinder occurring apparently quite regularly and at the right time. The exhaust valves were working well. We then replaced the valves and tried again but with just the same result—misfiring and back-firing. The back-firing seemed to be connected with the back cylinder, so we decided to try and run on the front cylinder only, taking out the back sparking plug to enable us to do so. The explosions on the front cylinder were too irregular to enable us to do this. We therefore decided to replace the back plug and try again. Before replacing it we cleaned it up, though it really did not need it. We did another thing, however, reversed the primary current. We then started the engine without the slightest difficulty and there was no more misfiring on either cylinder. I have on several occasions lately found that this simple reversing of the primary current has done away with misfiring and greatly improved the running of the car for a time. I used to find that my car ran well when the accumulators showed a voltage as low as 3.8. Latterly I have not been able to get the car running with anything below 4.2 volts. My accumulators now show 4.3 volts. What does this better running following a reversal of the current indicate? and why should it have done away with back-firing? Why should I require greater voltage? In connection with the latter, I may say I believe all the wires and terminals are sound. There is another point I wish to mention. I find that the pistons move full $\frac{5}{16}$in. after the exhaust valves have closed before the completion of the exhaust stroke. Is that of any importance?—SAML. CRAWSHAW.

It is hardly possible to say whether the wiring of the car is correct without a complete sketch of the wiring arrangement, but it would appear from your description that the wires to the contact breaker may have been connected to the wrong terminals, and thus the sparking in the cylinders may take place at the wrong time. Or the insulation of one of the wires may be defective, and vibrating on a metallic part of the frame, causing an earth and completing the primary circuit at odd times, thus causing a secondary spark at variable periods. A particle of grit or other foreign matter on the inlet valve seating would cause similar effects to the misfiring and back-firing you mention. If any acid or vapour from the cells works its way on to the terminals, a white or green deposit is formed which offers extra resistance to the passage of the primary current, as does also any loose terminals or defective wires; hence a higher voltage is required to get a satisfactory firing spark. The piston should be exactly at the top of its exhaust stroke when the exhaust valve just closes, otherwise the engine cannot work at its best. Probably the exhaust valve stem or tappet rod has worn shorter than it should be and requires repairing or replacing. If such is not the case, then the timing is wrong and requires to be set properly as above.

GEARING AND WATER-COOLING.

(1) Will you kindly inform me what number of tooth sprockets are required on engineshaft and countershaft, the latter having two pinions meshing with two gear wheels on back axle? The whole to give two forward speeds of, say, eight and sixteen miles per hour; engine running up to 1500; wheels 26in. Kindly say also what size of pinion and gear wheels. (2) I also wish to know the correct way of connecting up water-cooled engine on the thermo-syphon or natural circulation system, using *no* pump? Must the tank be placed above the level of top of cylinder, and then from tank to radiator, thence to bottom part of cylinder out of top, and back to top of tank?—A.D.

(1.) To gear to eight and sixteen miles per hour, it is necessary in the first place to find out how many revolutions the 26in. diameter road wheels make per hour. In one revolution of the road wheel the distance covered would equal three and one-seventh times the diameter, this being the length of the circumference of a circle compared with its diameter—

$$3\tfrac{1}{7} = \frac{22}{7}$$

$$\text{Therefore, } 26\text{in.} \times \frac{22}{7} = 81.68\text{in. approximately.}$$

There are 5,280ft. in a mile and 12in. to a foot; also sixty minutes in a hour. Therefore, the distance travelled per minute by car moving at sixteen miles per hour is equal to

$$\frac{16 \times 5.280 \times 12}{60}\text{in.} = 16{,}896\text{in.}$$

Therefore, number of revolutions of road wheel per minute

$$= \frac{16{,}896}{81.68} = 207$$

So that we have to gear down from 1,500 revolutions of the engineshaft to 207 on the road wheels, that is, about seven and a quarter to one. By the system of driving this can be done in two stages. First gear down from motor sprocket to countershaft sprocket, say four to one, and take not less than six teeth in the engineshaft sprocket, that is, there will then be twenty-four in the countershaft chain sprocket. The remaining reduction must be done between the gear wheels on the countershaft and rear axle. The necessary proportions between the two will be obtained by multiplying all the driven wheels together and dividing by all the drivers. These must come out in the proportion of seven and a quarter to one. Therefore,

$$\frac{24}{6} \times \frac{\text{Rear axle gear wheel}}{\text{Countershaft gear wheel}} = 7\tfrac{1}{4}$$

for sixteen miles per hour speed and fourteen and a half for eight miles per hour. As there are two unknowns in the above equation, it will be necessary to assume a value for one of them, care being taken that whatever the number of teeth employed the other gears will fit in, and not come to unworkable proportions. In no case must the gears have less than twelve teeth, and it is preferable to make them with a larger number. If we put in a value for the countershaft gear of twenty-four teeth and work out the equation, we find that the rear axle gear wheel should have forty-four teeth to bring the high speed approximately to sixteen miles per hour. That is—

$$\frac{24}{6} \times \frac{44}{24} = 7\tfrac{1}{4}$$

This would give 204 revolutions per minute of the road wheel. Therefore the speed would be about two per cent. less than sixteen miles per hour. Now, as the shafts are parallel, the sum of the teeth in the driver and driven gears must be the same for the high and low speeds. This sum is sixty-eight teeth. Therefore, by simple arithmetic, it will be found that fourteen and fifty-four teeth would be required to give the low gear, and this would come out slightly below the eight miles per hour. To raise the gear the twenty-four tooth sprocket may be replaced by a smaller one, or the six tooth sprocket by a larger one if desired. It is best to work with even and easily divisible numbers for the gears, these being more convenient for milling where a universal dividing head is not kept. The outside diameter of a six tooth sprocket lin. pitch would be 2.25in. approximately. The outside diameter of a twenty-four tooth sprocket 1in. pitch would be 7.98in. approximately. The sprockets should be cut to suit the particular make of chain employed, as the dimensions vary with different makers, who supply particulars when desired. A fourteen tooth gear wheel eight pitch would measure 2in. outside diameter, a twenty-four tooth gear wheel eight pitch would measure 3¼in. outside diameter, a forty-four tooth gear wheel eight pitch would measure 5¾in. outside diameter, a fifty-four tooth gear wheel eight pitch would measure 7in. outside diameter. The width of gear wheels would depend on the horse-power of the motor; 1½in. wide would be easily capable of transmitting 6 h.p. at the required speeds with good steel. The wheels may be wider, in which case they will last the longer without excessive wear. (2.) The arrangement of connections is as you state, but it is better to come from top of the cylinder to about threequarters up the tank, as the circulation is kept up better until the water is vaporised to the level of the inlet. Placing the tank all above the level of the engine top allows all the water to be used before refilling if desired, although in a number of cases the tank is placed behind the engine in front of dashboard with only a small part of it above the level of the cylinder top, in which case the tank requires filling up much more frequently.

CUTTING OUT.

I have carefully read your answer entitled "Noisy Cut Out," page 545, *The Autocar*, and I do not feel quite certain that I have got hold of the right meaning of the term "cutting out." I take it to mean simply that the engine is not being driven. For example, in the case of an engine governing on the inlet, if the valve is completely throttled down so that no mixture is drawn into the combustion chamber, then the engine is cutting out completely; if the valve is partly throttled down, then the engine is partly cutting out, and so on. I should be much obliged if you would kindly tell me whether my interpretation is correct; and if not, what "cutting out" does really mean?—E. LLOYD.

Your interpretation of the term "cutting out" is perfectly correct as understood by engineers, that is, when the engine is deprived of its source of power by means of the governer it is said to be "cutting out." The term has been somewhat variously misapplied and misused in connection with automobilism. The fact of withdrawing the clutch and preventing the motor driving the car has been termed by some "cutting out" the engine, and is to a certain extent correct, as it does cut off the engine from its gearing and consequently prevents its driving the vehicle. Again others apply "cutting out" to switching off the electric ignition or closing down the throttle valve by hand to temporarily or permanently stop the motor. In this case the term is certainly wrongly used.

FRONT WHEEL BRAKES.

The following letter has been received from the Bowden's Patents Syndicate, Ltd., in reference to our reply under the above heading on page 478 in *The Autocar* of last week:

With reference to the enquiry of your correspondent "Stopper" last week, we shall be glad if you will permit us to inform him that we are prepared to fit our well-known double-acting hand brake to his front wheels.

We have already fitted a large number of similar brakes to forecarriages for motor cycles, and as the movement of the steering wheels does not affect the application of the Bowden wire mechanism we have no doubt that we shall be able to give him a perfectly satisfactory front wheel brake control on his car.

We may point out that our double-action brake is equally powerful no matter in what direction the wheels are revolving, and the brake pressure is equalised on each wheel. As its application does not necessarily interfere with the mechanism of the car in any way, it may be found when fitted to the steering wheels in the manner suggested by your correspondent—a valuable safeguard against temporary failure of other brakes on the car.

LINCOLNSHIRE AUTOMOBILISTS AND ROAD SURVEYORS.

On Thursday last week, the members of the Lincolnshire Automobile Club entertained the whole of the road surveyors of the county to lunch at the club headquarters, the Saracen's Head Hotel, Lincoln, the surveyors being brought in by members of the club on their own cars, of which there were over thirty present. About one hundred guests sat down to the lunch.

Mr. W. Garfit, the member for Boston, one of the latest converts to the movement, and who drove over in his 10 h.p. Wolseley, was in the chair, and was well supported, a great many influential gentlemen in addition to those on the toast list being present. After the keen appetites, found in the wintry air through which those present had driven, had been appeased, the Chairman proposed "The King." In doing so he referred to his Majesty's successes in most forms of sport, and to the fact that, as in everything else, he excelled in automobilism.

Sir Hickman Bacon, Bart., the president of the club, in proposing "The Houses of Parliament," went over the history of the roads, and the improvements made and necessary. He thought that the present law was unsatisfactory, and though perhaps he stood alone in the club, he believed they would have to give identification for abolition or extension of the present limit. He did not think that if they were numbered they would be prosecuted maliciously, nor that the public would care to do so.

Mr. Garfit, M.P., in responding, said that what the House did depended on what the people want. If automobilists did not annoy people they would not trouble them, and if they drove carefully and considerately they would have little to fear. The scorcher did more harm than many of them imagined. Mr. Garfit was in favour of the abolition of the speed limit, but the strong punishment of wrongdoers. He rather thought that the House had given its case away as to the speed question by legalising the race in Ireland in which a pace of fifty to sixty miles an hour would be maintained. (Laughter and applause.) He believed the proposed inquiry into the roads would be of immense good.

Capt. J. Ruston, J.P., in giving "The Road Surveyors," made an appreciation of the improvements effected in the roads of the country, and appealed to the surveyors to remove the "little things" from the roads, such as horseshoes with nails projecting, the stones, and other foreign matter.

Mr. Hooley's Waterproof Road.

Mr. E. P. Hooley, the surveyor to the Notts and to the Kesteven County Council, said that the Lincolnshire roads had improved wonderfully. There was no local stone, and all material had to be brought in. There were no main waterways by which material could be transported cheaply, and in some districts there was an insufficiency of water even for the steam roller. He thought there would be a far better state of things if the surveyors were left more alone, and that if there was less of that meddlesome interference by ignorant nobodies, the surveyors would be able to give better results. Then, turning to the chairman, he said he would like to be allowed to point out the fact that on the Departmental Committee being formed in the House to consider the roads question, there was not a single road surveyor or other road expert, and he thought that there should be at least one man on that committee of investigation who had expert experience of the roads. (Cheers.) As for the dust problem referred to, with the present material there was a great absorption of moisture, and that could only be given off in the form of mud, which turned to dust. He had been experimenting with a material that was practically impervious to moisture, and so would wear well. By getting furnace slag, about eighteen hours' old, and mixing it in a machine with oil of tar, he had a material that answered to the requirements of the roads, and he was to put down an experimental length in Notts on one of the worst roads. The absorption tests showed for granite 2.8 gallons per ton in twenty-four hours, in slag 3.745 gallons, and in the new material 0.278 only.

Capt. J. A. Cole, J.P., chairman of the club, in proposing "The County Authorities," referred to the fact that only five of the members of the club had been proceeded against, which showed both tolerance on the part of the authorities and care and consideration on the part of the automobilists of the district.

Mr. W. Embleton Fox, J.P., chairman of the Lindsey County Council, made a very interesting speech, which was listened to carefully by those present. He said that in the whole course of his magisterial experience he had never had to sit on the case of an automobilist, which was a marvellous testimony of the care exercised and the feeling of the authorities. He felt that a radical alteration was necessary in the law as affecting automobilists. He was a member of the County Councils Association (An influential one.—ED.), and they were agreed as to the necessity of removing all limitations as to the pace of motors, but there must be some means of identification and greater punishment for repeated offences. It was, he thought, absurd to have a law which everyone thought it quite right and proper to break. As to the objection to numbers, which he could see was in strong evidence in the club, it had been urged that numbers were a very ineffective means of identification. If so, then it was for the benefit of the motorist, and the public ought to be the ones to object. The carrying of numbers would soon become used to, and it was not worth while to object to numbers on the grounds of the looks of them. As for the risk of persecution, the only persons who would take the trouble, and trouble it was, would be the police, and what could they do with no legal limit? They would have a difficulty in proving common danger, therefore the fear of persecution might, he thought, be dropped. His impression was that the solution to the whole difficulty was the abolition of the speed limit, identification, bringing motors under the common law, and increase of punishment for repeated offences.

Mr. Rees Jeffries also spoke, and referred to the status of the Lincolnshire Club and the work it had done. Police traps increased fast driving, for even considerate drivers knew it was useless to drive slowly. He thought the club might well turn its attention to the assistance of agriculture.

Mr. E. Cragg, M.D., the hon. secretary, in responding, said that the agricultural motor, of which Lord Willoughby de Eresby possessed four, would be used on their chairman's farm at Roxholme during harvest, for the purpose of demonstrating, under the auspices of the club.

After the lunch many of those present drove over to Sleaford, and there partook of tea.

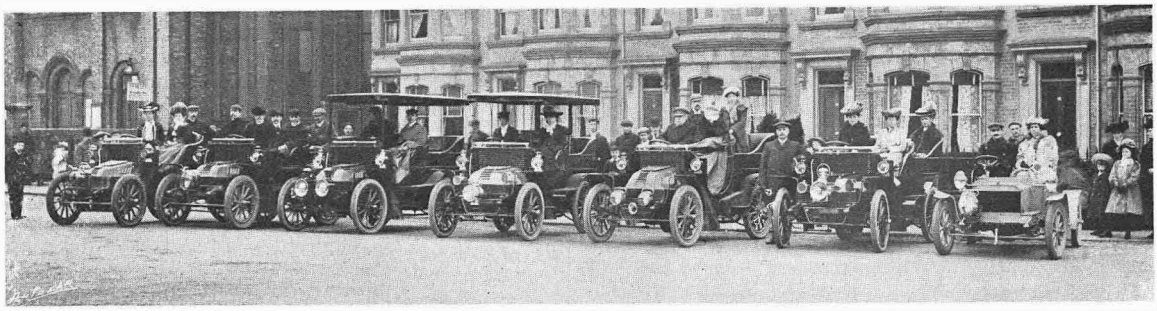
THE NEW POLICE TRAP AT KINGSTON.

The Kingston police trap which has been active during the last few weeks consists of two policemen—one with a stop watch, which he is careful no one shall see. They stand on the path to the right—going south—about 300 yards the London side of the Angel at Ditton. From this point they can see as far up the road as the point where a motorist going south loses sight of the river on his right, and is passing the new reservoir on his left. From the constable's point, the actual difference in distance may be anything from 100 to 300 yards, depending upon whether the approaching motor car is over to one side of the road or the other. If the motor driver hugs the left side of the road, he comes in sight an appreciable time after another car which is over to the right, passing cyclists or other vehicles, is in full view, and, of course, times taken at such a distance are utterly unreliable. Obviously, the sooner a car is seen the longer is the time before the constables are reached, but in any case the pace should be eased as the little bridge is approached, and if the driver intends to stop at Ditton, he may just as well turn up to the right and come back to Ditton along the green; the road is just *beyond* the bridge. The road to the left on the London side of the bridge is impassable at present, and in any case there is a very sharp corner close to Ditton.

The Ripley man was apparently off duty on Sunday, or perhaps he had gone to dinner—a sacred function with the police, with which nothing is permitted to interfere.

A correspondent signing himself "Moriturns" reports that police traps have been established on the Pontefract-York Road, two miles out of York, and the Selby-Doncaster Road at Whitby. Twenty miles per hour is the official speed allotted to anything resembling an autocar.

CLUB DOINGS.



Seven "Brooke" cars which took part in the Easter run of the Norfolk Automobile Club, taken at the conclusion of the run.

The Manchester A.C.

The second run of the season of this club was to Chester on Saturday last and was attended by fifteen cars. The weather was everything that could be wished, and there were no mishaps of any kind to mar the enjoyment of those participating in the run. Dinner was served at six o'clock at the Grosvenor Hotel, some members returning the same night, others remaining over the week-end.

The North-Eastern Automobile Club.

At a general meeting of this newly-formed club, held in the Hotel Metropole, Newcastle-on-Tyne, Mr. Walker stated that the club had an offer made to it by a local firm to build a garage on condition that the club paid a percentage on the cost of such erection. After some discussion it was decided to hold over the matter. The following gentlemen were elected to form the committee: Messrs. R. A. Young, W. Oliff, T. Sanderson, L. T. R. Ridley, F. Turvey, A. Scorer, R. B. Smith, R. B. Milburne, and R. Crosier; Mr. F. A. Young, honorary treasurer; and Messrs. R. B. Smith and B. Walker, joint honorary secretaries. Over forty members have already been enrolled, including a large number of motor cyclists. The address of the honorary secretaries is 125, Glenthorn Road, Newcastle-on-Tyne, and either they or the honorary treasurer, or any of the committee, will be pleased to receive the names of any gentlemen desiring to join the club. The subscription to the club is £1 1s., including badge; honorary members, 10s. 6d.

The Scottish A.C. (Eastern Section).

The opening run of the Eastern Section of the S.A.C. took place from Edinburgh to Gorebridge on Saturday afternoon. The weather was fine, and fourteen cars assembled in Charlotte Square. With the roads in good order an enjoyable run took place, the cars travelling *vid* Newington, Liberton, and thence to Mr. Moss's residence at Middleton, a few miles past Gorebridge, a distance of about fifteen miles. After enjoying the hospitality of Mr. Moss, Mr. Norman McDonald, chairman of the S.A.C., proposed a vote of thanks. Mr. Moss, who owns a 22 h.p. English Daimler, replied, and stated that he would be pleased to receive another visit from the club.

New Patents.

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

The following specifications were printed and published on the 16th April, 1903. All notices of oppositions to the grant of patents on the several applications should be filed not later than 1st of June, 1903.

1902.

1,775.—H. A. Bertheau. Explosion motors which may be started forward or backward by stored compressed burnt gases.

7,502.—J. A. McMullen. Means for circulating cooling water through the pistons of internal combustion motors.

8,539.—J. R. Churchill. The driving wheels can move independently of one another, and the springs do not receive the driving effort.

9,238.—A. Craig. One flange of a sleeve is secured to the road wheel and the other carries the sprocket wheel; the chain case is mounted on the radius rod.

9,301.—W. Meischke-Smith and G. F. Meischke-Smith. Device for keeping the engine running slowly while the car is at rest.

10,422.—L. A. J. M. Josseaume. Carburetter of the valve type operated by the suction of the engine and regulated by hand.

18,163.—R. Pairier. Internal combustion motor with integral flywheels, crankshaft, and crankpin; and exhaust valve lifter.

24,414.—C. H. Batten. Motoring coat with detachable sleeveless outer coat.

28,791.—La Société Mont Père et Fils. Explosion motor of the two cycle type.

1903.

3,975.—A. J. McDonald. Water tube steam generator for motor vehicles.

NOTICES.

SUBSCRIPTIONS.

"THE AUTOCAR" is published every Friday morning in Town and Country, and may be obtained of all Newsvendors and Book stalls, or delivered first post on Friday, at the following rates:

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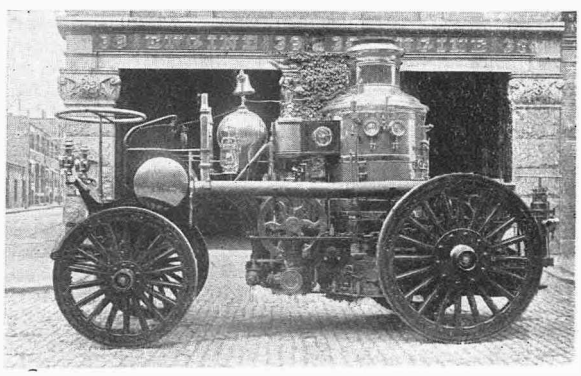
EDITORIAL matter and general queries should be addressed "The Editor, *The Autocar*, Coventry."

ADVERTISEMENTS and Business Communications should be sent to ILIFFE & SONS LIMITED, Coventry, or 3, St. Bride Street, Ludgate Circus, E.C.

Communications to the Editor should be written on one side of the paper only, and must be authenticated by the names and addresses of the writers—not necessarily for publication, but as a guarantee of good faith.



The motor fire engine shown under steam on page 482.