The Motor
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TAKING A CAR DOWN AND RE-ASSEMBLING IT.

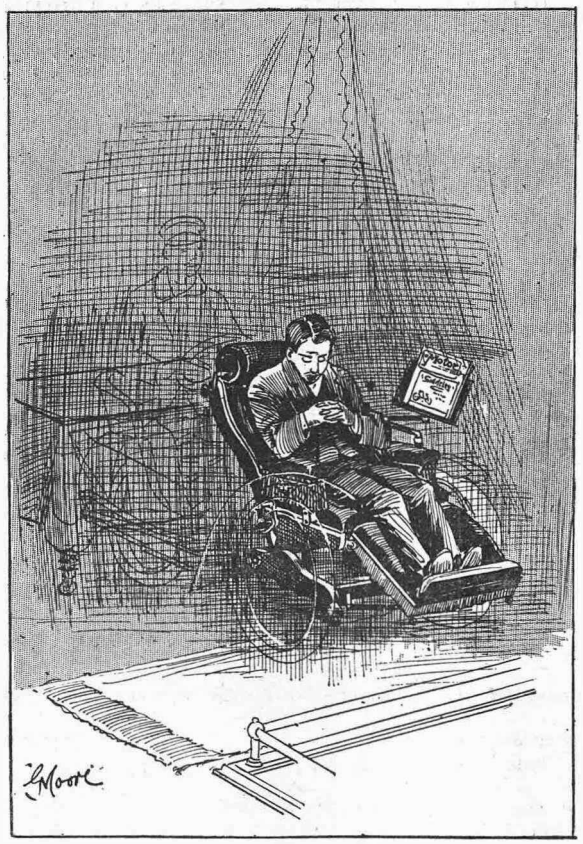
By "VEEAITCH."

PART IV.

Remembering to punch identifying marks upon the holding down bolts and the holes through which they are inserted, the cylinder or cylinders can now be lifted from the crank-case, after removal of the bolts. Operations will be facilitated if a little paraffin is injected on to the top of each piston and the starting handle given a few turns, thus clearing the cylinder interiors of thick oil. When the cylinders are removed, wash out well with paraffin; over-lubrication will now reveal itself by a deposit of hard black material upon the inside head, and this must be gently chipped out; the cylinders being made of cast iron, any force used for this purpose might crack them, and a gentle tapping over every portion of the head with a long screwdriver will clear all away. After well washing again with paraffin and making certain that not a particle of grit is left anywhere upon the interior surface, stuff up all the holes with rag (such as spark-plug orifice, etc.) and set aside to drain, afterwards running some cylinder lubricating oil around inside. Much time will be saved when the parts are being again fitted together, if all are clean and quite free from dirt and oil, and therefore a few minutes spent thus upon each piece as it is removed will be fully appreciated afterwards.

THE REMOVAL OF THE CRANK-CASE

will next be in order, and, to do this comfortably, it will be well to release the clutch by tying the clutch pedal down to some portion of the frame. If the starting handle is permanently fitted on the front of the car, its detachment can easily be effected. The crank-case is usually supported upon a subsidiary framework carried upon the main frame; four or six bolts hold the crank-case in position, and in most cars these will be, quite properly, a tight fit. Unscrew the nuts to the ends only of the bolts so as to leave end of nut flush with end of bolt, and, holding a block of wood upon nutted end to cushion the blow, drive the bolts as far as the nuts will permit; then take nuts right off and, still using the wood block against end of bolt, a hard blow will doubtless drive the bolt clear of the hole. All the bolts being removed, the crank-case can be moved towards the front of the car, so as to clear the fly-wheel from clutch cone, and then lowered to the floor: a couple of ropes round each end of the case will enable this to be done single-handed. All the dismantling operations so far have been such as to permit easy reinstatement by any careful amateur; but the crank-case, as also the gear-box and any bearings with adjustable phosphor-bronze bushes, require more consideration. Offhand inspection of such bearings shows them to consist of two halves accurately fitting both the cases in which they are carried and the shafts they are designed in their turn to support, and it is in the manufacture and perfect adjustment of these bearings throughout a car that the careful builder spends a lot of time. When fitted together, the interior of the two halves must be absolutely concentric, for if they were not so the shaft would only touch the bearing in spots and would thereby cause friction instead of acting as a preventative;



This horrible weather prevents Jones taking his accustomed spin on the front seat of his friend's tri-car; but, adjusting his patent cosy chair to the required position, he spins away in dreamland.

THE FUNCTION OF A FIRST-CLASS BEARING

is to support a shaft and also to keep down friction losses by constantly interposing a film of oil between the bearing surfaces. To attain this end is the aim of first-class firms and is again one of the differences between the shoddy and the well-made article. If the bolts holding two halves of a bearing together are not tightened to the exact degree, neither more nor less, trouble will certainly ensue, with the risk of "knocking" or hot "brasses." It is therefore suggested that if the owner is wise he will not touch adjustable bearings, unless with the aid of someone with experience in such matters. The crank-case will be well-washed out with paraffin, after draining off all the waste oil therefrom, and then some lubricating oil run around the bearings. The pistons should also receive attention, the

Taking a Car Down, etc. —Contd.

charred oil being taken from the tops, as was done for the cylinders. The pistons, being cast iron, must not receive a blow or knock, and the connecting rods from pistons to crank-shafts should be wedged up with soft material to prevent them rocking whilst pistons and rings are being cleaned. Occasion should be taken to note the condition of the rings; if they are blackened in places, it is a sign that gas has been getting past them, and a fresh set should be procured and fitted, being sure to get the slot of each ring as far removed as possible from the slots of its neighbours. Three rings are the normal number for each piston, and if each ring has its slot at an equal third of the circumference the slots will be correctly spaced.

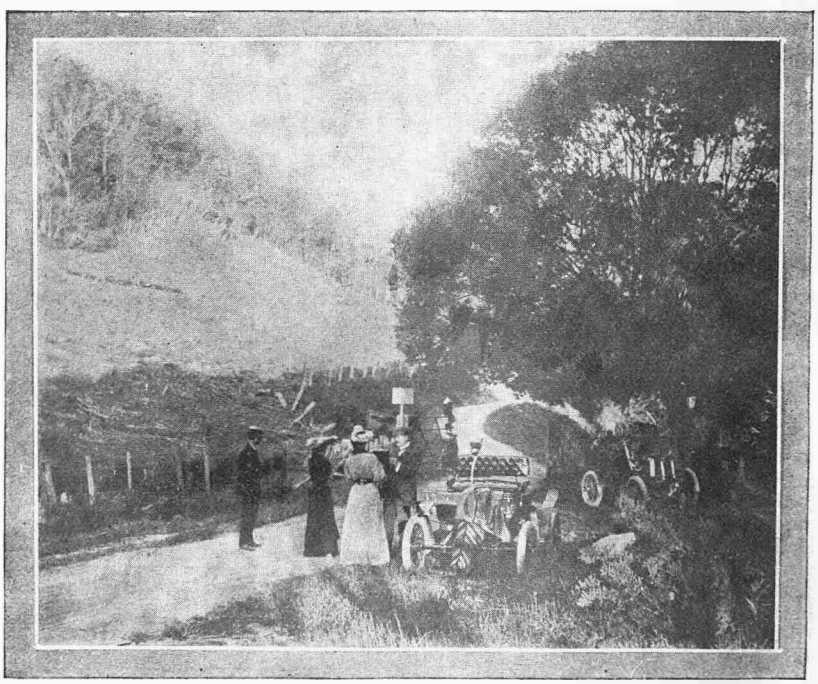
The levers and rods between the clutches and brake pedals should next receive attention; prior to disconnecting these observe if there is any wear upon the rod or lever joints and attach labels at the particular spots needing attention so as to quickly locate the exact points at the right time. The clutch levers and connections vary on every type of car, and in general notes it is impossible to more than indicate the bare outlines of necessary attention; but with the clutch particularly it is important to note the exact disposition of all nuts, bolts, etc., particularly where a long rod is threaded at both ends and is screwed into connecting parts such as bell cranks, etc. To make certain of the same adjustments afterwards, put a slight file mark upon rods of this description, this mark indicating the exact spot up to which the rod should be turned when replacing; of course careful measurements would serve equally well, but do not so effectually cover the purpose in view. If there is a universal joint between clutch and gear-box, the clutch can now be separately taken away; otherwise the brake shoe must be removed from the brake behind the gear-box and disconnection made between back end of gear-box and universal joint upon propeller-shaft; upon taking away the bolts holding the gear-box to the frame, the box can then be taken away. Drain all dirty oil from the box,

WASH OUT WELL WITH PARAFFIN,

and examine every tooth of each gear-wheel; if these are slightly worn or burred up at the edges, send the box away to a good local repair shop and have them attended to. A smart mechanic can rectify the matter at a moderate expense by softening the wheels and filing the teeth to some approximation of their original shape If the teeth are worn badly or have some part of the engaging surfaces in poor condition, the cheapest expenditure (in the end) will be renewal of the worn portions. The first and second speed-gear wheels are those as a rule needing attention, because of their more frequent use, and this doubtless explains what to many new drivers seems often a mystery; an easily-explained fact if the car is a secondhand one. The owner finds he can change easily from second to top or top to second speed, but the wheels will not engage properly from first to second; if the faulty changing is not personal, it can often be traced to worn gear-wheels or worn gear-box bearings. If the wheels are all sound the shafts should be tried and note made of any play in the bearings; if the shafts can be lifted the slightest fraction in their bearings so as to cause even a minute rocking motion they should receive skilled attention. It may be that the flats only need a slight scraping to bring the faces again in contact with the shafts or a tightening up of the bolts, but whatever the remedy that may be needful, it is a proper job for a mechanic to undertake who possesses the requisite tools. The foot-brake shoes should also have attention; almost without exception on modern cars these are of metal, the carrying bands on good machines being phosphor-bronze with cast-iron braking shoes riveted thereon. If these shoes are nearly worn through to the bands, file off the heads of the rivets (these are copper), and having procured shoes of exactly similar length and curve so as to exactly fit the bands, rivet them on with copper rivets. These iron shoes can frequently be obtained from the makers of the car with the holes drilled ready to quickly affix; but before attempting to rivet up make certain that the holes in band and shoe are exactly opposite when shoe is placed in position and that the right size rivets will fit through the two holes in every case. The holes should, of course, be countersunk to take the rivet heads on the face of the shoe and riveted up at the back. It will be convenient also to take down the brakes on the rear wheels, and if of the outside band type to give them similar attention to the foot-brake.

THE REAR WHEELS VARY CONSIDERABLY

as to the method of braking: some have metal-lined bands, others leather or canvas-lined bands, and the most recent, even on light cars, are of the internal expansion type. With metal-lined bands the proceedings will be exactly as for the foot-brake; if leather lined, throw the leather away and refit with balata belting; this is a canvas material, woven and prepared in a special way for machinery driving belts and can be procured at all machinery material stores, but very rarely at a motor garage or repair shop. It should be bought with finished edges, of a width slightly less than the band, and can be drilled, countersunk and riveted up just the same as cast iron; it has numberless advantages over leather in that it is unaffected by oil or grease, does not harden or become brittle, will outlast three or four leather shoes, and is half the price. If the brake connections, either from side lever or across the car, are made with wire or Manilla rope, mark the spot where the ends are joined up; securing these upon remounting in the same positions pre-



MOTORING IN NEW ZEALAND.

Reproduced from a photograph kindly sent to us by Mr. M. A. Jenny, the secretary of the Nelson Automobile Association, New Zealand.

Taking a Car Down, etc. —*Concld.*

viously occupied will save a long time in trying and adjusting. Internal expansion brakes are very generally self-adjusting; wear of course takes place and must be rectified, but it is desirable to examine for wear after removal of the rear wheels as being easier than taking the brake down with the wheels in position. The previous difficulty as to the engine and gear-box bearings now presents itself with respect to the rear axle, for it can naturally be presumed that this is of the "live" type and carries the differential. To many old car-owners the differential is and always will be a box of tricks, and when running well they prefer to leave it so. The mechanism of the rear live axle is as simple, taken in detail, as the rest of a motorcar; all parts are supposed to be properly fitted together, but a car builder has to give a little more attention, if such a term is possible to use in regard to a well-built car, to this portion as it has to support half the total weight of car and passengers, and take the whole of the driving and braking strains. Further than that it will need removal of all the four wheels if we are going to proceed to take everything to pieces. Of course if it is thought desirable, the axle can be removed, but the rear of the car must be supported quite separately from the axle or wheels so that when the latter are removed the weight can be properly supported. Within the limits of such an article as this it would be quite impracticable to give precise instructions upon every point that arises, and therefore, regretfully, the rear axle must be treated as a solid piece of metal. It can be well washed out with paraffin, and the removal of the wheels, by taking off the brass end caps, together with the castle nuts and lock rings upon the ends of the axles, will enable the wheels to be slid from the squared axle ends. Or the wheels can be left in position and only the caps, nuts, and locking rings removed: both wheels being jacked up, the cap at top of differential case is opened, the case filled with paraffin, and then the wheels quickly revolved. Two or three churnings up of this nature will clear out all the dirt, and then a final run through can be made, but before turning the wheels on this occasion the drain cap at the bottom of the differential can be removed and the accumulated dirt will run through. The paraffin should be allowed to drain clear all night and then all the parts of the axle can be thoroughly greased and lubricated.

FOR RE-ASSEMBLING THE CAR

all the operations will be taken in exactly the reverse order to that attempted as previously indicated, remembering always to be certain that all nuts must be properly tightened up and split-pinned. A little hint as to the nuts: if these and the bolts they run upon have their threads dipped in oil, the nuts will run up more easily, and if at a future time some portion of the work has to be dismantled, the nuts will not be found to be rusted. Oil applied to the leaves of the springs and the carrying shackles will be useful, and, in fact, upon every part of the car where there is movement or a joint exists. It will be noticed that the steering mechanism has not been touched upon, but space will not permit, and a description of best methods for tackling this must be reserved for a later period. In replacing such portions as the cylinders and cover of gear box, cut brown paper patterns to exactly fit the top of the crank-case and top of gear-box. Of course such parts of the engine, etc., have faced joints and are nearly, but not quite, oil-tight and the added thick sheet of brown paper will make them effectual. When the cylinders are being placed upon the crank-case, do not tighten up fully one bolt at a time, but only run up the nuts at first by hand until the wrench must be brought into use; then, with this give each nut a half or whole turn, treating the nuts thus alternately; viz., nut 1, then 3 and 2 and 4, going over them again and again in this order and giving to each exactly the same amount of movement. The object in view is to ensure that the cylinder or cylinders have equal and the same pull all round so that they face accurately on to the crank-case.

Those who thoroughly understand car construction may, if they have been good enough to read the four articles, think some of the directions given superfluous, but the sole aim has been to offer a lead to many men who, having the time, would like to know something more of the internal construction of their cars, but hesitate to try and learn for fear of committing some irreparable damage.

On page 610 of last week's issue of "The Motor," Mr. M. A. Jenny, the Secretary and Treasurer of the Nelson Automobile Association, gave some interesting details of the spread of automobilism in New Zealand. The illustration depicts some members of the Association on the occasion of a recent run.

JOHANNESBURG TO DURBAN.

The following account of a five days' trip from Johannesburg to Durban—a distance of about 500 miles—will be read with interest. The rider was a comparative novice in motor-cycling. His machine was a 3 h.p. Rover.

After leaving Johannesburg at 6 o'clock in the morning, I followed the road and travelled well until I struck the Natal Spruit; but whilst trying to cross this I slipped, and both machine and rider fell in. Luckily I saw a man in the distance, and he came to my assistance, so I managed to get the bicycle out. It proved to be no worse for its bath, and I started off as though nothing had happened. After travelling about five miles I had a cropper, and buckled my front wheel. After truing it as well as I could, I started off again, and arrived in Heidelberg at 9.45 a.m.; breakfasted at the Coronation Hotel, and then went to the cycle agent and had my front wheel put right. By 10.30 was on the way to Greylinstadt.

I travelled well, and arrived at Vlaklaagte at 12.15 p.m., leaving again at 12.20. In about an hour it struck me I must be on the wrong road. Seeing a kraal in the distance, I made for it, and found I was completely off the road, so I had to travel over the veldt, and had a terrible shaking for about eight miles before I struck the road again, arriving at Greylinstadt at 1.45 p.m., and leaving again at 3 p.m. Progress from this point was slow owing to the roads being very sandy; and soon after I came to a nasty spruit which was one mass of boulders, and which took me some time to get my motor across. After this I had a good run, and was able to make up for lost time. Arriving at Standerton at 5.30 p.m., I put up at Masonic Hotel, and, feeling rather lazy, thought I would take it easy, so did not leave until 12.15 p.m. the following morning. The road was good until I arrived at Kromdraai, where I had a lot of sand, about a foot deep, to contend with until reaching Platrand. After this I had a change in the shape of huge boulders; I managed to dodge these, and then found that the road was better, so I let the machine out at full speed, and, arriving in Volksrust at 6 p.m., put up at the Transvaal Hotel for the night, leaving again at 7.30 a.m. Nothing noteworthy up to Mount Prospect, where the roads were

TERRIBLY BAD WITH STONES AND SAND—

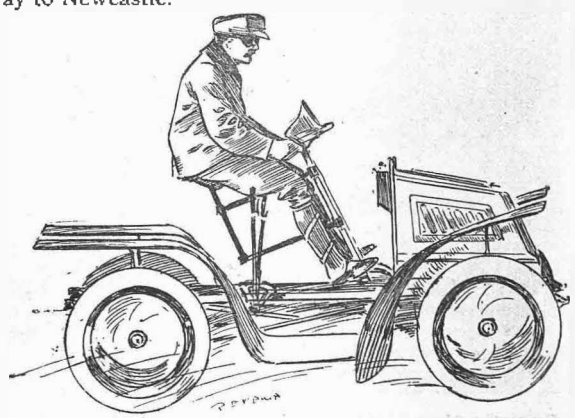
the grades in places must have been quite 1 in 4, and the sand quite a foot deep, so the only alternative I had was to wheel the machine up by degrees. I eventually arrived at Newcastle, quite fagged, at 2.30 p.m., and put up at the King's Hotel. I should mention that through all this I never touched the motor or the machine, and it ran splendidly.

Leaving Newcastle at 7.45 a.m., I had a fine run for about eight miles; but then the road was not so good, although far better than the previous day. Reaching Elandslaagte at 1 p.m., I had lunch, and left for Ladysmith, arriving there at 3 p.m.; and after having a fill of petrol and refreshment I left about 4.30 p.m. for Colenso, which was about 15 miles away. Somehow I took the wrong road, and after riding for half an hour I met some Kaffirs, who informed me that the road lay over some hills in the east; so I made a bee-line across country, arriving on the road just as the sun was setting. Having made up my mind that I would have to sleep on the veldt for the night, I thought I would push on as far as possible, and managed to cover about five miles, until I could barely see to ride, when, as luck would have it, I espied a farmhouse in the distance. On making enquiries thereat I discovered that a Mr. Crouch, an English farmer, was the owner. I promptly made his acquaintance, and he and his wife were most kind, and put me up for the night. Leaving here at 8.30 a.m., I travelled well, the roads being fairly good until coming into Highlands. Here I had a very steep hill to contend with—a stony surface which took me some time to get up, as I was unable to rush it. After getting to the summit, I had a nice run to Mooi River, reaching it at 3 p.m., and leaving it again, after some refreshment, at 3.45 p.m. for Nottingham Road, which place I arrived at about 5 p.m., staying over night. The following morning I started for Maritzburg about 10.45 a.m., arriving at 3.30 p.m. The roads were very stony in places, especially descending into the town.

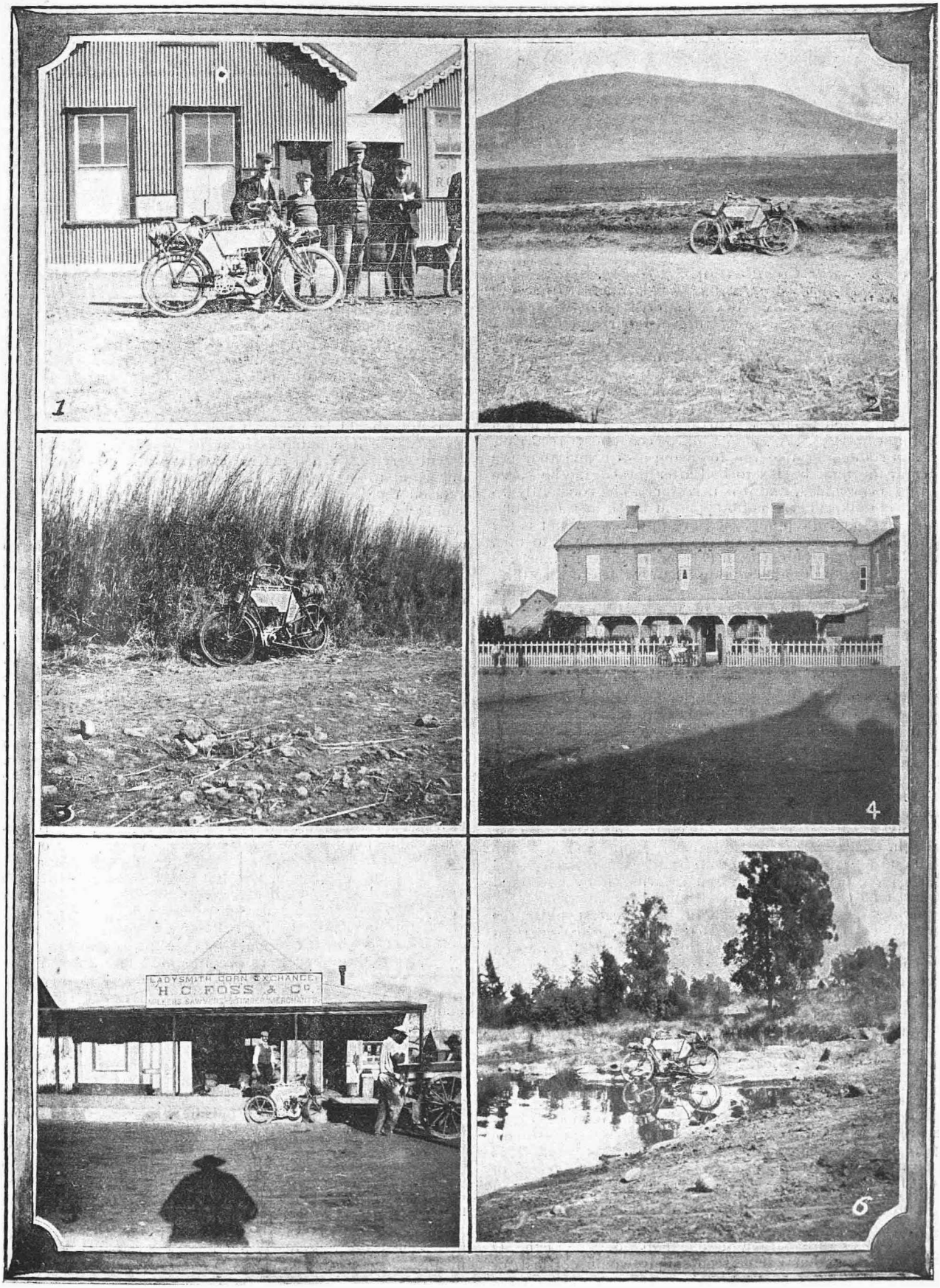
I put up at the Central for the night, and next morning was on my way to Durban, progressing fairly well—although the roads were rather sandy until I reached Inchanga. After climbing the Inchanga Hills I travelled well until I came to Botha's Pass; here the surface was strewn with very sharp stones, and, whilst descending, I felt my back tyre go down, and found that a stone had pierced the tube in two places (I may mention that this was the first puncture or stoppage on account of the motor or machine I had on the whole journey). In about half an hour I was again on my way, and after travelling about three miles I arrived at Hill Crest, where I stopped to fill my water-bottle. Leaning my bicycle against a wire fence it fell over and bent the crank, but, thanks to the assistance of a gentleman at Hill Crest, we managed to straighten it, and I started once more, arriving in Durban at 4 p.m. (without further mishap) after enjoying some very pretty scenery and good roads.

After completing the journey I did not find it necessary to have the motor touched; and the accumulators were both fully charged. I ran on one accumulator the whole way, and on testing it immediately I got off found it was exactly four volts. The machine never gave me the least trouble from beginning to end.

The illustrations relating to this article on the opposite page are: (1) The Hotel, Greylinstadt; (2) Near Platrand; (3) On the Road to Elandslaagte; (4) The King's Hotel, Newcastle; (5) The Corn Exchange, Ladysmith; (6) On the Way to Newcastle.



A NEW DESIGN!
A light-weight by a light-headed contributor.



The Views referred to in the Article "Johannesburg to Durban."

Magneto's Point of View

Defective Water Circulation.

In general, it may be fairly said that ignition troubles are no longer the "bete noire" of the motorist. The whole subject has been so exhaustively thrashed out and discussed ad infinitum in the motor Press, generally, that the merest novice need never be long in doubt on any point that may worry him. Judging, however, from the number of complaints made recently it would certainly seem that water circulation difficulties of a minor character are just now far ahead of ignition troubles. Particularly so with small cars and fore-carriages. A sample of a constantly recurring query is something like the following:—"I find that the water in the tank begins to boil after the engine has been running a few miles, and it is necessary to be constantly refilling the tank. There is no apparent block in the circulation system, and the pump, etc., are in order. What is the explanation of this and the remedy?" In answer to this, I should say that the cause in two out of three instances is sluggish circulation either due to some accidental throttling in the pipes somewhere, or a badly-designed radiator having small bore tubing and very sharp bends. All this puts excessive resistance in the path of the water current and a very powerful pump is required to force the water through the system.

OBSTRUCTIONS IN THE SYSTEM.

A very simple and unsuspected matter will sometimes throttle the circulation. I have known of an instance in which a 5 h.p. car gave its owner any amount of trouble till a thorough overhaul revealed the fact that one of the india-rubber connections between the engine outlet and tank had been so carelessly made that, in forcing it on to the sharp edge of the tube, the inside of the rubber had become torn or cut and a sort of plug had formed, which practically left only a small hole about ¼in. for the water to pass through. The fact was, the rubber connection was too small and had to be forced on the tube. On replacing this with a piece of the full size and securing it by two band clips instead of wire no further trouble was experienced.

Furring up of pipes is one of the greatest nuisances imaginable. If the water used contains lime held in solution this is gradually deposited as the carbonic acid gas which holds it in solution is driven off. The hotter the water becomes the more rapidly is this deposit thrown down. There are several remedies for getting rid of this, one of the most practical being to dissolve a pound or two of caustic soda in the tank water and run the engine for a couple of hours. This solution will dissolve the lime pretty rapidly. If the water used is addicted to furring, this process repeated every 500 miles of running will keep the system clear. A dodge sometimes adopted is to tap the outside of the tubes lightly with a hammer, so as to break off the crust, and then connect up one end of the system to the high pressure house tap by means of a hose and clear the tubes this way. This is not a very sure method, however, as very often a piece of the "fur" will get dislodged and wedge itself firmly in one of the bends of the tube.

DEFECTS OF THE PUMP.

Faulty pumps are more numerous than would be generally credited. Many that I have seen simply would not last, or do effective work for more than 800 miles. Inadequate shafts and bearings which quickly wear out when subjected to high speed is a common defect I had a centrifugal pump to pieces recently that had not done a 1,000 miles. The bearings had worn quite oval, the shaft could be moved from side to side 3-32nds of an inch, and the turbine disc inside showed unmistakable signs of having jammed hard up against the casing. Little wonder, then, that the pump had ceased to act. Really good bearings, which, if not ball bearings, should be made of some anti-friction metal, are indispensible if a pump is intended to give anything like decent service. When a friction-driven pump is used it is important to see that the drive is all right. Grease often gets on the leather-rimmed pulley and causes slip. This should be cleaned with petrol, and attention paid to the spring which keeps the pulley up to its work. This may require slight adjustment. It must not be adjusted too tightly, such as would unduly strain the bearings, only just sufficient adjustment being given to prevent the pump being jolted out of contact with the clutch drum.

LEAKAGES.

Loss of cooling water is very often not so much due to boiling away as to a slow and steady leak somewhere on the system. The effects of vibration in cracking copper tubes are curious—that is to say, a crack may occur at a most unsuspected place. I have seen several instances of this sort happen. An awkward leak in a radiator tube I knew of could only be located by plugging up one end of the system and connecting the other to a high pressure water supply. A good deal of trouble was at one time experienced with the water tanks fitted to fore-carriages. The soldered joints used to give way, probably due to insufficient support being provided for the tank. It is very difficult to effect a temporary and effective remedy for a leakage of this kind on the road. Short of getting it soldered up, white lead is about the only thing applicable, and the water soon gets through this. A leak on a pipe, if it is get-at-able, can be effectively stopped by slipping a piece of rubber tubing over it and wired on, or if the tubing cannot be worked on to the tube it can be slit at one place and sprung over. On some fore-carriages the radiators are mounted low down under the frame to catch the draught. When placed in this position they require watching to see that they do not get smothered with mud. This coating greatly diminishes the cooling capacity. In fact, for keeping the heat in the water a thick coating of dried mud is one of the best methods to adopt. It therefore pays to keep these clean, and, after a ride in the mud, to sluice them with a hose if possible.

In effecting this operation some care of course must be taken in using the hose to avoid the water splashing about on to the engine and gear. I remember seeing a tri-carist in the yard of a country inn last autumn giving his chain-driven machine what he called a thorough wash down. The spray carburetter and chains came in for special attention, and the way he scoffed at the idea of getting sand in the bearings and water in the carburetter was amusing, but personally I should not have relished the job of trying to start that machine. I know what water in the carburetter means.

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OPINION.

This Year's Motorcycle Trials.

Some misapprehension seems to exist in club and trade circles in regard to the motor-bicycle trials intended to be promoted this year. It has been stated that in addition to the light-weight trials fixed for April, there is to be another 1,000 miles reliability trial for ordinary motor-bicycles in August. As a matter of fact no trials, other than the one for light-weight machines, have been settled upon, and we very much question whether any other bicycle trials are at all necessary this year. The ordinary motor-bicycle has been proved and we know what it can do. Not so the light-weight. It is necessary to demonstrate under conditions which will afford conclusive evidence that the light machine is the practical vehicle we believe it to be. Such proof has already been long enough delayed, and undoubtedly such a trial should take place early in the year so as to secure business for this season. It is also essential that the light-weight should be proved on its merits in a class by itself, and apart from any other trial, so as to avoid the possibility of its performances being overshadowed by those of heavier and more powerful bicycles and tri-cars. We notice that the suggestion has been made that the holding of separate trials would lead to confusion in the minds of probable purchasers. Apart from the fact, already pointed out above, that no trials for heavy machines have yet been decided upon, we hold quite the contrary view, and we think all unbiassed readers will agree with us that confusion is much more likely to exist in the minds of likely purchasers if three classes of vehicles take part in one trial with the resulting overshadowing. What is wanted is a clear, outstanding, decisive, and practical test for the light motor-bicycle, and it is wanted at the very earliest moment, earlier, if possible, even than the date already fixed—early April—but certainly not later.

Spoiling the Gordon-Bennett Race.

The decision of the French Automobile Club to run the big race for its Grand Prix concurrently with and over the same course as the Gordon-Bennett race emphasises the painful fact that the French regard sport from a totally different standpoint to what we do in this country. In fact, whilst we, so far as motor racing goes, are content to play a sporting game and use the results for the benefit of the trade, the French subordinate everything to business and self-interest. In connection with the Gordon-Bennett race, the French Club was in the happy position of being privileged to draft the rules of the Cup, and so was able for two or three years to reap advantages over its competitors. But now it finds with intense chagrin that the industry in other countries has made such vast progress that it is almost impossible to say that any substantial distance separates the leading countries in the race for premier honours. The French club resents the fact that 30 or 40 French makers can only be represented in the race by three cars, so that the individual chance of winning the Gordon-Bennett is small, whereas such countries as Italy, Switzerland and Austria, with but one manufacturing house, have a very good chance. But the compensating advantage (and one which asserted itself most unmistakably last year) of having a very fine field to select from is quite ignored by the French. So the French club has determined to sink the importance of the Gordon-Bennett race by smothering it in the other event open to French makers, and by standing out of the classic race altogether in 1906. It has chosen a course that is dangerous and narrow and tortuous, and trusts that, by crowding this course with competing cars, to make sure of the leading French car getting home. A total absence of the sporting instinct can be seen in the scheme, and England would do well to refuse to be a party to it. If another race is desired, let it be run on the day after the Gordon-Bennett, and let it make its own fight for the honour of being regarded as the blue riband. If the French club be obdurate, and really desires another Paris-Madrid holocaust (which, it must be recalled, was the outcome of the same club's mismanagement), then let the English Automobile Club set the example, and, by washing its hands of the Gordon-Bennett, show to English legislators that it regards with abhorrence the promotion of that wild, reckless racing which, in the case of the Paris-Madrid contest, sent such a thrill of horror through this country and brought down upon us the restrictions of the present Act of Parliament.

Patent Law Improvement.

The new patent law which came into force at the turn of the year introduces a much-needed reform in the methods in vogue in this country, but, at the same time, the so-considered ideal system adopted by Germany and America have been studiously avoided. We have never agreed with those who have regarded the German and American system as being fair and equitable, and unquestionably the English system, despite all its faults, has been the better. The latter practically permitted an inventor to protect any idea which was, at any rate, not so absurd or obviously unprotectable that it could be rejected by the Comptroller. In this way the inventor paid fees to the Exchequer and had the satisfaction of being able to find out under protection whether his idea was workable and his patent likely to be valid. True, he too often found that he had paid money to his country with no advantage to himself, but this knowledge, it must be conceded, was purchased cheaply. Frequently, too, he was able to complete his patent, to market his article, provide the public with a useful addition to the resources of civilisation, and to reap a profit to himself, and nobody was the wiser or the loser by the fact that the validity of the patent could not have been improved. In the case of infringement, actions at law have followed, but let us now observe that probably not one legal action has resulted for every 500 applications filed, whereas in Germany and America, where a staff of Government officials, not often competent and not always conscientious, almost every rejected application has resulted in an appeal—frequently with legal assistance, and thus the act of securing a patent in those countries has been one of difficulty and expense, and no doubt many a bad patent has been accepted and many a good one rejected. The new law does not alter the English methods, except in this wise: a special staff will now conduct a search for the applicant, and tell him whether or no the method covered by his application has previously been made the subject matter of a patent. Then, if he desires, after being informed that he has been anticipated, to proceed with the application, the final letters patent are endorsed with the Comptroller's objections. Although this latter provision may reduce the value of the patent, yet, after all, it is not unwise in that it protects capitalists.

THE SIDDELEY 12h.p. CAR.

THE CAR WHICH IS NOW UNDERGOING A 5,000 MILES TRIAL.

We take particular pleasure in describing this well-designed and constructed car because it is entirely the product of a British factory, and can be genuinely named as an "all-British" machine. Originality is prominent in several of the principal constructional features, but has not been secured either at the expense of reliability or accessibility; in fact, accessibility is the keynote of the car throughout, and if two bolts will equally serve a particular purpose as well as four, there has been no hesitation in securing the end in view by re-designing. Considerable interest also attaches to the method adapted for suspending the engine and gear-box so as to secure the various shafts with their bearings always remaining in line and being free of any twisting strains set up by the wheels and frame over rough roads.

THE THREE-POINT SUSPENSION

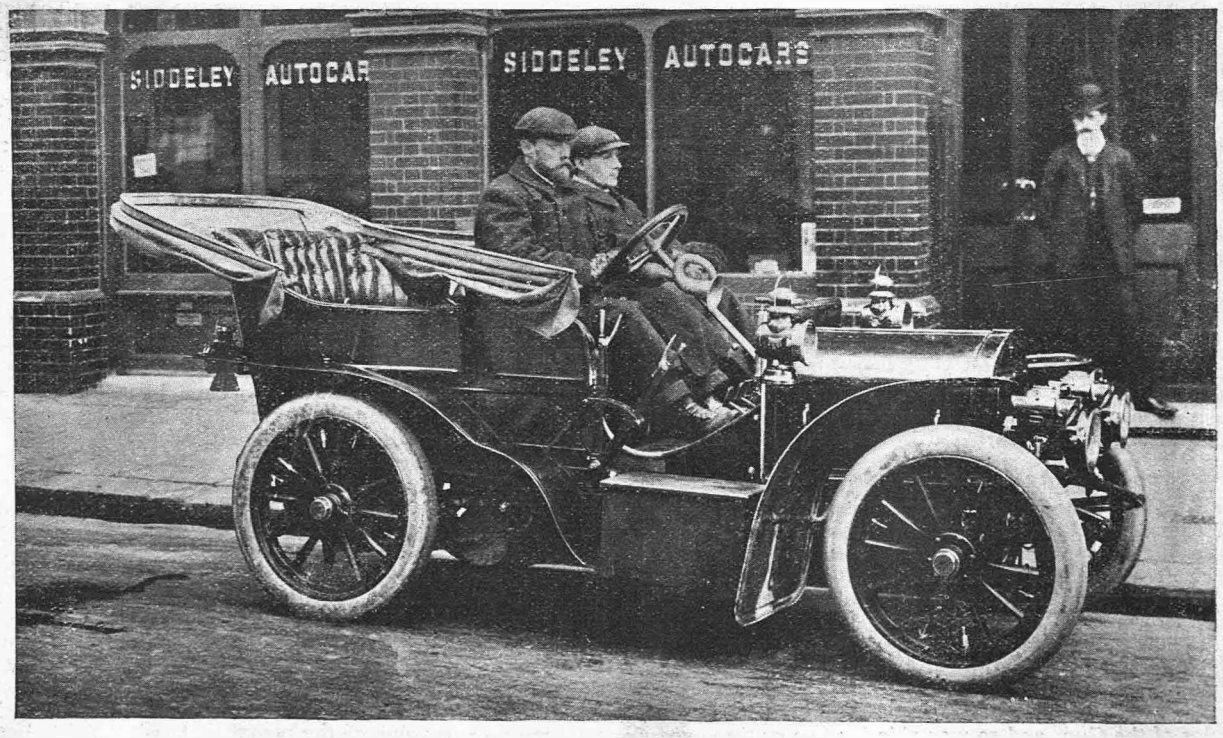
used is of the greatest importance, as wear can only then result from the actual friction of the shafts with their respective bearings, and with the splendid workmanship of the car under notice such wear should be infinitesimal.

The framework is pressed steel of taper channel section, and is set inwards from the dashboard to the front ends so as to enable the steering wheels to have the largest available "locking" space. The frame itself is extended fore and aft, and acts as the dumb irons for carrying the semi-elliptical springs. Two steel cross-bearers form supports for the front centres of the engine and gear-box respectively, and also act as struts in generally stiffening the frame, whilst a third strut runs across the rear end of the frame.

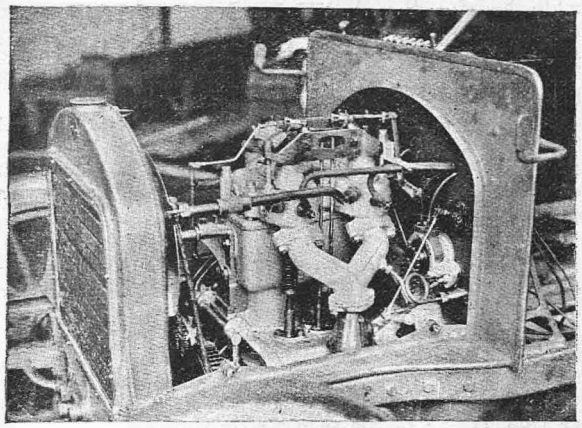
The engine differs considerably from the usual type of vertical employed in the majority of cars; it has two cylinders, and that is practically the only exterior point which bears any resemblance to the normal. The bore of each cylinder is 4½ inches, and the stroke is also 4½ inches; the normal revolutions are 850 per minute, and by accelerating the engine speed can be increased to 1,400. The two cylinder jackets (minus the heads) form one complete casting with the upper half of the crank chambers; the three supporting arms forming the engine bearers upon the front cross frame member and the main frame are also cast solidly with the crank case, the whole being turned out in aluminium, and thus securing the maximum of strength with the minimum of weight. The actual working cylinders are formed of cast iron, and are forced hydraulically into position in the aluminium water jackets; the cylinders are ground accurately to size when in place; the cast iron cylinder heads, carrying the inlet and exhaust valves, are a ground fit with the cast iron cylinder liners, and are held in position by four bolts and nuts each.

THE VALVE POCKETS ARE ENTIRELY WATER JACKETED,

and in connection with these jackets and the water jackets of the cylinders appears one of the special features before mentioned. There is no attempt to make a water-tight joint between the cylinder and the head, which would become a source of considerable trouble in the hands of unskilled users; if the cylinder jacket and the head be treated as two separate and distinct water receptacles, each complete in itself, the method will then be understood. But it is necessary to secure continuous circulation not alone around the head, but also around the cylinder, and therefore the base of the head water jacket and the upper portion of the cylinder jacket are joined by a short length of piping of "U" shape, which can be described in the illustration depicting the valve side of the engine. The base of the crank chamber forms an entirely separate aluminium casting; it can be entirely detached without disturbance of any bearings, and its removal permits almost instant access to the crank shaft bearings, big ends of the connecting rods, and interior of pistons and cylinders. Those who at any time have had to make adjustments, and for such purpose have gone to the trouble entirely dismantling the engine, will appreciate



The 12h.p. Siddeley Car which is now essaying a 5,000 miles trial under the auspices of the Automobile Club. The drivers, Messrs. A. E. Sutcliffe (at the wheel) and Sidney Girling are aboard.



View of engine showing valves.

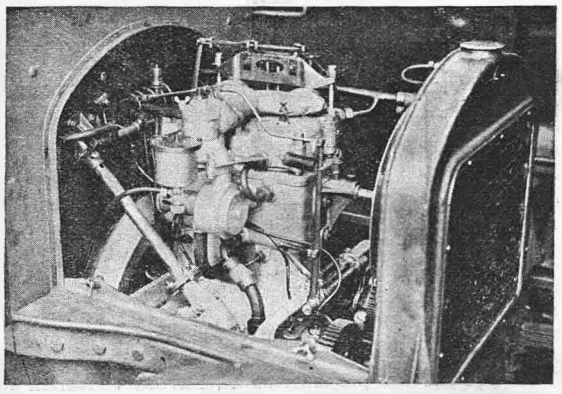
the skill of the designer in so well providing for possible contingencies. The inlet valves are mechanically operated, and are situated in the tops of the cylinder heads, immediately above the exhaust valves, one pocket therefore sufficing for both valves, with the advantage of the incoming cold gas serving to keep the head of the exhaust-valve somewhat cooler than is usually allowed. The inlet valves are actuated by long tappet rods coming up parallel with the cylinders; the actual tappets are carried in a yoke which runs across the two cylinders, and this yoke also keeps the complete inlet valves with their seatings in position.

THE INLET VALVES HAVE A VARIABLE LIFT,

and as the valves are at the tops of the cylinders, this variation is made possible in an ingeniously simple manner. The rocking inlet valve tappets are pivoted at their centres in square brass blocks, these blocks sliding in grooves in the yoke; to the brass blocks are attached screws with a coarse thread, these screws being connected to a tappet rod common to both. Upon the steering wheel is fitted a toothed sector with very minute gradations, this sector carrying an arm notched to fit. Movement of the arm, around the sector, is communicated by suitable rods to the tappet rod before mentioned, and as the rod is turned backwards or forwards so are the brass blocks moved vertically in their grooves. The valve tappets are of course moved from beneath one end by the long tappet rods and hit the valve stems at the other end when thus moved; now, as the brass blocks, sliding in their grooves, form the fulcrums upon which the tappets ride, it will be seen that as the blocks move up and down, the leverage is necessarily altered, and therefore an infinite lift is obtained between fully closed and right open. The single, solid cam-shaft which serves the four valves is enclosed in the crank case and, extending beyond the rear end, carries a sprocket which drives the contact breaker on the dashboard by a connecting chain. The fore-end of the cam-shaft carries a fibre half-speed spur-wheel, meshing with the smaller driving spur-wheel upon the crank-shaft; the crank-shaft spur-wheel at the other side of the engine meshes with another spur-wheel upon the driving-shaft of the rotary water-circulating pump. The fibre half-speed wheel has upon its face a round belt pulley for driving the fan behind the radiators by a gut belt. The sparking-plug enters the cylinders horizontally between the inlet and exhaust valves. As to the crank-shaft, this is of a single piece, and is carried upon three long bearings, and it should be noted that the crank-shaft is not set at 180 deg. for the pistons, but that each connecting-rod is upon the one pin, so that

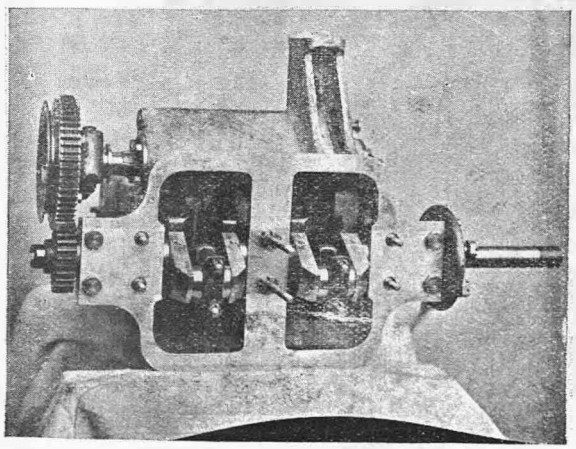
THE PISTONS RISE AND FALL SIMULTANEOUSLY.

The centrifugal governor is upon the arms of the fibre half-speed spur-wheel, and is connected up in the usual manner to the throttle and the pedal accelerator. Before leaving the engine the ease of removal of both inlet valves is worthy of note. The yoke carrying the variable lift mechanism and holding both inlet valves in position is held down by two nuts: removal of these permits the yoke to be raised off bolts at either end, and it can then be swung up clear of the engine, the connections for the lift mechanism being jointed specially to permit of this being managed. The carburetter is on a level with the tops of the cylinders,

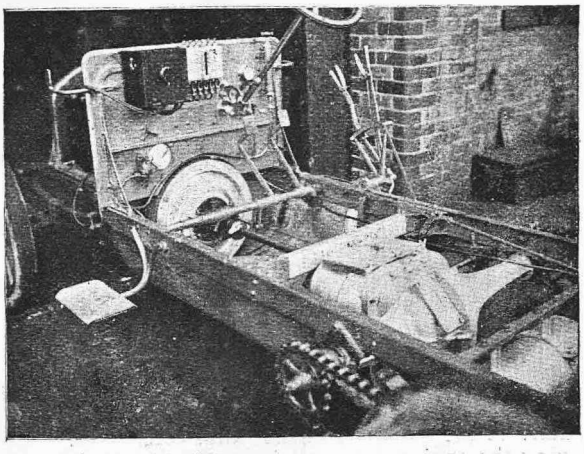


Another view of engine showing carburetter.

and the induction pipe therefrom is properly as short as possible, with the throttle (of the barrel type) as near as can be fitted. The carburetter has an automatic air inlet, depending for its actuation upon the suction of the pistons against the pull of a stiff spring, but, unlike others of this type, is not what might be termed an air-leak variety. The air, prior to entering below the jet, is warmed by a hot-water jacket, and for starting up, the engine is shut off (by hand close to the float) sufficiently to secure sufficient suction on the petrol. When the engine is running this is opened full, and consequently the greatest possible quantity of air taken up, past and from below the jet. Around the circumference of the spraying chamber a series of passages are formed, which the air can reach, and which passages come into the spraying chamber considerably above the jet. These passages are closed at normal speeds by a plate held up to its mark by a spiral spring. As the engine accelerates, the piston suction lifts the flat plate against the spring pressure, and permits some of the air (which had previously passed the jet *from below*) to reach the cylinders from above the jet. No more air passes actually into the induction pipe at high speeds than at low, but the greater the suction the greater the amount that comes out above the jet, and less passes from below. It follows that as the passage of the air past the jet decreases at high speeds, less petrol must necessarily be drawn from the jet, and therefore the correct mixture is obtained for low or high speed of the engine. The petrol tank is at the rear



Crank-case cover with inspection plates removed.



View showing dash, clutch, gear box, etc.

of and below the frame of the car, and must be pressure-fed from the exhaust; the pressure is led by a by-pass from the exhaust pipe through a valve, where it is filtered, and has to pass through several thicknesses of fine mesh gauze, so that there is no possible risk of any flame reaching the tank. The valve is set at the factory to blow off beyond a pre-determined maximum pressure. For starting the pressure before engine is running, a vertical hand air-pump is affixed to the right-hand end of the dashboard with a pressure gauge in connection. A few strokes of this is sufficient to force the petrol to the carburetter, and thereafter

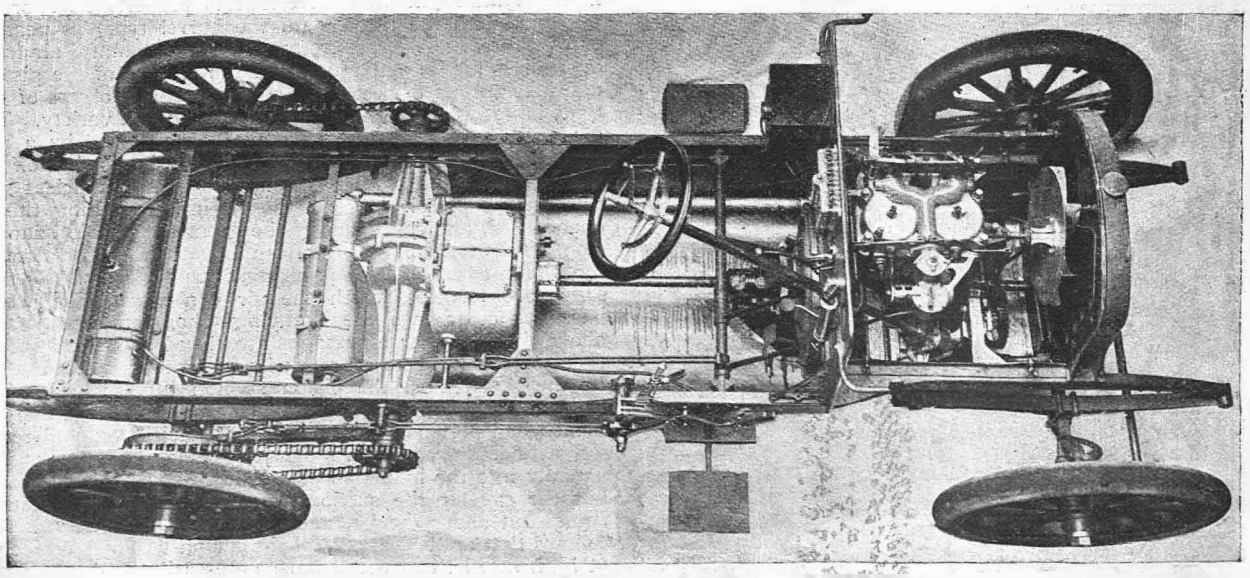
THE PRESSURE IS MAINTAINED BY THE ENGINE

itself. The whole of the engine and the mechanism just described, as well as the fly-wheel and clutch, is suspended from three places only: one immediately at the front centre of the engine upon the steel cross member, whilst the two arms, cast solid into the crank-case, support it upon the side members of the pressed steel frame. The fly-wheel is of exceptional size for a 12h.p. engine, and has the major portion of its weight upon the rim; the clutch, coned and leather-faced, is carried upon the rear extension of the crank-shaft carrying the fly-wheel: between the clutch and the gear-box is the propeller-shaft, having universal joints at either end. The detachment of the clutch is so ridiculously simple that, save for the strength to release the nuts clamping up the front universal joint, a child could easily tackle the job. It is quite a revelation to lift up the floor-boards and observe the space left in which to get at the clutch connections. It is quite clear of a complication of rods, shafts, and levers which one expects to find in such a place, and we would recommend those who admire an engineer's job thoroughly well carried through to inspect this clutch mechanism at the forthcoming show at Olympia, and we are assured that our good opinion will be completely confirmed. The gear-box contains sliding spur-wheels, giving

FOUR SPEEDS AND A REVERSE:

the gears are carried upon two sleeves operated by a drum and a toothed sector. The shafts are all of specially case-hardened steel, and run in adjustable ball-bearings. To the rear of the gear-box are bolted the two halves of the differential casing, which extend outwardly as far as the steel side members of the frame, and carry the shaft therein at whose extremities are keyed and bolted the driving sprockets. The front centre of the gear-box is supported upon one of the frame cross struts, and to its two rear ends by swivel bearings from the main frame, thus securing a three-point suspension. Separate drainage pumps are fitted to the gear-box and differential casing. The shafts carrying the bevel-gear connections between gear-box and the sprockets shaft are upon ball-bearings, and avoid many friction losses thereby. The final drive is by large-size roller chains. The water circulates through a bank of gilled tube radiators, which are enclosed, as to the sides and top, by the aluminium water tank; a fan covering nearly the whole space of the radiators helps in the cooling arrangements. Lubrication is attained by sight-feed drips from the dashboard, and screwdown grease caps are fitted at every needful point, save that the pump-shaft is lubricated from the dash-board.

The push-forward pedal controls *two* internal expanding metal-to-metal brakes within the rear drums, whilst the side lever pulls on two external bands upon the same drums. The lever pulls towards the driver to apply the brakes, and we could wish that more makers would follow this good example. The change-speed lever quadrant is a simple variant of the Mercedes, by which it is impossible to run through a gear when changing up or down, and yet the gear is bound to be locked in the wished-for position. The wheels are equal 32in., with 90mm. tyres on front and 100mm. to the rear. The price of this car, with standard type of tonneau body, weighing all on about 16½cwt., is £450. We are hoping to have the pleasure of a run upon one of these cars at an early period, and shall look forward to our high expectations being fully realised.



The chassis of the 12h.p. Siddeley car.

NEWS

The next London Motor Show

Will be held at the Crystal Palace.

It will be open from Friday, January 27th, until Saturday, February 4th.

His Royal Highness the Prince of Wales has consented to be vice-patron of the Automobile Club of Great Britain and Ireland, His Majesty the King being patron.

Lanfranchi, the holder of the world's kilometre and mile motorcycle records is still an inmate at the Boucicaut Hospital, Paris, suffering from a badly fractured thigh, caused through a fall at the Winter Track two months ago.

The Auto-Cycle Club has, by agreeing to pay the annual subscription, agreed to join the Federation International des Clubs Motocyclistes. The countries forming part are Great Britain, France, Austria, Denmark, Germany, and Belgium.

Victor Rigal, the well-known French chauffeur, who first came into prominence as a daring motor-tricycle racer and record breaker, will shortly leave for America, and endeavour to fix up some matches with the fearless flyer, Barney Oldfield.

There appears to be a desire in certain trade circles that the English Motor Show should be held in November instead of February, it being suggested that manufacturers and buyers would benefit if the new models were shown not later than November.

The arrangements for the eliminating trials for the selection of the riders to represent England in the forthcoming International Auto-Cycle Cup race are now engaging the attention of the Auto-Cycle Club, whilst preparations are also under way for the big long-distance race at the end of May for "THE MOTOR" trophy. It is hoped that these may be run concurrently, but if the date of the race in France (May 14th) is adhered to, they must be conducted separately.

Coming Events.

Jan. 11 *to* 24. New York Automobile Exhibition. (N.A.A.A.)
" 14 *to* 26. Fourth Brussels Salon.
" 21 *to* 28. Birmingham Motorcar Show.
" 27 *to Feb.* 4. Crystal Palace Automobile Show.
" *and Feb.* Automobile Show at Bombay.
Feb. 1. Entries close for Motorcycling International Cup.
" 4 *to* 19. Berlin Automobile Exhibition.
" 4 *to* 11. Chicago Automobile Exhibition.
" 5 *to* 19. Nice Automobile Meeting.
" 7. Ladies' Automobile Club of Great Britain and Ireland's Illustrated Lecture, "Motor Mountaineering in the Alps," by Captain H. P. Deasy, at 3.30 p.m.
" 10 *to* 18. Society of Motor Manufacturers and Traders' Exhibition at Olympia.
" 15. Automobile Club Annual Dinner (Hotel Cecil).
" 24 *to Mar.* 4. Manchester Motor Show (St. James' Hall).
" 24 *to Mar.* 4. Edinburgh Cycle and Motor Show
Mar. 3 *to* 11. Liverpool Motor Show.
" 18 *to* 25. Cordingley's Motor Show (Agricultural Hall).
April 1. Commencement of Automobile Club's Van Trials.
May 14. Dourdan (France—subject to confirmation) International Motorcycle Cup.
July 1. Ladies' Automobile Club of Great Britain and Ireland's Motor Gymkhana at Ranelagh.

Henceforth all Eisemann high-tension magneto machines imported by Messrs. G. T. Riches and Co. will be fitted with the Simms Manufacturing Co.'s license plates, the importers and patentees duly recognising the makers' patent rights concerning the timing gear fitted to this apparatus.

The Olympia Show opens on Friday, February 10th.

The Rev. B. H. Davies has been elected to the committee of the Auto-Cycle Club.

The 100 h.p. Napier racing car which has been entered for the Gordon-Bennett trials will compete in the Daytona Beach races in Florida this month. Arthur Macdonald is in charge of the car.

Messrs. C. S. Rolls and Co., of 28, Brook Street, Bond Street, W., and Lillie Hall, Earl's Court, S.W., have become sole agents in London and district for the new 15h.p. Orleans motorcars, formerly known as the New Orleans.

The difficulties that foreign motorcyclists encounter on entering this country with their machines for touring purposes are so great that the Auto-Cycle Club is now approaching the authorities in order to secure some concessions in the way of the temporary licensing of the riders and registration of their machines.

By an explosion of petrol at his motor-house in Sunderland last Thursday, Mr. F. W. Taylor, president of the Sunderland Football Club, has lost a valuable 30h.p. Napier. The car was so badly burned as to be practically destroyed. Mr. Taylor bought it for £1,400 at the Motor Show at the Crystal Palace last year, on which occasion it won a first prize.

That active organisation, the Birmingham Motor-Cycle Club, of which Mr. John R. Bedford is the indefatigable hon. secretary, hold their annual dinner on Saturday next, at the Crown Hotel, Birmingham. Mr. H. Austin, the president, will occupy the chair, and will present the prizes won during the past year, and Mr. Charles Jarrott will be amongst those who will support him. Unattached motorists wishing to attend may obtain tickets from Mr. Bedford, whose address is Hillaris Road, Gravelly Hill, Birmingham.

HIGH CAME.

BUCOLIC P.C.: "Yus, y' washup, 'e was agoing at a tremenshous speed—'e was a racing like a hare."
BUCOLIC J.P.: "Ah, well—the hare will become 'jugged hare' for 14 days!"

NEWS.

Despite the objections of the English Auto-Cycle Club, on the score of its earliness, the date of the race for the International Auto-Cycle Cup has been fixed for May 14th, the other countries represented at the recent congress in Paris outvoting England on the grounds (1) that it was desirable that the motorcycle race should not be overshadowed by the big car events, (2) that it was desirable to hold the race early, and (3) that no other date was free. The A.C.C. is trying to get the date altered to June or September.

Motor Race Meeting for Brighton.

Brighton, never slow to keep abreast of the times, is projecting a motor race meeting for the coming season. Those who know the ample extent of promenade available will realise that there will be no difficulty in finding a sailable course—with the co-operation of the Brighton Corporation, whose assent is said to have been already secured. From the spectators' point of view, too, the affair should be successful, there being plenty of safe vantage ground for sightseers. The events will probably include the usual one mile and one kilometre speed tests. The actual date is not yet fixed; but we shall give our readers early intimation of this.

5,000 miles Trial of a 12h.p. Siddeley Car.

As we announced last week, a 12h.p. two-cylinder Siddeley car is undergoing a 5,000 miles reliability trial under the auspices of the Automobile Club. We have received the following report of the daily runs during the week:—

Monday, January 2nd, 1905.—Oxford Road. No involuntary stops. Puncture of near-side driving-wheel tyre at 134 miles. Distance 165 miles.

Tuesday, January 3rd.—Coventry Road. One involuntary stop, owing to want of petrol, at 159 miles. Puncture of off-side driving-wheel tyre at 99 miles. Distance 185 miles. Total distance 350 miles.

Wednesday, January 4th.—Great North Road. No involuntary stops. Distance 166 miles. Total distance 516 miles. Buffers on back springs adjusted in motor house in evening.

Thursday, January 5th.—Banbury Road. The driving-wheels slipped on the grease on Sunrising Hill, and passengers dismounted. The committee will decide next week whether this will count as a voluntary or an involuntary stop. Distance 168½ miles. Total distance 684½ miles. Brakes and chains adjusted in motor house, and new spring fitted on air-valve on carburetter.

Friday, January 6th.—Bath Road. No involuntary stops. Distance 157 miles. Total distance 841¼ miles. Puncture 61 miles out on near-side driving-wheel. At the end of the day new cover was fitted on near-side driving-wheel, the cover having run for 841¼ miles. The off-side driving-wheel tyre has now run 263 miles, and 578¾ miles without trouble, a total distance of 841½ miles. The tyres fitted are Continental.

Saturday, January 7th.—Exeter Road to Stonehenge. During this week the same routes will be covered, but the order will be somewhat different.

The United Motor Industries, Ltd., of 45, Great Marlborough Street, W., have just brought out a large "Castle" sparking plug, which, while it retains all the good features of the smaller type which they have marketed so long, is suitable for car engines. The porcelain between the two metals has been lengthened, thus minimising the chance of jumping. The plug complete with washer and cap is retailed at 2s. 6d.—a very low figure for a good plug.

Gordon-Bennett Entries.

The following entries have been received and accepted for the Gordon-Bennett selection trials:—1, S. F. Edge (Napier car), driver Cecil Edge; 2, S. F. Edge (Napier), driver W. Clifford Earp; 3, S. F. Edge (Napier), driver Arthur MacDonald; 4, John Hargreaves (Napier), driver John Hargreaves; 5, H. Austin (Wolseley), no driver nominated; 6, H. Austin (Wolseley), no driver nominated; 7, Lionel de Rothschild (Siddeley), driver Sidney Girling; 8, Sir Alfred Hickman, M.P. (Star), driver J. Lisle; 9, E. Lisle (Star), driver F. R. Goodwin; 10, A. Lee Guinness (Weir), driver A. Lee Guinness.

Successful Appeals by Motorists.

At the Clerkenwell Sessions, C. S. Gabriel appealed against a fine of £5 and costs for driving his car at an alleged speed of 26 miles an hour in Kensington Road last June. The appeal was allowed, with costs.

Mr. Lonis Sinclair, M.P., who was recently fined and had his license endorsed at Folkestone for driving his car down Dover Road Hill at an alleged excessive speed, appealed against the conviction last week. The Recorder of Folkestone (Mr. Lewis Coward, K.C.), in giving judgment, said he did not think it was the intention of the Legislature in passing the Motor Car Act that it should be interpreted harshly against the holders of licenses to drive. It was his duty to decide whether the appellant had driven in a manner dangerous to the public. No evidence had been brought before him that there was any vehicular traffic either crossing the roadway or meeting the appellant. He, therefore, quashed the magisterial conviction.

Col. Kemp, M.P. for the Heywood division of Lancashire, was recently convicted by the Boston magistrates for the alleged driving of a motorcar to the public danger near Boston in October last, and his license was endorsed. He appealed to Quarter Sessions, and was heard last week. The Recorder (Mr. Collingwood Hope, K.C.) quashed both the conviction and the endorsement, expressing the opinion that the car's speed had been exaggerated.

A Good Mount.

A member of our staff has been riding a 3 h.p. N.S.U. motor-bicycle for some time, and speaks very highly of it. He rarely finds it necessary to use the pedals when negotiating hills, and its speed abilities, when it is seriously put to the test, he tells us are truly remarkable. The N.S.U. has a splendid reputation on the Continent, and judging from the above report, and also from an inspection of the machine, which is a strongly-made and well-finished production, we should say it is likely to gain many friends here.

The Brighton Promenade on which the projected race meeting may be held.

In our next issue we shall publish details of our Olympia show programme.

Minerva Motors, Ltd., of 40, Holborn Viaduct, London, E.C., have been honoured by H.R.H. the Prince of Orleans to supply him with a 14h.p. four-cylinder Minerva car.

"The Motor Boat."

This week's issue of "The Motor Boat" is a specially interesting one, it being a Foreign and Colonial Number. It will be found to contain a wonderful record of the world's progress in motor boat design, construction, and use. Supplements in eight languages are inserted in copies going to different countries, and it is certain that the world-wide circulation of this special number will give an impetus to the movement generally and to the British industry in particular.

NEWS.

The Birmingham Corporation have placed an order for a Talbot car with Messrs. Piercy and Co., of Birmingham.

The Simms-Bosch magneto electric ignition will be fitted to Mr. Rothschild's 1905 Gordon-Bennett racing car, now being built by Messrs. the Wolseley Tool and Motor Car Co., Ltd.

The Olympia Show.

The photograph we reproduce this week will enable our readers to get an idea of the immense size of the exhibition building for the Motor Show on February 10th to 18th. The distance, end to end, is 440ft.; side to side, 250ft.; and from floor to centre-line of roof is about 120ft. The gallery is a clear 40ft., fall to balcony, and the arrangements this year will permit the public to obtain an uninterrupted view of the hall from any part of the balcony, as no stalls will abut thereon. The man standing upon the floor gives a comparison of size. The lids scattered about the flooring are beside the new underground jointing boxes of the electrical installation, thus obviating any overhead unsightly cables for conveying current to the lamps on each stand.

The International Motorcycle Cup, commonly known as the "Little Gordon-Bennett," will probably be run over the Dourdan course again. The date is Sunday, May 14th.

Barney Oldfield has created fresh track records from 13 to 50 miles at Fresno, California, on his Peerless car, the "Green Dragon." The 25 miles were covered in 23min. 39⅘sec.—19⅘sec. better than Earl Kiser's record with a Winton car last October. The next 25 miles were reeled off at a steady mile-a-minute bat, the full time for the "50" being 48min. 39⅘sec.—over 7min. faster than Charles Gorndt travelled in his Winton record in October.

Motorcar Trials at Olympia.

Arrangements have been made in connection with the forthcoming motorcar exhibition at Olympia so that exhibitors will be able to give intending purchasers trials of their cars. A large garage, capable of holding over a hundred cars, has been erected on the Hammersmith side of the building, and there is also standing room for 300 more cars for visitors. In a short time the trial cars can run from the exhibition, over Hammersmith Bridge, into Richmond Park, where a steep test hill is available to demonstrate the hill-climbing capabilities of the vehicles.

Forthcoming Papers at the Automobile Club.

The following papers have been arranged to be read at the weekly meetings of the Automobile Club during this month:—

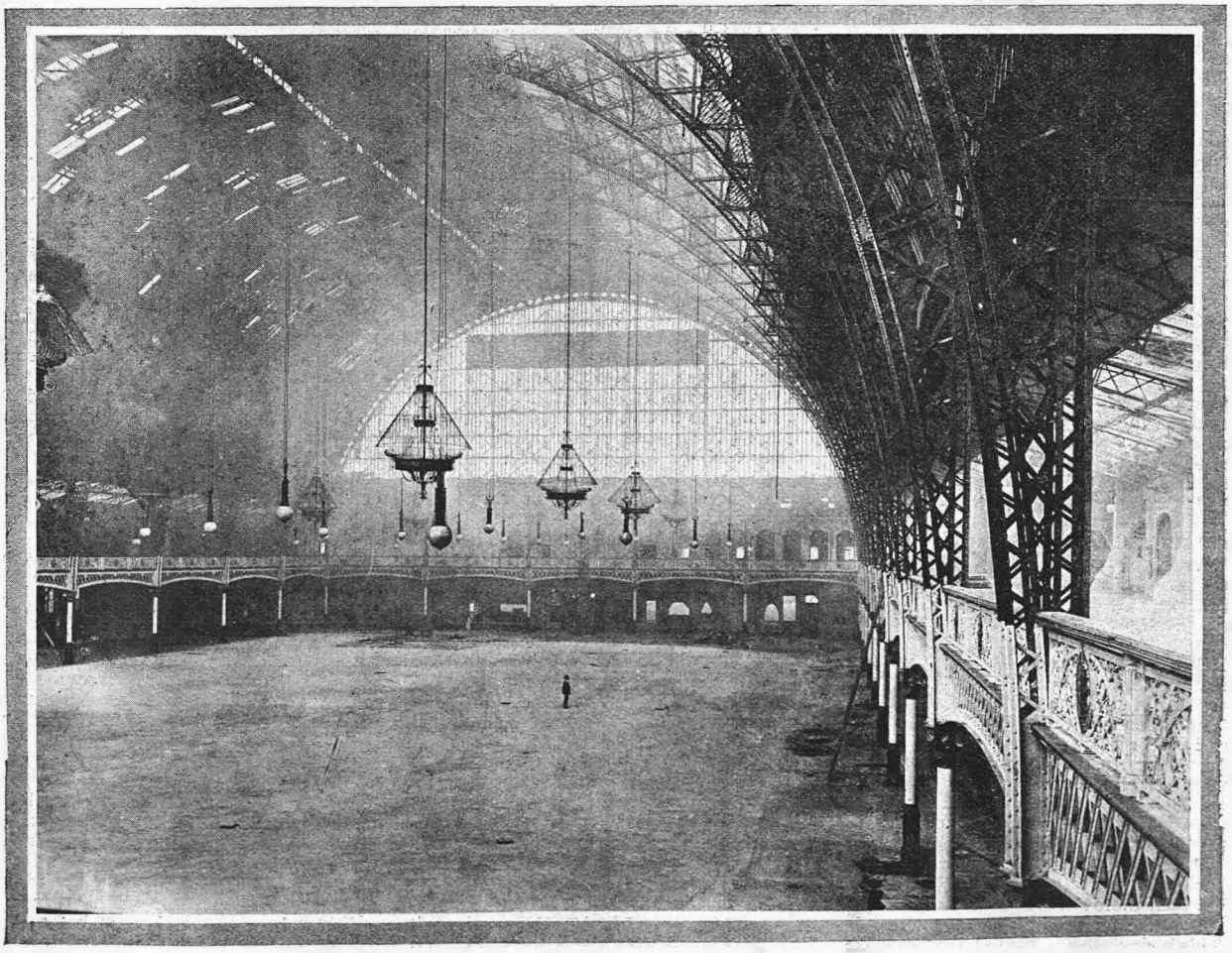
January 12th, "The First Year's Working of the Motor Car Act," by A. Moresby White.

January 19th, "The Paris Salon," by E. H. Cozens-Hardy.

January 26th, "Problems of Traffic," by J. Swinburne.

A Resignation.

Having resigned his position with Messrs. Humber and Co., Mr. H. Belcher completes a period of service which has extended over no less than 17½ years, which, in these days of quick changes, is a very long time. Mr. Belcher was always a hard worker and frequently at his post for 15 hours a day. Two years ago he was largely instrumental in inducing his company to take up the manufacture of light cars, a course which "THE MOTOR" had strongly advocated, and as the output of such vehicles to date has been enormous, we think the company has had no reason to regret its decision. We regret that Mr. Belcher is no longer associated with the famous old firm, but we are confident that his energy will make it impossible for him to be for long out of harness.



View showing Olympia dismantled and ready for the great Exhibition. The photo was taken under adverse conditions, as asphalte was being laid and the building was full of smoke.

THE INTERNATIONAL FEDERATION OF MOTORCYCLISTS.

The Constitution, Aims, and Objects of the New Body.

As we have already reported in these columns, the outcome of the recent race in France for the International Auto-Cycle Cup, and the correspondence initiated by the English and German Auto-Cycle Clubs upon the matter of the nail-strewn course, was the establishment of a congress in Paris on December 21st and 22nd. At this meeting the Auto-Cycle Club of England was represented by Messrs. M. O'Gorman and J. Pennell, and as a consequence of the discussion the Federation Internationale des Club Motocyclistes has been established. The constitution, aims, and objects of such a body are a matter of great interest to all motorcyclists, and, in view of that fact, the Auto-Cycle Club has given us permission to publish the report which it has received from its delegates at the Congress. The Auto-Cycle Club had laid certain proposals before the Congress, and these are dealt with in the report which follows. It is an interesting document, and is in itself indicative of the work which the Auto-Cycle Club is called upon to do—work of an entirely different character to that undertaken by any other motorcycling club.

At the suggestion of the Auto-Cycle Club a meeting of the delegates of the International Auto-Cycle Club was called in Paris, and the dates provisionally fixed were December 22nd and 23rd, 1904 (altered later to the 21st and 22nd). This meeting decided that it represented the Auto-Cycle Clubs of Europe, and that as the representatives were empowered to decide upon the main purpose of the agenda (the business of an International Federation of Auto-Cycle Clubs), such a Federation should be formed.

Those present or represented were:—

Great Britain.—Mr. M. O'Gorman, Auto-Cycle Club (and who was also delegate on the International Auto-Cycle Cup Commission); Mr. J. Pennell, second delegate, without vote.

France.—M. Deckert for the Motocycle Club, with vote; M. de la Hausse, of the Motocycle Club de France, and who is not a member of the International Commission for the International Auto Cup; he was the second delegate, without vote.

Austria.—Ernst Libotte, delegate to the I.A.C. Commission, with vote.

Denmark.—Fritz Schmitto, member of the I.A.C. Commission, with vote.

Germany.—Mr. E. Schmoltz, first delegate (not present on second day); Robert Hein, represents Motorfahrad Vereinigung, Stuttgart, second delegate, without vote.

Belgium.—Baron de Crawhez, represents the Automobile Club of Belgium, delegate for the Commission I.A.C., but did not attend on the second day (December 22nd, 1904).

In order to properly constitute the Federation, it was resolved:—

(1) That the Congress should recognise only one A.C.C. from each country.

(2) That for England that body should be the A.C.C., and for other countries similarly as named below.

(3) That there should be only one voting delegate for each club.

This body once constituted, the delegates elected a permanent executive, to be called the "Bureau," consisting of one president, two vice-presidents, one treasurer, and one secretary. This body to have only executive functions and not legislative ones. The permanent executive is elected for one year, and is eligible for re-election each year by the Commission of the Federation, at the meeting which takes place in Paris on the occasion of the Automobile Salon. It was decided that "Members of the Executive are not necessarily members of the Commission; but members of the Commission may be members of the Bureau or Executive."

On the present occasion two members of the Commission were placed upon the Executive, and two persons outside the Commission, namely:—As President, M. de la Hausse (who is not on the Commission); as first Vice-President, Mr. O'Gorman (who is on the Commission); as second Vice-President, Mr. E. Schmoltz; as Treasurer, M. Libotte; Secretary, M. F. Dercoles (who is not a member of the Commission). The annual subscription for membership to the Commission was named at not exceeding 500 francs.

The six countries together would produce 3,000 francs, of which it is suggested that about one-half may be expended on the salary of a secretary.

The new body is to be called the "F.I.C.M." (Federation Internationale des Clubs Motocyclistes).

The various matters which were recommended by the A.C.C. Committee to discuss were:—Touring: Unification of riding permits; facilities for passing frontiers. Racing: To get the various countries to adopt our system of licensing riders; to recognise licenses issued and confirmed by other countries; to recognise each other's suspensions; to suggest that the fitting and use of pedals in the International Cup race be optional.

The whole were favourably considered, and it was decided to take action in each case, that is to say, the French Club will approach the Minister of the Interior with a view to getting temporary permits for auto-cycle tourists, but it is considered impossible to obtain any admission by the French Government of the riding permits of any club or foreign country. One of the delegates reported that three countries already accepted each other's permits (and numbers) on motorcycles—Austria, Italy, and Switzerland, and the English Club were asked to (1) obtain information as to the exact position of a foreigner arriving in England with a foreign number, (a) stating what permit or license he must obtain to drive a motorcycle, (b) whether he is bound to obtain an English number, or whether his foreign number will be recognised at all, etc., etc. The Auto-Cycle Club should send to the French Club full description of formalities of registering. (2) Take immediate steps to get either the foreign licenses and numbers recognised in England without question, or, failing this, to obtain temporary permission for all those who have the authority of their individual club (duly forming part of the International Association) at home in some such shape as is usual with ordinary bicycles [doubtless a deposit would be made with the home club]. (3) To enable the foreign clubs to appreciate the exact situation under the existing formalities, the English delegates were asked to get six copies of all the permits and forms necessary to be filled in, and to send them to the International Bureau, to be there translated into French, and to be circulated with the French translation to the six countries represented. Other clubs are to do similar work in their countries.

The Motocycle Club de France and the other clubs present expressed through their delegates willingness to recognise each other's licenses, and to refuse to license persons who had been struck off the rolls of any of the other countries. With respect to France, the Motocycle Club is only empowered to deal with riders on roads, track riding in France, whether for motor or other cycles, is in the control of the Union Velocipede de France. This body will therefore be separately approached by the Auto-Cycle Club.

The question of abolishing compulsory pedals was discussed, and it was considered that this merely amounted to increasing the amount of weight available for the engine, and was departing from the usual useful "touring-machine" type. Further, the police would not authorise the race unless the pedals were fitted and could be used to propel the machines in controls.

It was agreed that the pedals, however, might be as light as the makers liked, and that, provided the riders kept behind the pedal cyclists in the controls, the driving of the auto-cycle by pedals only would not be enforced; but a rider must both start and finish with pedals capable of transmitting power enough to drive the road wheels along.

It was agreed that the definition of an auto-cycle should be an automobile weighing less than 250 kilos (without any restriction as to number of wheels, use of pedals, etc.).

It was proposed by the Motorcycle Club de France that the race should take place on May 7th, 1905. this being a Sunday, which, while coming before the Gordon-Bennett, did not clash with other motoring events which would eclipse it in public interest. The English delegates objected strongly to so early a date. Reasons were given why May 21st and 28th were inconvenient, and it appears that the consensus of feeling amongst the foreign clubs was in favour of the earlier date, so that the utmost concession England could obtain was May 14th, 1905.

The most elaborate precautions as to nails on the course will be taken this year. The course will be guarded by the military—swept the eve of the race—guarded all night by one cyclist and one policeman patrolling every kilometre. The reward offered at present will not be offered for fear of its forming an inducement to lay nails, but the offers from the clubs are kept open in case some other means may be devised later for utilising them.

Guippone's Exact Distance.

Joseph Guippone, the young Italian motorcycle record breaker, covered 56 miles 266 yards in his recent hour ride at the Parc des Princes, but even this distance, although it appears truly remarkable on paper, will, we are assured, be considerably improved upon before long, as Anzani is having a special machine built, and declares he can cover close on 60 in the hour—with ordinary luck.

NEWS.

Inauguration of the Third Minerva Factory in Antwerp.

Minerva Motors, Ltd., who already have gained a world-wide reputation for their small petrol motors, have entered the ranks of automobile constructors on a large scale.

The inauguration of the new factory in Antwerp took place on the 28th ult., and was attended with great success. The importance attached to this event in Belgium must, indeed, be very great, for several high officials attended this interesting ceremony, amongst those present being: Mr. Georges Francotte, the Belgian Minister of Industry; Mr. Cogels, Governor of the Province of Antwerp; and Mr. Jan Van Ryswyk, the Burgomaster of Antwerp.

The guests were received by Mr. D. Citroen and Mr. S. De Jong at the new factory, a portion of which had been set apart and decorated for the purpose. Mr. de Jong, in an exhaustive and interesting address, reviewed the history of the Minerva Company.

The Minerva motor made its debut in 1900, when the production was one engine per day. In the year 1902 15 motors were being produced per day, and during the past year as many as 35 engines per day.

The Company has now

THREE WELL-EQUIPPED FACTORIES

all situated in Antwerp. The number of men employed will soon exceed 1,000. The new factory will be used exclusively for the production of the larger cars, whilst in the two older factories the Minervette and motor-bicycles will be manufactured.

Mr. Francotte, in reply, wished the Company continued success.

The guests, numbering about 150, were then conducted through the factory, which was in full operation.

The factory is spaciously built and well lighted. No expense has been spared—the latest and most perfect automatic and labour-saving machinery being installed, all electrically driven. A steam engine of 200h.p. is installed in the power-house for the production of electricity. The works throughout are lighted by electric arc lamps.

On the ground floor are situated the blacksmith shop, in which is installed a large pneumatic hammer, the stores, packing department, brazing shops, and testing-room, where all engines pass an electrical brake horse-power test before being fitted to the chassis.

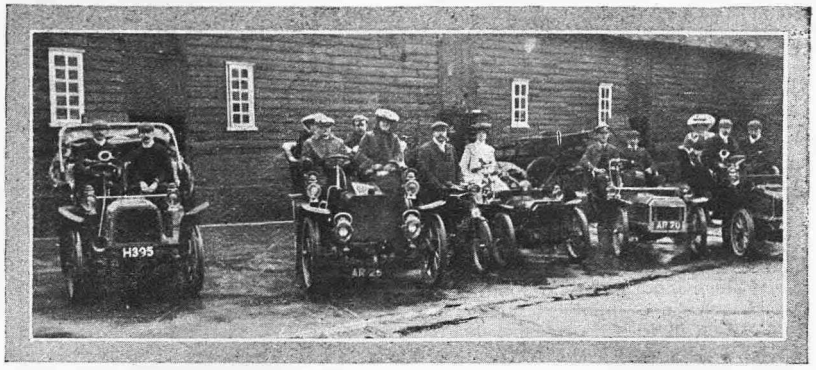
On the first floor we arrive at the shops containing the heavy machinery. Here are to be found various parts of the Minerva cars in rapid course of construction. On the second floor are the erecting-rooms, separate shops being reserved for the assembling of the various parts that form an automobile. On this floor is also a plant for the hydraulic testing of cylinders before they are fitted to the motors. The third floor contains the body and wheel-building and painting shops. The latest labour-saving machinery is also installed here. Electrical lifts are provided to take the automobiles from one floor to another.

The guests having returned to the reception-room, refreshments were offered, and Mr. Citroen, the chairman of the Company, proposed the health of the Minister of Industry and the other high officials who had honoured the ceremony with their presence.

During the ceremony the Minerva band and the Minerva Choral Society, each about 60 strong, gave several of their selections. All the performers, including the bandmaster, are men employed in the factory, and it was an interesting spectacle to see the performers dressed in their factory costumes.

In the evening a smoking concert, organised by the employees, was given in a spacious hall situated in the town, at which the directors of Minerva Motors, Ltd., attended, the audience numbering about 1,400.

Exceedingly fine albums, containing a testimonial with the signatures of all the men employed at the factory, were presented during the course of the evening to Mr. Citroen and Mr. De Jong.

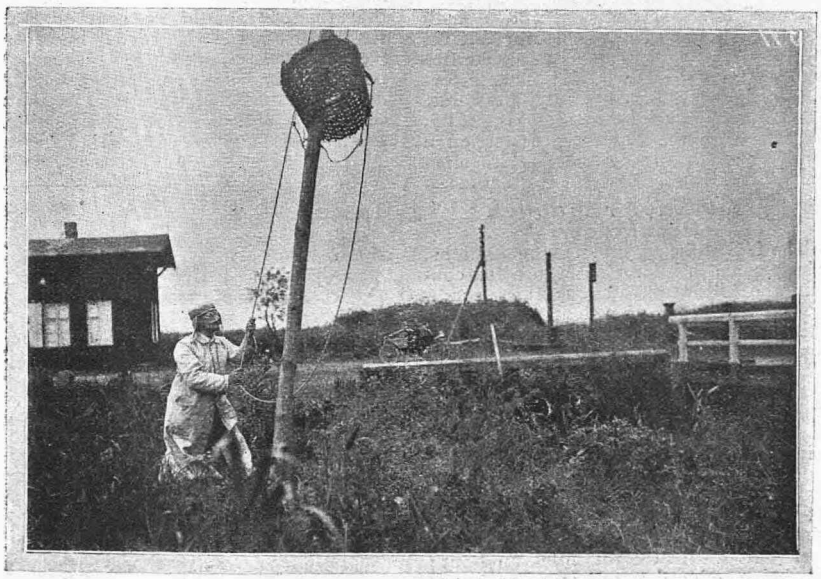


Some members of the Hertfordshire A.C. at Hatfield.

Messrs. Clement-Talbot are receiving visitors daily at their works, which are now in full swing. The machine-room is of special interest, large quantities of parts being turned out with great rapidity.

Delhi-Bombay Trials. Light Cars Brilliant Performances.

Brief results of the Indian reliability trials have been cabled, but it is, of course, impossible to give anything like a report of the affair until the Indian mails arrive. Out of some 35 starters 21 finished; tyre troubles accounting for most of the failures: the bullocks which draw the wagons along the country roads frequently lose nails from their shoes, and these are picked up by the tyre as it passes. We have already referred to the excellent performance of Mr. Basil Johnson's Napier in the early stages. We now hear that a 6h.p. Wolseley and a 12h.p. Darracq did non-stop runs and gained full marks, securing both the Gaekwar of Boroda's and the Lyons Cups. A De Dietrich also secured a cup for general reliability; and a Speedwell the Maharajah of Gwalior's Cup for economy. For ease of manipulation and absence of noise, the Nawab of Rampur gave a trophy, which was won by a Fiat car. The light Darracq won the Light Car Reliability Cup, and De Dion cars carried off the prizes for "cars most suitable for district work" and "best condition at the end of the trials." We hope to give fuller particulars of these successful trials in a later number.



"Ferry ahoy!" A snap-shot of a Prussian motist hoisting a basket (that was) in order to attract the attention of the ferryman on the opposite bank.

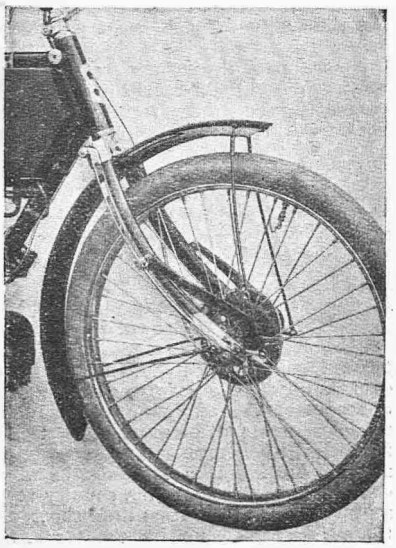
NEWS.

The Future of Motorcar Legislation.

The "Daily Telegraph" is of opinion that "on the whole the Motor Car Act has worked well, and the public attitude towards motorcars has become more friendly. Before the time comes for the renewal or alteration of the Act the general knowledge of motoring will have become so much extended by the introduction of cheaper forms of automobiles and by the increase of public service motor vehicles that there is little fear of harsher regulations being introduced."

The Motor 'Bus Movement.

The London Road Car Co. have placed an order for 50 new motor 'buses, to cost about £700 each and to have carrying capacity for 32 passengers. Three English and two Continental firms are to divide the order between them. The Company consider that the motor 'bus, with which they have been carefully experimenting for some time, is bound to oust the horse 'bus, and they estimate the earning capacity of the motor vehicle at 50 per cent. more than that of the horse 'bus. The 50 new cars will displace about 700 of the 5,500 horses which the Company have to keep for the working of their 460 'buses. The new cars will be mostly two-deckers, lighted by acetylene gas, and driven by petrol and steam.



The N.S.U. spring forks.

The N.S.U. Spring Forks.

The above illustration depicts the new N.S.U. motor-bicycle spring forks. They are exceptionally long and flexible, and the method of working is as follows:—The long bell crank lever, which, as may be seen, is attached to the middle of the spring, takes its fulcrum from the end of the fork; the short end of the lever is attached to the axle, and as the wheel strikes an obstacle it rises, and the long end of the lever pulls the spring outwards. The tension spring may be adjusted to suit the varying weights of different riders. We recently tried a N.S.U. machine fitted with these forks, and we found that it made the running remarkably smooth.

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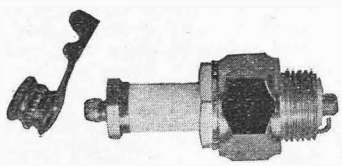
The result of a displaced gudgeon screw.

What Happened when a Gudgeon Screw came Adrift.

A noteworthy example of the damage that may result through a gudgeon set screw coming out of its position when the motor is running is illustrated. The damaged piston from which the photograph was taken belonged to one of our readers. The set screw appears to have lodged on the top of the crank-case ledge, and the piston striking it resulted in a large piece being torn out.

A Sparking Plug with "Quick Snap" Connection.

A sample of a new plug having a very convenient device fitted for making the cable connection has been forwarded to us by the Civil Service Cycle and Motor Agency, Featherstone Buildings, High Holborn, London, W.C. The illustration depicts the device. Instead of the usual



threaded terminal stem and nut, a small rounded stud projects; and over this fits a snap fastening, not at all unlike a glove fastener in principle. This fastening has a clip attached to carry the cable. The connection can be detached instantly, whereas with the ordinary connection a screw or nut has to be undone with often the prospect of losing it in the darkness.

Heavy Motor Traction Regulations.

The L.G.B. heavy motorcar regulations, which come into force on March 1st, contain the following, among other, conditions. The limit of weight (unladen) is raised from 3 to 5 tons; and if a trailer is used the joint weight (unladen) may be 6½ tons. The limit of 12 tons has been fixed for the load. With regard to tyres, if pneumatic or elastic they may be of any dimensions; inelastic tyres must have a minimum width of 5in., and the width must be proportioned to the weight. The maximum width allowed for the car is 7ft. 6in.; and the minimum diameter for wheels 2ft. The legal limit of speed has been put down at eight miles an hour; this being reduced to five miles an hour; for vehicles over 3 tons (unladen), or when drawing a trailer.

An Improved Seat for Tri-cars.

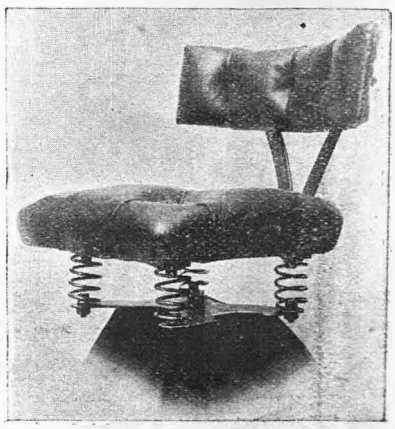
An article that should meet with a good demand is the tri-car seat shown in the illustration. It is mounted on four spiral springs, is roomy and comfortable, and well upholstered in leather. The makers say that it can be clipped to nearly ordinary L or T pin fitted to a tri-car. From the appearance of the seat, with its well-cushioned back rest, we should say that it should be a very comfortable one. The price is very moderate, viz., £2 2s. The makers are Messrs. Smith Bros., 1, Ford Street, St. Mary, Nottingham.

Extension of Business Premises.

Mr. Geo. A. Barnes advises us that in order to cope with his rapidly increasing business, he has been compelled to take over larger works at 112, Prince Street, Deptford—a place situated within three minutes from the station (S.E. Railway). He informs us that he possesses special facilities for turning out the best work at remarkably low prices. He has in course of construction several racing machines, amongst which is mentioned a 10 h.p. racing runabout, a two-cylinder 8 h.p. motor-bicycle, and a 5 h.p. light racer. He has also received an order for a 24 h.p. pacing motor-bicycle from Tommy Hall, the well-known racing cyclist, who is now riding in Paris.

When is a Trade Car not a Trade Car?

Mr. J. E. Staples was summoned at the Lambeth police court last week for driving an unregistered motorcar, and Mr. E. Gould (manager of the Gladiator department of S. F. Edge, Ltd.) was also summoned for aiding and abetting in the commission of the offence. Briefly, the facts are that Mr. Staples took out the car (which is a second-hand one used for trial purposes, and as such bears a trade identification-plate) to proceed to the assistance of a motorist who had met with an accident at Croydon. The car carried a spare wheel and a towing rope. The police stopped it on the ground that it was not being used for trial purposes. Mr. Gould was summoned on his own admission that he had given instructions that the car should be sent out. Mr. E. C. Hemmerde (instructed by Messrs. Kennett, Brown, and Co.) pleaded that no offence had been committed under the Act; and the magistrate (Mr. Hopkins), coinciding with this view, dismissed both summonses.



An improved seat for tri-cars.

NEWS.

THE AUTOMOBILE CLUB OF CEYLON.

Thanks to the initiation and energy of Mr. Harold North, the well-known proprietory planter of Kadugannawa, Ceylon has now a well-established club to safeguard the interests of all motorists in the island. In reply to the preliminary notice 80 motorists enrolled their names to support the new association.

At the inaugural meeting held in Kandy on November 12th ult. at the Queen's Hotel, a goodly number of motorists, many of whom showed their enthusiasm by travelling many a weary mile to be present, took part in the proceedings. These were of a formal nature. Mr. North, the originator of the movement, in his opening speech, detailed the various objects of the Club. He announced that H.E. the Governor, Sir Henry Blake, G.C.M.G., had proved the kindly interest he takes in what will undoubtedly become one of the most convenient and economical means both of transport and travel in the East by consenting to be the first patron of the club. Officers and a committee were then elected. General Money, the Commander-in-Chief of the Forces in Ceylon, was elected president, and Mr. L. Creasy, of the Public Works Department, vice-president. Mr. North was unanimously elected to fulfil what he has doubtless already discovered to be the by no means light duties of hon. sec., and an enthusiastic vote of thanks was then passed to him for his services in organising the club.

The main objects of the club at present are, firstly, to render the roads safer for motorists by urging the Government to enforce the law forbidding the trespassing of native-owned cattle on the public highway. At present herds of cattle are allowed to graze uninterruptedly on the edges of the road. The brutes are often very savage, especially cows with calves, and have an especial dislike to anything on wheels, either carriages, motorcars, or cycles, even ordinary bicycles not being immune from their unprovoked attacks. The hon. secretary had his horse and trap severely damaged by a charging cow, and there is not a motorist or cyclist in the island who has not at some time or another suffered from this danger.

The second danger on the road is that of pariah dogs. In every roadside village, and near every roadside habitation,

SWARMS OF UNFED, HIDEOUS, AND DISEASED ABOMINATIONS

come flying savagely out at every passing vehicle, and constitute a most serious danger.

The animals are for the most part unowned, and it is impossible to prosecute the owner, but motorcyclists now nearly always carry a small revolver, so the numbers of these roadside pests will doubtless diminish considerably in time. The Government has already been approached on the matter of allowing greater facilities for conveying petrol by rail, and has already consented, by amending the petrol ordinance, to meet the wishes of the club in a reasonable manner. The club has also considered the best manner of combating the extremely high rates of petrol and motor accessories at present prevailing. Messrs. Walker, Sons, and Co., the well-known Colombo firm, have agreed to supply members of the club with accessories at 10 per cent. over English retail prices. Members should therefore have very little to complain of in this respect.

In an interesting letter to us, Mr. C. D. Rotch, of Kadugannawa, says:—

"At the moment of writing, 96 members have joined the club. The subscription for the first 100 members is fixed at 10 rupees per annum; after this number an entrance fee of 10 rupees will be payable in addition. The greater number of the members are motorcyclists, but there are at present about 30 cars of all sorts in the island, ranging from the huge Chelmsford steam car, recently imported in connection with Messrs. Thomas Cook and Son, to the small Oldsmobile runabout. A fair number of Humberettes are running, and appear to give satisfaction to their owners, but the most suitable all-round light car for Ceylon is, in my opinion, the 6 h.p. Wolseley, only one of which has up to the present been imported. The owner, Lieut. Skelton, R.A.M.C., speaks most highly of its performances over the long and trying gradients of Ceylon roads.

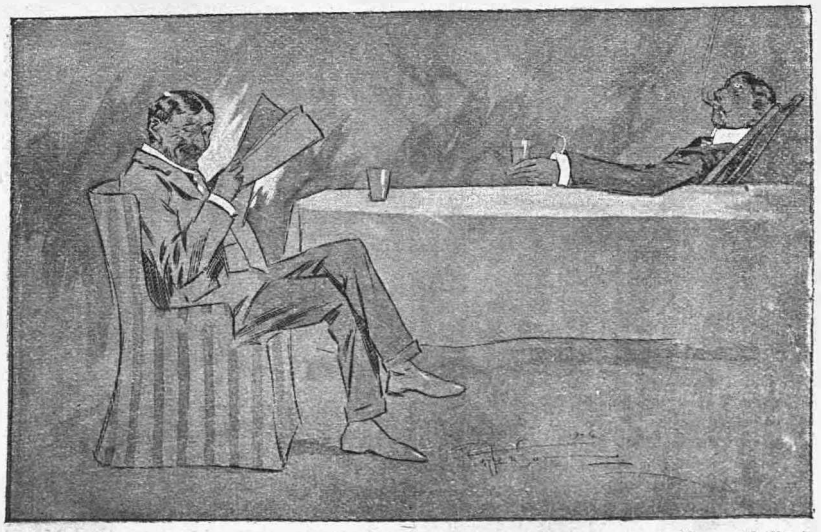
"Tri-cars are now being imported in considerable numbers for a small community. Where Europeans are separated in many cases from their nearest neighbours by many miles, and in a country where the roads are for the most part of excellent surface, the motor-bicycle was certain from the very first to become extremely popular. In conclusion, I must give manufacturers and agents at home to understand clearly that the motor trade in the East is a very important and steadily-growing industry, and they would do well to make strenuous efforts to secure the lion's share from foreign competitors. This they should be ablet o do; the quality of British-made motor-bicycles is far superior to that of any foreign make I have yet seen, and from personal knowledge I can assert they give far greater satisfaction for use in a country where there are very few facilities outside Colombo for repairs. Against this, however, must be placed the fact that the foreigner realises far better than his English rival that his customer requires his order executed promptly and according to specification. Motorists in Ceylon do not make alterations from standard specification from sheer cussedness, but because they know the peculiar conditions under which they want their machine to run. Manufacturers should take pains to send out both cars and motor-bicycles amply tyred and with the best possible makes; the climate is very trying to tyres. For cars, particular attention should be paid to the water-cooling arrangements and the radiating surface should be larger, for obvious reasons than would be necessary for cars intended for use in a temperate climate."

The Crystal Palace Automobile Show opens on Friday, January 27th, for a week.

In connection with the "Grand Prix" open international race which is to be run concurrently with the Gordon-Bennett, the Paris sporting daily, "L'Auto," is opening a public subscription list to provide prizes for the second, third, fourth, and other competitors. The amount so raised will be in addition to the cheque for £4,000 already offered by the journal as a first prize.

Technical Motor Education.

In order to encourage technical education in motor engineering the Society of Motor Manufacturers and Traders, whose third International Motor Exhibition, officially recognised by the Automobile Club, will be held at Olympia from February 10th to February 18th, under Royal patronage, have determined to grant free admission to all engineering students attached to any recognised school or polytechnic classes. Principals of engineering schools and polytechnics are invited to apply for these free admission tickets for their pupils to the secretary of the society, Clun House, Surrey Street, Strand. It is hoped that the opportunity afforded by the examination of the latest advances in motor construction will be of material benefit towards the education of students of engineering.



BROWN: "My dear chap, I do all my own repairs, just like a skilled mechanic. Why, I've just invented a new type of motor and think nothing of it."

JONES: "I suppose the manufacturers think the same?"

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NOTE.—These columns are set apart for the discussion of motor topics by bona fide readers of "THE MOTOR," and trade letters containing veiled advertisements are not admitted. The Editor is not responsible for opinions expressed by correspondents in this section.

Featherweight Motor-bicycles.

Sir,—I shall be glad if any of your readers will give their experiences of extremely light motor-bicycles. Like most other Glasgow cyclists, I stay in a flat, and anything over 60lb. or 70lb. at the very most would be too heavy to carry up several stairs. My weight is 11st. I would be quite contented with a speed of 20 miles on dead level, and would not object to giving some assistance on moderate hills, and hard pedalling on stiff ones. Is the French 55lb. machine a practicable mount?—Yours faithfully,

FESS CHECKY.

Mason and Brown's Light-weight Motor-bicycle.

Sir,—In answer to Mr. P. Eckford, I can give him my experience of the M. and B. 2 h.p. light-weight, after riding one for twelve months. Starting is no trouble; a few turns of the pedals set it going, and I have started it on a hill 1 in 8. I have mounted all the hills in my district without pedal assistance just as a trial, but do not do so as a rule, considering engines do better with a little help. Control is quite sufficient. The lubrication is quite as efficient as my previous mount with a pump. The speed is well over the legal limit, 30 to 35 on good roads. I consider it economical. I would be pleased to answer any further questions.—Yours faithfully,

GEO. LOWE MEREDITH,
Surgeon.

Hugglecote, near Leicester.

The Weight Question.

Sir,—As a regular reader of your paper may I give my opinion of the heavy-weight motor-bicycle. In June last I bought a 2¾ h.p. Bat without pedals, and the weight is about 170lb. all on; my experiences on this machine make me plump for the heavy-weight. One of the principal advantages is its steadiness, and as I have the spring frame fitted on mine, there is absolutely no vibration at all to the body, and the long handles make spring forks quite unnecessary. I have ridden several other makes (without spring frame) and always felt tired after a long ride, but on this machine I arrive home almost as fresh as I start, as it is more like sitting in a car than on a bicycle. It took me a long time to make up my mind to buy a machine without pedals, but I have never regretted it, and so far have not had any troubles excepting the ordinary minor ones. I have ridden the machine over 2,000 miles, and on an average I have covered 121 miles per gallon of petrol, which seems to me a very cheap way of travelling. The sum total of my experience is that I would not buy a machine without a spring frame and long handles.—Yours faithfully,

ARTHUR H. MOORE.

Tri-car Gears.

Sir,—I should like to see a little more attention given to two-speed gears which are adaptable to existing fore-cars. To me it seems that something after the style of the Micrometer is what is wanted. Can anyone give me any information *re* the Roots and Co. (?), Herne Bay, gear? I understand that this gear has been on the market for some time. Also, I should like to hear opinions of the Garrard, although this gear does not run solid on the high speed, as, in my opinion, all gears of this type should. I have noticed several letters in "THE MOTOR" lately on this subject. Evidently I am not the only one anxious for information.—Yours faithfully,

H. A. CALLARD.

Car Tyres.

Sir,—Like several of your recent correspondents, my thoughts run "carwards," but, unlike them, I am not so particular as to initial outlay. If the first cost is, say, £400 to £500, well and good; but if the running cost totals to anything from 4d. to 8d. a mile because of pneumatic tyres mainly, my money will remain where it is at present. I have read most of what has been published on the tyre question for some time past, and am almost sure that solid tyres will satisfy me. What I wish to know is the actual behaviour of solid tyres, compared with pneumatics, carrying a total weight of car and passengers of about 18cwts.: do solids wear out quickly; is the vibration excessive at 27 miles per hour; and comparauve cost of running for, say, 4,000 miles per annum? Perhaps some of your numerous readers will oblige,—Yours faithfully,

COLONEL (R.E.).

Side-car and Tri-car.

Sir,—I was in hopes of seeing some discussion re the relative advantages of "Side-car v. Tri-car," as I am particularly desirous of obtaining opinions of unbiassed users on both types of machines. Considering the number of tri-car makers as compared with side-car makers, it is rather significant that not one of them has had a word to say in favour of the three-tracker. The belt-driven side-car that I have has gone splendidly during the recent awful condition of the roads. There is one difficulty, viz., starting with passenger on a hill without first running down. I should, therefore, welcome a satisfactory free engine device, and perhaps A. C. L. Back can supply additional details of his arrangement published in "THE MOTOR" of December 13th.—Yours faithfully,

T423.

Car Experiences in Australia.

Sir,—In a recent issue of "THE MOTOR," "V.P.K." discusses the disgraceful condition of the finger-posts in England. It is just the same out here in Australia: the finger-posts are most of them absolutely unreadable, and I agree with "V.P.K." that it is a matter that is in want of immediate reform. I can hardly agree, however, with him when he says he thinks there ought to be extra boards put 20 yards before the cross-roads, because this would entail so much extra expense and work, and, after all, a motorist has time, or ought to have, to go slowly or pull up when he comes to cross-roads. I think the main thing is to have plainly painted (say black letters on white background, or the other way about) boards, and fairly large ones, say six inches high, pointing towards the town they indicate. Perhaps it will interest your readers to know how, in spite of the bad roads, motoring has gone ahead in Australia, especially in the States of New South Wales and Victoria. An 8 h.p. De Dion car ran up to Bowral the other day, 80 miles from Sydney, in six hours, including the lunching hour. A great part of the road is covered with a thick red soil, and the rest is very loose. An 18 h.p. car has started taking trips from Sydney to Leura, carrying passengers. Leura is situated in the heart of the Blue Mountains, and as it is a very stiff climb up it proves the reliability of the motor. At the country bicycle races there is generally to be seen a motor. The Sydney Metropolitan Fire Brigade has recently imported a petrol chemical fire engine, and it is the superintendent's intention, if the first one proves useful, to replace all the horse-drawn engines by motors, for, as he says, although the initial cost is greater, the upkeep is not nearly as expensive as that of a horse-drawn engine.—Yours faithfully,

K. WINCHCOMBE.

Chatswood, Australia

O.P.U.

Electric Governor Connections.

Sir,—Would Mr. H. W. H. Vaughan oblige with a diagram of connections for the electric governor described by him on p. 453 of "THE MOTOR," November 22nd, 1904?—Yours faithfully, P. A. EGAN.

The Aft Car.

Sir,—Referring to the Aft car, a drawing of which appeared in the issue dated November 22nd, it will be seen from the photo I enclose that it is somewhat on the lines of a runabout I designed some four months ago, which is now running satisfactorily. I have a body, which I do not use, that carries an additional passenger over the back wheel. Your correspondent is correct in assuming the smooth running of a long wheel base. I have experienced it, also the marked absence of side-slip it assures.—Yours faithfully, A. WRIGHT.

Adding Two-speed Gear to Tri-car.

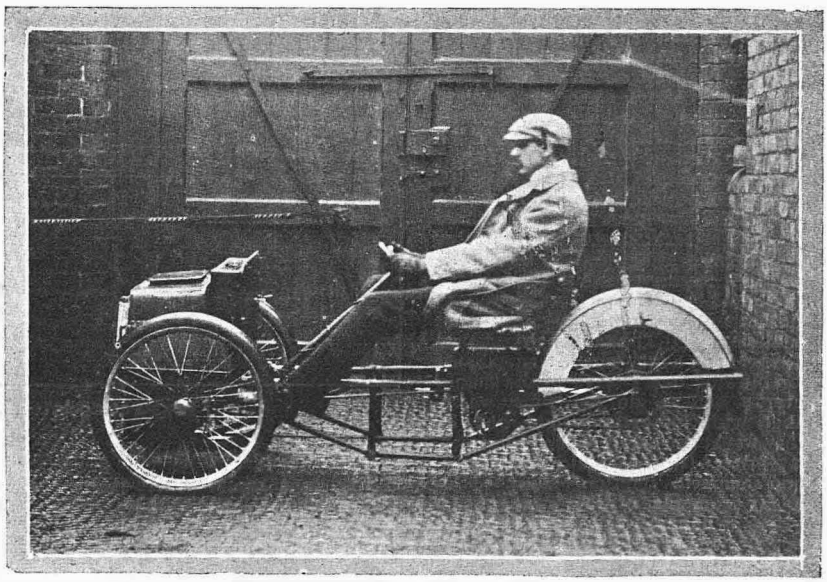
Sir,—In June, 1904, I bought a 3½ h.p. Excelsior tri-car (air-cooled, gear 5 to 1), which has given every satisfaction excepting in the matter of hill-climbing. I should be glad if any of your readers would give me the benefit of their experience regarding the fitting of a variable speed gear to this type of machine. I do not wish to travel faster than about 16 miles per hour on the level; but I do want to get up any reasonable hill, which at present I am unable to do unless I can "rush" it. I should like to fit a fan, a two-speed gear, and free engine clutch; but I do not see how this can be fixed on the engine shaft, as the starting handle would not work, the tube from the forecar to the back wheel being parallel with the centre of the engine. I shall be grateful for any suggestion as to some make or type of such fitments as I have mentioned. —Yours faithfully, INQUIRER.

The French Club and the Gordon-Bennett Race.

Sir,—Referring to the proposition of the French Automobile Club to promote a motorcar race in opposition to the Gordon-Bennett race, this is stated in several papers to be viewed with satisfaction by the British manufacturers. I cannot help thinking that this is not correct, and, judging from the published views I have seen, they appear to me to be the views of English importers of foreign cars, and not the views of English manufacturers. Speaking on behalf of Mr. Napier, the first English manufacturer to make British motorcars for competition in the Gordon-Bennett race, and a continuous manufacturer of such cars for this purpose since 1901, and as the manufacturer of the only British car that ever won the Gordon-Bennett race, and other International racing competitions both on land and sea, I may say that to the British manufacturer this proposal of the French Automobile Club is one simply made with the idea of helping the French industry, a very proper idea from the Frenchman's point of view, or, possibly, an Englishman's point of view who lives by the importation of foreign cars, but a very improper one from the British manufacturer's point of view. The reason for the French Club's move is a very obvious one; the Gordon-Bennett rules provide that each country shall meet in the Gordon-Bennett race on an equality, each country only having its three best cars. This, from a French manufacturer's point of view, is not good enough: what they wish is to have 30 or 40 French cars against every two or three from other countries, as it enormously increases the chance of a French car winning by such a large number starting. This seems to me absolutely against the whole spirit which has raised the Gordon-Bennett race up to its present high pinnacle as a sporting success. Its present rules exist with the idea of making every country meet in the Gordon-Bennett race on an equal footing, so as to try and give a good little manufacturing country as much chance as a good big one. The French Club's new race is brought forward with the idea of giving the big manufacturing country a great advantage in a so-called sporting event over the small one, and this, I think, is entirely wrong from a sporting point of view. I see no objection to the race itself, providing it is held at some other time than the Gordon-Bennett race, and if all humbug as to intentions is removed. Let the French Club clearly say: We intend to establish this race for the benefit of French manufacturers, and we have so framed the rules as to give French manufacturers an advantage over every other country. No one can object to this; they have a perfect right to do it; every country can then compete or not as they like; but do not let us deceive ourselves, and pretend in any way that this is a sporting event at all on all fours with the Gordon-Bennett race from a sporting point of view. It is not, and never will be anything but what is intended—a French manufacturers' advertising race. The sooner everybody understands this, the better. I think myself the time has really come when it should be seriously considered whether these long-distance high-speed races with the present heavy racing cars are useful or necessary at all. They have been very useful in the past, but I think under their present rules their utility has entirely passed away, and that either the races should cease or the rules be amended in such a manner that they tend to the greater improvement of motorcar construction than the present rules do.—Yours faithfully, S. F. EDGE.

Belt v. Chain Drive.

Sir,—Much discussion has taken place re the above question, each having its partisans; but, speaking from my own experience, my vote must be accorded absolutely in favour of the chain, if the engine shocks can be overcome, which, as you know, is very bad for both engine and tyres. I would, therefore, ask for a few lines to testify to the merits of and the great satisfaction I have derived from Simpkin's patent pitch band; perhaps you are aware that it is a flexible band, in which teeth are fixed to take the ⅜th pitch Hans Renold chain. This band is merely a nice fit around the back pulley, and is fastened by two hooks. I can vouch that it is simply perfect in action, and not only makes a direct drive but also acts as a large clutch, and anyone who once tries the drive would certainly never return to the belt with its consequent stretching, slipping, and, worse still, breaking. I have used the band on my tri-car with a 4½ h.p. De Dion engine, and it has run now over 4,000 miles and is certainly good enough for a similar distance again, and the chain is the ordinary ⅜in. by ½in. motorcycle chain, which plainly shows that, notwithstanding the power, the necessary slip which the pitch band allows, the chain is of ample strength. I have ridden fully 100 miles on soaked roads without the slightest trouble. Could that be done with an ordinary belt and heavy tri-car? the only alteration necessary being a new flat belt rim on the back wheel and a small tooth sprocket for the engine, the whole cost, including chain, being about equal to that of three belts; and, when done, will practically last the machine out. I have not the slightest interest whatever in Mr. Simpkin's patent, and merely write this to advise other present belt users to have their machines altered and share the satisfaction I have had myself. My machine originally was fitted with a flat belt, and the patent was introduced to me by a factor.—Yours faithfully, P. CLARKE.



Illustrating letter from A. Wright.

O.P.U.

Brake Fitting.

Sir,—I should be glad if you would find space for the following complaint. A friend of mine owning a well-known chain-driven motorcycle has had a lot of trouble with his horseshoe rim brakes jamming. We therefore detached them, and the cause of the trouble was self-evident. The two small pegs at the bottom of the horseshoe which should be bent outwards had been hammered in until parallel with the stays, so that the spring of the shoe simply now helped to stiffen the brakes. The small guides in which these pegs worked had also been twisted round to take the bent pegs. Surely such an important detail as the brakes should be in working order before the machine leaves the factory.—Yours faithfully,

H.M.

On Tri-cars.

Sir,—Despite opinions to the contrary recently expressed I am so fully persuaded that I represent a very large class of people who have no room for a car, and could not afford either its primary cost or its up-keep, and yet desire something better than either the fore-car or the side-car attached to a motorcycle, that I have no hesitation in stating what we do wait in the hope that manufacturers will set to work to supply us. We want something after the fashion of the new Batkar as regards the seating, that is, a comfortable seat for the driver and a fore-carriage that will hold two persons. (2) We should be content with a 5 h.p. engine, but want two cylinders. (3) The said engine should be air-cooled by a fan, whether an exhaust one or blowing one I leave to the manufacturers; but we do not want water-cooling, with its extra weight and its liability to get choked or shaken to pieces, at any price. (4) We should prefer high-tension magneto ignition, many of us being far from places where we can get batteries recharged, and having had a bitter experience of ignition troubles. (5) We want all working parts properly protected from dust and mud, and yet so placed that they can be got at without pulling the whole machine to bits. (6) The frame must be properly slung on really well-designed springs, so that we shall not be shaken to pieces ourselves. (7) We want at least two speeds, but do not want any reversing gear. (8) We want semi-solid tyres, such as were to be seen at the Paris Exhibition; and the total weight of the whole machine must not exceed 3 cwt. (9) We are quite sure that if manufacturers will really go into the question, a thoroughly sound long-lived tri-car could be built on these lines to sell at from £90 to £100. And the manufacturer who will bring out such a tri-car as this will assuredly never regret his enterprise.—Yours faithfully,

EXPECTANT.

A Club for Steam Car Owners.

Sir,—It has been a matter of some comment that with all the numerous clubs and associations existing in connection with motoring there does not appear to be one which appeals to the particular support of steam car owners. There seems to be a real need for such a body in connection with this particular branch of the car world, as there is such great room for improving and bettering these cars, and I should be pleased to be instrumental in starting such an association. I should be very glad to hear from any of your readers who are favourable to the idea, and would also be obliged to them for any assistance they could render in bringing this matter before anyone owning a steam car or likely to be interested in this project. Or, if they will favour me with names and addresses, I would write direct. I think personally that such an association would be an immense boon to owners of such steam cars as the Milwaukee, Locomobile, Toledo, Weston, etc., etc. There are innumerable advantages that would accrue from joining; to mention only a few: the arrangement of meets and recognised programmes, which is entirely neglected at present, assistance to members requiring any parts, accessories, etc., and the obtaining of these on special low terms. To afford facilities for the exchange of ideas, which would probably result in many suggestions for the improvement in various ways of the different types of cars, and to the carrying out satisfactorily of same. It is also suggested that at intervals of, say, six months, a report of improvements made be published.—Yours faithfully,

T. MURPHY.

135, Cloudesley Road, London, N.

Road Improvement.

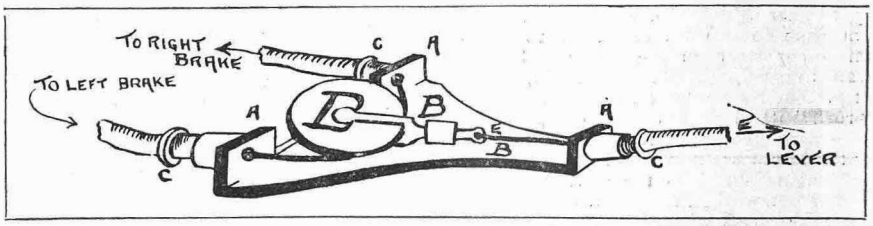
Sir,—May I venture to call attention in your columns to what I consider the most urgent matter relating to automobilism, now that the car itself has reached such a state of reliability and perfection? I refer to the state of the road surface. There is, I am aware, a society which deals with this subject. The authorities are, I have reason to know, most anxious to do what is possible in the way of improvement, and are really only waiting for information. Might I suggest that the society in question or the Automobile Club, preferably the former for obvious reasons, conduct experiments (by arrangement with one of the county surveyors) and publish the results by memoranda to all county and district surveyors; and, further, that the opinions of surveyors and other experts be encouraged in your columns? I am quite sure that these means could only result in good and immediate results.—Yours faithfully,

WM. COLLINS.

British Trading Methods: A Complaint.

Sir,—It may possibly interest your readers to hear how very expeditiously a much-advertising British firm can supply a coil of their own manufacture. November 15th.—Sent order (enclosing cheque) for first-grade trembler coil. November 17th.—Received receipt, "order having their best attention." November 21st.—Coil arrived, out of order and quite useless, owing to the insulating wax having run all over the trembler, etc. November 22nd.—Wrote to draw attention of firm to state of coil. November 24th.—Firm advise me to scrape wax away with a knife. November 25th.—Being unable to get coil to work, return it to maker. December 2nd.—Receive coil back, with 1s. 7d. carriage to pay. A first-grade and thoroughly reliable coil of French manufacture can be had from the agents by return post.—Yours faithfully,

(REV.) G. DE Y. ALDRIDGE,
Somerset A.C.



Illustrating letter from Thomas O. Blake.

Compensating Brake Action.

Sir,—In a recent article on tri-cars in "THE MOTOR" the author makes some remarks regarding compensating action for the application of front tri-car brakes, which lead one to believe that such a desideratum is seldom met. I have not inspected the practice adopted in this particular; but quote him an action I have designed, which I think he would find satisfactory. It consists of a malleable iron casting (B), having three lugs (A A A) cast on, fitted with adjusting screws (C C C), drilled for Bowden tubing. D is a pulley wheel over which the middle portion of the single Bowden cable, which actuates the two brakes from its ends, passes. E E is a cable or rod forming connection to lever. I think the compensating action will be obvious to observers. The moment one end of the wire receives a strain during application of brake the movement of wire is continued towards the other end until a like strain is set up thereon. This works admirably on my 3½ h.p. runabout. As regards engine pulley throwing oil, this may be prevented by fitting a retaining flange on pulley wheel at the side nearer crank case. The flange or cup may be made from a flat ring of sheet brass, dished towards smaller circumference, and fastened on by small metal screws. This prevents the oil being worked to edge of pulley wheel, from which it is thrown by centrifugal action.—Yours faithfully, THOMAS O. BLAKE.

Air Vent in Motor Shaft.

Sir,—We have before us "THE MOTOR" of December 13th, and note with pleasure that Mr. L. Wallace, in recommending an air vent through the shaft of the engine, was not aware that it was our patent. It will be found fully described in our price lists of the last two seasons. We are, however, very much surprised to observe on page 544 and in answer to "J.F.T.," that you recommend him to make precisely the same air vent. As this device is of such extreme importance to the cleanliness of the engine, belt, and rider's clothes, we shall certainly not allow any infraction of our rights either by manufacturers or private individuals. If manufacturers desire to adopt it they must make the usual arrangements with us.—Yours faithfully,

THE QUADRANT CYCLE CO., LTD.

O.P.U.

Carburetter for 2 h.p. Machine.

Sir,—In reply to "Pritchard," in a recent issue of "THE MOTOR," I am a traveller, and have just finished 1,000 miles on my machine fitted with a Force carburetter. My duties take me all over the country in all weathers. The only thing on my machine I never have to look at is the carburetter: the Force people "guarantee satisfaction," which is a great thing to people who do not understand carburetters.—Yours faithfully,

H. PENN.

Horizontal v. Vertical Engines.

Sir,—As one who has passed the novice stage, but is yet anxious to learn all possible from others with longer experience, may I beg you to insert this letter of enquiry. I have passed beyond the motor-bicycle and tri-car, and having driven one or two cars belonging to friends, feel that I have sufficient knowledge of practical working to keep a car in good order, and not spoil it by want of attention to details. I must keep somewhere about £300 for first cost, and I have selected a few leading cars from those in your interesting booklet "Light Cars at a Glance." But prior to selecting these I had, and still have, a leaning towards the horizontal engine, and writing without actual usage I feel that I should be more comfortable with one than with the more popular vertical engine. It seems to me that the important point of good and thorough lubrication is better arranged for with the horizontal; water circulation also looks to be on better lines than with vertical because the engine can be well below the radiators and tanks and thermo syphon should give splendid cooling without the complication of a pump. I count many practical motorists amongst my friends and acquaintances, but without exception they all most strongly advise me *not* to buy a car with a horizontal engine, and advance many cogent reasons for inducing me to follow the fashion. I have searched the reports of the recent Paris Show and cannot find mention of horizontal car engines, and this confirms my friends' arguments that Frenchmen do not consider them correct. The main objections (I omit mention of several which I think unimportant) are want of elasticity and huge consumption of lubricating oil. I am told that when changing up from second speed to top speed with a horizontally-engined car the car will not "jump away" as would a vertical type, but that the ignition must be retarded to the slowest point and then gradually accelerated as the car picks up speed. As such statements have been made to me in good faith (and I have no reason to doubt my friends) I am almost deterred from proceeding to purchase my pet car. The oil also is a consideration as I don't want a car that will drink ½gal. of oil in 50 miles. Will some of your readers be good enough to help me in my dilemma by recounting their exact experiences with horizontal engines, for I do not want to spend £300 and then find my car obsolete. I see that the Wolseley were showing a car with vertical engine at Paris, and as the leaders in horizontal work this may or may not be confirmatory of my friends' advice.—Yours faithfully,

HORIZONTAL.

The United Kingdom Trophy.

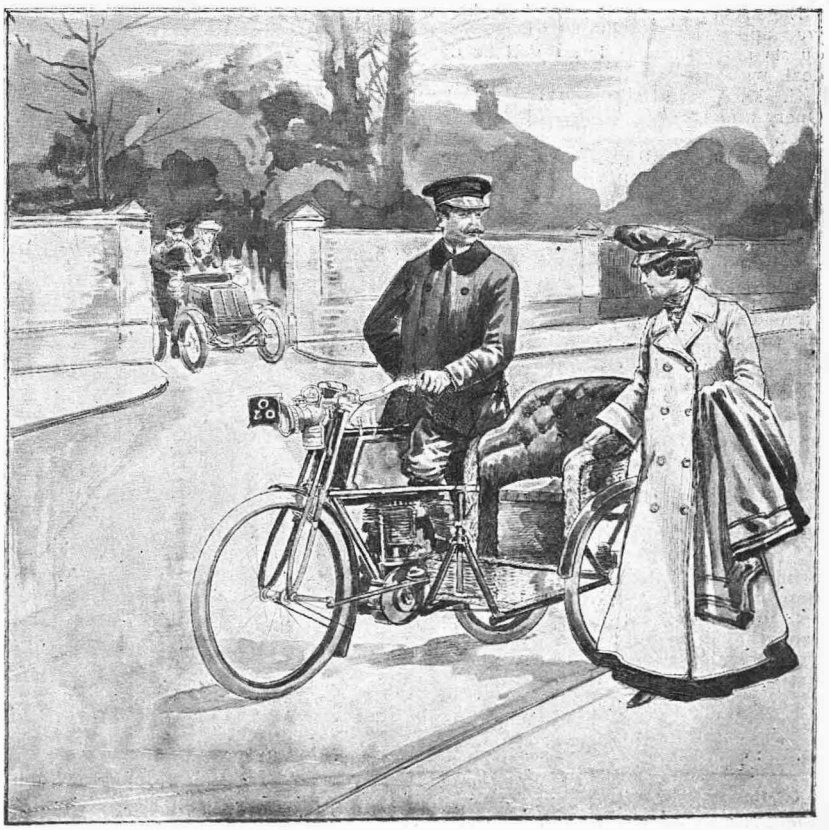
Sir,—Whilst congratulating the committee gentrally upon the very practical set of rules they have put forward for the above contest, may we point out that if these rules are to be considered final they will have the effect of shutting out several good cars—our own included—from any possibility of taking part therein, however much their makers may desire to do so; and, as these cars are all essentially touring vehicles, and it is the development of the touring car that the contest is intended to promote, it seems to us that the rules as they stand somewhat defeat the object of the whole proceedings. The particular clause which, as it stands, is insurmountable is that "The platform behind the dashboard shall not be less than 6ft. 6in. long, nor less than 30in. wide." Now the first part of this clause would effectually debar either the Lanchester, the Arrol-Johnson, or the Duryea from taking part, for neither our car nor the others mentioned has a "dashboard" at all, whilst the central and more or less elevated position of the engine in each results in there being no long "platform" as in the common type of car. Of course, if it is the object of the committee to perpetuate one type, and stifle all attempts at more correct mechanical design, we have nothing to say if the object is stated, but we prefer to think they have simply overlooked the fact that other cars than the French type exist. Another point to which we take exception so far as our own car is concerned, is the specifying that "Efficient mudguards to the front wheels shall be fitted to the chassis, for, whilst this is common practice, the frame of the Duryea is covered by the body to which the front mudguards are attached, and it is not possible to attach them to the chassis without entirely altering the design. Again, we hardly see the reason for the requirement that seats should be 34in. from the ground. In our case we should have to raise our front seats 2in. to meet this requirement. Not a large matter, perhaps, but we take it the committee do not want "freak" machines in any way, but cars which, except in the matter of the size of the petrol tank, shall in every way be the standard vehicles of the competing firms. Further, we note the weight of the drivers is to average 11st., instead of the usual 10. Now, if we entered a car, the driver we should most probably employ weighs just 10st. Must we, therefore, reject our best mechanician to accompany him if he weighs less than 12st? Surely the better way would be to require that the weight carried, inclusive of the two occupants of the car, should be 950lb., and specify no particular weights for the passengers. As all cars have to carry the same net load, there would be no gain to a competing firm in selecting specially light men, because a live load always carries easier than dead weight, and as the rule now stands a firm whose best men for the job happen to weigh more than 22st. together would be handicapped by their additional weight, as they would still have to carry "not less than 300lb. ballast."—Yours faithfully,

THE DURYEA COMPANY, LTD.

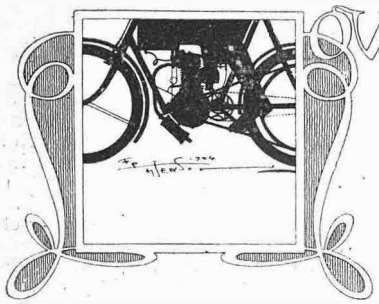
The Eagle Tandem.

Sir,—Would any of your readers be kind enough to give their experiences with the Eagle tandems?—Yours faithfully,

EDWARD JONES.



Displacing the horse.



OUR INFORMATION BUREAU

SPECIAL NOTICE.

The Editor is at all times pleased to answer any queries put to him by the readers, or to receive correspondence from readers upon any motor topic. In consequence of the large number of letters received, however, he must insist upon the following simple rules being strictly adhered to :—

1. Plain writing. Type writing for preference.

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

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

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

L.O.—See the diagrams in our "Motor Manual" in the chapter on "Ignition." You will have no difficulty in tracing path of current.

Eugene Orgler (Stolberg).—Thanks for your appreciation of our efforts. The requests made in your letter will be duly dealt with.

C. M. Travis (Pittsburg, U.S.A.).—Query altogether too vague for us to answer. Send us a sketch or illustration of some kind that will give us an idea of the kind of machine you refer to. Then we have little doubt we can help you.

Calcutta 59.—(1) The inward set is most probably due to slight strain to the axle end in jumping an obstruction. It would be necessary to have axle tested between lathe centres to see if it was true. (2) You will require a special tool to get the wheel off. This consists of a heavy cramp, which holds on to the back of the spokes and a central screw presses against the axle end, the screw cap of course being removed. Not advisable to attempt to remove wheel by hammering the axle end as this is almost certain to result in the screw thread being damaged.

Varying the Strength of Mixture.

A. L. Kennedy (Plaistow) writes:—Is there any way of regulating the richness of mixture in a float-feed carburetter? I now have a Wolseley and cannot use benzole in it on account of the mixture being too rich. In my old car (an Oldsmobile) I could regulate the amount of spirit reaching the jet, and could use benzole with great economy, one gallon going over 40 miles. What is wanted is some means of regulating spirit till one gets a mixture that will just fire.—The carburetter on the Wolseley cannot be varied (as to richness of mixture) when running. We find that in spite of this, it starts up easily, and apparently gives good results at any speed of the engine.

H1031 (Enfield Lock).—(1) Yes, quite legal, but it is imperative to carry a rear number. (2) You may have to show license any time at the request of a police officer.

W. J. Trigg (Rotorua).—You would do much better to get a machine or car by one of the standard makers who has a reputation and long experience behind them. For the work it would be required to do only a car of the very soundest construction would stand.

H.L.W. (Rugby).—(1) The frame should prove quite equal to the task. (2) No greater strain. (3) Sure to be a slight amount of spring, but this is of no moment. If you find the side-car run steadily enough there is no need to worry about the details you refer to.

Firing Charges in Different Size Cylinders.

Rupert (High Barnet) writes:—I venture to think that a reply to the following query would interest many other readers besides myself:—Does it require a spark of equal intensity to explode a charge in a very small cylinder and a larger charge of similar proportions of gas and air. It seems hardly possible to my mind that a miniature coil and accumulator—such, for instance, as used on your light cycle—would answer the purpose of firing a large car engine.—As a rule the spark that will explode the charge in a small cylinder will do so equally well in a large cylinder. The intensity of the spark required is not affected by the volume of gas to be exploded. It is, however, affected to some extent by the degree of compression to which the gases are submitted. A coil giving a ⅛in. spark would probably explode a charge compressed to 50lb. per square inch quite regularly, but if the same charge was compressed to 80lb. or 90lb. a coil giving a longer and hotter spark would be required.

NOT SUCH A FOOL.

POLICE OFFICER: "And you say the car went by at least at the rate of 90 miles an hour!"

ANCIENT: "Yes, maister."

P. O.: "And what horse power do you suppose the car to be?"

ANCIENT: "There weren't no hosses, sir, but – hee, hee – there was two asses aboard."

L.E.X. (Coventry) wishes to hear from any reader who has given the Hub two-speed gear a good test in conjunction with 3 h.p. Riley or 2¾ h.p. M.M.C. engine.

E. Searson (Hunstanton).—Try the effect of injecting a few drops of petrol direct into the cylinder; the engine should start up without any difficulty. We never heard of an instance in which it was necessary to warm up the motor before it would start. See that the inlet valve works freely.

H. Payne (Barnes, S.W.)—The effect of having the inlet pipe smaller in diameter than the carburetter aperture probably produces some slight amount of lag in the suction effect and this causes the petrol to spray out more suddenly. But the difference of 2mm. you mention seems too small to have any marked effect.

Chevalier Francis Brucato (Palermo) asks us for names and addresses of British firms manufacturing motor omnibuses capable of carrying 40 passengers. We can recommend Messrs. Milnes Daimler, Ltd., Tottenham Court Road, W.C.; Messrs. Clarkson and Co., Ltd., Chelmsford, Essex, England; Stirling Motors, Ltd., Granton, Edinburgh, Scotland.

8 h.p. Argyll.

G.M. (Chesham) writes:—The brakes on the driving wheels of my 8 h.p. Argyll car are wood blocks laced on wire rope, which soon wear out. Could you tell me of a more substantial brake? One that will hold the car from running back when stopping in middle of a hill, and where I could procure same.—The brake described must be on an early pattern Argyll car, and, we believe, has been discarded by the Argyll Company. As now fitted, the brakes on their cars hold equally well in both directions. Explain your trouble to the Hozier Engineering Co., Bridgeton, Glasgow, and they may be able to supply something better. The Bowden Patents Syndicate, Ltd., Baldwin's Gardens, Gray's Inn Road, E.C., make a speciality of motorcar brakes and connecting mechanism.

Lessons in Driving.

C.T.T. (Woolwich) writes:—I put an advertisement in a London daily for course of instruction in motor driving. I have got numerous replies. Some firms offer special advantages and go so far as to say that highly remunerative positions are assured for all their pupils. This is a matter of much importance to me, as I should not care to pay a large sum for lessons in motor construction and driving and then find I could not get a good position. Would you be good enough to say if it would be safe to trust this statement? I may say that the fees asked vary from £5 5s. up to £100 for a two years' course, and that all the firms give certificates of competency.—We find it necessary to warn our correspondent before proceeding too far in this matter. Whilst there are undoubtedly genuine schools where a useful technical motorcar training can be had, there are others whose methods, as we have already pointed out, are open to criticism. We have heard from some who have held certificates of competency, that such documents have proved of little or no use as recommendations for positions. If "C.T.T." will send the replies to us, we will advise him in confidence.

BUREAU.

S.B.P. (Old Hill) would be glad to know of the address of the maker of the Black tyre (pneumatic).

A. Day (London).—The method of connecting up the electric governor was given by Mr. G. Roberts in "O.P.V.," issue 143, and we advise you to refer to this description.

J.D.W. (Leicester).—(1) If you have protected the idea your best plan is to advertise it, and doubtless you would not have any difficulty in disposing of it. (2) Interrupters of the type you refer to have been tried, but have never worked, chiefly owing to the period of contact not allowing the core to become fully magnetised.

W. Hebden (Mortlake).—(1) You can use a trembler coil with a plain make and break by screwing the platinum-tipped screw rather closer than usual, but a plain coil works best with this type of contact. (2) It is not possible to convert a trembler coil into a non-trembler without altering the connections inside the case. Simply screwing the trembler down short circuits the condenser.

Size of Number Plates.

J. Duckworth (Accrington) wishes to know exact particulars as to size, etc., of number-plates as stipulated by the Act.—They are as follow: The plate must be black, and figures and letters painted in white: these must be 3½in. high, every part ⅛ths broad, and that width of space taken by each letter or figure 2½in. The spaces between each letter or figure must be ½in., and margin between top and bottom of plates and nearest letter at least ½in.; and between sides, 1in. For motorcycles the above dimensions must be halved.

Damaged Cylinder of Car Engine.

Driver (Manchester) writes:—I drive an 8 h.p., two-cylinder car, and for some time have observed a gradual falling off in the power from one cylinder. At times there would be scarcely any compression at all and at other times it was good. But in actual running the explosion in this cylinder was always feeble, and I had to take quite moderate hills on the second speed. I determined to dismantle the engine recently, and discovered that the cylinder that gave the trouble was badly scored, there being about five deep grooves cut in it. I notice that one of the rings is damaged, and I want to know if you can suggest a reason for the damage. I presume it will be necessary to have this cylinder rebored, but will this also mean having a new piston, or would the original piston do if fitted with larger rings?—The reason for the damage would seem to be that probably, through failure of lubrication, the piston had seized and a piece chipped off one of the rings had broken up and got wedged in against piston and cylinder. Presumably, the piece broken off the ring is at the slots, where it is quite possible a flaw existed. The cylinder will certainly have to be rebored, as there is no alternative. As to the piston, it would be difficult to say if the old one could be used; it depends on how much metal has got to be taken out of the cylinder to bring it true and smooth again. This is often less than might be thought necessary.

Re-charging Accumulators.

P.H.D. (Belfast) writes:—I have a current (continuous) supplying shop, some lights in singles, and I have also sets of three, lighted from separate switches. Corporation rate is 220 volts. I have both 16 and 32 candle-power lamps. I wish to know the best way to charge, say 15 or 30 ampere accumulators. I have been using two 32 and one 16 lamps, all three lamps lighting from one switch. I find that this appears to charge up too rapidly, and in one case plates were buckled. Would it be possible to charge accumulator at a slower amperage than mentioned above? That is to say, would it be better to charge through three 32 lamps or three 16 lamps. The poles are correct and switch-plug is in off position.—If you use two 32 c.p. lamps in parallel it would be quite safe. Should scarcely think buckling due to overcharging, probably a short circuit. Get our "Manual," it gives full details on charging. The cells last longer when charged rather slowly.

"What a party you carry in your car, Isaacs."
"It pays. We divide the fines. See!"

The Vinet Car.

T.H.G. (Carlisle) writes:—I have the offer of a Vinet motorcar in this district, and should like you to tell me the probable value of it. It is in very good condition, paint unscratched, tyres in very good order, and seems to have very little wear. It is fitted with two-cylinder Buchet engines (separate), and is about 12 months old, 8¼ h.p. As they do not seem to be advertised in this country, I thought perhaps you would know them. I have one of the 2¼ h.p. Buchet engines fitted to a motorcycle that I had built for me nearly two years ago, total weight under 100lb., and it runs to-day as perfect as when new. It has covered many thousands of miles, and gives great satisfaction.—The Vinet car is better known on the Continent than here, and so far as we know is a soundly-constructed car. In buying a secondhand car (as your knowledge of engines will enable you to quickly appreciate any points connected therewith), examine all teeth of the wheels in gear-box, and also every portion of the differential mechanism; brakes, etc., you can easily test. A 50 mile trial run over hilly country will show up any defects. We note you have been riding a light-weight motor-bicycle for nearly two years, and are glad to have confirmation of that which we are preaching and practising.

A Commercial Motor.

H.S. (Salisbury) writes:—As you kindly offered to try to get me a rough estimate of a motorcar, I now beg to trouble you. I want one with solid tyres and serviceable engine for steep grades, to carry passengers or goods, similar to a carrier's van. I am a carrier, and do not want an artistic car, but a plain and strong one, and I should think one like a wagonette, and to carry about half a ton at slow speed (say, about eight miles per hour) would do; but speed is a secondary and hill-climbing a primary consideration. A rough estimate at first as to cost would greatly favour me.—Our correspondent opens up a subject of wide interest, and one on which we have received many enquiries recently. The Cremorne Motor Manufacturing Co., Lots Road, Chelsea, S.W., are marketing a light lorry, with open platform at the rear, costing about £300: a wagonette body to suit special requirements would cost something additional.

Car for Commercial Traveller.

C.F.W. (Upper Armley) writes:—Can you inform me who are the agents for Durkopp cars in this country, or where I could get a catalogue of their productions and of their two-cylinder car in particular? I want a car costing not more than about £300, new or secondhand, suitable for a commercial traveller who travels about 8,000 miles a year and carries about 280lb. of samples with him. That is to say, it would have to be strong enough to carry three or four people at an average rate of about 16 miles an hour in all weathers and on all kinds of roads. I have a two-cylinder Durkopp car offered me secondhand, about 12 h.p. but weighing about 17cwt., which I think is rather too heavy. Can you recommend the Horbick Minor three-cylinder car for substantial wearing qualities and being reliable enough? Also the four-cylinder Minerva car seems to be a good car, but is it not likely to be flimsily constructed and a "non-wearer," as the price is rather low? Do you think the Star two-cylinder car, 7 h.p., would be strong enough? Any information or suggestion as to any other suitable make of car would be gratefully received. My idea is to have a car with a detachable tonneau and have a sort of baker's cart made to fit in its place, so that the car could be used for both business and pleasure.—The distance you propose covering per annum, the *average* rate per hour, and the weight carried would, under ordinary circumstances make the use of a light car prohibitive but for the fact that you do not place your price limit too low. The figure of £300 gives you a wide range of choice, and you appear to have lighted upon two excellent cars in the three-cylinder Horbick and the Star. The new four-cylinder, 10 h.p. Star would be better (for your use) than that company's 7 h.p. two-cylinder. Humber and Co. also make a four-cylinder 8 h.p. car at an extremely reasonable figure. The Minerva four-cylinder, 14 h.p. car at £285 is cheap, but we are satisfied, from the past reputation of the makers that they are not likely to market anything else but reliable goods. You might also consider the Coronet, Eagle, Vauxhall, and the latest two-cylinder Wolseley. Your idea of having a detachable tonneau with sample box to take its place has been successfully adopted by one or two up-to-date commercials. We are unaware of the address of the present agents of the Durkopp car.

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BUREAU.

R. Oldfield (Kensington).—The 1905 type of car you refer to is a great advance on the earlier specimens sent over from America. We do not hear any complaints about them now, so assume that they stand the work all right.

A. R. Rutherford (Newcastleton). (1) Have you tried a Parsons chain non-skid? This should give an effective grip in snow. (2) The Revenue tax is £2 2s., registration £1, license to drive 5s. (3) Although we are not quite certain on the point, we believe it is £200.

W. F. Cox (Upton Park).—(1) The very long gas pipe you have fitted might have some bad effect, but it is much more likely to be the coil. You must fit a suitable size condenser, otherwise the spark will be thin and weak. (2) Benzoline requires rather more heat in the carburetter to vaporise it. It may also cause the plug to foul. Better use some good petrol till you solve the difficulty.

W. Bradwell (London, S.W.).—The jet of the carburetter might be slightly enlarged, and it is very important to see that the valve just above the cork float does not leak. From the fact that the carburetter will not take much air, it shows that petrol supply is inadequate. (2) Difficult to see why the oil should get past the piston to such an extent. You might try the effect of using very small charges, and these at frequent intervals.

Car-pac (Brooklands).—(1) It is not usual to put a fuse on the ignition circuit. You can, if you wish, arrange one in circuit with the plug switch. It is of doubtful utility, however, because, if the fuse wire is sufficiently thin to melt with a short circuit, it is liable to break with vibration also. (2) No advantage in using picric acid. (3) You can thoroughly charge the cells, run off the acid, wash very thoroughly, and then fill up with water. They will keep in good order for months. (4) For slow running, throttle down and use the exhaust lifter. (5) Difficult to say if you can get such a lens for your lamp. An optician might supply, but the expense would be prohibitive.

The Boyer Car.

W.B. (Altrincham) writes:—I have a 5 h.p. light car, two speeds and reverse, which is very satisfactory, except that I cannot get into the second speed if there is the slightest rise in the road, owing to the small horse-power: therefore, hill-climbing is slow and tedious even on moderate slopes. I have the opportunity of buying a secondhand Boyer car, De Dion engine, 6½ h.p., three speeds and reverse, for about £90. (1) Is the make considered a good one? The water cooling arrangement is from tank fixed immediately over engine without pump. (2) Is water cooling usually satisfactory without pump? (3) Should I be wise in purchasing this car?—(1) Yes. (2) Yes, if provision is made to carry a sufficient quantity of water, and ample radiating surface is provided. Pumps seem to give so much trouble to light car users as to lead us to think that their requirements would be better served by natural, or what is called "thermo-syphon" circulation. (3) A personal inspection would be needful, and this we never undertake.

H. Hardy (London).—The headquarters of Motor Van and Waggon Users' Association is at 16, Down Street, Piccadilly, London, W.

T. H. Roberts (Bray).—We may be able at a future date to give the particulars you refer to; but to deal with the matter at once is impracticable, as it is a very wide subject.

H.M. (Leeds).—(1) Yes, very probably the float is at fault. Although the holes may be very minute, the petrol would get through and upset the balance. (2) The Bates treads should prove quite satisfactory.

The Humberette.

Calcutta 59 writes:—I should be much obliged if you could suggest a cause for the following:—My 5 h.p. Humberette has developed a trick of either misfiring (or what appears from the sound muffled firing) every few hundred revolutions, not oftener, and this seems to occur whether travelling at slow or high speeds. Probably as a result of this I have noticed a falling-off in power in that I am unable to exceed 15 or 16 miles an hour without excessive vibration. Compression appears good when turning the handle slowly, inlet and exhaust valves are correct, former having a lift of about .15m. to .2in. Petrol consumption is good, over 40 miles per gallon (the country being dead flat). I have the cone with least number of notches in my carburetter, but have tried a larger one, which only had the same effect and in addition would not allow me to run at a less speed than about 12 miles an hour. At all times I find some difficulty in doing this. Is this always so with a single-cylinder engine, unless a very heavy fly-wheel is used? Can you inform me the uses of the various spare funnels to the Longuemare? The Humber booklet says the funnel and cone giving best results should be fitted, but this is vague. With the exception of the above small defects I have nothing but praise for the Humberette, which I have been running now for some months. It seems a pity the slow speed should be quite so slow. A rather higher speed and a very slow reverse as in the De Dion, I believe, would appear to meet ordinary requirements better. I find the car jumps back on the reverse. The great bar to motoring in this country is dust, which you in England have little conception of.—Assuming ignition is all right, the misfiring (from the description you give) appears to be due either to a weak inlet spring or a worn inlet valve stem. The effect given by the fitting of a new spring can sometimes be obtained by pulling out slightly the present spring; this should only be used as a temporary expedient until a new spring can be obtained. Wear on the valve stem would also cause misfiring, because the stem would jam itself sideways against the guide in which it works; if unable to renew the valve at once, try well rubbing the stem and guide with blacklead. You will find the working of the exhaust valve improved also if stem is also blackleaded. There is no rule for arranging the sprayers and copper choke funnels that are sent out with Longuemare carburetters, it being solely a question of "trial and error" for securing best working. If the smallest sprayer gives full power, do not change; the copper funnels have some effect upon the speed of the mixture. Every carburetter needs "tuning" to suit the engine to which it is fitted.

ANSWERS BY POST.

In addition to answers appearing on these three pages the following correspondents have been replied to through the post:—

Friday, December 23rd.—A. Johanning (London), H. G. Cook (Cardiff), A. K. Jardine (Westgate), E. Watts (Brighton), H. Baker (Derby), C. R. Taylor (Langsett), F. Berry (Bradford), W. Ramsay (Aberdeen).

Saturday, December 24th.—Dr. Holmbrook (Ingatestone), H. Pearmund (Tunbridge), E. Whitham (Sheffield), J. Clemmison (Thames Ditton).

Wednesday, December 28th.—H. Callendar (London), W. H. Castlehouse (Scarborough), F. Hankinson (New Milton), A. J. Luke (Malta), F. Charlton (London), R. Woodward (Worksop), A. W. Temple (Dundee), J. W. Frost (St. Austell), W. Glibran (Altrincham), L. G. Mortimer (Leeds), R. van Somerin (Edinboro'), F. L. Pochin (Fakenham), A. V. Blake (London), C. S. Wilson (Bath).

Thursday, December 29th.—A. Rambud (Lincoln), G. A. Bromage (Sutton), W. Redpath (Ballymoney), G. F. Chester (Birmingham), H. Trotter (Canhill), R. Williams (E. Molesey), R. E. Palmer (Tralee), W. Liebert (London, N.W.).

Friday, December 30th.—O. Gallagher (Belfast), C. C. Gates (Bury St. Edmunds), H. Mills (Mexborough), T. Hollingdale (London), T. Sandell (Amesbury), V. Taylor (London), R. G. Boyden (London), T. Oliver (Hexham), A. Draper (London), H. Woodman (Halstead), C. R. Nanson (Hammersmith), G. Unsworth (Woking), E. Williams (Newport), W. Todd (Lochgilphead), G. Shaw Scott (Sutton), H. Wood (Widnes), J. Gaunt (London), R. Holton (Hednesford), T. Thompson (Barnetby).

Saturday, December 31st.—C. Perry (Birmingham), S. Cowan (Hove), A. Cole (Bristol), F. E. Bunting (Wealdstone), W. G. Eadie (Lisbellaw), J. Campbell (Perth), J. Wheeler (Watford), L. D. Leonard (Plymouth), H. W. Gaze (Walton), O. Edwards (Exeter), C. F. Woodall (Old Hill), C. Moore (Lincoln), D. S. Pepper (Herne Hill), C. Dean (Keighley).

Monday, January 2nd.—T. Carty (Mageney), W. Wright (Stevenage), A. D. Sedger (W. Bromwich), A. Grainger (Forest Row), A. J. Thatcher (Transvaal), T. A. Briggs (Leicester), H. Wilman (Cape Town), W. B. Oakley (Birmingham), G. Waugh (Jarrow), H. Morgan-Byrne (Castleknock), W. J. Dexter (W. Bridgeford), F. G. Carter (London), J. J. Hanley (Leominster), F. J. Adams (Tooting).

Tuesday, January 3rd.—J. Draper (Finchley), P. Groser (London), T. W. Cheesman (Brighton), H. P. Lucas (Chiswick), D. R. Lewis (Aberystwyth), W. Hague (Oxford), G. R. Hildreth (Greenock), H. T. Higginson (Dublin), L. Milhard (Leeds), H. C. Butcher (London), D. Dicke (Kilmarnock), G. Gazzard (Bristol), Johnson T. Wright (Northampton), Matthews, Wrightson, and Co. (London), J. Brand (Kinnoull).