

TAKING A CAR DOWN AND RE-ASSEMBLING IT.

By "DEEATCH."

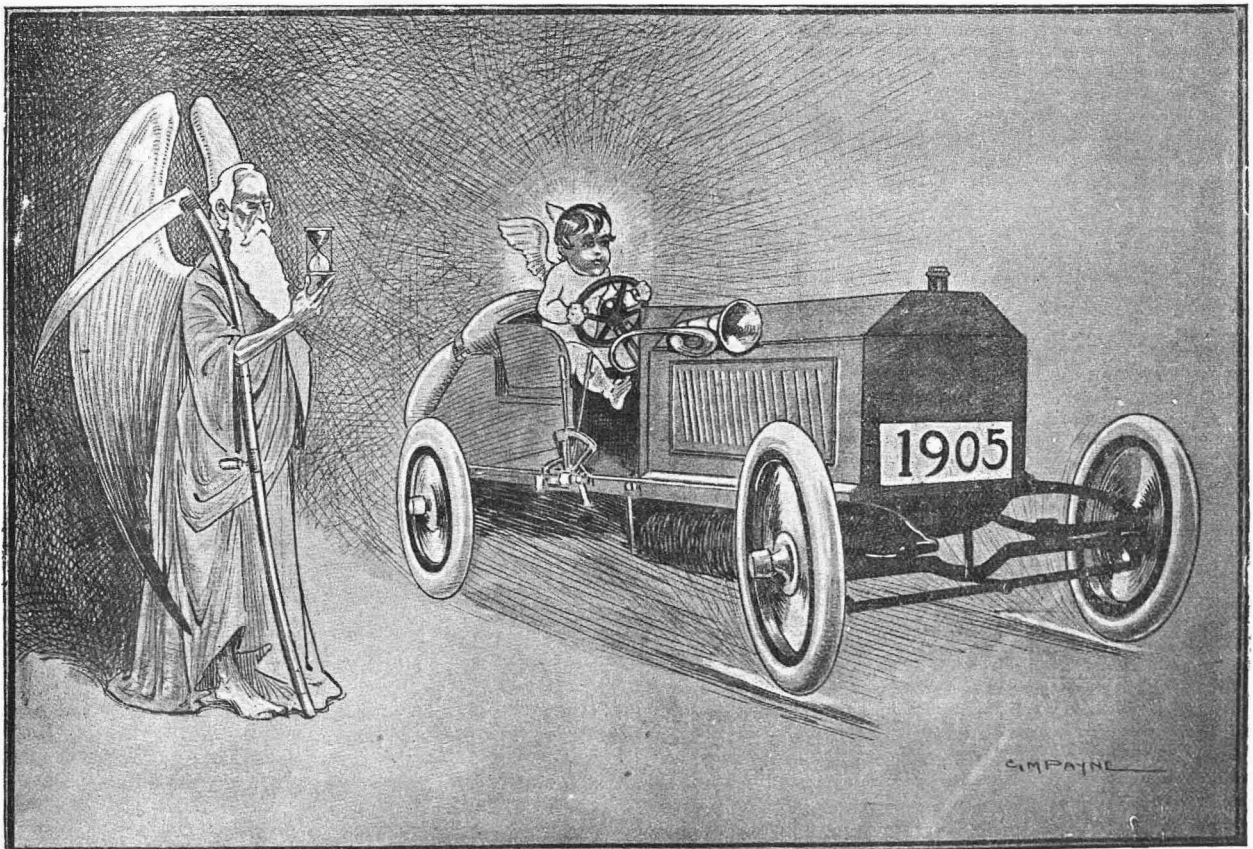
PART III.

The exhaust pipes should now be detached from the cylinders, and when the bolts are withdrawn it will sometimes be found that washers, shaped to fit the ends of the pipes, will come away with them. Joints between exhaust pipes and cylinders are usually of the "faced" type—their surfaces having been carefully machined or filed to ensure a close fit; and as an extra precaution to make certain that the exhaust does not blow through between the joints and cause detonations resembling an artillery display, these washers are therefore fitted. The material of which they are made varies according to the fancy of the car builder. They should be carefully preserved against the time the pipes are re-fitted. It will be convenient at this point to remove also the exhaust pipe and silencer. If the lubricating oil

tank is a "forced feed" by pressure from the exhaust pipe, the copper tubing from oil box to exhaust should first be disconnected both at box and pipe: and when removing same take great care not to alter in the slightest the bends or their direction. This small tubing is of a soft nature and if kinked or dented in any part is likely to fail its allotted duty. The pipes conveying oil to the different bearings should now be removed, first taking precautions to

SHUT DOWN THE SIGHT-FEED DRIPS

or taps at the oil box. Each pipe should be well flushed out with paraffin: if one end is corked up and then the pipe filled up with paraffin and allowed to remain therein for 24 hours, any heavy matter which may have lodged in the bends will come away.



ENTERING ON ANOTHER ROUND.

Taking a Car Down, etc. —Contd.

The connecting rods and levers for the ignition, throttle and carburation can now come apart; but if these and the lower portions of the engine are (as is usual) covered with dirty grease and oil, go over everything with the petrol and paraffin mixture, including lower part of crank chamber, fly-wheel, gear box, propeller shaft, differential, etc., etc. The stiff brush will find its way into the odd corners, and this treatment, applied to all the mechanism and woodwork below the body, will make a wonderful difference in easily locating out-of-the-way split pins. Split pins somehow seem to have a peculiar influence upon individuals. I have often observed, with amused interest, a smart mechanic taking down a gear box, where it is important to get the work through quickly. The nuts which were not locked or pinned were soon spun off the bolts, but when the castle nuts were reached from two to five minutes would be spent upon the split pins in order to remove them whole and unbent so as to be useable again. And when dragged out eventually with the pliers, the sideways pull would nearly always bend them, and then the vice would have to be requisitioned later to straighten out. It is well to learn how to withdraw a split pin without injury, pending the day when a roadside trouble happens; but the smaller sizes of split pins are so cheap that it is waste of time to try and bend the ends up so as to pull the whole length through the bolt eye. If a pair of sharp cutting pliers be possessed, snip off the bent ends of the pins as close to the bolt as possible, and holding the big end of the pin with one pair of bull-nose pliers, use another pair of bull-nose pliers to pinch together the two ends and the old pin is easily withdrawn. Split pins lead naturally to the parts they are meant to lock together, and it would be well to suggest here that the owner go carefully over his car, and, wherever a nut is of the ordinary plain-head type, to forthwith replace it with a castle nut as best, or as next best, the hexagon nut with single hole for pin. If the owner takes the trouble to examine his car and search for such small but most important details as split-pinned nuts, he will soon appreciate where the difference in cost rests in comparing the very, very cheap French car and a similar horse-power car turned out by our worthy British manufacturers. It is mainly because he does not waste time on split pins, locking nuts, and such-like needless refinements (?) but absolutely essential for the safety of passengers and drivers, that the French car maker can often undersell the home production.

The writer has a

GOOD DEAL OF FAITH IN CARS TURNED OUT IN GREAT BRITAIN,

and by a few of the larger Continental firms; but he would hesitate to go and drive some of the fearful rubbish which has been foisted upon the English car novice during the past two years by foreign firms. A demand having arisen for a cheap line of goods, there will always be a profit taker ready to supply, and the usual rule has held good in 1903 and 1904, and to those who have unwarily bought what are euphemistically termed "bargains," one's sympathy can only be tempered by the thought of "serves them right." Buy decent British goods from firms with a reputation to lose, and pay the price the quality demands, and it will be found that any difference in initial cost will be more than saved in the first six months in such items only as lost nuts and shaky connections.

And in consequence of the examination now being made of the car it is possible to find out whether it is lacking in essential life-saving features: as with a pedal-bicycle, so with a motorcar, for the owner has necessarily to trust to the conscientiousness of the maker. If any bolts be discovered which are simply held in place by plain nuts, at once remove them and drill their ends for split pins; if you do not feel capable of tackling such a matter, doubtless the local repair man will be pleased to undertake the job. It does not matter in the least where such nuts are situate: for good motorcar

work it can be considered as an invariable rule, without the slightest exception, that every nut should be locked by some mechanical means, whether it be by split pins, split locking rings, patent lock nuts or otherwise. If nuts are being purchased to replace the plain ones, get what are called "castle" nuts, as these give six positions, for every complete revolution of the nut, in which to get the split pin into position, as against the half circumference offered with a single hole.

HAVING SECURED SERENITY OF MIND

by split-pinning all loose nuts, the carburetter will now have attention, and of course the petrol supply pipe must come away also. If the carburetter or petrol pipe has not been touched for several hundred miles, a small piece of dirty white jelly will usually come to view at some part of the carburetter interior; I have never worried myself as to its composition or its cause and have seen it in most types of float-feed carburetters, made of different materials and in which different spirit had been used. The construction of carburetters varies, and it is impossible to give any reasonable directions which would be applicable to all; if the type in use is not well understood, now is the time to take it to pieces and find out; but don't drop the float, don't bend the needle valve, and don't put the float back in float chamber wrong way up. Wash every part thoroughly with clean petrol and wash over and over again until you are assured that not a single particle of grit or dirt remains anywhere within the interior; it will sometimes be found difficult to dislodge some of the dirt which collects on top of the draining screw, just below the petrol inlet; a lady's hat pin will be useful in gently scratching where the dirt has accumulated. Time spent upon the carburetter is gained in the end if it be remembered that the minutest piece of dirt in the spraying nozzle has possibility of delaying progress upon a journey in about inverse proportion to its size. If dirt gets everywhere else upon a car, it should be religiously kept out of the carburetter by shields or guards, but kept clean it must and should be; upon a modern car roadside troubles can be allotted in the proportion of 25 per cent. to carburetter and petrol troubles, and of this 24½ per cent. can be put down to carelessness and the other ½ per cent. to causes beyond control. Wherefore having cleaned the carburetter and again assembled it, replacing all screws or attaching nuts, and placed it in a covered box to keep dust away, try and devise something in the nature of a gauze screen right round the whole exterior so that when it is replaced upon the car the air must be filtered before reaching it.

The removal of all the pipes and carburetter, tank, etc., has made the engine look somewhat bare, but less like

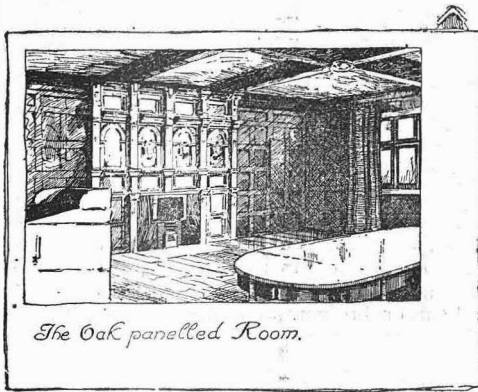
AN INTRICATE CHINESE PUZZLE

than it did when operations were commenced, and if the car has been raised from the ground (as previously recommended) upon baulks of timber we can now go ahead quickly. If the car is only 12in. above the ground, it will not involve such wriggling to get below it, but 2ft. will be better; whilst the donning of the oldest suit of clothes in the wardrobe, which henceforward will be useless except in the motor-house, will enable you to flop down anywhere underneath without regard to after appearances.

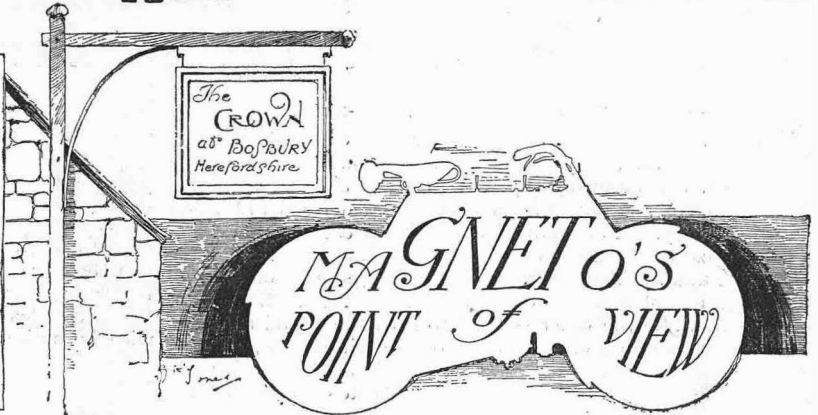
(To be concluded.)



THE PLEASURES OF MOTOR BOATING.
CHAUFFEUR DE MER: "Ahoj! D' happen to have such a thing as a sardine opener aboard? My Guvnor's underneath here."



The Oak panelled Room.



Handle-bar Control and Brakes.

That the subject of handle-bar control has not received the full attention it deserves from the makers of motor-cycles there is, of course, no denying. Matters have advanced very little in this direction, if at all, since motor-cycles became popular. The majority of machines are still fitted with control levers mounted along the top of the tank, necessitating the removal of one hand from the steering bar to actuate them. At the period when the surface carburetter held the field the construction of the mixture tap and throttle was such as to prove a serious obstacle to a satisfactory handle-bar arrangement; but, now that this type is practically obsolete, things are very much simplified. The amount of attention that is being paid towards solving the problem of an automatic spray carburetter will directly help in the direction of obtaining handle-bar control. The air regulator will be thereby rendered unnecessary, and there only remains the throttle as indispensable between carburetter and engine. Now, we must retain the spark advancer and exhaust lift, and then we must have the indispensable front brake.

The Minimum of Adjustments.

At the very least, we have got to provide four adjustments on the handle-bar. These must be close up to the grips, so that they can be manipulated without having to alter the position of the hands. The Bowden cable principle has so far offered itself as the simplest way of effecting handle-bar control, but a little experimenting would suggest other and possibly better methods. With regard to the exhaust lifter, this should certainly be capable of gradual and positive movement, so that it can be kept definitely fixed at any point, and thus give the rider the benefit of a valuable means of control. As things are at present, it is necessary to hold a lever against the pull of a spring all the time. This does not matter, of course, for starting off easily, but it is a serious disadvantage to try and keep the exhaust valve slightly open for negotiating a few miles of traffic. It must not be forgotten also that the rider has the bell or horn to manipulate at times, so that, even with the simplest possible form of handle-bar control, his hands would be occupied to their fullest capacity. The handle-bar grip switch, although still largely retained, I think, could be very well dispensed with.

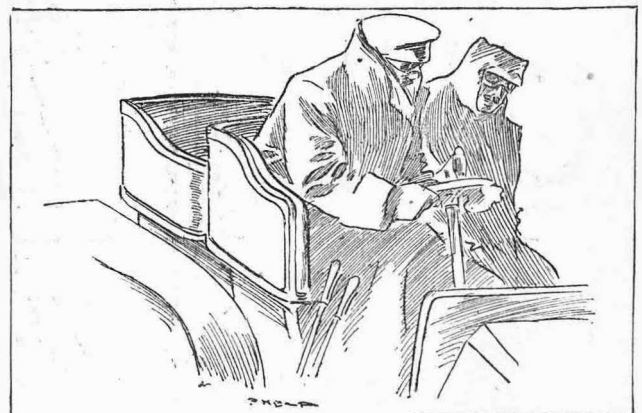
Why Retain the Handle Switch?

After a good deal of experimenting I have come to the conclusion that the correct period to break the sparking current is after the exhaust valve has been slightly raised. This gets over the annoyance of exhaust box explosions. These are continually occurring when the handle-bar grip or brake lever switch is used. With the graduated exhaust lifter on the handle-bar it would be a very simple matter to arrange the switch with it, so that before the spark is switched off the charges of gas drawn in to the cylinder are greatly minimised or stopped altogether. If the spark is switched off whilst the engine is taking in gas it is obvious that these charges are pumped into the exhaust box, and the heat or flame of the next exploded charge fires them. The plug

switch would, of course, be retained as a main cut-off. Even with high-tension magneto ignition it should not be a very difficult matter to arrange an exhaust lifter contact. I tried the experiment of a combination of brake lever, exhaust lifter, and circuit breaker, that is to say, one movement performed the operations of first lifting up the valve, then stopping the sparking, and finally putting on the brake. It was perfectly satisfactory in performing these operations, but, on the other hand, it nullified the advantages of a fixed exhaust lift position and the braking effect of the compression when the spark was cut off, and it is difficult to see how all these advantages could be got with one movement. I see no reason why the spark advance and throttle levers could not be arranged on the left-hand side of the handle-bar, and the movements conveyed to the engine and carburetter by jointed rods with a ball and socket joint to compensate for the steering movement.

One Brake Lever Sufficient.

I consider that one brake lever on the handle-bar is enough, and that the other brake should invariably be foot-operated, preferably by back-peddalling. The rear brake is rarely used more than once in ten occasions: it is, in fact, more of an emergency brake for a very sudden stop, or to descend a dangerous hill at an easy pace. This being so, I cannot understand the strong objection some riders have to a foot-actuated brake. It is possible to get enormously greater power on the brake by the foot through the agency of a 7in. crank than by having to grasp an inconveniently placed hand lever. I notice that one or two makers are fitting a foot brake which necessitates taking one foot off the pedals. I cannot see the special advantage of such an arrangement. It would be more likely than not to prove exceedingly worrying to the novice, and perhaps cause him to lose his balance at the critical moment trying to get his foot in position to press the pedal down.



COSY.

"A closed stove under the seat would be cosy this weather."
 "Cosy, indeed, that's where we store petrol."

SOME PRACTICAL MOTORCYCLE HINTS.

1.—REPAIRING A CRACKED SPARKING-PLUG.

If a sparking-plug, either mica or porcelain, becomes short-circuited internally, there is no need to throw the whole away, as it can be easily repaired and made equal to new at a slight cost, if only the following instructions are followed carefully. Porcelain or mica bodies can be obtained at most stores for 8d. for the former, and about 2s. 6d. for the latter, kind. The gland of the old plug should be taken off by the use of a couple of spanners, one for holding the plug shell, while the other is used to turn the gland round. The broken porcelain or mica can now be withdrawn, along with the old packing. The new one should now be inserted, but before doing so a few turns of fine asbestos twine should be wrapped round the body in two places: one above, and the other just under the shoulder. The gland may now be tightened up, and if it is found that the stuffing box will hold more packing, a few more turns can be put in, taking care that the gland of same has a firm hold. The central wire in the plug body should be bent round to meet the one on the shell; then cut off to allow about 1-32in. clearance between them. The plug is now complete, and will be found quite equal to a new one, at half the cost.

2.—USING A SURFACE CARBURETTER WITH A LEAKY FLOAT.

It sometimes happens that the float of a surface carburetter gets punctured, the construction of which renders the task of repair an extremely difficult one. By observing the following hints, however, a float may be constructed to replace the damaged one in a very simple manner, and will be found quite as efficacious. Obtain a perfectly sound cork and cut it with a sharp knife to $\frac{1}{4}$ in. less in diameter than the bore of the chimney, leaving it about $1\frac{1}{2}$ in. long. Three copper tacks are then pushed into the middle of the cork at 130 degrees apart, so that the heads protrude slightly. These are to form a guide for the float in its place in the chimney, and to prevent any sluggishness which would be occasioned by capillary attraction between the two. A piece of perfectly straight steel wire, about No. 24 L.W.G., is now taken and passed through the centre of the cork longitudinally, allow-

ing the end to project about $\frac{1}{4}$ in. A brass washer is slipped over this end of the wire and soldered in position against the cork, and the other end is treated likewise.

The float is now complete, and may be placed in position in the carburetter chimney, care being exercised that it slides freely therein. A fine hole must be bored in the chimney cap, through which the float wire is passed, and the end can then be cut off and bent at right angles, so that when the right quantity of petrol is in the carburetter, this wire just protrudes about $\frac{1}{4}$ in. above the cap. This prevents the wire becoming bent or broken, and is quite sufficient an indicator for all requirements.

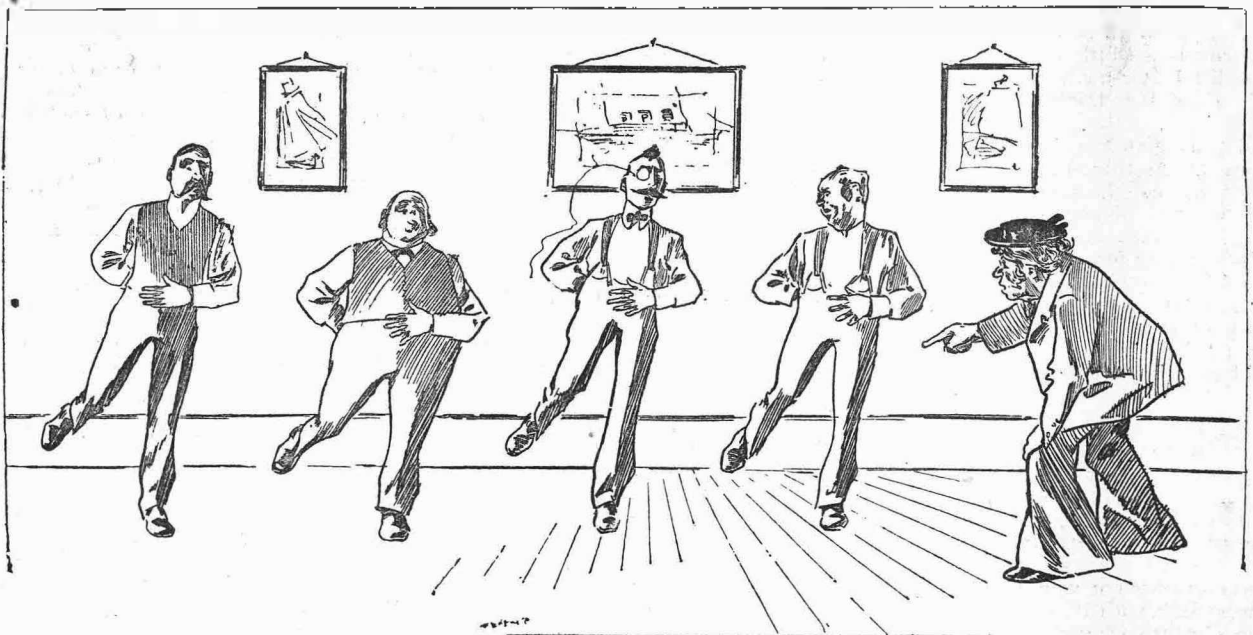
3.—FIXING LOOSE CONTACT-BREAKERS.

Most riders of Minerva engines have found out, after some time, that the contact-breaker rocker works loose on its bearing, so much so that misfires are often the result, due to the imperfect electrical contact between crank-case and rocker. The following hint overcomes this defect, and is not only applicable to the Minerva motor, but with suitable modifications could be made use of for others as well.

In the centre of the right-half of the crank-case will be found a nut covering the shaft, whose purpose is to prevent the oil flooding out of this side. This nut must be taken off, and a 3-16in. tapping hole drilled in the centre of it. This hole is tapped, and a set screw with a small head is then screwed in tight from the back. The nut may now be replaced on the crank-case and tightened up.

A piece of spring steel about 1-16in. \times $\frac{1}{2}$ in. is now taken, about 2 $\frac{1}{2}$ in. long, and a 3-16in. clearance hole made in one end. This end is placed over the set screw in the shaft-nut, and a 3-16in. nut run up to hold it in place. This piece of steel should be suitably bent so that the end of it presses the cover of the contact-breaker tight against the case and bears over the centre of the 2 \times 1 shaft. This method ensures a good electrical contact between the rocker and frame, and also holds the former quite rigid.

J. WALLACE.



MOTOR BOATISTS.

Old Bill Barnacle makes a handsome little income instructing motor launch owners in "hoisting their slacks," with true nautical abandon.



AN EVENTFUL RIDE—

NOTES BY THE WAY.

Two weeks' holiday, especially when taken at separate times, is not enough for anyone confined in an office all the year round; still, when one is busy it is better than nothing at all.

My first week—a trip on the river Wey—was described in "The Motor Boat." During my second holiday (taken some few weeks later) a friend and myself decided to run on our motor-bicycles to Folkestone, making that place our headquarters and taking long runs each day.

We started on the Saturday morning; my friend on his 2 h.p. motor-bicycle, myself on a 1½ h.p. machine.

The weather was perfect, and the roads very good. We ran from Hampton-on-Thames to Farningham, stopping here for lunch. When some nine miles from Maidstone, my friend's machine stopped very suddenly. Thinking the piston must have seized, as we could not turn the pulley, we waited for the engine to cool, pouring plenty of paraffin into the cylinder. But it would not move, so we decided to take off the cylinder, and after half an hour's hard work it slipped off as easily as possible, but the piston could not be moved up or down. Coming to the conclusion that the damage was too colossal to be mended by the roadside, I

TOWED MY FRIEND TO MAIDSTONE

—very slow work, having to pedal every hill.

Fortunately, we found a very willing repairer here, and we all three set to work. Taking the engine off, we discovered the pulley-side bearing had seized very badly. Every means were tried, but nothing would move it, and, as a last resource, we had to hammer it out of the bearing. We worked on that engine from three o'clock until nine p.m.

Again starting off, we hoped to reach Folkestone by 11 o'clock, but had only got a few miles when my engine gave a sharp click, accompanied by an awful grinding noise, and then stopped. Not attempting to find out what had happened, I slipped off the belt and my friend started towing me. We got about three miles when—whir! went his engine. Of course the belt had come off, and with it the nut and pulley. After hunting in the ditch for some time we found the pulley, and the nut in the road. Fortunately the key was still in its place, so we soon had it on again. After half a mile (this time) once more we had to dismount, and the same performance was repeated. This went on for three or four times. The last time the nut and key could not be found—it was then 12 o'clock and a nice thick mist. If ever two machines were going cheap I think ours were at that time, both of us now having to pedal. We stayed the night at a little inn a few miles further on.

The next morning the landlord informed us that we were ½ miles from Ashford, where we found a garage, and the pulley of my friend's mount was soon properly fixed: the thread had been damaged with the hammering it had received. On this pulley the nut is countersunk—it is much better to have the rim turned off and a nut fixed, so that an ordinary spanner can be used.

We next turned our attention to my machine—the old gudgeon pin set screw again; this time it chipped the bottom of the piston and bent the crank-shaft—another engine to come to pieces. Having an engagement in the

afternoon at Folkestone, and time being short, I was again taken in tow, and this time we arrived.

Fortunately for us it had rained all night, so that riding would not have been very pleasant. We spent the best part of the next day in pulling my engine to pieces and cleaning up.

After this our luck changed, and some most enjoyable rides we had to Canterbury, Herne Bay, Deal, Ramsgate, and on the very level road to Dungeness. On the following Sunday the ride up to Hampton was

ONE OF THE BEST RUNS I HAVE EVER HAD

—not a misfire, and the weather lovely, the machine taking the hills in fine style considering the h.p.

Since this holiday was undertaken I have become possessed of a 2½ h.p. machine, and, although it is very fast compared with my 1½ h.p., yet for comfort in traffic and on wet roads give me my little machine with its short wheel-base. As I have no doubt that there are plenty of these machines still about, a few improvements I have made on mine might help others.

My engine, being very close to a fairly wide mudguard, is rather sheltered, so I drilled about 200 small holes in the guard, and, unless the roads are muddy, they do not fill up very quickly. I have often run several week-ends, and they have kept perfectly clear, and I notice quite a distinct improvement. Drilling a few holes at the elbow leading to the exhaust-box, also a few in the exhaust-box itself directly underneath the carburetter (surface) is also a good thing, and I can use every drop of petrol.

A tap instead of the butterfly nut provided on top of the engine for paraffin, and a hole over the inlet to squirt petrol, saves trouble.

THE EXHAUST-VALVE LIFTER AND SWITCH COMBINED

was the cause of a lot of mystery at different times. A much stronger spring, however, helped to overcome the oil getting between the points of contact, but it is still better to have a switch fixed on the handle-bars.

The whole time I have had my machine (2½ years) never once have I had anything go wrong with the engine, until the gudgeon pin, as already described, came out, and once I took it to pieces to fix new bushes. I think this speaks very well for small-power engines.

A thing which I consider worthy of note (as I have never heard of it before) occurred to me one day on my 2½ h.p. engine. Two air release valves are fixed on top of the distribution-case; the screw holding the ball in place fell into the case and jammed between it and the valve lifter. Something had to go, and three teeth broke off the 40-tooth wheel. I have taken care that this will not occur again, having left the screw out altogether.

EDWARD HASTIE.

Messrs. J. Pullar and Sons, of Perth, the well-known dyers and cleaners, have just started a motor van for delivery purposes. It is a 9½ h.p. Milnes-Daimler, with a carrying capacity of 1½ tons. The length of the van is 17ft. 2in. It is capable of an average speed of ten miles an hour.

MOTORISTS AND THE POLICE.

By T. Artemus Jones, Barrister-at-Law.

BERT. WRIGHT '05.

Three or four influences account for the unfriendliness which police officers all over the country are now exhibiting towards motorists. The uninformed prejudice many county magistrates are showing against motorcar drivers has had much to do with stimulating policemen into professional zeal. The Motor Car Act of 1903, which gave policemen power to apprehend motorists without a warrant under certain circumstances, has been another influence. It is true that this drastic power is exercised only when a motorist refuses to give his name or address or produce his license, and, moreover, the power has not been often exercised. But the knowledge that they possess such a power has had its effect on the whole police force in the country. The chief influence at work, however, is the state of indefiniteness in which the Act of 1903 has left the driver of a motorcar at the mercy of any police constable. No doubt in many respects the Act has yielded satisfactory results. Its system of registration of cars, which was intended to make certain the identification of cars and their owners, has worked well, though less is to be said for its system of licensing, which ensures facilities for suspending or disqualifying offending drivers.

THE CHIEF OBJECT OF THE ACT

was to deal with cases which could not be brought within the range of the provisions relating to the full-speed limit. It sought to regulate motoring, regardless of the question of absolute power, and to this end the Act entrusts a policeman with wide discretion. Up to the present, however, this has proved in too many instances a mere instrument of persecution of motorists in the hands of the police. Not only does a policeman, as a rule, make the most ludicrous miscalculations as to speed, but he can also, under Section 1, draw at fancy on any one of the large variety of considerations which help to make the driver's conduct punishable. Let us look at the offences which Section 1 alone creates:—

1. Driving a motorcar on a public highway recklessly.
2. Driving a motorcar on a public highway negligently.
3. Driving a motorcar on a public highway at a speed dangerous to the public.
4. Driving a motorcar on a public highway in a manner dangerous to the public.

Here are four distinct offences, and to help the policeman to run the motorist to earth, the Act goes on to enumerate the different things which the policeman must take into account in estimating whether an offence has been committed. These are:—

1. "Having regard to all the circumstances of the case."
2. "Including the nature,
3. "Condition,
4. "And use of the highway,
5. "And to the amount of traffic which actually is at the time,"
6. "Or which might reasonably be expected to be, on the highway."

It was definitely laid down (in *Mayhew v. Sutton*), before the Motor Car Act was passed, that risk of collision or accident in the immediate vicinity of the car or policeman was not necessary to support a conviction for reckless driving "having regard to the traffic." But the effect of Section 1 in strengthening the hands of the police at the expense of justice to the motorist goes much further. Peril to actual passengers on the highway, or actual danger in the im-

mediate vicinity of the car, need not be proved if the constable forms the opinion that either the speed or the manner in which the car is driven is negligent or reckless or dangerous. What is more, the onus of knowing what traffic may reasonably be expected on the highway is thrown on the motorist, however unfamiliar he may be with the country he is motoring in. The phrase "traffic . . . which may reasonably be expected to be on the highway" is

THE MOST UNSATISFACTORY CLAUSE

of all the ambiguous clauses in Section 1. No doubt the reason why the words were inserted was to provide for cases where motors approached cross-roads or off-turnings out of which traffic might emerge with some degree of suddenness. But the phrase as it stands throws upon every motorist the responsibility of knowing the topography of rural England to an extent far beyond reasonable.

Another circumstance makes the Act still more unjust. As it was originally drafted the Bill was simple and clear enough in its proposals, but it bore an entirely different appearance when it emerged in its final form. Between the two phases of opinion which the measure excited in its committee stages, a compromise was attempted. Alterations were hurriedly made in the original wording of the Bill with additions and amendments, all of which produced an unfortunate result. Phrases and terms proposed on the spur of the moment by M.P.'s unversed in legal phraseology were substituted in all their ambiguity and looseness for the precise and lucid language of the parliamentary draftsmen. This has resulted, first, in

THE UNJUST CONVICTION OF MANY A MOTORIST;

and, secondly, in doubts and misgivings as to what certain sections in the Act mean. In July last, for example, the Home Office issued a circular to the magistrates correcting the wrong punctuation of Section IV. Power to indorse licenses was given in that section to the justices in regard to

"Any offence in connection with the driving of a motorcar, other than a first or second offence, consisting solely of exceeding any limit of speed fixed under the Act."

Punctuated as these words are, it is impossible to decide whether the concluding phrase, *consisting solely of exceeding any limit of speed fixed under the Act* relates to (a) the words "any offence in connection with the driving of a motorcar"; or (b) to the words "other than a first or second offence." At last the Home Office has felt it necessary to issue a newly-punctuated version of the section, which now reads as follows:—

"Of any offence in connection with the driving of a motorcar (other than a first or second offence consisting solely of exceeding any limit of speed fixed under the Act)."

Few of the M.P.'s who voted in committee for Section 1 contemplated that the police would exercise their wide powers as to furious driving in the vindictive fashion in which they are proceeding against motorists of every class. The long roll of motor accidents proves, of course, the existence of reckless and rather irresponsible drivers, but these form but a very small percentage of the enormous number of motorists in the United Kingdom. The Motor Car Act expires in 1906, and when the time for its revision arrives motorists, who are not an unimportant section in Parliament, should insist on rectifying the arbitrary use the police made of their powers.

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OPINION.

The Republic of the Road.

Judge Coventry, of Blackburn (if he has been rightly reported in the Press), was responsible recently for a somewhat remarkable utterance. The following comments are based on a report of a motorcar case taken from a North country journal whose accuracy we have no reason to doubt. In the course of the proceedings counsel for defendant (the motorcar owner) is reported to have expressed the opinion that "the motorcar has as much right to the highway as any other vehicle"; whereupon Judge Coventry is reported to have said, "Nothing of the kind, or the legislature would not have made special rules for it." Now let us, first of all, clear the ground of any possible misunderstanding; any vagueness of phraseology; let us know what we are saying, and what we mean by what we are saying. If Judge Coventry meant to infer that the motor vehicle has not the same right (in point of kind) as other vehicles, we have no quarrel with him: he merely stated a self-evident truth, or, at any rate, a truth which quickly becomes evident to a careful observer. It is obvious that the rights of the motorcar on the highway are not quite the same as those of the hay-cart or the bicycle: a motorcar must (in practice) carry at least two lights at night: a bicycle need carry but one: a hay-cart none at all: these are special rules which the legislature has made for different kinds of vehicles: but, from this point of view, we have quite as much justification for the statement that the hay-cart has not as much right to the highway as the motorcar as we have for the same statement reversed. Now, when we come to what we take to be Judge Coventry's real meaning, that the motorcar has not the same right (in point of degree)—in other words, has not as much right—to the highway as other vehicles, we must flatly decline to accept the logic of such a statement. In what respect do the rights of the motorcar to the highway fall below those of the horse vehicle or the bicycle? In none that we know of. What authority has Judge Coventry, or any other judge, for depriving the motorcar of that full right to use the road which other vehicles enjoy? None that law and equity recognise. The fundamental principle underlying all legislation of highway traffic is that of mutual comfort, convenience, and safety. The legislature seeks to impose on every form of road-using vehicle those restrictions, and those only, which the above considerations render necessary. In so doing it does not curtail the rights of the vehicle: on the contrary, it extends them. A vehicle that is legislated for is a vehicle that is recognised; without such legislation the vehicle would be at the mercy of public opinion, and would have no

court of appeal if public opinion were against it. Such a vehicle would admittedly have inferior rights to others. It is obvious that so long as our road traffic embraces a variety of vehicles and a variety of methods of locomotion, so long will it be impossible to control traffic by one broad and simple law. But meanwhile the several laws which govern these several forms of locomotion must not be regarded as giving any one vehicle more right than another to the King's highway.

An International Federation of Auto-Cycle Clubs.

As the result of the recent Congress held in Paris, an International Federation of Auto-Cycle Clubs has been formed, the constituent bodies being the Motor Cycle Club of France, the Auto-Cycle Club of England, and the Auto-Cycle Clubs of Germany, Denmark, and Austria, only the one leading Club recognised as the ruling body of the sport by the Automobile Clubs of the country being admitted to the Federation. Thus, the Motor Cycle Union of Ireland and the Scottish Cyclists' Union are eligible, and we hope to hear that they have applied at the next Congress. The president of the permanent International Bureau is M. de la Housse, of the Motor Cycle Club of France, Mr. Mervyn O'Gorman, of the Auto-Cycle Club of England, being first vice-president (he has our congratulations), the German delegate being elected second vice-president. The Federation has as one of its objects mutual help and support in the control of sport and in the fostering of the pastime. When matters are definitely arranged, it will be impossible for the wrong-doer in France, after being thrown out of the sport over there, to come to this country and compete. But not the least important section of the work of the Federation will be the removal of harassing restrictions upon foreign touring on motorcycles. We wish every success to the Federation, and particularly hope that it may steer clear of the difficulties that beset such international combinations of ruling bodies, whilst at the same time we trust it will use its undoubted powers for the general good of the sport and pastime.

Sleeping Drivers.

The frequency of accidents to motorists and cyclists due to some slow-moving form of vehicle whose driver has gone to sleep prompts us to renew attention to the leniency with which this practice is regarded by the Bench. It is particularly important, from the point of view of the general safety of the road, that these offenders shall be severely dealt with as, in the usual absence of any lights, the vehicle becomes dependent absolutely upon the vigilance of its driver. The driver of a lighted vehicle might go to sleep with far less risk of precipitating an accident; but in nine cases out of ten it is a farm waggon, a market cart, or a lumbering dray which is allowed to roam about the road, unlighted, at the sweet will of the animal which draws it. To give the horse his due, he often displays more intelligence than his driver; if it were not so, this class of accident would be much more common than it is. But we cannot reasonably rely on the instinct of even a well-trained horse, and we should be glad to see far severer sentences imposed in cases where it is clearly proved that the man in charge of the vehicle was asleep. Another point which seems ridiculous to us is that the fault of going to sleep at night should be regarded as less serious than that of going to sleep in the daytime. A driver who was caught sleeping in broad daylight would be sternly dealt with, we imagine, whereas at night—when his offence is infinitely more dangerous—he would seem to be more or less privileged to take forty winks on his box.

THE OLYMPIA SHOW.

This important event will be especially dealt with by "THE MOTOR," which will be the first journal to publish a fully illustrated report of the great Automobile Exhibition held for the first time at the huge West End building. The exhibits will be dealt with interestingly and instructively, and illustrations of novelties will be a special feature.

AN AMERICAN INVASION—IS IT PROBABLE?

By "ANGLOPHOBE."

At the moment that these notes are written American motor factories are taxed to the uttermost to try and cope with the enormous demand which has suddenly grown up in America. In anything over 12 h.p. the European manufacturers, or rather the Frenchmen, have hitherto been the sole suppliers of the United States market, as wealthy buyers have left native productions severely alone and only purchased imported cars of world-wide reputation. With the lighter and cheaper cars there was not sufficient profit obtainable, after paying heavy import duties, to warrant the trouble, and, therefore, for cars up to about £500, American makers have had their own markets free from outside competition. Having discovered what their own folks want, whether it be light or heavy cars, American engineers are hastening to supply, and in proverbial U.S. style are not going to sleep about it either. If fashion demands long chassis with side entrance bodies, every up-to-date maker not only will catalogue it but will give a customer a trial. If four-cylinder vertical engines are called for, American machine shops have not hesitated to

JOB OFF THEIR OBSOLETE PATTERN

horizontal with opposed cylinders and make what the public wants and *not* what the maker thinks the public ought to have. How long the fever will last for 60 h.p. foreign cars at £3,000 each it is impossible to predict, but it is safe to prophesy that two years will see the end of the export of European cars to the United States. High-powered cars are sold in the States on purely racing results and records, (reliability at present has no bearing on sales), and the American maker, appreciating the position, has been booming his wares by track racing on the mile-to-the-lap trotting tracks which abound in that country of large ideas. The buyer, seeing his neighbours can build faster cars than the Europeans (for enclosed track work and driven by the right sort of driver) is already placing his orders at home for the cars selling at 4,000 dollars and upwards. Even

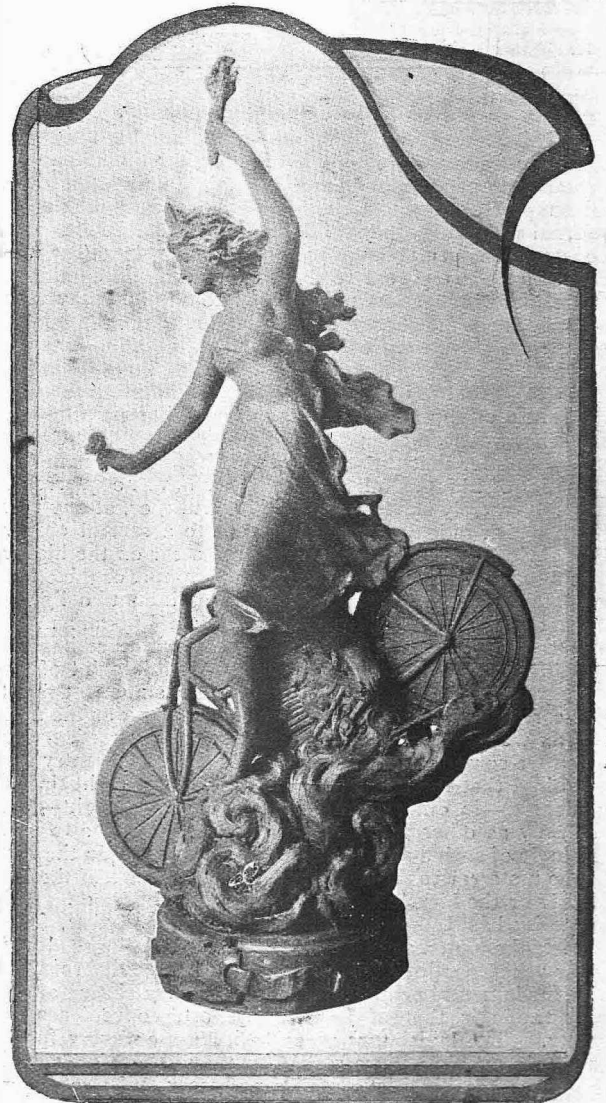
THE LITTLE "RUNAROUNDS"

selling round about 500 dollars sell largely on track-racing results. The foreigner is going to be certainly squeezed out, and when that has happened, the Yankees in their usual way will start the same pleasing game upon each other. The larger manufacturers being then secure in their own markets will look around for others, and it is certain that the United Kingdom of G.B. and I. will be one of the earliest to receive their kind attentions. Every American factory is increasing its output; new factories are

SPRINGING UP LIKE MUSHROOMS

in all directions; the cycle factories built to carry along the 1897 pedal-bicycle boom for ever and ever are being refurbished up and fresh plant is being installed, and, in fact, in all corners any business connected with motors is just humming. Several leading factories are looking for an output of 25 cars daily in 1905, or 7,500 cars for the year out of one factory: multiply this by possible home demands and it will be seen that there is a limit thereon. But once the factories are built and plants installed for production of very large quantities, those quantities must be kept up or else bankruptcy quickly comes along. We have had a foretaste of the American invasion in the petrol cars which have been sold in England for two years and are still being pushed, and as one

of the larger makers has now entered the British market we can look for an accession of numbers at an early date. These American invaders are found to be nice fellows in themselves and keen on selling the goods they handle, and as some of the more enterprising but less scrupulous may at some period in 1905 or 1906 swoop down upon this country, it behoves the poor untutored Briton to keep his eyes open and save himself a repetition of the dumping of obsolete American types which took place in the cycle boom year—1897. To be forewarned is to be forearmed.



A HANDSOME TROPHY.

The International Auto-cycle Cup won by France last year.

The Popularity of Motoring in France.

The big banquet which marked the close of the recent Paris Show was made the occasion of a considerable amount of after-dinner oratory. M. Gustave Rives made a long and notable speech in the course of which he drew attention to the "entente cordiale" existing between the Government of France and the motoring community, instancing the number of honours which had been officially conferred on representatives of the sport and the industry. The Royal visit of the King and Queen of Portugal was also favourably commented on. M. Rives also scored another point when he acknowledged the goodwill of the Prefect of Police (M. Max Lepin , who was a guest at the banquet) in connection with motoring and motor-boating events and trials. M. Max Richard, another speaker, reminded his audience of the encouragement given to the motor industry by the Minister of Agriculture in connection with the development of alcohol, and the Naval Minister in connection with motor-boat trials. M. Trouillot, the Minister of Commerce, contrasted the Show with the recent Fine Art Exhibition, evoking a burst of applause when he produced figures showing that in two months 220,000 visitors attended the latter, whereas in a fortnight no less than 220,000 passed in through the gates of the Automobile Show.

Experiences of Tri-cars.

As a rider of one year's experience, allow me to second the recent remarks of your correspondent "Paraffina." I have been riding an out-of-date machine, viz., a motor-bicycle with a fore-carriage frame attachment (I do not use the front seat), single gear, and belt drive. This machine is out in all weathers, and, besides taking me to my work and back again six days a week, has carried me more miles than I should care to count in week-end spins, etc., without a single breakdown or stop for more than a belt adjustment.

Although the engine is only $2\frac{1}{4}$ h.p., with a gear of six to one, it takes me regularly up a hill of 1 in 12 at about 15 m.p.h. without pedal assistance, and will average 18 m.p.h. over ordinary roads.

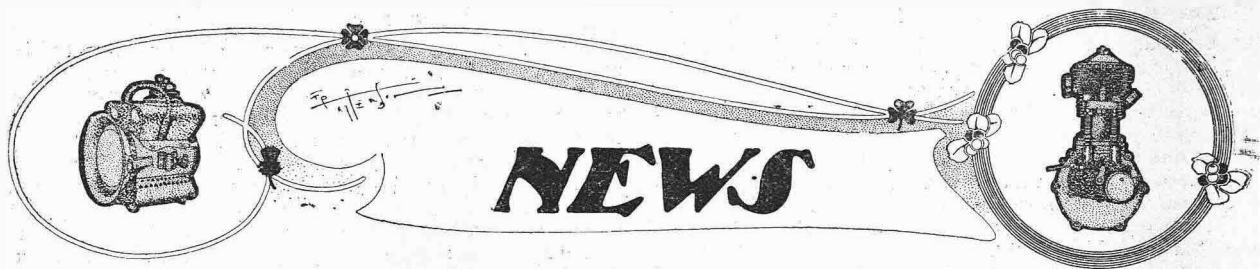
The steadiness on grease leaves nothing to be desired, but the steering (of the earliest type) originally was rather whippy, and was not adjustable for wear. The frame also was very weak laterally, but this was rectified by running two tubes from saddle to front axle.

In conclusion, let me say that I consider the tri-car is an excellent all-weather machine, but that if I were investing in a new one it would not be without springs for any consideration.

THETA.



Lord Hindlip's handsome 24 h.p. Wolseley car. It is fitted with a long double tonneau body with "rullip" seats moulded in aluminium, painted dark red, lined light red and white lines, and upholstered to match. A departure from the usual "Wolseley" practice is the fitting of a curved dash on which is mounted a plated rail, which greatly adds to the car's appearance; this rail is extended to serve as a support for the front portion of the canopy, where a glass weather screen is also fitted.



NEWS

The next great event!

The Olympia Exhibition in February.

The Ceylon Automobile Club, which was only established in November, already has 80 members.

The Hungarian Automobile Club, which was formed in 1899, now possesses a membership of 90.

The "Automobile Club Day" at the forthcoming Olympia Show has been fixed for Thursday, February 16th.

The Cardiff Motor Club promises to be a success. A general meeting was held at Cardiff last week, and a large number of members attended.

It is reported that it has been decided to hold another international race on the same day as the Gordon-Bennett race. Entries for this will be free.

The motor omnibus services instituted last year by the G.W. and L.S.W. Companies have proved great successes, and the services are likely to be extended.

An entry fee of half a guinea will henceforth be levied on all members joining the Yorkshire Automobile Club. This indicates a rapidly filling membership.

Negotiations have been pending for a motorcycle race at Canning Town between George Barnes and the young Italian Giuppono, whose recent performances in Paris have excited comment.

A meeting of the South Wales Auto Club was held last week. It was decided to hold a hill-climbing contest, but the date will not be fixed until the Leicester and Gloster A.C.'s have been consulted on the matter.

Mr. E. M. C. Instone, the commercial manager of the Daimler Motor Co., Coventry, after a visit to the Paris Salon, is convinced that to-day Great Britain has nothing to learn from other countries in the matter of automobile construction.

Ben Hind has won the gold medal for the longest non-stop car run in the Sheffield and District A.C. with 172 miles in 9hr. 55min. A similar medal for motorcyclists has been captured by A. T. Dewhurst with 50½ miles on a motorcycle.

Messrs. Muratti and Co., of Manchester, have presented a very handsome and valuable silver trophy to the Ulster section of the Motorcycle Union of Ireland to be competed for in July next. Like most challenge cups, it must be won three times to be secured outright.

We regret to report the death of the Rev. J. M. Bacon, the celebrated aeronaut. He was widely known also as a writer and lecturer, and he used his balloon on several occasions for carrying despatches in order to demonstrate its practicability for military service. He was, however, once run to earth by some automobile pursuers.

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.
- " 1. Final date for selecting Gordon-Bennett Course.
- " 4 to 19. Berlin Automobile Exhibition.
- " 4 to 11. Chicago Automobile Exhibition.
- " 5 to 19. Nice Automobile Meeting.
- " 10 to 18. Society of Motor Manufacturers and Traders' Exhibition at Olympia.
- " 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.

A party of carol singers connected with a Shepherd's Bush Tabernacle were conveyed from point to point by two motorcars at Christmas.

A Cambridge undergraduate has been killed whilst motorcycling, as the result of the recent heavy fogs. He collided with a cart and was killed instantly.

In our issue of last week a correspondent stated that the South Wales Auto Club debarred motorcyclists from the club. This was not so; any motorcyclist is at liberty to join the club.

Baron de Caters' new Cup will be confined to touring cars of standard make and catalogue price. A course of not less than 312 miles will be selected, affording a continuous run without compulsory stops.

The One Mile and Five Miles motorcycle records (standing start) for Australia have been lowered respectively from 1min. 18½sec. to 1min. 15½sec. and from 6min. 35sec. to 6min. 17sec. The new figures were in both cases set up by W. J. C. Elliott on an 8 h.p. Massey machine at Sydney.

The Motor Union has decided to communicate with the Board of Trade and to call attention to the great danger involved in the practice of stopping tramcars suddenly without giving warning to traffic behind. The M.U. suggests that regulations be framed enforcing the carrying of an automatic signal.

The island of Corsica is to have a motor exhibition of its own in connection with the International exhibition at Bastia. It will be confined to motors using denaturalised alcohol, and will include a road trial to be called "The Corsican Circuit."



LIKE POLAR BEARS!

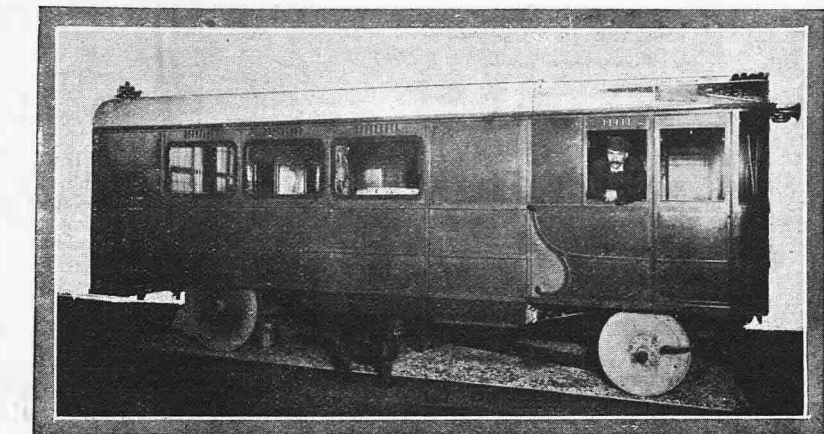
Captain Scott, R.N., of "Discovery" and Antarctic fame, is lecturing in the Provinces, and was at Brighton the other day. Appropriately enough, a number of heavily-furred automobilists, possessing a Polar bear-like appearance, entered the hall.

NEWS.

There has just arrived in Paris from Bordeaux a curious motorcar which is a sort of rolling house. The car belongs to a M. Secresto, and contains a kitchen, and dining, sleeping, and machinery rooms. The vehicle is 10 metres in length and is mounted with wooden wheels without tyres. The motor is of 20 h.p. and gives a speed of 30 kilometres (about 20 miles) an hour. The dining-room table can seat 20 persons, while the sleeping-room can accommodate two. The sleeping-room can be transformed into a drawing-room.

Light Motor Vans.

A huge field for business lies ready for working at the door of every manufacturer in this country, with promise of reasonable profits and absolutely no competition from foreign sources. We cannot name any maker of repute who has troubled (except in a haphazard sort of way) to cater for the big demand which will presently arise for light motor vans to carry about 10cwt. to 15cwt. We know that the majority of tradesmen who own one or two carts and horses are not yet sufficiently educated in the uses of the motor vehicle to appreciate the help they can obtain by running one for everyday work upon their business rounds; time must be allowed in their case for information and reliability to filter through. But we are certain we are not exaggerating when we state that there are literally thousands of retail business men in Great Britain who own from 6 to 20 light delivery vans each, with the necessary complement of horses and who would eagerly avail themselves at once of the facilities which the light motor vehicle offers them—if they could find the right pattern at a fair price. To put it mildly, past efforts in the direction of these light vehicles have been simply farcical; the usual plan has been to remove the pas-



The French motor-house referred to on this page.

senger body from a 6 h.p. car, fix on a hybrid something, dignified by the title of tilt body, and the maker proudly produces his "light motor van," guaranteed to break down at any and every opportunity. Many of our readers can recall the motor vehicles which some of the enterprising London drapery houses used for delivery purposes two or three years ago; these were simply converted passenger vehicles and spent best part of every week in the repair shop. Some of them were fitted with solid tyres, and as the complete machine was not originally designed to run upon these, the vans were an assured income for the local garage. For a light motor van to be a real and commercial success several points need very careful consideration, but we would emphasize as the more important—designing upon fresh lines, quite apart from fashion or demand as to passenger vehicles, and solely with the object of the van user in view; a slow running two-cylinder engine preferably using paraffin as fuel; simplicity of all working parts and protection of bearings from grit and mud; strongly trussed live axle, and solid tyres.

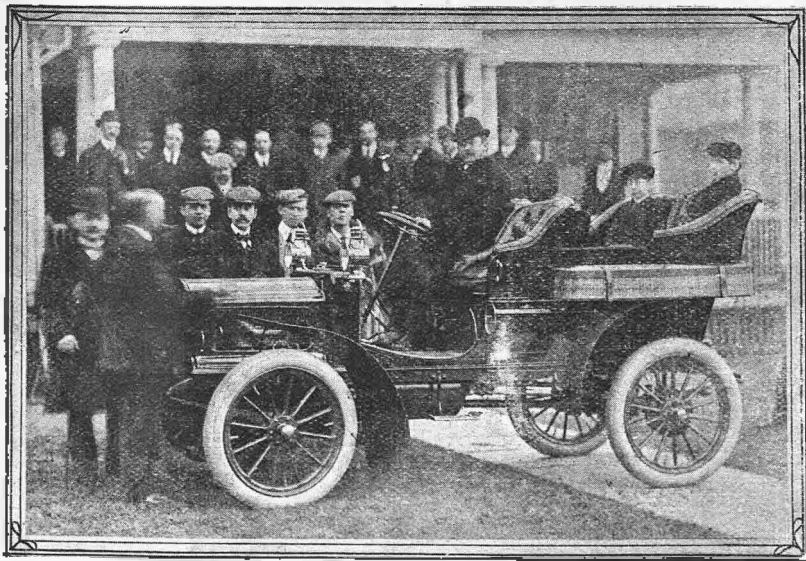
A Dangerous Trick.

The motorcycle has been pressed into the service of the sensation monger. A variation of the "looping the loop" feat, known as "A Leap to the Moon," has been performed in Berlin by a young lady named Dutrieu, who may be remembered as the heroine (save the mark!) of the "Human Arrow" or "Flight Through Space" feat at the Crystal Palace in 1903. The present trick is a development of the former, the lady being mounted on a motor-bicycle, which rushes down a steep inclined plane, then swerves sharply upwards and is hurled into space through a pictured representation of the moon. Miss Dutrieu was badly hurt the other day, the machine catching the edge of the platform on which the moon is raised.

Close of the Paris Show. The Social Side of the Exhibition.

The social side of the Paris Show is always well looked after, culminating in the "Salon Banquet," which winds up the Exhibition. Preceding this, however, there was the banquet given by the "Chambre Syndicate du Cycle et de l'Automobile." This was a great success, and several interesting and notable speeches were delivered by men eminent in the motoring world. It was held in the large hall of the Palais D'Orsay, the guest of the evening being M. Trouillot, Minister of Commerce. M. Darracq, the famous motor manufacturer, presided, and among others present were Messrs. Richard, Le Blanc, Rawlinson, Lacoste, Godefroy, Desponts, Michelin, Ducellier, Chenard, Givaudan, Godard, Schneider, de Pawlowski, etc.

On December 27th the Salon Banquet was held at the headquarters of the Automobile Club of France, a vast assembly of motoring and cycling celebrities being present. Mons. Trouillot was again an honoured guest, and Mons. Lepine (Prefect of Police) was also present. The French Press was represented by Messieurs Henri Rochefort and Bailly, in addition to a crowd of well-known motoring and sporting journalists. As usual, a musical and spectacular entertainment formed part of the proceedings, such celebrities as Mdle. Marguerite de Bernier, Mdle. Santori, Mdle. Eva du Perret, the famous beauty, Mdle. Cleo de Merode, etc., etc., contributing "turns." Speeches were delivered by M. Gustave Rives, Baron de Zuylen, M. Max Richard, M. Lepine, and M. Trouillot.



Mr. W. C. Scarrett, the retiring President of the American A.C., has been presented by his fellow members, as a mark of esteem, with a 15 h.p. White steam car. Mr. Scarrett is depicted on the car immediately after the presentation.

NEWS.

Overtaking Trams.

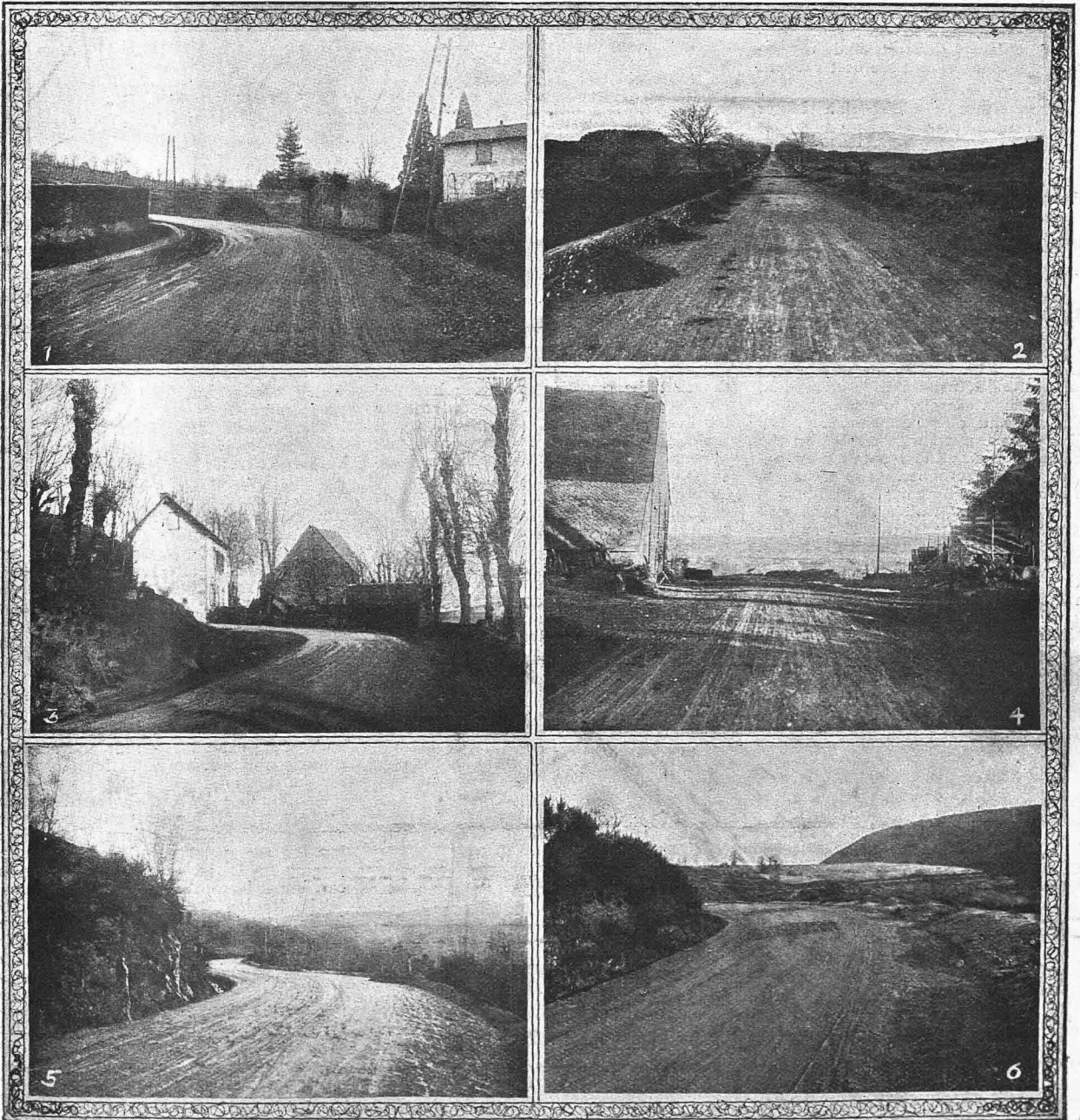
Supplementing our paragraph in the issue of December 27th on the rule of the road when overtaking trams, we learn that the Commissioner of the Dublin Police has communicated officially with the hon. sec. of the Irish A.C. on the subject. The Commissioner states that the Irish police do not insist upon motorists or cyclists following the law and overtaking on the off-side, as such a procedure may sometimes involve danger, but they do insist

that when a vehicle wishes to pass on the near-side when a tram is taking up or setting down passengers it (the vehicle) must pull up until the passengers are clear. The recent Blackrock prosecution was instituted by the police not because the cyclist passed on the near-side, but because he refused to allow foot passengers to cross before doing so.

The Gordon-Bennett Course.

The Automobile Club of France met last Wednesday, and selected the Auvergne course for this year's Gordon-Bennett race. From the plan and illustrations which we reproduce, the reader will get a general idea of the shape and nature

of the course. It is situated among the Auvergne hills in the Puy de Dome department of south-central France, some 80 to 100 miles due west of Lyons. The race will start near Clermont-Ferrand, from where the course runs in a south-westerly line to Rochefort and Bourglastic. Here it turns abruptly to the right and runs due north through Herment to Pontaumur, whence it doubles back at an acute angle before proceeding eastwards to Pontgibaud and Luzet, from which a short southerly stretch brings us back again to Clermont-Ferrand. The course has a number of sharp curves and stiff hills, and one level crossing.



THE GORDON-BENNETT COURSE.

(1) The first turn, 200 metres from the start. (2) The first straight run of the course (one kilometre from the pass of Moreno). (3) A dangerous turn just outside Rochefort. (4) Summit of steep hill outside Rochefort. (5) Stretch between Bourglastic and Herment. (6) Decline and corner before Pontaumur.

NEWS.

The A.C.G.B.I. van trials begin on April 1st, and not February 1st as we inadvertently stated in last week's issue.

A correspondent writes to say that a 1903 New Departure coaster hub fitted to a motorcycle has run 19,000 miles in all weathers without needing adjustment. This speaks well for the workmanship put into this popular hub.

The general impression among French motorists is that the Auvergne course, which has been selected for the Gordon-Bennett, is a very difficult one. Mons. Brasier, in particular, the maker of the car which won the race last year, considers it unfairly difficult, and has expressed the opinion that the best car will not necessarily win.

We hear that the Austrian Motor Liability Bill's prophesied evil effects upon the trade have already begun to materialise. Dealers are loudly complaining of stagnation in business. People, they say, hesitate to order in face of the heavy responsibilities created by the Bill. Austrian legislators have clearly furnished another example of "how not to do it."

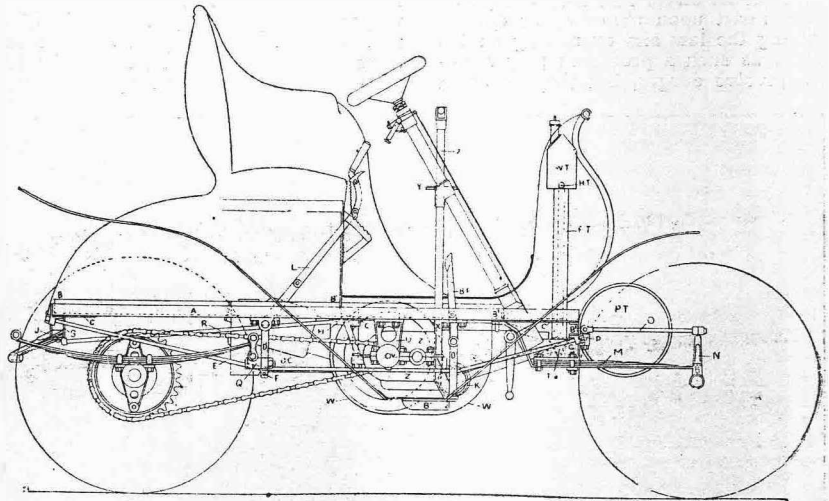
The Bergmann Car.

H. E. Hall and Co., of Tunbridge Wells, inform us that they have secured the sole agency for the United Kingdom of the Bergmann automobile, which is a light, well-built, two-seated car, retailed at 115 guineas. Owing to its simplicity, durability, and all-round efficiency, the car has a large number of friends on the Continent. It has the reputation of being a good hill climber. The transmission is by Messrs. Bergmann's well-known friction drive, in which the necessary pressure between the friction disc and the fly-wheel is produced automatically by the forward movement of the driving wheels, so that any possible slipping of the friction disc is counteracted. Five of these cars will be shown at the Crystal Palace Exhibition.

AN INTERESTING LIGHT CAR.

Mr. C. M. Shaw, of 25, Clapham Road, London, S.W., has designed and constructed a light 6 h.p. two-seated car, which, for a car so constructed, has some interesting points. The main details of the car are clearly shown in the accompanying line drawing, while its general appearance is depicted in the photo-reproduction. With regard to the latter, we may

of angle steel (A, A1), the transverse pieces (B, B1, B2) being of the same material, and B3 of channel steel. These are connected by the web plates (C) and steel rivets. The frame is completed by the steel struts (D, D1), etc., the tie rods (E), the cross piece of angle steel (B4) and another tie rod (AF). There is also a light piece of angle steel between B1 and B2,



Side elevation of the Shaw car.

say that the car was originally intended for a steam vehicle, and this accounts for the flue hole in the side of the body and the casings underneath. These would not appear on the petrol car. The suspensions, brakes, and steering gear have also been altered as seen by the drawing. The general design, however, remains the same, and Mr. Shaw informs us that the photograph gives a good idea of the appearance of his car, which is entirely a home-made production.

The details of its construction are as follows:—The main part of the frame is composed of the two longitudinal lengths

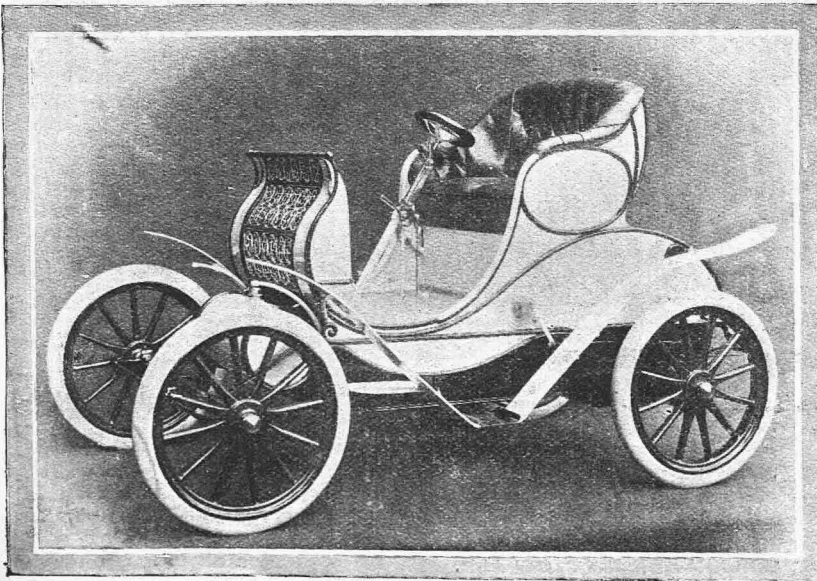
which carries one of the bearings for pedal spindle.

The piece B3 has the following fittings attached to it, viz., two cast steel brackets (G) for the front springs, two gun-metal castings supporting the radiator, two lamp irons, two mudguard irons, two angle steel brackets supporting the petrol and lubricating oil tank (PT), and the two tie rods (E, E1). B2 supports the two ends of the front springs, and the steering gear-box. B1 also forms one of the supports for the motor and change speed gear-case, and also has the bracket (H) for the vertical clutch shaft fixed to it. B has the transverse spring (J) and the tie rods (E, E1) attached to it. B4 forms the other support for the motor and change speed gear-case. In addition, it supports the circulating pump (K). The ends of B4 extend outwards and are bent towards the rear so as to form supports for the steps.

The forging D forms a strut for the frame, a support for the motor and change speed gear-case, a step iron, and a bearing for the pedal spindle. A similar forging to D is on the other side of car, but it has no bearing formed in it.

The forging D1 forms a strut for the frame, a scroll iron, and a bracket to receive the fulcrum pin of the hand brake lever (L). A similar forging to D1 on the other side of car also forms a strut for frame, a scroll iron, and a bearing for the short length of shafting used for starting the motor. The forgings (D1) are connected at their lower ends by the tie rod (F).

The fore-part of car is supported by two cantilever springs (M). The fore-ends of these springs are provided with eyes and are connected by pins to the vertical levers (N) fixed to the front axle. The rear ends of springs (M) are clipped to the cast steel brackets (G), and the bottom



The Shaw 6 h.p. light car.

NEWS.

plate is bent upwards and bolted to the cross member of frame (B₂). The upper ends of levers (N) are

CONNECTED BY MEANS OF A BALL AND SOCKET JOINT

to the horizontal rod (O). The rear end of rod (O) is forked and is pinned to the vertical bolt (P), which is made a working fit in the casting (G). All motion of the front axle is thus provided for, and the forks and pivot axles are always vertical.

The rear portion of the car is supported by two semi-elliptic springs and a transverse spring (J). The fore-ends of the semi-elliptic springs are connected by shackles to a universal joint piece (Q) and Q is supported by the forging D. The rear ends of the semi-elliptic springs are connected by double shackles to the transverse spring. The transverse spring is bent rearwards as shown, and the bending stress that would be on the straps (S) is removed by the tie rod (R).

The front axle is a steel tube provided with steel forks at the ends for the pivot axles and the levers (N).

The rear axle consists of a solid steel axle extending to the outside of each rear hub. The near-side wheel is fixed to the axle direct, and the off-side wheel is fixed to a sleeve working on a reduced portion of the axle. The inner end of the sleeve has one of the spur wheels of the differential keyed to it in the usual way. The rear axle runs on roller bearings.

The engine has one cylinder, 4½ in. bore by 5 in. stroke, and runs at

A NORMAL SPEED OF 800 REVS. PER MINUTE AND DEVELOPING 6 H.P.

The axis of the engine is inclined at 15 degrees to the horizontal. The valves are mechanically-operated, and are situated in the end of cylinder. The stems of the valves are vertical. The valve covers can be removed after a movable portion of the floor under the seat has been taken out. The valve springs can be easily compressed by using the bosses of the bell crank levers as fulcra for a forked lever, after which the cotters through valve stems can be removed. The adjustable tappet rods, bell crank levers, valve springs and stems are enclosed in a dust-proof casing (DC) attached to the underside of cylinder. The exhaust silencer is placed on the off-side of cylinder, and the carburetter on the near-side. The water circulation is maintained by a centrifugal pump (K), driven by friction from the fly-wheel of motor. The crank webs, crank pin, and big end of connecting rod are balanced by weights fixed to the crank webs. The crankshaft, connecting rod, and piston can be removed after the top half of crank chamber has been removed. The fly-wheel contains an internal leather faced expanding clutch. High-tension magneto ignition is fitted.

The change speed gear is of the sliding spur-wheel type, and gives two forward speeds and a reverse with direct drive on top speed. The outer end of first motion shaft runs in a ball bearing formed in the steel casting (U), and this bearing takes the pull of the chain. The adjustable

radius rods are connected by universal joints at the point (V).

Regarding lubrication, the crank pin and main bearings of motor are lubricated by splash in the usual way. All other working parts are lubricated by an automatic pump worked off the inner end of the half-speed shaft. This pump gives a few strokes every now and then, at other times it is at rest.

A dust-proof casing (W) surrounds the motor, change speed gear-case, etc.

Coming to the control, steering is by hand, wheel, and screw, and nut gearing. The usual throttle and ignition levers are fitted on the column as shown.

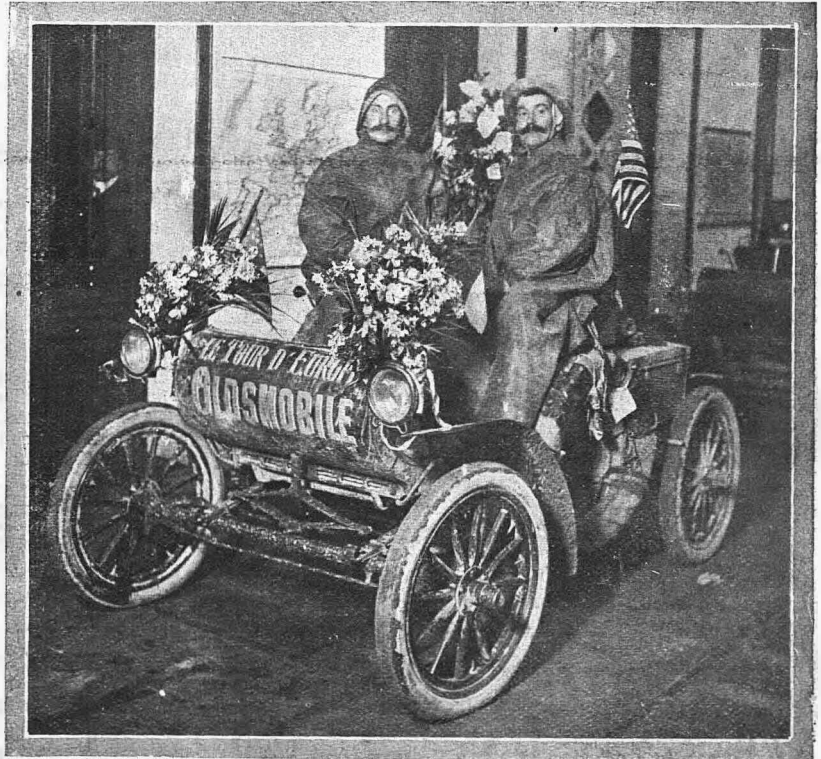
The change speed lever is horizontal, and is hinged to the top of the vertical steel tube (X). A notched plate is fitted

forated at intervals along its length so that the water is properly distributed amongst the cooling tubes. The radiator is removed by taking the cap of filling plug off, and then the bolts that connect the gun-metal brackets at its base to the channel steel (B₃).

The designer says that a car of this type can be turned out at £150.

The White and Poppe engine described and illustrated last week is 80 x 85. The dimensions as stated last week were given us in error.

Chicago "Motor Age" facetiously remarks that American importers might find a ready sale for English tri-cars if they would throw in an imported road with every machine.



Maurice Fournier on the Oldsmobile car on which he has just completed a tour through Europe.

at Y, and when it is required to shift gear the handle end of lever is raised slightly and shifted round to the position required. The tube (X) goes straight down into the lower half of change speed gear-case (Z), and its lower end is fitted with a lever which is coupled up by means of links to the fork that slides the wheels along the squared first motion shaft. A large internal expanding brake is fitted to the sprocket on back axle, and is operated by pedal (B₁).

Internal expanding brakes are also fitted to each of the rear wheels, and these are operated by the hand lever (L) through the medium of flexible steel cords.

The radiator is mainly composed of flattened tubes (FT), these are connected at their top ends to the water tank (WT), and at their lower ends to a triangular tube (TT). The water enters the radiator through the tube shown dotted and passes along a horizontal tube (HT) situated in the water tank. The tube (HT) is per-

By a slip of the pen we announced in our issue of December 27th that Sir Wm. Crundall and Mr. Basil Joy had received A.C.G.B.I. medals in connection with the cross-Channel motor-boat race. It was the Automobile Club of France who presented the medals.

The Ueeder Dashboard Odometer.

Messrs. Markt and Co., 20, Chapel Street, Milton Street, London, E.C., have introduced a new Odometer, or distance recorder, for fitting on cars. There are two dials; one gives the distance of each trip, and the other totals up the mileage. The indicator has to be fixed to the car dashboard so that it is in full view of the driver. The transmission from the road wheel is effected by a flexible shaft. One type has a direct drive from the flexible shaft, and the other is provided with a bevel reducing gear, so that the parts move much more slowly, which means that the wear is very slight.

NEWS.

If the gentleman, "H.R.P." (Ben Rhyding), whose letter, "Fitting a Carbureter," appears on page 544 of "THE MOTOR," December 13th, 1904, would favour us with his address we should be pleased to forward a letter which we have for him.

An American Association of Automobile Engineers.

A new organisation styled the Engineers' Branch of the Association of Licensed Automobile Manufacturers has just been established in New York, the object of which is the exchange of ideas in construction and a study of the methods by which the automobile may be best simplified through a reduction of the number of parts, their standardisation and the most accessible arrangement of them, while at the same time the cost of production may be lowered. A meeting of the whole body of engineers and superintendents has been called for January 19th, to be held in New York, when the organisation will be completed. The branch of the A.L.A.M., says an American exchange, will deal entirely with constructional questions and act in an advisory capacity to the manufacturers, but there will be no consideration of such subjects as a price agreement, the A.L.A.M. not concerning itself with this matter, nor will there be any seeking after a uniformity of design, as it is the policy of the main body not to discourage in any way either competition or the free expression of individuality in the output of its 30 members.

AMERICAN TOPICS.

NEW YORK, December 21st, 1904.

More Speed Work by Oldfield.

There is very little doing but there is lots to talk about, just now, among "the men who mote" on this side of the Atlantic. First of all, there is that wonderful new smashing of records by the "Wizard on Wheels," Barney Oldfield, at Fresno, Cal., on December 13th. Up to 2 p.m. rain promised to prohibit any attempt at automobile racing, but the track was scraped, and dried, to make it as fast as possible, and at 3 o'clock the "wizard of the motorcar" broke every existing track record from 25 to 50 miles, and also the track record for 15 miles. The first mile was reeled off in 56½secs., the second in 55½secs., and the fifth in 55½secs. He made the 10 miles in 9mins. 18½secs, or six seconds slower than the world's record. One and two-fifth seconds were clipped from the world's record for 15 miles, the distance being covered in 14mins. 3½secs. A brilliant attempt was made to beat the 20-mile record, but it failed by a few seconds. The 25 miles was covered in 23mins. 38½secs., beating the former records by over 20 seconds, and the 50 was completed in 48mins. 39½secs., beating Charles Gornet and his big Winton by 7mins. 2½secs.

American Shows.

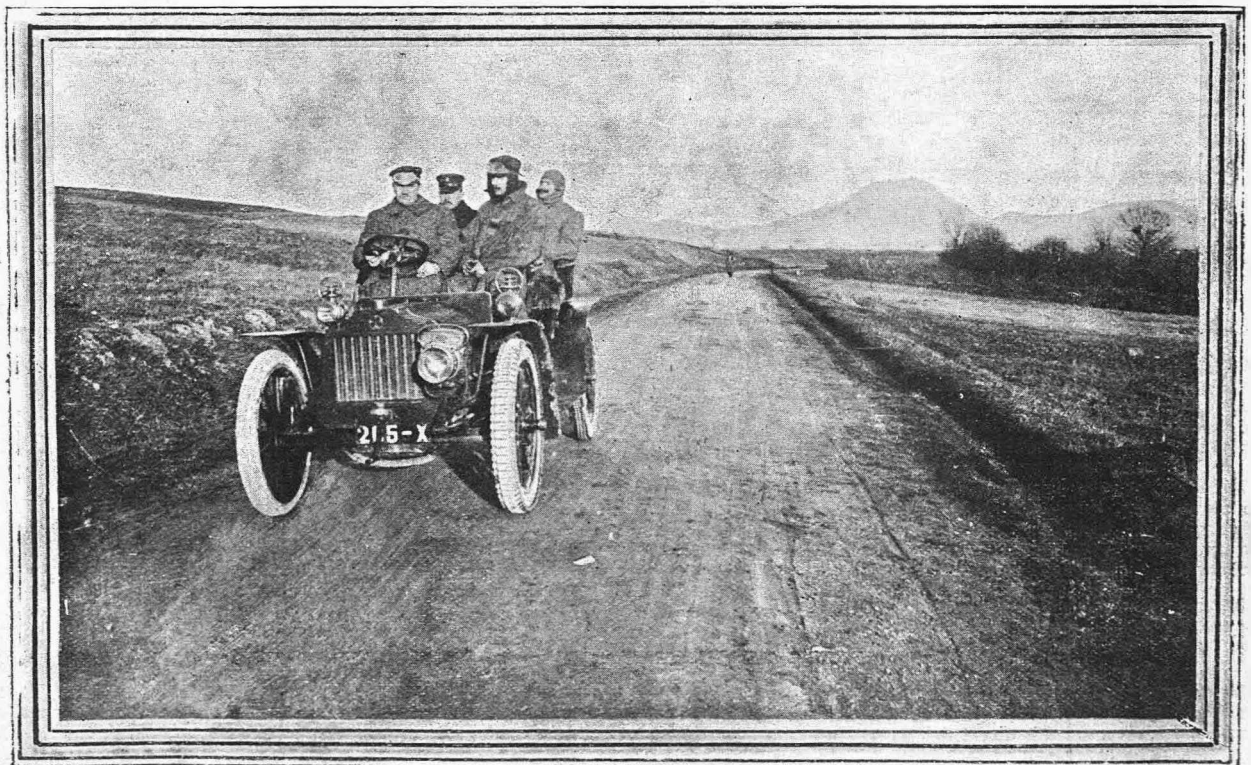
There is a lot of talk about the two big coming automobile exhibitions, the annual National Automobile Show, and the Salon, to be held by the American importers of European automobiles. The first will be "the biggest ever." Unusual honour is to be shown the second, for the diplomatic representatives of five coun-

tries, whose industry will be represented, have authorised the use of their names as patrons, and have promised to visit the exhibition of European machines. Messrs. E. Rand, Hollander, and E. T. Kimball, of the Importers' Automobile Salon, who recently went to Washington to wait upon the foreign representatives, have returned with the written authorisation of the ambassadors of Italy, France, Germany, Great Britain, and Belgium as patrons of the Salon. The foreign ministers, and particularly Baron Mayer des Planches, of Italy, and M. Jusserand, of France, evinced keen interest in the importation of the machines of their respective countries to the United States. In view of the fact that the Salon will be the first exhibition ever held in this country of foreign cars exclusively, the importers express gratification at the distinguished patronage under which the Show will open. The foreign ministers will head a list of nearly 100 persons, prominent in society or automobilism, who have consented to act as patrons.

Motorcycles will, as usual, form a part, a very modest part, of the Automobile Show. On the main floor they will be, of course, exhibited in connection with the cars displayed by the respective makers, but on the upper balcony there will be a little colony of motorcycle exhibits.

A January Fixture.

The Ormond-Daytona Beach races, in Florida, are the leading automobile events of the year, and they easily overshadow every other function in an automobile way. This winter's races, which are



Messieurs Therz, Brazier, Callois and another taking a spin over the 1905 Gordon-Bennett route.

NEWS.

scheduled for January 23rd to 28th inclusive, constitute the third annual tournament, and will, as heretofore, be given under the auspices of the Florida East Coast Automobile Association. The official headquarters of the great meet will, as usual, be at Ormond, but the tournament will be divided equally between the latter place and the pretty city of Daytona.

Drivers from every point of the United States, and Europe, are getting ready to go to Florida, and it will be a battle of giants when they meet on the famous beach course in January. To accommodate this host a special and costly automobile motor-house has been built at Ormond, together with a special hotel for the drivers and mechanics, who will accompany their employers in the quest of fame and trophies. Every country will be represented, and the races for the costly International Cup presented by Sir Thomas R. Dewar, M.P., of London, who will be present, will be keen indeed.

The Stanley Motor Carriage Co. are placing on the market for 1905 five new models of steam cars. Three of these will have the boiler in front under the bonnet. A 20 h.p. touring car for five passengers will be an interesting type. This car will be fitted with a side entrance tonneau body. The agents for Stanley cars are Messrs. Galloway and Co., Sunderland Road, Gateshead-on-Tyne.

A Satisfactory Report.

The annual report of the Civil Service Motor and Cycle Agency, Ltd., High Holborn, London, shows a gross profit of £4,279 2s. 1d. for the business year, and a net profit of £823 3s. 8½d. The gross profit shows a substantial increase on last year's figures, and the net profit a slight decrease, this being due to certain expenses which have not figured in previous balance-sheets. The percentage of expenses to turnover remains about the same, and a decrease of relative expense is anticipated in the coming year. In addition to the interim dividend already paid on preference shares, the balance of the dividend on 6 per cent. cumulative preferences and 7 per cent. preferred ordinaries will be paid, as well as a dividend of 5 per cent. on ordinary shares.



Anzani, the well-known breaker of motorcycle track records, going at full speed.

A limited liability company, with a capital of over £100,000, has been floated in Berlin for the purpose of manufacturing the new Edison accumulator. It will begin operations within the next few days.

Ripley Roadmenders' Dinners.

There will be four Ripley roadmenders' dinners given this spring, at intervals of a fortnight in February and March, as follows:—New Inn, Ham Common; Angel, Thames Ditton; White Lion, Cobham; Anchor, Ripley. Many of our readers will no doubt be glad to send a trifle to the fund for so deserving an object: contributions may be forwarded to the Secretary of the Motor Union, 16, Down Street, Piccadilly; or to Mr. G. P. Giuseppe, 72, Shaftesbury Avenue, Hammersmith.

Winter Storage of Motorcycles.

In storing motorcycles for the winter, the advisability of "jacking up" the wheels should suggest itself, and is referred to by the "Bicycling World" in a timely paragraph. While bicycles can be easily suspended or turned upside down—and either of these procedures are desirable—the construction and greater weight of the motor-driven article require other methods in order to relieve the tyres of their burden. On those motor-bicycles fitted with exhaust valve lifters it is well to keep the valve closed, in order that the spring may be relieved of tension during the months of disuse. As our contemporary remarks, this will tend to preserve the elasticity of the spring.

The United Motor Industries, Ltd., are giving away, post free, a set of repair docket books to any motor repairer who will write up to the company at 45, Great Marlborough Street, London, W.

The Commissioners of the Exposition d'Automobiles, which has just come to a close, have awarded Messrs. C. S. Rolls and Co. a medal for the elegance and comfort of their Rolls-Royce cars.

Motorcycling Record at the Winter Track, Paris.

Anzani's recent figures for the 100 kilometres light motorcycle path record have not been allowed to remain for long. The young Italian rider Giuppone attacked them just before Christmas at the Winter Track in Paris, and succeeded in lowering them. He covered the full distance of 100 kilometres (62½ miles) in 1 hr. 6min. 36½sec.; and, incidentally, established a fresh record for the hour—90 kiloms. 360 metres. Giuppone rode a special Peugeot racing machine. The times at every 10th kilometre were:—

	H.	M.	S.
10 kilometres	6	10	36½
20 "	12	10	36½
30 "	18	47	36½
40 "	25	45	36½
50 "	32	39	36½
60 "	39	27	36½
70 "	46	12	36½
80 "	52	56	36½
90 "	59	44	36½
100 "	1	6	36½



Racing on the famous Ormond-Daytona Beach, Florida

NEWS.

Dr. Henderson Pounds, of Derby, who was recently thrown out of his car through colliding with a dog, has died of his injuries.

The Spread of Automobilmism in New Zealand.

Mr. M. A. Jenny, the Secretary and Treasurer of the Nelson Automobile Association, New Zealand, has written us the following interesting letter:—

In the last number of "THE MOTOR" which I received, I see that a gentleman in Western Australia gave some information on motoring in general in that country, and it may be of some interest to you to learn how this sport is advancing in our beautiful islands. Only a very few cars of a small size made their appearance about three years ago, mostly all Benz cars of the old type. In 1901 an Auckland firm imported some Oldsmobiles, which cars found a ready sale for the first two years. Soon after the Darracq was imported into New Zealand, and the makers of this car have, so far, decidedly the best trade, supplying one or two coaching companies in Rotorua and a goodly number to doctors and private people. In the course of the last two years the New Zealand market got

SWAMPED WITH AMERICAN CARS.

Christchurch tried hard to push these American cars, which are now being superseded by French and English makes. I may only mention a few of the American cars offered in Christchurch at abnormally high prices, viz., The Conrad, Orient, Buckboard, Rambler, Oldsmobile, Ford, Northern, and others, superseded now by Humbers, Dion-Boutons, and Simms Welbeck cars. The people in general are slow in taking up the new sport, and cars are not so easily sold as importers out here make you believe. This is partly due to the fact that the majority of roads are unsuitable, to the entire absence of really good and experienced motor experts, and also to the high prices charged for cars out here. Invercargill, Timaru, Oamaru and Napier are the favourite centres; the roads near these places are good, at least in the summer time. Napier boasts of about 10 cars, the other centres only three or four. Canterbury possesses long stretches of good roads, all more or less metalled, but

THE ENORMOUS QUANTITY OF DUST IN SUMMER,

the endless water-races crossing the roads and the frequency of unbridged rivers are a great disadvantage to motoring. Dunedin and Wellington are hilly, and there are few cars in each of these towns. Auckland is in parts hilly, but it possesses fair roads in summer; in winter time only a few of the roads are passable for motors, others being of clay formation and simply impossible for any vehicular traffic. The Auckland Automobile Association was established at the end of 1902. The writer was instrumental in establishing the Canterbury Automobile Association last year and the Nelson Automobile Association this year. Auckland has about 60 members on the roll; Canterbury about the same, and Nelson 12.

A Richmond motorist who was alleged to have driven his car at 25 miles an hour offered to give £10 to a charity if anyone could succeed in driving the car at a faster rate than 17 miles an hour. The Bench did not accept this sporting offer; but they dismissed the charge of exceeding the legal limit.

Lincolnshire A.C.

Capt. J. A. Cole, J.P., Chairman of the Administrative Committee of the Lincolnshire Automobile Club, presided at a meeting of the committee at the White Hart Hotel, Sleaford, on Wednesday, December 21st. In addition to the Chairman there were also present Mr. C. W. Pennell, J.P. (Lincoln), Mr. W. R. Pennell (Lincoln), Dr. Gilpin (Bourne), Dr. Godfrey Lowe (Lincoln), Mr. George Godson (Asgarby), and Dr. Cragg (the Club Secretary). A draft of the new club rules were before the meeting, and these were ordered to be circulated amongst the members for approval and confirmation at the general annual meeting to be held in February. Three new members were enrolled, namely, Earl Brownlow (Lord Lieutenant of Lincolnshire), the Rev. J. Herbert Heath (Folkingham), and Dr. Stitt-Thomson (Lincoln).

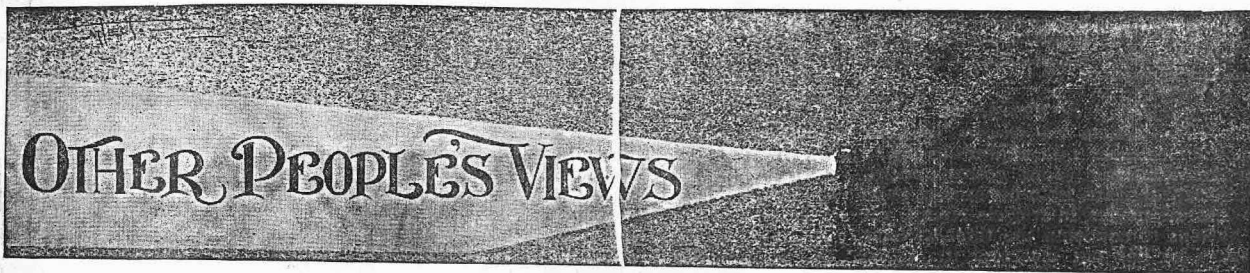
The number of motor buses in London is rapidly increasing.

Value of Motor Vehicles for Municipal Work.

In a letter on the subject of roads and road-making which appeared recently in a Kentish journal, the following paragraph is worthy of quotation— Now when you have got a good road engineer you want him over his district in the smallest space of time. A motorcycle or a motorcar is the thing to do it. Your one first-class man could then do more than double the work of two with no fatigue. At one time we had two road surveyors in our district who usually walked their roads; but walking does not discover the bumpy, bad roads like a rapidly-moving motorcar. I dare say either of those gentlemen would have thought that he had done well after walking perhaps 10 or 15 miles; whereas with a motorcar, after travelling 10 times that distance, the man would be as fresh as when he started, and quite ready for a little clerical work at home. The motor could be kept in repair at the council's own repair shops, where their road rollers, etc., were repaired, at very small comparative cost."



"K9."—An after-dinner dream of—dogst



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.

Carburettor Flooding.

Sir,—Having just been acquainted with chronic flooding in a Longuemare carburettor, caused by the air inlet valve or trap being jammed in a shut position, thereby diverting all suction to jet, and causing flooding, I would suggest "H.H." (Sedbergh) to look for this in reply to his query in a recent issue.—Yours faithfully,
MONTAGUE GREENWOOD.

Dust Raised by Cars.

Sir,—I have been much interested in your leading article in a recent issue of "THE MOTOR" on the question of dust raised by cars. I do not know if you are already aware of it, that there is at least one car on the market which embodies all the ideal points suggested by you, and, in addition to your suggestions, it has no revolving machinery exposed to the air; so that no dust is stirred up in this way. The whole of the machinery is enclosed in an aluminium case. I refer to the new 8 h.p. Rover, which certainly throws up less dust than any car I have seen.—Yours faithfully,
H1103.

Sir,—I read in "THE MOTOR" accounts of attempts to keep down the dust by tarring the roads, yet I notice on a large number of cars and motorcycles (cycles in particular) that the outlet of the silencer is directed straight on to the ground, which, I should think, must raise as much dust as the rest of the vehicle. As an instance, during the summer I saw a car standing on Marlow Bridge, with the engine running free, yet it was simply enveloped in a cloud of dust, although the road wheels were stationary. In another instance the outlet of the silencer came within about three inches of the ground, pointing directly down. The other day this machine stood out in the road with the engine running free; the road was wet and muddy, so there was no dust to blow about, but instead it had blown quite a hole in the soft road. I could mention several makers of repute who pay no heed whatever to this simple but highly important detail, for there is no getting away from the fact that the "Dust Nuisance" is not a matter to be lightly dealt with; and, in my opinion, the first thing for the motorist to do to lessen public prejudice is to seriously tackle the problem. On more than one occasion whilst driving my tri-car on a main, dusty road, and being overtaken by a large car, the dust cloud has been so bad that I have had to stop, as it was impossible to see either side of the road. When one's own feelings towards a fellow-motorist on occasions like this are the reverse of amiable, what must be the feelings of a motorphobe?—Yours faithfully,
BENTFIELD C. HUCKS.

The Kynoch Motorcycle.

Sir,—Would any of your readers give me their experiences of the Kynoch motor-bicycle?—Yours faithfully,
FC103

The Bozier Two-speed Gear.

Sir,—I can quite endorse J. D. Walker's favourable opinion of the Bozier gear in a recent issue, but disagree with his statement that "one cannot put the clutch in gently." I have used this gear on a 3½ h.p. De Dion tricycle for several thousand miles, and find that the gentle action of the clutch depends (a) on the good condition of the leather; (b) on suitably delicate manipulation of the lever. I quite agree that the manipulation would be rendered easier by a longer lever, but it must be remembered that a long lever on the top bar of a tricycle would be distinctly inconvenient.—Yours faithfully,
E.J.W.

Sir,—I see that J. D. Walker speaks favourably of the Bozier two-speed gear. I would also like to say a word in favour of this gear. I am at present driving a small Rochet car (engine behind) and the gear has, so far as I know, never developed any mechanical defect since the car was built. That this gear has been well tried and found reliable is proved by the fact that the makers of the Rochet cars fit the same gear to-day; this also is rather interesting, as so few (if any) other makers are building light cars with the engine at the rear. Personally, I find this position more accessible than when the engine is in front under a bonnet. It might be of interest to other users of cars with engines in this position if someone would suggest a really simple method of keeping the mud off the engine. Some device to effect this would be an advantage.—Yours faithfully,
WING.

Air-cooling Device.

Sir,—The air-cooling device referred to by "A.D.E." is probably the patent of the Pelham Cycle Co., of Gravesend. I have it fitted to my Clyde, not because I was troubled with overheating, but to enable me to use paraffin more satisfactorily. The apparatus does all that is claimed for it, and is not an expensive fitting. Would some of your other correspondents tell me if they find the cheapest or the dearest paraffin the most satisfactory?—Yours faithfully,
BK39.

Hints About the 3 h.p. Fafnir Engine.

Sir,—In reply to "A.D.E.'s" letter in your issue of Dec. 6th, I believe that the contrivance he mentions has been patented by a firm of motor dealers at Herne Bay, Kent, but I do not know their name. However, I think that if he adopts the following simple plan, he will find no need for fitting up any arrangement for additional cooling on his 3 h.p. Fafnir:—Disconnect the rod from the governor (acting on exhaust valve in 1904 pattern); cut the induction pipe, and insert a throttle, which will completely shut off the gas when closed; connect up rod, and work from top tube as before. I found this alteration made a wonderful difference to the running of the engine; it took hills better; was far swifter on level and down hill than it had hitherto been; and ran much cooler. I have also fitted an exhaust cut-out, for aid on hills. My gear is 4 to 1, weight about 11 stone, machine about 10lb. Trusting this letter may be of assistance to other users of this engine, for which I have nothing but praise during a season's use.—Yours faithfully,
J. E. CARTER.

Excessive Hotel Charges.

Sir,—Might I suggest that all motorists should make a note of the various hotels, inns, repairers, etc., in the British Isles where they have been overcharged for refreshments and garage? I think a list of such places would be very useful for the coming season, especially for those who intend taking lengthy tours. There is no doubt, if all motorists were asked through the medium of your columns to report upon the treatment received in the various towns they have visited it would be most popular and a great boon to motorists in general.—Yours faithfully,
DU69.

[We are afraid that, since no two motorists' ideas as to charges, attention, comfort, cookery, etc., coincide, our correspondent's suggestion would prove less useful than he anticipates—apart from the obvious difficulties which such a scheme would present.—ED. "THE MOTOR."]

WHEN IN DOUBT
CONSULT
THE MOTOR
MANUAL,
THE SIXTH EDITION
(40th thousand) of which is now ready.
PRICE ONE SHILLING.

O.P.U.

Steering of Tri-cars.

Sir.—The article on tri-cars in your issue of December 13th appears to me to call for criticism. Your correspondent, "Petrolia," appears, from his article, to be an absolute novice in tricycle riding, yet he hastens to condemn the three-wheeler because he has not mastered it. If he will apply the same rule to the bicycle, he will find that the single-tracker is a peculiarly uncanny instrument to novices who have not learnt the art of balancing. As an old tricyclist and present-day enthusiastic tri-carist, I have no hesitation in styling his statement about the steering of three-wheelers as "nonsense." No man who knows how to ride feels the least bit inclined to topple over on a sharply cambered road, and corners can be taken quite as fast as is advisable, having regard to the necessity of seeing round them. I admit it is possible that "Petrolia" may feel this tendency to topple over, but it is solely due to attempting to balance himself on a tricycle as he would do on a bicycle, as I have seen some of our best bicyclists absolutely unable to steer a tricycle on a dead straight road from this cause, whilst a novice who had never ridden a bicycle steered the tricycle with ease, but I never before heard of one of the aforesaid bicyclists condemning the three-wheeler because of his incompetence.—Yours faithfully,

G. P. MILLS.

Cause of Water Boiling Away.

Sir.—Under the above heading I notice that "DO114" has a grievance to make about his Olympia tandem, 3½ h.p., water-cooled. I have driven one of these machines for 1,800 miles, and must say that I have, after the first day, covered as much as 74 miles on 1½ gallons of water. The tank is practically the same as "DO114's," and has the overflow pipe and filling plug, out of which I have noticed water being thrown when on bumpy roads. I remember the first day I drove it I only got 30 miles, and had to fill up again. This I attribute to not being used to the machine and to driving with too much gas, and on the spark advance. Perhaps your correspondent does the same. It is a very common fault. Twenty miles is a ridiculously short distance to go on a gallon and a half of water, and if it is not lost through the overflow pipe and filling plug, and through leaks in the circulation pipes, the cause must be put down to bad driving. Another cause of boiling water rapidly may be that the flexible tube where the pipes are pushed into the rubber have skinned the inside lining of the rubber and got partly stopped up, thus causing bad and slow circulation, with consequent boiling. I have only once had a jet of steam issue from the overflow pipe, and that was when the water was low in the tank and I had a long hill to tackle. When I reached the top there was a fine cloud of steam, which was not to be wondered at, as I had covered close on 65 miles. My experiences with the Humber-Olympia tandem have been absolutely satisfactory in every way, and I consider them absolutely reliable. I have not any interest in Humpers, needless to say.—Yours faithfully, D.J.M. (B1582.)

B20

Side-car v. Tri-car.

Sir.—"Petrolia," in his article in recent issues of "THE MOTOR," complains, among other things, of insufficient weight on the driving wheel of a tri-car. A.C.B. (1423), in the issue of November 22nd, suggests bringing the centre of gravity very much further back. But this would cause the machine to be rather unstable in going round corners; I think this is quite obvious, for assuming that the centre of gravity was immediately over the back wheel it would be in unstable equilibrium even when standing. A.C.B. also says that he prefers a side-car principally on account of its efficient weight on the back wheel in a tri-car; I quite agree with him, but I should like to suggest an improvement. If a 2 h.p. engine, with coil, be fixed on to a side-car driving by means of a belt, or chain with free engine clutch, on to the side-car wheel, the inlet being connected to the carburetter of the other motor and the coil connected to the accumulators of the bi-

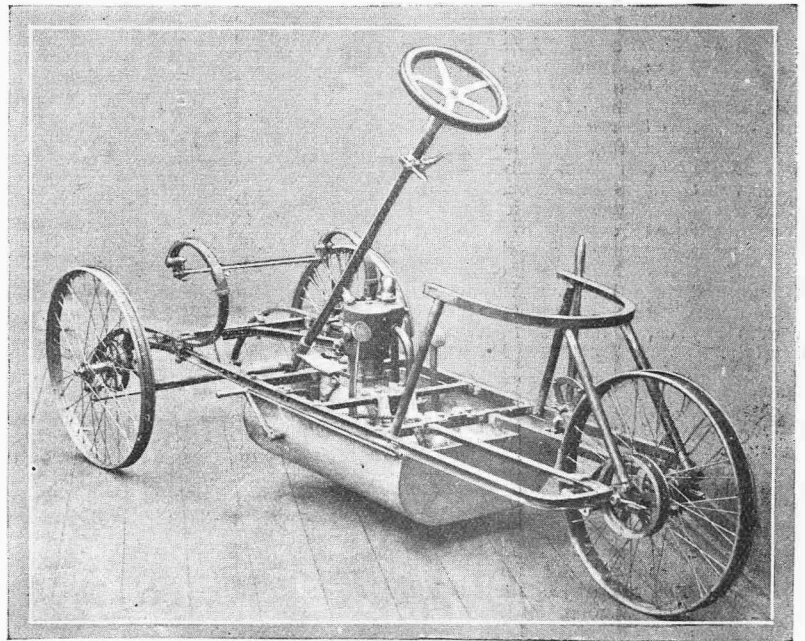
ceeded. With passengers these could be exceeded by a small amount in the case of the tri-car and by a large amount in the case of the side-car, the radius of the curve traversed by machines being 70ft., gauge of side-car being assumed to be 3ft., and tri-car 3ft. 6in.—Yours faithfully,

A STUDENT OF ENGINEERING.

P.S.—The formula for the above was taken as—

$$V = \sqrt{\frac{RD A}{0.672 H L}}$$

where V = velocity in miles per hour; R = radius of curvature or arc in feet; D = distance of the line of contact of the wheels with road from centre of gravity of the machine and man (measured parallel to road and perpendicular to machine) in feet; H = height of centre of gravity above road in feet; A = length from centre of back wheel to centre of a front wheel in feet; L = wheel base in feet.



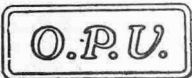
A view of the new Revolution Tri-car (which we recently described) with body removed.

cycle, the following advantages, among others, would be obtained:—(1) price £20 to £24, with £40 motor-bicycle £60 to £64, which is very much less than a tri-car of the same horse-power; (2) over 5 h.p. without water-cooling; (3) weight not more than 60lb. to 70lb., making a total weight with bicycle of 200lb. (tri-cars seem to weigh from 30wt. to 50wt.); (4) easy steering, provided the axes of the two hind wheels are in a straight line at right angles to the line joining the front wheel (when straight) with the back of the bicycle (this applies to all fixed wheel side-cars). I have calculated that with the above a right angle corner to the left, with roads 24ft. wide, could be turned, if taken properly, at a speed of 12½ miles an hour with one person up, or 17½ miles an hour when the person moves his centre of gravity 8in. to the left. Doing the same things with tri-car with no front passenger the speeds of 14½ and 18½ respectively could not be ex-

Preventing Punctures.

Sir.—Perhaps my experience as regards the prevention of punctures, without unduly slowing the tyres, may be of service to readers of "O.P.U." I have had one puncture only (in the back wheel) in about 5,000 miles, on one tyre; and no punctures in about 1,500 to 2,000 miles with another tyre. The first tyre was a Clincher A Won (28in. by 2in.) tyre. When I got it I had an extra canvas strip solutioned on inside the cover before fitting it to the machine, and used self-sealing inner tubes. My second tyre was a Palmer cord tyre, 26in. by 2½in., and I used self-sealing tubes without any additions to the outer cover. I have found these latter tyres very steady in grease. I have not tried any special bands for the prevention of either side-slip or punctures, so can offer no opinion about them; I believe most of the bands tend to slow the tyre somewhat.—Yours faithfully,

R. S. Fox.



Misfiring on 4 h.p. Automoto Engine.

Sir,—Like your correspondent, H.R.P. (Ben Rhydding), I, too, have a motor of the same power and make, and like him have the same trouble, viz., engine misfiring, uses a lot of petrol and gets very hot, boiling all the water away in a very short time. It is fitted with a Longuemare carburettor that has a nine-slit cone, which I find gives plenty of gas. The trouble, I think, is at the spark-plug. The hole where the spark-plug fits is 1 1/2 in. diameter, and as the spark points of plug are about 1/4 in. from the collar on plug, it follows the spark occurs in a small pocket over an inch deep. This pocket becomes filled with burnt gases, and consequently requires a very rich mixture before it will ignite. I have improved matters a little by sawing off the boss of the spark-plug hole and so letting plug go in a little further. I am now looking for a spark-plug that has the points about 1 1/4 in. from the collar so that the spark will take place inside the valve chamber, but up to the present have not found one, and should feel obliged if any of your readers could tell me where I can obtain one. I should think such a plug, if placed on the market, would have a ready sale, as there must be a good number of Automoto engines about. Wishing "THE MOTOR" every success.—Yours faithfully, W.R.M.

Tri-car Suggestions.

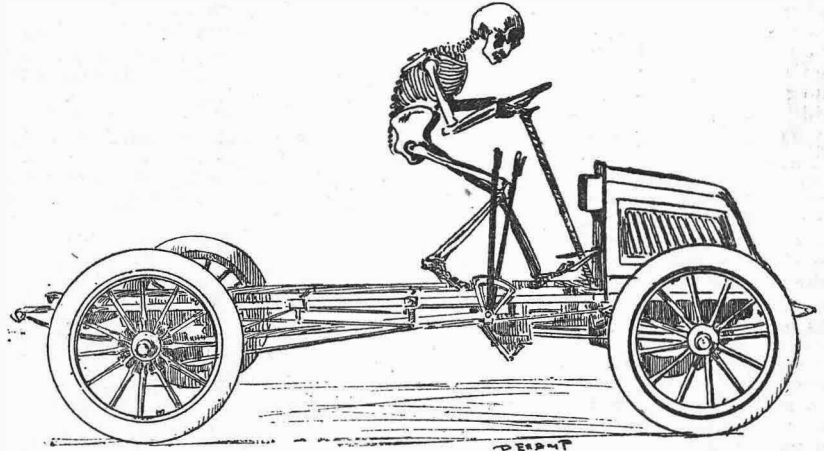
Sir,—Having watched with interest the growth of popularity of the tri-car, it has occurred to me that a really splendid vehicle could be made if makers would spend, say, another £10, and put two wheels at the back instead of one. It would, of course, mean another tyre; but I feel sure purchasers would, when spending close on £100, not begrudge another £10 for such a vehicle. It would embody all the advantages of the tri-car without the disadvantages. It would cost no more to run, take up no more space, and very little more cleaning. Look at the comfort of such a vehicle as compared with a "three tracker"! In my opinion, what is wanted is something after the type of the Ariel quad, only driver's seat to be a comfortable one, such as is now seen on tri-cars; also a free engine and clutch, a longer wheel base, wheel steering, and other up-to-date improvements such as we see on tri-cars of to-day. Another point is they would look more graceful vehicles, for some of the tri-cars now out are, I am sure you will agree, anything but that. Some people will doubtless say that such a vehicle would be too much like a small car—not at all, if the line is drawn at the proper place. A small, light, wire-wheel vehicle of about 5 to 6 h.p., with passengers sitting tandem fashion, is not a small car. It could be made much less than any small car, and would be preferred by many on account of its cheapness, lightness, economical upkeep, and small storage space, while it would possess the luxury of a car. I fell sure if some makers would turn their attention to this class of vehicle they would have their efforts rewarded. I have had 16 different motors of various sorts, including quads and tri-cars, so I have had a little experience.—Yours faithfully, CLAUDE H. MAY.

Motorcycle Difficulties in South Africa.

Sir,—Being a subscriber to "THE MOTOR" and also being a practical motorist I should like to point out a few of the difficulties a motorcyclist has to contend with out here in the Karoo Desert. I have a machine fitted with 2 1/2 h.p. Kerry engine. I will first start with ignition system (high tension), which I had fitted, as I was told that magneto ignition was not reliable. I am stationed more than 400 miles from Cape Town, the cheapest place for charging accumulators. The firms there charge 3s. 6d. for charging and 5s. sometimes for carriage, according to weight. I have had mine recharged there, and they have not done 50 miles when they have become exhausted. I put it down to the cells being knocked about on the railway. I have also since got a primary charging battery, and that is very expensive here, as I cannot get the chemicals, zincs, etc., nearer than Cape Town, and the cost of car-

sued to the back country, where you do not, in some parts, meet a white person in several days' travel; enough oil capacity, say, for 300 miles; and a double engine with tandem or single gear at will, so that if one comes to a good bit of hard road one engine is sufficient; and if you come to sandy roads have both running on a low gear; the machine must be chain driven, with free engine, and tyres 2 1/2 by 28 in., and a starting handle also because if you come off in the sand it is an impossibility to get on the machine and pedal it to start again. It is not speed we want in this country but power to keep going over heavy roads at about 12 miles an hour. I may state that I am in the trade, and should be pleased to hear from any firms as to probable cost of such a machine, or if such a machine can be supplied by them. Hoping you will publish this letter for the benefit of exporters in the cycle trade to South Africa.—Yours faithfully, GEO. HUBBERT.

Church Street, Victoria West, S. Africa.



CHASSIS I

Tri-car Criticism.

riage is often more than the value of the goods. From this you will see that out here high tension ignition by accumulators is practically out of the question. I have also tried dry batteries, and find that they do not last more than a week, and they are also expensive—viz., 15s., plus carriage for four small cells (and I think they were old stock). As to petrol capacity, the majority of motorcycles only carry from 1 to 1 1/2 gallons of petrol, and that is only about enough to get to the next nearest town from here (Carnarvon, 85 miles); and as it is not possible to get petrol out there, the only way to send it on is by post-cart, which is another extra expense, so that for use in the Karoo a machine ought to be capable of carrying petrol for 250 or 300 miles at least. The next thing is the engine. Out here we have to ride through miles of sand, 2 in. to 6 in. deep, and we find it an impossibility to get through without an excessive amount of pedalling. My engine is strong enough for hard road and steep hills, but when it comes to the sand it is no use unless one rushes it; and that is dangerous, as you slide from one side of the road to the other and do not know when you may encounter a sluit, steep and narrow, as the majority of them are; I certainly think there is a big future for the motorcycle trade in South Africa, but what we want is reliable ignition,

Sir,—I think the majority of readers of "THE MOTOR" will agree with me that the makers have gone a little too far with the tri-car type of vehicle and paid too little attention to the light car. The tri-cars of to-day are not far off the light car, as far as horse-power, weight, and price are concerned; and no doubt they cost nearly as much for up-keep. But the light car, in my opinion, is the better vehicle from every point of view. The best tri-cars are unstable, and this defect has been made more pronounced by hanging them on springs. Why are the makers or the public so afraid of two back wheels? The extra cost of the additional wheel would be repaid in tyres in a few thousand miles. Imagine one of the latest tri-cars with a 6 to 9 h.p. engine, three-seated body, and three-speed gear, going up a hill on the low gear, with a total weight of not far off 8 cwt. All this weight has to be transmitted through one cycle tyre, that has only got about one-third of the total weight upon it. I think that the makers of tri-cars are imitating the light car in every way but the right way, and thereby making a vehicle very little better than the Bollee of six years ago. The subject is one of special importance and interest, and, I think, demands careful consideration and discussion.—Yours faithfully, E. H. H.

O.P.U.

Electricity v. Petrol as Motive Power.

Sir,—In regard to the article on electricity as applied to road vehicles, allow me to state as one who has had considerable experience of these vehicles, that owners of petrol cars need not be in the least nervous of their cars being rendered obsolete by the advent of electricity in the near future. The long-coming accumulators of Edison, which are so simple that a child can manipulate them—a saying by no means original—I have not yet seen, but the present disadvantages of electricity, namely, great cost of running, small radius of action (about 30 miles), low motor efficiency, charging and chemical difficulty, etc., etc., renders it out of the question as a competitor against petrol, and the writer is inclined to think that the coming of the petrol motor bus will prove a serious competitor to the electric tubes. In regard to the future, it is quite within the bounds of possibility that the rays of the sun may be turned into energy—but all is hypothesis.—Yours faithfully,

E. P. PROUD.

Belt Transmission for Tri-cars.

Sir,—My experience of belts on tri-cars may prove interesting to "Forlex." My machine is fitted with a 3½ h.p. M.M.C. engine, and I have driven it to date upwards of 4,000 miles, and tried nearly every leather belt on the market, with varying success, the chief trouble being stretching, rapid wear, and fasteners pulling through. I was on the point of converting it into a chain-drive, being assured that there was not a leather belt that would stand the pull of a 3½ h.p. tri-car engine, when a friend persuaded me to give the canvas and rubber belt a trial, and as he spoke favourably of this on his 3 h.p. bicycle I purchased a length of ¾ in. belting, fitting it, if anything, on the slack side, as the makers recommend. When running the machine, even with a heavy load, I was delighted to notice no signs of slip even on hills, and at the first start off drove to Bognor and back, a distance of 140 miles, without having need once to shorten the belt. After some 300 miles I found it necessary to tighten it a little, but drawing the wheel back in the forks ends the merest trifle was quite sufficient. The belt has now run over 1,500 miles, and it still its original shape and size, and beyond an occasional clean with petrol it never requires attention. Wet and mud, if anything, tends to tighten it, making the rubber and canvas composition contract. The belt is cheaper than a leather one, and is made by Stanley Webb, the motor agent of London Road, Bromley, Kent. I have no interest in this belt whatever, but can honestly recommend it to brother motorcyclists who experience trouble with leather belts on high-power tri-cars. The M.M.C. 3½ h.p. air-cooled engine is a beauty for tri-cars. With two passengers up and a single gear of 5 to 1 I can climb almost anything, and have often beaten more powerful water-cooled-engined tri-cars on the level and uphill. The latter I come across are generally "steaming" up hills, and a lot of improvement, I think, is to be made in their cooling arrangements.—Yours faithfully J. A.

Air v. Water-cooling.

Sir,—With reference to the article in your issue of December 17th re air v. water-cooling for tri-cars, I fully agree with "Melita" that air-cooling would be much the better of the two, if only on the score of simplicity, could the cylinder be so placed as to get the full benefit of the air when running. Water-cooling, in my opinion, is not only very cumbersome and apt to be extremely unreliable, but it is not nearly so effective, especially in winter, when frozen jackets and such trifling items become a by-word with every driver of a water-cooled tri-car. I see that "Melita" thinks that a tri-car built on the lines of the Avon trimobile, with extra large radiators, would be an ideal air-cooled tri-car. I saw a machine at the Stanley Show which appears to me to combine all that is necessary. I refer to the two-seated 4½ h.p. J.A.P. tri-car. To mention only one or two advantages of this excellently-designed and finished machine: The seats are placed side by side, greatly adding to the pleasure of driving, each seat being supported on a separate set of springs. There is ample room for luggage underneath—a feature which is conspicuous by its absence in some three-wheelers. The control is entirely from the steering wheel, the change-speed and back brake levers being placed on the left-hand side of the driver, between the seats and well forward. The steering is very neat and the car is isolated from road

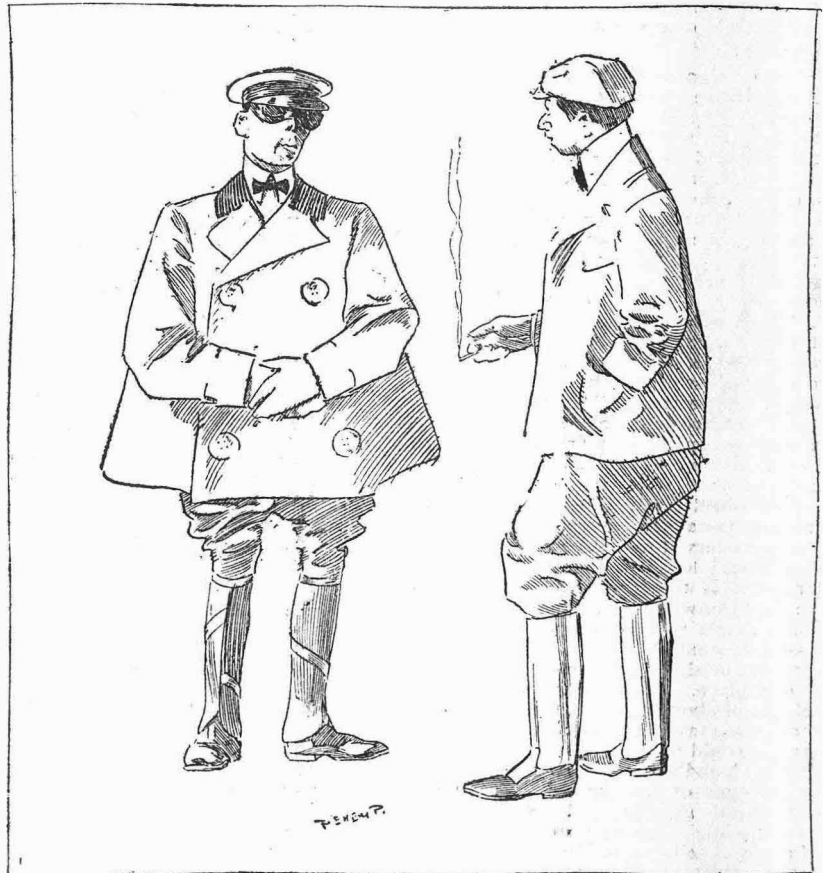
shocks by two spiral springs, one at each end of the axle. Now, to come to the chief reason for my mentioning this car in detail: this is the cooling system, which is perfectly natural, without either water or fans. The engine is placed in front of the dashboard and between the steering wheels, but a little in the rear, exactly like that of a car. As there is no bonnet the result is that the engine, having nothing whatever in front of it, is automatically cooled by the draught created when running. The only fault I have to find is that, in my opinion, the power is insufficient to overcome the extra wind resistance, which must be considerable, caused by the seats being side by side. A 5-6 h.p. engine would, I think, be more suitable, though I am fully aware that the J.A.P. engines are well up to their power, and that in this particular case very little is lost, owing to an extremely efficient worm drive.—Yours faithfully,

CECIL ADAM.

Anti-freezing Mixtures.

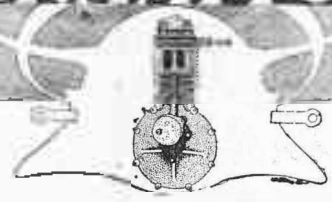
Sir,—I was very much interested in "Magneto's" article on anti-freezing mixtures. I am using a 15 per cent. solution of wood alcohol. Do you think this will be satisfactory? I am wondering if it will affect the cooling property of the water, or have any harmful effect on the rubber tubes connecting the cylinder jacket and radiators.—Yours faithfully,

F. COPPELL.

**TAXING HIS BWAIN.**

ALCIE (admiringly): "So you have mastered the motah, Chollie. How brilliant! And you weally understand what 'hwake horse-powah' means?"
 CHOLLIE (dubiously): "Y-e-s, Algie, perfectly, after three years' hard study and a surgical operation."

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.

Byron (Ilkeston).—The spring forks you enquire about are those fitted to the Quadrant machines. They are only supplied with the Quadrant Co.'s productions.

Essiquibo (Gold Coast).—We think the most satisfactory plan would be to advertise your requirements. You are more likely to get what you want at a reasonable figure by this means than if you went to certain firms we could mention.

H.C.F. (Kilburn).—(1) Most probably a leaking needle valve causes the erratic working of carburetter. (2) The gear you have is about as low as you could adopt, unless you fit up a fan for cooling. Then you could reduce it to 1 to 6½ with advantage. (3) There is nothing amiss with the position of the carburetter.

Quad (Grimsby).—The connections will most probably be as follow:—Positive of accumulator to B terminal on coil. Negative of accumulator to handle-bar switch, from this to plug switch, and on to trembler blade connection. B.M. to contact screw. L to frame—or, better, to some convenient place on engine. The single terminal (unlettered) connects direct to spark plug.

Carburetter Difficulty with 8 h.p. De Dion.

E.M. (Stockport) writes:—I shall be much obliged if you will kindly give me an explanation of the following:—I have an 8 h.p. 1902 De Dion car, with the usual type of carburetter—a Longuemare. If I drive with full gas on, the engine chokes after having run about 20 yards, and sometimes even stops. In addition to this, I am using double the quantity of petrol that I ought to be using. The car runs all right on the low speed. I do not think that the carburetter floods, nor that the float leaks.—Not quite clear what you mean by the engine choking. Perhaps you mean a fire-back through the inlet pipe occurs. If so, it is most likely the inlet spring that is weak. It is also quite possible some flooding occurs and the mixture will not fire.

A.B.L. (Bodmin).—Wash the plates of the cells very thoroughly to get rid of the acid, then fill up with water. They will keep intact for long periods.

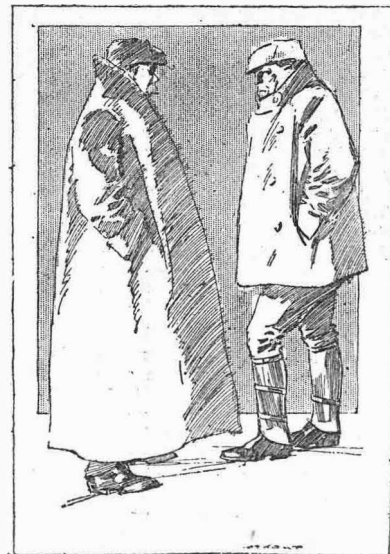
W.F.F. (Wellington College).—How would a Hub two-speed gear suit you? This is compact and simple. It would of course be necessary to have the wheel rebuilt.

F. W. Cory (Clovelly).—A Fuller charging battery would meet your requirements. The others are made on a similar principle. The battery requires some attention, but the charging is not uneconomical.

S.A. (Hatherleigh).—How would a Humber 70lb. machine suit you? If you want a light, small power attachment only, the "Ixion" set supplied by Primus Motor Co., Rathgar Road, Loughborough Junction, London, would meet your requirements.

Car Details.

BO17.—(1) You require a minimum of 6½ h.p. (2) The multi-cylinder engine has less vibration, a more uniform drive, and more flexibility in power than the single cylinder. (3) A matter of opinion as to the transmission, both systems have their own advantages and disadvantages; for a small car a single central drive chain would be hard to improve on. (4) They are an improvement on the non-automatic carburetter, but not to such an extent as might be thought from the claims made. (5) Not less than 3in. back and 2½in. front tyres.



STRUCK!

HINKS: "Poor Jinks' motor proved far too complicated for him: you know, it was a 'two-stroke.'"

BINKS: "Ah, yes, I remember. What's he having now?"

HINKS: "An apoplectic stroke."

Novice (Kettering).—The Humber at 98lb. gives nearly 2½ h.p. This would come up to your requirements. Of course if you anticipate taking an attachment over very hilly roads you will have to get something nearer 3 h.p.

A.L.M. (Bowdon).—(1) Yes; 8 h.p. is a very low power for a four-seated car. Of course, it is a question of gearing. The maximum speed would be not more than 20 miles an hour on the level, and the low gears would have to be constantly in use. (2) Obviously the wear and tear on the engine and gear is greater than with a 12 h.p. two-seater.

J.M. (Swanage).—The Clement silencer is simply two tubes, the smaller one concentric with the outer one. There are a series of holes at the top of inner tube. If you can arrange to do away with the bent elbow and substitute a 3in. tube with easy curve it will improve running. Also make about 20 more holes in outer casing of silencer. We will shortly give a diagram of the silencer on our experimental machine. It is very effective.

Supposed Loss of Power in Car.

J.H. (Ipswich) writes:—In April I bought an 8 h.p. M.M.C. five-seated voiturette. It has served me well, but I have just had it overhauled before putting it by for winter. Now, on first and second speed it goes admirably. Directly I slip in top speed on the level (the engine seems killed, and it slows down, and would stop if I did not return to second speed. Valves all fit; compression excellent; carburetter works well. Can you suggest any cause for this loss on top? (2) Do you think back pressure from exhaust being free has anything to do with it? (3) I have had a new fly-wheel, 7lb. heavier, put on, with the idea of getting more power, but here I am still. (4) Do you advise me putting in a new two-cylinder 8-10 h.p. engine? (5) Will the chassis and gear bear it? (6) What engine do you recommend?—(1) The pulling up of the engine, when top gear is put in, is more often due to want of appreciation of the conditions under which the engine has to run than to any actual loss of power. To ask an 8 h.p. single-cylinder engine to push all the weight of the car, plus five passengers, is imposing a very heavy task, and we are not surprised that the engine will not pull under such very abnormal circumstances. It is possible that your car is too highly geared on the top speed, and if this were lowered (as you do well on first and second), your difficulties would doubtless cease. Reduce the weight to two passengers and you may get an improvement without going to any expense. Many tri-cars, weighing about 4 to 4½ cwt., are now fitted with 6 h.p. engines, and only carry two passengers. Compare this with the total weight of your car and passengers and your problem is, we believe, solved. (2) Take down exhaust pipe and box, and see that everything is clear. (3) A heavier fly-wheel, unless of larger diameter, would not help. (4) Yes. (5) Yes. (6) Simms.

BUREAU.

H. Wimpenny (Dunedin, N.Z.).—The correct explanation, we believe, is that the 800 revolutions is a printer's error in the programme. It should read 1,800 revolutions. Practically all the engines entered in the trials, which were 2½ h.p. or thereabouts, developed full power at from 1,600 to 2,000 revolutions.

Enquirer (Hampstead) writes:—Will you please say if there is any reason for the back wheels of a car not being set quite vertical. That is to say, they appear to splay out at the parts in contact with the road. I know that front wheels are often given a slight inward tilt to make them steer easily, but the back wheels of the car I refer to are tilted outwards at the bottom. — Back wheels should always stand quite vertical. If they spread out at all it shows the axle is not strong enough. It is not unusual to see car wheels splayed out. It looks bad, and certainly does not improve the running.

Tri-car Gearing.

W.E. (Manchester) writes:—I am making a 3 h.p. tri-car, engine runs 1,400 per minute, and what I want to know is what will be the average speed if I put a seven-tooth wheel on engine-shaft, and 28-tooth wheel on counter-shaft, then another seven-tooth on counter-shaft to 20 on back wheel, which is 28in. diameter? Chain-wheels ½in. pitch. Also will the gear be the same if I use 1in. pitch chain-wheels with the above number of teeth, as I have been told it would make a difference? —Working the above out shows that the gearing is about 1 to 11, which means that you could not get much more than 10½ miles an hour at 1,400 revs. If you use 1in. pitch, same number of teeth on wheels, the gear remains the same, obviously because the relative diameters of the wheels remain the same.

Trembler Coil Difficulty.

H.B. (Islington) writes:—I should be glad if you would give me advice, per your "Information Bureau." I have a motor-cycle with positive make and break on engine and non-trembler coil. As the spark is not very good with this arrangement, I lately bought one of Fuller's midget syntonix high-speed trembler coils, and have tested it on machine, the old make and break being used, as I have not yet made the wipe contact. The engine works well on stand, but if I press contacts on contact breaker together, and cause trembler to buzz continuously, it soon stops, and I find contacts on trembler are stuck together. The spark at trembler is large, and makes a crackling sound, whereas I understood that this coil worked with unusually small current. My connections are as follow: are they correct? SP, to sparking plug; +, to + of accumulator; C, to insulated pillar on contact breaker of engine, and a wire from one of Mason and Brown's switches on handle-bar to — of battery.—The connections seem right, but we think that you have the trembler contact screwed down too far. The current taken by this little coil is greatly influenced by adjustment of trembler. The lighter it is adjusted the less current it takes. If contacts are tightly screwed down, the platinum are likely to fuse together.

S. L. Taylor (Philadelphia, U.S.A.)—The addresses of makers you want are as follow:—(1) Triumph Cycle Co., Coventry; (2) Humber and Co., Beeston, Notts; (3) Rover Cycle Co., Coventry; (4) Centaur Cycle Co., Coventry; (5) Werner Motors, Ltd., 45, Dean Street, Shaftesbury Avenue, London, W.; (6) Brown Bros., Great Eastern Street, London, E.C.; (7) Kiley Cycle Co., City Works, Coventry; (8) F.N. agent, W. McFaggart, 48, Wells Street, London, W. The subscription per annum for "The Motor" mailed to the United States is 2½ dollars.

Clutch Difficulty.

Clutch (Pimlico) writes:—(1) I have a 1903 Humber Olympia tandem and have trouble with the clutch on the counter-shaft by which the engine is started by means of the pedals. I have had the covering plate off and put new springs in, but it still slips. I have also washed it well with petrol so as to get rid of any dirt, etc. (2) I am troubled with occasional popping in the carburetter: the inlet valve (automatic) seems to shut all right and has just been ground in, nor does it seem sticky with oil. There is a new washer between the inlet valve seating and the part of the combustion chamber on which it rests.—(1) Presumably the clutch is a leather-faced one and has worn considerably. If so you will have to get it re-covered. You might, however, give the leather first of all a dressing of Beltine. This gives a good grip and may effect a remedy. (2) Make sure you have a good spring on the valve. If there is nothing prevents it closing tight on its seating the popping can only be due to you getting the engine too hot.

Carburetter Trouble.

Novice (Hants) writes:—(1) Longuemare, new last summer, worked well for three months. Then right mixture impossible. Removed carburetter. Found shutter at auxiliary air inlet broken in half, thus probably letting in too much air. Closed this gauze inlet completely by tying a cloth round it. Off went the engine at once—on the stand, but worked badly on the road, and petrol dropped copiously at this part of the carburetter. I removed cloth. Had shutter repaired; yet no good. Can you tell me what is wrong? (2) Have two accumulators; connect them together—positive and negative poles and get about six volts. Has this damaged either coil or batteries or both? Connection lasted only for about 15 minutes.—(1) It is probable that the effect of the repair has been to make the shutter too heavy, if soldering or brazing has been resorted to. The carburetter must be perfectly level when fitted, so that shutter hangs perpendicularly. The gauze in front of shutter must be kept quite clean and also the gauze between inlet pipe and inlet valve. Filing a minute portion at a time off face of shutter (experimenting after each filing) might make some alteration. The latest pattern Longuemare is without the shutter, the auxiliary air being admitted by a spring controlled valve. (2) Not much harm would be done by working a coil for a short period with six volts; if by 15 minutes you mean continuously, without using the engine make-and-break, some cheap coils might have the insulation melted. Most modern induction coils are wound for a voltage of about five volts and are designed for intermittent work only.

G.F.B. (Tunstall).—Gamage's stock such a lamp as you specify. Vibration is not likely to affect the working to any noticeable extent.

T. Gray (Bushbury).—(1) Easily 2½ h.p. (2) Engine pull-y 3¼in., edge to edge. (3) A five-slit spray should do. Use a fairly small funnel, but best to experiment till you get the best results.

More Ignition Details.

L. Wheeler (Shaw).—(1) A non-trembler coil, if you have a make and break. (2) The Fuller coil takes less than an ampere. (3) The negative terminal is that connected to the two outside plates. The positive plate is always sandwiched in between the negatives. (4) To find the poles at the wall plug, get two strips of clean lead, twist a wire from each plug hole round one of the strips, then place in dilute acid (sulphuric), keeping them about ½in. apart. In a few minutes the positive pole will show itself by turning one of the strips a brown colour. (5) To charge up, you require a simple circuit, with a 32 c.p. lamp, and the accumulator in series. A 16 c.p. lamp at 210 volts. would be of little use. Diagram practically same as on page 37, Manual, if you consider one of the lamps out of the circuit and the dynamo brushes to represent the wall plug contacts.

ANSWERS BY POST.

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

Tuesday, December 20th.—J. W. Secombe (London), C. H. House (Gosport), A. G. Donovan (Ealing), S. Osborne (Wimbledon), H. Hardy (Mayfair), W. Hopkins (Exeter), S. D. Young (Renfrew), F. Webb (Barnes), J. Mason (Bradford-on-Avon), G. Wordon (Stepney), E. Richards (Old Whittington), A. F. Hughes (Huddersfield).

Wednesday, December 21st.—F. T. Marsh (Camberley), L. Benson (Liverpool), H. G. Morris (Gt. Bridge), S. Oldfield (London, N.W.), E. W. Preece (Monmouth), A. N. Buchanan (Tunbridge Wells), H. MacDonald (Dulwich), R. H. Edwards (Birmingham), J. Chapman and Co. (London), R. Prickett (Milnthorpe), J. W. Lane (Blackrock), E. S. Hughes (London), S. Salmon (Poolway), M. Justin (London), C. M. Shaw (London), G. Aldington (London), V. Taylor (Pimlico), S. Leach (Camberne).

Thursday, December 22nd.—C. King (Swindon), P. Goth (Southampton), F. Terry (Birmingham), H. Iynton (London), J. C. Parker (High Wycombe), J. Wood (Hazel Grove), E. W. Cashmore (Birmingham), F. Peart (Ealing), J. Gosling (Bourne), J. A. Marrie (Montrose), Bitton and Harley Bros. (Yarmouth), G. Avery (Peckham), C. D. Elsworth (St. Petersburg), H. Gordon Tidey (London).

Correspondents are requested to keep their queries as brief and concise as possible. The great and quite unnecessary length of many of the communications sent in precludes the possibility of them being dealt with promptly.