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5TH FEBRUARY 1913

ONE PENNY.

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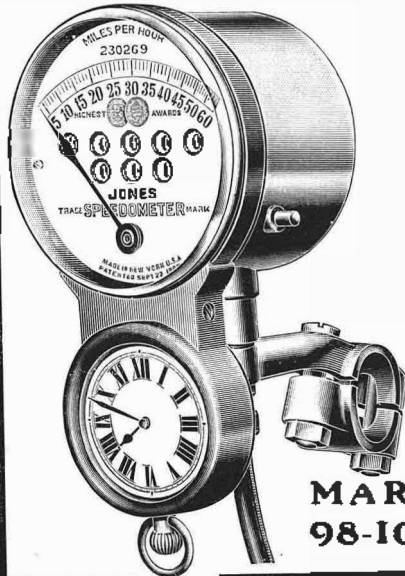
The Cyclocar



"Steady as a rock,
Accurate as the Greenwich Time Ball."

JONES

CYCLECAR (GOLD MEDAL) SPEEDOMETER (and for Motorcycles).



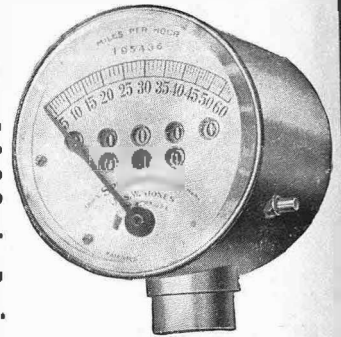
The Value of the "JONES."

I may say that I have used practically every Speedometer on the market and I have found the "Jones" to be far and away the best, not only for the steadiness of the indicator but also for the extreme accuracy with which it measures the mileage. I have found the trip simply invaluable for reliability trials, as I can reset the trip mileage to zero at every point on the route card and in addition can cover every tenth in 18 secs. which in these days of secret checks galore is very often extremely necessary. I would strongly advise every Motor Cyclist who contemplates competing in reliability trials and who wishes to put up a good performance to invest in a "Jones Trip," as no other Speedometer will serve him so well.

(Signed) J. BROWNE,
Captain Dublin & District M.C.C.

PRICES :

Model 26. Mileage to 10,000 M. and repeat	£3 3 0
Model 31. Ditto and with Trip Recorder	£4 4 0
Model 32. Ditto and with Max. Hand	£5 5 0
With reliable Watch attached, either model, extra	£1 1 0
Speed to 60 or 80 m.p.h. any model.	

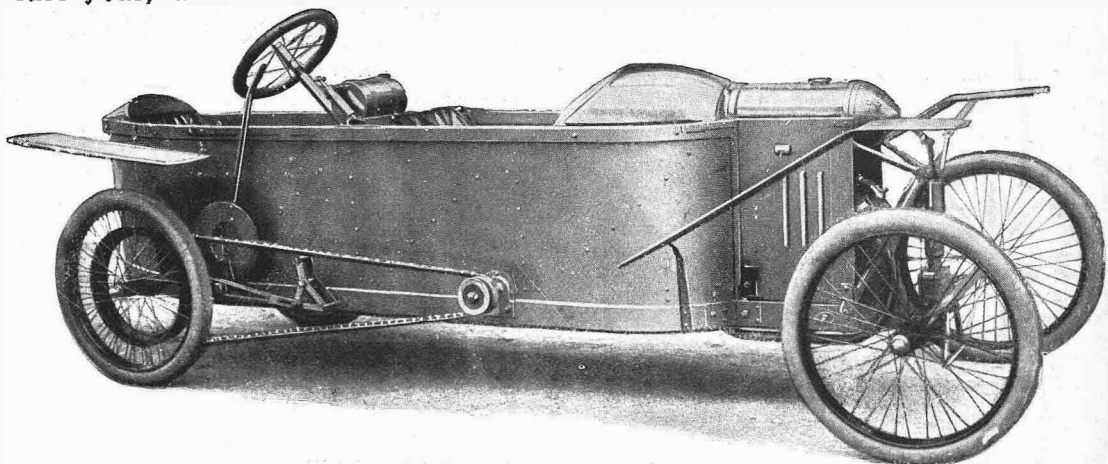


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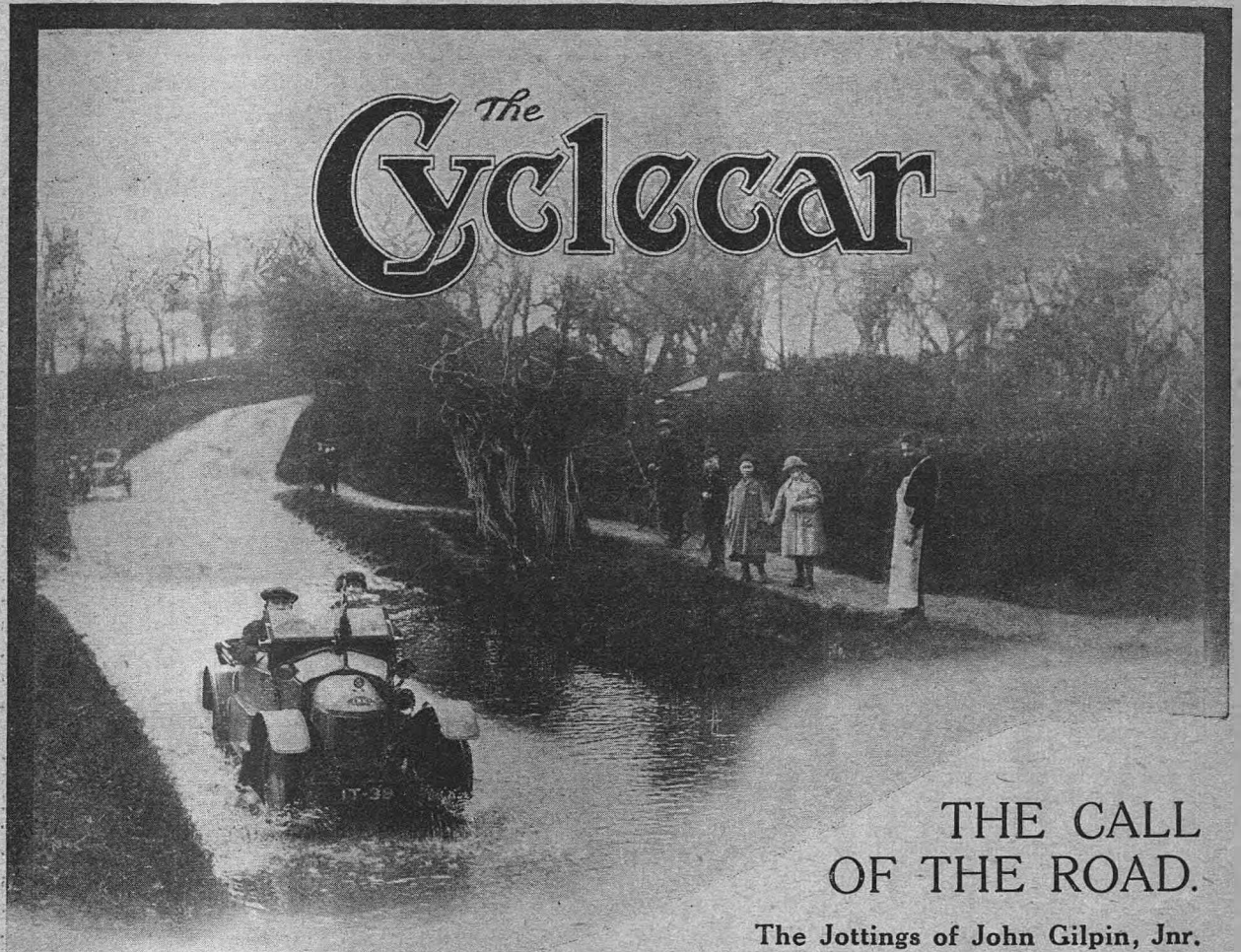


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The Cyclecar



THE CALL OF THE ROAD.

The Jottings of John Gilpin, Jnr.

On Road Hogs.

EVERY sane motorist deplors the road hog, and the non-motoring public execrate him. The latter make road hogs by their own piggishness, however. The intentions of the driver may be quite good, but the continual strain imposed upon him by the thoughtlessness of other users of the highway engenders a reckless spirit and a desire to return in kind the many anxious moments caused in the course of a drive. At this time of the year, when the roads are often greasy, the careless act of those who walk, ride or drive may have serious consequences. Cyclists who deliberately ride abreast, and by derisive comments intended for the driver behind them make it perfectly plain that they are intentionally obstructing the road, would change their note if the motorist, in overtaking them, skidded and brought one over—not by any means an unlikely event. Those who walk are not less unreasonable, for every driver knows the utter disregard for any rule of the road displayed by ambling pedestrians, their habitual carelessness, their regard for the footwalk as only a final haven of safety when their lives are actually imperilled, the lack of decisiveness in their actions, and their general disinclination to make way for faster traffic. For these sort of people there is only one way of arousing their

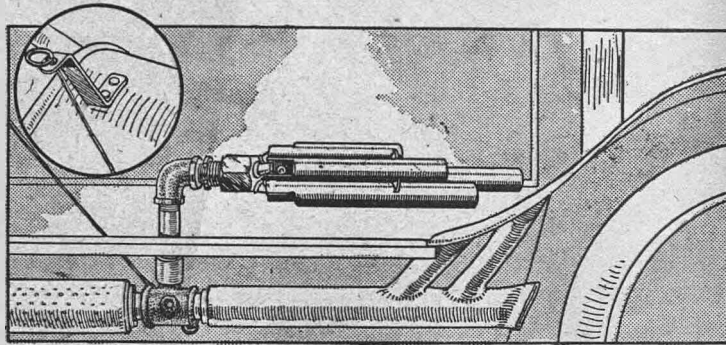
intelligence, and that is by making a noise of an unusual or particularly insistent character. The prohibition of "cut-outs" is, in my humble opinion, a mistake, for it is a very effective form of "audible warning." It conveys the very important suggestion to traffic in front that there is something approaching at a much faster speed than their own rate of progress, and the instinct of self-preservation being strong in mankind, the desire to get out of the way overcomes a somnolent aspect of the use of the road. As we cannot lawfully make use of "cut-outs," although many still do, we must have recourse to other effective "road-clearers," for the ordinary horn is perfectly useless for the purpose. There is nothing so effective as a Klaxon horn, which makes a peculiarly insistent noise. A clanging bell, being an unusual sound, usually receives respect. Sirens and exhaust whistles are effective, but the noise of the former is unpleasant, and personally I should not care to fit one to my cyclecar. It is not necessary for the particular form of audible warning selected to have such an unmelodious note as to prompt ordinary peaceably-disposed folk to request the driver to "stop that row." The most desirable type is the Gabriel, a Brown Bros.' speciality, operated by the exhaust gases, which produces a melodious diapason that compels attention from its harmony.

Recently I was asked to give an opinion of a horn of this type, stocked by Messrs. Morris, Russell and Co., Ltd., 6, Gt. Eastern Street, London, E.C.

THE CALL OF THE ROAD (contd.).

—the Aermore. To do this it was necessary to try it and get it fitted to my exhaust pipe, an operation much more easily referred to than carried out. I took it to the best people I know for repairs and odd jobs, in my district, the Lankester Engineering Co., of Kingston and Surbiton, and between us we hit out a solution of various difficulties. The exhaust from my engine is taken by a short length of $1\frac{1}{2}$ in. piping, and then by a longer piece of $1\frac{1}{2}$ in. diameter, closed at the end and perforated with numerous holes—a simple and sufficiently effective silencer where absolute silence is not desired. As

the diameter of the attachment was somewhat less than the smaller pipe, a cut had to be made in it and a jointing piece for the two ends left in. Then came the greatest difficulty: how to dispose of the horn so that it would be clear of the front wheel. As the piece of pipe forward of the silencer was very short, this appeared to be a riddle without an answer, until the bright idea of taking a connecting piece through the running board was hit upon. Accordingly, this was done, and, contrary to usual practice, which is to place the horn where it will be effectively choked with mud in the shortest space of time, it was attached above the running board. It is a pity, in one sense, that the Aermore could not be placed under the running board, for I should say that, owing to its peculiar design, it would be impossible for it to become choked with mud, the exhaust gases impinging upon the ends of the reeds in an upward and slanting direction, instead of being blown through them. The next difficulty was to fit a connection easily controlled without taking a hand from the steering, the great disadvantage of the ordinary bulb-horn. The Aermore, as sent out (the price complete is 30s.), has a wire to the cut-out lever pulled up against a spring. The alternatives are to fix a rod in the floorboard or footboard, which can be depressed by the heel with the foot on the brake pedal simultaneously, if desired, with the application of the brake, or to attach a Bowden control to the steering wheel. For the moment, I am making use of the standard control in the manner shown in the accompanying sketch. When fitted, the horn produced too shrill a note in the opinion of the Lankester Engineering Co., who advised experimenting with it placed abaft the silencer. I decided to try it first, and the opportunity occurred on Tuesday of last week, when I had a run of about 38 miles through many twisty, narrow by-ways. The note is certainly more like a whistle than a horn, but it is a melodious and most penetrating sound. While the ordinary bulb horn, as usual, was more or less ignored, a signal from the Aermore instantly aroused the lazy carter, who would spring to his horses and clear the way. I am, in fact, very pleased with this attachment.



How the Aermore exhaust whistle has been fitted by the Lankester Eng. Co. to the machine of "John Gilpin, Jr."

Starting-up.

A few weeks ago I referred to the uncertainty of starting an air-cooled engine—a difficulty which proper adjustment should obviate, always excepting various causes that cannot be guarded against. If the pistons become "gummed up" with congealed

and half-burnt oil, the engine certainly will not start easily, for it will be found almost impossible to crank it over. The remedy is an injection of paraffin through the compression tap. Petrol and paraffin mixed will not start the cycle of operations in my engine, and the petrol has to be injected separately if, after freeing the pistons, there is still no incli-

nation to fire. Oil finding its way into the magneto is another cause of failure to start up, while, of course, if the points of the plugs are sooted up or coated with oil, the necessary spark will not be produced. A flooding carburetter (requiring adjustment of the needle valve), too rich or too weak a mixture, or a faulty connection between the magneto and the plugs are other frequent reasons for failure to start. All of which gave me much consideration the other morning. As on the former occasion referred to, the temperature was very low, and the cyclecar was coated with hoar frost when I took it out of the open shed in which it is kept. I flooded the carburetter, and found the pistons moved fairly easily, but the engine would not fire. I did not bother much about that, but removed the compression taps, gave the engine a few turns to let air into the cylinders, injected petrol, replaced the compression taps, and cranked the engine over—in vain. I tried various settings of the control levers (I believe in the two-lever hand control and have a B. and B. carburetter) to make allowance for the cold morning air, but without result. The plugs next demanded attention. I found one sooted up and cleaned it. Still no result. I cranked the engine over with one hand and caught hold of the terminals on each plug with the other. By the slight shock from one and the absence of a spark from the other, it was apparent that there was no spark from the front plug, the one I cleaned, which put me a little nearer the cause of the trouble. I changed the plug for a Hobson—an excellent and simply-designed plug, by the way—and there was still no spark. Then I decided to cut away the insulating tape holding the high-tension wires away from the hot exhaust pipes, and the cause of the trouble was apparent. When taking delivery of the machine, this important detail had been overlooked, and consequently the connection to the front cylinder had fallen on to the exhaust pipes and had burnt through. A temporary repair had been effected with insulating rubber tape, but the wire had broken at the damaged point. It was now quite clear why, on bumpy roads, the engine had frequently misfired the day before, the vibration shaking the ends of the

THE CALL OF THE ROAD (contd.).

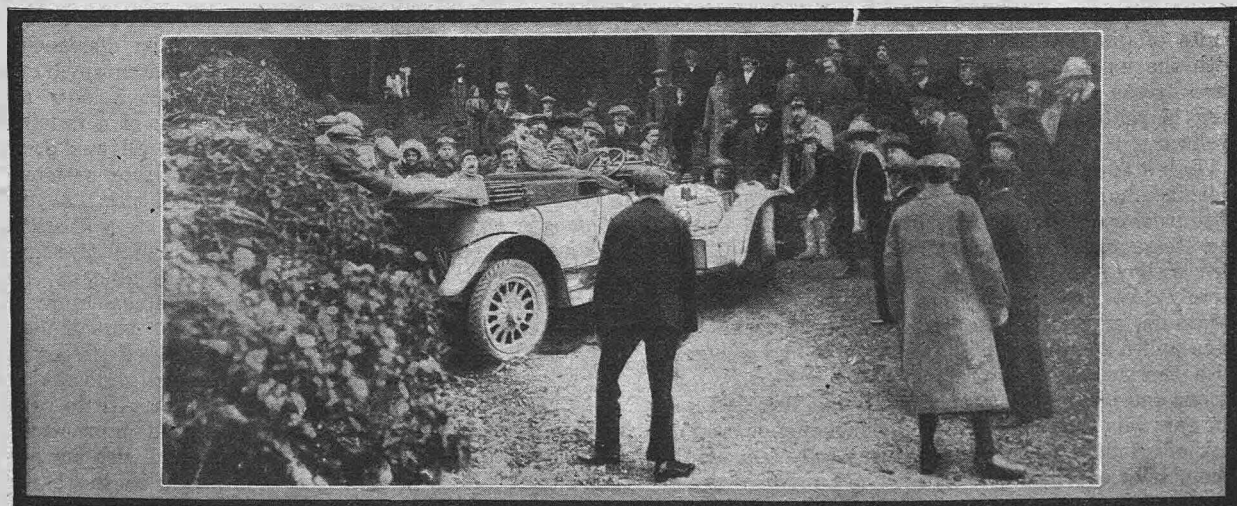
wire apart. The remedy, of course, was to fit a new high-tension cable, a length of which I always carry, but, explain it how you may, I was still unable to get a spark to the front cylinder. In despair, for time was getting short, I replaced the cable, and then, as a last happy thought, gave the back cylinder an injection of petrol in the hope of getting one cylinder to fire, cranked the engine over once—and, lo! she started, firing beautifully on both cylinders.

Tuesday week I had the misfortune to break a belt fastener—the first time this has occurred to me. There was no doubt about the belt having been shed, for the machine pulled a little to one side, and, looking back, I saw it lying in the road. One of the pins had broken in half, and this was directly attributable to a misfire. One cylinder suddenly ceased working, and the other started pulling in powerful jerks, which were evidently more than the fastener could withstand. It was a somewhat difficult matter to remove the broken fastener, as the sound bolt had rusted into its socket. Eventually it had to be filed away piecemeal and hammered off. The end of the belt was intact, and once the new fastener was replaced, and an oily plug—the cause of misfiring—changed, we were soon under way again. I mention this because I think these actual experiences are just the information intending purchasers of cyclecars desire. I am running a belt-driven cyclecar specially because more information is required as to the performance of this type of machine than any other, and this is the only way to obtain it. I have no prejudice against any other type of cyclecar, and will, no doubt, later on give my experience of other forms of transmission. It may interest my readers to know that the Duo (which is a belt-driven machine) depicted on the front page this week, owned by another member of the staff of THE CYCLECAR, has been run 2000 miles in seven weeks with only minor adjustments. Its engine (a J.A.P.) is in perfect tune, and has never had to be touched, and the speedometer the other day soared up to 45 m.p.h. on the level. As for the belts, the machine was driven time after time through the

watersplash illustrated, the belts being completely submerged, without any sign of slip in the drive.

I hope people will not infer from the foregoing remarks that cyclecars are horribly unreliable, for I am quite certain that when I have finished tuning up the engine and its accessories, that I shall be able to start up from cold without doing more than injecting a few drops of petrol, and that only on rare occasions. If any readers do have trouble of this nature, and do not feel equal to tackling it themselves—most useful and instructive practice—they should certainly put their machines in the hands of competent repairers for the engines to be overhauled. Great physical strength should never be required in cranking over an engine coming within the 1100 c.c. class—it is a different matter with the tremendously high compression of a powerful Brooklands racing car. What is required is knack more than anything else. Get a little swing on the handle, and then pull it up (never press down) sharply, taking care not to close the hand too tightly, in case of a backfire. In the latter event, the starting handle is simply pulled downwards, somewhat violently, it is true, but it easily leaves one's grasp. If it were pushed down, it would fly up, and might very possibly break the arm. "Swinging the engine," by cranking it over several times, should be tried, but look out for a backfire, and hold the handle lightly. A common error of the inexpert is to leave the machine in gear, when it is 100 to 1 that the engine cannot be moved. If it can be, and the engine fires, the machine will move and there will be trouble. See that the change-speed lever is in the neutral position. See that the petrol is turned on, and try various mixtures of petrol and air, if the control allows, or if an automatic carburetter is fitted, try altering the setting of it. Variations in temperature and humidity call for quite different setting of the levers, which really require to be continually varied when driving. This is only fully possible with the non-automatic carburetter, which, for this reason, I prefer, for it makes driving much more interesting and gives scope for endeavouring to obtain the highest number of miles per gallon.

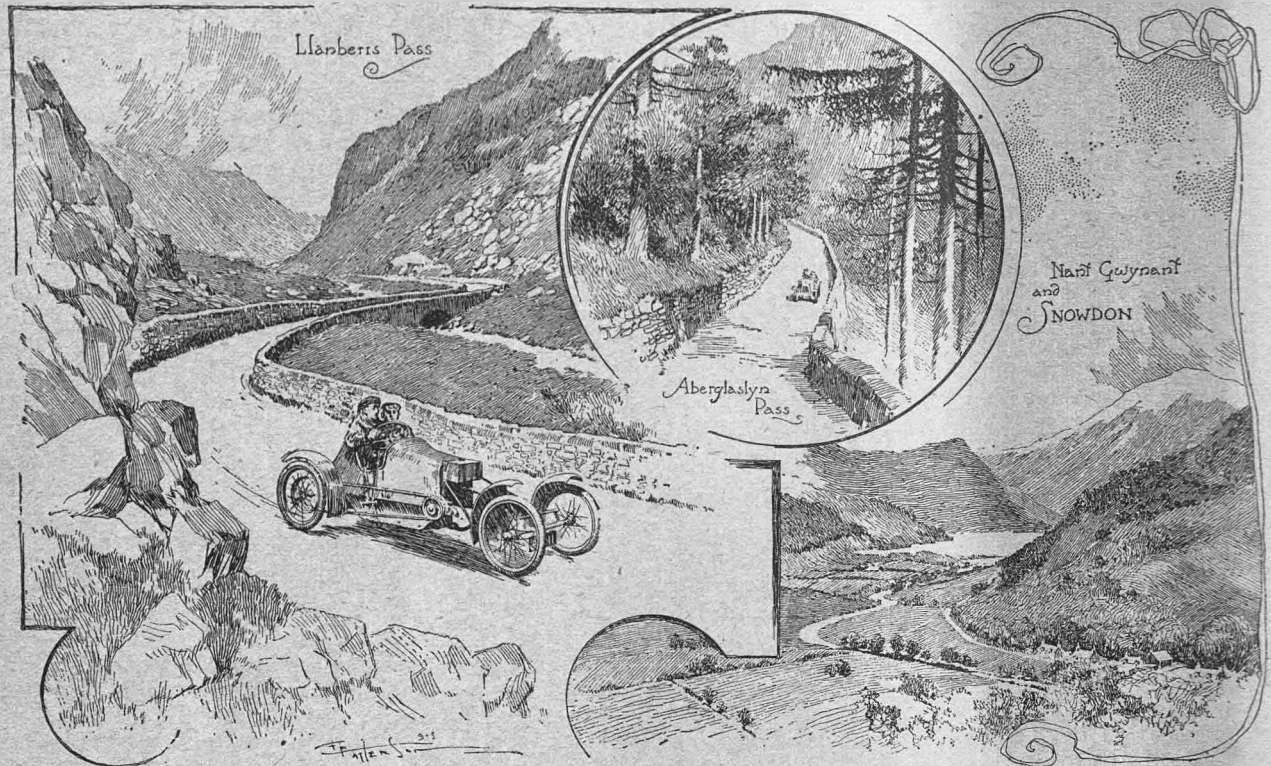
JOHN GILPIN, JNR.



A Rolls-Royce in a critical position on Arns Hill, after sliding back into the bank, owing to the tyres failing to grip the greasy road. A cyclecar made an ascent with Parsons non-skid chains attached.

WALES FOR THE NEW MOTORIST.

A Delightful Holiday and Magnificent Roads.



YEAR after year, sometimes early, sometimes late, once on pedal-cycles, other times on motor-bicycles, again with sidecars, and now on board a cyclecar, the writer and his fellow constructor have journeyed to the same favourite haunts in North Wales. One thing which has impressed us is that, however enjoyable the trip had been on previous occasions, the three short holidays on which we have employed the cyclecar have been unquestionably the best. Even the all-in-one-piece sidecar which we designed, built, and ran so speedily and happily for a time, is now relegated to a position outside the limits of our esteem, and we have asked ourselves with the most monotonous regularity how we could have driven so unmechanical a machine and been so long in realizing the possibilities of comfort in the cyclecar. But to our last trip on the latter machine.

We left town in the small hours of a certain Monday morning, hoping to call on a friend in a small North Staffordshire village about lunch time, and then in the afternoon go on through the Potteries, along the Dee Valley, to Llangollen for the night. We were merely two considerably-more-enthusiastic-than-wise amateurs, and before we had reached St. Albans the pace and a stoppage in the oil supply had disagreed with the usually uncomplaining 8 h.p. J.A.P. The rather emphatic note of complaint that first fell upon our ears was thought to be of no consequence, and our lack of wisdom and diplomacy was only too evident when, after continuing to within the bounds of the old Roman town, we discovered the crankshaft bush seized up and turning somewhat eccentrically in the side of a very hot crankcase, which made us think that after all aluminium is not a good material for bear-

ings! It was not yet 4 a.m., but we had extraordinary luck, for the nearest garage proved to be only a few yards away, where the proprietor, who lived on the premises, was soon ready to help us.

Now, no doubt many have read, and most certainly have heard, of the value of accessibility, but those who know will agree with us that it is simply a delusion. Unfortunately, in this case we ourselves were responsible, and our feelings may be imagined when we found the first experience of our holiday would be something as follows: Taking an engine out of an extremely inaccessible position in a very narrow frame—probably four hours work; then dismantling an epicyclic gear—another few hours; after which mild delights the procedure necessary to fit a new and larger bush. Well, after the despatch of a batch of telegrams, we set to work, and when all was down, found it impossible to do anything further without a rather large bushing to fit the crankcase. A messenger was sent off, and, to cut a long story short, by dint of working nearly all night, two very tired and considerably-subdued individuals were able to continue their journey again very early the next morning.

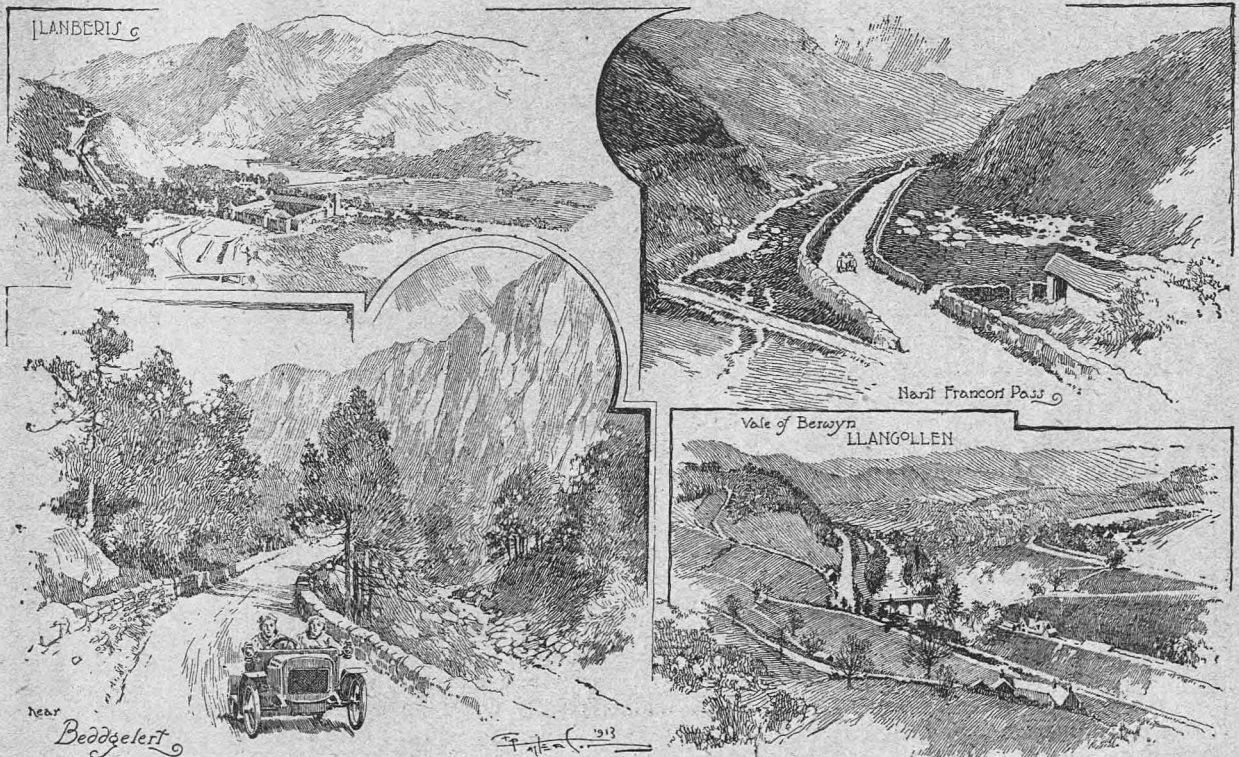
The extra care and little additional tune made it possible to extract more speed out of the little engine, and we did the 140-odd miles practically all out and absolutely non-stop. The tank had very little of its three gallons left, but we always counted on practically 50 miles to the gallon. Having lunched with our non-motoring friends, and duly submitted to the banter consequent on our arriving exactly a day late, we filled up our tanks and set off due west. Our road lay through that vilest of all districts, the Potteries, where for seven or eight miles the highway was simply a

WALES FOR THE NEW MOTORIST (contd.).

tram track with the rails in places 2 in. above the surface and a drop often of 3 in. or 4 in. from the stone sett track to the macadam sides. Added to this the whole was covered with the greasiest of clays, forming a surface only equalled in vileness by the yellow smoke cloud that enveloped the squalid, dirty string of towns. Here the springs of our little vehicle were sorely tried, but, fortunately, came through the ordeal without harm.

So intent were we to leave this district as quickly as possible, that we missed our turning out of Newcastle—pronounced with an emphatically short "a," please—and only discovered the mistake when well on the road to Congleton and Manchester. The roads were excellent here, and the undulating nature of the country made the return to find the correct turning less irksome. All along the way bands of miners re-

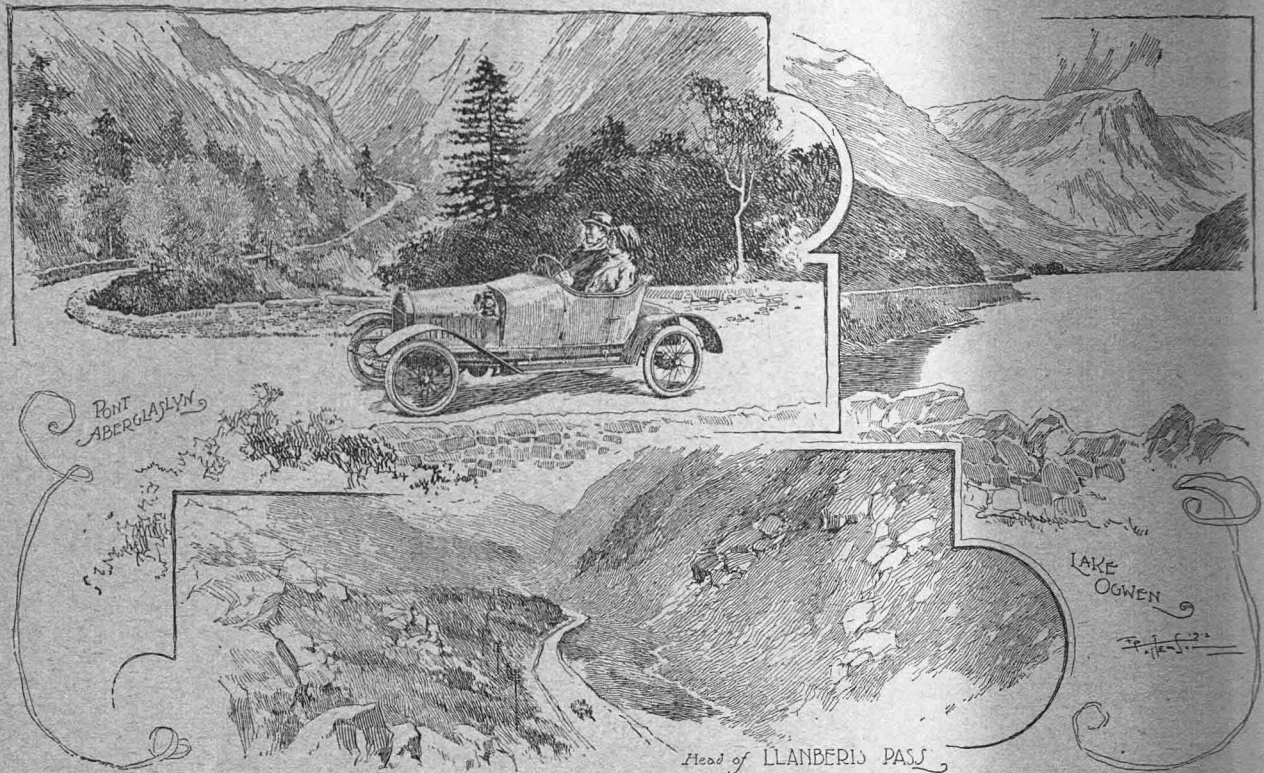
Arriving at Llangollen when it was still daylight, we drove to the top of the celebrated Horseshoe Falls Hill, recently the scene of a big hill-climb. From this eminence we were able to watch one of the most gorgeous sunsets it has ever been our good fortune to behold. Away down in the valley the white foam of the falls fringed by the green tops of the trees could be discerned, whilst the white line of the River Dee, with its many minor falls, meandered away in the distance amid an ever-receding background of dark mountains beyond. Soon the whole scene seemed to change; the valley was flooded with a strange red light, slowly changing to purple and then to gold. A perfect stillness seemed to reign over all, broken only by the ripples of the falls beneath, and as the golden light faded away into the lengthening shadows of eventide, we awoke from our reverie, the chill air reminding us it was time to seek quarters and prepare for the morrow. The machine, as we had long since



turning from work, greeted the weird machine with shouts of kindly, if somewhat broad criticism. In fact, the jokes were usually expressed in such extremely broad dialect, that we were quite innocent of their meaning. Once more the yellow pottery town was entered, looking worse, if possible, than previously, the proper turn was found, and then, as it was growing late in the afternoon, it was a case of full throttle all the way to Llangollen. In parts the roads were simply ideal, and we never slackened, except to dodge the crowds of miners at Ruabon, and, later, to gaze spell-bound at the wonderful panorama to be seen across the viaduct as we ascended the long, winding hill at Chirk. Throughout the whole journey the little twin never faltered, and, being geared fairly low, the revolutions seldom fell below 2000, a nicely-adjusted clutch and the long belts giving that sweetness of drive only enjoyed by the belt-drive enthusiasts.

learned to expect, showed no signs of its speedy journey; the slack belts had not slipped on the last steep ascent, so needed no attention; and, beyond filling up and carefully oiling the machine, nothing else was required. It wanted only a turn of the handle.

The next morning we were early on our way, following the main Holyhead road through Corwen, and as this wonderful highway was in very fair condition, we again made good time along the long, straight stretches. Soon the Snowdon range came into view, and as we began the long ascent of the hill outside Bettws-y-Coed we could hear the roar of the Conway Falls below, and now and again caught glimpses of the river as it rushed on its way through the long fissures of the valley. Down the winding descent over Waterloo Bridge, with a passing view of the Fairy Glen, on through the village much despoiled by tourists, on and up again, passing motor chars-à-bancs and brakes full of typical German and American—



a few English—holiday-makers; on past the Swallow Falls, then up and up to Capel Curig and the first and finest view of the great mountain range. One road branches on the right to Bangor, through the wildest of country, past the dark Lake Ogwen, on to Holyhead, whilst another passes Lake Mynbyr, on to Pen-y-gwryd, where the road again forks, the right-hand one leading over the Llanberis Pass and, after the long descent along the roads by the beautiful Lakes Llyn Peris and Llyn Padarn, on to Carnarvon, and the left-hand fork down into the Gwynant Valley, on to Beddgelert, Port Madoc, Criccieth, etc. Our way was the former. The Corphwysta Hotel at the top of the pass stands some 1400 ft. above sea level. We took the whole climb on top gear, and then glided down the long four miles descent to the lake side and so to our destination near Llanberis.

We had one small encounter on the pass. A car that seemed too huge for the narrow road refused to give way, so, perforce, we had to follow it for some distance until, on the last bad corner, using our knowledge of the road to some advantage and a heap of stones as a banking, we sped past, much to the annoyance of the driver of the car, who failed to overtake us again. This is where the cyclecar scores; handy, narrow, and light, with rapid acceleration, an exceptionally good car is needed to hold it on any give-and-take road. The afternoon was spent in generally overhauling the machine, and as the valves had not received any attention for some months, we carefully ground them in, fitted new springs, and prepared to show at the first opportunity what a little cyclecar can do on narrow, winding mountain passes.

A certain great statesman was billed to speak at his native village of Llanystumdwy, and as to reach this place meant journeying through two beautiful passes, we decided to go. We had hardly covered

the first mile of the long ascent up Llanberis Pass, when the belts, that had caused even ourselves to laugh because of their absurd slackness, at last began to slip, and when it is stated that we cut no less than 3 in. out without making them unduly tight you may imagine their prior condition. We were soon hurtling up the pass again, when presently a motor-cyclist roared past, only to be overtaken himself on the bad bends higher up. Then down we sped on the other side, round the bad hairpin, through the beautiful Pont Aberglaslyn, winding round and down, with the most glorious views of Llyn Gwynant and Llyn-y-ddinas, backed by the Snowdon range with all its sombre greyness. Then through Beddgelert and on again, the scenery meanwhile being so grand that we simply drove on perfectly oblivious of the fact that we had passed the turn and were now running slowly along the side of Lake Quellyn near Bettws-garnon on the road to Carnarvon. We found all so enjoyable here that we stayed and forgot Llanystumdwy, returning later the way we had come.

The evening sun was sinking lower, and we were dawdling at the foot of the long pass when, with a roar, a solo rider came by on what afterwards transpired to be a very racy machine of his own construction. The setting sun, the scenery, in fact all other thoughts and intentions were at once forgotten; we had been passed, and, moreover, on our own ground. True we were not playing at the time, but the opposition in front evidently was, for he had now slowed down awaiting us. Slowly we crept up, the engine beginning to develop its customary howl; as our speed increased, so did his, and for some time he seemed to be much the faster. The double corners were a mile or so further up—but we had jumped round them before and therein we placed all our hopes. Up and up we tore, slightly accelerating the while, but still

WALES FOR THE NEW MOTORIST (contd.)

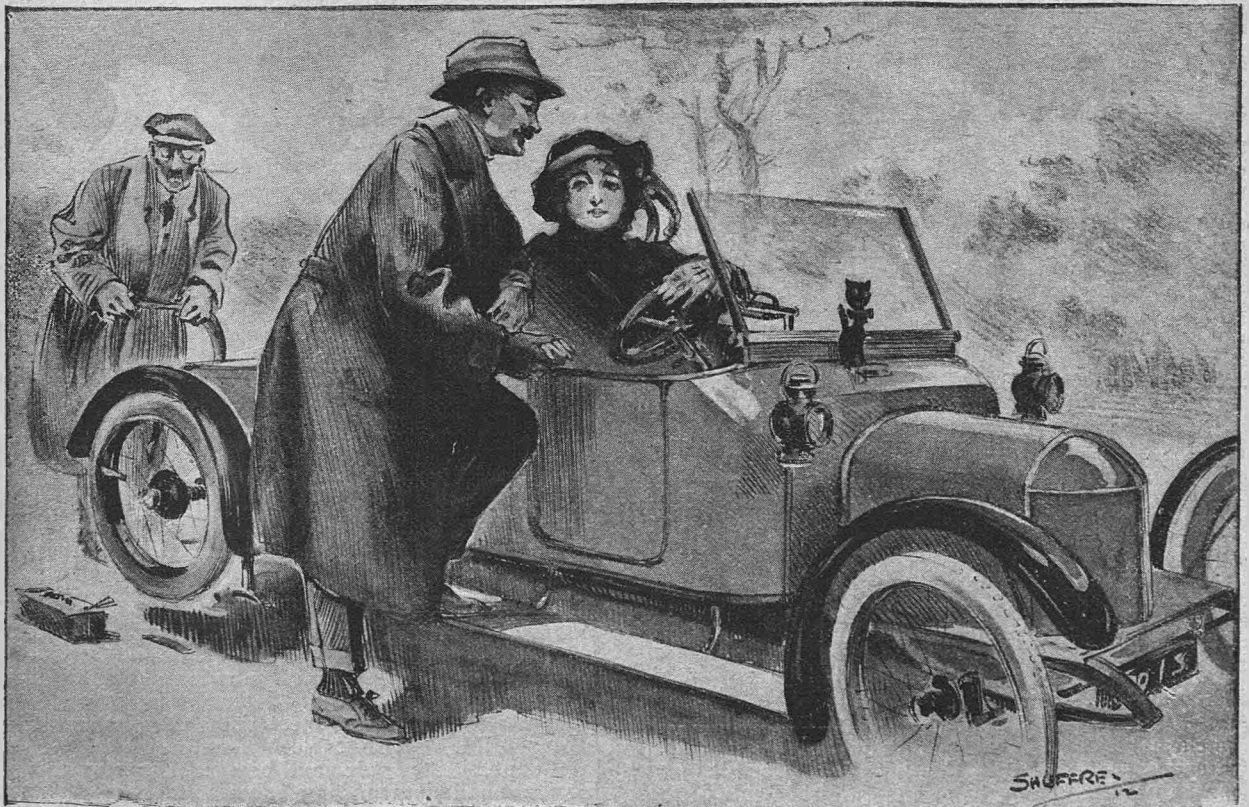
each time the road straightened we could see our esteemed antagonist a clear 150 yds in front. We still had a little more throttle in hand, and we wondered if he had. The bad double bend was in sight, and we hoped nothing was coming down. The man in front slowed to about 10 m.p.h., but ere he was round the first corner we were close behind him, and with a double skid we were round, scattering the stones to the side and far down into the valley and lakes beneath. We were now in front, throttle full open, but could not look back, another bad bend being in sight, round which with another gigantic skid we bounded, never pausing till the short, level stretch at the summit was reached, when pulling in to the side of the road we had just stopped as our friend roared past. Presently he returned, and, holding out his hand, said really pleasant things until we began to feel quite proud of the little car, and when, after a late tea, we parted, he was thinking there might be something in cyclecars after all.

Day after day we seemed to divide our time between little experiences of this kind or in climbing the many mountains around, until one unhappy morn arrived when a telegram summoned us back to town without delay, and as the matter concerned the health of a near relative our departure was somewhat of the high-compression kind. The nearest point from which we might hope to reach town speedily by train was Llangollen, some 50 miles away, and as this lay on our direct route we decided to make for that town

first. The receipt of the telegram, paying bills, filling up tanks, etc., could scarcely have occupied 15 min., and that little machine seemed to understand what was expected of it. We do not approve of, neither do we indulge in unlimited scorching, but the occasion and circumstances were exceptional.

How we got round those corners, how those hills were climbed, how we rushed through the many small villages and at last into the station yard at our first stop, we shall long remember—50 miles, part of it up mountainous road in 1 hr. 15 min.—and the train had just left! The next train did not leave for nearly three hours, and again, to cut a long story short, we used the telephone to some effect, and eventually found that after all there was no real cause for alarm. Later the weather, which had been showing signs of impatience, completely broke up, and the next day we set out for home very sober, very sad, and the wetter every mile. We followed what we always claimed to be the most direct and fastest route, through Shrewsbury, Oswestry, Bridgnorth, Kidderminster, Alcester, Stratford, Banbury, Buckingham, Stony Stratford, and St. Albans. The roads seemed utterly deserted, and we drove straight through except for a fill up in Stratford, with its eight-mile limit. We hardly saw a pair of tyres all the way, and even the monotonously good running of our own engine hardly appealed to us, but we think now of those few days, with memories of the grand scenery and those little exciting encounters on those glorious mountain passes, in a way that means we shall try to repeat the experiences another sunny day.

T. A. HUBERT.



THE USES
OF MAN.

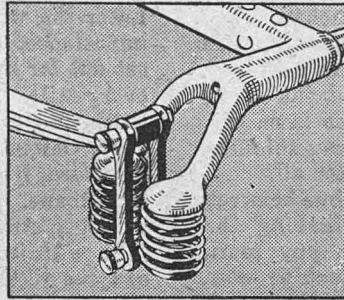
"Weally, Dinah, I wonder you care to bwing him out. Such an object!"
The Wife of "Him": "Oh, well, he comes in useful at times!"

NOTES AND QUERIES.

Readers' Problems Investigated by the Editor.

Readers are asked to write on one side of the paper only, and to use a separate slip for each question.

WITH centrally-pivoted steering, the independent rising and falling of the front wheels has to be allowed for, and many designs have been put forward to overcome the difficulty. In the early days, if one front wheel mounted an obstacle, the twisting motion thus set up had to be absorbed in the frame. In modern tandem-seated cyclecars which have centrally-pivoted steering, some kind of device is employed to take up the oscillations. The Bedelia has a shock absorber contained in a box underneath the spiral spring, which provides for a lateral movement of the front axle without subjecting any strain to the chassis itself. Another design used is to mount the sliding sleeve on a transverse leaf spring, which in turn is fixed to the axle. The simplest way, and it certainly proves itself efficient, is to have the inside of the axle bracket, which slides up and down the pillar, shaped like a cone. This will allow the axle to tilt sufficiently, and thus accommodate itself to almost any road inequality that would be met under ordinary conditions. These points arise out of a query from "A.E."



The shock absorber fitted to the Perry and referred to in the accompanying remarks.

BELT DRIVE.

"I HAVE had enough of belt drive," writes "B.D.T." (Leeds), but the experiences he relates were gained on an 8 h.p. motor-bicycle and sidecar. He then jumps to the conclusion that he will meet with the same trouble on a four-wheeler, if it is fitted with that type of transmission. Like many others, he forgets that the position of belt drive on a four-wheeler is entirely different to what it is on a sidecar combination. On a cyclecar, to start with, the weight is better distributed, two belts instead of one are employed, and they are at least 11 in., and, lastly, their length, which is an important factor in the efficiency of belt drive, is greatly in excess of what is met with on a single-tracker. Surely the two sets of conditions are entirely different. However, the proof of belt drive is in the results which it has achieved, and if "B.D.T." has an acquaintance who is the happy possessor of a belt-driven cyclecar, I should advise him to arrange for a run on it, preferably on a wet and muddy day, and at the end of it he will no longer be unconvinced of the efficiency of belts. The way they grip under appalling conditions is incredible unless it is experienced. * * *

LIGHT TYRES.

"J.P.D. (Middlesbrough) asks me which is the better of these two schemes: to have a cyclecar shod with four cheap and light covers and have a spare wheel, or to have all four wheels fitted with heavy tyres of good make, without an extra wheel. I should certainly advise him, as well as all my readers, not to err when purchasing tyres, on the side of lightness or cheapness, unless there is reason to suppose that the cover is exceptionally good. The general experience is that a good tyre, even if it is expensive in the first cost, is really cheaper in the end. There is an exception, of course, to every rule, but the difficulty is to find it, without, as it were, going through the mill to discover it. "J.P.D." will be wise if he adopts his latter scheme although it may at first be costly. * * *

DEPRECIATION.

At present the amount which ought to be put down as depreciation on a cyclecar appears to worry many readers. No two devotees of the new motoring will agree on the subject, and this divergency is not difficult to understand. Take, for instance, the prices at which second-hand motorcycles sell, and we see that some makes fetch a better price than others. Why is it? Primarily, it is a question of material. If a machine is constructed of the best material and well put together, its deterioration value is low. The effect of supply and demand is also a determining factor, those machines which are the most popular commanding a higher price. With cyclecars we may expect the same: the most popular and best-made machines will have a small depreciating value. On the average, however, a loss of 26 per cent. must be expected at the end of the year, but if the demand for second-hand machines continues to increase 20 per cent. may be nearer the mark.

SHOCK ABSORBERS

THE question of shock absorbers is brought to the front by "W.T.C." (Belfast). The make he proposes to fit to his three-wheeler is the famous Truffault, the London agents of which are Messrs. Automobiles Peugeot, Brompton Road, London, S.W. This design depends on friction for its damping action, but many others are obtainable which are composed of small spiral springs, but they really partake of the nature of a subsidiary springing system, although they are popularly known as shock absorbers. The 10 h.p. Perry fits these coil springs as a standard, but on many other makes they could be easily used. The purpose of these subsidiary springs is to absorb the minor vibrations, which cannot be provided for in the ordinary leaf springs. When a large shock comes on the spring, the main springs take effect. * * *

DISC WHEELS.

I HAVE an inquiry from "W.D.W." with regard to fitting discs to the wheels of his A.-C. Sociable. Disc wheels have much to recommend them, but they also have some disadvantages, among which I may mention the increased tendency to fling mud about, the difficulty of oiling the hubs, and the extra surface they offer to a side wind. However, these drawbacks are probably outweighed by the amount of trouble saved in cleaning the wheels. The discs can be fitted to practically any wheel, and are best made of aluminium. They can, of course, be spun out to the necessary cone shape, but if the owner is not too particular and does not disapprove of a riveted joint in them, they can be cheaply made of sheet aluminium. Short spokes, threaded each end with the aid of some small nuts, can be used to clamp them, one on either side of the wheel. Small openings, which can be suitably covered up by sliding doors, will have to be provided where the valves and security bolts come, but it is only necessary to have them on one side.

THE CYCLECAR WORLD.

Notes, News and Gossip of The New Motoring.

FORTHCOMING EVENTS AND FIXTURES.

Feb.	5th to Leicestershire Motor and	Feb.	17th ... North-West London M.C.C.,	Mar.	1st ... A.-C.U. One-Day Trial.
8th ...	Cycle Show, Empress Rink.		Paper on "The Trend of	2nd ...	Cyclecar Club Run to
7th ...	Lecture by Mr. W. G.		Design in Cyclecars," by		Biggleswade (Swan).
	McMinnies before Mersey		Messrs. Frank Thomas and	15th ...	Cyclecar Club, First Cycle-
	M.C.C. on "Air-cooled En-		H. J. Paolely.		car Trial.
8th ...	Liverpool A.-C.C. Trial.	18th ...	Cyclecar Club Cigarette	21st to	Cyclecar Club, Easter Tour
9th ...	Cyclecar Club Run to Forest		Smoker.	24th ...	(North Wales).
	Row (Brambletye Hotel).	21st ...	A.-C.U. Annual Dinner,	29th ...	B.M.C.R.C.R. 100 Miles High
14th to	North of England Show (Car		Hoiborn Restaurant.		Speed Reliability Trial for
22nd ...	Section), Manchester.	22nd ...	Cyclecar Club Run to Bea-		Cyclecars, Brooklands.
15th ...	Sutton Coldfield and Mid-		confield (White Hart).		
	Warwick A.C. Colmore	26th ...	Cyclecar Club, Lecture by		
	Cup Reliability Trial.		Mr. A. E. Parnacott, on		
			"Cyclecar Design."		

Light up : Saturday, 8th
February, 5.58 p.m.

Six o'clock

For lighting up time, after next week-end.

Now, indeed, we can look forward to long spring evenings.

We have seen a large number of Humberettes on the road recently.

Are you not longing for summer days, especially after recent tastes of spring?

Several cyclecars have been entered for the Liverpool open trial in North Wales next Saturday.

A four-cylinder friction-driven model from a well-known cyclecar factory will shortly be out on trial.

Within the last few days we have heard of three new cyclecars, the transmission systems of which combine double belt and friction drive.

The 90 degrees twin engine is causing magneto designers many sleepless nights owing to the difficulty of securing a perfect ignition system for this particular type of engine.

At the debate on "Cyclecars v. Sidecars" which was organized by the Essex M.C., one speaker suggested that cyclecars would be better were they fitted with 30 in. road wheels.

Preparations are already well in hand for the first reliability trial of the Cyclecar Club. We shall publish complete and correct particulars as soon as anything definite is decided.

Messrs. Manley and Buckingham have received so many orders for their 750 c.c. Ohota four-wheeler that they have abandoned the manufacture of a 1500 c.c. air-cooled twin for the present.

One point on which cyclecars score over light cars is in the matter of tyre manipulation. On a cyclecar, ordinary solutioned patches can be used with safety, but on a car their practicability is very doubtful.

Mr. Alan Hill, known as the successful driver of a Humberette in various trials this year, is shortly to undertake a visit to Jamaica for a two months holiday. On this occasion he is taking a motor-bicycle with him.

The famous French-made Anzani engines will soon be seen in England. The air-cooled models are particularly suitable for cyclecar work. The 24 h.p. three-cylinder engine is certainly on the large side for cyclecar work, although we know of a designer who intends to fit it.

Taking advantage of the new classification of cyclecars which will be enforced at the B.M.C.R.C. race meeting on 29th March, Messrs. Auto-Carriers, Ltd., will probably enter quite a fleet of their handy little three-wheelers in the 750 c.c. class, when an average speed of 30 m.p.h. must be maintained for 100 miles.

Ninety miles an hour—?

Will this be the speed of the winner of the cyclecar Grand Prix?

One part of the Grand Prix course, which has a sharp right-angled turn, will test the stability of the cyclecars to the utmost.

It is proposed to adopt a class for cyclecars in the Austrian Reiderberg race on 1st June. There are several cyclecars in use in Vienna.

Sixteen Auto-Carriers are being despatched to buyers every week. This is most encouraging in view of the fact that now is not the best season for effecting sales.

In a debate on "Cyclecars v. Sidecars" on Thursday evening, nine votes were recorded in favour of the cyclecar as against fifteen in favour of the sidecar. A large number of the audience did not vote at all.

A new fuel, which can be mixed with petrol, is shortly to make its appearance. By using it in certain quantities the price of the fuel will work out at 10d. per gallon, whilst the general running of the machine is not altered in the slightest.

A Crouch carette with full load recently made a top gear run from Coventry to Manchester via Lichfield, Stone, Newcastle-under-Lyme, and Congleton. Those who know the winding hill out of Congleton will realize that this is a good performance.

In an interesting article appearing in our pages this week, describing a tour in Wales, the author recalls a desperate endeavour to get past a motorcar, the driver of which refused to give way, and how the cyclecarist eventually triumphed owing to the handiness of his machine.

On Sunday next the Cyclecar Club has a run to the Brambletye Hotel, Forest Row. This rendezvous for lunch will be reached by the picturesque Eastbourne road, through Caterham, Godstone and East Grinstead, and a great variety of cyclecars should be seen passing up the hills en route.

According to several prominent dealers in the North of England, there is very little future for the cyclecar in hilly districts, and that Yorkshire people particularly are afraid to take up cyclecaring, because of the hills. Well, we shall have to see what we can do in the way of organizing a Yorkshire hill-climbing expedition—unofficial, of course.

Don't buy a cyclecar until every manufacturer has come to an agreement upon mutually employing the same type of engine transmission and frame, is the purport of an article upon cyclecar design in a contemporary. How frightfully interesting life would be! And why buy motor-bicycles, motorcars, or even a lawn-mower in the present unsettled state of the respective trades?

THE CYCLECAR WORLD (contd.).

A Precision Cyclecar Engine.

A new Precision engine, of 8 h.p., specially designed for cyclecar work, has been produced. Its outstanding feature is the long, plain bearing on the opposite side to the timing gear, which is designed to take any end thrust from clutch or transmission. The other end of the crankshaft runs on a ball bearing of the usual type, but provision is made in the timing gear cover for the insertion of a starting handle. The long boss supporting the opposite end of the crankshaft is strongly ribbed, the lower rib being drilled out to return oil to the crankcase. The lubrication of the plain bearing of the crankshaft is as follows:—The bush is turned with a spiral groove, so that the rotation of the shaft screws the oil, as it were, along to the end, where it is flung out into a recess by centrifugal force and returned by the aforementioned lead to the crankcase. The end of the crankshaft is tapered and provided with a keyway for the fixing of a clutch member. In other respects the engine is similar to the 8 h.p. twin motor-bicycle engine, the cylinders being set at an angle of 50 degrees.

Charlecote Bridge.

A very fine photograph of Charlecote Bridge appears on our front cover this week. It crosses the Avon near Stratford, and is a most picturesque structure. The cyclecar crossing the bridge is a Premier, made by the Premier Cycle Co., Ltd.

The Wilkinson T.M.C. Co., Ltd., inform us that they have finally decided on the dimensions of their cylinders as 64 mm. by 75 mm. The front axle will be retained as tubular, and the spring boxes will be made of malleable iron in subsequent models.

The A.-C. Gear Ratios.

With reference to the comments on the low gears of the A.-C.s in the North Middlesex Trial, in our last issue, Auto-Carriers, Ltd., inform us that the standard machines have gear ratios of $4\frac{1}{2}$ to 1 and $11\frac{1}{2}$ to 1, and 5 to 1 and 13 to 1, the latter combination being advised for hilly districts. It will thus be seen that the machines entered for the trial were standard. Auto-Carriers, Ltd., also point out that an A.-C. engine can be run when the machine is at rest without harmful results.

OUR FINANCE BUREAU.

Letters in reply to the following will be forwarded:—

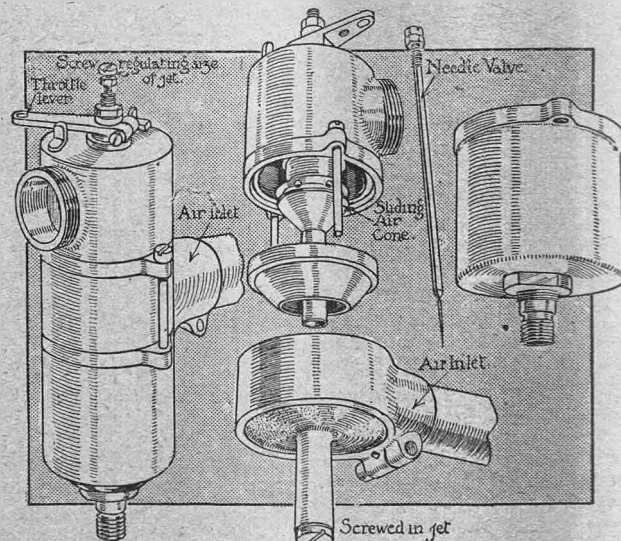
Ref. F.—We know of a cyclecar concern which is seriously hampered by lack of capital, with a good machine well spoken of by users, and with many orders on the books. About £2500 is wanted to enable these orders to be completed.

Ref. G.—One of the oldest-established French cyclecar concerns, with a number of English customers, requires a managing director, with capital, to open London show-rooms. If necessary, an English company could be formed.

A NEW AUTOMATIC CARBURETTER.

A NOVEL automatic carburetter was fitted to the Gordon cyclecar in the recent North Middlesex Trial, and the mere fact that the petrol consumption on this run of the machine in question was 60 miles to the gallon, shows that it is efficient. The most interesting feature is the adjustable jet, which is placed in the float chamber itself. The jet has a tapered orifice, into which a needle is placed, and by fitting this needle on a long rod which passes directly through the centre of the carburetter, adjustments can be made while the engine is running. By turning the rod, which is provided with a screwlike head, the needle descends deeper into the jet, and in consequence the jet aperture diminishes in size. The petrol is led in through the bottom of the float chamber, and its level is regulated by a short needle valve, controlled in turn by weights. No valve spindle projects up through the float as in most carburetters, but the circular passage through the centre of the float is of large diameter. Into this passage fits a tube, which is part of the middle portion of the carburetter where the air valve is situated. The jet is placed in the interior of this tube. Another important feature is the provision made for easy starting, the fuel nozzle being so arranged that the top of it lies below the level of the petrol. Thus the fuel flows over the jet, the moment the engine is stopped, and fills a circular well. The result of this is that no tickling of the carburetter is necessary, nor is any provision made for so doing. Two concentric tubes form the choke tube, the inner one, which is attached to the piston air valve, dipping into the circular trough, which is filled with petrol. Immediately the engine is started the suction thus caused raises the air valve and draws up the small quantity of spirit which clings to the inner tubes, with the result that the engine starts first pull up of the handle. No springs are used to control the air valve, gravity alone being deemed sufficient to bring it back to its seat. The carburetter is illustrated, and it will be noticed from its appearance that it resembles an

acetylene generator, having a cylindrical shape, while the regulating screw and clipping rods add to the resemblance. For convenience the device is made in three parts, which are firmly clipped together by two long screws, passing through lugs on the uppermost portion, and screwing into two others on the float



A new automatic carburetter with novel features described on this page.

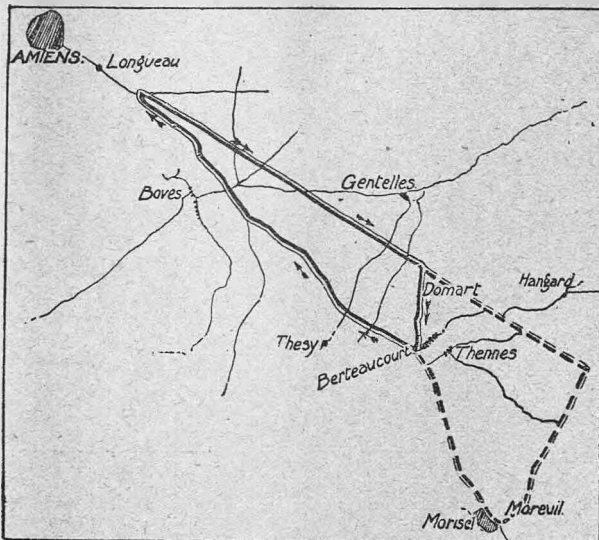
chamber. An ordinary revolving throttle is fitted, and can be easily set to keep the engine ticking over when the accelerator is released. The price has not yet been definitely decided upon, but we are informed by Messrs. Cass's Motor Mart, 5, Warren Street, Tottenham Court Road, London, W., who are handling it, that it will be sold for about 30s.

THE CYCLECAR GRAND PRIX.

Map and Description of the Course.

ROUGHLY 12 miles round, with two right-angle turns and one specially-banked curve, the cyclecar Grand Prix course at Amiens is practically a combination of road and motordrome conditions. The course is a portion of the one selected for the big-car race on Saturday, 12th July, and, as can be seen from the accompanying map, is triangular in shape. The deep-black lines show the cyclecar section, and the dotted lines the additional portion covered by the big cars. Amiens is only a couple of miles from the western end of the course; there is, however, a station on the main Paris-Calais line within 200 yards of it, but it is not known whether it will be used for the occasion. As can be readily understood, the good people of Amiens would like visitors to be brought directly to their city. After running parallel for about a mile, and never being more than 120

of the cross-road is of exceptional width, so that there will be no difficulty in cornering at speed. The home stretch is a little over five miles in length, and is of a slightly undulating and easy-winding nature. For a certain distance the main railway line from Paris to Calais is parallel with the course, and at places there is only a hedge between the two. At first the railway is on the outside of the course, but at half distance it crosses over to the inside. The bridge under the railway narrows the road somewhat, while still leaving plenty of room for cyclecars. It is likely that the road at this point will be cut up, for the big cars will have been round on the previous day, and will have taken off the surface. After being on the inside for a little more than a mile, the railroad again cuts across and takes up a position on the outside of the course. This second passage under the railway is really difficult, and will have to be taken with caution, the road here having a decided S form. Here, too, the surface will be damaged by the passage of the big cars. It ought not to be a difficult matter, however, to clear away all the loose stones in the interval between the two races, so as to avoid the possibility of punctures for the lighter vehicles. Towards the end of the home stretch the road becomes parallel with the back stretch, the two being so close together that any person within this tongue of land could walk across and see the cars go by on both stretches. The grand-stands, as already explained, will be at the end of the two long sides of the triangle.



The course of the Cyclecar Grand Prix race, to be run on 13th July, is indicated in heavy lines.

yards apart, the two roads forming the long sides of the triangle unite at what is known as the Fourche. It has been decided, however, not to take the cars round the present sharp bend, but to unite the two parallel roads by a specially-prepared cross road banked sufficiently to allow big cars to be taken round at a fairly high speed. Experience has shown that when a turn is really difficult, drivers attack it with so much caution that it loses both its danger and its interest. On the outside of this special cross-road the grand-stands will be erected, and from this position it will be possible to see the cars approaching, watch them on the turn, and see them disappear on the second straightway.

This second straightway—or backstretch, as it would be designated in American parlance—has few distinctive features. It is dead straight for at least 15 miles, but the cyclecar drivers will only have to cover five miles on this natural speedway, turning sharply to the right to enter a cross-road of medium width. The big cars continue straight ahead for about three miles further. The length of the cross-road is two miles, the cyclecarists coming into the home stretch on the edge of the village of Berteaucourt. The turn is a right-angle one, but the mouth

A High-speed Contest.

On the short course to be used by the cyclecars and motorcycles there are no hills of any importance. The event will thus be a high-speed contest from beginning to end, with engines running at the maximum number of revolutions from start to finish. The drivers will have an opportunity of showing their skill on the two turns under the railway, on the two right-angle turns at the base of the triangle, and, to a lesser degree, on the banked turn in front of the grand stands. There are really no villages on the course, for Berteaucourt is only skirted and Boves is passed on the left. To the spectator there will be plenty of interesting points, for, in addition to the grand-stand headquarters, with the petrol stations immediately in front of them, there is the opportunity of getting inside the course and moving about from point to point. There are sufficient cross-country lanes to make this possible, and three or four foot bridges over the road will facilitate sight-seeing.

Cyclecars will be specially catered for in the third annual Colmore Cup Open Reliability Trial, which will be held on 15th February by the Sutton Coldfield and Mid-Warwickshire Automobile Club. Prizes will be offered for the best cyclecar performance, irrespective of whether it gains the premier award.

Lighting the Lamps from the Magneto.

A new device for lighting acetylene lamps from the driving seat has recently been patented by Lieut. E. Renouf, R.N., of the Royal Naval College, Greenwich, S.E. Two small electrodes are placed over the jet, one of which is earthed to the frame, whilst the other is connected, when desired, by suitable means to one of the sparking-plugs. When such connection is made by means of a switch, a spark jumps across the electrodes and the gas is ignited. It is claimed that one spark is sufficient, so that only one misfire takes place.

CYCLECARS v. SIDECARS.

Interesting Debate at the A.C.U.

ON Thursday, 30th January, the respective claims of cyclecars and sidecars were fully thrashed out at a well-attended debate held in the General Committee Room of the A.C.U., and arranged by the Essex M.C.C. The proposer of the motion, Mr. W. G. McMinnies, prefaced his remarks by stating that he did not intend to compare cyclecars with the cheapest form of motor-bicycle and sidecar, but rather would draw comparisons between the £100 cyclecar and the £90 sidecar combination, as it is between these two that the choice of the ordinary purchaser would lie. This being so, he feared that he had rather taken the wind out of the sails of the opposition, as they could not, therefore, urge the point of easy detachability in favour of the sidecar machine, the reason being that the purchaser of a £90 sidecar machine would use it practically entirely as a passenger machine.

Mr. McMinnies then proceeded to enumerate the various points in which he claimed the cyclecar to be superior to the motor-bicycle and sidecar. These were as follow:—(1) Comfort, both for driver and for passenger; (2) weight distribution is better in a cyclecar; (3) there is a certain indefinite sense of superiority felt when steering with a wheel than when steering with handlebars; (4) cornering is much safer and faster in the case of the cyclecar; (5) speed (the cyclecar has covered a greater distance in the hour than the motor-bicycle and side-car, although he admitted that the cyclecar only carried one person as against two on the sidecar machine); (6) on a cyclecar, belts and tyres last longer than on a sidecar motor-bicycle, due to better application; (7) cyclecars have performed as well as, if not better than, sidecars in the public trials; (8) in a cyclecar the air-cooled engine is better disposed for cooling purposes; (9) solo driving is safer than on a sidecar machine; (10) a cyclecar is generally made complete at one works, whilst in the case of a sidecar combination the bicycle might be made in America and the sidecar hail from Coventry; (11) the repair of tyres is simpler, and their wear is less on the cyclecar; (12) lady drivers will be better suited by the cyclecar; (13) luggage accommodation is greater on the cyclecar; (14) as there is more room than on a sidecar machine, the silencing arrangements may be better carried out; (15) it has been proved that a cyclecar can be carried almost as easily by train as a motor-bicycle and sidecar.

Mr. W. B. de Siffken then rose to put the case for the sidecar, and agreed with the proposer in comparing only the £100 cyclecar and the £90 sidecar outfit. He devoted the first portion of his reply to criticising cyclecar design, instancing a few of the worst points of some badly-designed machines. He considered cyclecars unsuitable for the middle-aged novice, and the slipping belt, to provide differential action, he thought most unsatisfactory and unmechanical. After considering other points in cyclecar design, such as tandem seating, friction drive, steering and springing, he suggested that 30 in. wheels would be more satisfactory than 26 in. wheels for cyclecars. The sidecar, he stated, has the advantage of the cyclecar in (1) ease of storage and (2) lower tax. He disputed the lower cost of tyres for cyclecars, and pointed out that most sidecar engines could be started from the seat. Further advantages were accessibility of engine, light weight, ease of handling, a large steering lock, and low depreciation. Whilst admitting that the cyclecar is more comfortable for both driver and passenger, he considered that it was not the same value for money as the motor-bicycle and sidecar.

Mr. Spencer supported the proposer, and spoke in glowing terms of his cyclecar experiences. He

pointed out that Mr. de Siffken had devoted a large part of his speech to criticising cyclecar design without really comparing them with sidecars.

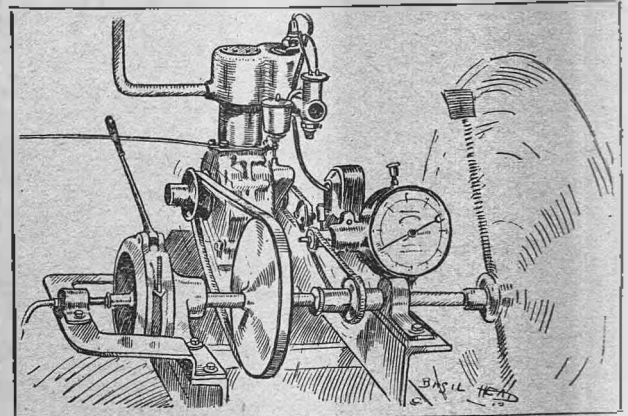
Mr. Grey spoke in support of the sidecar, drawing comparisons between two specific machines, namely, the Clyno and the Morgan, pointing out that the motor-bicycle was quieter both as to engine and transmission, the finish was better, and the sidecar was the more comfortable.

Mr. Alan Hill preferred both the cyclecar and the sidecar. He finds that the cyclecar costs less for tyres and petrol, doing 50-55 m.p.g. The small 3½ h.p. three-speed sidecar he believed to have a future for those to whom first cost is a consideration.

Mr. W. Pratt pointed out that the sidecar combination was two machines in one, and spoke of a sidecar manufacturer who was prepared to beat any cyclecar on the road both for speed and cornering. He stated that the cost of upkeep was greater with the cyclecar.

After a number of speakers had pointed out the advantages of the cyclecar, Mr. Kerr said that the demand was the great thing, and that this would settle a number of points at issue between the sidecar and cyclecar which are at present undecided.

Mrs. Edwards considered that cyclecars were more suitable than sidecars for married men; but for the passenger the sidecar was more comfortable, a view



How the silencers were tested at the A.C.U. silencer trials described on the next page. The illustration shows a Blumfield engine working against a fan brake, the size of the blades regulating the revolutions per minute.

that was supported by another lady present, whilst Mr. H. Norrish said that cyclecar drivers were treated as "carriage folk," and charged accordingly.

After it was pointed out that a sidecar machine has less depreciation and speed than a cyclecar, Mr. Selby spoke in favour of the comfort of sidecars, instancing the fact that he had several times gone to sleep in one, which he considered impossible on a cyclecar.

Mr. W. G. McMinnies rose to reply, and regretted that in the debate they had dealt with too many instances, and had not considered the subject in the abstract. He pointed out that the cyclecar was yet in its infancy, and thus finish, at present, could not be expected. He recapitulated his various points, and put the motion that "In the opinion of this meeting, the £100 cyclecar will supersede the high-powered sidecar combination," which was lost by 9 votes to 15, a number of those present refraining from voting.

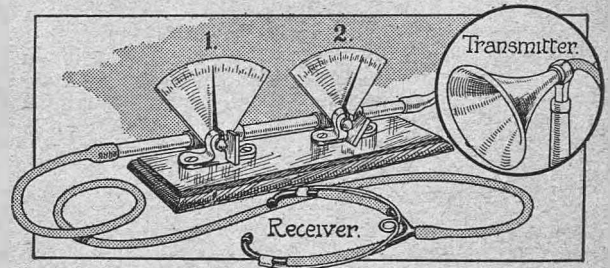
The Amac carburettor has found a new home in larger premises at 97, Aston Road North, Birmingham.

THE SILENCER TRIALS.

Testing Back Pressure, Silence and Efficiency.—The A.-C.U. Experiments.

THE concluding stages of the Auto-Cycle Union Silencer Trials took place at the works of Auto-Carriers, Ltd., Thames Ditton, last Wednesday, when the various devices entered, which had been subjected to the track tests the week before, had to undergo tests for efficiency, back pressure and silence. To carry out these trials, Messrs. Auto-Carriers, Ltd., kindly placed at the disposal of the Union a shop, in which was erected a water-cooled, single-cylinder Blumfield engine coupled to a countershaft, on which a fan brake was fitted, in addition to a revolution counter. Each silencer, including the A.-C.U. silencer, was fitted to the exhaust pipe of the Blumfield engine, which protruded through the wall of the shop, and the engine was then run at approximately 900 r.p.m. with the larger blades used, and 1900 r.p.m. with the smaller of the two blades used, Mr. Brooker being in charge of this department. On the other side of the wall through which the exhaust pipe protruded were instruments for determining the back pressure created by each silencer, and also the amount of noise. For determining the former a very interesting instrument had been evolved by Dr. Watson. It consisted of a U-shaped glass tube containing mercury. One end of the glass tube was in connection with the exhaust pipe between the engine and the silencer under trial; the other end was open to the atmosphere. Under normal conditions the two columns of mercury would, of course, balance each other, and a graduated scale placed at the side of the glass tube indicated "O" at the balanced position. When the pressure from the exhaust pipe was allowed to bear on one column

of mercury, it would naturally force this down and the other one up, and the reading would then be taken from the graduated scale, which was marked off in centimetres. From this the amount of back pressure per square inch could be calculated on the basis of 76 cm., being equivalent to 14.7 lb. per sq. in. pressure. The relative silence of the machines was measured in two ways, by Colonel Holden's audiometer, which incorporates a telephone in its design, and by Dr. Low's most simple and, at the same time, efficient device, which we illustrate. This consists of a trumpet, which is placed near to the silencer, and a



Dr. Low's audiometer described on this page.

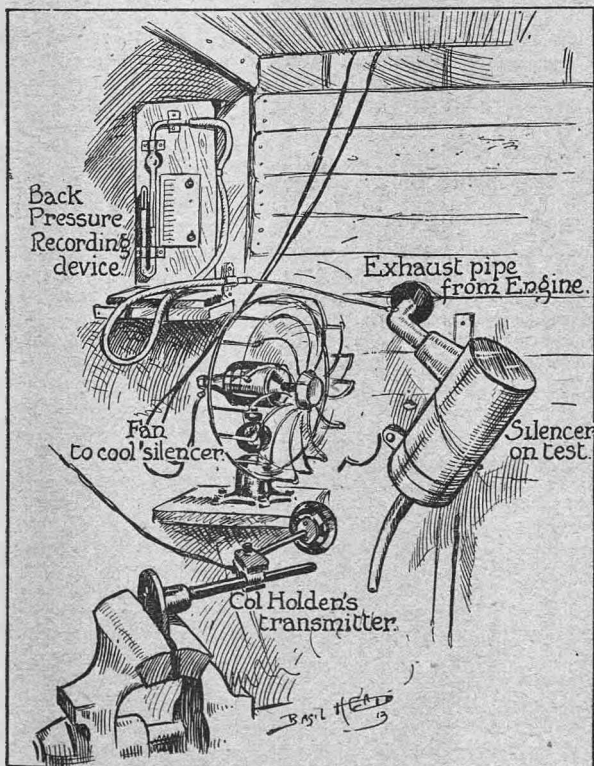
long strip of indiarubber tube communicating with the listening device, which is used by the hearer some distance away. Let into the tube, and placed conveniently for the operator to manipulate, are two taps in the pipe. These taps are provided with pointers, which are arranged so as to be moved over a graduated scale. The function of these taps is to act as throttles for the noise. One tap is turned full on to begin with, and the other one is set so as to cut down the noise considerably. The other tap can then be set until one can just hear the beat of the engine. The position of the pointer on the graduated scale is then noted. We tried Dr. Low's device ourselves, and found it extraordinarily efficient as a means of indicating the relative silence obtained by the different silencers. It was also interesting to note that Dr. Low claims to have obtained results practically identical with those obtained by Colonel Holden with his device, illustrated in "Motor Cycling" last week.

The performances of the various silencers under test varied considerably, and, whereas some appeared to give very little back pressure indeed, others exerted as much as 8 lb. to 10 lb. to the square inch. Then again, whereas some were practically silent, although in our opinion none were quite as silent as the A.-C.U. device, others were extraordinarily noisy. The Hutton Macbeth, the Clair, the Chase and the Rover appeared to us as efficient as any. The judges' report is not yet available, as all the results of silence, speed and efficiency trials at Brooklands, as well as the trials on the bench, have to be carefully tabulated and verified. It will be awaited with interest.

Further details and illustrations of the trials appear in "Motor Cycling" this week (published yesterday).

If an engine refuses to run as slowly as previously, test for air leaks in the induction pipe.

Some cyclecarists, in their enthusiasm, forego meals at the ordinary time. We know of three hardy souls who drove 62 miles to a hill-climb after breakfast, witnessed it, and then broke their fast for the first time at 3.30 p.m. But they made up for lost time!



The silencer trials. An interesting method of determining back pressure is illustrated (described in detail above). Col. Holden's audiometer is shown.

THE NEW CALTHORPE CYCLECAR.

A Very Light Miniature Car.

THE cyclecar which is being placed on the market by the Calthorpe Motor Co., of Cherrywood Road, Birmingham, is practically a car in miniature, in which all superfluous weight has been eliminated, with the result that two men can easily lift the chassis. Commencing with the engine; this is a very neat little four-cylinder thermo-syphon cooled unit, with cylinders cast en bloc and valves all on one side enclosed by an aluminium cover plate. Two silent chains are employed to drive, from the front end of the engine, the camshaft and the magneto respectively, the latter being mounted on one side of the crankcase. The crankshaft runs on two large plain bearings, and from the back end of the camshaft an oil pump is driven direct, which maintains a supply of oil under pressure to the main bearings and to troughs under the big-ends. An indicator showing the pressure of the lubricant is mounted on the dash, and the oil is drawn from and returned to a sump in the bottom of the crankcase, the underside of which is ribbed for cooling purposes. The cylinder bloc is connected by pipes of exceptionally large diameter to the radiator, which is a smaller edition of the usual Calthorpe type. From the engine, power is transmitted through a Hele-Shaw multi-disc clutch to a three-speed and reverse gearbox mounted on the tubular underframe, by which the engine is also supported. This sub-frame consists of two straight

seats, the whole being braced underneath by a thin steel tie-rod. The main frame consists of two pressed steel side members joined together by tubular cross-members and inswept in front.

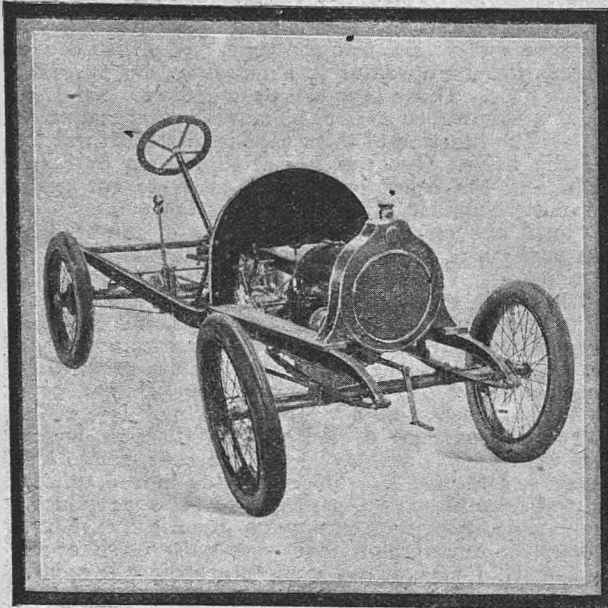
The chassis is hung on four semi-elliptic springs of good length and width, those at the back being employed to take the drive in a distinctly novel way. The torque of the axle is resisted partly by a light triangulated member shackled to the cross-member behind the gearbox at its forward end and partly by the propeller shaft casing.

The bevel and crown wheel provide a direct ratio of 3.7 to 1, so that the machine should be capable of very high speeds.

The engine is controlled by means of an accelerator pedal and an ignition lever mounted on the steering wheel, the foot pedals operating respectively the clutch and the rear wheel brakes, which are of the internal-expanding type. The steering gear has been most carefully and thoroughly carried out, the worm and sector being enclosed in an aluminium casing bolted to the main frame, and all connections are made with ball swivel joints. The front axle is of the straight tubular type, and the insweeping of the frame provides for a good lock. The equipment includes Calthorpe detachable wire wheels shod with 700 mm. by 80 mm. tyres, and a particularly smart two-seated body will be fitted. Up to the present time the price of the complete machine has not been decided, but it will be in the neighbourhood of £150.

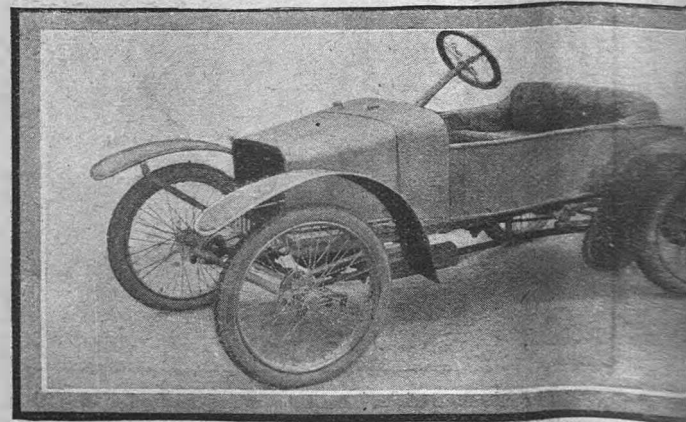
The standard of painting and varnishing on a cyclecar should be the same as on a Rolls-Royce if the machine is to sell well. Such is the view of a well-known London motor dealer. We hear he intends to produce a cyclecar himself shortly, so we shall see if his preaching and practice agree, and what the price of the machine comes to.

A Duo which belongs to one of the members of our staff at one time gloried in the name of "The Comet." On discovering that a Morgan was similarly named, it was rechristened "The Deuce." Every day that it has been on the road since its new name was given it the rain has descended in torrents. Perhaps if it was baptised once more and called "Sunshine" we might get some fine weather.



Front view of the new Calthorpe, showing the radiator which is like that of the Calthorpe car.

tubes of good diameter, which are passed through circular lugs on the gearbox and crankcase castings, the gearcase being three-point suspended, whilst the engine is hung from four supports. The change-speed lever works in a neat gate, the bracket supporting it being drilled out to save weight, and beside it the hand lever operates an internal-expanding brake just behind the gearbox, from which power is transmitted through a leather-covered universal coupling and encased propeller shaft to the bevel-driven back axle. The casings for the axle driving shafts are well tapered from the differential housing to the spring



Left, the West cyclecar; and right, the Calthorpe cyclecar.

RULES FOR THE A.-C.U. ONE-DAY TRIAL.

Stringent Regulations for Cyclecars.

THE rules for the A.-C.U. Spring Trial, to be held on 1st March, are now available, and a copy may be obtained from the secretary of the A.-C.U., 89, Pall Mall, London, S.W. The trial will be a non-stop one over a course from 100 to 150 miles in length, and, in order to qualify for a first-class certificate and silver medal, cyclecars must conform to the following requirements:—Each machine must have (1) free engine and variable gear; (2) two brakes working independently; (3) mudguards of a greater width than the tyre by at least 10 mm. (say $\frac{1}{4}$ in.) each side, and covering at least 120 degrees of the circumference of the front wheel and 180 degrees of the circumference of both rear wheels; (4) minimum tyre size, 2½ in.; (5) efficient silencer, which does not exhaust directly on the road; (6) magneto reasonably protected from mud or placed in a sheltered position; (7) two lamps shining forward to indicate as far as possible the extreme width of the vehicle, also a rear lamp; and (8) a genuine touring body. The gear ratios of the competing machines must be given in the entry form, and

will be published. In the case of variable gears, the highest and lowest ratios must be given. In addition to these requirements, the cyclecars must be in good condition and reasonably clean, and the outside of the engine must be reasonably free from oil at the conclusion of the trial. Exhaust cut-outs, if fitted, will be sealed at the commencement of the trial, and must not be used. The maximum time allowed will be calculated on a speed of 18 m.p.h., and the minimum 20 m.p.h., allowance being made for 10 m.p.h. limits, difficult country, etc. Arrival times will only be taken at the luncheon stop and the finish. The entry fee is 10s. 6d. for every private driver in the "general" class, and £1 1s. in the "expert" class. The entry fee for manufacturers or agents is £2 2s. in either class. The rules will also apply to the autumn trial on 24th September. A number of standard machines may be ruled out by the specification insisted upon, especially by Rule 2. It is a matter for doubt whether two independently-operated brakes, both braking with the same pair of brake shoes, will pass this rule.

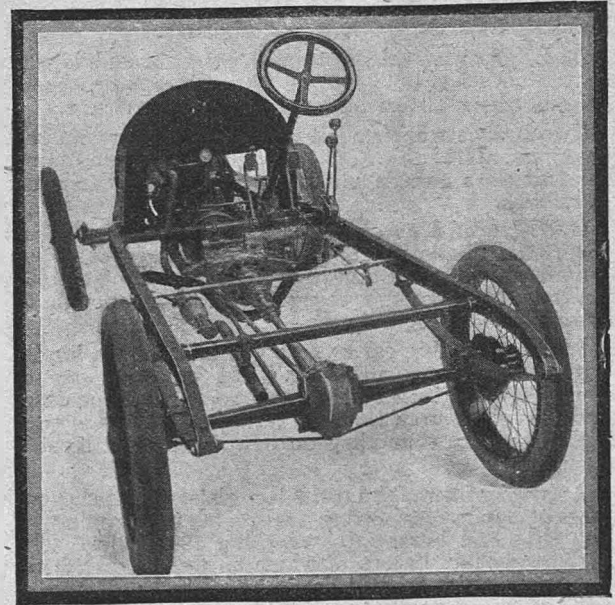
No Need for Reverse—A Demonstration.

In a recent issue we published a drawing entitled "Is the Reverse Necessary?" suggesting it was possible, under certain conditions, for a cyclecarist to turn round in the road simply by locking the wheels and skidding. The other day we saw this feat performed by Mr. Fraser Nash with a G.N. The narrow road was fairly greasy, and the driver, when going at 15 miles an hour, locked his steering wheel over, and at the same time applied his brake quickly and took out the clutch. The result was the machine turned round in the direction in which it had been coming, thus demonstrating the fact that, under certain circumstances, there is no need for a reverse.

A great amount of interest is being taken in the forthcoming 500 miles race to be held on the Indianapolis speedway in May next. The announcement is made in "The Motor" this week that a Peugeot car has been entered and will meet the Sunbeam again. In "The Motor" two remarkable panoramic pictures of this wonderful speedway will be found.

On Sunday next the Cyclecar Club run is to Brambletye Hotel, Forest Row.

We accidentally omitted to insert the name of Mr. H. G. Chester amongst those who received bronze medals in the recent reliability trial promoted by the Middlesex Motor Cycling Club. The machine Mr. Chester drove was an L.M.

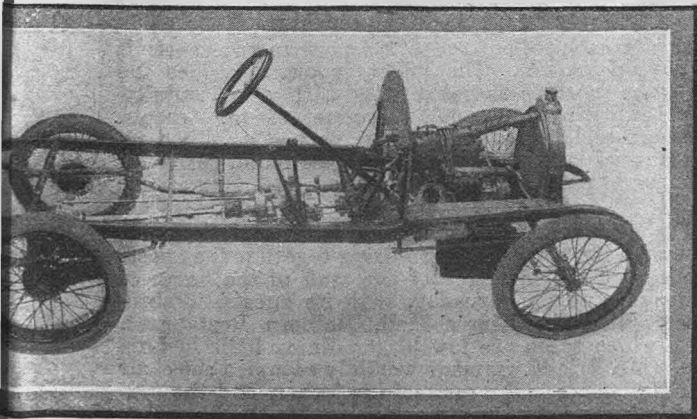


Rear view of the Calthorpe chassis, showing the toe rod on the rear axle. Note the torque stay and tube.

A New Cooling Device.

A device to keep air-cooled engines cool when used indoors to drive dynamos, etc., has recently been invented in New Zealand. The efficiency of the device may be seen from the fact that without the aid of a fan it is possible to run a dynamo with an ordinary air-cooled engine continuously for 30 hours, and one can lay one's hand on the cylinder at any time during this period. We hear the inventor is on his way to England, so that developments may be looked for.

engine for
be extended
is described
88.



Showing the unusual arrangement of the rear springs



A Duo cyclecar climbing Bury Hill, near Pulborough, in the Surrey v. Streatham inter-team contest on Saturday. The machine climbed this fill on one belt, as one of the pulleys had become detached. Note the flooded country.

The Brighton road between Handcross and Brighton is in a disgraceful condition. Some of the ruts are six inches deep.

A cyclecar suspended on air springs and incorporating a new transmission gear is being built and should be ready for the road in a month's time.

At Brighton on Sunday morning the Esplanade was coated with ice, but later on it was swept by sheets of rain, blown almost horizontally by a hurricane.

Two brakes working independently are among the requirements of the A.-C.U. for machines qualifying for first-class awards in the spring non-stop trial on 1st March.

G.W.K. and Duo cyclecars competed in the inter-team trial of the Surrey M.C.C. and Streatham and District M.C.C. on Saturday. Neither completed the course, Mr. Messervy being unfortunate enough to shed one of his belt rims.

We hope the big car owners will look with a kindly eye on the "new motoring." At present some of these drivers give us very little room when passing, and we might urge them in future to pull over to a greater extent than they do now when they meet a cyclecar.

A driver of a well-known 8 h.p. three-wheeler spent most of Sunday last fitting a new back tyre in place of one that had burst after covering 1280 miles. The elaborate chain guards of which he was so proud did not prove quite so well designed when he wished to remove the rear wheel.

The week-end mileage of three members of THE CYCLECAR was as follows:—131 miles on a G.N., 172 miles on a Duo, 125 miles on a Morgan and 90 miles on a Warne. Very few other cyclecars were seen, or, in fact, vehicles of any type, gales of wind and storms of rain making the roads very heavy.

Great amusement and excitement were caused on Sunday last at the Old Ship Hotel, Brighton, by the endeavours of a Cyclecar Club member to get inside his poncho. The difficulty may be explained by the fact that this thin waterproof had to be coaxed over two large overcoats. At one time we thought the unfortunate owner would neither get in nor get out of it again, such was his position when we caught sight of him and helped him out of his predicament.

B26

The road and weather were atrocious during the week-end.

During the week-end many motorcyclists appeared to be having trouble by the wayside, belts of the rubber variety having to be shortened.

We noticed on Saturday last two well-known experts struggling with a burst back tube. Was there any special advantage in putting large quantities of mud in with the tube?

The public interest in cyclecars is extraordinary. At the Old Ship Hotel Brighton, all the visitors and staff crowded at the windows to see the drivers of a G.N. and a Duo start off. The neighbouring windows were also full of interested spectators.

A hood has many disadvantages, and we experienced one very vividly on Sunday last. We were proceeding almost against a hurricane, when the rain began to descend. As our passenger urged us to put up the hood, we did so, with the result that we almost came to a standstill, until it was folded down.

We took the opportunity of taking a friend for a run down to Brighton and back on Sunday last. Before we started he had serious misgivings as to belt drive, but after doing the journey under vile conditions, without any involuntary stop, and in excellent time, he now seriously considers becoming a cyclecarist and buying a belt-driven machine.

That rumour about the £70 American two-seater is still flying round. The latest report describes the phantom machine as being fitted with a horizontally-opposed twin water-cooled engine, 28 in. wheels, pressed-steel frame, epicyclic two-speed gear and reverse, dual ignition, and sold complete and ready for the road, with lamps, tools, hood and tyre repair outfit.

The Gamage Amateur Athletic Association was formed a few months ago to bring together the sports sections of the members of the staff of the house of Gamage, and on Saturday, with its guests, it absolutely filled the King's Hall, Holborn Restaurant, than which there are few larger dining halls in London. Mr. Eric M. Gamage worthily occupied the chair in the absence in America of his father, and the proceedings were rendered most enjoyable by the enthusiastic character of the speeches and the excellent musical entertainment provided.

The Cyclecar

Wednesdays—1d.

Conducted by EDMUND DANGERFIELD.

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"AUDIBLE WARNING."

This is an important consideration for every new motorist. Will any sort of cheap hooter be all that is necessary, or had something that will satisfy the user, and last as long as the machine, better be fitted? What is the choice? These questions are satisfactorily answered in the very important illustrated article that will appear in next Wednesday's issue of "THE CYCLECAR."

NOTICES.

Letters.

EDITORIAL Communications should be addressed to The Editor, "The Cyclecar," 7, 9, 11, 13 and 15, Rosebery Avenue, London, E.C.

Letters relating to ADVERTISEMENT and PUBLISHING Departments should be addressed to The Manager. SUBSCRIPTIONS should be forwarded to the Manager (rate, 6s. 6d. per annum, or pro rata).

Press Times.

IMPORTANT LATE NEWS and Photographs can be accepted up to first post Monday morning for insertion in the following Wednesday's issue.

ADVERTISEMENT COPY, Blocks, &c., should come to hand by Wednesday morning to ensure careful attention and allow time to submit proofs, except when an earlier time is specified.

Return of MSS., &c.

Drawings, Photographs and MSS. not suitable for publication will be returned if sufficient stamps are enclosed for this purpose, but the Publishers cannot hold themselves responsible for the safe keeping or return of contributions.

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Advertisements of Cyclecars for Sale, new or second-hand, Sundry Announcements, and Rates for Advertisements, will be found amongst the end pages.

Topics of the Day

MORE than one reader of THE CYCLECAR has written to us recently suggesting that the very arbitrary definition of a cyclecar should be closely acted upon in the compilation of our advertisement pages, and its provisions not only carried out but extended to exclude machines that come within the definition but do not resemble cyclecars. In particular, exception is taken to the inclusion of advertisements of cheap American cars, a method of stifling competition which would be very unusual and quite unnecessary. That cheap American cars should be advertised in a journal interested in the encouragement of a different type of machine, is a tribute to the keenness of the competition of the cyclecar. While the running costs and appearance of the average cyclecar are so vastly in its favour, little notice will be taken by those interested in the new motoring of the cheap American car. We are glad to see from numerous letters received that our readers are fully alive to the discrepancy between the real value of a motorcar, the production costs of which have been whittled down to a low figure, while the running costs remain the same, and a cyclecar built specially for simple and economical motoring.

The Disadvantage of the Cheap American Car.

* * *

WE have advocated the necessity for some kind of classification for cyclecars for competition purposes. The wisdom of this has been recognized both at home and abroad, and a classification adopted. It is obviously unfair to expect a 750 c.c. single-cylinder-engined cyclecar to compete in a hill-climb, a reliability trial, or a race at Brooklands with an 1100 c.c. engined machine. It is equally absurd to expect a two-seater to hold its own with a single-seater monocoque, the engine powers being the same. The International Federation of Motor-cycle Clubs realized the necessity for adopting some form of classification in Paris recently, and made certain suggestions, but it was not until we brought the matter up at the Auto-Cycle Union last week that it was decided definitely to institute a new class for cyclecars with engines limited to 750 c.c. This classification will come into operation in the One Day Trial on the 1st March, and also at the first meeting of the B.M.C.R.C. at Brooklands on the 29th March. The classification will certainly encourage the development of the simpler type of machine, especially if a further distinction is drawn between cyclecars designed to carry one or two persons.

The Classification of Cyclecars.

THE importance of trials in the development of the cyclecar is that the exaggerated stresses imposed upon the machines demand such adequate provision that the margin of safety, or reliability, for the ordinary user is greatly enhanced. Engine, transmission, and frame have to be designed necessarily to stand up to the severe conditions of the competition. Hence the addition of a high-speed road trial to the competitions in which cyclecars may be entered this year is highly satisfactory, for it will undoubtedly encourage efficiency in design and workmanship. It seems unlikely that a road race for standard cyclecars will be held in the Isle of Man in connection with the motor-bicycle races this year, but, on the other hand, our suggestion that the French authorities should organize a race for cyclecars on the Grand Prix course has been adopted, or practically so. It will be one of the chief events of the year from a sporting point of view. One other competition, and a very practicable method of testing various cyclecars, which we should like to see organized, is referred to in "Cross Country Comments" this week, where a series of transmission tests is suggested. Their chief object would be to determine the highest percentage of efficiency for various forms of transmission. Belt, chain, shaft, and friction drive could be thus compared.

The Cyclecar Grand Prix.

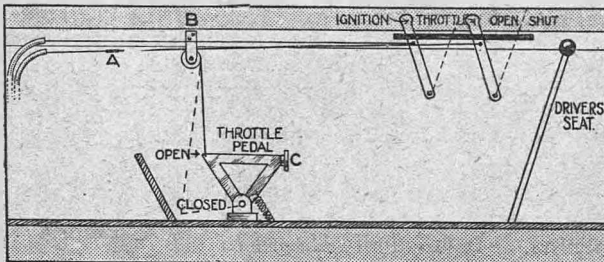
TIME AND TROUBLE SAVED. — Useful Hints and Suggestions Supplied by Readers of "The Cyclecar."

Straightening Bent Axles.

PROCURA a piece of iron about 1½ in. square by 3 ft. long, a jack, and two pieces of chain. Place the chains round the axle, put the bar in the chains, place the jack on the bar and screw up tight. By this method no paint is disturbed, and there is no necessity to dismantle the axle. C.A.

Fitting a Decelerator Pedal to a Bedelia.

OWNERS of Bedelias will find it extremely awkward to manipulate the throttle lever and the belt-cum-brake lever with the right hand only, as frequently simultaneous motion is necessary. The arrangement sketched, in which a very light bell-crank lever, some 4 in. in each arm, works simultaneously with the hand control, permits the right foot, otherwise unemployed on the Bedelia control system, to actuate the throttle when desired. The ar-



An additional foot control to the Bedelia control levers.

angement, even if it looks a shade primitive, is effective and light. At A a Bowden inner wire is soldered and clipped to the throttle control wire already fitted. This passes, at B, over a small pulley to one arm of the throttle pedal, a very thin affair, kept close to the side of the Bedelia. A small projecting piece at C, covered with a little square of rubber, can be reached by the foot, whilst the bracket to carry the pedal is screwed into the bottom board. When in use the hand throttle is left wide open, whilst the foot pedal, pushed down, closes and, as released, opens the throttle. W.R.G.

Attention to Belts.

PROPERLY-FITTED belts on cyclecars are well able to take care of themselves. No trouble need be feared, unless, through bad fitting or faulty design, the length is short or the pulleys small. Be careful to drill fastener holes absolutely central, and examine the fasteners from time to time; if they incline to pull out fix a fresh end at once. Keep belts as slack as they can be without slipping, the secret of the wear of long belts being due to the fact that they can be run slacker than if they are short. They should not come off, however slack, and if they do you will be sure to find something is out of line. T.A.H.

Using up Old Covers.

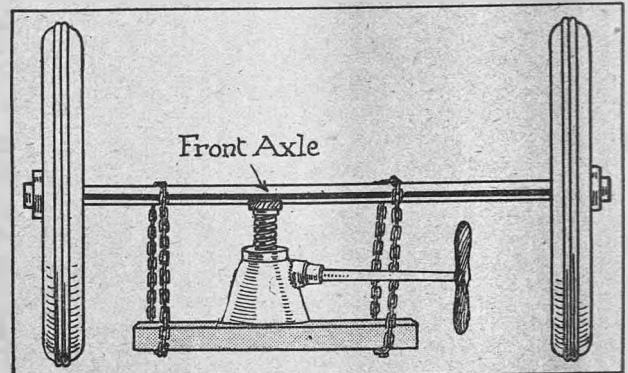
TAKE an old tyre that has the canvas in fair condition (one that has been discarded through bursting at the bead is ideal), cut off the beads and then strip the rubber from the canvas, which is not difficult once a start is made. Then use the canvas casing as a liner for all old tyres, wearing them till the liner is reached. Burst tyres should have a patch stuck over the burst, and it is wonderful how long they will then wear. H.W.

Care of Wheel Hubs.

EVEN cyclecar wheels require attention. At this time of the year, in particular, road grit in suspension pours round the inside ends of the hubs, and even if they have been carefully packed with grease, after a time the ever-present supply of abrasive compound works in to the detriment of cones and balls. If neglected, the bearings will very speedily be ruined. Sometimes a careful packing will keep out all foreign matter quite effectively, but sometimes it will not; the only safeguard is to clean out the hubs frequently. If we would only remember how we used to clean the wheel bearings of our first bicycles years ago and then consider how we treat our present wheels, which are constructionally the same, we should exhibit some little virtue which would assuredly have its reward in comparative freedom from such mundane troubles as broken wheel bearings. H.A.T.

Lost Nuts Prevented.

IN cases where a small nut has to be removed, say, from a sparking-plug which may be hot, and the hands may be greasy, cold, or encased in gloves, it is not infrequent for the nut to be dropped and lost.



A method of straightening a bent axle.

This can be overcome by filing away the first few threads on the terminal screw. The nut is unscrewed by merely giving it a left-hand spin. When it reaches the last thread it does not fall to the ground, but merely revolves on the filed portion, and is easily lifted off. LE 5568.

To Obtain Slow Running.

THE following device, which I have fitted to my machine, is invaluable for traffic work, and also for short visiting calls. It consists of a fitment whereby the exhaust valve of one cylinder of a twin engine may be lifted, thus cutting it out of action. This allows the engine to be run on one cylinder, and so tick over very slowly, which is a quality not possessed by many twin engines. A Bowden wire cable is fixed on to each exhaust valve lifter, and then the two cables are taken to two levers on the steering column. To make each exhaust valve lifter work separately is very easily carried out; in fact anyone can fit it in a short time. Strange as it may seem, the cylinders do not carbon up, and, by alternately using the two levers, the life of the engine is not shortened in the slightest. This device can be used in many ways. For instance, when stopping, the clutch is taken out and one lever raised, so that the engine ticks over, the throttle, of course, being opened to a previously determined amount. W.M.T.

THE DESIGN OF CYCLECAR PARTS.

A Special Consideration of Strength and Reliability.

By a Practical Cyclecar Designer.

THE chief points which should be the ideal of the cyclecar designer are generally conceded to be lightness of parts, cheapness of manufacture and reliability, to which might be added the following desirable features, standardization and accessibility.

Lightness of Parts.

Taking each of these desiderata in turn, let us examine how to attain as near the ideal as possible in such a compromise as a cyclecar must necessarily be. To attain lightness of parts, the material to be used must be carefully chosen, whether it is for a casing or for a heavily-stressed part such as a connecting rod. The design, in which the metal should be placed in exactly the position where it will give most support, must be as compact as possible without doing away with accessibility. For instance, gear shafts should be short, so as to keep the gearbox small in overall size, and at the same time rigidity will be considerably increased. Wherever reasonably possible, metal should be removed by drilling or shaping; for example, the webs of all channel irons may be almost drilled away without materially weakening the structure—whilst a slightly different position of some part such as a silencer will allow the bolts holding it to perform some other function.

It must be borne in mind that parts such as shafts, cross members, etc., may be strong enough to withstand breakage and yet lack rigidity, so that whip or flexure occurs, causing wear in the bearings unless suitable flexible couplings or swivelling bearings are provided. As in a cyclecar frame it is almost impossible to prevent serious whip unless the weight is excessive, it is imperative to so mount the units and so connect them together that no strain can come on the bearings. The body should also be arranged so that frame flexure shall not cause binding of side doors or creaking of joints. This can be accomplished by insulating the body from the frame, or by some form of three-point suspension. With regard to the material chosen for the frame, it is well known that tubular construction requires very careful trussing, and though cheap to produce in small quantities, pressed-steel construction would be much cheaper when cyclecars are turned out on the same scale as cars. The choice then lies between

pressed steel and wood frames. The first-named is probably the one which the public will favour in the end, but, in my opinion, wood with flitch plates, which is able to bend to a greater extent without damage, would be more satisfactory.

Cheapness of Manufacture.

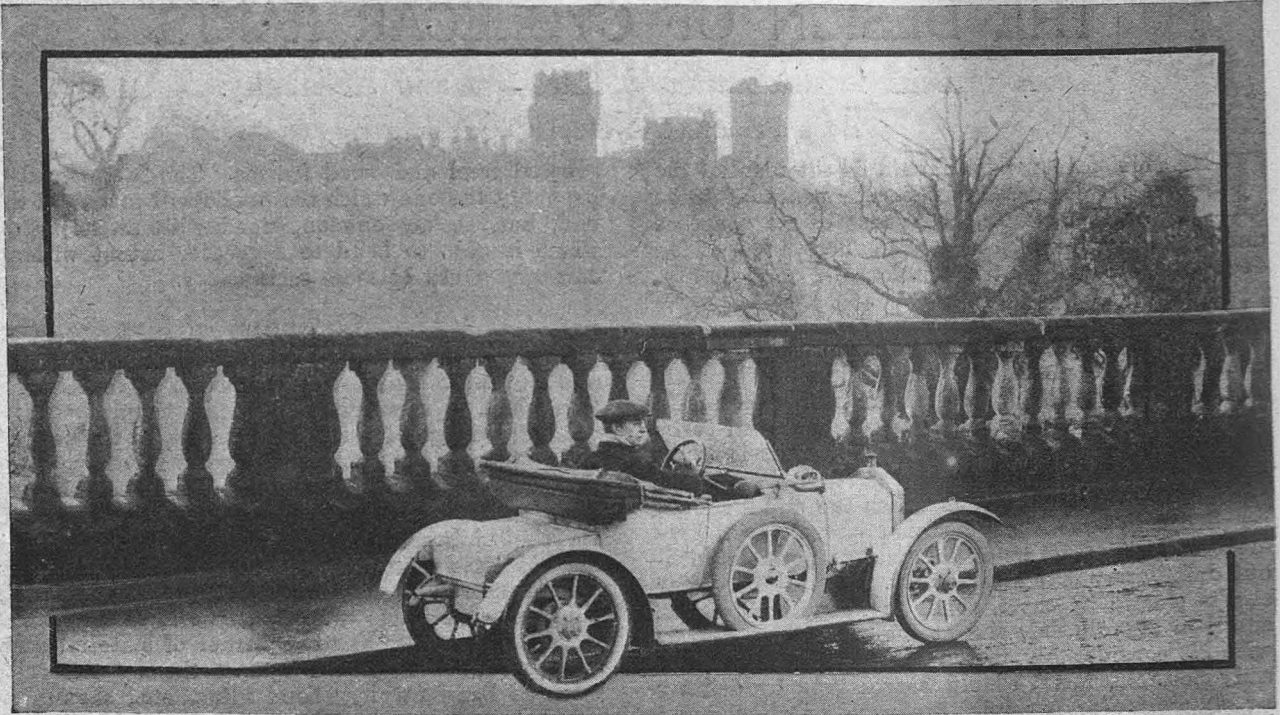
Cheapness of manufacture is a question of design and quantity. Careful consideration of each operation which is required to be done, coupled with a good knowledge of workshop practice on the part of the designer, is the secret of success in this particular. The parts to be machined should be designed so that as few settings as possible are required, and also that elaborate or costly jigs should not be necessary. Bosses through which bolts pass can be peg-drilled instead of planed and drilled. Pressed steel flanges and the like can often be left as they come from the dies, if a packing washer of material such as Amabestine is placed against them. All such work as hand forging, hand filing, etc., should be avoided, as it is not only costly, but also militates against standardization. The use of inferior materials, in the endeavour to obtain cheapness, is false economy, for if the parts are designed to be sufficiently strong more of the bad material would have to be used than would be the case if the best material was put into the job. Even small parts such as nuts and bolts should be made of good steel, since they are often called upon to bear big strains. The American system of only manufacturing one model of chassis has much to recommend it from the view of cheapness, and provided small changes, such as different gear ratios, can be fitted to suit the class of body there are no serious objections.

Reliability.

Under this head we may also place durability, as both are the outcome of good design and material. It is usually the small things that prove unreliable, as a broken crankshaft is not often heard of, but a broken bolt can sometimes cause almost as much delay and expense. By close attention to detail, nearly all possible causes of trouble can be avoided. Spring washers placed under nuts often prevent bolts coming out, and the use of grease cups or oil



February Fill Dyke: Flooded fields and roads are now seasonable, but not unfamiliar.



Warwick Castle from Warwick Bridge, on the road to Stratford-on-Avon, the balustrade of the bridge giving an excellent idea of the low build of the Singer cyclecar in the foreground.

holes will obviate binding or undue wear of such parts as spring shackles and brake connections. All driving connections such as chains, belts or universal joints should be adequately protected from wet and dust, and steering joints should have properly-made leather covers.

Durability may be attained in a great degree by hardening all moving parts, unless they are bushed with phosphor-bronze. Such parts as steering pins, shackle bolts or fan spindles should all be case-hardened, but how often do we find them soft, even on fairly expensive cars? Square shafts should always be avoided, castellated members being used instead. The cost of manufacture should not be increased thereby, whilst greater freedom from looseness and backlash is obtained. Ball bearings, needless to say, should always be used, except perhaps in the engine, as they make for a neat and compact design, and, provided they are large enough in the first place and properly protected, should wear almost indefinitely. For positions where considerable end thrust has to be taken as well as radial load, such as in front hubs, some form of bearing, like the Timken, specially designed for such work should be fitted.

Standardization.

This point is advantageous in several ways. Firstly, the workshop routine is considerably assisted if it is known that all parts will fit, there being no search needed to find a shaft which will fit a bush, and no sending back to have "a shade more off," whilst, secondly, spare parts required by a customer will always fit. All parts should be made to a jig or limit gauge, and care must be taken that these jigs and gauges are kept in perfect order and

frequently checked, whilst as few different sizes of bolts and nuts as possible should be used, and they should be all of one standard thread, say, metric or Whitworth, the former being preferable. In a well-equipped factory the spare parts stores will be one of the most important departments, but in the early stages of the cyclecar movement it is rather too much to expect that this desirable feature will be as well attended to as it ought.

Accessibility.

Designers who previously have had experience with motor-bicycle work must remember that a cyclecar chassis is not so cramped for space as a motor-bicycle frame, at the same time care being taken that the future occupants of the cyclecar are allowed plenty of room. With regard to accessibility of details, the designer should strive to place all nuts and parts which often require removing in the most get-at-able positions; whilst parts which seldom or never require moving may be placed more compactly. Thus, nuts holding down cylinders should be in an accessible place, whilst those holding down the crankcase may be more awkwardly positioned if some other advantage, such as ease of casting, can be obtained. Should it be necessary to place a nut in a position difficult to get at with an ordinary spanner, a key should be included in the tool kit specially designed for the purpose.

In conclusion, let me say that the designer should thoroughly test the machine on the road, and should himself do all adjustments and small repairs to it before putting it into the hands of the public, as by this means and by no other will he find out the awkward places and the inaccessible nuts which cause the public a great amount of annoyance.

Cross Country Comments



Assisting a cyclecar up the 1 in 3 portion of Arms Hill. The sole trouble was the refusal of the tyres to grip the greasy surface, but when a Duo was fitted with chains on the tyres it made a successful ascent. A Rolls-Royce car failed to get up, and it took about 50 helpers to prevent it running back down the hill, owing to its weight.

THE performances of cyclecars, motorcars and motor-bicycles at Arms Hill the other day convinced me that back-wheel slip is not so much due to the number of driving wheels used as to lack of weight and excessive power of the engine. It was certainly entertaining to note that the back wheels of a Rolls-Royce, which ascended as far as "the Cannons"—the 1 in 3 point of the hill—decidedly slower than a G.N. or Morgan, on arriving at the steepest bit of all slipped quite as badly as the wheels on either of these cyclecars. Now, there is an idea afloat that there is more slipping on a three-wheeler with one driving wheel than there is on a four-wheeler, but, judging by the performances on the Henley test hill of Mr. Messervy's Duo, which was provided with Parsons chains, no one could truthfully say that the three-wheeler single-driver slipped more than the double back wheels of the four-wheelers. One or two who attempted the hill fitted chains to one of their driving wheels, with the result that the other wheel spun furiously in the grease. It was only back-wheel slip which prevented Mr. Cooper making a very good show on his Humberette, which he told me was fitted with new ball-bearing wheels. This, he contended, made the machine very much easier to steer than it was before. The number of motorcar owners and drivers who turned up to witness the cyclecar attempts on the hill was quite remarkable, and showed the interest that is being taken in the new motoring, not only by the general public and motorcyclists, but also by motorcarists. I warrant that they were surprised at the performances of some of the machines up the hill before the back wheels began to buzz. Coming down the hill was an even more difficult and dangerous matter than going up, and brakes must be good indeed, and tyres must be secure, to withstand the strain. Mr. J. T. Wood, one of the directors of G.W.K., Ltd., told me that he uses this hill as a testing ground when he wishes

to tune up any machine to concert pitch. Coming down, the back wheels are often locked, and the machine then begins to jump in a most unpleasant and disconcerting manner. When the roads are a bit drier, it will be very interesting and instructive to see which machines are capable of starting from a standstill on the steepest part of a hill. I shall be particularly interested to see how the friction-driven machines perform.

* * *

On examining a new cyclecar, one of the first things I inspect is the transmission system, and a question always worth asking is as to the adjustment of chains and belts, should it be of that type. Sometimes it will be found a most long and troublesome task to adjust an engine chain or countershaft chain, and one which necessitates the adjustment of several other chains or belts either before or in front of the particular part which requires tightening. I cannot help thinking that the transmission systems on the majority of cyclecars are extraordinarily inefficient, and that a great deal of power must be lost between the engine and the rear wheels. I believe that the Royal Automobile Club have some instrument for determining the horse-power developed at the road, and it would certainly be interesting if the A.C.U. were to conduct a series of trials to determine the efficiency of the various transmission systems. At the same time we must remember that there are two points of view to be studied. Efficiency in developing power is not everything, and simplicity, cheapness, and reliability must also be considered, a combination of all these points being the ideal. In this connection it seems strange to me that the fastest time for the flying kilometre on a cyclecar is under 60 miles an hour, whereas the fastest time for a sidecar with belt drive and engine set in line with the motor-bicycle is more like 75 miles an hour. As the Morgan, which holds the speed record, was a monocoar,

CROSS-COUNTRY COMMENTS (contd.).

it presumably offers less wind resistance than the sidecar combination, and yet its speed is 15 miles an hour slower. Such comparisons as these are certainly interesting, and provide a good subject for a motor-ing debate.

* * *

The other day I came across another monocarist whose engine is set across the frame very much like mine and drives to a countershaft, on which are chains communicating with another countershaft, on the end of which are large belt pulleys. The size of his engine is about 80 mm. by 105 mm. bore and stroke, and it is provided with a very heavy external flywheel and overhead inlet valves. My present engine is 85 mm. by 85 mm. twin J.A.P., side-by-side valves. His machine was geared to 4 to 1 on top and 8 to 1 on low, whereas my gear ratios were 4½ to 1 on top and 8 to 1 on low. Inspired by a friendly rivalry, we decided to conduct a speed trial up a long curving hill, the gradient of which varies between 1 in 10 and 1 in 20. At the start my friend got away on his high gear, and I on my low, with the result that I gained 20 yards before I engaged my top speed. I held the lead till we got to the steepest part of the hill, where, curiously enough, he, with his bigger gear, came up hand over fist. The hill eased, and I picked up again very quickly, being beaten by only half a length at the end of a mile. Now, the performances of these two machines on the varying gradients are somewhat unusual, for the machine with the big gear was faster on the steeper part, which is exactly opposite to what one would have thought, especially in view of the fact that it did not appear to pick up speed on the level like mine did. Perhaps the solution of the behaviour of these two engines lies in their stroke-and-bore ratio, and this would account for the long-stroke machine hanging on better on the gradient and yet not picking up so quickly on the level. It was in a practice trial up the hill that a very strange occurrence befell me. I whirled round one bend at speed, and then had to make a sudden swerve to avoid a cyclist. The result was that I pulled the front cover completely off the rim, the tube being only secured to the rim by the valve nut. I was only able to pull up after traversing 30 yards, and then, to my amazement, I discovered the tube, although greatly swollen at one point, was still unpunctured. It only took a few minutes to put it back and pump up the cover so hard that there was no chance of it blowing off again at the same corner.

* * *

I drove down to Brooklands the other day in a four-wheeled cyclecar to witness the A.-C.U. Silencer Trials, and found that, unless I sat bolt upright in the body, it was impossible to see over the steering wheel, the seats being practically on a level with the footboard. By instinct in an emergency one braces oneself up in order to look down on the ground in front of the steering wheel and to get an unimpeded view of the situation. Now, I contend that, with the majority of cyclecars, it is impossible for the driver to obtain an advantageous view of the road ahead. It seems to be a fashion for the bodys to be built so low that the driver must assume a kind of recumbent position, strongly suggesting that of an invalid in bed, or else a very lazy man in a large armchair. The position may be comfortable, it is true, but it is not correct. Moreover, there must be many people who object strongly to be seen in such undignified positions, and I actually know motorists who will not sacrifice less security for comfort in driving. I have heard it said that the railway companies should know the most comfortable positions for a seat to be constructed in, and here we have an upright back, a well-upholstered seat, and a good drop for the legs. It

is my opinion that the driver's seat should be arranged so that he can be seated over the work, as it were; he certainly ought not to have to look through the steering wheel at oncoming vehicles. The passenger, if you like, can be seated lower down.

* * *

It is in the small points of design and manufacture that the average cyclecar is mostly at fault. No provision, for instance, is made for lubricating shackles or springs; steering connections, chains, gearboxes and clutches are left unprotected from mud and water. The magneto drive, by chain or bevel, is exposed to grit and dust, oil pumps and controls are placed most awkwardly, in some cases it being practically impossible to operate them with any degree of comfort. It has taken me a good month to remedy most of these defects on my own cyclecar, but now both my driving chains are completely encased, and the front springs are encased and filled up with grease. The same remark applies to the steering connections and rear spring shackles. Finally, I have had shields made for the clutch and clutch-coupling, and also for the gearbox and dog clutches. These shields and cases have been made specially for the machine by Messrs. Dunhill, of Euston Road. They are constructed of patent leather, and in some cases are secured by straps, whilst in others they are laced up tightly round the part to be protected, which is invariably well greased before the case is fitted. One advantage of these shields is that I can now hand over the machine to the washer at the garage and tell him to direct his water squirt on to the bodywork without any fear of the water entering the mechanical parts and damaging them. It has been quite interesting to me to watch the manner in which the shields referred to were made. The man who carried out the work came down one day armed with several sheets of thick brown paper, a pair of scissors, and a number of pins. He found out what was wanted, and set to work to make paper patterns and to fit them in place over the parts to be protected. This was done by cutting the paper into various shapes and piecing and pinning them together so as to form a big shield.

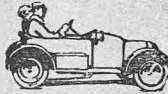
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The Grand Prix Race for cyclecars, for which I am glad to note THE CYCLECAR is organizing a party, should be, in the absence of a standard Isle of Man race for cyclecars, one of the most sporting, and at the same time instructive, events of the cyclecar competition year. I have done a certain amount of touring in France myself, and the glorious roads, combined with occasional stretches of most vile pavé, which strongly resembles the present condition of the Bath Road between Hounslow and Colnbrook, provide a testing ground by no means to be despised. I sincerely hope that the English cyclecar manufacturers, a number of which have already stated that if a standard cyclecar race were run they would be willing to support it, will see their way to enter for this classic Continental event, which is being run by the Automobile Club of France.

* * *

There is no comparison between the Grand Prix Race and other trials, such as the Paris-Nice, which are merely organized by French newspapers with the permission of the Automobile Club of France. Such events are in no way international trials. Mention of cyclecar events in France reminds me that the Cyclecar Club run from London to Paris should be a most amusing and sporting event. The rules, of course, are not yet framed, but if someone were to offer a wreath of laurel, such as is the custom to victors in Continental races, to the man who arrives first in Paris, I warrant there would be some excitement, not to say many breakdowns on the Route Nationale to the South.

THOUGHTS AND OPINIONS.



*"The suggestions of to-day may
be the realities of to-morrow."*



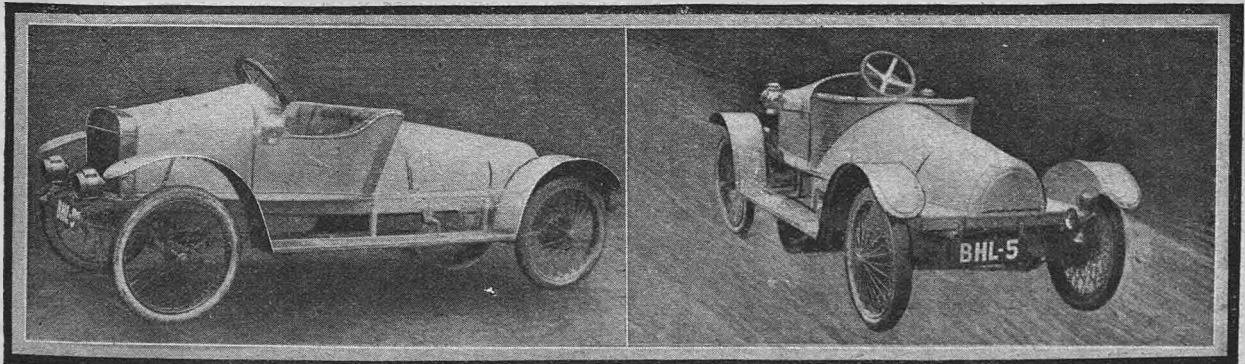
Dr. LOW'S LECTURE AND HIS CRITICS: A REPLY.

I note with interest the remarks of your correspondents on the subject of compressed air. As usual, Sir, you were very correct in your statements and references, and I am sure, therefore, my letter will not be necessary to most people. In your article you certainly did not advocate the use of compressed air in preference to petrol; in fact, nothing was further from what you said. You merely pointed out, if I may venture to say so, that if the conditions were similar it would be quite practicable to use compressed or liquefied gases, and, of course, this is quite true. It is ridiculous to suggest that you or anyone stated that it was a good plan to use compressed air, for, of course, it would be quite impossible as we stand at present. The quantity of compressed air needed depends entirely on how it is used, and why should your correspondent assume that it would be used with an ordinary engine? Why should he assume that it would have to be carried in a very compressed state? The fact that your correspondent speaks of cost absolutely gives away the whole point of his letter, for you very properly and deliberately left cost out of the question. If the cost was immense, this still has nothing to do with the possibilities and mental status of any novelty, and if such data were never hammered into the public we would still be without such a thing as a modern cyclecar at all. Compressed air can, under certain conditions, be made to transmit power without great loss, but there is no need to use it in any hard-and-fast manner. Let me also point out that the remarks made in my lecture were somewhat in the nature of a simple academic discussion. They were a plea for novelty, and an obviously much-needed request for open-mindedness, without which we would be living in stone caves wrapped up in skins, and often inside the skins of living as well as dead animals! I think that design has a terrible tendency to proceed on wrong lines, for we are all too prone to begin at the wrong end, instead of thinking how perfectly we can construct any mechanism, and then seeing how it can be cut down to everyday conditions. I think the atmospheric inlet valve is an excellent example, or else how could such a thing, which can only be called extraordinary for most purposes, have lasted for about 12 years?

I spoke of compressed gas, not compressed air, and this is simply an example of our being tied down to

existing conditions. I do not say that we can use compressed gas; I merely point out it is possible, and it depends entirely on relative conditions. It is an absolute fact that in one or two chemical works on the Continent there are engines used for shunting which are charged up in the morning and run the whole day. Now it would be just as absurd for these works, under their conditions, to use petrol as it would for us to use their particular compressed chemical for ourselves under our conditions. I feel, Sir, that even if my lecture has only led to a "discussion," it has done good, for I simply stated facts, and only hope it will lead to a little departure from the common rut, so that I propose, after replying in this letter, to temporarily retire, and allow anybody to hurl objections as fast as they wish. My references to engines actually run on the conditions I suggested are sufficient to refute in a painfully powerful manner any suggestion of absurdity in your comments. Compressed gas could be used with the greatest ease, and I know everybody will agree with me that your valuable paper is doing a world-wide service to everybody in lifting us all out of the beaten track, and in helping us to bring new things to perfection for the new motoring. How very often have suggestions been made and laughed at by everybody, only to become absolutely practicable, and in my partially academic discussion and in your comments you were, of course, more than justified in stating the facts as you did. Why, engines are running in the manner your correspondent himself objects to:

I note with great interest another letter from "A Bengalee Reader." I fear he has somewhat misunderstood a discussion rather academic in tendency. I do not for one moment wish any of my remarks to be construed into a statement that engines can be run for nothing or without fuel. What I said was that "our subscription to the Cyclecar Club of a few thousand years hence might include power, and that there was no very definite reason why it should not." Your correspondent seems rather to have lost himself when he speaks of running an engine at a cost of practically nothing, for even if the engine is a model, the cost of fuel must be in proportion, or else we must congratulate him on the discovery of perpetual motion. Might I also mention that I could give you a dozen methods of lighting lamps without going



A new semi-racing type of body on a G.W.K. seen at a recent run of the Cyclecar Club.

THOUGHTS AND OPINIONS (contd.).

near them? The method I mentioned has nothing to do with the steadiness of the flame whatsoever, and, incidentally, a patent was taken out in the neighbourhood of eight years ago. I fear your correspondent has, perhaps, slightly misunderstood some references, and I hope he will forgive me for pointing out the facts, as I do not for a moment mean to quarrel with him, and I am exactly like him in one way—I also wait for THE CYCLECAR with "uncontrollable interest"!

A. M. Low,
London. A.C.G.I., D.Sc., etc., etc.

Another Lady Enthusiast.

I am enclosing a photograph of another lady enthusiast, who finds the cyclecar an ideal machine to drive, as it is fast, reliable and comfortable. No trouble is experienced in starting up, and, although having driven this machine several hundred miles, over every description of road and in hilly districts, the first involuntary stop has yet to be made. UI122.
Scarborough.

A Rexette Conversion.

A Mistake that Made All the Difference.

I notice in the issue of THE CYCLECAR dated 22nd January a letter from Mr. Stansfield Vickers, together with an illustration of a converted Rexette, which he claims to have constructed. This machine was converted by me from an original Rexette in June, 1911,



Another lady enthusiast. See letter from "UI122."

and sold by me to Mr. Vickers in December, 1911, when it was exactly as shown in the illustration, which was taken several weeks before Mr. Vickers even saw the machine, I myself being in the car. The gear is not epicyclic as stated, but is of the double internal-expanding clutch type.

Paignton. N. WILKINSON COX.

In a recent issue of THE CYCLECAR is an illustration of the converted Rexette T1762. I myself drove this tricar in its present form long before it became the property of Mr. Vickers. It was constructed by Mr. Norman Cox, of Torquay. STUART G. BLACK.

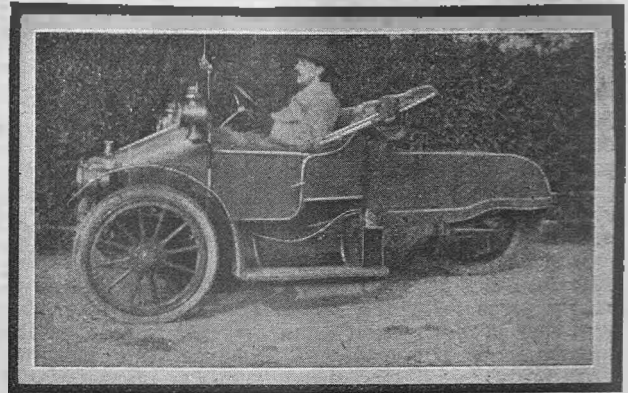
St. John's College, Cambridge.

[The explanation is simple. In Mr. Vickers's original letter he wrote: "I thought, perhaps, you would like to know of a cyclecar constructed out of a Rexette tricar." In preparing the letter for press a sub editor misread it, and added the incorrect statement that the machine had been constructed by Mr. Vickers.—ED. THE CYCLECAR.]

B34

Luggage Carrying on a Three-wheeler.

Your problem of luggage carrying on a cyclecar (referred to by "John Gilpin, Jr.," in THE CYCLECAR) ceases to exist if you have one something like the Crouch carette (three-wheeler) in shape. I may say it was chosen for its powers in that respect, after much viewing of other "possibles," in preference to any other make. It has such a long "tail" (I promptly dubbed it the "caterpillar," though it certainly did not crawl!), the top of which is covered with a corrugated, non-slipping surface, so that a good-sized cabin trunk can be stowed away with ease. There are a couple of brass loops each side, about 18 in. apart, so that luggage can be securely strapped on. There is a little door in the side, about 6 in. by 4 in. sliding in grooves top and bottom, and fastened



Ample space for luggage carrying on a Crouch carette, referred to in the accompanying letter from Miss Boyet.

by a tiny bolt, which gives access to the carburetter, saving the trouble of lifting up the "tail." This was a brilliant idea of the owner himself, Mr. R. S. Bell, who has now returned to Agra, but is so enthusiastic a cyclecarist that he has THE CYCLECAR sent out to him every week. I would also like to assure you that the mudguards efficiently prevent any splashing, and the hood, which can be raised as easily and as quickly as an umbrella, together with the screen (and, in extremely wet weather, side flaps, with celluloid windows), keep us dry. MAY E. BOVET.

London, W.

[We are always interested to hear of the provision made by readers for the weatherproofing of their machines, but if descriptions are sent they should be accompanied, when possible, with sketches or photographs.—ED. THE CYCLECAR.]

Cyclecars in New Zealand.

It is rather late, perhaps, to congratulate you upon THE CYCLECAR, but it is a step in the right direction. The cyclecar is not a dream; it is a reality, and is bound to be a success. Cyclecars are represented here by the A.-C., Rollo, Bedelia and the L.M. We await the G.W.K., for it will be one of the most suitable for colonial roads. Some of the experimental cyclecars illustrated in "Motor Cycling" are freaks, and on our roads would only last about three months. Certainly cyclecars are improving; such machines as the Premier, Humberette, G.W.K., Morgan, etc., are sound propositions. Manufacturers are now learning that to make a cyclecar one does not make a frame, stick a motorcycle engine in it, and drive with unmechanical belts. No; they learn that the cyclecar is in a class of its own, and needs individual attention and development. No doubt THE CYCLECAR will go far to perfect the cyclecar. INTERESTED.

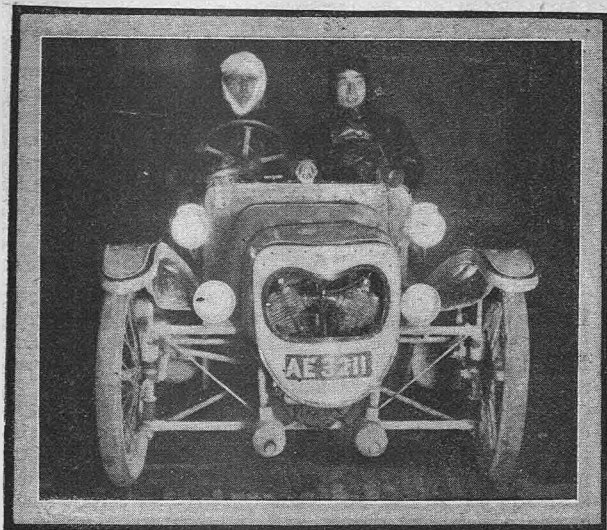
Christchurch, N.Z.

THOUGHTS AND OPINIONS (contd.).

A Trip to Olympia from Bristol on a Morgan Runabout.

We crawled out of bed feeling very cold, and wondering whether it was worth it or not, as the climatic conditions at 5 a.m. on a November morning are not at the best of times too tempting. However, we decided it was, and, following breakfast, went out looking like Arctic explorers. We lit the lamps and started up; everything was in perfect order, so we entered the cyclecar and glided away on our journey to the Show at Olympia.

Very good going was made for the first 20 miles, when we stopped to warm our hands; we discovered afterwards that there were 14 degrees of frost. For



Starting at 5.0 a.m. for a winter run to London.
See letter from "AE3211."

the next few miles the roads were bumpy through the frost, so speed had to be reduced somewhat; when daylight began to appear things looked a little more cheerful. Having changed places, we started once more, only to be stopped a few yards further on, the trouble being a broken top gear chain. Marsfield only being six miles distant, we drove there on second gear without any sign of overheating. Here we found a blacksmith, who repaired our chain while we obtained some coffee, as provision against the cold.

The chain repaired, we once more made our way onward, keeping up a very good average till we neared Marlborough. The engine began misfiring, but we decided to push on to that place, where we had a look at the engine and found the carburetter very dirty; this being remedied, we resumed our run.

The journey proved uneventful till Hounslow was reached. Here the ill-fated Hanley-Page monoplane passed overhead, making a fine sight. The journey into Sloane Square, our destination, was a very slow process, taking nearly two hours to accomplish.

After lunch we proceeded to the Show, feeling very pleased with ourselves, having once more assumed the normal appearance of human beings.

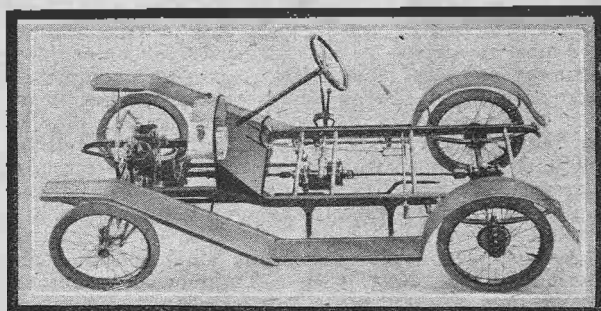
The start for the return journey on Sunday was made just after 10 o'clock. Progress out of town was very much quicker than on the previous day, there being no traffic except the motorbuses. As we got out into the country the air became much warmer and cheerful. The engine ran with such a steady purr that we were inclined to believe we had solved perpetual motion, the only stoppages being to change seats, as the two of us drove alternately.

On reaching Salisbury Plain we essayed a speed test, reaching 45 for a few miles. On ascending the next hill, however, we discovered that compression had been lost and consequently power. It was necessary to pull up, which we did on the next down slope. The trouble lay with a stretched exhaust valve. This was soon replaced with the aid of an A.A. scout who appeared on the scene. Heavy rain began to fall, but we were well equipped, so remained quite cheerful. The last 40 miles through the rain was quite uneventful till we were 100 yards from our destination, where the repaired link of the chain gave way, and, putting in the low gear for the remaining distance, we arrived at our destination in time for a much-needed meal.

The running time for the return journey took just over five hours, which I think is very good for a 7.8 h.p. air-cooled engine with two up and luggage.
AE3211.

Seventy Miles Mud-plugging on a Chassis.

It was with great anticipation and mingled hopes that I set out for London to take delivery of a Chater Lea cyclecar chassis. On arriving at Messrs. Chater Lea's, I saw a crowd, and, on enquiry, found the people were all looking at the machine that I was to drive 70 miles. I had a good look round, and, after placing a rug on the box which was to be my seat, and strapping on my bag of tools, Mr. Lea, Jr., explained the levers to me, and I took my seat, put in the reverse, and, before I knew where I was, my back wheels were on the pavement. (This was, I may mention because I have never started a car with direct



Chassis of 8 h.p. Chater Lea cyclecar.

steering before.) What surprised me most was the flexibility of the engine on top gear in traffic; I could cut her down to five miles an hour. I never changed down more than once, and that was through a traffic block, the whole way out of town. After that I had a non-stop top-gear run to Portsmouth. Every hill, including Hindhead and Butser, the little car took with ease. The engine never missed fire once all the way down, with only one sign of overheating, when stopped by traffic for five minutes, the water just starting to boil. The steering is most simple and effective when understood, much better than geared steering. The fastening to the steering column might be better. The gear drive is perfect, silent and simple. The springing is very good, but on the light side, and there is rather too much movement of the back axle. Wheels and tyres are of substantial size, but the plated hubs are rather too liable to rust and call for much more attention than the average driver will give them after a day's run in the wet. The bonnet wants some kind of top fixing, as, at high speed, it makes more noise than the engine. The chassis frame is rather heavier than necessary for such a light car. In conclusion, I must say that I thoroughly enjoyed my 70 miles ride, although it was raining nearly all the time, and I was only sitting on a sack of straw instead of a nice padded seat.
BK656.

THE DESIRABILITY OF EASY STARTING.

The Starting Difficulty.

Many readers have doubtless experienced difficulty in starting the engine, and I confess that mine suffers rather badly from this malady. Therefore it will be readily understood that my interest was greatly aroused by reading the article by "John Gilpin, Jr.," in *THE CYCLECAR* of 22nd January. When I bought my cyclecar I quickly realized that starting up was the crux. I, therefore, set to work to practise starting, both with a view to acquiring the knack of pulling up the handle with the necessary briskness to give a good spark, and also to find the ideal positions for the various controls. After some practice I carefully marked the positions of the levers which appeared to give the best results. Now, I have visited my motor-house at intervals of an hour or two (long enough to ensure the engine being quite cold every time), and, putting the controls in these marked positions, have sometimes succeeded in starting the engine on either the first or second pull; while at other times, under what appear to be exactly the same conditions, it point-blank refuses to start until after a more or less prolonged struggle. It would seem as though some variable condition existed which is entirely outside those which are governed by the controls, some condition which is elusive and unknown. Vague hints at variations of atmospheric conditions are sometimes suggested as being responsible; but it is very difficult to believe that therein lies the explanation, for if it were so, one can only conclude that the modern carburetter is about the most imperfect piece of apparatus ever designed. This uncertainty of starting, I confess, completely takes the "gilt off the gingerbread" for me. Now "20 minutes hard work" of engine starting may be all very well for a young and athletic man; but for an elderly man, with none too much muscular strength, the prospect becomes a veritable bugbear. There is another interesting point upon which I should welcome enlightenment. The power unit in my machine consists of a 6 h.p. single-cylinder air-cooled engine. Now, with a single-cylinder engine, where only one spark per four strokes (i.e., two engine revolutions) is required, the engine and magneto are usually geared 2 to 1. But in this machine of mine the gear is 1 to 1, consequently, during the complete four strokes, two sparks pass instead of one, i.e., one at the top of the compression stroke and the second at the top of the exhaust stroke. Now this gearing-up of the magneto is no doubt done to make it easier to generate the necessary spark when starting up; but I should like to ask whether it is quite safe. When the engine is actually running, the passing of a spark at the top of the exhaust stroke is, of course, quite innocuous, although it is conceivable that if the spark were much retarded the inlet valve might actually be opening when this spark passed, and the incoming mixture might fire back through the carburetter, and possibly even ignite the petrol. However, when the engine is being started up, it seems to me that the passing of this second spark might conceivably be the cause of trouble, and, perhaps, is in some way connected with my starting difficulties. For instance, suppose the engine fails to start on the compression stroke, then such gas as is in the cylinder during the exhaust stroke may consist of an explosive mixture, and might be fired by this second spark at the top of the exhaust stroke. What would be the consequences of an explosion at this irregular time in the "four-stroke cycle" I am not prepared to say; but there is one result which would seem very likely to follow, namely, that the following "suction stroke," being thus more or less converted

into a "power stroke," the correct intake of explosive gas would be interfered with, and, consequently, at the next compression stroke there would again be a failure to start the engine. There is yet another point. If, as I have already hinted, there is a possibility of this second spark causing the gas to fire back into the carburetter when the spark is much retarded, then the margin of safety in the position of the spark lever in starting up is reduced. Too much retard may fire the carburetter, and too far advanced may result in a maimed or broken arm: truly one is literally between two fires! I should be glad to have the opinion of other readers on the points here raised.

Godstone.

NON-STARTER.

[Many practical readers will be able to suggest remedies which we should be pleased to publish. We think that, with properly-adjusted engine, carburetter and magneto, there should be some very valid reason for failure to start at the first two or three turns of the handle, such as sooty or oily plugs, varying humidity of the atmosphere, temperature, or faulty connections between the magneto and the plug. "John Gilpin, Jr.," returns to the subject this week.—ED. *THE CYCLECAR*.]

Starting Appliances.

I am about to purchase a cyclecar, but of what make I have not decided, and as my daughter would probably often use it, easy starting would be essential. May I ask if readers could recommend a simple and moderately-priced starting device which could be operated from the seat? That there would be a great demand for a starter of moderate cost is obvious, for the cyclecar will become a lady's car without doubt for shopping, also for golf, etc. I see a great deal of stress is being laid on the fastest speed that a cyclecar is capable of going, and it seems to me that all the makers vie with each other in this, what I may call a perfectly unnecessary adjunct to a useful machine. One firm will state that such-and-such a car will run with a load (two persons and luggage) up a steep hill at 40 miles an hour. Who wants to drive 40 miles an hour either uphill or on the level? For comfort and safety's sake, 15 or 20 should satisfy any cyclecarist, and if that pace can be kept up for a few hours without heating, then that class of car is the one which would satisfy me. If cars are built for racing purposes that is a different matter.

Leamington.

CYCLIST.

Cyclecars in Competitions.

Why Makers do not Enter.

We are interested in your remarks upon makers of cyclecars entering their machines in competitions, though we are not altogether in accord with your views. It is so very easy for any maker to build a special machine that will always do well in competitions. Take the case you mention. A cyclecar gave every satisfaction to its owner for 15,000 miles, but it could not win competitions; it was "altered," and immediately did well. This merely bears out what we have already stated, that any maker can build a special machine to win competitions. We are inclined to think, however, that the vast majority of buyers are not greatly influenced by the results of trials, and they buy their machines for pleasure and not for winning competitions. As cyclecar manufacturers, we find that intending purchasers ask for the opinions of users rather than how many gold medals we have won, and we much prefer to refer them to delighted users than to boast of medals won by expert drivers on tuned-up machines. *THE ROLLO CAR CO., LTD.*

Birmingham.

THOUGHTS AND OPINIONS (contd.).

Long Belt Life. ::**First Shortening—3500 Miles.**

I enclose a piece of Lyso belt for your inspection. It is part of one that has done 3500 miles on the right-hand side driving wheel of my G.N. Last week was the first time since I got the machine, nine months ago, that I have had to shorten my two driving belts. Wakefield. **Cecil H. ROBINSON.**

A Belt that has Run 12,000 Miles.

In considering the relative advantages or disadvantages of belts, chains, differentials, gears, etc., in cyclecars, perhaps my experience with belts during the last 16 months may be of interest. My cyclecar, one of the first G.N.s, is fitted with Lyso rubber belts, one of which I lost last June, after nine months wear, and the other one pulled out (through rust) last week at the fastening, after nearly 16 months wear. Although this belt has now done over 12,000 miles, it looks as if it is good for another 12,000 miles, the small, round holes on either side being still quite deep, and I am carrying it now as a spare. During these 16 months I have only had to shorten the belts twice, although I run the car in all sorts of weather, and give it practically no attention. As regards tyres, the car, when new, was fitted with Michelines, both front and rear. I have still the original back tyres on the front, and have had a new pair put on the rear wheels. My main trouble with regard to tyres, however, is that a puncture remains unnoticed, owing to the good suspension, and the tyre creeps and pulls out at the valve. I am now trying security bolts to prevent this, and I am certain that, with proper care or even ordinary precaution, Michelin voiturette or any other good tyre will last for 20,000 miles on a G.N. cyclecar, on account of the small weight and flexible drive. I think now, as I thought when I ordered my G.N., that the cyclecar has a great future, and I also consider that the running costs of a light vehicle such as I have are less than those of a motorcycle and sidecar. There are still some points wherein cyclecarists are at a disadvantage, e.g., insurance and taxation. I fail to see why a motorcycle can be insured, according to advertisements, at £1, and the lowest satisfactory policy that I have been able to get is £5 10s. Taxation is a farce, assuming that taxation should be fair.

Cricklewood.

P. M. BENJAMIN.**Comfort Wanted Rather than Speed.**

While there is an undoubted demand for cyclecars capable of doing 45 or 50 miles an hour, why will the manufacturers tumble over each other to supply this demand and, at the same time, neglect the gold mine that has been waiting for years for the man who will supply a cyclecar, noted for comfort and reliability, coupled with little trouble and small expense after the first cost? The following, I think, would meet the needs of many who do not require speed:—6 h.p. air-cooled twin, and £1 1s. tax saved, low compression and easy starting, three-speed gear and reverse (this is very important in country districts), top speed 20 to 25 miles an hour at the most, extra well sprung so that filled tyres or solids can be used, and this would do away with punctures, seats side by side, and four wheels. Cost about £100 complete. Who would be likely buyers? Clergymen and doctors in widely-scattered country districts, to whom reliability is more important than speed; ladies who wish to drive themselves but who dislike punctures and the difficulty of starting; the middle-aged who want a cyclecar to take the place of the pony and trap; others, like myself, who cannot afford and do not want a motorcar. **Pembroke.**

COUNTRY TORTOISE.*Tickling the Carburetter.**Setting the control levers.**Started up—letting in the Clutch.**Off—too much oil.*

Starting off for a run. The cyclecar is a G.N.

THOUGHTS AND OPINIONS (contd.).

Cheap Car and Cyclecar. Mr. Morgan Replies.

Mr. Gordon Stewart misunderstands me. By "cheap car" I mean a motorcar which is much cheaper than the standard English cars of equal power and size. It is, I think, sufficiently obvious that the English makers have not made large profits. Therefore, in order to secure cheapness in a car of the standard pattern, and still make a fair profit, something must be sacrificed. I hold that this sacrifice will diminish the efficiency and probably the economy of the car. The case is not the same in regard to the cheap (or perhaps I should say inexpensive) cyclecar. It is true that the Singer at £185 may be good value, whereas a cheap cyclecar, if built on the same lines as the Singer, would be worthless. But the result of the London-Exeter trial seems to show that an inexpensive cyclecar can be built on simpler and more original (or shall I say less orthodox?) lines, which will prove equally or even more efficient. At any rate, the expensive cyclecar has yet to prove its superiority as regards efficiency.

It seems to me that it is not difficult to construct a small, low-powered car, such as the Morris-Oxford, for £175. I may say that I know nothing of this car, and do not question its efficiency. I do not call it a "cheap car." There are cars of 20 h.p. selling at £50 less. The problem which is the real crux of the cyclecar movement is to construct a thoroughly efficient light car at a really low price. This, I maintain, cannot be done on standard car lines. I may add that efficiency includes speed, and, therefore, the cyclecar, with its engine of less than 1100 c.c. capacity, must make up in lightness what it lacks in power. The comparatively heavy car, with a small engine, has been tried and found wanting, hence the collapse of a former boom. The motorist cannot be persuaded to crawl even by the attractions of luxurious bodywork, water cooling or three-speed gears.

Malvern.

H. F. S. MORGAN.

Automatic Stability of Cyclecars.

Not even the most enthusiastic adherent of the three-wheel cyclecar would venture to suggest that perfection has been attained. One has, by this time, become accustomed to seeing the passenger leaning over the inside mudguard when a cyclecar is rounding a corner at high speed. Therefore, as the attitude is neither elegant nor dignified, and as the Road Board refuses to "bank" the corners for high speeds, we must "bank" the machine, this entailing no elaborate mechanism, addition to the weight, or extra expense. Few designers have given any thought to the inclination of the steering heads. Considering that, in steering, the stub axles always move in circles round their respective steering heads, and at right angles to them, also that the wheels, being at different sides of the circles, move in opposite directions (i.e., one goes forward whilst the other goes backward), we find that the "lie" of the steering heads is of the utmost importance. When the steering heads are upright, the stub axles move parallel with the ground. Occasionally, steering heads are inclined backward, and this means that the stub axles, being at right angles to the heads, are raised when moved to the front and lowered when moved to the rear. Therefore, if a wheel is steered forward, it rises, whilst the other wheel, which moves in an opposite direction, sinks. However, as the wheels are in

contact with the ground, and can neither rise nor sink, they transmit the movement to the frame, so that, where the wheel should rise, the frame sinks, and vice versa. With this arrangement, if we steer to the left, we move the right wheel forward and the left wheel backward, and we find that, with the right wheel moving forward, the frame on that side sinks, whilst the left-hand side rises, which means that our cyclecar lies outwards on turning a corner. This is exactly the opposite to what is wanted, so that, obviously, what is required is an inclination of the steering heads forward and we obtain a machine with a natural balance that will lie inwards when cornering, making the steering automatic and irreversible.

Glasgow.

G.S.

Why?

As an intending purchaser of a belt-driven cyclecar, I recently consulted my local agent upon the matter. "Don't touch it," was the agent's reply, "it's frightfully unmechanical; the belts will give you a lot of trouble; I should advise you to have a motor-bicycle and sidecar." "And do you call that a mechanical proposition?" I replied, and went away disgusted. Is a sidecar often used for carrying three, and driven by a single belt, a more mechanical proposition than a double-belt-driven cyclecar carrying two, and if a sidecar belt, with short drive, will do this, why should not the two long belts, on large pulleys, of a cyclecar have greater efficiency?

NEMO.

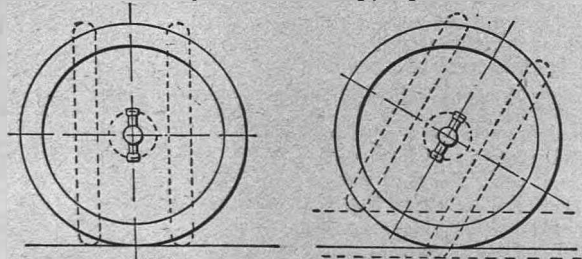
London, S.W.

Burning Out Valves.

The remarks appearing in THE CYCLECAR on the subject of burnt valves exactly describe my own experiences when I first took to driving a cyclecar. The engine is a V twin, placed longitudinally in the frame and at the front of the car. I had three exhaust valves burn out in the first 250 miles, and two more inside 500 miles, and the mystifying part of it was that it occurred in the front cylinder, which, as a matter of fact, is most favourably placed for cooling, whereas the back one has its exhaust port close up against the dashboard. I went very carefully into the matter, verifying the timing, etc., examining lift and clearance, and closely inspecting the cylinder casting itself, but all to no purpose. One valve after another burnt out, and always in the front cylinder, that in the back never giving a second's trouble. Finally, I took the matter up with the makers of the engine, and they supplied me with two valves made from another brand of steel; but, although giving longer service, these valves in turn burnt out, with a mileage of only about 100 each to their credit. On communicating this fact to the makers, the latter supplied me with a new cylinder straightaway, promising to make a careful examination of the other one. I have just heard from them to the effect that they can find nothing whatever wrong with the cylinder, and as, since fitting the new one, I have never had a second's trouble with the valves in a mileage of nearly 1000, while grinding-in is not even necessary, my interest in the matter has assumed an academic rather than an urgent and practical character. I would, though, very much like to discover the reason for the extraordinary occurrence. The valves were not merely scaled; they were, in two cases out of the three, absolutely deformed, the head portion being rendered geometrical shapeless.

O913L.

Chalfont Common.



A suggestion for obtaining automatic stability. See accompanying letter