

A TOUR THROUGH NORTH WALES.

Recording the Remarkable Performance of a Light-weight Motor-bicycle.

"Where shall we go for our holidays?" was the remark made by my friend early this year. We were neither of us very wealthy, but shared the possession of a $1\frac{1}{4}$ F.N. motorcycle and trailer, upon which we had had many pleasant trips, besides those in the company of our respective lady friends. After many suggestions, discussions, and counting of money, we decided to tour through North Wales. We knew that North Wales was a miniature Switzerland, and we had misgivings and imaginations of walking every hill more than about 1 in 20 we came to, so we tried to get another machine of higher power. We ordered a $2\frac{1}{4}$ h.p., and thought we were all right, but at the last moment we were disappointed, for the new mount could not be delivered to us until a week after we wanted it. This was vexing, and we looked at each other with gloomy faces, and, had we been girls, I have no doubt we should have resorted to tears. But as we were young fellows, ready to make the best of a bad job, we determined to make our "little baby" (as we termed our $1\frac{1}{4}$) do the work. Now for the work; and in consideration of the fact that we had a hilly district to contend with, we made sure of helping our machine to do all that could be expected—and more.

We cut up an old belt, which, by the bye, was a $\frac{3}{4}$ -in. flat one, and cemented it on with tyre cement to the engine pulley, and this, together with a new belt, made

A PERFECT MEANS OF TRANSMISSION

—so perfect that when we had the compression tap closed we could not move the back wheel round. We filled up with "Carless Capel" petrol, and packed our few things together and started, each confident of the success of the tour, but each inwardly thinking of the hills we should have to walk.

We started on a Saturday morning at 11.30, hoping to do 80 or 90 miles before nightfall. Just before we reached St. Albans our engine stopped, but we located the trouble immediately; the pin holding the inlet spring in place had broken. We remedied this and got on our way, if not rejoicing, perfectly contented, owing to the "mopping"

qualities of the bike. Stop No. 2 was made through going over some rough ground, and snapping the metal terminal of one of the wires connected with accumulator. It was the work of two or three minutes putting this in order, and

WE PROCEEDED WITHOUT FURTHER MISAD

on through Dunstable, Stony Stratford, Towcester, Daventry, and Coventry.

As it was still quite early, and we were both fresh, we thought we would go on to Lichfield, which is about 120 miles from our starting point. We arrived there at 8.15, and put up at the "George Hotel" in the High Street. This was our first day's ride—nearly 120 miles with trailer, passenger, and necessary luggage, in less than nine hours—and only $1\frac{1}{4}$ h.p. machine. So far we had only walked one hill, and shed the passenger on about three others, while the gentleman who was manipulating the levers slightly assisted the engine to climb these three.

The following morning we got a fresh supply of petrol, and proceeded on our journey. Here someone recommended us to go through Newcastle as the best way to get to Nantwich—oh! if we could only meet that chap! He could not have sent us over more unsuitable roads if he had tried. Whenever I think of Newcastle I think of a hill that is more fit to be called a precipice. It would not have been so bad if the roads had anything to recommend them, but they were loose, and altogether unpromising. Proceeding by many by-roads and side-roads, we arrived at Nantwich after 48 miles of the most uncomfortable roads I have yet seen. It had taken us four hours to do this journey, and we felt thoroughly "done." Lamb's Hotel supplied us with refreshment for the inner man, and we were both all right again as we started for Rhyl, via Chester. We had completed about 10 miles when I noticed the front of the trailer appeared to be nearer the ground. On examination, this proved to be that the arm of the trailer attached to the motor was bent, through the passenger endeavouring to help the machine on steep hills by giving a lurch forward now and then after the



Three Types of Vehicles—an interesting Contrast.

A Tour in North Wales. —Contd.

manner of the cox in a boat. We spent about three-quarters of an hour doing various gymnastics in the endeavour to pull it back to its original bend, and were just giving it up as a bad job when oh! happy inspiration, we espied a telegraph pole with a triangular-shaped protection round the foot. We saw at once that by placing an end of the trailer under one bar and over the other near the corner, we obtained an excellent vice, and we then easily put matters right. Altogether, this delayed us about $1\frac{1}{2}$ hours; but, all being right again, we went on to Chester, where we arrived about 5.50, having passed through some delightful country.

We left Chester at 6 p.m., and turned towards Rhyl, where we intended stopping for a day. From Chester to Rhyl it is about 30 miles, but the road for the most part is flat—very flat. Imagine our surprise when we found we had done the journey in one hour and twenty minutes! it seems hardly credible with only an $1\frac{1}{4}$ h.p. motor. At Rhyl we put up at the Grosvenor Hotel, and, after feeding, and a "brush up," we once more felt fit; so we took a walk on the promenade. I look back, and my mind carries me to the scene. We two, in motor rig-out, seated among the fashionably-attired ladies, listening to a grand alfresco concert; if the power of writing were given to me I would try to describe

THE SOOTHING POWERS OF A RICH CONTRALTO VOICE

on the air of a cool summer's evening, and the gentle plash, plash, of the little waves beating with increasing regularity upon the shore, and, again, echoing from a distance one could hear little strains of similar entertainments. We both felt we should like to linger long in that self-same spot. Still, time waits for no man, and, all too soon, we had to turn in for the night.

The next day (being Monday) we stayed in and around Rhyl, visiting the Dyserth Falls, etc.

On the Tuesday we oiled up, filled the petrol tank, and ran into Llandudno, on our way visiting the stone quarries, and jamming our fingers in our ears while the blasting was going on. At Llandudno we made Evans' Hotel our head quarters, and from here potted about, climbed the Great Orme's Head in a gale, and nearly got crushed to death with the force of the wind pressing us against the flag-staff at the summit. Wednesday was spent lazily seeing the various sights, and having little climbing expeditions.

Thursday morning we started for Bettws-y-Coed, but had only proceeded about three miles when it began to rain—it rained as though Jupiter Pluvius was determined we should not go on! Well, the result was we got drenched to the

skin. Of course, when it got this far, it was a case of do or die, so we went on—at least, we tried to. The rain had made our flat belt rotten, and it quickly broke; we fitted a spare one which we luckily carried, and started again, but more troubles followed. We lost the break-foot of the front brake; then a wire left its terminal. At length we managed to put things right, and we arrived at Llandudno Junction after about 15 miles' running, through taking the wrong roads—the actual distance is about three miles, I think. At Llandudno Junction we put up at an unpretentious little house, the proprietor of which calls it "Junction Hotel." Here the lady of the house dried our clothes while we once more partook of food. By this time the rain had stopped, and the sun was beginning to shine. In half an hour the world was

CHANGED FROM A FLOOD INTO A GLORIOUS PARADISE,

lit up by powerful "Old Sol," and the recent downpour had freshened everything. So out we went!

The Plas Mawr was visited, and also the ruins of the old Conway Castle, from the battlements of which we had a lovely view of the surrounding country. It was now time for tea, and so we returned to our "hotel."

Friday morning we looked towards "Bettws" once more, and this time got there, to be received, if not with open arms, with a very hospitable table and a pleasantly-talkative Welsh woman of the name of Mrs. David Jones, at a cottage with an absolutely unpronounceable name. After dinner we made for the Swallow Falls, where we spent all the afternoon, and in the evening we went over the Conway Falls, where I fell in, but luckily escaped with only a little wetting.

Bed once more, and then for home.

We started about 10.30 Saturday morning through Llangollen, Oswestry, Shrewsbury,

THE MOTOR BEHAVING SPLENDIDLY ALL THE TIME.

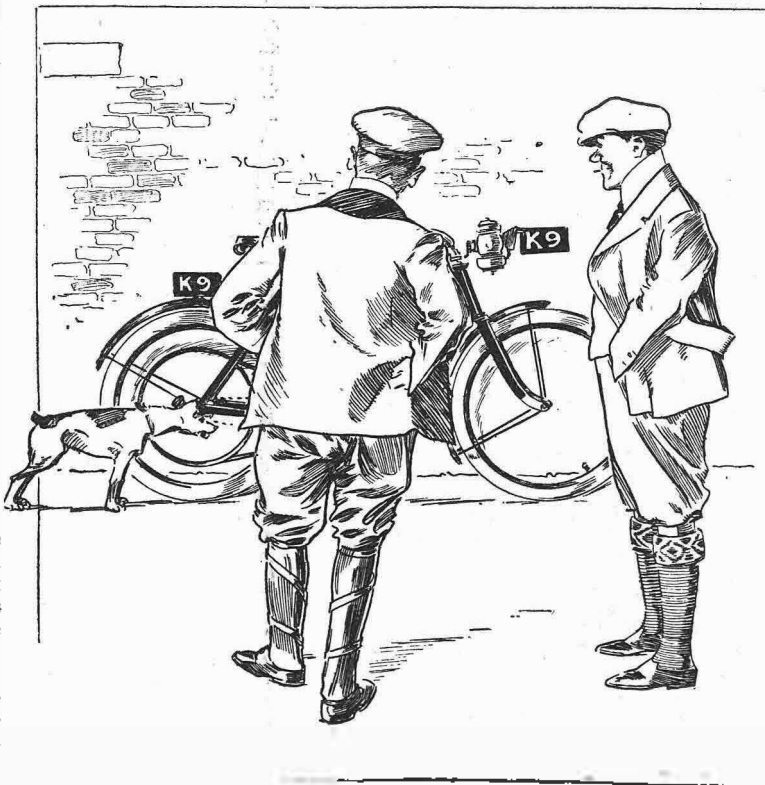
On our way we stopped a little party of Welsh boys and gave them a penny each to jabber Welsh—it might have

been anything for all we knew; still, it satisfied both parties. One little Welsh girl whom I allowed to ride in the trailer was quite the heroine in that village.

We were now travelling rapidly towards Birmingham, which we went through, and pushed on to Coventry. We slept here, and in the morning followed up the route by which we had come. We used our last stock of lubricating oil and petrol at St. Albans—20 miles from home, where we reached in time for tea on Sunday, the eighth day of the tour.

Just a word or two in conclusion. The motor we used was a $1\frac{1}{2}$ F.N., with a Mills and Fulford trailer. Our total expense was about 12s. a day each, and we felt particularly well at the finish. We did not carry a change of suits, but only a change of underclothing. We only had one puncture, which occupied about 15 minutes to repair, and for anyone of moderate means, like we two, no better holiday could be imagined.

F. REVILLE POTTS.

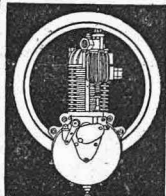


FIRST MOTORIST: "How is it, old man, that you are always getting mixed up with dogs?"

SECOND MOTORIST: "Don't know, old chap, unless it is that my number is an irresistible attraction to them."

(Motorist points to his car with the symbol K9 on it—canine!).

INVENTIONS



THE LATEST IMPROVEMENTS IN MOTORS, MOTORCYCLES, MOTOR CARS & ACCESSORIES

The "S.B." Spark Plug.

Of spark plugs there are no end, but one of the best which we have tested is the S.B., which has just been placed on the market by the Simms Manufacturing Co., Ltd., Kilburn, N.W. Price 7s. 6d.

Outfit for Celluloid Repairs.

The Prested Electric Lamp Co., Elthorne Road, Holloway, London, N., have just placed on the market a most useful outfit that should meet a long-felt want amongst motorists. It consists of a small pocket case containing every requirement and directions for repairing damage to celluloid accumulator cases. Judging from the numerous queries from readers who have been in difficulties through a slight mishap to the cells through falls or vibration, they have in this set exactly the thing they want. The price is 2s., post free, from the makers.

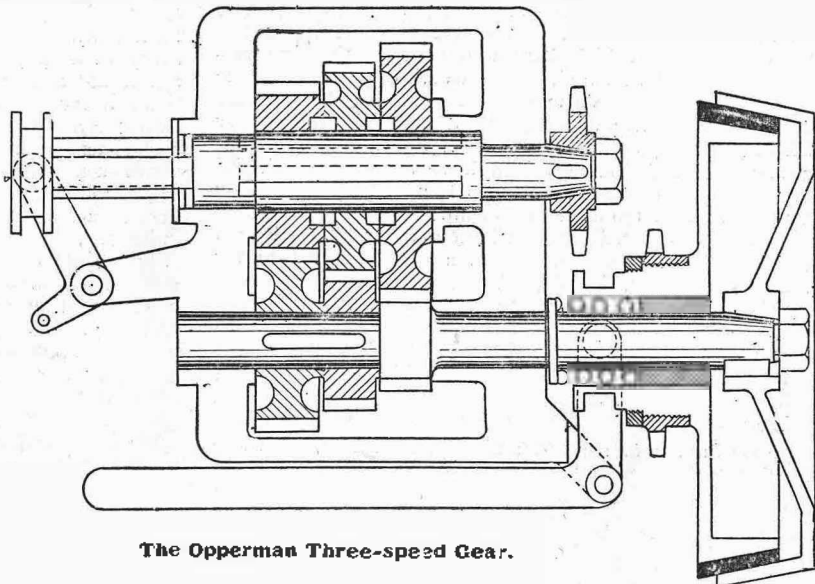
A New Tri-car.

A nice-looking and well-designed tri-car is that now being turned out by the Imperial Swift Motor Co., Imperial Works, Queen Street, Walsall. As the illustration shows, it is fitted with a water-cooled engine; this having a bore of $3\frac{1}{2}$ in. and a stroke of $3\frac{1}{2}$ in. A Garrard two-speed gear is fitted, and a free-engine clutch is operated by a lever on the side of the tank. A combined radiator water-tank is fixed just behind the front seat and circulation is effected on the Therms-Typhon principle. Ignition is by trembler coil and wipe contact. The box at the rear contains two Lithanode accumulators, with three-way switch on top. The carburettor is of the well-known Longue-mare. The wheels are 26 in., fitted with Palmer 2½ in. tyres. This machine is retailed at £70, but, with side wings, as the illustration, £3 extra is charged.

Improved "Non-skidders."

The "Otto-Bennett" Company, of 8, Snow Hill, E.C., announce important improvements in connection with their "Otto" detachable non-skid band. In place of the solid steel attachment in use

is now vulcanised completely over the outer cover, including the beaded edge. This will prevent any tyre "creeping" and the possibility of the band working loose. The band thus offers more protection, with added power to the rim clutch.

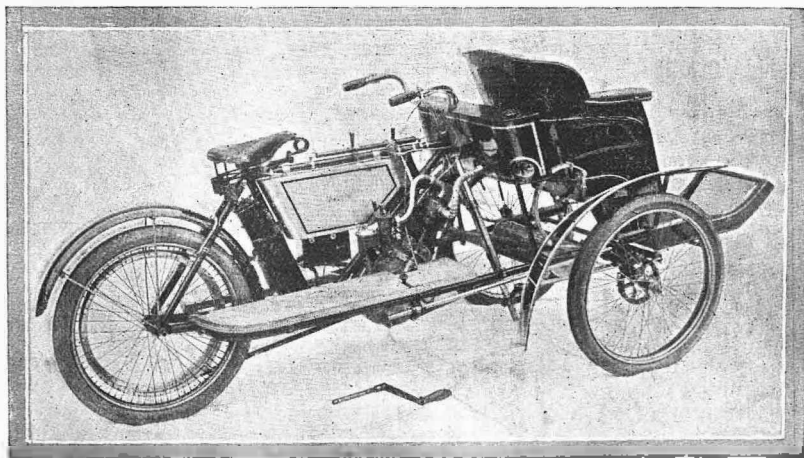


The Opperman Three-speed Gear.

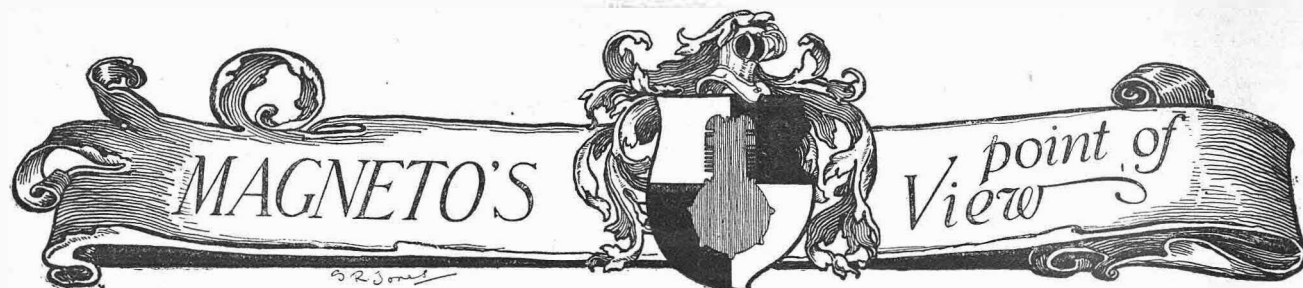
up to the present, flexible wires are introduced. By the working of an ingenious little lever, fitted with three notches, and which is placed under the covers, the wires can be tightened or slackened at will, vastly simplifying the methods of attachment or detachment. An improvement has also been made in connection with the "See" bands. The band

The Opperman Three-speed Gear and Clutch for Motorcycles.

A type of gear that should have a good future before it, principally for adapting to fore-carriages, is the three-speed gear and clutch just placed on the market by Opperman and Sons, 13, Albemarle Street, Clerkenwell, London, E.C. It is compact and moderate in weight (21½ lb.), and the workmanship is particularly good, as it should be in a speed gear if it is going to last. From the illustration, which shows a section through the gear-box and clutch, it will be seen that there are two sets of cogs always in mesh, this being a specially good feature, as there is no possible chance of damaging the gear teeth by sliding them into mesh. The clutch is mounted on the counter shaft and this latter carries the sprocket receiving the drive from the engine. On the other shaft the cogs are put into engagement alternately by means of keyways with inclined planes and projections leading up to each keyway. Strictly speaking, these wheels form positive clutches, which are engaged by the advancing keys. These are actuated by the pivoted lever, which is connected to a Bowden wire. A free engine position occurs between each speed. This gear is placed on the market at £11—a reasonable figure, considering the good work put into it.



The Imperial Swift Tri-car.



Motorcycle Petrol Consumption Trials.

The tests recently carried out by the Auto-Cycle Club to determine the petrol consumption of different machines, although by no means conclusive as to their capabilities, nevertheless provided some interesting data. For one thing, it proved that even on heavy roads, and with unfavourable riding conditions prevailing generally, it was possible to get very close to 200 miles running per gallon of petrol, with a motor-bicycle. That the motor-bicycle is miles ahead of any other motor vehicle for economical running is generally admitted, but that a shilling's worth of petrol could be made to last for 200 miles is remarkable. The smallest engine used in the competition was an F.N. $1\frac{1}{2}$ -h.p., the cylinder of which is only 50 mm. by 68 mm., approximately 2 in. by 2 11-16th in. This, as might have been expected, did a very good performance, but was handsomely beaten by a very much larger (70 mm. by 76 mm.) engine. The second smallest engine entered was a Clement-Garrard, 60 by 70. This did well, and as it has such a good reputation for economical running, it is doubtless capable of a much better showing than 152 miles to the gallon it actually performed. As the contest was supposed to have been arranged so that a fixed minimum speed (20 miles per hour) was kept up, it precluded any possibility of "faking" or helping the engine in any way.

HOW THE SIZE OF ENGINE AFFECTS THE CONSUMPTION.

A large engine can be run economically, we know, but there is no doubt that a small high-compression engine, if in thoroughly good condition, would beat it every time at moderate speeds. A heavy, high-powered mount cannot be throttled down to the same extent, but by manipulating the exhaust lifter every hundred yards or so, a good deal of petrol can be saved, because the engine will not take in gas with the exhaust valve open, but will continue to run with its own momentum. One of the machines entered for the competition had a very large engine, but its chief feature was the gearing, which was about 1 to 2 $\frac{1}{2}$. The rider had evidently come to the conclusion that the low number of revolutions of the engine per mile would tell strongly in its favour. I should hardly have been sanguine of its success myself, because the friction losses in a big cylinder are very much greater than in a small cylinder, and therefore the mechanical efficiency is lower. Of course there is the question of low gearing to be considered. A small engine geared unduly low would not make a good showing, as it would be racing more or less.

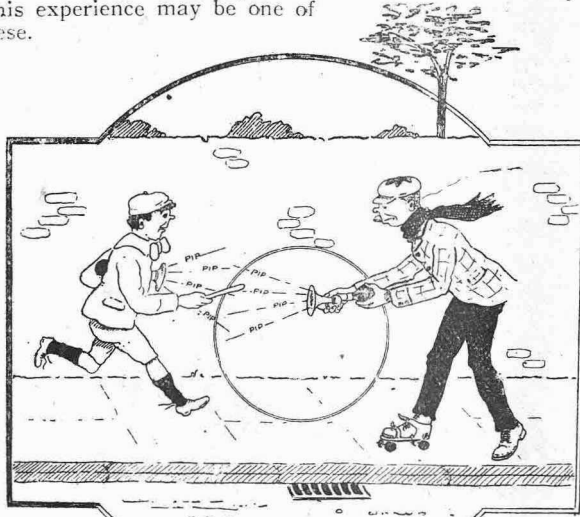
THE BEST CONDITIONS.

There is only one gear which will give the best all-round results so far as petrol consumption is concerned. The other main factors are to keep the compression as perfect as possible, have a large flaming spark, use a good oil, and lubricate often; have the spark well forward, and throttle down to a minimum. The type of carburetter has not so much to do with the question as some people think. The surface carburetter being the thing for economical running was almost accepted as an axiom at one time, but the best result in the trial was obtained with an F.N. spray. The carburetter must be in good order, of course; by this I mean it must be petrol-tight everywhere—especially at the needle-valve—and have a suitably proportioned jet or sprayer. A very small difference in the size of the hole makes a considerable difference in the petrol consumption. If too large, more petrol will issue through it than can be sprayed properly, and this is so much loss. Another matter to be

observed is not to have too much heat in the jacket. The consequence of this is for the petrol to be flashed into gas, as it were instantaneously developing pressure enough to blow out of the air-holes, and thus escaping. This in itself is a source of considerable loss.

A Strange Accumulator Experience.

Has any reader come across a similar experience to this? I have a small 8-ampere accumulator of a certain make, which I have always found reliable. I put this away in a fully-charged condition, and did not look at it again for a matter of about four weeks. I happened to want it for use on a ride, and expecting to find it practically as fully charged as when I put it away, I put a voltmeter across the terminals. It showed just $1\frac{1}{2}$ volts only, much to my surprise. The plates looked good, the positive being a dark chocolate and the negative a dull grey. There had been no leakage between the terminals, as these were quite dry, as also was the top of the case. Now, this is the mysterious feature. I connected the accumulator straight on to a lighting circuit to charge it at 1 ampere, and, again to my surprise, in 30 minutes it was gasing furiously. I tested it with the identical voltmeter as before, and got 4.5 volts. On discharging through a lamp at 1 ampere I got over 8 $\frac{1}{2}$ hours' light. Now it is clear that the cells were in order when I previously tested them and got but $1\frac{1}{2}$ volts, as I only put $\frac{1}{2}$ ampere-hour in, and they were fully charged again. It seems to me that the only explanation is that a film of a gaseous nature had formed on the plates when they were standing, or possibly it might be a thin deposit of lead sulphate, and when this disappeared the cells at once gave full voltage, whereas before the plates would be polarized and giving a counter electromotive force. I believe I am correct in saying that there are many mysterious chemical reactions in accumulators not yet fully understood by the recognised authorities on the subject. This experience may be one of these.



The growing popularity of the motor-horn amongst cyclists makes one wonder whether the future will witness a development such as that depicted in our illustration.

AMERICAN

TOPICS

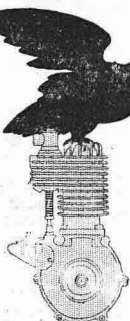
NEW YORK, October 12th, 1904.

A Record Meet.

Three kinds of records have just been broken at the automobile race meet at the Empire City track. The first was in the largest attendance of spectators that ever entered the gates of the Yonkers' trotting park and, incidentally, in the largest attendance of any automobile tournament ever held in the metropolitan district; the second was in the largest gathering of automobiles ever seen together in this country; and the third was in the setting up of a new record table for track competition of middle-weight machines from two to ten miles inclusive. The attendance was in the neighbourhood of 15,000 persons, but this was overshadowed by the magnificent display of automobiles, which were parked in the enclosures in the rear of the grand stand. By actual count, when the race programme was about half concluded, 445 machines were within the boundaries of the park, including the cars then on the track, which exceeds by nearly one hundred the best previous record of the kind in this country. A member of the automobile trade, who made the count, estimated the value of the machines on the grounds at \$1,250,000. He figured it out that the cost of 200 averaged \$2,000 each, another 200 averaged \$3,000, while 45 averaged \$5,000. The highest-priced cars were the 90 h.p. Mercedes machines of B. M. Shanley, Jun., and H. L. Bowden, which were reputed to have cost their owners nearly \$20,000 each. Of foreign cars most largely in evidence were 17 Mercedes, 11 Panhards, nine Darracqs, and eight Decauevilles, with a liberal sprinkling of F.I.A.T.S., Renaults, Richard-Brasiers, Mors, Rochet-Schneiders, and Clement-Bayards. Practically every type of American automobile built was to be seen, and it was instructive to note that touring cars greatly predominated. The programme itself was dull. The close was, however, redeemed by the splendid performance of W. Gould Brokaw's Renault racer—rated at 30 h.p., but believed to possess almost double that power. Driven in faultless manner by Joseph Tracy, the Renault clipped the track records for middle-weight cars at two and three miles, in a heat of the international race, and in the final of the same event smashed all the figures in the same class, from two to ten miles inclusive. In the final, six of the intermediate miles were turned in less than a minute each, the time for the whole journey being 10 mins. 1½ secs. The middle-weight class comprises cars weighing from 881 to 1,430 lb.

Some Impressions of the Cup Race.

I was in a wagon at the first turn in the course, and there a thousand persons had gathered by six o'clock in the morning. Shortly after six everybody began to watch a very slight turn about a mile distant. It lacked a minute of half-past when those with the best ears heard a faint "B-r-r-r" in the distance; and in an instant, followed by an immense cloud of dust and steam, a small light-coloured car came into view; and with speed reduced hardly a notch, a long gray cigar-shaped car shot around the turn. So fast was it going that as it struck the bend in the course it tilted to an angle and for a moment ran on two wheels only. The rear wheel skidded about on the soft gravel, raising a cloud that enveloped the car and lost it to the spectators' view. Not a person present but thought that the car was going to be turned over. Every one stood breathless for a moment, but when the driver, while two of the wheels were still in the air, let out his engine and shot ahead like a flash, every throat joined in a cry of "Gabriel!" It must have been lost to the daring Frenchman, for, before the people could draw breath, the car was hundreds of yards distant. Heath's first turn of the bend was not very daring, and people were heard to say that if he turned every corner as he did that one he would not win. His big Panhard was



brought almost to a stop before the turn. On the second round he turned at a greater speed.

As Heath came about the turn on his fourth round Gabriel was still in the distance behind. Everyone realised that Heath had taken the lead in the race, and with a cheer that could have been heard for miles they urged him on to success. Thereafter he was the favourite, and whenever he appeared at the turn he was greeted with round after

round of applause. Each time he was applauded he raised his hand to his visor. One of the most thrilling brushes of the race occurred just west of Jericho, where Tarte, going ninety miles an hour, passed Lytle in the straight. Tarte swung his arm high and yelled in triumph.

Immediately after the race William K. Vanderbilt, Jr., was almost overwhelmed by the rush of people to congratulate him. "I'm glad an American won it," he said. "I think the course was good—fully as good as European courses, and I have had a pretty good experience with them." Heath, while dismounting, said, "At no time did I have my machine running at full speed. I was running carefully, taking no chances, yet going at a good speed. I think my predominant sensation during the race was hunger. I'm as hungry as a bear now."

The Course.

The course chosen for the race was by no means ideal, though it probably was as good for the purpose as any that could have been selected in the vicinity of New York. The road surfaces were fair to excellent, and there were no grades worthy the name, but there were four sharp corners to be turned, dangerous to anything exceeding 20 miles an hour. In places there was not room for one machine to pass another at high speed in safety, while an unimproved section at the Bethpage turnpike was dangerously covered, alternately with broken stone and ploughed earth. The longest straight-away stretch was along the Jericho turnpike, from Queen to Jericho, a distance of about 16 miles. This road was undulating, with several short, two per cent. grades, and a slightly winding course, averaging 25 feet in width. Arrangements were made for the sprinkling of the entire route of 30 miles with nearly 100,000 gallons of crude petroleum, costing about \$5,000. This sum was guaranteed by the donor of the cup, who desired that every means possible should be taken to prevent accidents. So great was the interest attached to the event, and so many were the demands for seats, that it was decided to build the grand stand near Westbury at least twice the size first planned. Care was taken that none of the seats got into the hands of speculators; and applicants had to be vouched for by members of the American Automobile Association or of affiliated clubs. Nearly all the foreign cars arrived overnight, and had to be scaled down by honeycombing the frames and heavy parts. Neither did the American machines escape, for Frank Croker's 75 h.p. Smith and Mabley Simplex was fairly riddled with holes, while the Pope-Toledos, and the Royal Tourists were said to have been similarly treated. As much as 40 lbs. were taken from the frame of a car by the perforating process, the cost of which in some cases exceeded \$2,000. The "chassis" thus treated will have to be practically rebuilt for equipment now that the race is over. This may cost another \$2,000, or perhaps more. When the transportation of cars, drivers, and mechanism, the renting of special quarters near the course, and the wages of attendants are taken into consideration, it will be seen that the sport of automobile cup racing is an expensive one.

Cup Race Insurance.

In order to secure itself against the payment of damages in case of injury to spectators, the American Automobile Association is said to have taken out an accident policy, for which it paid \$6,000. The terms of this novel insurance

American Topics.—
Con:d.

contract were that the Association would be indemnified in the sum of \$10,000 for each accident which killed, or injured, spectators. It is said that no American concern would make such a policy, and the American Automobile Association had to deal with London Lloyds.

Motor Boat Burnt on the Hudson.

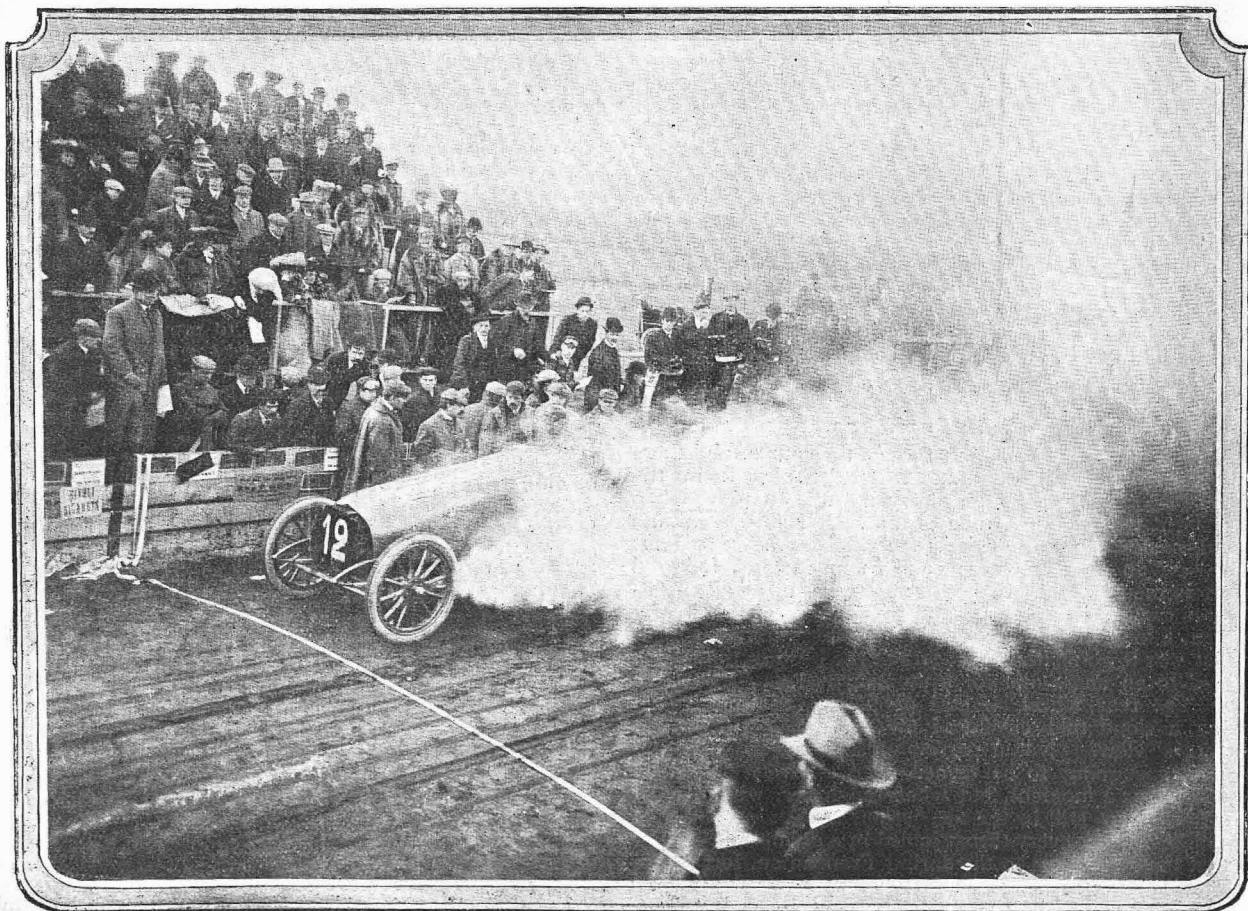
The motor boat races on the Hudson presented an attraction not provided for us on the programme. C. H. Tangeman's auto-boat, the "Macaroni," was totally destroyed by fire, while she was racing for the upper mark in the last of three days' races. William Wallace, an expert automobile driver, who was steering the boat, and Louis Stuenpfer, the machinist in charge of the machine, had a narrow escape from death. With scarcely any warning the boat which was plunging along in the rough water, suddenly burst into flames—from the breaking of a pipe it is said, which supplied the gasoline. She was then in the middle of the river, at a point nearly opposite Dobbs' Ferry. Wallace and Stuenpfer tried to beat out the flames, but they were quickly driven to the bow and stern respectively, whence they dropped overboard and hung on to the burning hull. They were rescued in a few minutes by a boat's crew from a steam yacht that was passing. The "Macaroni" was abandoned to her fate. Those who watched her expected to see her blow up, but she burned to the water's edge and sank.

The Foreign Chauffeur.


Sir Alfred Harmsworth, just before he sailed for home, had this to say for publication:—"I am afraid I was not sufficiently emphatic regarding foreign drivers of automobiles, when I spoke yesterday. Look at that," he said, pointing to a big touring car, travelling along Fifth Avenue. The owner was driving. The professional driver sat by his side, chatting while he puffed on a big cigar. The automobile was emitting a steady stream of smoke. "Too much oil in his tank," commented Sir Alfred. "A little further on the thing will suddenly stop and he'll wonder what has happened. He doesn't take care of the car. Do you know the foreign drivers that you have over here are only those that have been driven out of England and France? I call it absolutely senseless, in a country where people have the greatest mechanical skill, to import worthless drivers. I do not see why it is not possible to get good American drivers. I myself have been driven by two American drivers, and they are just as skilful as any I ever saw. It is nothing short of criminal for these reckless French drivers to run fast amid a traffic that is so congested as it is along this avenue. It would not be allowed in England."

Motor-bicycles for Military Use.

An American military expert, General Baldwin, has put forward a strong recommendation to the War Department in favour of instituting a series of trials to find out whether the motorcycle is likely to be of use in warfare. It is not, however, expected that the recommendation will be favourably treated by the authorities. Recent experiments with the pedal-bicycle have not been so successful in America as in other countries; and, curiously enough, the War Department of the most go-ahead nation of the day is singularly lacking in energy and enterprise.



The Vanderbilt Cup Race: the Clement starts with a huge exhaust.



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OPINION.

The Trade in Light Cars Next Year.

Proofs are not wanting for our assertion that next season will be a magnificent one for the light car trade. They are in our own hands, and in more instances than one we have seen them in the hands of dealers and manufacturers of popular-priced cars. Now that the rush of the season is over producers (or those who are wide-awake) are busy with their plans and preparations for next year, and it has pleased and almost surprised us to note how thoroughly the importance of the situation has been grasped, and how business-like are the desires and intentions of those who are catering for the public. There is this merit in the light car, and in the light car public:—The qualities in the one necessary to meet the requirements of the other are known, and can be definitely specified so that no manufacturer need hesitate about the lines upon which he is to proceed in order to enjoy an extensive, or, at least, satisfactory sale for his wares. The first of the "shows" will shortly be upon us: it, and those that follow it, will serve to supplement our efforts to familiarise the public with the details of, and also with the advantages afforded by, the pleasure to be obtained from a light car. These efforts should be supported and aided by the trade: the report of the judges in the recent trials will have indicated the points upon which improvement is necessary or desirable. With the removal from the cars of the few defects that remain, with the issue of instructive catalogues, and with the early publication of the fullest details of the new patterns, the buying public should be attracted in large numbers. The turning point has arrived, and we are convinced that only enterprise is now needed to establish the light car industry on a very firm basis next year.

Trams and the Rule of the Road.

We have received a letter from a correspondent who signs himself "Cockney." It amounts to an *ipse dixit* on the recent accident to the Duke of Connaught. In the first place, our correspondent observes that we put the entire blame on the cart for being without lights. He then goes on to say:—"It is quite evident, and perfectly clear to me, that the accident would not have happened at all had the driver conformed to the rules of the road. It was simply his wilful transgression of these, in attempting to pass the tram-car on the off-side, which was the cause of the regrettable accident. How long will it be before motorists and also cyclists will understand that the ordinary rule of the road? 'To pass vehicles which are being overtaken on the right-hand or off-side,' does not apply to the passing of tram-cars

which run on fixed rails? The *only side* on which trams should be passed is on the near-side between the car and the kerb of the footpath." In the first place, we did not intend our comment to be construed as fixing the blame entirely on the unlighted cart. At the time of writing the editorial note, we had not sufficient information to warrant our definitely forming such an opinion; we said the accident emphasised the need for universal lighting; this it does, even if there were contributory negligence on the part of the motorcar driver, which is not proved. Our correspondent is certainly not justified in charging the driver with "wilful transgression" of the rule which he lays down as inflexible. We agree that almost invariably it is the safer plan to pass trams on the near-side, but it is possible to conceive circumstances when that course would not only be inadvisable but dangerous and impossible. For instance, in parts of Brentford, and for some miles between that place and Twickenham, such a rule could not possibly be adhered to, for the simple reason that no vehicle, save, perhaps, a bicycle, could pass a tram-car on the near-side. How does our correspondent's cast-iron rule apply in such a case? How does he know that some such circumstance did not prevent the passing of the Duke's car on the near-side in this particular case?

Once Again—The Show.

It is hard to realise it, but it is a fact, that within a month from the present issue of this paper will witness the opening of the Stanley Cycle and Motor Show at the Agricultural Hall, Islington. Already "the Show" is an important topic for conversation both in and out of the trade, and many motorists are eagerly anticipating the inspection of the 1935 models. Indeed, a number of intending buyers are actually leaving the matter of purchase over until they have had an opportunity of comparing the leading machines at the forthcoming exhibition, which from a display point of view will, we are assured in high places, eclipse all previous records. What will characterise the new season's productions? is a question which is being widely asked. Dealing with motor-bicycles first, valuable refinements will be noticeable in the machines turned out by the most up-to-date firms, and in several instances features such as improved transmission (in the form of belt and chain protectors), spring forks, magneto high tension ignition, automatic spray carburettors, automatic lubrication, petrol and oil gauges, improved concealed wiring, and simplified handlebar control devices, will be appreciated by all practical riders. Then again, machines with free engines and two-speed gears will be seen, and it will be found that the weight question has received the earnest attention of some makers who will give prominence to models substantially lighter than their present ones. Coming to tri-cars and machines in this category, variable speed gears will be widely adopted, while improved air-cooling devices in some instances will show that a real attempt has been made to solve the cooling problem without having recourse to water. Improved steering (wheel system in two or three cases), spring suspensions to minimise road shocks, magneto electric ignition, less weight and lower power—all these will be features of the most advanced tri-car types. Then, there are the light cars. Here again, it will be evident that a steady advance has been made towards the goal of perfection in the construction of these popular vehicles. The bodies of the best specimens will be roomier and better sprung, and possess hoods; many will be fitted with three speeds and a reverse, ease of control will be brought to almost the irreducible minimum, there will be better protection of the mechanism from mud, and, lastly, but by no means least, there will be reductions in price. To minimise the possibilities of side-slip various devices will be found widely fitted to all classes of machines. Altogether, we think, this year's Stanley Show will demonstrate beyond all doubt that the evolution of all types of petrol vehicles is progressing satisfactorily.

Our first two Show issues—on November 8th and 15th—will accurately forecast the actual novelties to be seen. The third one on November 22nd will report and illustrate the motor side of the Show.

THE DIFFERENTIAL OR BALANCE GEAR ON SMALL CARS.

By "AUTOLYCUS."

There are many motorists apparently who are quite unacquainted with the meaning of a balance or differential gear on a small car, and who have no conception of its object or principles. A query put to me a few days ago in this connection by the owner of a small car, who asked me to explain it to him, caused me to make enquiries, with the result that I found many motorcyclists even who did not understand it, and there were numerous car owners, who are in a position which does not necessitate their troubling with the mechanism, who confessed that the term had always puzzled them when spoken of. Strange to say, too, I have not seen any articles on the subject which explained it, so it is evidently taken for granted that the differential gear is generally understood. That this is not so, however, can easily be proved by anyone who cares to take the trouble, when it will be found that it is a veritable "box o' tricks" to anyone of a non-mechanical turn of mind. For one thing it is generally well casel in, and as a really well-made article very rarely gets out of order, the inside works are seldom seen by car owners and their friends. Otherwise the principles and objects of the differential gear would be at once apparent. It is rather a difficult matter to explain it without drawings, but I will give the details of the idea in the hope that it may interest those motorists who have never given the subject a thought, and also the numerous class who regularly read "THE MOTOR" to gain knowledge of cars generally preparatory to purchasing and joining the ranks of motor enthusiasts. A motorcar must of course be a double-driven vehicle, that is, the power applied to the two road driving wheels

MUST BE EQUAL UNDER ALL CONDITIONS.

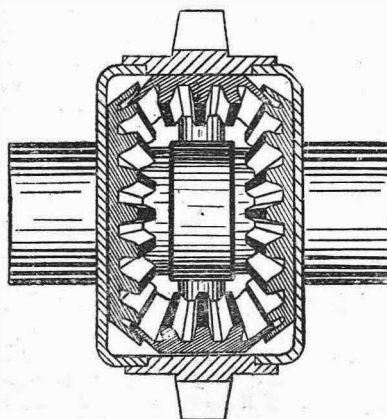
Now if two wheels have to be driven simultaneously and equal power applied to both, and they are each fixed to a "live" or revolving axle, it is obvious that they could only run in a straight, forward direction, or on parallel lines. The moment a straight course is deviated from, even to only cross the road, not to mention turning round a corner or travelling in a circular direction, the outside wheel must of

necessity travel further and faster than the inner one, and if the axle were rigid throughout it would twist and break. The balance or differential gear, therefore, is a compensating arrangement to allow either wheel to *automatically* run faster or slower as required, whilst *power* is, all the time, being *applied to both*. This is accomplished by dividing the axle fixing bevel wheels at the inner ends and connecting them through a rotating box which has teeth (to take the driving chain) on the outside, and transverse bevel wheels revolving on pins on the inner side. The power is communicated to the axles equally as long as the car is running in a straight line, but on a curve the axle of the outside wheel is able to overrun the axle of the inner wheel, the smaller bevels turning sufficiently to allow of this.

It will thus be seen that when the two driving wheels are running on a perfectly parallel course all the cog-wheels remain stationary; and the whole is the same as a perfectly rigid axle. If one wheel requires to travel faster and further than the other (as in turning a corner), the bevel cog-wheels move in exact proportion, while the rigid drive is still maintained.

It is a very clever mechanical contrivance, and was the invention of a Mr. James Starley, of Coventry (who was the

father of the cycle trade), at the time of the introduction of the double-driving tricycle in 1878 or 1879, and I well remember riding my tall "Humber" bicycle alongside the old gentleman in 1879 when he was up in the North of England introducing his double-driving tricycle—at that time considered a marvellous invention. He died in 1881, and a monument is erected to his memory on Coventry Green for this and other of his meritorious inventions. Without the balance gear even a motorcar would be of little value. It is strange that after all these years the balance or differential gear of Starley's has been so little altered or improved upon. I saw an expensive motorcar the other day which had (bearing the difference of driving gear in mind) almost the same design of balance gear on it that Starley fitted to his "Salvo-quadricycle" in 1879.

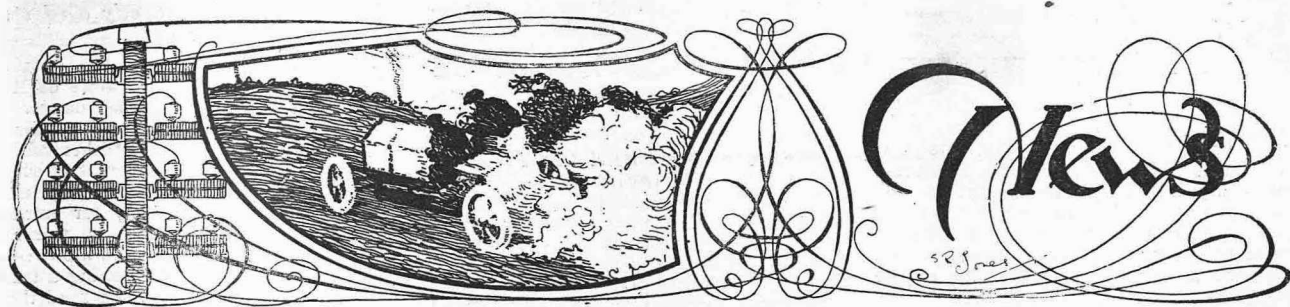


A tricycle balance gear.



THE BLACKPOOL TRIALS.

(1) The Napier, Wolseley and Mercedes racing cars by the grand stand. (2) Mr. Higginbottom's 93 h.p. Wolseley about to start.



The Stanley Show:

Three special numbers of "THE MOTOR" will be published in connection with this important event.

These will contain a number of special articles and illustrations. Full particulars of the contents will appear in our next issue.

Will the makers of a machine styled "Monocycle" or "Monocycle" kindly communicate with us, as we have received some enquiries about it?

The second annual banquet in connection with the Society of Motor Manufacturers and Traders, Ltd., will be held at the Hotel Cecil on Tuesday, November 22nd.

The stipendiary magistrate of Bradford recently remarked that motorcycles were more dangerous than motorcars, and he would not allow people to go gallivanting about the city. This statement, coming from a Bradford man, may be taken as pure "shoddy."

R. W. Ireton's performance on the Riley machine in the recent Portmarnock speed trials is highly creditable both to the Belfast rider and to his motor-bicycle. Although beaten in the final of the mile he did the fastest time of the meeting in his heat—viz., 1 min. 28 sec.

To-morrow evening (October 26th), a lecture with lantern illustrations will be given by Mr. Basil Crump, M.A., in the Society of Arts' lecture room, John Street, Adelphi, W.C., at 8 p.m., entitled, "The Possibilities of the Double-seated Motor-tricycle." Non-members are cordially invited.

The Southern M.C. have arranged the first dance of the season for Tuesday, November 15th, at the Avondale Hall, Lander Road, Clapham, adjoining the headquarters. Dancing to commence at 8 p.m. Double tickets 2s. 6d. Tickets can be obtained on application to the hon. sec. Motors at 12.30 a.m.

The Panhard firm have had a splendid season in racing circles, despite their failure to qualify for the Gordon-Bennett. A victory in the Belgian Circuit of the Ardennes, the winning of the Vanderbilt Cup, and a triumphant display in the big motor boat race at Maisons-Lafitte are three notable feathers in the cap of Messrs. Panhard and Levassor.

The Committee of the Motor Cycling Club have decided that in the case of anyone becoming a member between now and the end of the year his first subscription will entitle him to all the privileges of membership until the end of 1905. The annual club dinner will take place on Saturday evening, December 10th, with Mr. S. F. Edge in the chair.

Coming Events.

Oct. 26. C.T.C. (Metropolitan District Association). Lecture with limelight views, by Mr. Basil Crump, M.A., on "The Possibilities of the Double-seated Motor-tricycle, with notes on Continental Touring," at Society of Arts' Lecture Room, John Street, Adelphi, W.C., 8 p.m.

" 28. Lincoln A.C. Dinner at the Saracen's Head (to be followed by a paper by Dr. Ormandy on "Alcohol for Commercial Purposes").

" 30. Gailion Hill Climb (organised by "L'Auto").

Nov. 5. Auto-Cycle Club's 100 miles non-stop run for fore-cars.

" 18 to 26. Stanley Cycle and Motor Show (Agricultural Hall, London).

" 20. 100 Kilometres Trial (A.C. Algeria.)

" 20. Motor Cycling Club meets at Slough, "Royal Hotel," 1.30. Provincial motorists to the Stanley Show will be invited.

" 30. Auto Cycle Club's Annual Dinner.

Dec. 5 to Jan. 15. Exhibition of Engines for Motor Boats and Airships, and Heavy Automobiles; also special prominence to devices for alcohol consumption (Cours de la Reine Conservatoires).

" 9 to 26. French Automobile Salon (Grand Palais, Paris).

" 10 Annual dinner of the Motor Cycling Club at Frascati's. Mr. S. F. Edge in the chair.

" 26. to Jan. 2. Motor Union of Western India Reliability Trial.

" 31. Entries close for 1905 Gordon-Bennett Contest.

To be borne in mind.

The three special numbers of "THE MOTOR."

The dates of the issues are November 8th, 15th, and 22nd.

St. Patrick's Hill, Cork, a notably stiff rise, has recently been negotiated by a 7 h.p. Oldsmobile. A 60 h.p. Wolseley racer is said to have been the only car to have climbed this hill previously.

Mr. A. Meier, Station Carriage Works, Redhill, informs us that he is now stocking petrol, and being only 29 miles from London and 32 from Brighton, and also situated about 100 yards from the main road, he is in a convenient position for supplying automobilists passing through this well-known Surrey town.

"A novelty of the past week," says the "Gloster Echo," "has been the passing through Tewkesbury of a swift two-seater motorcycle, propelled by a lady." It is a trifle ungallant to comment upon a lady's breakdown in this public manner. The inhabitants of Tewkesbury appear to have had nothing so interesting to talk about since the battle.

Mr. Archibald Ford during his recent non-stop motor run covered 1,500 miles on his four-cylinder Darracq on one accumulator, and finished the trip of 2,391 miles on the other. He travelled over shockingly bad roads as regards the unevenness of the surface, and the fact that they were not shaken to pieces speaks well of their stability against vibration. The accumulators used were two of the makers' No. 90 sets taken from stock.

Berlin's motor 'bus service is to be revived. The old 'buses had a short and dismal existence: their performances were much like those of the London vehicles so humorously referred to by the "Daily Telegraph," more calculated to provide themes for the scoffer than facilitate traffic. The Berlin General Omnibus Co. purposes making a trial with a Daimler 'bus. A fast motor 'bus service ought to pay in Berlin, as the electric street cars cannot cope with the increasing traffic.

Austria's luck and success in the international motorcycle fiasco have had so encouraging an effect upon Austrian motorcycle circles that the "Motocyclisten-Vereinigung" is already occupying itself with preparations for next year's race. Motorcycle firms are to be approached as to their willingness to compete, and in the event of the entries being sufficiently numerous selection trials will be held over a course of the same length as the race course itself. This year only the Jungbunzlau firm of Laurin and Klement represented Austria in France, it will be remembered; although Austria is certainly not lacking in first-class houses.



"Can't make out wot's come over the young boss lately, Bill! When I showed him the mare's broken knees, he called 'em her front forks; an' then he began to talk about the colt's 'ead lights when I showed him 'er weak eyes."

NEWS.

In a report of the Bristol Club Hill-climbing Competition in a recent issue we omitted to mention that the performance of Mr. Tricks, riding a Crabbe, with a 3 h.p. Fafnir engine, was a distinctly meritorious one, seeing that this machine had no pedals fitted. Mr. Tricks was only three-fifths of a second behind the winner, who had assisted his engine by pedalling.

An American Speedometer.

The Jones "Speedometer," an American device for registering the speed of a motorcar or a cycle, has been adopted by the Metropolitan Police Department of Washington (District of Columbia); and seems to have given great satisfaction. The price varies from £13 13s. (special car instrument) to £4 4s. (for a bicycle). It is fitted as follows:—The large gear is attached to the front wheel of the car with screws. A smaller gear is carried by a ball-bearing shaft supported on the steering arm by means of an attaching clamp. The speedometer proper is attached to the dashboard of the car in any convenient position, and is connected with the drive gear on the wheel by means of a flexible shaft. The small gear-shaft support is provided with a swivel base which permits the gears to separate in the event of any obstacle, such as a stone, getting caught in the teeth, and thereby preventing any damage to the gears.

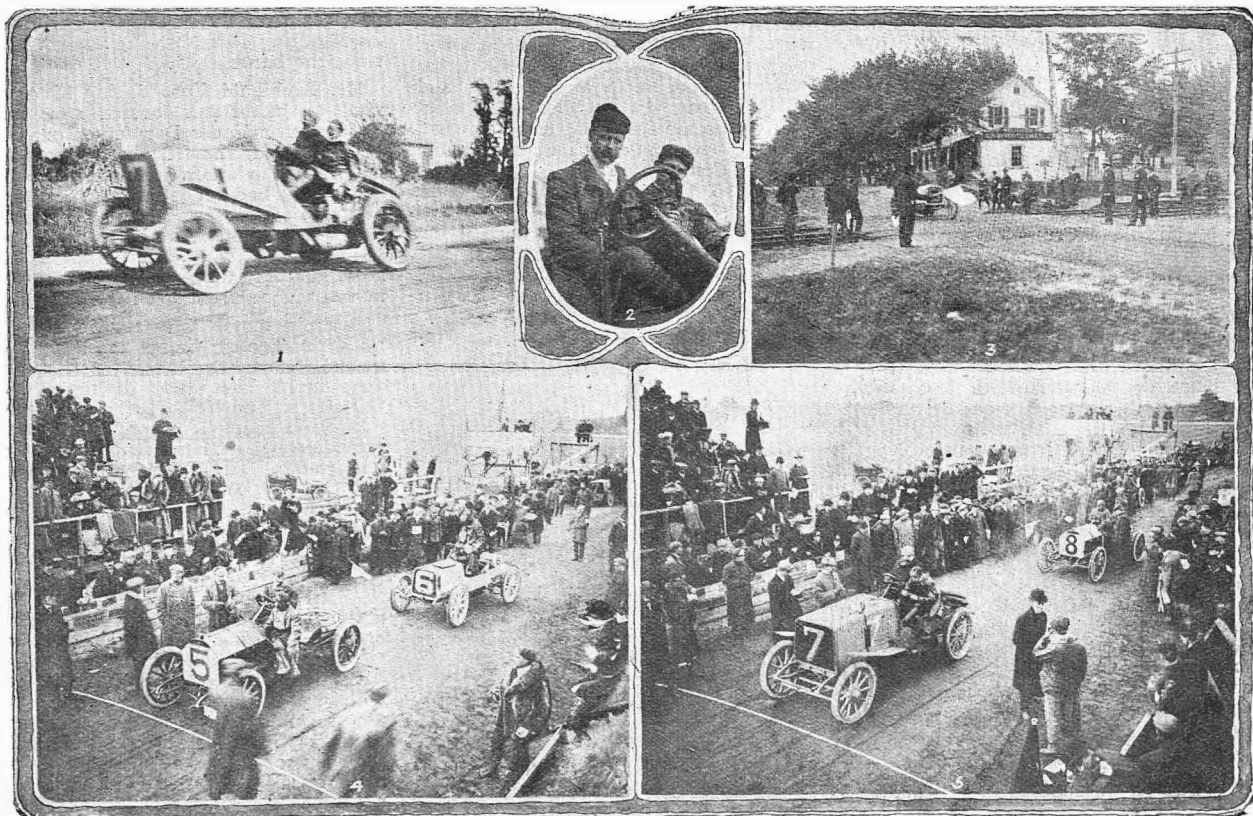
"It is a positive fact," says an American writer, "that the safest thing to do in passing a horse from either direction is to get past it as quickly as possible." But the law says otherwise, and horse drivers, except the few who know how to drive, tend to endorse the wisdom of the law.

Director Gossi and the Public Prosecutor.

It is not often that a Public Prosecutor in Prussia lets slip an opportunity for putting the machinery of the law in motion. Director Gossi, of the Neue Automobilgesellschaft, has just had an unpleasant experience of that functionary's fiery zeal. Herr Gossi had the misfortune to knock down with his motorcar a Fraulein Borchmann as she was stepping out of an electric tram. The lady, who is a book-keeper, sustained rather serious injuries and was in the doctor's hands for several weeks. Naturally, the popular motorist received a summons, but on the Automobilgesellschaft offering Fraulein Borchmann £100—probably a third more than she could have earned in a whole year, as wages go in Berlin—legal proceedings were stayed by the court. The lady was very well satisfied with the amount of compensation, which is more than can be said for the Public Prosecutor in respect to the stopping of the legal machinery, which he held to be inadmissible. Accordingly the Public Prosecutor let in his clutch, and the car of law started again, with the result that Herr Gossi found himself mulcted in a fine of £25 for careless driving, already made good by the aforementioned compensation.

The Sheffield Tragedy and its Moral.

The fatal accident which has just occurred near Sheffield once more emphasises three points:—(1) The danger of allowing tram lines to be laid so near to a kerbstone as to preclude another vehicle from passing; (2) the danger of allowing unlighted traffic on the highway after dark; and (3) the necessity for extreme caution when overtaking a tramcar. Briefly, the accident was as follows:—A Sheffield motorist was overtaking a tramcar. On the near side of the road there was not room between kerbstone and tram rail for the car to pass. Swinging out to the right, the motorist noticed, as he was passing the tram, a hitherto invisible handcart trundled by two lads; he made a desperate effort to avoid running this down by swerving into the footpath, but his left side spring caught the cart and knocked one of the lads over, inflicting fatal injuries. The car was proceeding slowly, and the driver sounded his horn continuously. The coroner's jury brought in "Accidental death," and expressed the opinion that there was an error of judgment on the part of the motorist. With this "rider" we have no wish to find fault; but at the same time we would impress on our readers the fact that, in our opinion, the other two causes—viz., the dangerous situation of the tram line and the unlighted condition of the handcart—also contributed to the unfortunate calamity. But facts such as these are strangely enough often overlooked at coroners' enquiries.



THE RACE FOR THE VANDERBILT CUP.

- (1) Heath, the winner, riding at top speed in the last round. (2) Heath in a characteristic position.
 (3) Lytle, on a Toledo car, crossing the railway track at Queens. (4) Arents starting his Mercedes.
 (5) Heath starting his Panhard.

NEWS.

NOTES ON THE BLACKPOOL RACES.

(BY OUR REPRESENTATIVE WHO REPORTED THE MEETING.)

Blackpool is certainly an eminently suitable place for a motor meet. The enterprising character of its corporation, its perfect promenade, and the large and influential body of local automobilists, all unite in presenting a combination of favourable circumstances such as few, if any, other towns could offer.

Hence it is not surprising that the recent meet turned out to be such a great success. At the same time there were several matters which were not so satisfactory as they might have been. In the first place, many motorists seemed to consider that the permit granted for racing on the Promenade extended to the whole town, and excessive speeds were very frequently indulged in. Luckily there were no accidents in consequence, but many narrow escapes were reported. Much harm was undoubtedly caused by the indiscriminate use of silencer cut-outs, with which a surprisingly large number of cars were fitted.

Coming to the races themselves,

THE ARRANGEMENTS WERE BY NO MEANS PERFECT.

At the starting point the officials were greatly hampered by crowds of people straying on to the course, which should have been entirely roped off. When occasionally the police were spurred into activity, in their zeal they swept everyone back—Pressmen, photographers, and all. The representatives of the Press obtained—if they asked sufficiently often—a small card admitting the possessor to the track. This permit many policemen

would not recognise, while for the benefit of those who would, the ticket had to be carried about in the hand. Why Press badges or ribbons were not issued is a mystery. Again, on inquiring at the secretary's office on Friday morning, the writer was informed that no times would be published collectively, and the only way of obtaining the results was by copying down from the board in front of the grand stand. However, the committee afterwards relented, and late on Friday evening the times were posted up at the Metropole Hotel. Now the rub was how much reliance was to be placed on these official figures? Such items as a 15 h.p. car being credited with doing a standing mile in 49 secs., and another car of the same make in 1 min. 2½ secs., seemed rather too good to be true. The frequent alterations and erasures made in the list by no means simplified matters.

However, we must not criticise too harshly; both the secretary and the members of the committee worked like Trojans to ensure the success of the meet, and great credit is due to them.

A matter which at future meets should receive attention is the question of

THE RELATIVE IMPORTANCE OF THE MOTORCYCLE EVENTS.

Considering that from the spectacular point of view the motorcycle races were not far from being the most interesting items on the programme, it is rather surprising that such slight attention was given to them by the committee. In fact, the impression given was that the motorcycle events were to be hurried out of the way as quickly as possible in order to make way for the car races, some of which were not so interesting to the public.

By the way, the writer would like to see at future meets a class for bona-fide touring motor-bicycles and also an event for two-seated motorcycles.

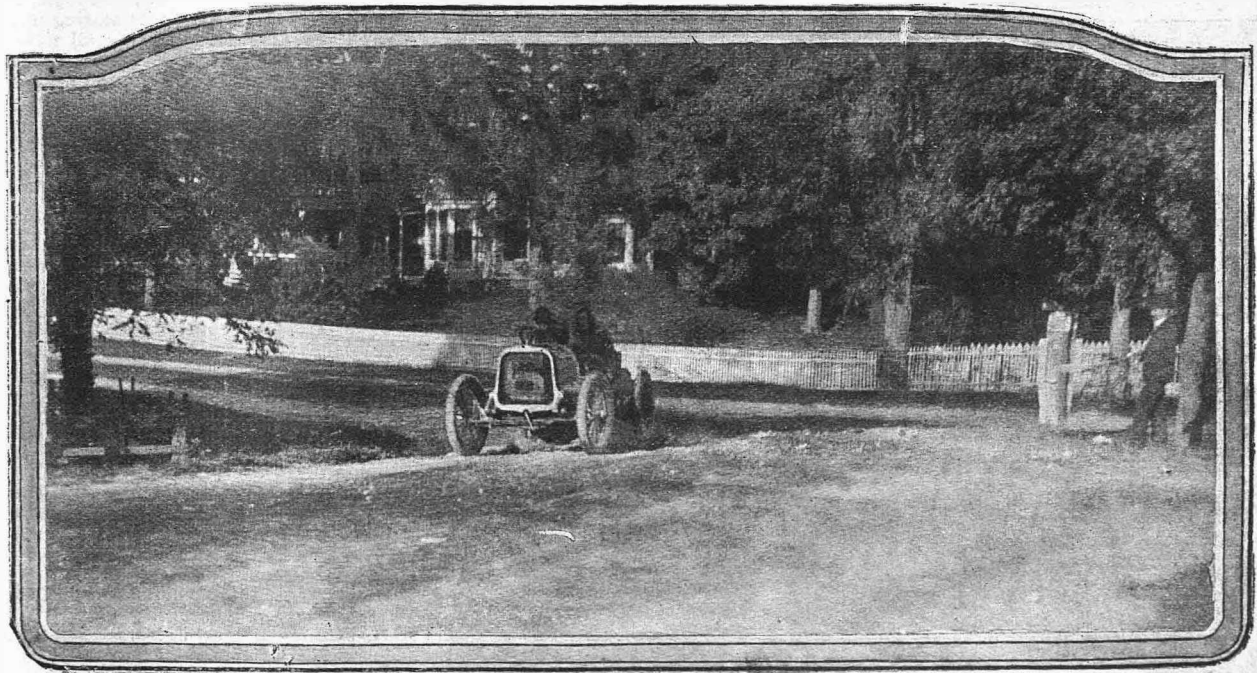
The lady driver was a prominent figure at Blackpool, and made by no means a

bad show compared with her male opponents. Miss Levitt—by the way, where was this lady's dog?—drove her Napier right through to the final of Class W. Miss Hampson surprised everyone by the great skill shown in driving her 60 h.p. Mercedes. Miss Hinds formerly an enthusiastic rider of a 3 h.p. Singer motor-bicycle—has advanced a step further by becoming the driver of a pretty little 10 h.p. two-cylinder Brown light car. Several other lady drivers were seen, all of whom seemed quits at home behind the wheel.

Passing to other subjects, there were as usual several disqualifications, with the consequent ill-feeling. Mr. Instone's sporting challenge on behalf of his 28 h.p. Daimler, and his marvellous driving which eventually won him a victory on the post over an opponent with quite a quarter of a mile start, caused much excitement.

Great local enthusiasm was aroused by the motor meet, and on all sides were heard expressions of appreciation and goodwill on the part of the townspeople. Almost certain it is that the Blackpool Corporation will again throw the town open to motorists at an early date. Blackpool's season is at its height from the middle of July to the beginning of October, but outside this period a motor meet would be extremely popular. The writer would suggest the end of June or the beginning of July as a suitable time for a future race-meeting. Not only will the longer days afford time for a greater variety of events, but the warmer weather will make the lot of the spectator far more pleasant. The new Promenade extension which the Corporation are building will probably be completed by next year, and a clear course of some two miles will then be available for racing.

It has been suggested that another race meeting should be held at Blackpool before the end of the year.



THE VANDERBILT CUP.

Little (Toledo) turns a right angle corner at top speed—a dangerous act.

NEWS.

A Triumph Light-weight with Ball-bearing Engine.

The Triumph Co., of Coventry, are putting on the market a 3 h.p. motor-bicycle weighing not more than 120 lb. net, i.e., without fuel, lubricant and accumulator. This means a throwing overboard of some 40 lb. dead weight. We have been putting the first of the new models through its paces for the last week or two, and can say that up till now a more speedy, comfortable and easily controlled single-tracker we have never had the good fortune to drive. We give an illustration of the machine with its producer, Mr. Schulte, in the saddle, and it will be noticed first of all that it is a low-built vehicle fitted with footrests in addition to the usual pedalling gear, and rendering it possible for the user to easily reach the ground with his feet. The handlebars are semi-circular, affording a most comfortable position. The engine is new, the main-shaft being fitted with ball-bearings, an achievement not hitherto successfully attained by many makers. Specially large and heavy fly-wheels are employed, whilst the valves are mechanically operated. Another important feature is the design of frame. The double top tubing is dispensed with, but there are double tubes from the head to engine affording stability in the right place. Further, the frame is to an extent elastic, so that over rough roads there is a certain amount of "give," which considerably lessens vibration. Two brakes are of course fitted: one on the front rim and one operated by the left foot (whilst on the footrest) on the inside of the belt rim. Transmission is by three-plate. This machine will be exhibited at the Stanley Show, but it really requires trying on the highway for its many good points to be appreciated.

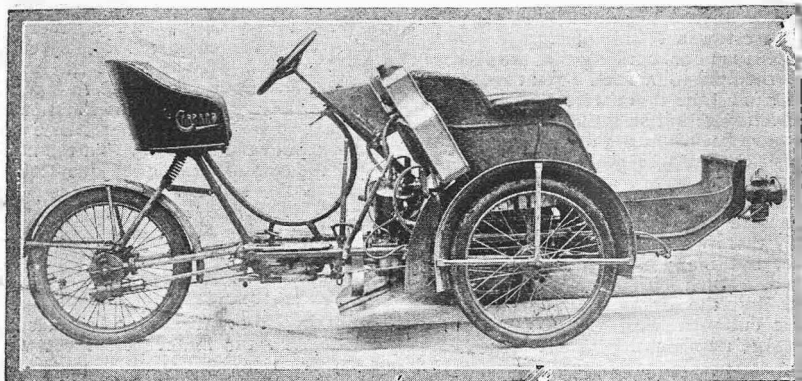


Mr. Schulte on his light Triumph.

THE LATEST GARRARD TRI-CAR. BUILT ON CAR LINES.

On Friday last we had the opportunity of inspecting the new Garrard two-cylinder tri-car, and of being piloted for a short trial spin by Mr. Garrard, Jun. A sufficient distance was covered to enable us to fully judge of the speed and hill-climbing capabilities of the machine, and to test the springing of the fore-carriage over some of the vile road surfaces on the outskirts of Birmingham. We should estimate possible speed on level at some-

attainable by a high-powered car and yet whilst keeping the weight within reasonable limits to afford both driver and passenger ease and comfort for a long journey. The engine is a two-cylinder set V-wise upon an aluminium crank chamber lying across the frame, each cylinder being 85 mm. bore by 85 mm. stroke and developing 8 h.p. on the brake. Automatic inlet valves are used and an ingeniously simple method of retaining the spring on



The new Garrard Tri-car.

thing approaching double the legal limit. We found the front seat very comfortable and

ASTONISHINGLY FREE FROM VIBRATION, due to the double system of spring suspension; the question of ample leg room has not been overlooked, and we must tender our congratulations to the designer of one of the best tri-car seats we have yet come across. The machine has been designed with the object of obtaining the average speed

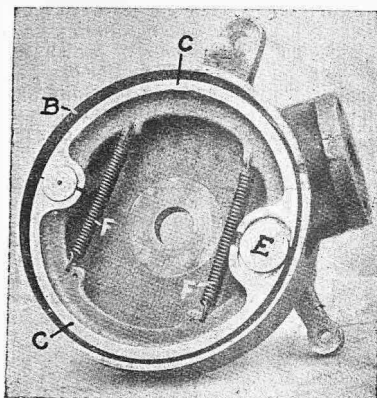
the stems both of these and the exhaust valves is adopted. The

GARRARD AUTOMATIC CARBURETTER

feeds the engine, the gas being supplied evenly at all speeds. The cylinders are cast separately, and their tops are open so as to ensure clean castings; they are finished off with aluminium caps and a watertight joint is made with a material known as "Klingerite." The inlet valve and its seating is held in position by a swinging yoke; through the centre of this a bolt finds its seating upon the gas pipe union and holds all tightly in position. The crank shafts have a double spiral cut upon them and they are therefore efficiently lubricated and yet oil is prevented from running outside the bearings. The valves as well as the cylinders are water-jacketed, the water being carried in a tank behind the front seat and supported on the rear ends of the "C" springs; upon each side of the tank and extending outwardly beyond the sides are the gilled radiator tubes, three rows of six being used each side with a total radiating length of 21 feet; thermosyphon is relied upon for the circulation. The fly-wheel (diameter 14 in.) carries the clutch upon the engine shaft and is quite separated from the gear box to permit of easy detachment, and also to allow for any springing of the frame, which would otherwise set up torsion. Between the clutch and gear box is an universal joint somewhat different to those usually employed. Within the gear box are the three gears of the Panhard sliding type. The gear wheels both for the first and second motion shafts are solid with the shafts themselves, and the shafts run in long phosphor-bronze bearings. Outside the gear box is another universal joint attached to the propeller shaft. The motion is communicated to the rear driving wheel by a worm drive contained within an oil tight and dust-proof casing. The drive is silent and very efficient,

NEWS.

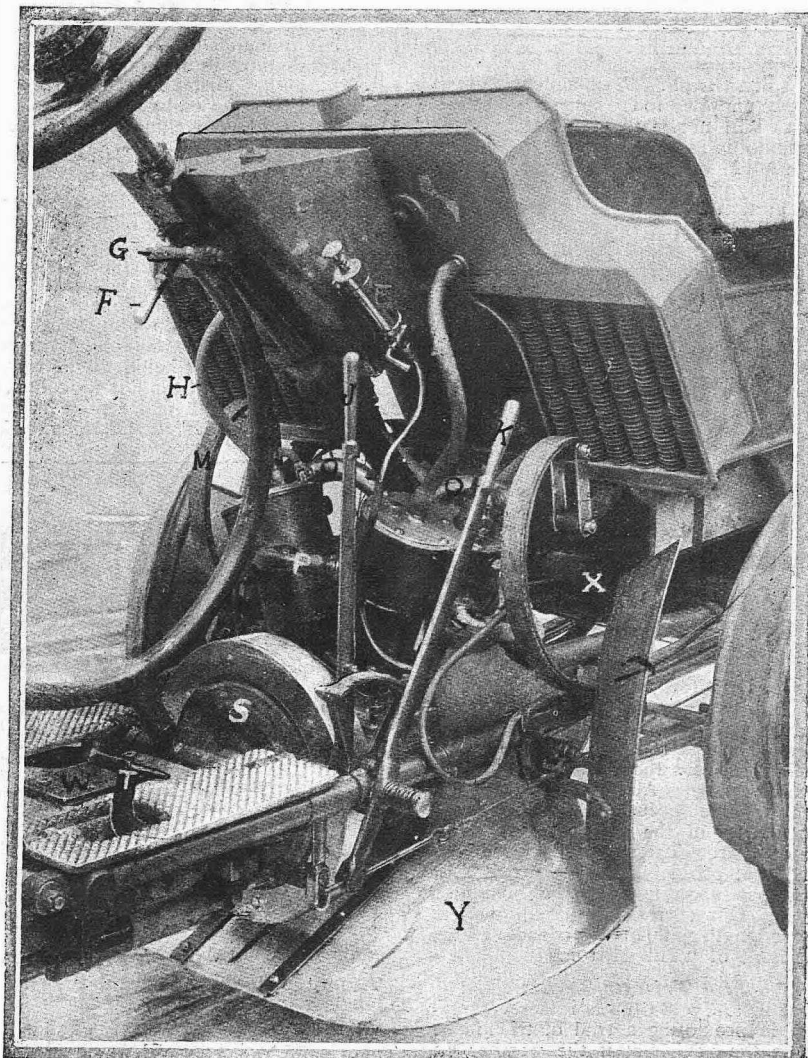
and as the worm is carried upon ball thrust bearings blocks at both ends it ought to wear indefinitely. Upon the left-hand side of the rear wheel is fitted the new Garrard patent internal expansion brake of which we give an illustration. This is actuated by the left pedal, the right pedal releasing the clutch; the two



Internal expansion brakes of Garrard Tri-car.

B Internal braking surface. *C* Phosphor-bronze brake shoes. *E* Oval toggle to put brakes in action. *F* Spiral springs holding shoes from braking surface.

brakes on the steering wheels are also internal expanding, and are controlled by the side lever. The front brakes can be locked in any position by means of the notched quadrant below the lever. A very simple method of balancing the front brakes ensures equal effect on both wheels, and prevents any harsh jerking action. The steering is effected by a wheel, the column being supported upon ball bearings, and is of the irreversible Ackerman type. Upon the wheel is the two-way switch, and immediately below are the ignition and throttle levers. For the ignition a high speed trembling coil and two sets of accumulators are carried in a box below the petrol tank under the front seat. The wipe contact breaker will



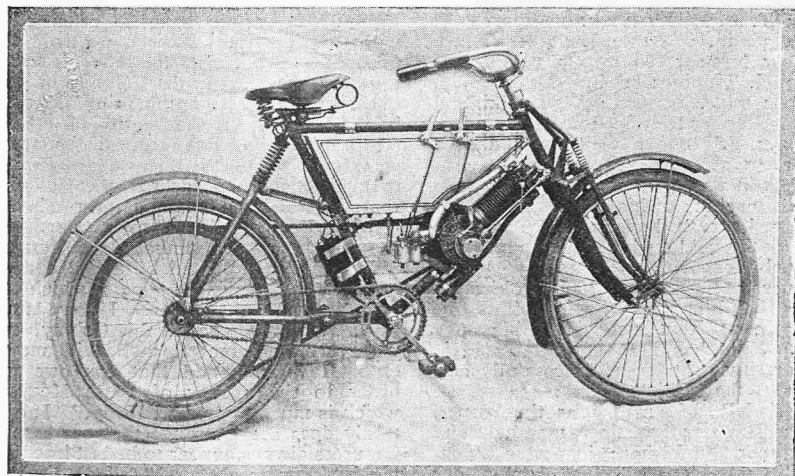
Engine and other details of the Garrard Tri-car.

F Ignition lever. *G* Throttle lever. *J* Change speed lever. *K* Brake lever for steering wheel. *O* Pipes from carburettor to inlet valves. *P* Water connecting pipe between the two cylinders. *S* Clutch. *W* Pedal to clutch. *W* Gear box. *X* Silencer. *Y* Engine shield.

be worked off the timing gear by bevel pinions and a long shaft, and will be brought up under the rider's eye

BELOW THE STEERING WHEEL,

and attached to the column. This is a startling innovation for a tri-car, as such a luxury in the way of detail has only been looked for on high-powered automobiles. It should not fail to be appreciated by all practical riders who have experienced trouble with the contact breaker in the normal position. Lubricating oil (capacity half a gallon) is contained in a tank clamped to the column, and a force pump conveys the oil to the crank chamber. Two sparking plugs are fitted to each cylinder, and an immediate change over can be made if one fails. The petrol capacity is four gallons, and a little detail is the discharging of the top of the tank so that any spilled spirit must go into the orifice; the filling cap contains an air release valve to prevent any air lock in the petrol supply pipe; when engine stops the valve closes the air vent and keeps



The New Garrard spring frame motor-bicycle.

NEWS.

the spirit fresh. Two-and-a-half-inch tyres are supplied to the three wheels, and readers will notice the serviceable mudguards to the driving wheels, and also the shield below the engine, which thoroughly protects it from the mud. The front portion of the frame is carried upon 30 in elliptic springs, and the front seat is further suspended upon long "C" springs. The rear frame is also insulated from vibration by the well-known Garrard principle of jointed rear stays and a powerful compression spring below the rear seat; the latter is carried in addition upon spiral springs (not shown in the illustration). Wherever there are joints in the machine they are hardened by a secret process known as "Garrardising," and the gear wheels and worm drive are also hardened in this manner. The total weight is about 4½ cwt., and the price is 125 guineas.

The Light-weight Motor-bicycle Stands the Test.

A member of our staff has been giving our experimental 72 lb. motor-bicycle an extended test during the past week. He reports runs to Eastbourne, Brighton, Oxford, Guildford, Dunstable from London, totally about 500 miles, so that the machine has done altogether about 1,000 miles. The machine is giving the utmost satisfaction, and the tyres especially are standing well. Although so light, no puncture has occurred, and a close examination of the tread fails to show sign of wear. The stability of the frame is all that could be desired, despite the stress put upon it by riding on rough roads. Our correspondent will deal at greater length with his experiences in the next issue of "THE MOTOR."

The Tri-car Trials.

The Auto-Cycle Club is rather venturesome in promoting a trial of tri-cars so late in the year, but if the weather on November 5th be suitable, and the event be free from disappointing incidents, criticism may be disarmed. Entries close on Saturday next, and they are open to makers and private users; whilst, if two or more machines are entered by one person, they will run as a team. Each machine must have a free engine and change speed gear, and be without pedal gear. The course is one of 100 miles, from Hatfield (9.30 a.m.) to Wade's Mill, Barkway (23½ miles), Whittlesford (34½), and Newmarket (49—stop of 15 minutes for lunch), and then back via Whittlesford, Royston (73), Buntingford, Wade's Mill (88), and Hertford to Hatfield. Five hours is the minimum running time, and six hours the maximum. Petrol and oil must be carried for the full journey, water being the only thing that may be taken on board at Newmarket, and the only repair or adjustment that will not disqualify from a non-stop award will be for tyres. The machines will be timed on one hill, and on another each observer will call on his driver to stop the machine and then restart without leaving the saddle. Awards are as follows:—Any machine or team gaining a non-stop certificate and also a certificate awarded for excellence in (1) fuel economy, (2) hill-climbing, (3) ease of starting and control, and (4) brakes, will

also gain a gold medal, to be presented by Messrs. Iliffe. The certificates are quite separate and distinct, the non-stop being gained automatically by any machine which goes through without delay (tyres excepted); the others, for general excellence, will be awarded by the judges. The machines will be individually observed.

Manchester M.C.'s Hill-climb.

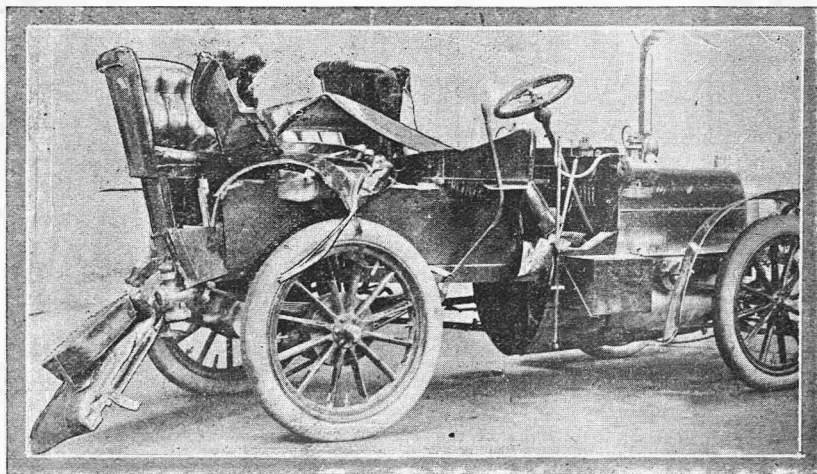
A SUCCESSFUL MEETING.

On Saturday the above club held their first hill-climbing competition. The event was confined to motorcycles and fore-cars, and was a handicap, the starts being allotted by F. Straight, of the Auto-Cycle Club. The venue was the mountain road up to the "Snake," on the borders of Derbyshire, about 15 miles from Manchester, the starting point being a mile and a half from Glossop, at the Shooting Box, a little way up the hill, which rises for five miles to a height of about 1,300 feet. The

At the Automobile Club on Thursday Mr. Claude Johnson will move the prohibition of high-speed cars in road or track competitions in this country.

Chateau Thierry Hill-climb.

The annual hill-climbing competition organised by "L'Auto," at the Chateau Thierry, was successfully carried out on Sunday last. There were no less than 74 entries in the various classes, and from a cable which reaches us from our French correspondent just as we go to press we learn that Magali, on a Colomb machine, secured the first award in the motor-bicycle category, and that there were six car sections (each section being different as regards weight and price), of which four were won by Gardner-Serpollet cars, and the other two respectively by Bolide and Mercedes cars. A full, illustrated report of this event will be included in our next issue.



THE DUKE OF CONNAUGHT'S ACCIDENT.

The appearance of the 12 h.p. Argyle after it had collided with a lightless cart.

British Manufacturers and the Colonial Trade.

When calling recently at the Mobile Motor and Engineering Company's garage in John Bright Street, Birmingham, we were shown a letter received that morning from Waibi, Auckland, New Zealand, which again touched upon the question of the apathy of the British manufacturers towards the trade in the Colonies. As we have so often dealt with this important subject, we print the following extract from the letter as showing the feeling out in the Colonies on this question. After complimenting the Mobile Company on the merits of a new 6 h.p. car he had just received, the writer went on to say:—"It seems a strange fact to loyal British subjects in the Colonies that no British manufacturer should think it worth while to appoint agents in the Colonies, while numbers of foreign makers are represented by active agents, and, saving a few — cars (which are very little thought of here), I don't know of a British-made car in this Colony, and yet every important town has its motor club. I wish to add that you owe my order to the agency of 'THE MOTOR,' which is much appreciated here." It certainly does seem strange that our manufacturers always appear to be last in opening up new markets. We hope the remarks above will be taken to heart.

course measured about a mile and a half. There were 22 entries, of which 11 competed. The men were sent off at two-minutes intervals, 50 yards behind the starting line, up to which they were allowed to pedal, but not beyond. The times of those who finished were as follows:—H. Andrew (3½ h.p. Fleet, 10 secs. start), 2 mins. 50½ secs.; W. J. Kennedy (2½ h.p. Minerva, 35 secs.), 3 mins. 29½ secs.; T. E. Kilfoy (2½ h.p. Minerva, 35 secs.), 3 min. 50 secs.; J. Fraser (4 h.p. Humber fore-car, 60 secs.), 3 mins. 52 secs.; H. Tippings (2½ h.p. De Dion, 30 secs.), 4 mins. 21 secs.; W. J. Maitland (4 h.p. Humber tricycle, 30 secs.), 5 mins. 14 secs.; F. Dunderdale (4 h.p. M.M.C. tri-car, 75 secs.), 6 min. 44½ secs. Andrew's win was a popular one. He rode a Fleet machine of his own make on Bat lines, and averaged over 28 miles an hour. He took the gold medal of the club, and a silver challenge cup presented by Messrs. Humber. Ltd. Kennedy had an objection laid against him for competing with a different gear to that specified on his entry form. This has not yet been decided. The arrangements were successfully carried out, the officials being:—Judge, G. B. Cliff, J.P., of Northwich; timekeeper, J. H. Baynes; starting marshal and timekeeper, R. Fisher; inspector of engines, S. B. Haynes; chief marshal, F. C. Hunt.

NEWS.

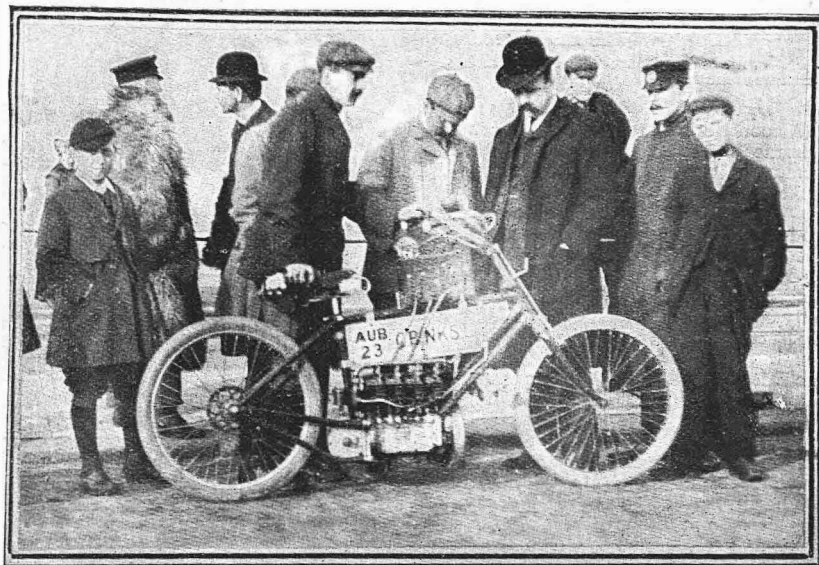
A Basingstoke cycle agent has "passively resisted" paying his rates on the ground that the police "who set traps for motorists and tell lies about them" are paid out of the rates.

The Samson Tread.

Capt. Theo Masui, representative in Great Britain of the Samson Co., who has been so successful in introducing the Samson Leather Tread to the English market, announces a reduction in the price of these treads, and also that the company can supply a complete Samson outer cover, consisting of a Samson leather tread vulcanised on to a motor tyre casing at a price which is only moderately in excess of an ordinary outer cover. These Samson outer covers have been used in France for a considerable time, and have proved very satisfactory. Capt. Theo Masui's address is:—1, Harver Court, Hanover Street, London, W.

The "Thor" Light Car.

The Thor Motor Car Co., 45 Horseferry Road, S.W., has specially designed a car for running upon solid tyres, and with this object in view the arrangement of the springs departs considerably from the usual practice. Two double elliptical springs are fitted upon the rear axle. No end shackles are used, but instead the weight of the body is carried centrally upon each spring by means of suitable clamps. It is, of course, understood that the springs are outside the framework. The front side springs are abolished, and in their stead a transverse double elliptical spring is clamped to the front axle, and the body rests upon the centre of the spring. The body has therefore three points of suspension only, and from a short run we had upon the roads in the neighbourhood of the factory the designer's efforts appear to be quite successful. The car is driven by a two-cylinder engine of the company's own manufacture developing 7 h.p. and having automatic inlet valves, gas being supplied by an automatic carburettor. The lift of the inlet valves can be regulated as desired. Transmission follows the accepted practice by means of leather-faced cone friction clutch, sliding spur wheel, gear box and differential with side chains from differential shaft to rear wheels. Three speeds forward and reverse, functioned by one lever, with direct drive on top speed, are arranged for an average of something over the legal limit. A special pattern of combined gilled tube radiator and water tank forms the front portion of the bonnet, and circulation is maintained by a rotary pump, spur wheel driven. The ignition is by a high-tension rotary magneto, with ordinary sparking plugs, and regulated as to advance and retardation by a lever on the steering column. A pedal brake provides the control, and as a standby two tyre brakes, worked by a side lever, are arranged. The body is very roomy and exceeds that found on many light cars: artillery wood wheels with English oak spokes are shod with Clincher solid tyres. The price is £175 complete with lamps, horn and tools, and the company are turning out 12 h.p. two-cylinder and 14 h.p. four-cylinders on similar lines and are intending to cater specially for the light van delivery trade as well as pleasure vehicles.



The Binks four-cylinder motor-bicycle which competed in the Blackpool Meeting

Croydon Motor Club.

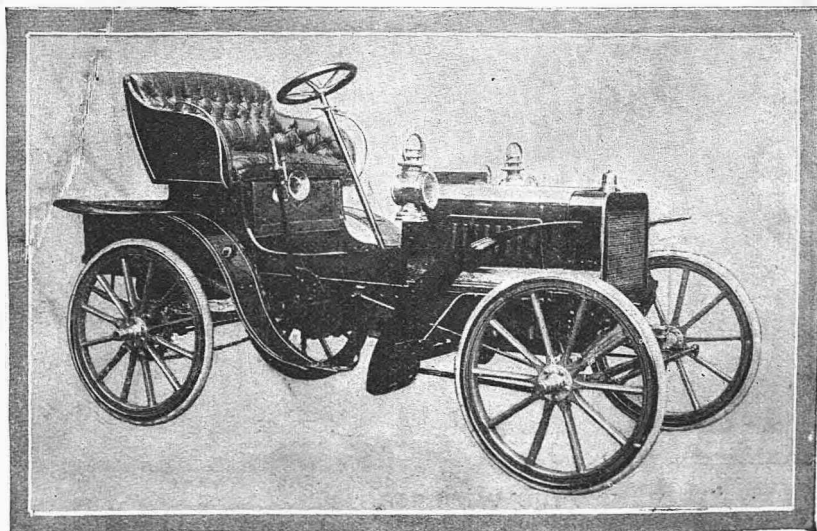
The annual non-stop run in connection with the above club was decided on the 18th inst., the route being to Brighton and back, a distance of 80 miles. The first award was the president's silver cup and special gold medal, the second prize being a gold medal. There were nine entries, but in consequence of the unfavourable road condition the starters were reduced to five. Mr. C. W. Brown, acting as starter and timekeeper, gave the word "go" soon after 8 a.m., the riders being Messrs. Martin, Steel, and the brothers Bradbury. The first to drop out was Mr. F. Bradbury, who retired at Crawley on the outward journey, whilst his brother gave up the contest soon after leaving Patcham on the return. Messrs. Martin and Steel, who were mounted on the Excelsior and Rover motorcycles respectively, completed the journey, each gaining the maximum number of marks. A second round over the same course was therefore necessary. This was imme-

diately undertaken, the result being almost the same, except that Mr. E. J. Steel was compelled to dismount at Dale Hill to avoid a herd of cows, for which one mark was deducted. The holder therefore retains the "Brown" trophy and secures the special prize. The second award, of course, went to E. J. Steel.

A number of interesting letters are again crowded out of our "O.P.V." columns this week. They will appear as space permits.

Mr. F. W. Bailey Exonerated.

Mr. F. W. Bailey appeared at the Bromley Police Court on Monday of last week in regard to the fatality in which he was concerned, and when the case was called the police intimated that in view of the verdict of the coroner's jury they did not intend offering any further evidence. It should be said that the coroner's jury exonerated Mr. Bailey from all blame in the matter.



The "Thor" light car.

NEWS.

Upkeep of the Light Car.

A contributor to the "Westminster Gazette" has given a very interesting summary of the expenses of running and upkeep of a 6½ h.p. British-made car, with seating accommodation for two persons, and costing 160 guineas. As evidence, at the outset, that this country can produce as reliable a car as the best Continental makers, the writer says:—"I have had only one serious trouble with this car, and that cost me just four shillings to repair. By 'serious trouble' I mean a breakdown that stops the car. Little things will happen at any time, but such minor troubles as can be put right in a few minutes are rare, and not worth considering. In 95 per cent. of my runs I have never had to stop the engine between the beginning and end of the journey, and the few stoppages have been due to such items as a loose connection in the wiring or some other minor affair not enough in itself to stop the car." During the month he ran 867 miles, mostly in the hilly county of Kent. With a petrol tank capacity of three gallons, a non-stop run of over 100 miles was easily possible. His expenditure for petrol, oil, and grease was: Petrol, 23 gallons = 29s. 6d.; oil, one gallon, = 5s.; grease, 4lb. = 3s.; total, 37s. 6d.—an average per mile of 0.518d.

He then makes an estimate of the average annual cost of running a car—this, of course, including, besides the fuel and lubrication expenses noted above, the wages of a man to clean and oil up the car, etc., re-charging of accumulators, licenses, incidentals and refitments (including small accessories, tyres, and repairs). This he states as follows, taking 5,000 miles as a fair average mileage:—

5,000 miles at 0.518d. per mile, £10 15s. 10d.; man, 52 weeks at 5s. per week, £13; re-charging accumulators, 10s.; Inland Revenue, £2 2s.; car license, £1; driver's license, 5s.; incidentals, small accessories, etc., £1; tyres and repairs, £5; total, £33 12s. 10d.; which works out at 1.615d. per mile.

In order to arrive at the total cost of the car for one year he added this £33 12s. 10d. to an estimated depreciation in the car of 33 per cent. of its original cost, i.e., £56, making a total of £89 12s. 10d., which on a mileage of 5,000 works out at 4.303d. per mile. Then he compares this with the cost of a pony and trap for a similar period, viz.: Fodder, straw, etc., 52 weeks at 12s. 9d. per week, £33 13s.; stable boy's wages, 52 weeks at 9s. per week, £23 8s.; license, 15s.; shoeing cob, stable accessories, etc., £3; total,

£60 16s.; an average of 9.12d. per mile; or, with an estimated depreciation in value of trap and pony of £70 16s. per annum, 10.62d. per mile.

The net result of these calculations is that the motorist saves sixpence on every mile as against the horse-driver.

The Alcohol Question.

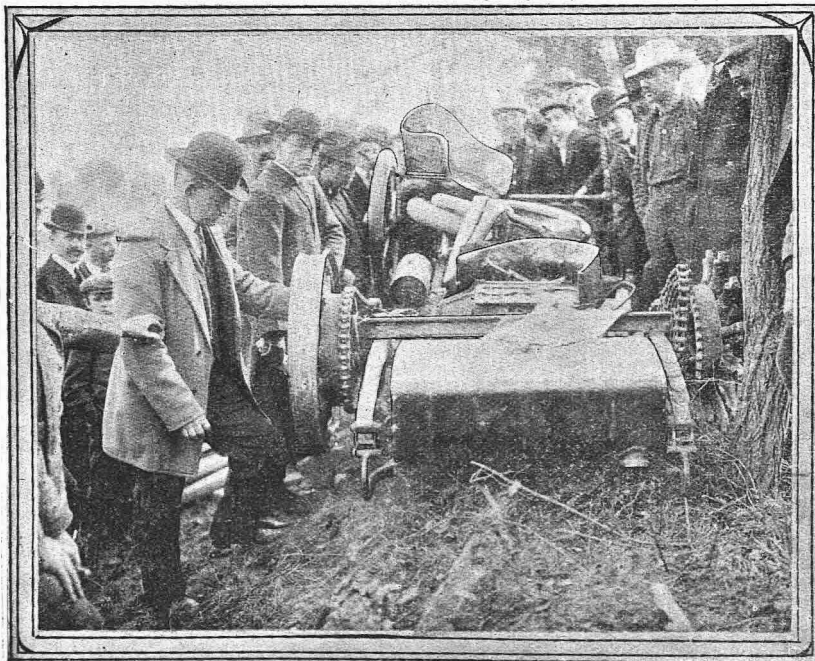
The Alcohol Committee of the Lincolnshire Automobile Club has arranged for a lecture on "The Need for Duty-free Alcohol for Motor and Industrial Purposes, and its Profitable Production from Home Agricultural Produce," to be read by Professor W. R. Ormandy, D.Sc., at the Lincoln Science School. A discussion will follow, and an informal dinner has been arranged at the Saracen's Head Hotel at 6.30.

A Motor Service for Italy.

A company has been formed to work the "Diligence" service in middle and Southern Italy by motor vehicles in place of the horsed vehicles at present in use. An order has been given to the Compagnie Belge de Construction d'Automobiles, the makers of the well-known Pipe cars, for 600 20 h.p. Pipe chassis, 300 omnibus bodies, and 300 wagon bodies. The motor vehicles will be so constructed that the omnibus body can be replaced by the wagon body, as occasion may arise, the change from one type of vehicle to the other occupying only half an hour to effect. The Pipe omnibus will carry 10 or 12 passengers, and the Pipe wagon 2,000 kilos. (about two tons) of merchandise. The roads present unusual difficulties but where awkward corners exist means will be taken to render them easy to negotiate; roads will be widened where necessary, and in some cases bridges will be built across ravines. The Motor Transport Co. will enjoy the same privileges as the Italian Railway Companies: there will be fixed stopping places, where the passenger vehicles will stop to take up or set down. The Municipal authorities of each city have agreed to furnish a station, with waiting-room. The Railway Companies are favourably disposed to the new service, as they will benefit by the tapping of districts hitherto untouched by railways. The first route will be opened on January 1st, 1905, and other routes as quickly as the vehicle can be manufactured.



Blackpool: the 8 h.p. Rover and 8½ h.p. Humber cars starting in their heat.



THE VANDERBILT CUP.

Arents' wrecked Mercedes. It will be remembered that this driver and his mechanic were pitched out of the car through a deflated tyre. The latter was killed.

NEWS.

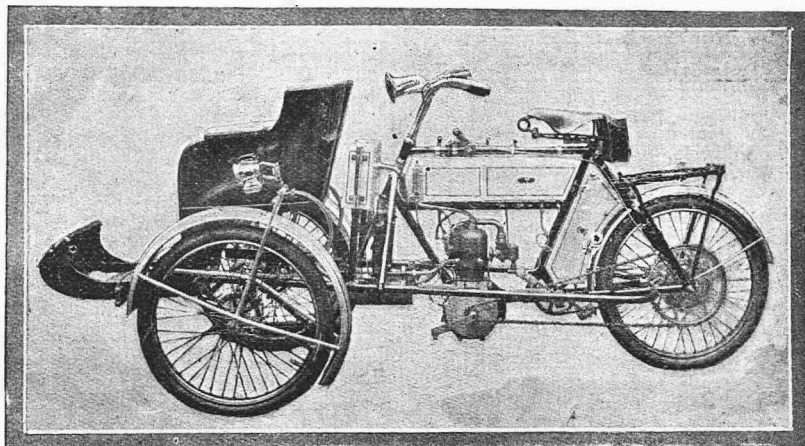
Up Kirks tone Pass.

THE VALUE OF A TWO-SPEED GEAR.

A correspondent has written to Phoenix Motors, Ltd., testifying to the benefit derived from the company's two-speed gear and chain drive. He has driven a Phoenix so fitted 900 miles over the hilliest roads in the country. He took it over the worst hills in Cumberland, and reports having twice passed cars stuck on hills which he managed to ride up. The machine was taken up Kirkstone Pass from the Penrith side. This pass rises about 1,500 feet, the gradient varying from 1 in 8 to 1 in 6. By the way, in a description under a photograph last week the height of this pass got magnified into 15,000 feet by the simple addition of a nought.

Another Light-weight Motor-bicycle.

Following our lead, W. W. Genn, of 17, Church Road, Wimbledon, has turned out for a client a very smart light machine, of which we give an illustration. This is fitted with a standard pattern Clement-Garrard engine, weighing 21lb., and the total weight of the machine as shown is 76lb. The machine is of very taking appearance and exceedingly well turned out. Like our own light-weight the frame is built of Chater-Lea fittings, the design being very compact; the fork and crown are heavy roadster, strengthened by girder tubes. The tank, specially made by the Chater-Lea Mfg. Co., is sheet steel, with sight gauge, and contains over a gallon of petrol—sufficient for 150 miles—and oil for 150 miles, with sight feed pump. Wheels are 26 by 2 in., shod with Clincher tandem tyres. Other items in the equipment are Longuemare carburetter, 10 a.h. Lithanode accumulator, Basse-Michel coil, and celluloid mudguards, with full-size Brooks' motor saddle. Mr. Genn's name will be familiar to our readers as having figured successfully in many competitions during the past season; this is so far the lightest machine he has turned out, but he states that he could, if required, build a somewhat similar machine at 70lb. weight. His latest effort decidedly reflects much credit upon him.



The Addison chain-driven tri-car.

On Tuesday, October 11th ten ladies were elected to membership of the Ladies' Automobile Club.

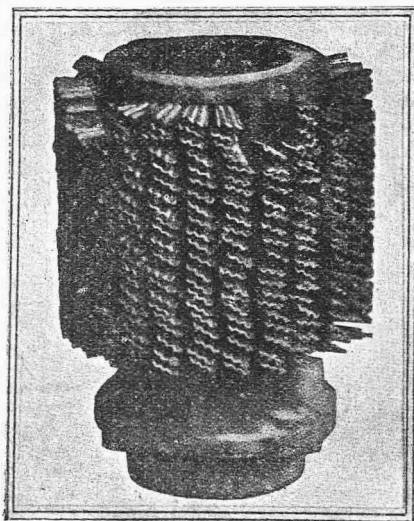
An American motorist has been acquitted of a charge of furious driving on the evidence of a speedometer attached to the car.

An American Air-cooled Cylinder.

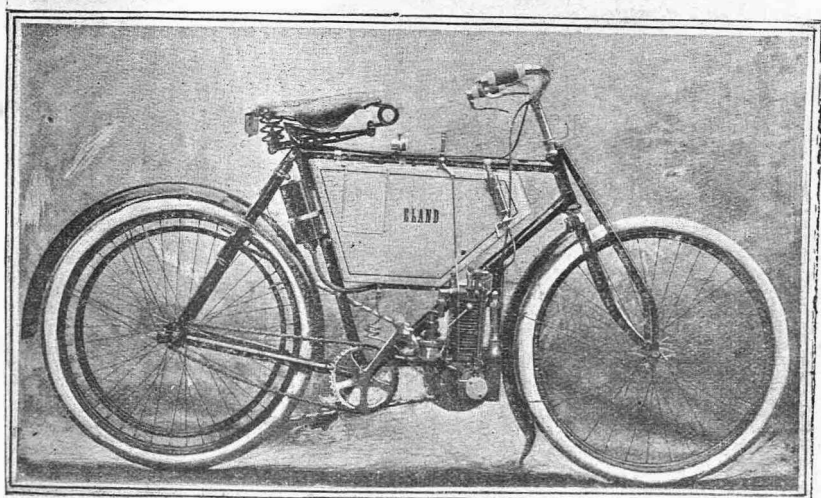
In the air-cooled cylinder illustrated a novel method of attaching the fins is employed. These are cast into the cylinder, a process which is said to be both more effective and more economical. The fins are placed in the mold, and the metal allowed to flow into a groove on the inner edge of the fin, so that these become a part of the cylinder. By an ingenious arrangement a spiral movement is given to the air as it circulates through the fins, and it is claimed that this greatly facilitates cooling. The cylinder is an American idea, and is made by the Hartford Pattern and Model Co., Hartford, Connecticut.

The Addison Chain-driven Tri-car.

We illustrate on this page a new tri-car, made by the Addison Motor Co., 18 and 20, Addison Street, Liverpool. The engine is a 3½ h.p. water-cooled Fafnir, with automatic inlet valve, governed on the exhaust. A 2½ gallon water tank, with a good length of radiator tubing, ensures efficient cooling. The transmission is by a Hans Renold chain to a Bowden clutch in the back wheel, and the engine is started by a handle. Ignition is by two of the latest Fuller accumulators, connected up through a two-way switch to a Basse-Michel coil. Palmer tyres are fitted as standard. Powerful compensating band brakes, foot applied, are fitted to the front wheels, while a Bowden rim brake is fitted to the rear wheel. The coil and accumulators are carried in the frame tank, which also holds lubricating oil for 800 miles and one gallon of petrol. An extra tank behind the seat pillar contains another 1½ gallons of petrol. A comfortable and well-sprung coach-built body is fitted. The tri-car is well finished, and the long controlling levers fitted are worthy of mention. The machine is supplied complete with all accessories, lamps, horn, and Main-Hilton stand, for £72 10s., and is guaranteed for 12 months. A two-speed gear can be fitted, if desired, for £5 extra. This seems a very good machine at the price, and we understand that several of these tri-cars have been supplied to customers, and are giving great satisfaction.



Novel method of fixing fins to air-cooled cylinder.



The Eland light-weight motor-bicycle. 76 lbs. all on.

NEWS.

Heath, who won the Vanderbilt Cup, drove a Panhard-Levassor car fitted with Michelin tyres. The second man, Mr. Clement, also had his Clement-Bayard fitted with the same make of tyres. Cars fitted with Michelin tyres have been wonderfully successful this year in important racing events.

The Ducellier motor lamps exhibited at the international show at St. Louis have been awarded the diploma of "Hors Concours"—the highest award of its class. This will be very gratifying, not only to Mr. G. Ducellier himself, but also to Mr. André Godin, of Red Lion Square, Holborn, who personally erected and superintended the Ducellier exhibit while he was in the United States.

A Flourishing Club.

The Hull and District Automobile Club, although a newly-formed organization, has a membership of over 50 with a prospect of an appreciable increase at the next meeting of the Executive Committee. It has just carried out a non-stop run to York and back for motor-cyclists. Twelve competitors faced the timekeeper at Hull and were started off for York with sealed tool-bags. Four competitors, Messrs. Nicholson, Freeman, Hageseade, and Philipson, were successful in securing awards in the order named. Messrs. Dunn, Donovan, Hancock, Hamlyn, Lowery, Parker, Straker, and Whiteley also took part. After the event the members, together with several ladies, dined at the Imperial Hotel, where a most successful evening was spent, while as a result of the event there were several applications for membership.

The Village Motor-trap.

(WITH APOLOGIES)

Screened by a wayside chestnut tree,
The village "P.C." stands.
The "cop.," a crafty man is he
With a stop-watch in his hands,
And the muscles of his lower jaw
Are set like iron bands!

He goes each morning to his lair
And hides among the trees,
He hears the sound of motors there
And it sets his mind at ease,
For it seems to tell of captures—and
Promotion follows these!

Folks often call his statements lies
And his ruse a "shady" plan.
But he *knows* his watch is accurate!
And he stops whoe'er he can.
And he looks the motist in the face
For he fears not any man.

From morn till night he's timing there
The cars that come and go,
While his stop-watch ticks the seconds off
With measured beat and slow,
Nor thinks of rest till he homeward turns,
When the evening sun is low.

Hiding and clocking, summing,
Onward through life he goes.
Each night he's had his vengeance on
Some of his "scorching" foes.
Somebody summoned, someone "done,"
Has earned a night's repose.

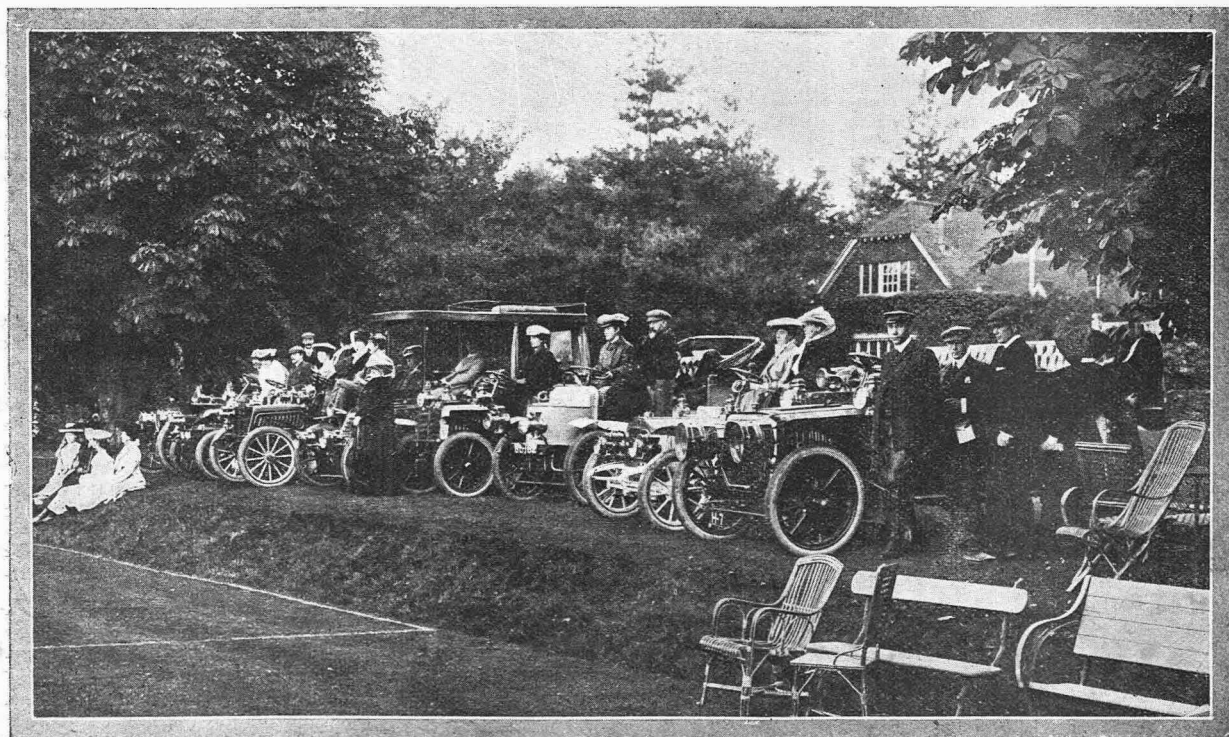
Thanks, thanks to you, ye zealous
"chaps,"
For the lesson you have taught,
For now we read in "thicket," "traps,"
And, warned, we go uncaught.
For where the trees are thickest—there
We know such deeds are wrought.
"PEDAL AND CRANK."

Motor Cycling Club Closing Run.

The closing run of this club took place on Sunday, the 16th inst., and was a great success. The destination was the Bull Hotel, Redbourn, and the main body approached that village, via Edgware, Berkhamsted, and Uxbridge Park—altogether a delightful ride. Forty-one sat down to luncheon at the Bull, J. A. Jackson, the captain, being in the chair, J. Van Hooydonk in the vice-chair, and amongst those present were Messrs. S. H. Fry, F. R. Johns, C. W. Brown, J. Reeves, A. Candler, S. G. Sewell, Leonard Jones Cowles, A. J. Wilson, and a host of others. Short speeches followed the luncheon and photographs were taken. It was voted a most successful and satisfactory day.

The Ladies' Automobile Club.

On October 15th several members of the Ladies' Automobile Club were entertained by Mr. and Mrs. Wilson Noble at Tangley Park, Guildford. Mrs. Noble had had a special road laid out round the house to enable the cars to drive on to the south lawn to be photographed. Among those present were:—Lady Cecil Scott Montagu, the first vice-president of the club; Mrs. Ainslie, with her nephew Mr. Lafone, on a new 24 h.p. Panhard; Mrs. Alfred Bird and Miss Bird on a Georges-Richard; Mr. and Mrs. Buttomer and friends on a 10 h.p. Decauville; Baron and Baroness Campbell von Laurentz (Serpellet); Miss Hill, with her aunt, Miss Pilcher, on a 12 h.p. Ariel; Mr. and Mrs. Copland (16 h.p. Clement); Mrs. Piggott and Lieut. T. E. Russell (8 h.p. De Dion); Miss Christabel Browne and friends (6 h.p. De Dion); Miss Crowthers (9 h.p. Darracq); Miss Edith Schiff, Mr. Schiff, and Miss d'Esterre Hughes (24 h.p. Panhard).



A MEET OF THE LADIES' AUTOMOBILE CLUB AT GUILDFORD.

NEWS.

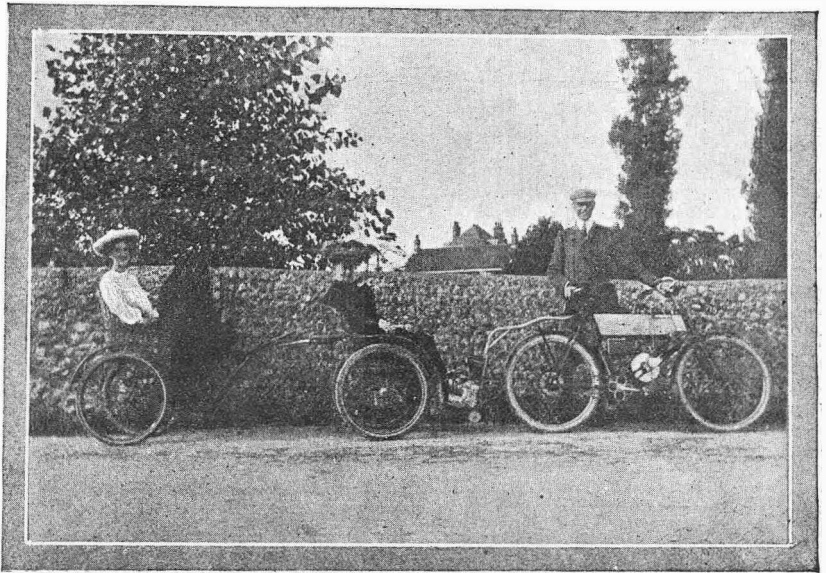
The Hubbards Motor and Engineering Co., Much Park St., Coventry, undertake all kinds of motor repairs. They also manufacture motors from 3 to 24 h.p., which they are prepared to fit to customers' cars.

We have received a number of letters from readers on the subject of motoring schools. As many of them are addressed to us by sufferers, their opinions are somewhat forcible, and sufficiently convincing to prove that our warning was a timely one.

The experiment of putting tar on the roads at various points in the Holland Division of Lincolnshire has answered very well so far; but some of the doubting Thomases on the Council are wondering how the sections will answer in very frosty weather.

Motorcycling for Ladies.

The two ladies depicted in the Raleighette tri-car are enthusiastic motorcyclists, and are quite independent of the aid of "mere man" either in driving or adjusting their machine. "I may say," writes one of the joint owners of this Raleighette, "that we find it perfectly safe and easy to drive; after one lesson I was able to drive 30 miles alone. With ordinary forethought and a proper knowledge of the mechanism (easily acquired) a lady can grapple with any emergencies that are likely to arise, without being obliged to call a man to the rescue. This is an important fact, as I think the fear of not being able to manage the machine alone deters many women from attempting this delightful means of scouring the country. I do not know if we are the pioneers amongst ladies in the use of the tri-car; we certainly are in this part of the country (Watford)."



A long wheel base!

An Efficient Two-horse Motor.

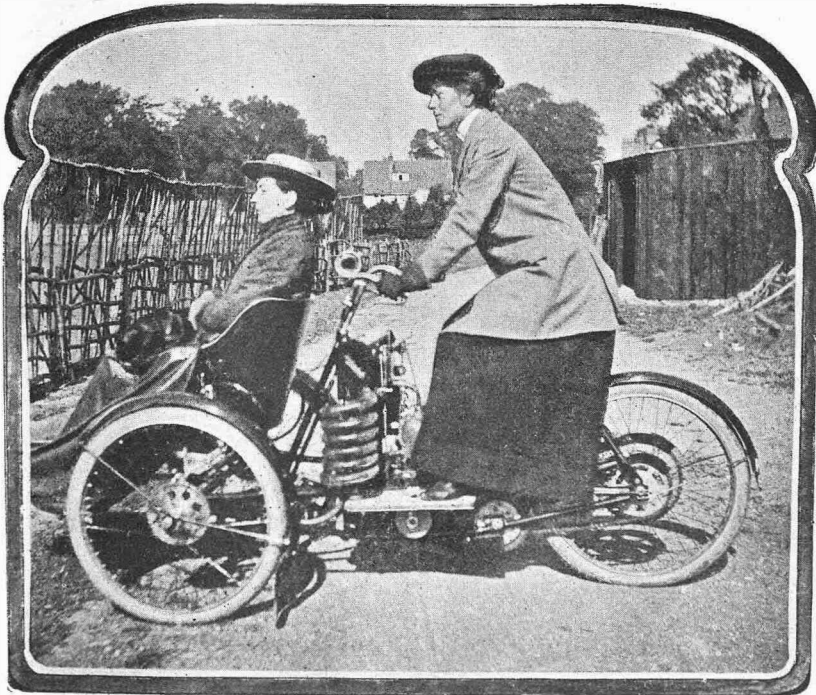
The accompanying illustration shows a 2 h.p. Coventry Humber motor-bicycle, with two trailers attached, which has been driven lately by one of our readers with very satisfactory results. The second trailer is attached to the back of the first by means of the ordinary clip, straps being added as a safeguard and to assist both in supporting and drawing. No trouble at all has been experienced with the connection. The machine is fitted with a surface carburetter, and is capable of carrying its three passengers at about 12 miles an hour on the level without any signs of overheating.

Italy and Next Year's Gordon-Bennett.

In response to an appeal by the chairman of the Automobile Club of Italy, three firms have promised to manufacture special cars for next year's Gordon-Bennett. They are the Fiat (Fabbrica Italiana Automobile, Torino); the Itala (M. Ceirano and Co.); and the Rapid (G. Ceirano and Co.). All three firms are established in Turin.

Importation of Cars into America.

With reference to the importation of automobiles into the United States of America the following official regulations have been announced by the Treasury Department, Washington. (1) Automobiles of foreign manufacture brought to this country for touring purposes, whether by foreigners or residents of the United States, and whether accompanying the owners or not, if to be actually used by them in this country, are entitled to free entry under bond, for a stay of three months. (2) Automobiles used in business pursuits are not exempt from duty, as, under the provisions of paragraph 504 of the Act of July 24th, 1897, the article must be a part of the household economy. (3) Automobiles used abroad as household effects for a period of one year or more, whether consecutively or not, and whether or not the one year of use abroad immediately precedes the importation, are free of duty upon the filing of the usual oath. (4) Free entry of an automobile is accorded only to the actual automobile used by the owner for one year or more, and cannot be allowed in the case of an exchanged machine which has not been used by the owner for that period. (5) Automobiles are free of duty if used abroad for one year or more, although a period of a year or more may have elapsed since such use. (6) Automobiles to be free of duty as household effects must have been used abroad for a period of one year or more by the owner or his family, whether driven by a chauffeur in his employ or not; but the use of an automobile by a chauffeur or friend unconnected with the owner or his family does not meet the requirements of the law.



The Raleighette referred to on this page.

NEWS.

The manufacturers of the German-built N.S.U. motor-bicycle have opened a depot in London at 4 and 6, Hatton Wall. The N.S.U. machines have achieved great popularity on the Continent by reason of the excellent workmanship put into the construction. The firm have issued a very complete booklet giving details of the machine and its management. This is printed in the German language, but a special edition in English will be ready soon, which will be supplied on application to the firm's London address.

Dangerous Tram Lines.

A Brighton correspondent forwards us an account of an accident with a motor-bicycle and side-car which recently occurred to him, with personal injuries and damage to his machine. Our correspondent alleges that the accident was caused by the negligence of a private tramway company in allowing their side rail to project an inch or so above the adjoining roadway. In consequence of this the steering of the machine was interfered with, and in order to avoid collision with a horse and cart he was compelled to steer into a factory door. Our correspondent is, naturally, very indignant with the tramway company, and asks us whether he has any claim for damages against them. Morally, yes; legally, doubtful. Tramway companies are difficult to beat in a law court, unless your case is very convincing; and we are afraid that the fact that the motorcyclist voluntarily steered into the door rather than take his chance in the roadway would tell against him. If our correspondent thinks that he has a good case he should communicate with the secretary of the Motor Union, 18, Down Street, Piccadilly, who make it their business to protect the rights of motorists.

The Budapest International Motor Exhibition, arranged for next March, will probably be held in the Industrial Hall, in the Stadtwaldchen. Dealers and manufacturers have expressed a wish that the exhibition may remain open for ten days, and that intending purchasers may have an opportunity of trying the exhibited cars over a suitable track.

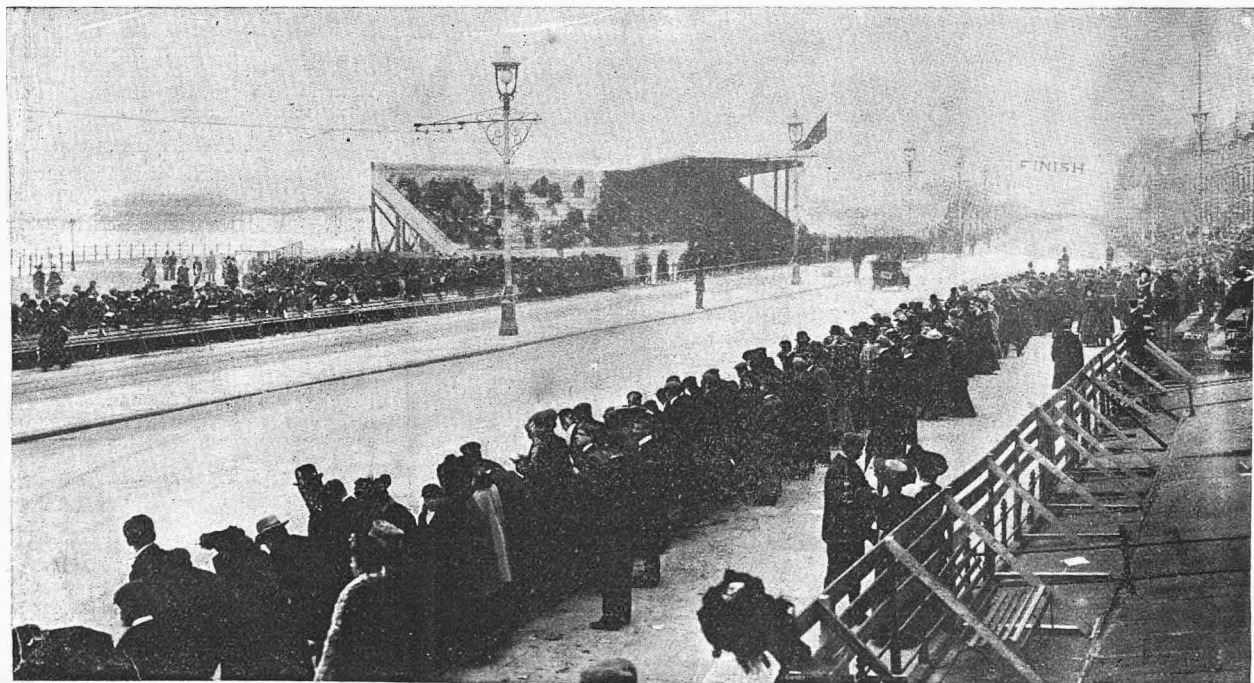


A recent photograph of Eduard Nicodem the well-known Continental racer.

The new motor 'buses which will shortly commence plying on London and suburban streets will be watched with interest, for they are undoubtedly the vehicles of the near future. These 'buses will be shod with solid tyres, pneumatics having been found unsuitable for so heavy a type of vehicle. Mr. J. M. Macullich, the well-known expert on tyres, who is prominently connected with the Sirdar Rubber Co., who manufacture wheels and solid rubber tyres, is of opinion that a "triplet" solid tyre will be found most suitable for the motor 'bus. The Sirdar Co. was the first to convert the single tyre to the twin, and now they are converting the twin to the triplet.

The Kaernten Waggoners: A Statistical Indictment.

Dr. Karl Brecht, of Vienna, has been weighing up the Kaernten waggoner, and found him short weight. All "unknown" to this worthy son of toil, the doctor was abroad industriously noting and also cataloguing his sins of omission and commission for a period of five months. As we glance over the indictment, we cannot help feeling grateful that our motor lines have fallen unto us in England, where the waggoner's stern sense of responsibility, benevolent attitude towards modern modes of locomotion, nice regard for the rights of others, and invariable courtesy—especially in cases of collision—are prominent and pleasing features of our life on the road. Read then, O English waggoners! and, with hand on heart, thank heaven that you are not as other waggoners are, or even as these Kaernteners. To begin with, Dr. Brecht noted 543 cases where the driver hadn't the reins within reach, and 224 of single-rein driving. And how many drivers, think you, left the horses to their own devices? No fewer than 186. In 294 cases the bridle was not properly fixed on, but hung down like a nosebag. Over 200 drivers slumbered—a phenomenon certainly not to be witnessed on an English highway!—and 128 were—drunk! On a round score occasions the doctor found further progress barred, and 12 times he was refreshed with a shower of abuse. As many as 124 carts were left standing without supervision on the road, and 87 in charge of children under 15 years of age. Over a hundred carters rushed their animals down-hill—of course, with the brake off; while 89 didn't trouble to put on the brake when driving down, and 82 carts carried no light at night! To all such transgressions the police are asleep, but wide awake—oh, so wide awake!—to every peccadillo of a motorist.



The Blackpool Meeting: a view of the course and grand stand near the finishing point



Other Peoples' Views

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

The Chapman Pulley.

Sir,—Has any reader tried the Chapman Expanding pulley on a motorcycle engine? I should like to know whether it is efficient, and if it would suit a 2 h.p. V belt drive machine.—Yours faithfully,

A. LIVERMORE.

Belt Transmission for Tri-car.

Sir,—If a flat belt will suit "Fortex," we should advise him to try "Hendry's Patent." In our new B.R.C. transmission, we formerly conducted experiments with all sorts until we got one of these. The experimental car on which it has been used for some time has been tested under all sorts of weather conditions, but we have never touched this belt. We use it regularly on public service work, and, except for the easy speed changing, starting, and flexibility, one might judge the vehicle to be gear driven. We ought to mention we have automatic tension, so cannot tell exactly if the belt has stretched or not. As regards width we use a 4 in. No. 2, and even when overloaded with 12 passengers on hills, slipping never troubles us. The type of his pulleys, however, must of course enter into his calculations.—Yours faithfully,

C. DENT AND SON.

Tamworth.

Roadside Repairs.

Sir,—May I suggest to your readers the value of having a few odd pieces of metal handy? I was riding along the Epsom Road on a recent occasion when I saw a car broken down. I enquired of the occupants the cause of the stoppage, which turned out to be that they were having a new sprocket wheel made, and in the meantime they had a gunmetal one fitted on temporarily. This had evidently been fitted very badly, for the key had worked out and was lost. There was no place in the vicinity where they could get one made, so I searched through all my tools and found a piece of metal half an inch in diameter by a quarter of an inch thick. I only had a 4 in. warding file to work with, but after about 1½ hours' filing I made them a key. During the process I broke the file in three pieces, and at the finish I was working with a piece 1½ in. long. I managed to make a good, sound job of it, and I pity the man who has to take the sprocket off. I strongly recommend all motorists to carry, when convenient, a small vice, a good 6 in. flat file, a good pair of pliers, two or three odd pieces of metal, and some binding wire. If the occupants of the car I have referred to had had these appliances, they could doubtless have got over the trouble in a very short time.—Yours faithfully,

JOHN WALKER.

Merits of Puncture-proof Bands.

Sir,—A puncture in the back tyre of a 4 h.p. tri-car on a dark, rainy night, miles from shelter, is no joke, and an assured immunity from such would enhance the pleasures of motoring a hundred-fold. May I therefore ask you to invite and publish the opinions of your readers as to the merits and demerits of the various steel-studded puncture-proof bands that are now advertised?—Yours faithfully,

MERE TYRO.

Cause of the Tyre Coming off Rim.

Sir,—Regarding tyres blowing off rim, as mentioned by "B.R.B." recently, I have had a case this week of a motorcycle doing exactly the same thing on several occasions, and upon examination found the back wheel was not set in line with the front, thus causing, when driving, a side pull at tyre. This, in my opinion, often causes the trouble mentioned by "B.R.B." It is rather difficult to right the two wheels on a motorcycle, and on that account I believe there are a good many which are running out of truth.—Yours faithfully,

W. MITCHELL.

The Side Car.

Sir,—I have decided to buy a side-car, but am somewhat puzzled as to which of two forms it shall be—the duplex-steering type or the fixed rigid; as the Liberty, for instance. The former seems to suggest that the wear on the side-car tyre would be less than with the rigid wheel; but I understand it is difficult when turning. Perhaps Mr. F. A. Johns, whose letter in a recent issue I have read with interest, would be good enough to give us the benefit of his experience and views as to the better type, and whether the difference is more apparent than real.—Yours faithfully,

J.J.P.

Trembler v. Plain Coil.

Sir,—With reference to the letter signed "Maurice Beck," re oil engine, in a recent issue, I find that a trembler coil is best for oil engine work. The speed of the 2-to-1 shaft is too low to work a non-trembler coil properly. I have had no experience with the "Trusty" carburetter. The engine I have has a jacket round the exhaust pipe, into which paraffin is dropped by a needle valve. Petrol is used for starting, with an old "Roubeau" carburetter. This engine has cylinder 2½ in. by 5, speed 400 revs., and runs an installation of 15 lamps, a charging dynamo for ignition cells, circular saw, grindstone, etc. A 3 in. by 6 in. engine should develop ½ to 1 h.p. at about 350 revs. Valves should be at least 1 in. diameter; a mechanical inlet valve is an unnecessary complication; the automatic valve is perfectly satisfactory. I find the glass centre sparking plugs very useful, and they do not soot.—Yours faithfully,

R. B. VERNEY.

Good Work with a Small Engine.

Sir,—In reply to your footnote to my letter in a recent issue, and also to Mr. W. F. Taylor, I now have pleasure in giving particulars of the 2½ h.p. fore-car mentioned by me. The engine pulley was 3½ in., belt rim 21 in., back wheel 28 in. I cannot tell you the gradients, but will give you some idea of the roads. My weight is just under 10 st. I have taken a 12-st. passenger from Folkestone, through Cheriton, up Beechborough Hill, through the Elham Valley and Bridge to Canterbury without a dismount or a stop; and have then returned via the Stone Street Road to Folkestone without a stop. On several occasions I have taken a lady passenger (about 9st.) up the Sandgate Hill to Folkestone, and several times I have ridden the Dover Hill without a passenger. Many times, too, I have conveyed a passenger from Dover to Folkestone without a stop, and could make an easy run with a passenger from Folkestone to Ashford. Many of your readers will recognise these routes and will understand the hills better than if I were to give gradients, as these are often very misleading. The engine was the ordinary 2½ h.p. Kerry taken from stock, and the machine was built here. There is at the present time another 2½ h.p. tri-car (Kerry engine) in the town, and the owner does pretty nearly the same work with it. Mr. Taylor is correct in stating that the Kerry engine must be a marvel of engineering skill. I have beaten many higher-powered bicycles with my 2½ h.p. tri-car, and would not think of anything above 3½ h.p. for a tri-car for my own use.—Yours faithfully,

FRED B. BURLEY.

THREE SPECIALS!

Our Stanley Show Numbers will eclipse anything we have accomplished in this direction. Each will contain a number of special articles and illustrations, and the first two will forecast the novelties to be shown; while the third will be devoted to a complete illustrated report of the entire motor exhibits.

Note the Dates!
Nov 8th.
" 15th.
" 22nd.

A complete list of contents will be published next week.

O.P.U.

The Gudgeon Screw.

Sir,—In reply to G. Varney re gudgeon pin set screws, why not follow the idea as described by R. K. Hubbard in "O.P.U." September 6th. After two seasons' hard wear with M.M.C. 2½ h.p. engine I had experienced no trouble whatever with set screws until a fortnight ago, when one of them suddenly pulled out, stopping the engine dead. I was nearly 30 miles from home at the time, but a friend and I, after three hours' hard work, effected a repair which landed me home. I am now fitting up with "R.K.H.'s" idea, which I think is excellent.—Yours faithfully, Wios.

Sir,—I have read with interest the various letters in your interesting paper on the subject of the gudgeon pin-set screw working loose and coming out. I have experienced this trouble on two occasions. On the first occasion the results were not very serious; but on the second occasion the screw came out as I was going down a rather steep hill just outside Prescott. I removed the cylinder and found that the piston coming down on the screw, which was lying on the top of the crank-case, had taken a piece out of it. I removed the screw and went the remainder of the run without it. Since then I have run about 200 miles with no trouble resulting, and have been wondering why I did not take the pin out before; for, as far as I can see, the gudgeon pin cannot come out, owing to the cylinder walls practically touching the ends. Two or three of my friends have experienced the same trouble, and after taking their screws out, have had no trouble whatever. One of them had his engine to pieces the other day, and on examination the pin did not exhibit any undue signs of wear. For my own part, nothing would induce me to put another screw in, as I maintain that there is no necessity to do so.—Yours faithfully, B905.

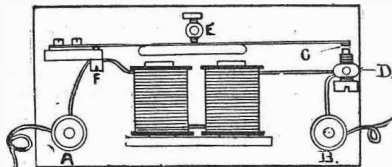
Handlebar Control.

Sir,—I have noticed that considerable argument has been carried on in your estimable paper concerning the advantages and disadvantages of handlebar control. My opinions on the subject clash particularly with those set forth by your correspondent, Mr. George Roberts. This gentleman would have no less than seven items controlled from the handlebar by means of Bowden wires for the most part. Now, a rider who is suddenly desirous of stopping his machine as quickly as possible in nine cases out of ten will act entirely on his first impulse. Not infrequently he can think of nothing but jamming on the brakes. Often it is on first impulses that a man's life depends. Where, then, is the unhappy amateur who rides your correspondent's ideal machine? His brain whirls, he sees a knob here, a button there, a lever somewhere else, and while he is consulting his pocket dictionary of motoring on the subject he is transferred to a fairer world. On my own bicycle I have a switch handle and a lever on the top of the frame, which retards the ignition and opens the exhaust. Now, I am not, to the best of my knowledge, a freak, but in every emergency I have hitherto jammed down the exhaust lift, this being

my first impulse. It is, I admit, a simpler motion to turn the handle, but it does not occur to me. Had I always ridden Mr. Roberts' ideal, I should not, I am afraid, be here to tell the tale.—Yours faithfully, J. KENNEDY.

In the Event of Brakes Failing on a Car.

Sir,—As no one—that I am aware of—has replied to "Caterham's" enquiry as to the best thing to be done should a car become unmanageable, I should like to reply: First, in coming to a standstill in going uphill, brakes and sprags failing to prevent its backward progress, I should recommend that, before the car acquires any considerable impetus, the driver puts in the low gear and then turns the car half round, placing it exactly across the road, and so destroying the tendency to descend. As to query No. 2: How to stop when brakes fail in descending a steep hillside forward; the method I should adopt is to take a side to side course, at first just sufficient to retard the extreme momentum, afterwards making the turns much more frequently until before reaching the bottom the driver would have retarded sufficiently to stop dead.—Yours faithfully, STOPWELL.



Illustrating letter from G. Roberts.

Trembler v. Non-trembler Coils.

Sir,—Having been away from home I am rather late in reading my copy of "THE MOTOR," and so have only just noticed the letter by Messrs. Fulier, Macleod and Co. Of course, experts will place the true value upon the tests "carried out by Mr. John Hewett, B.A., M.I.E.E.," but, unfortunately, the bulk of your readers are not experts, and are only too likely to give undue importance to such a test, especially when backed by such high authority. To comfort those who are the possessors of trembler coils, I would make the following remarks: It will be remembered that the outcome of Messrs. Noller's experiment was to show that the trembler coil took nearly three times as much current as the non-trembler, and therefore ran the battery down in a third of the time. But is this a fair test? They take a trembler coil having a resistance of, say, half an ohm, and compare it with a non-trembler of one and a half ohms! It scarcely requires a member of the Institute of Electrical Engineers to tell what the result would be in the above conditions. No, the fair test would be to take two coils of the same resistance, trembler and non-trembler, of course. But here, again, a test is superfluous, for if the contacts were properly set it would be found that the trembler coil, far from taking three times the current of the other, would take almost exactly half! And this is quite simple, and is due to the fact that all the time the contact is made the trembler blade is half on and half off its contact, while in the other the current flows steadily all the time.—Yours faithfully, ALEX. HILL.

An Address.

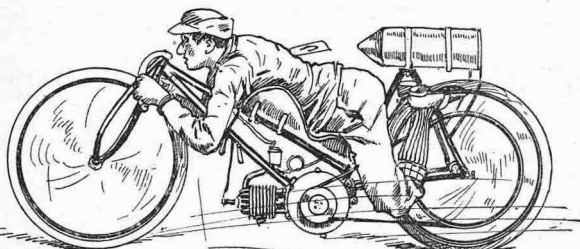
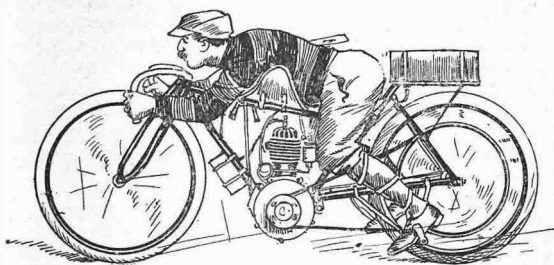
Sir,—In reply to "P.B.J." (Dresden, Germany) requiring the address of Cintrat, Paris, I may inform him that this is H. Cintrat, 25, Rue Ruhmkorff, Paris.—Yours faithfully, C. A. MOSS.

The Rulux Gear.

Sir,—Would any reader who has had experience with the Rulux two-speed gear on a tri-car help me with a little advice? I have such a gear, and experience trouble with it. The leather wears down and slips, and if I press the cone well home, as the makers advise, it acts as a brake and stops the engine. I have had to wedge the cone up tight by means of hard wood wedges, and, of course, it is impossible to disengage the gear. Could I use anything in place of the leather?—Yours faithfully, W. J. WILSON.

A Simple Electric Governor for Internal Combustion Engines.

Sir,—Some of the smaller cars are without any governing apparatus for the engine, and consequently directly they have been started the driver must rush to the throttle lever to control the speed, otherwise the engine rushes off at a terrific rate, shaking the car almost to pieces. If the engine is throttled too much, it stops, and the driver cannot leave the car for even a few moments without the chance of its gathering speed and again racing, or vice versa. Also when coasting down hill with the clutch out, the same difficulty occurs. To have an ordinary governor fitted means considerable expense, and also a good deal of pulling the engine to pieces, besides which it is a somewhat complicated mechanism. The governor which I have devised costs only a few shillings, and can be attached to a car in about 10 minutes, and does not require any alteration of the machinery. The drawing shows the governor complete, and all that is necessary is to cut the wire which goes from the switch on the car to the frame, and attach the two ends to the terminals (A and B). The primary current has then to pass through the governor from A to B before going to the frame. Now, if another wire is carried from the terminal (A) to the steering wheel, and there put to the frame by means of a small switch, the current passes to the frame without going through the governor, so that to put the latter in or out of action it is only necessary to move the switch on the steering wheel with the finger. The mode of action is as follows:—The primary current having to pass round the coils of the electro magneto is so reduced by the resistance of the wire on the coils that no proper spark takes place in the cylinder, but owing to the magnetism produced the armature is attracted and contact is made at C. The current now is able to pass from A to B by means of the armature spring, so that the resistance of the coils is cut out, and a spark occurs as usual in the cylinder. All this takes place during the time that contact is being made by the contact maker on the engine; directly this is broken the armature springs back for the magneto. Two set screws (D and E) regulate the length of stroke of the armature, and a third screw (F) alters the tension of the armature spring. By regulating these screws the engine can be made to go at any required speed.—Yours faithfully, GEORGE ROBERTS.



Our artist was so much struck with the various positions adopted by the motorcycle pacers at the World's Championships that he has invented a few more on his own account.

1.—A position suitable for handicap racing, and showing the stuffed support for the chest.

2.—This would do for a ten miles' scratch race on a fast track.

The Bowden Band Brake.

Sir,—In a recent issue of "THE MOTOR" you inform "B. B." (Exeter) that it would be difficult to have a band brake fitted to the back wheel of his bicycle. We may say that we have recently supplied several band brakes for this very purpose, and they are in every case giving the greatest satisfaction. The drums may be had to fasten on to the spokes of the back wheel, or screwed on to the hub to take the place of the free-wheel. We make them in two sizes, namely 7-in. and 8-in. drums, or they can be supplied in pairs for tri-cars.—Yours faithfully,

E. M. BOWDEN'S PATENTS SYNDICATE.

Fan-cooling for Small Engines.

Sir,—I am at a loss to understand the necessity for fan-cooling under the circumstances referred to by W. J. Colebrook. If a $2\frac{1}{2}$ h.p. engine will not take a trailer with eight-stone passenger up "moderate gradients" without overheating there must be something radically wrong with it. Engines of this power can be built to keep cool without the addition of fan contrivances, and I think it a pity to encumber a motor-bicycle with such fittings if it can be avoided. I have this season, and last, been riding a machine of the same power as your correspondent's, geared to $5\frac{1}{2}$ to 1, with 28-in. driving wheel, and it has taken me with trailer and eight-stone passenger many hundreds of miles over all sorts of roads and without the slightest suspicion of overheating even on long and trying hills. In fact, I have never had a moment's trouble with the engine, which is a $2\frac{1}{2}$ h.p. J.A.P. I notice another correspondent is in trouble with his coil. I had a precisely similar experience, and although I found I could run on one cell I preferred to replace the coil by a Fuller, which has run me faultlessly for about 1,000 miles.—Yours faithfully,

MIDLAND MOTORIST.

Errors in Police Timing.

Sir,—From Press reports it appears that 220 yards is a favourite distance over which to time motor vehicles. By taking such a short length as this the smallest inaccuracy makes a perceptible difference in the result when worked out to give the speed in miles per hour, as the following figures will show:—

220 yds. in 22½ secs. = 19.911 miles per hr.
220 yds. in 22½ secs. = 20.089 miles per hr.

This shows the difference due to an error of only $\frac{1}{2}$ sec. in the timing. Given that the stop-watch itself is absolutely accurate, yet it is worked by human agency, and it is by no means impossible to make an error of $\frac{1}{2}$ sec. between starting and stopping the watch. In the next place, there is the liability to error owing to the signals for starting and stopping the watch not being given exactly as the vehicle crosses the lines at the entrance and exit of the measured distance. In the following calculation I have assumed that, owing to inaccurate signalling, the vehicle is only timed over 215 yards, instead of over 220 yards. At 20 miles per hour 215 yards are covered in 21.988 secs. The figures are, of course, worked out as if the vehicle had covered 220 yards in the recorded time, showing the following result:—220 yards covered in 21.988 secs. equals 20.465 miles per hour. At a speed of 20 miles per hour it only takes some half second to travel 5 yards, and half a second is a very short time to allow for any error in observation and signalling. Finally, the errors in timing and in observation will probably be combined, thus increasing the resulting discrepancy. I have purposely taken very small margins, and it is surely possible, if not probable, that they will be often exceeded in actual practice. Half a mile is the very least distance over which the police should time a vehicle.—Yours faithfully, Wm. HOOTON.

The Rating of Engine Power.

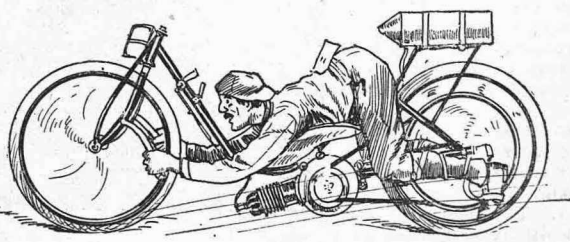
Sir,—In your issue of August 16th, 1904, you gave a list of entries for the Auto-Cycle Club's reliability trials, giving the power size of cylinder and revolutions per minute. It is presumable that the revolutions per minute given refer to the speed at which the engine runs when developing the power stated, and it would appear from the list that cylinder capacity and revolutions per minute are quite independent of the power developed. Compare Nos. 3 and 4:—

Description.	Bore.	Stroke.	Revs. p.m.
No. 3....2½ h.p. Vindec ...	70 mm.	80 mm.	2900
„ 4....2½ h.p. Noble ...	76 mm.	78 mm.	800

The cylinder capacities are the same within 10 per cent. and the power is supposed to be the same, but one is run nearly three times as fast as the other. As power developed is a function of pressure, cylinder capacity, and revolutions, it follows that the average pressure (that is, the average pressure during compression deducted from that during firing stroke) in the cylinder of the Noble engine must be about $2\frac{1}{2}$ times as great as that in the Vindec. Then, again, take Nos. 21 and 38. Both are rated at $3\frac{1}{2}$ h.p., both are Minerva engines, both are 82 by 82, and yet one is run at 1,800 and the other at 1,000 revolutions per minute. Also Nos. 30 and 36. Both are De Dion engines, 74 by 76, running at 1,800 revolutions, but one is rated at $3\frac{1}{2}$ and the other at $2\frac{1}{2}$ h.p. Of course the revolutions given are probably mere guesses, but surely it is time the question of power of motor-engines was put on a more scientific basis, and I think that you would be doing both the public and the industry a great service by advocating the establishment of a scientific method of rating.—Yours faithfully,

HERBERT G. DEMPSTER.

Natal, South Africa.



3.—A comfortable arm-chair position for a hundred miles' race.

4.—For time trials and record smashing—fitted with combination chest and saddle comforts.

O.P.U.

The Light Machine.

Sir,—Referring to your correspondent, Mr. Bind's, letter in your issue of October 4th, on light-weight motorcycles, I should like to point out that his arguments seem to be somewhat illogical. He has ridden a $2\frac{1}{2}$ h.p. Griffon machine, and complains that it is too heavy, weighing, all on, 150 lb. I also ride a $2\frac{1}{2}$ h.p. Griffon, and I can safely say that no other bicycle I have been on seems to be so light in proportion to its engine power. With my gear 5 to 1 I can go so fast, not only on the level but on moderate inclines, that the engine positively rattles, so that I fear it will shake to pieces. It has never yet stuck at any hill I put it at. I may mention that my specimen weighs, with tools and everything, just 123 lb. Mr. Bind is an advocate of light machines. Is it then, because his $2\frac{1}{2}$ h.p. Griffon is not fast enough that he would have a 5 h.p. double-cylinder engine weighing 10 lb. more? Certainly such machines have been built, but only for racing. A few of these on our roads would make it unsafe to walk on them. No one is a more ardent advocate of the light machine than I am; but let us try to do away also with excessive engine powers.—Yours faithfully, SD44.

Accumulator Tests, Sulphating, etc.

Sir,—Will you allow me to thank your able contributor "Magneto" for his note on my letter in your issue of the 27th ult? I am now carrying out a series of experiments with the cells on an intermittent discharge, having a small water-cooled engine for the purpose running at a uniform rate. I am adding a P. and R. 7Q cell to my list. If you would care to have the result I should be happy to forward same. Mr. S. J. Watson cannot have read my letter in your issue of October 11th very carefully. I stated that the lamps took the amp.—i.e., after an actual test, having rejected "8" as not quite accurate. I also used the word "lamps" as, of course, one lamp would be useless. The cells were discharged and acid added to give them all a fair chance, as some were charged by the makers before being sent out. I can assure him that the acid was properly added. It is an elementary fact that acid should be added to the liquid in the cells when they drop below the correct spec grav. The "Pfluger" cell is a semi-solid; it can, as a matter of fact, be poured out. The reduction in the discharge between a solidified cell and liquid cell on a continued discharge varies between 10 per cent. and 20 per cent.

I have found 12½ per cent. about the average. In my experiments I took nothing for granted—lamps, voltmeter, ammeter, wires, etc., were all tested by myself beforehand, and then tested again independently by the engineer to one of the largest electric installations in the world. As regards "sulphating" I am aware of the methods advocated; but they are, when dealing with a small, delicate cell that cannot be got at, practically useless. I have never yet cured a cell of bad sulphating by these means. Will you permit me to ask your readers to send no more cells, as the idea has now been disposed of to a big firm? I am returning the remainder of the cells sent to me as rapidly as possible.—Yours faithfully, DUBLINITE.

Hill-climbing Feats on Motor-bicycles.

Sir,—I have only just seen the letter of "One in Five" in your "O.P.V." of Sept. 13th, in which he asks how it is possible that my Excelsior motor-bicycle could climb a hill of 1 in 4½. The hill I wrote to you about is the Gas House Hill, Norwich, and I gave the gradient as 1 in 4½, not 1 in 4¼. This gradient is given me on very good authority, and I see no reason to doubt it. The Excelsior is a standard $2\frac{1}{2}$ h.p. machine, Lincoln belt, gear on the occasion that I climbed the Gas House Hill about 6 to 1, the machine weighs 155 lb., and my own weight is 13 stone. This hill has been climbed by Mr. Egerton several times on a Werner, and by Mr. Densham on an Anglian, besides by many others, and is, as a performance, nothing to be compared, in my opinion, to Mr. Chase riding Westerham Hill at 31 miles per hour on his $2\frac{1}{2}$ h.p. machine. If "One in Five" were not in Natal I would suggest that he

took the trouble to go to Norwich and measure the Gas House Hill before he comes to the conclusion that the gradient is nothing like what I said it is, and that if he believes the Chase $2\frac{1}{2}$ h.p. went up a hill of 1 in 8 at 31 miles per hour he will have the courtesy to believe a poor amateur who climbs a hill of 1 in 4½ slowly, *pedalling hard*. I am sorry that you, sir, think it most probable that I estimated the gradient wrongly, and when I am next in Norwich I will try and obtain a contour of the hill from the Borough Surveyor.—Yours faithfully,

H. SPILMER MARRIOTT.

The Simpkins Pitch Band and Chain Drive.

Sir,—After seeing your illustrated description of the Simpkins pitch band and chain drive in a recent number of "THE MOTOR," I should like to let you know how I have found the device work after some 5,000 miles.

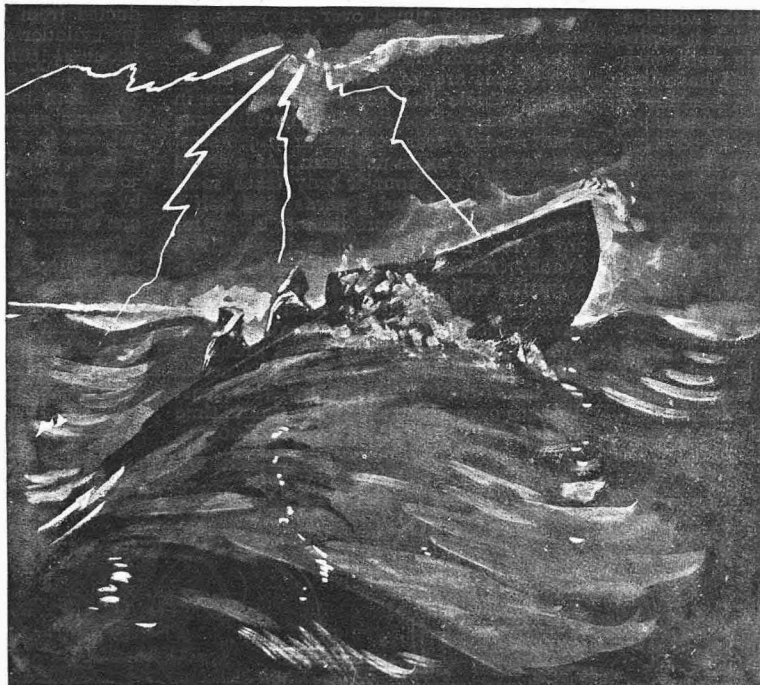
I was the first person to try the drive on a single machine—a 3 h.p. Fasnair engine on a Chater-Lea frame—and have certainly found it answer very well.

I have had four seasons' experience of motorcycling and I daresay have travelled well over 20,000 miles altogether. I have tried round, flat, and V belts, and experienced various transmission troubles, but the Simpkins drive has done away with all those, and now, beyond a slight wearing of the gun-metal engine sprocket wheel, the band and chain look good enough for 5,000 more miles.

The only attention I find the chain requires—and I have about 9 ft. 6 in. of it too—is an occasional soaking in melted Russian tallow and powdered blacklead, this ensuring a nice sweet drive for hundreds of miles. My experience is that wet has absolutely no effect at all.

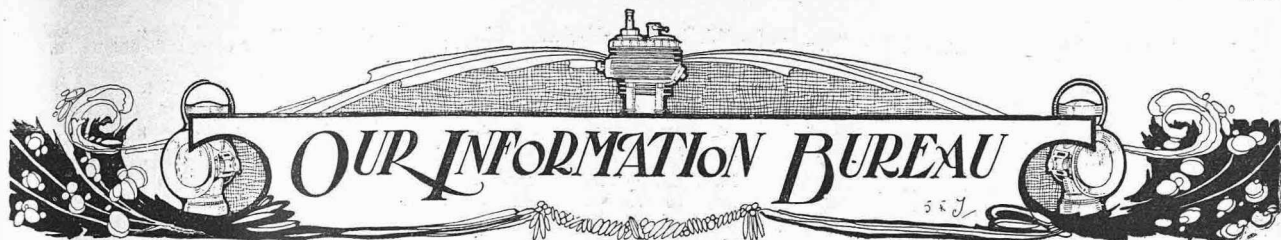
The great charm of the drive, in my opinion, is the way in which it enables the engine to keep up its revolutions, and consequently power up hills—the band slipping on the driving wheel pulley and the chain to a certain extent overrunning the back wheel. The only effect of this slip has been to take off the enamel on inside of pulley and to polish the surface nice and smooth. Altogether, I suppose transmission has cost me 1s. for tallow etc., and perhaps an hour or so in taking off and replacing chain, and this for over 5,000 miles is not bad. I find an extra mudguard running close to the driving wheel pulley and completely covering it up at the back and on top to be a great advantage. The chain thereby being kept free from all mud, etc., thrown up by the back wheel.

I have absolutely no interest in the invention, but am convinced that it is a good thing, —Yours faithfully,

**SEA DOGS!**

"Say, Jock, I pity all poor lubbers on land in a storm like this!"
"Aye, aye, with all the chimney pots and tiles a-flying about their heads."

(And the motor boat rolled perilously as they spoke.)



SPECIAL NOTICE.

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

1. Plain writing. Type writing for preference.
2. All letters to be written on one side of the paper only.
3. Questions to be clear, terse and to the point, without tedious preamble or needless flattery.
4. Should an immediate reply be required, an envelope must be enclosed bearing a penny stamp, and the name and full address of the sender. NOT a stamped undirected envelope.

F.R.E.—We are afraid you would not get sufficient remuneration to make it worth your while. Considerable experience is necessary to get a post in a works.

C.F. (Crewe).—Better get a copy of our latest "Manual." You would find "The Automobile," published by Cassell and Co., La Belle Sauvage, London, an excellent all-round treatise. It costs a guinea.

W.C. (Canning Town).—(1) Yes; a Bowden clutch should be all right. It is a good size and does not require undue pressure to get it to drive. (2) A 12-tooth sprocket on the engine shaft will give you the gear you want.

The Driving Belt.

L.P.B. (London, N.) writes:—(1) I am told by some motorcycling friends that it injures a driving belt to keep it on the pulley when the machine is not being used. Is this so, and what is the explanation? (2) Whilst riding recently I have been somewhat alarmed to observe a distinct puff of smoke come from the extra air inlet of my Longuemare carburetter. I cannot detect anything wrong whatever with the inlet valve. Is there any risk of an explosion, and how can I remedy the defect?—(1) It cannot be said that it affects a belt to a very serious extent to keep it under tension, but it is decidedly an advantage to remove it when possible, so that its elasticity may be restored. The belt will contract a little and always be in a condition to fit the pulleys fairly tight when required. (2) It would seem that you got a premature ignition of the gas whilst the valve was open. This would obviously cause a blow-back into the carburetter. Overheating of the combustion chamber or imperfect clearance of the exhaust is the cause. You might see that the exhaust valve lifts its full amount, and clean out the inside of combustion chamber from burnt oil.

N. A. Adlard (Ipswich).—We should advise you to experiment with one or two smaller sizes of choke tubes; you seem to get too much air from beneath the carburetter at present. You might improve matters by very slightly weighting the float to bring the petrol to a higher level in the jet.

Valve Timing.

A.R. (Banbury).—The most probable trouble with your machine is that the timing of the valves is wrong. It would have been better to have the machine tried before purchase. Being a secondhand one it is not unlikely that it has been taken to pieces at some time and not put together properly. The fire and smoke you refer to as coming through the carburetter can be nothing else but the result of a fire-back through the inlet valve. Unless you feel confident that you could overhaul the machine yourself, it would be better to look up a good practical repairer to do it.

Defect in the Sparking Plug.

F.F. (Sleaford) writes:—I have just got a new 2½ h.p. Minerva motor fitted in inclined position. On the first journey out, before I had got 12 miles, the brass dome end of the mica sparking plug came off in the cylinder. The next day the same thing occurred in the same distance, and this time the end of the plug got wedged between the inlet valve top and cylinder head, and bent the valve stem, and, as a result, I had to pedal four miles into Lincoln to get it straightened. I might say that the second plug had been in an old pattern Minerva 1½ h.p. engine for about three months, and had worked very well. —The most probable reason, it appears to us, for the cap coming off is simply that the small charge of compressed gas in the dome has blown it off when ignited. The continual heating and hammering the end of the plug gets when in use also tends to loosen it. There have been so many instances of this type of plug breaking in the cylinder that it cannot be considered as safe as the simpler pattern, and we should prefer one of the latter type, even at the risk of its being more liable to be fouled by the oil. It cannot damage the engine, at any rate.

J.M. (Govan).—You would be well advised not to attach a fore-car attachment to your machine. Since it is giving so much satisfaction as it is, it would be a pity to interfere with it. It would be necessary to reduce the gear to 1 to 6 and have a fan fitted if you attached a fore-car, and even then you would not get up every hill. The trailer would be all right.

J.B.B. (Bishop's Teignton).—It is quite a fallacy to suppose that no dry cell will give more than 8 or 10 amperes when short circuited: it entirely depends on their size, internal resistance, and general condition. We have tested dry cells in fairly new condition which showed 15 amperes when connected up to a low resistance ammeter.

Piston Rings.

J.P. (Teddington) writes:—I have an Ariel 2½ h.p. tricycle, to which I have recently fitted a new piston and set of rings. My trouble since the alteration is that the machine is very difficult to start, requiring a long run before firing regularly. Valves and carburation are all right apparently. The machine has not its old power on hills. Can it be that the new rings are a shade too small and so let part of the charge get by?—You would be able to judge by the degree of compression whether the rings were not tight. If they are slack it would account for the loss of power. On the other hand, new rings may be the right size, but do not fit pressure tight till they have been run a hundred miles or so. Are you sure that the position of the timing gear has not been altered when taking the engine apart?

Wear after 10,000 miles!

F.A. (Sunderland) writes that he has a 12-16 h.p. Gladiator car, Clement engine, which has run about 10,000 miles without much trouble. There is now a loss of power, crank case gets very hot, and having removed the pins from piston he finds they are a very slack fit. He wants to know if wear should have taken place after this distance, or should the engine have run longer without attention.—New piston rings seem to be the remedy required for all of the cylinders. Wear could hardly have taken place between gudgeon pins and piston walls, and the term "pins" we therefore take to mean the small ends of the connecting rods. The distance mentioned is a huge one without thorough overhauling, and we can congratulate "F.A." upon the possession of an engine and car which must be a credit indeed to its manufacturers. If he is certain of the mileage, it is a confirmation of the splendid work Messrs. Clement put into their engines. Now that "F.A." has gone so far with the dismantling, we would recommend him to take the engine right down, and if all the bearings want re-bushing, why, the job then will be comparatively cheap for the miles covered.

THE BEST OF ALL!

"The Motor Strip Maps."

A most interesting series of strip maps of handy size for motorists are now ready. The following are obtainable at once:—London to Bath and Bristol; London to Birmingham, Liverpool and Manchester; London to York, Leeds and Harrogate; London to Exeter and Teignmouth; London to Southampton, New Forest and Bournemouth; London to Brighton and Portsmouth.

Post Free 1s. 1d.

BUREAU.

H. Rasenear (Bristol).—Try Bransom and Kent or Gamage's for the sparking plug cement you refer to.

J. F. Taylor (Nunhead).—(1) Palmers. (2) Regarding two-speed gear, we should advise you to wait developments. (3) Yes, you would have sufficient power if you had two gears; say, 1 to 8 for the low gear; and for the high gear 1 to 4½ would be best.

J.T. (Workington).—(1) It would be worth your while to take the combustion head off your engine and give it a very thorough cleaning to get rid of charred oil. Also remove any from piston head and cylinder walls. This might be the cause of the firing back and knocking you experience. We should advise you to make certain there are no bad contacts anywhere, especially at the make and break. (2) The leather tread you refer to is effective, but it undoubtedly slows the machine and reduces its hill-climbing powers.

Benz Car in Trouble.

W.H.T. (Newton Abbott) writes:—I have purchased a secondhand 3½ h.p. Benz car, which seems to lack power although valves and piston are good. (1) Why is a Benz motor with cylinder 4 5-16 by 4 5-16 only 3½ h.p., while another motor, such as a Wolseley, with a cylinder 4½ by 5, is 6 h.p.? (2) Can the power be materially increased by decreasing the compression space? (3) How should the milled screw on trembler coil be adjusted? My coil never works until started by some vibration, such as rattling the brake handle after contact is made at the wipe. (4) The third automatic valve, the only one on cylinder cover, seems to let additional air into cylinder. Should the spring be tightened so that this valve acts only as a sort of governor when engine races?—(1) The smaller power given by a Benz engine is due to the slow speed at which it runs as compared with a similar cylinder capacity of a modern internal combustion engine, the latter being run at possibly double the number of revolutions per minute. (2) We have known of such devices as the addition of an aluminium plate bolted on to the top of piston to decrease the compression space in Benz engines, but very careful fitting is required, and unless you possess the tools to carry out the work the results are not commensurate with the expense. Mechanical inlet valves have been tried in place of the automatic, but as each user expresses a different opinion we do not think this would mean increase of power. (3) Turn the engine over in the usual way by the fly-wheel until the wipe completes the circuit through the blade and switch on the current; the coil ought then to buzz. Try various adjustments, in and out, of the coil trembler screw; if it is still necessary to start the coil by outside vibration, the cause may be found in the trembler having become weakened by continued use and sticking to the bundle of iron core wires. Remedy, stick a piece of very thin paper to top of core or to under side of blade where it touches the core. (4) We hardly follow your description of a "third automatic valve"; this may be some addition made by the previous owner.

D.G.H.—We cannot promise that the alteration to the carburetter you suggest will make your car run quieter. The noise is most probably due to worn transmission gear. The extra air valve should reduce your petrol consumption: fix it as close to the carburetter as possible.

E.N.S. (Caterham).—The falling off in power of your De Dion engine is most likely due to the circulation not being as good as it formerly was. If the compression valves and everything else is in good order, it is difficult to see what else it can be. You mention that the engine misses fire occasionally when running fast: in nine cases out of ten you would find that it was the spark at fault, the contact breaker probably being adjusted too lightly for fast running. If you fancy slightly enlarging the carburetter jet it will do no harm, as you can easily solder it up again if you find no improvement.

Falling Off in Power.

"Petrol" (Blackburn) writes:—I have a two-seated, two-speed Gladiator car, 4½ h.p. Aster engine, Longemare carburetter, which up to very recently has done remarkably well, climbing hills which have "stuck up" cars of greater h.p. Now, however, trouble has come which two expert repairers have failed to overcome. It will not pull on top speed. It will run on low gear, and takes hills on it, not quite as well as formerly, but still leaves little to complain of. Gears all right, and clutch does not slip, but the slightest incline, say 1 in 50, on top speed stops it. Even on dead level I have to watch it very carefully or a stop results. The car at present will not take hills that it formerly took at top speed. Compression is good: engine (car stationary) will run with throttle half closed and compression tap open. Ignition is all right, and no misfiring occurs; water circulation is distinctly good, all bearings free, and no binding noticeable anywhere. Runs splendidly down hill, but the beat of engine (stationary) seems weaker than formerly. Carburetter has been altered both ways to give more and less petrol: result the same. The engine will not start without flooding the carburetter, which points to its being short of petrol: on the other hand, with petrol leaking from the air inlet joint of the carburetter it will not take air. Valves are right, and there is no leakage. Would a new carburetter be likely to effect a cure, and, if so, what would you recommend, and what size?—There is a serious loss of power somewhere, and we are inclined to the opinion that it is in the engine rather than the carburetter that the fault lies. It does not prove that anything is wrong because it is necessary to flood the carburetter to start. Of course, you will adjust your carburetter to give a steady feed to the jet. If the petrol drips, it means you will be unable to get a good mixture. Assuming carburation satisfactory it would be as well to see that the lift of the exhaust valve is all right. In a very similar case to this we found that a worn exhaust cam and bearing was the cause of the trouble by throttling the exhaust. Should this not be the cause the piston rings would be the next part to look at: you might have good compression with engine cold, but slack rings would cause loss under the explosion pressure. If you examine these you will be able to judge their condition.

W.S.G. (Milford Haven).—The type of vehicle you refer to would not be suitable for the work you specify: it is really more intended as a runabout for good roads. A good two-speed gear tri-car, 3½ or 4 h.p., would be the thing.

A Charging Battery.

"Lazarus" (Paris).—(1) From the details you give we do not think the bichromate battery you have would be suitable for charging accumulators. It appears to be an ordinary single fluid type. This would be no use at all. You must have the zinc in a porous pot. You could get a very suitable battery from Messrs. Fuller's (see advts.). You must always connect the positive of the accumulator to the last carbon of the series and the negative to the zinc. A good diagram and full details of the arrangement are published in "The Motor Manual." Get a copy and study the whole subject. (2) You will find very little difference in the cost of the paper, obtaining it by either method.

Selecting a Second-hand Machine.

"New Reader" writes:—I am an absolute novice in motor matters. I can afford £25 for a good second-hand motor-bicycle. Might I ask a little assistance in the way of hints in order to avoid being "done"? I weigh 11 stone, and should expect the machine to climb a long hill of 1 in 12 without pedal assistance. I do not mind giving help on hills steeper than this. The machine would not be required to pull a trailer or drive a fore-carriage. What power would suit me?—If you have to rely on your own judgment you will have to take some risk. The safest plan is to get to know someone who rides a motor-cycle regularly to look the machine over for you and try it. If you cannot arrange for this your best plan is to follow out the following scheme:—(1) Let the machine be by a well-known maker and not older than this year's pattern. (2) A good 2½ h.p. engine would suit. (3) V section belt transmission is the simplest for a beginner, and there is more scope for the selection of a machine. (4) Beware of loose and worn bearings in the engine: there should be no up or down motion possible in the shaft, and turning the engine pulley round (minus the belt) and with compression released the motion should be smooth. Any tendency of the piston to jerk or knock shows the connecting-rod bearings are worn. (5) Examine tyres carefully for cuts and wear, and try all spokes and spin the wheels round to note that they revolve truly—that is to say, see whether or not they "wobble" in the forks. They should be quite firm and run quite evenly. (6) Examine the petrol and oil tanks for possible leaks and "faked" places at the joints. (7) See that the lubricating pump acts properly and sends a charge of oil into the crankcase. (8) Look at the accumulator; if it shows both the plates to be of a chalky colour instead of a distinct grey and brown the chances are it is sulphated and of no use. (9) Try the compression of the engine: if good it should be a difficult matter to turn the pulley round by hand. (10) See what sort of spark the coil gives from the end of the high-tension wire. It should be thick and give a sharp snap at each discharge. (11) Examine carburetter; be sure that all nuts and levers are firm. (12) Finally, test the machine's capabilities up a long steep hill.