

CRANK-TURNING EFFORT.

Though much has been written explaining the action of the gases in the cylinder as shown by the indicator, so far as the writer is aware very little has been written concerning the result their ever-varying pressures have on the crank—a matter at least as important to motorists as the pressure of the cylinder gases and one having a far more practical bearing with regard to the performance of an engine. The indicator diagram, however, is one of the two sources from which we derive our information as to what is happening at

the crank, and doubtless most readers will be conversant with its theory, but those who are not will find the matter ably treated in previous issues. Two forces are transmitted to the crank from the connecting-rod, the one a radial force, the other the turning effort. With the first we are not concerned, and need only mention, in passing, that it is greatest at the points where the turning effort is least, and at a minimum when the greatest turning effort is being exerted. Crank-turning effort, which needless to say is the force tending to turn the crank round in either direction, may be measured in moments of inch-lbs., which fact is best explained by saying that a crank of 2 in. length with a force of 1 lb. at its end, acting at right angles to it (or in other words acting tangentially to the circular path of the crank pin), is subjected to a turning moment of 2 inch-lbs.

The two factors of inches and pounds are interchangeable, so that if the crank was 4 in. long and the force acting on it was reduced to $\frac{1}{2}$ lb., the turning moment would still be 2 inch-lbs. (See Fig. 1.)

Unfortunately at only one point in half a revolution does the force transmitted along the connecting-rod momentarily act at right angles to the crank, and this when the cylinder pressure exerting that force is by no means at its highest, while at all the points along the crank pin path on either side of this favoured spot, the possibility of crank-turning effort decreases until at the dead centres it is reduced to nothing, no matter what force may be exerted along the connecting-rod. (See Fig. 1 again.) Now by a method which need not be entered into here the equivalent value for turning effort at any point on the crank path can be determined, and this together with the piston pressure acting along the connecting-rod makes up the crank-turning effort. The diagrams given herewith show graphically and far more effectually than any figures what is happening at the crank. Each diagram may be considered longitudinally to represent the path of the crank pin unrolled

out into a straight line for two complete revolutions, each division representing 90 of the 360 degrees that make up the full circle of revolution.

Measurements in height or depth represent the crank effort in a forward or retarding direction according to whether they are taken above or below the thick line, the retarding effort being shown as a minus quantity. Thus the crank effort at any point during the cycle of operations can be determined not only in amount but also in direction.

Explanation of the crank effort diagram of the single cylinder motor will suffice to explain the other more intricate diagrams from multi-cylindered engines.

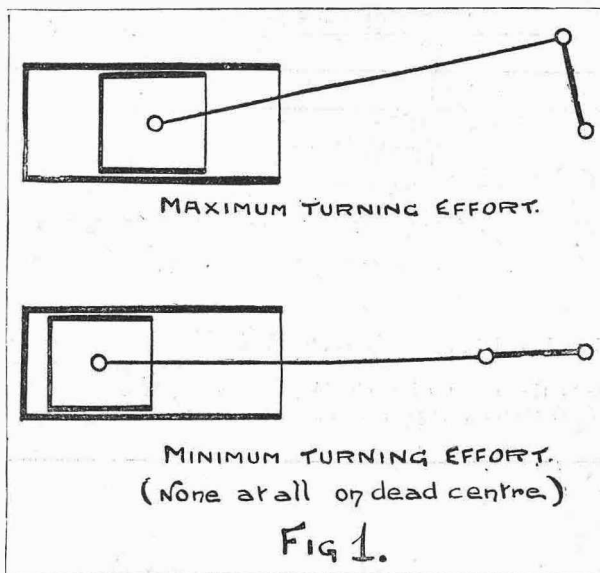
The cylinder pressure is greatest when the crank pin has travelled through 18 degrees, but the position is so unfavourable for obtaining a good crank effort that the maximum effort is by no means reached, while the crank is in its most advantageous position for turning at about 80 degrees, but by then the cylinder pressure has dropped to such an extent as to lower the total effort. On the return stroke for 180 degrees, the piston is sweeping out the exhaust gases, and at about the middle of its stroke is travelling faster than the exhaust gases escape, hence a slight retarding effort is set up owing to the back pressure thus caused. Again, on the

suction stroke a small amount of retarding effort is occasioned at about the middle of the piston stroke, while on the compression stroke, of course, the back pressure causes very considerable retarding effort, though this is somewhat lessened by the fact that when the compression is greatest, the crank is not in a position for the pressure to be so very much felt.

Diagram No. 2 shows the crank effort on an ordinary two-cylinder engine, with the cranks opposite each other. In this type of engine the forward effort of the explosion in the first cylinder is somewhat discounted by the retarding effort due to compression in the second cylinder, while the explosion in cylinder No. 2 is slightly less useful than otherwise it would be owing to back pressure, which at this part of the cycle of events, occurs in the first cylinder. Later

THE RETARDING EFFORTS DUE TO SUCTION

in the one cylinder and back pressure in the other combine, while towards the end of events the unfavourable effort caused by compression in the first cylinder is increased by the suction in the second.



Crank Turning Effort—Contd.

Diagram No. 3 (Fig. 3) shows what happens at the crank of an engine arranged with two cylinders working on the same crank pin, so that the explosions can take place every revolution, while Diagram No. 4 shows the crank effort of an

after the other, and the undesirability of this arrangement is shown by the uneven crank effort, which is all at one part of the cycle.

In Fig. 4, the Diagrams 6 and 7 represent the beautifully even efforts obtained respectively from a three- and a four-cylinder engine, and make the advantages of these types very apparent.

In Figs. 2, 3 and 4, where the crank efforts of the different types of engine have for any period coincided with each

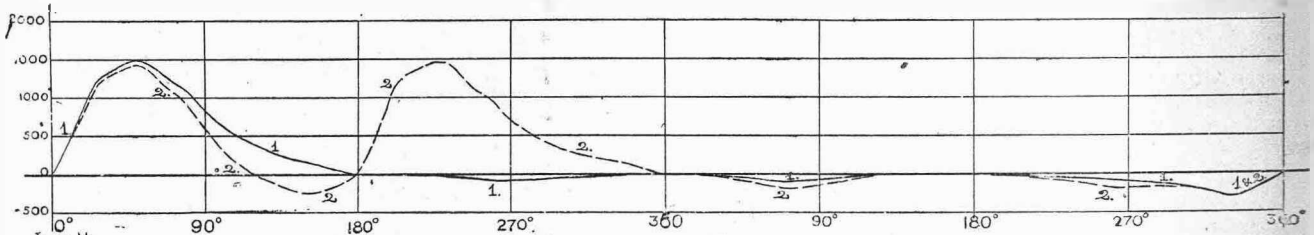


FIG 2

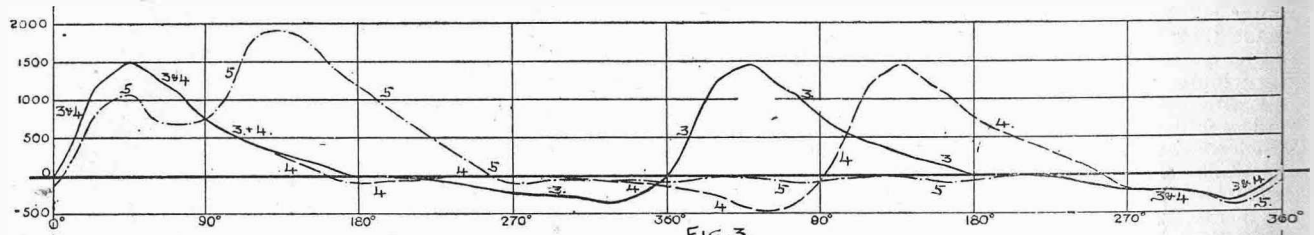


FIG 3.

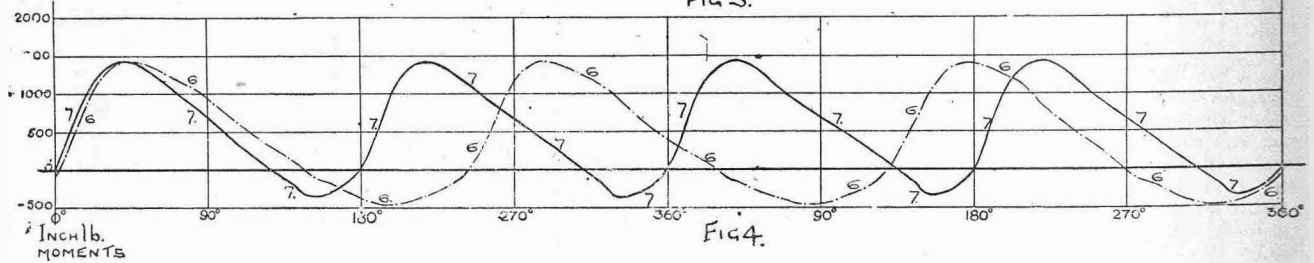


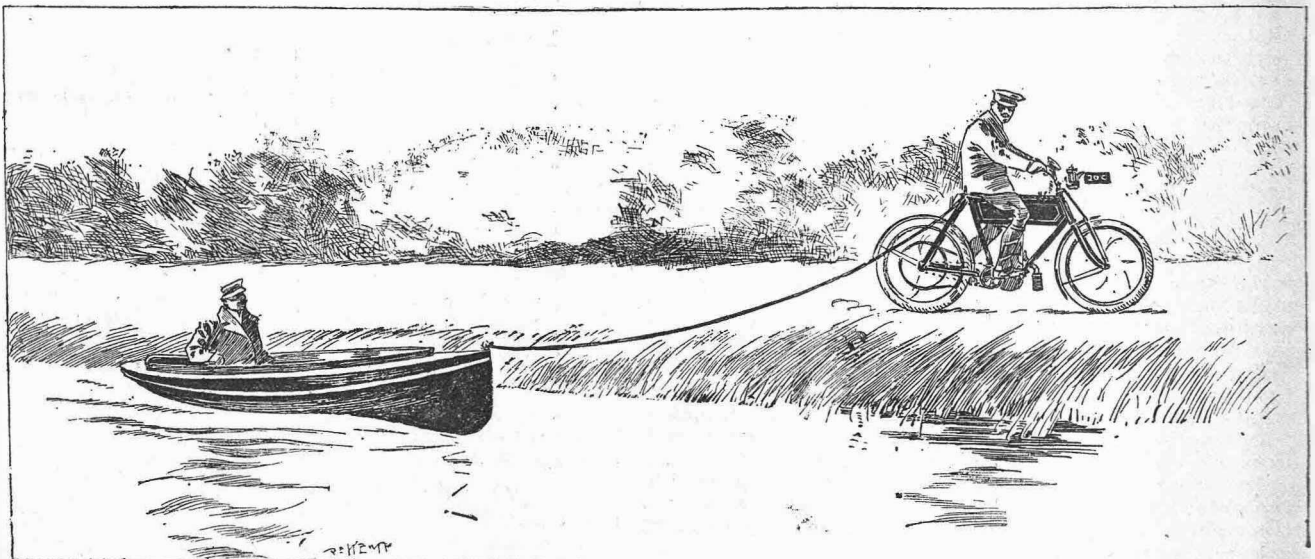
FIG 4.

engine with diagonal cylinders placed at right angles to each other.

Diagram 5 (in Fig. 3) represents the effort of a similar engine with the cylinders timed to fire as soon as is possible one

other, the line of the lower number has been taken as representing both. Thus, where the crank efforts of engines No. 1 and No. 2 have been the same, the line showing No. 1 has been used to show both.

L. M. MEYRICK JONES.



A FRIENDLY LEAD!

One touch of petrol makes all the (moting) world kin!



Some Light Car Impressions.

I spent a very busy ten days (or, as they facetiously put it in the office, a pleasant holiday) with the light cars in Herefordshire—and, by the way, this fact and another, that I have had to make a couple of visits to France recently, will account for the absence of my page of notes from the last few issues. Before I went down to the west country I thought I knew all about the capabilities of the little car for the man of modest pocket, but I came back greatly impressed by what I saw. Because I wanted to be able to pass from the extreme rear to the very front of the line of cars (and there was frequently a matter of five miles separating the last from the first!) I had a rather higher-powered car than I usually devote my attention to, and, although we could travel at a goodly pace, it now and again took us all our time to pull back the lead. My plan was to see all the cars away at the commencement of each run. Occasionally there would be something that had to be done or arranged after that, so it was not an unusual thing for the leading car to have been gone over half-an-hour before we started. Then we went the round in the same direction as the cars—not the reverse way as some of the slow spectator cars had to do! On the way we would stop to enquire causes of breakdowns, to take photographs and generally to conduct our business of information gatherers for the readers of this journal. But we dare not waste a moment or stop an unnecessary minute, for if we did we should not be back first into Hereford. The little cars travelled splendidly and I was as much surprised as I was pleased at their performances.

What impressed me as much as anything was the hill-climbing capacity of the majority of the cars. Hitherto there has been little opportunity for observing the capabilities of the light car on steep gradients, for hill-climbing tests, by their very nature, only attract entries from high-powered cars, and the Automobile Club does not feel itself capable of promoting more than one event a year for any particular section of the industry. I must say that I have always regarded hill climbing as the weakest point in the light car and have held the opinion that, as speed was not only illegal but was fraught with unnecessary risk, the only reason for getting a moderately high-powered engine was to ensure having a reserve of power for hill climbing. Thus, I have thought that, for the light two- or three-seated car somewhere about 9 or 10 h.p. would ultimately be adopted, recognising, however, that we must, for the present, be content with the 6 h.p. engine usually fitted and must wait for the increase of power to come as a development and an improvement. But the trials at Hereford proved that a piece of hilly country could be toured comfortably by the small car, and that, provided the car be reasonably light in weight and be suitably geared, there would be no greater trouble on the steepest of hills than the dismounting of the passenger, who could then, if needs be, give a little helpful push. I have never set my own car to a hill of a steeper gradient than about 1 in 12 or 1 in 13, simply because I had never, for a moment, imagined that she would surmount anything much stiffer. Perhaps in this I have, all along, done the car an injustice, and so I must take her out one day to a hill that I know which has a grade of 1 in 10 and then, maybe, if she proves successful, I shall have the pluck to try her on Westerham. It will be

much more useful to know the real limit to her power than to arbitrarily fix it in my mind at 1 in 12. Moreover, it was demonstrated at Hereford that, even though a district should be extremely hilly, it is a perfectly practicable matter not only to gear the car to suit the district, but even to make a hurried alteration of sprockets on the spot. And in this matter the chain-driven car has an advantage over a gear-driven car, for it is quite an easy matter, comparatively speaking, to change the sprockets and alter the chain length, and with two or three sets of sprockets one could take a light car into practically every district of Great Britain, from the flat fenlands of Lincolnshire to the mountainous roads of Cornwall or Wales. The trials have proved that light car designers are not sitting still, but that they are constantly on the alert to make the vehicle as reliable, as efficient, and as accessible in all of its details as possible. And certainly it will only be by such efforts that the confidence of the public will be gained. Another very satisfactory feature of the trials was the remarkable absence of tyre troubles. The light weight of the cars was responsible for this immunity.

A Very Interesting Light Car.

Naturally, with the cars under lock and key the whole time, there was no opportunity at Hereford for driving any of the competing cars, but after the spur wheels of the two-to-one gear of the Rover had been replaced I had a ride with Mr. Lewis, the inventor of the car, and for a stretch of the journey he was good enough to allow me to take the wheel. The car is quite a revelation, for, at times, it has all the feel of a four-cylinder engine. But for the demonstration of Mr. Lewis I would never have done what I did with the Rover, namely, put the second and even the top gear into engagement and then start away from a standstill. Just why the engine will put up with such drastic treatment rather puzzled me, but it can only be that the engine is perfectly flexible, that the carburation is always right, and that there is no loss of power in the transmission. It was quite the usual thing for Mr. Lewis to start on his second and then get on to his top and stay there except when a stiff rise was encountered. Through traffic or when crawling along at but three or four miles an hour top gear could be employed all the time, and that is a great advantage because it means silence, saving of wear on the gears and thorough efficiency. Very heavy fly-wheels are employed on the Rover, and these, of course, help largely towards attaining sweetness of running. I liked the system of transmission because of its simplicity; whether all the parts are thoroughly accessible is a matter on which I have yet to satisfy myself. The system adopted by Mr. Lewis of making a complete motor carriage, that is engine, transmission, back axle and dashboard all as one separate and complete unit, and then mounting the body upon three points of suspension, is not only clever and unique but it should provide efficiency with lightness. Only time can show whether the "girder" from the engine to the back axle has sufficient strength against twisting strains. I do not doubt it myself, but it is the only point that can be regarded as requiring to be proved. I must say that I am looking forward to an extended experience with the Rover—a few long drives over some hilly and even rough country, for she is a most interesting car, as full of novel points as an egg is reputed to be of meat.

AMERICAN TOPICS

NEW YORK, Sept. 3rd, 1904.

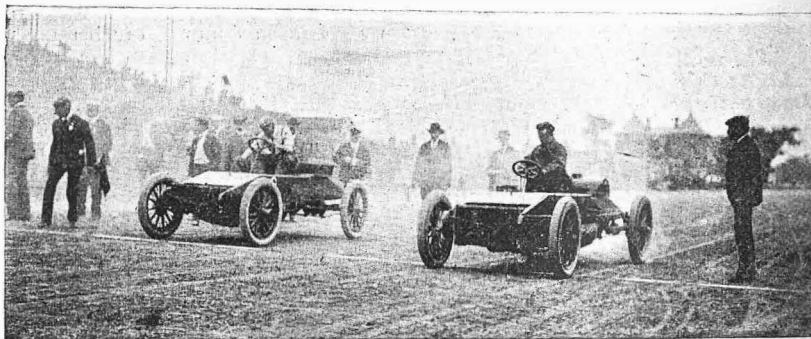
Oldfield "Done with Racing."

It is almost impossible to pick up a newspaper, nowadays, without reading of serious auto accidents, many of them serious, some fatal. At the racing meet at the World's Fair, at St. Louis, as reported in last week's "American Topics," there was a fatal accident—just a smash and crash—two men killed and the most picturesque figure in the American automobile world hurt, and off the racing track for ever. Barney Oldfield, doing his mile in less than a minute, momentarily blinded by his competitors' dust, lost his hold, dashed through a fence, and killed two of the track attendants. He was himself thrown off his machine and badly stunned and shocked. Upon recovering consciousness he positively and absolutely declared that he had "done with racing for ever," though he might appear upon the exhibition track.

Another Takes Up the Running.

"The King is dead, long live the King." Earl Kiser, whose record performances at Cleveland, Ohio, on August 22nd and 23rd were briefly alluded to last week, succeeds Oldfield as the "Tod Sloan" of the American motor track. Kiser not only cut record figures once, but twice—once in the five-mile race for the Manufacturers' Challenge Cup, when he did 54 secs., and the second time when he did 52½ secs. in a special match race against H. L. Lyttle, who drove the eight-cylinder "Pope-Toledo" with but six cylinders working, and Carl Fisher, in the eight cylinder "Comet." Remarkable as it may seem, Kiser placed the world's one mile record at 54 seconds in the first race he had

ever ridden on the Winton Bullet No. 2. The meeting of the three eight-cylinder cars was the first time in this country when such a thing had occurred, and the officials at the track side took to the timber—expecting trouble. Kiser's first flash into fame came in the closest race ever run on a track, a race which redeems automobile racing and makes successful meets certain in the future. The close finish and



C. Goindt in Winton Bullet.
1 mile in 58 4-5ths secs.

Earl Kiser in Winton Bullet.
1 mile in 52 4-5ths secs.

the record were, perhaps, accidents. Kiser, Fisher, and Lyttle, together with the Winton Bullet 2, and the Franklin, with Walter Winchester, got away falsely again and again at the head of the stretch and were brought to the tape for a standing start. At the gun Kiser's motor stopped just over the tape and he stood still. The motor was cranked and Kiser got away five-eighths of a mile to the bad. He never hesitated about trying for the race, but drove like a fiend, going wide on the stretches and turning into the poles in true Oldfieldian style. Slowly at first and then more rapidly he mowed down his competitors until only Lyttle remained. Down the stretch Kiser sailed and the cheering multitude was hushed. Kiser came two feet to Lyttle's one nearing the tape and over the tape was second by a bare yard. Then the crowd awoke and cheered as never automobilists cheered before, and Kiser was a hero with a mile in 54 secs., *four-fifths under the record.* Little else was talked about after that, and when Kiser won the five-mile match race with a final mile in 52½ secs. there was not nearly as much excitement. Another remarkable performance, at the same meet, was that of Chas. Goindt, of Cleveland, who never rode the Winton Bullet No. 3 in a race until Monday, August 22nd. On Tuesday, August 23rd, with this car, he reduced the world's record for cars weighing less than 1,800 pounds from 59½ to 58½ seconds, riding six consecutive miles all under the previous world's record. These miles were done in 59½, 58½, 58½, 59, 59½ and 59 seconds.

The Vanderbilt Cup Race.

Another foreign automobile has been entered in the Vanderbilt Cup race, which will be held over the Long Island course on October 8th. It is a 60 h.p. Italian Fiat and, while its owner is an American and a resident of Boston, he must be nominated by a recognised Italian automobile club because of the foreign make of his car. The machine is the property of William Wallace, of Boston, and it is said that his credentials from the Italian Club are already on the way. The exact distance of the race has not been decided. It will either be to circuits of a triangular course, which would aggregate over 300 miles, or nine circuits over the same course, making the distance a little less than 300 miles. In view of the fatal accident in the automobile race, at St. Louis, because of dust clouds obscuring the view of the competing drivers, the question has been raised in many



Kiser, the new Motor Racing "King."

American Topics —Contd.

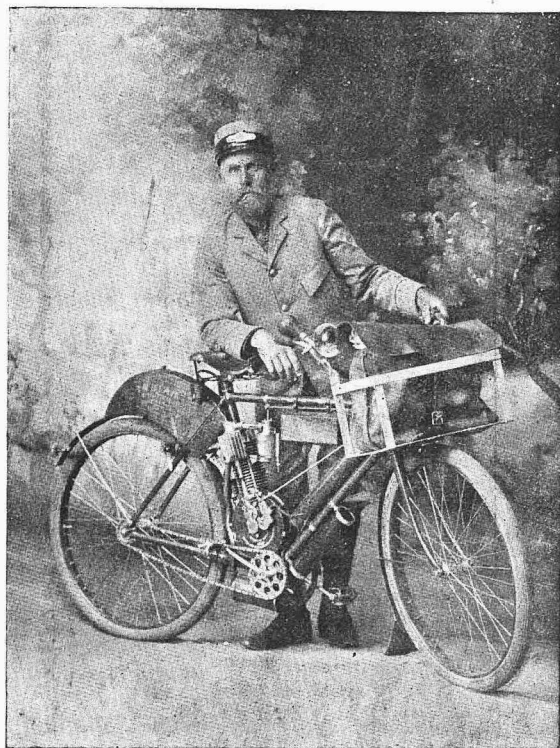
quarters as to what provision will be taken to obviate the danger from dust in the Vanderbilt Cup race. It is generally conceded that some solution of the dust difficulty is imperative if a safeguard is to be placed upon the contest. A. R. Pardington, chairman of the Racing Board of the American Automobile Association, to whom the question was put, said that it is planned to sprinkle the course with kerosene oil at the approach to railroad crossings and to the turns, but that nothing could be done with the long straightaway stretches owing to the almost prohibitive cost of oiling the roads.

American Plans for Next Year's Gordon-Bennett.

"Experientia docet," and in spite of its two failures to get together a competent team for the International Cup race, the Automobile Club of America has no intention of relinquishing its prerogative in this matter to the national body, the American Automobile Association. Instead it has decided to make a radical departure and start early to try to get entries for the big race, under conditions that it is hoped will preclude a repetition of the fizzes of 1903 and 1904. The conditions that will govern American entries for the race, which must be made through the Automobile Club of America, have been announced. They present interesting propositions. The entries are declared open from now until December 15th, but entrants will have until April 15th to place their cars at the disposal of the race committee. Each entry must be accompanied by 600 dollars deposit as usual, but this is not all. In order to prevent the disastrous practice of having cars completed just in time for the test, and turned over from the shop to the committee for trial, it is required that before April 15th, 1905, each entrant must file an affidavit, signed by two responsible persons, declaring that the car has been entirely completed for a period of more than four weeks, that it has been driven over 1,000 miles on the road, that it has been driven over 250 miles without stopping the machine, and that it has been driven more than 40 miles in less than 60 minutes on track or road. The foregoing provisions are the most radical in the new set of rules, but the others are wholly new also. They provide that the racing committee shall decide which of the entrants is to compete in the race, and may do so by a contest, or otherwise, but that all cars must be at the disposal of the committee on and after April 15th. Entrants who are not ready on that date or who decline to undergo the tests prescribed by the committee, will be disqualified and their entry fee forfeited. Entrants who are ready on time, and who comply with the instructions of the committee, but who are not nominated for the race, will have their entry fee returned. Entrants who are nominated for the race, but who do not start, will forfeit their entry fee. Those who are nominated and do start, if there are three of them, will have refunded to them two-thirds of their entry fee, less their proportion of the cost of holding the race. If only two candidates are nominated, and they start, they will have refunded to them one-half of their entry fee, less their proportion of the cost of holding the race. All entrants must submit the name of the intended driver of their car, and the driver must be approved by the committee.

Motor versus Mailcart.

Since the first rural mail route was established, more than a decade ago, the rural delivery of mail has spread with almost incredible rapidity. So popular is the idea that petitions have literally poured into the Post Office Department at Washington for the establishment of rural routes, and the department officials and their assistants have been overworked in their endeavour to satisfy the demands. C. L. Clayton, of Kansas, says: "My connection with the rural free delivery was the occasion of my purchasing a motor-bicycle, and while I am somewhat fond of cycling in any form, yet I am a motorcyclist from the standpoint of busi-



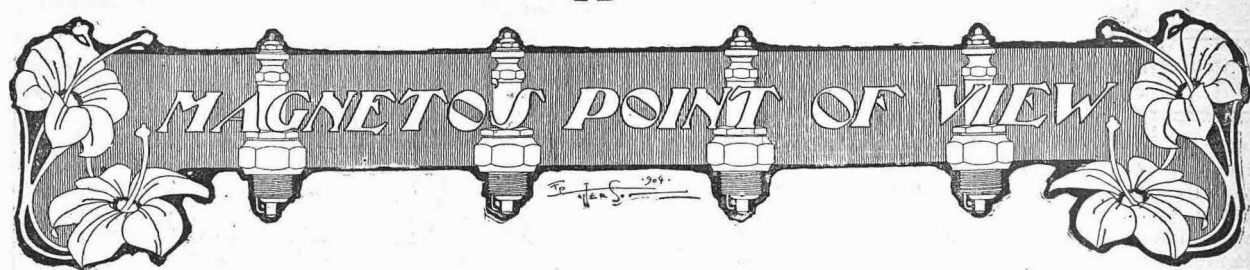
C. L. Clayton, rural letter carrier, Wellington, Kansas, U.S.A.

ness rather than pleasure. In the performance of my duties as a carrier I am compelled to travel 27 miles per day, and the discovery of the best means of daily locomotion over this distance has been with me a very important matter. After I had been driving horses over my rural route for more than a year, it occurred to me one day, when I had a lame horse, to try my motor-bicycle. I was rather pleasantly surprised to be able to make the route upon it as easily as I did. I carried the mail in this manner until my lame horse was well, and thereafter I alternated my bicycle with my team for several months to the great relief and improvement of my horses. With a good horse I can make my route in six and one-half hours, which, of course, includes many stops. With the motor-bicycle I am covering it in two and a half hours. I believe a motorcycle will easily do three-fourths of the work on a rural route. If it ordinarily requires two good horses to do the work on a route, a motorcycle carrier can dispose of one of them and keep the other in a much better condition for travel by the additional rest the animal receives. It requires seven or eight dollars per month, at a low estimate, to keep a horse. By disposing of one horse, that amount is saved on horses. With gasoline at 20 cents per gallon it costs me, roughly, 10 cents a trip to run the motor-bicycle on the rural route. If I use it three-fourths of a number of days I deliver mail (or about 20 days per month) the expense of operating it for that length of time will amount to two dollars. The expense for repairs on the motor-bicycle has thus far been no more than the shoeing and veterinary bill for a horse. Here, then, is a saving of at least five dollars a month to the credit of the motorcycle, with perhaps three dollars per month added to the value of the remaining horse on account of his better condition for work."

Development of the Motorcycle Trade.

The head of a big automobile concern puts the sum total of the automobile business for this year at 24 million dollars, or twice the amount for last year. Business vehicles are to receive the special attention of manufacturers next year, and the figures for 1905 will probably see an even greater increase.

"WHEEL."



Fixing of Non-slipping Treads.

The advantage of having a non-slipping rubber tread affixed to a worn back outer cover does not appear to be as much recognised as it might be; and consequently many motorcyclists find that the expenses for tyres and repairs mount up very considerably. A suitable tread can be purchased for a moderate sum, say, from 6s. upwards, depending on the thickness and quality of the rubber. When the original corrugations on the cover have worn down somewhat, it is perfectly easy to fix a band on, providing the instructions for fixing are carefully followed. Some riders, doubtless, would prefer to have the treads fitted on for them by the maker who supplied the tread. In this case of course the work can be relied upon to be well done, but it necessitates dismantling the wheel from the frame. The band can be put on at home with the wheel in place, as all that it is required to do is to mount the back wheel on the stand and remove the mudguard. The secret of success in fixing the band is to clean both rubber surfaces (tread and cover) in a most thorough manner, first by washing with water, and then several times with petrol or benzine. The roughening of the surface is also absolutely necessary, but ordinary glass-paper is no use whatever for this work. What is required is a wire brush, such as a piece of file card, which answers the purpose exceedingly well.

PREPARATION OF THE SURFACE.

Two coats of solution must be given to both surfaces, and great care taken to allow the first coat to dry before applying the next. The tread should be run on straight and true as soon as the second coating has reached the degree known as "tacky" or adhesive. The finishing of the ends or joint is where many amateurs fail. They generally cut the band a shade too short, with the result that a small gap exists, and the road flints tear one end of the band away from the tyre. The ends must come quite close, so that it should be difficult to detect the join. A few turns of tape should be wrapped over the joint and kept on for at least 12 hours. Users of fore-carriages especially will find that it pays to protect the tread of the driving-wheel. From the fact that the drive has to be taken by one wheel, the wear and tear of the tyre is very considerable, and it is easier and cheaper to replace a band than an outer cover. If the band is thoroughly well fixed it should last a season's average wear. A small amount of loosening of the edges may be noticed, but this is not a serious matter.

Back Fires when Starting Car Engines.

Most novices in handling a car experience some time or other a back fire and its more or less startling consequences when they attempt to start up the engine. Fortunately, really bad accidents from this cause are comparatively rare, but instances of broken arms have been known. Sprained wrists are more numerous; I had one from this cause myself on one occasion. Another time I was endeavouring to show a friend how easily a motorcycle engine with a big outside fly-wheel would start at the first pull round of the wheel: it started very suddenly, but in the wrong direction, and I got thrown violently on my back: This was only a 2 h.p. engine. Reading of a bad accident the other day in which a motorist sustained a double fracture of the arm from a back fire leads me to suggest that too great a degree of care cannot be taken to have the spark retarded to the fullest extent at starting. The temptation with many drivers who experience a difficulty in starting up their engines is to gradually advance the spark at each trial: This

is exceedingly risky: There is no necessity for having the spark advanced if one sees that the contact breaker is properly adjusted and the carburettor flooded. If any difficulty is experienced in getting an explosion it is better to inject a few drops of petrol into the cylinder through the inlet valve or compression tap. This rarely fails to give one or two initial explosions. On the whole a trembler coil will ensure a start more often than a plain make and break will do. There is of course a knack—only learnt by experience—of pulling the handle up sharp against the compression. This heats up the charge and makes it explode more readily.

The Effects of Wet on High Tension Ignition Apparatus.

During the Auto-Cycle Club's 1,000 miles tour many of the machines were temporarily thrown out of gear on the day of rain and storm because the coil and wires became saturated with wet, and the high tension current simply leaked away to the frame instead of sparking at the plug. In one particular instance I know of a competitor (whose machine stopped from this cause) who solved the difficulty by taking the coil from its exposed position on the frame, drying it and tucking it away in his bag on the carrier. Several instances occurred of the high tension cable becoming saturated with wet and the current leaking and occasionally giving the rider a shock when his legs got in the neighbourhood of the cable. Even where the coil was securely packed away in a compartment of the tank, the water, in many cases, trickled in and caused trouble. It is evident from these facts that the disposition of the coil on next year's mounts must be such that it is in an absolutely damp-proof position; and moreover I think it is pretty safe to say that wood is not by any means the best material to construct a coil case of.

I have seen a wood coil case warped and swollen out of shape from the effects of moisture. It does not seem to matter how well varnished a wood case may be; wet will find its way into the pores of the wood somehow and cause leakage. Vulcanite is, in my opinion, the material for coil cases, as it is a most perfect insulator and does not absorb moisture in the smallest degree, and I should think it would be easier to make a round coil case from ebonite tube than to build a square one of wood. With respect to the high tension cable, the aim obviously should be to have as small a length of it unprotected as can possibly be managed. I do not know if any of my readers have ever tried a piece of lead-sheathed cable. This of course would have one disadvantage in not being flexible, but on the other hand it would be absolutely proof against any amount of wet. I would advise any rider having an exposed coil on his machine to take the precaution of covering it up with a piece of mackintosh in the event of being caught in a heavy shower. Water will sometimes collect on the sparking plug insulation and form a path for leakage and stop the sparking. A piece of rubber tubing slipped over the terminal and part of the insulation is a safeguard against this to some extent.

A curious cause of leakage on a coil came to my notice recently. The coil and accumulator were fixed in the same compartment of the tank case, and it seems that a small quantity of acid had splashed out of the cells on to the top of the coil. This had dried up on the surface of the wood and left a streak of a crystalline nature which bridged the high tension terminal and one of the screws of the case. Every now and again the spark would travel along this path.

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OPINION.

Another Unauthorised Car Trial.

It is rather a curious trait in the character of some people that they will enter for a competition, and, on finding themselves beaten, will set to work to sneer at the contest, to belittle the doings of their more successful competitors, and to boast of their own unproved prowess. In the recent Light Car Trials two Oldsmobiles were entered. The smaller one travelled six miles, and broke down on the first hill that it came to through defective water circulation, and then retired from the contest. Other cars in the trials suffered from water troubles, but we heard of none so faulty in its cooling arrangement that the defect could not be repaired. The Oldsmobile, however, was seen no more after the first morning. The second Oldsmobile was deprived of its chance for a non-stop award by a broken chain on the third run, entailing a delay of 54 minutes, whilst a further stop of three-quarters of an hour occurred towards the end of the week through exhaust valve trouble. The record of this car will be found in a table which we publish this week, and, although the record is moderately good, it will be gathered that it does not justify the inclusion of the car in either the gold or silver medal classes. Bearing this record of Oldsmobile doings in mind, a letter which we have received from the firm of Messrs. Charles Jarrott and Letts, Ltd. (signed by Mr. Letts), is open to somewhat severe comment. Mr. Letts writes: "A number of people have written to me stating that they do not consider the recent trials at Hereford . . . was (sic) a severe enough test, as the distance was only 600 miles . . . and it has been suggested that, had the distance been doubled, a number of the cars would have totally failed." We are open to doubt the statement as to the number of people who have written to Mr. Letts voicing such an opinion. In the first place, there is no particular reason why people should ringle out Mr. Letts as the recipient of such letters, and, from enquiries we have made, we find that nobody else in the trade claims to have been similarly honoured. Had such an opinion been general, we might reasonably have expected to have found it amongst our own correspondence, but not a word of such a complaint has reached us. As a matter of fact, everybody knows that the test was not one of destruction, and therefore 600 miles was practically sufficient to provide the judges with the data they required, bearing in mind the fact that Trials are always best conducted expeditiously. As to the suggestion of total failure, such an expression of opinion goes for naught. Using these very doubtful statements as a prelude, Mr. Letts grandiosely announces the intention of his firm to embark upon "the biggest scheme

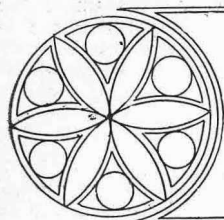
and the biggest test which has ever been undertaken," going on to add that "no trial of a motor or motors has created such a large amount of public interest as will the trial through which we are about to put two Oldsmobiles." Our readers can cast back in their minds, and recall many a genuine contest, many a task of magnitude, which will exceed in interest any advertising tour, even if it does consist of two fifty mile runs per day for thirty days. Some of the testing runs conducted quietly by Continental firms often extend over 10,000 miles. We are told that the Oldsmobiles will carry "observers," but nothing is said to show that these gentlemen will be absolutely unbiassed. It is naturally difficult to secure unbiassed observation unless the observer be appointed by some recognised representative body. It is only fair to those who have successfully undergone a sufficiently severe test, under independent and impartial observation and hampered by a number of restrictions, that the weakness of Mr. Letts's claims should be pointed out, and that it should be made quite clear that the perambulation of the two cars is only an advertising scheme, whilst the public have no check at all over the doings of the drivers, and no guarantee that nothing is done to the cars whilst the observers are asleep. It is precisely because the public stand in need of protection against these unauthorised and unchecked "tests," and because it is desirable that they should be supplied with reliable information and independent opinion that the Automobile Club goes to the trouble to organise and carry out its annual trials of cars. Naturally Messrs. Jarrott and Letts, or any other firm, have a perfect right to conduct any sort of private reliability trial on their own account, and it is not this feature of the affair to which we take exception. The objectionable part is the attempt to compare the run with the recent car trials to the disparagement of the latter, when, as a matter of fact, the organisation and the methods of conducting those trials are rendered entirely above suspicion. We should welcome any action on the part of the Club which would put an end to all unauthorised "trials."

Prospects of Magneto-Electric Ignition.

One of the features of the next season will be a noticeable increase in the number of cars and cycles that will have magneto-electric ignition fitted. The improvements that have been made in the high-tension rotary system are such that a high degree of reliability has been obtained. The old type of reciprocating magneto was generally conceded to have several disadvantages: The wear and tear of the actuating mechanism was excessive, and the mechanical make-and-break spark plug was a complex affair compared with the ordinary high-tension plug. There were springs liable to go wrong, and joints which, unless carefully attended to, caused loss of compression, etc. In the rotary dynamo there is very little risk of derangement due to wear, as the action is a perfectly smooth one. Not the least of its advantages is the fact that it can be adapted to any motor having an ordinary spark plug, as the current is high-tension just the same as from a coil. The necessary mechanical fitting is simple, all that is required being a small chain sprocket keyed to the engine shaft to drive the dynamo. This fitting is well within the capabilities of any practical mechanic. We hold the view that the high-tension magneto will eventually become an alternative system to the coil and accumulators. We do not by any means consider that it will displace the latter, because this system has reached too high a degree of perfection in recent years. But there are many motorists—notably in the Colonies—who have not facilities for charging accumulators.

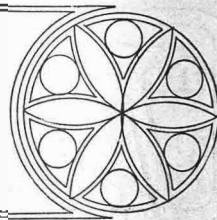
THE INTERNATIONAL MOTORCYCLE RACE.

In the next issue of "THE MOTOR" we shall give a full description of this important event, which will be contested by five countries on Sunday next over a course in France. Our description will be written by our own representatives on the spot, and will be fully illustrated.



THE LIGHT CAR TRIALS.

A COMPREHENSIVE DIGEST OF THE JUDGES' REPORT.
SOME INTERESTING AND INSTRUCTIVE TABLES.



In our last issue we were only able, because of the fact that the matter reached us at the last moment, to deal with the bare outlines of the report of the judges on the Light Car Trials at Hereford. That we do not altogether care for the form which the report takes was evidenced from our remarks of last week, because it leaves all the good points of the cars (and that they were numerous was amply proved during the week's trials) to be inferred by the readers, and naturally this was neither fair to the cars nor to those potential purchasers who looked to the report for light and guidance. Perhaps it was only right that any car which failed to complete the full distance of the trials should have been practically ignored by the judges; yet it would have been gracious, to say the least, had something more been said about the Rover and the Downshire than that they "were novelties." A statement of that sort tells the public nothing, and whilst we admit that the public do not go lacking in information, thanks to the efforts of the Press, yet it undoubtedly likes to hear much the same sort of statement and opinion from an equally independent body of persons such as the judges in these trials. In a word, the report lacks a touch of enthusiasm, and is not convincing, and it shows that the judges have formed their idea of what the light car was at some time or other,

and have just noted from the trials the improvements that have been introduced, and the defects that are still apparent. True, it is all very sound, but it is also very bare, and on that score only do we regard the report as incomplete and unconvincing.

The judges refer to the fact that a number of the cars appeared to be made up of almost identical parts individually well designed, but roughly and somewhat flimsily assembled. Certain features of these cars are pointed out as being open to improvement. This reference to the work of a certain well-known French firm of car assemblers is justified, and it enables us to draw the attention of the trade to the enormous amount of business that could be done in a cheap British built car if one of the large firms of component parts makers already established in this country were to design and manufacture a short range of cars similar to the ones produced in France. Such cars would have all the advantages of production in large quantities, and, coupled with English workmanship and the usual careful assembling characteristic of the English workshop, the result should be a series of cheap and reliable cars. As an instance of the lack of care in French assembling on piecework, the judges point to the fact that in more than one instance the axles were neither parallel nor at right angles to the frame, nor did the front

wheels track with rear wheels. The result of such improper alignment must be detrimental to the tyres. The judges rightly point out that whereas the side brakes on a few cars were effectively compensated, in other cases where wire rope with sharp bends was used the intended compensation was not effective. This is a really important matter, because unequal application of the side brakes has caused trouble on more than one occasion, and, moreover, there is not the least difficulty in the way of providing anti-friction devices at all points where the wire rope (when it is used) has a bearing. Adjustments, although provided on all cars, are not always accessible, and we have no doubt, now that the attention of makers has been called to this defect, that it will be remedied. The judges specially mention the foot brake on the De Dion cars as being notably easy to adjust. Mention is made of the fact that in the case of the Wolseley, Siddeley, and Prosper-Lambert cars the back wheels are carried on extensions of the tubular part of the rear live axle, thus relieving the differential axle of all weight and all stress other than that of torsion. The judges commend this method of construction, but we cannot understand how they came to overlook precisely the same effect which is secured by the cardan drive of the De Dion car. In this case the weight is also taken entirely on the sta-

Rank.	Name.	Order of Merit for		Grading for				O. of M. Qualities.	Horse power on dynamometer at 1000 yds. best performance up hill.	Nominal horse power.	Percentage of total weight laden on	
		Per cent consumption per ton mile.	No. of gallons consumed per ton mile.	Absence of vibration.	Absence of noise.	Ease of manipulation.	Comfort of passengers.				Front wheels.	Rear wheels.
1	Jackson	18th	059	3rd	5th	2nd	5th	24th	3 17	6	40	60
2	Speedwell	25th	066	5th	5th	2nd	5th	23rd	3 19	6	45	55
4	Jackson	24th	064	7th	7th	2nd	5th	26th	2 69	6	40	60
8	Pelham	18th	059	6th	8th	2nd	6th	27th	3 22	6	45	55
10	Wolseley	12th	050	4th	4th	1st	3rd	1st	5 57	6	39	61
11	Mobile	15th	056	5th	5th	2nd	3rd	20th	2 96	6	45	55
12	Brown	4th	037	4th	4th	1st	5th	22nd	3 97	8	45	55
13	Speedwell	21st	060	5th	5th	2nd	5th	16th	3 74	9	47	53
14	Swift	5th	038	3rd	3rd	1st	1st	3rd	4 87	7	45	55
15	Star	9th	045	5th	5th	2nd	5th	4th	5 58	7	47	53
16	Humber	7th	042	5th	3rd	4th	7th	15th	3 78	6	—	—
17	Alldays	8th	044	3rd	2nd	2nd	3rd	17th	3 77	7	46	54
18	Siddeley	2nd	036	2nd	5th	1st	2nd	5th	5 06	6	—	—
20	Wolseley	16th	058	3rd	6th	1st	3rd	6th	4 77	6	39	61
21	Clyde	1st	033	7th	7th	5th	3rd	25th	3 51	7	40	60
22	De Dion	13th	052	5th	5th	3rd	4th	2nd	4 92	6	42	58
23	De Dion	13th	052	5th	5th	3rd	4th	10th	4 26	6	45	55
24	Mobile	16th	058	5th	5th	2nd	3rd	14th	5 84	8	35	65
25	Oldsmobile	21st	060	4th	2nd	1st	4th	12th	5 87	9	40	60
26	Swift	18th	050	1st	1st	1st	1st	7th	5 19	7	42	58
30	Croxed	2nd	036	4th	5th	3rd	3rd	8th	5 71	8	52	48
31	Anglian	21st	060	4th	5th	2nd	5th	18th	4 53	9	41	59
32	Alldays	5th	038	4th	3rd	2nd	3rd	11th	5 13	7	35	65
34	Humber	26th	077	4th	3rd	2nd	4th	13th	4 64	7 1/2	51	49
37	Prosper-Lambert	9th	045	5th	7th	2nd	4th	19th	4 52	8	46	54
38	Star	11th	046	6th	5th	3rd	6th	9th	5 45	7	37	63

No.	Description.	Total quantity for the 620 miles run.	No. of passengers.	Total weight loaded (11st. per pass.)	Car—miles per gallon.
		Gals. pts.		Lbs.	
21	7 h.p. Clyde	13 1	2	1414	47.2
14	7 h.p. one-cylinder Swift	16 0	2	1512	38.8
18	6 h.p. Siddeley	16 1	2	1603	38.5
16	6½ h.p. Royal Humberette	16 3	2	1407	37.9
32	7 h.p. Alldays	18 0	3	1710	34.5
17	7 h.p. Alldays	18 5	2	1533	33.3
30	8 h.p. Croxed	18 5	2	1848	33.3
12	8 h.p. Brown	19 6	2	1904	31.4
22	6 h.p. De Dion	20 4	2	1414	30.3
23	6 h.p. De Dion	20 4	2	1414	30.3
15	7 h.p. Little Star	21 0	2	1694	29.5
1	6 h.p. Jackson Dogcart	21 6	2	1330	28.5
10	6 h.p. Wolseley	21 7	2	1596	28.3
37	8 h.p. Prosper Lambert	23 5	2	1820	27.2
2	6 h.p. Speedwell	24 0	2	1309	25.8
38	7 h.p. Little Star	24 3	3	1904	25.4
11	6 h.p. Mobile	24 4	2	1582	25.3
20	6 h.p. Wolseley	25 1	2	1451	24.6
4	6 h.p. Jackson Dogcart	25 3	2	1423	24.4
13	9 h.p. Speedwell	25 6	2	1547	24.1
26	7 h.p. 2 cyl. Swift	26 2	2	1610	23.6
8	6 h.p. Pelham	26 5	2	1638	23.3
31	9 h.p. Anglian	30 7	3	1862	20.1
24	8 h.p. Mobile	33 6	4	2093	18.4
34	7½ h.p. Royal Humberette	36 6	2	1722	16.9
25	9 h.p. Oldsmobile	39 7	3	2394	15.6

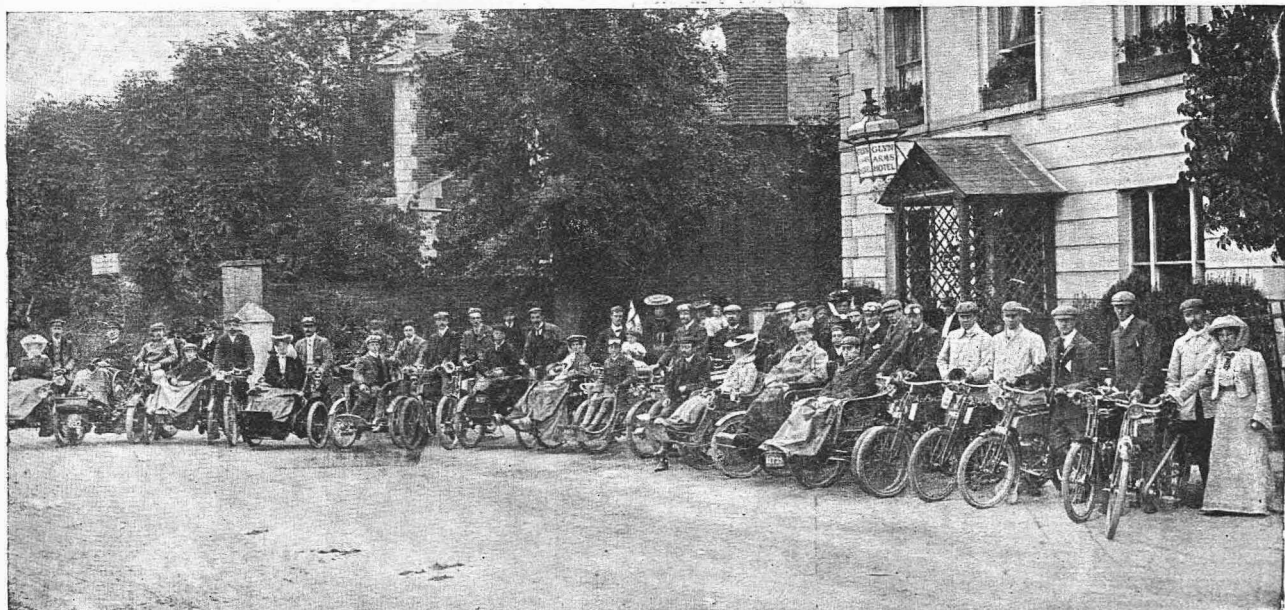
tionary axle. The competing cars were carefully measured by the judges, who state that the seating and footboard accommodation is less cramped than hitherto. They also state that remarkable improvement is shown in the carriage springs and body suspension.

Fault was found with the fitting of the steering gear in some cases, whilst the amount of wear on some cars is said to have been considerable. Despite this condemnation, the judges assert that, on the whole, there is a general improvement in the design and construction of steering gears. The absence of tyre troubles, due to the light weight of the cars, and to the

good quality of the roads, is noted in the report; but beyond these remarks nothing is said as to whether the tyres were suitable or not, or had stood the strain of hill climbing well. Many faults were found in the pipe work for water, oil, and petrol, and it is inferred that long lengths of pipe should be supported, that terminal collars or unions should be annealed after brazing, that the unions should be fine-threaded and a good fit. The cleanliness of cars fitted with aprons or undercasings is referred to, but a note is made of one badly fitted apron which caused slight trouble. Bowden wires as used for throttle and spark connections were evi-

dently not liked by the judges; but they worked admirably on the Rover car, we noticed. The construction of clutches as to adjustment and end thrust showed considerable improvement, especially in some British cars. This is a satisfactory statement, because the amount of end thrust and the difficulty—often impossibility—of adjustment were great defects in early cars. The electric wiring and general ignition arrangements come in for praise.

The classifications under the different headings given in the report have been grouped together, and we give the whole of the important information in the two tables which accompany these notes. In the first table we give the order of merit for all the cars that finished under the heads of petrol consumption per ton mile, the next column giving the fraction of a gallon of petrol used per ton mile by each car. It may be noticed that two or more cars are often graded alike. The other columns give the order of merit in the matter of absence of vibration, absence of noise, ease of manipulation, comfort of passengers, and hill climbing capacity. Another column gives the actual horse-power on the driving wheels as shown by the best performance on the hill tests; whilst next to it is a column giving the nominal horse-power of the car. There are big differences between the two, but the first figure is only approximate, the result being based on the assumption that the draw bar pull is equal to 60lb. per ton. The real value of the two columns may be said to lie in the comparison of the differences between the horse-power indicated, on a basis that was equal and fair for all, and the horse-power as claimed by the makers. The last pair of columns in the first table show the percentages of total weight on the front and rear wheels. The second table deals exclusively with petrol consumption per car miles, and it is useful as giving the loaded weight of each car. The judges' report is a magnificent document, which must have entailed an enormous amount of work.



THE SOUTHERN MOTOR CLUB.

A few of the Members at Ewell on the occasion of the Club's Hill Climb (passenger class), Ewell to Banstead.

NEWS

The Auto-Cycle Club's run to Exeter and Southampton.

A quaint idea, the penalising system adopted created an immense amount of fun on the run.

The speed trials of the Yorkshire A.C. will be held on Saturday, October 1st, at Wentworth Woodhouse.

The expiry of the Welch patent was signalled by means of a dinner at the Hotel Cecil on Friday last, and with great solemnity the letters patent were burnt at midnight.

All classes of sportsmen are finding in the motorcar one of the best means of getting about to and from the scenes of their sport. On the Scotch and Yorkshire moors this autumn, grouse shooters have availed themselves freely of a comfortable and quick form of locomotion.

At the meeting of the engineering section of the British Association at Cambridge, Mr. H. Darwin advocated rear-wheel steering for motorcars, on the ground that a driven rear wheel tends to side-slip when locked, whereas when the front wheels are locked the car keeps on in the right direction.

The Auto-Cycle Club's race meeting at the Crystal Palace on Saturday next will be well worth attending, for some fine racing is promised. Tickets of admission cover all the attractions of the Palace, and can be had of the secretary of the Club (119, Piccadilly, London, W.), for sixpence, or with a seat on the grand stand, one shilling—a very cheap way of "doing" the Palace, in fact.

These annual time trials will be held near Dourdan on October 2nd. All classes of vehicles are eligible to start, and it is expected that all the "speed monsters" will be present to fight one of their last battles before taking to their winter quarters. This meeting is generally productive of broken records, and is one of the most important of the year. More will be known about the entries next week.

During a recent visit to the works of the Eagle Engineering and Motor Co., Altrincham, we found that owing to pressure of business this firm had been compelled to make considerable alterations and enlargements to their premises. A complete new wing has just been added to the old factory, this being a two-storey structure 156 feet long by 54 feet wide; it is fitted with a single-span roof of non-inflammable material. On the ground floor is a fitting and tool shop, equipped with the latest labour-saving devices; whilst the upper storey is divided into two departments, one for "body" building, and the other for painting and finishing. This enterprising firm have several improvements in hand for next season, including one or two specially attractive types which we hope to deal with at an early date.

Coming Events.

- Sept. 24. Auto Cycle Club races at Crystal Palace.
- " 25. International Motorcycle Race.
- " —. Midland A.C. Speed Trials.
- Oct. 1. Auto-Cycle Club's Consumption Trials (members only).
- " 5. Dourdan Kilometre Trials.
- " 8. Vanderbilt Cup in America.
- " 9. Gaillon Hill Climb.
- " 14. Leipzig Motor Show.
- Nov. 18 to 26. Stanley Cycle and Motor Show (Agricultural Hall, London).
- Dec. 9 to 26. French Automobile Salon (Grand Palais, Paris.)

Lancia, the Italian Gordon-Bennett racer, will drive a Fiat in the Vanderbilt Cup race.

The Castle accumulators are still increasing in popularity. The winner of the "Albert Brown" trophy has written the U.M.I. in enthusiastic terms as to the behaviour of the Castle cells he used in the trial.

Next Tuesday (September 27th) is the day appointed for the hearing of the application of the City of London for a 10-mile limit within its boundaries. The application is, of course, being opposed by the Automobile Club. Any interested party may attend and speak for or against the application. Proceedings commence at 11 a.m. at the Guildhall. On the following day at the same time a similar application from the Kingston-on-Thames Borough Council will be heard; this, in addition to a 10-mile limit for the whole borough of Kingston, seeks to prohibit cars altogether on Bank Lane. The Kingston application will be heard at the Town Hall, Kingston-on-Thames.

A scorching motorist is known in America as a "speed bug."

A Newport (Rhode Island, U.S.A.) chauffeur has been sentenced to five days imprisonment for persistent scorching. His latest offence was furiously driving at night on the wrong side of the road, with the result that Miss Alice Roosevelt, daughter of the President, was frightened into a fainting fit.

A motorist was fined £5 recently for driving a motorcar near Manchester at an alleged dangerous speed, and refusing to stop when called upon. A labouring man who drove a horse and trap at an alleged terrific speed in the same district and gave a false name and address was fined 5s. Comparisons are odious.

J. A. Ellis and A. G. Schmidt, of the Chicago Automobile Club, have reduced the Chicago to New York road record from 76 hours to 72 hrs. 46 mins. The distance is 1,088 miles—the average rate of travelling being 15 miles an hour. The car driven was a 45 h.p. Apperson.

The Southern Motor Club held a very successful hill climb on the Ewell and Banstead Road, on Saturday, Sept. 10th. The competitors were W. Rathbone (3½ h.p. Seymour water-cooled motor-bicycle), B. Pattison (3½ h.p. Phoenix), C. Pattison (3½ h.p. Phoenix), H. Billing (3½ h.p. Excelsior). The result was a tie between Messrs. Rathbone and Billing. The fastest time recorded was that of B. Pattison, who climbed the hill in 1 min. 31 secs. The club are arranging a very interesting winter programme of social functions. The town headquarters will be the Landor Hotel, Clapham. A photograph taken on the occasion appears on page 177.



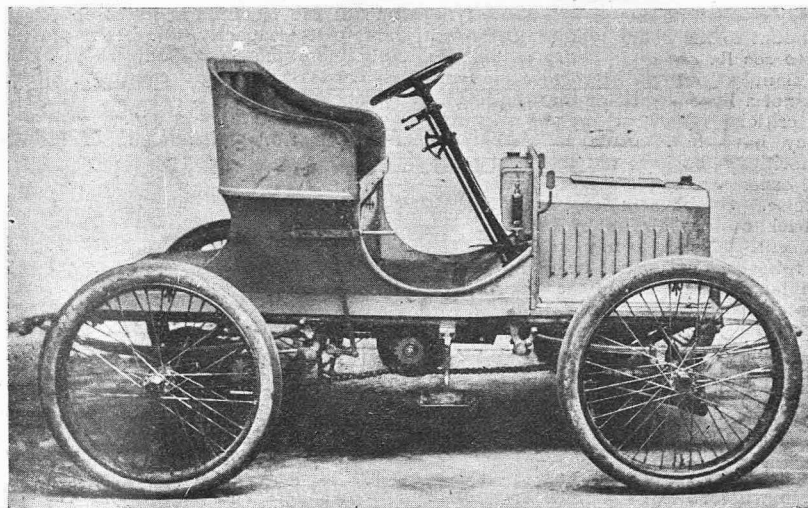
THE INTERNATIONAL MOTORCYCLE RACE.
Lamberjack qualifies in the French Eliminating Trials—to the intense enjoyment of the gentleman on the right.

THE MINERVETTE LIGHT CAR.

Minerva Motors, Ltd., are placing on the market a handsome little car at £108. It has been very thoroughly tested, and is capable of a maximum speed of 28 miles per hour. The specification is as follows. Motor.—Single cylinder, 90 mm. by 100 mm., 5 h.p., at 1,800 rev. p.m. The engine is placed in vertical position under the bonnet. The valves are mechanically operated and interchangeable. Water

turette type, 700 mm. by 65 mm. Body.—Two seats side by side, upholstered in leather. Dimensions.—From dashboard to end of springs, 4ft. 9in.; wheel base, 6ft.; total length, 7ft. 9½in.; width between centre of wheels, 3ft. 5½in.

We are not able to give any fuller description of the car in this issue, because we have not yet had a view of even the first production. It is expected that the



The new 5 h.p. "Minervette" with unfinished body.

circulation.—Thermo-syphon system. The radiator is enclosed in front under the bonnet; likewise the water tank. Ignition.—Electric, make and break contact, accumulator and coil. Carburetter.—Minerva-Longuemare, made by the company under license from Messrs. Longuemare, of Paris. The air inlet is of the latest pattern, and quite automatic in its action. Governing.—A device is fitted whereby when the clutch is withdrawn the throttle is simultaneously closed, cutting the engine down to its minimum number of revolutions. The motor is also controlled by a lever fitted to the steering column. The second lever controls the advance spark. Clutch.—Friction clutch of conical type, actuated by the pedal. Transmission.—Central chain to an intermediary shaft, on which are placed the friction clutch and a second chain which transmits the power to the back axle and to the driving wheels. The back axle is fitted with differential gearing and is strengthened by means of a secondary tubular axle, which carries the ball races in which the live axle runs. Speed gear.—The speed gear box is directly attached to the motor, and gives two speeds and reverse, wheels always in mesh. The change speed is controlled by Bowden wire operated by lever fixed to steering column. Brakes.—Two brakes are fitted, both acting on the differential drum. One is operated by a foot pedal, which also withdraws the clutch. The other brake is operated by a side lever. Steering.—By wheel on inclined steering column. Chassis.—Tubular frame, 35 mm. diameter. Laminated springs front and back each 800 mm. in length. Wheels.—Wire wheels and metal mudguards. Tyres.—Voi-

first deliveries will be over here in about three weeks, and after we have seen and tried the car we shall hope to have a good deal more to say about it.

"After a temporary residence at the *House Crescent*, the Ladies' Automobile Club of Great Britain and Ireland has moved into a handsome suite of apartments at the *Clarendon Hotel*, London. The Duchess of *Sutherland* is President of the Club." This is how an American editor informs his readers on September 3rd of the removal (several months ago) of the Ladies' Automobile Club (of which the Duchess of *Sutherland* is President) from *Carlton House Terrace* to *Claridge's Hotel*.

Germany will be strongly represented at the Turin Automobile Exhibition in February, 1905.

The number of motorcycles in Rhode Island, U.S.A., has increased over 50 per cent. during the last year.

Judicious Lubrication.

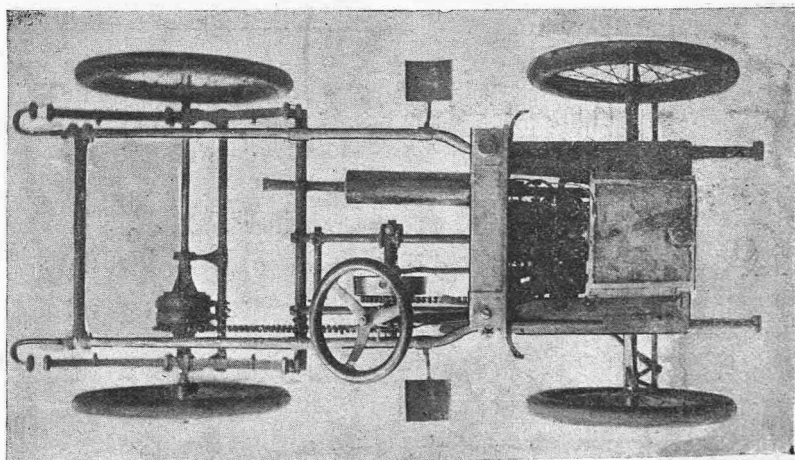
A prominent American motorcyclist recommends the use of the cyclometer on a motorcycle as a guide to lubrication. He says:—"I would make a cyclometer a part of the equipment of every machine I turned out. My three years' experience has convinced me that guesswork lubrication is the cause of a lot of trouble that could be avoided by the use of a cyclometer that would leave no room for guessing. The difference in the running of a properly oiled motor and the other kind is so great that I feel sure the cost of the cyclometer would come back to me in sales made by that best form of advertising—the praise of contented customers."

The Indictment of the Dog.

An American motor-bicyclist has obtained damages to the extent of 23 dollars 30 cents, inasmuch as "a dog of the defendant did run after the plaintiff in the public highway, and, without any cause or provocation of the plaintiff, did seize the plaintiff in the leg and the seat of the trousers, and did bite him severely, to his great mental and physical anguish, causing him to be thrown from his motorcycle on which he was at the time riding, thereby damaging the motorcycle, and the clothes of the plaintiff grievously, and causing other injuries then and there, etc., etc." English motorcyclists please copy!

Town Councillor Loses His Case.

At the Windsor Petty Sessions, Mr. Chilcott, of Lovelene, Windsor Forest, was summoned for unlawfully, recklessly, and negligently driving his motorcar in Thames Street, in a manner that was dangerous to the public at Windsor. The information was laid by Mr. Joseph Mercer Flint, who is a town councillor for the Borough of Windsor. Mr. Flint swore that the car was being driven at a very fast speed along Thames Street, and that he only escaped being knocked down by springing on both feet. He called Sergeant Barham in support of his case. Mr. Staplee Firth defended on behalf of Mr. Chilcott, and after a careful and prolonged hearing the magistrates dismissed the case with costs against Mr. Flint.



Chassis plan of the new "Minervette."

NEWS.

The Hon. C. S. Rolls informs us that he intends to convert his business into a limited liability company, and that Mr. Claude Johnson, late secretary of the Automobile Club, has consented to become a director of that company. In the meantime Mr. Johnson has become joint manager with Mr. Rolls of the present company.

A curious Police Court case was heard last week. A solicitor named Davis, secretary of the Acme Cycle Co., was prosecuted by Mr. Pearce, the director of the company, for the alleged theft of a motor-cycle. After hearing considerable evidence, the magistrate (Mr. Lane), with a strong expression of opinion as to Mr. Pearce's veracity, dismissed the case.

Royal Mail's Speed.

The driver of the Liverpool-Manchester parcels mail motor van was summoned at Liverpool last Friday for driving furiously through the city. The plea that he was "O.H.M.S." did not appease the wrath of the magistrates, who fined the erring motorists 10s. and costs. His license was also endorsed.

The Motorcyclist Exonerated from all Blame.

Mr. G. D. Holloway, who was unwittingly instrumental in causing the death of an old man at Mitcham by knocking him over with a motorcycle, has been acquitted by the Croydon magistrates. Both at the coroner's inquest and at the subsequent magisterial inquiry Mr. Holloway was absolved of all blame, and his generosity to the widow of the deceased was commended.

Herts Automobile Club Hill Climb.

The following is the official list of best times of the cars that competed in the hill climb on Aston Hill, on Saturday, September 10th. The 20 h.p. Napier, 1 min. 27² secs.; 24 h.p. Leon Bollee, 1.42³; 16 h.p. Martini, 2.22³; 9 h.p. White Steam car, 2.31⁴; 10 h.p. White Steam car, 2.50²; 10 h.p. White Steam car, 3.31²; 12 h.p. Wolseley, 3.22²; 12 h.p. Pipe, 3.26²; 12 k.p. Wolseley, 3.54².

OUR NEW LIGHT-WEIGHT MOTOR-BICYCLE.

Full Descriptive Details of a Practical 2½ h.p. Touring Machine weighing but 72 lbs.

We are now able to put before our readers the results of several months' experimenting and investigation in determining to what extent a safe reduction of weight could be carried in the construction of a thoroughly practical and safe motor-bicycle intended for all-round touring work by a careful rider of, say, 11 stone weight. Our object is to conclusively demonstrate that an alternative type of mount to the heavy type scaling from 140 to 200 lb. can undoubtedly be made if the manufacturers will recognise the fact. It is not a little surprising that the harshest criticisms of our weight-reduction policy have been made by self-styled authorities, who have not the least practical experience of the special matter they criticise. We have at least endeavoured to back up our claims by practical experiment, beyond merely asserting that the thing can or cannot be done. The manufacturer has, up to the present, we maintain, entirely neglected to cater for a large class of possible customers, who want a machine that can be handled with an ease in some degree approaching that of the pedal cycle. The market for the high-powered and heavy mount will always be a good one we admit. This is the class of machine for the riders of above the average weight, and

WHO WISH TO MAKE A HIGH AVERAGE SPEED

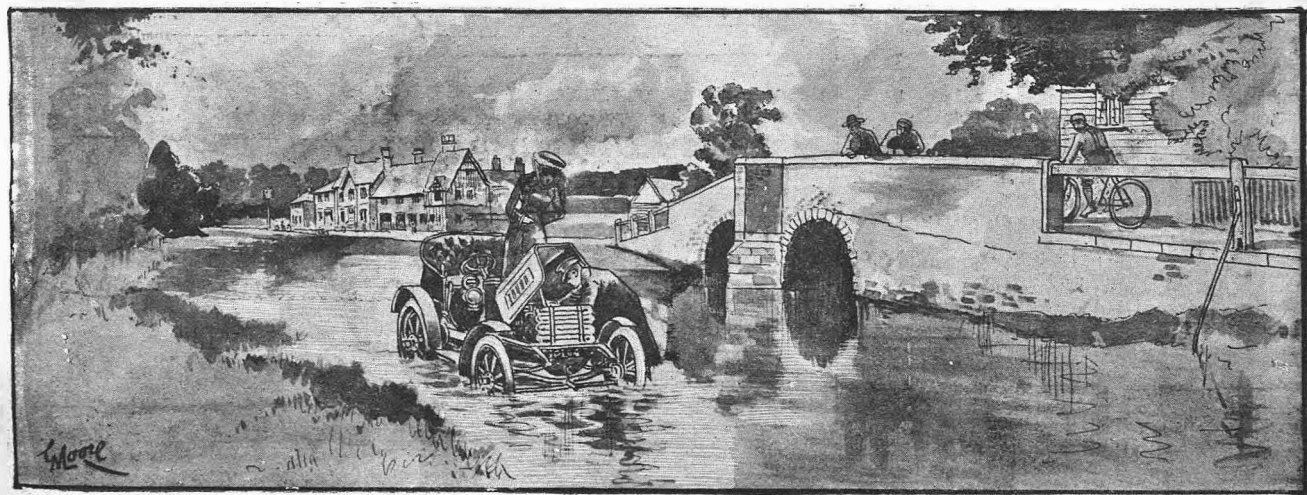
all day long up-hill and on the level. But even in this particular type of machine a substantial weight reduction can be made. There is a threadbare argument continually put forward by the upholders of the "weight-at-any-price" theory, and that is that there are at the present moment hundreds of 2 h.p. motor-bicycles throughout the manufacturers' depots that no one will have. The explanation is a simple one, and it is this. A 2 h.p. engine on a 135 lb. machine does not make an all-round efficient machine; but put that same power of engine on an 80 lb. machine, and it does make an efficient machine. The illustration from a photograph of the finished machine we have had built up will show that we have studied appearance in the design to obtain a machine with a clear

and symmetrical outline, and to avoid, as far as possible, having all the frame space occupied with tanks and boxes clipped on here and there. Accessibility of the various parts is another point we believe will strongly appeal to the motorcyclist. He should be able to get at a nut or screw quickly, and without having to perform an acrobatic feat to do it. A special feature of the machine is its comparatively large petrol capacity, this being considerably more than 1 gallon, which should give at least 150 miles' running. The following is

THE SPECIFICATION AND WEIGHTS of the various components of the machine:—

	lb. oz.
Specially designed Chater Lea frame with triple plate crown, wheels, Clincher A Won 26 by 1½ tyres, (full roadster front and special tandem back), celluloid guards, front rim brake, light pedal gear, 3-16ths roller chain	35 0
Clement-Garrard 2½ h.p. 60 by 70 mm. engine, steel bearings, special heavy fly-wheel, silencer and cut-out	23 2
Aluminium spray carburettor and supply tubes	1 0
Davidson specially light petrol tank, with gauges, and accumulator case	3 4
Oil tank and pump, sight gauge	1 2
Brooks' light saddle and N.A.B. spring seat pillar	1 14
Aluminium controlling handles and steel connecting rods	1 0
Bowden back rim brake	1 3
Fuller's Midget trembler coil	1 4
Special size accumulator	1 10
P. and R. cables and wires	0 5
Lycett V belt (two-ply)	1 0

Total ... 71 12
The frame is as rigid as a rock, and substantial gauge tubing is used at vital parts. The back wheel is strongly spoked, and should be equal to any strain. The tanks, although of thin gauge metal, have substantial corners to obviate any possible risk of springing a leak. The accumulator compartment in the lower part of the rear



A DILEMMA.

NEWS.

tank has much more space than might be thought, and can accommodate a cell 6 $\frac{1}{2}$ in. high, 4 $\frac{1}{2}$ in. across, and 2 $\frac{1}{2}$ in. wide, so that there is room for a double set of small cells. This compartment has entrance holes for the wires bushed with vulcanized fibre, so that there is no possibility of short circuits. These tanks were very difficult to make, especially the rear one, as the clearance was so limited. The Davison patent sight quantity gauges to show exactly how much petrol and oil is available should prove a great convenience. The oil tank holds 1 pint. The coil, although so small and light,

GIVES A MUCH MORE INTENSE SPARK

than several trembler coils we have tested it against, and which were more than double the weight and size. The amount of current it takes is well under $\frac{1}{2}$ ampere. In this machine we have knocked off 12lb. from the total weight of a previous experimental machine. It can be easily lifted with one hand, so there can be no doubt of its general handiness. The accumulator should last 350 miles on one charge easily, and a spare one could, of course, be carried if wanted for a long tour. We do not by any means consider that we have reached the limit of weight or type of light machine in this particular class. We are considering what can be done by utilising large diameter tubes in the frame as containers for lubricating oil, and at least a reserve petrol supply. We should like also to see what could be done in the way of making a very compact magneto electric sparker of the high tension type to replace accumulator and coil as an al-

ternative ignition. As to the length of wheel base and height of frame, we have adopted 49in. and 22in. respectively. This gives a machine taking up minimum of space, and the low build of the frame enables the rider to mount and dismount easily. A member of our staff reports taking the machine for an 80 mile spin on Sunday last. He finds its speed and hill climbing capacity exceed expectations. On the level it will easily do 30 miles an hour. As an instance of its hill climbing capacity it took Holywell Hill, St. Albans, without a touch of the pedals, although geared 1 to 5 $\frac{1}{2}$, which is fairly high.

Expiration of the Welch Patents.

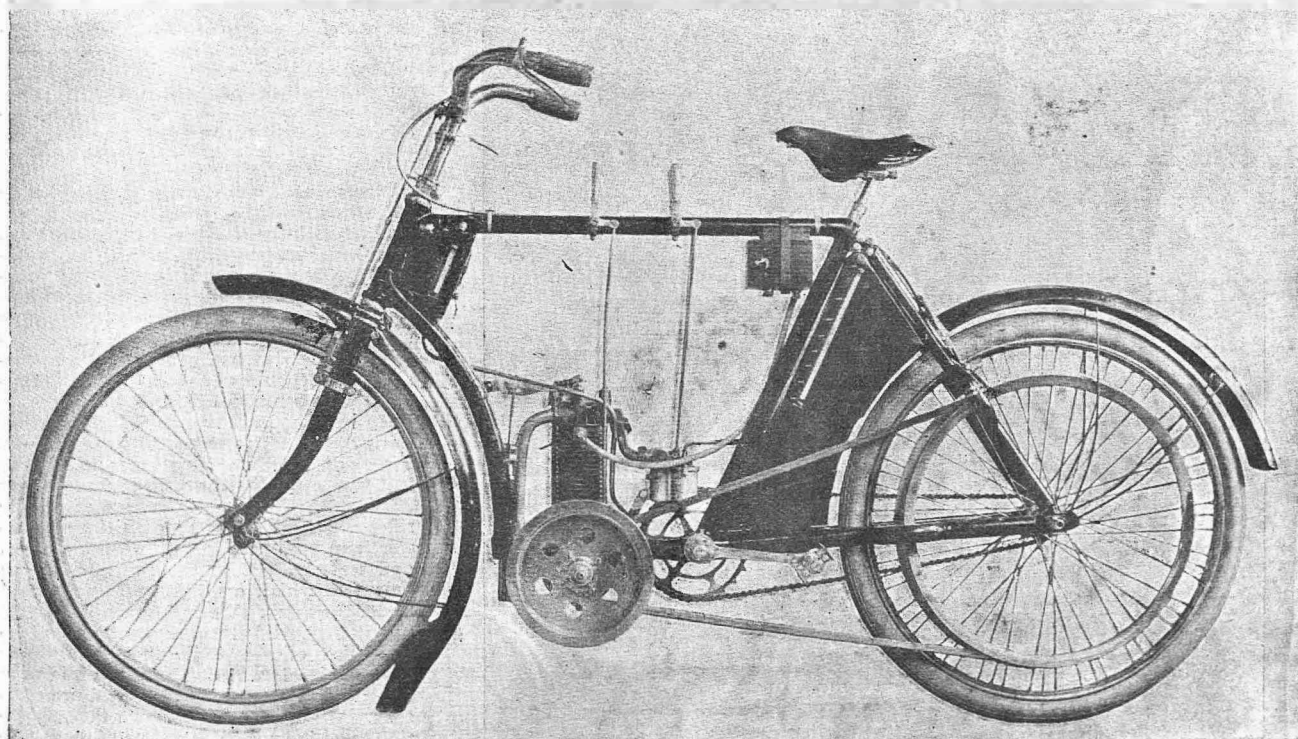
On Friday evening, the 16th instant, the directors of the Dunlop Pneumatic Tyre Co. gave a dinner at the Hotel Cecil to celebrate the expiration of the Welch patent. Mr. Welch's invention covers tyres attached to the rim by endless wires; while the invention of the Scotch-American, Mr. W. E. Bartlett (which expires about two months hence), covers tyres of the Michelin pattern, with beaded edges engaging with inturned flanges of a metal rim. Some 500 guests accepted the invitation of the Dunlop Co., and amongst these were very many prominent men in the motor trade. Mr. Arthur du Cros proposed the health of his guests, complimenting the English motor trade on the great progress they had made in recent years in overtaking the big lead obtained in the early days of the movement by their foreign competitors; he referred to an early experience of his, when Mr. Charles Jarrott took him for a ride on a car which was at that time a fair specimen of English manufacture. "Though we went at our top speed," said Mr. du Cros, "even the hearses overtook and passed us!" The

speaker referred to the modern car of British manufacture as being equal to the product of any other country. Although, as stated above, the Bartlett patent does not expire for some weeks, Mr. Harvey du Cros made the welcome announcement that from the following morning (Saturday, September 17th) Dunlop motor tyres would be sold at the same price as tyres could be obtained at in countries where no patents exist. Several speakers urged the trade to beware of the cheap and nasty tyres which would no doubt appear on the market as the result of the expiration of the two great master patents.

The Motorcycle "Gordon-Bennett": Latest Entries

Our Berlin correspondent writes as follows:—As already stated, the "Progress" Co., Charlottenburg, has entered two 5 h.p. machines, to be driven by Herr Adolf Mraz and Emil Folksdorf respectively; but both the "Brennabor" and the Neckarsulm Cycle Works desire to compete, and negotiations are proceeding with a view to inducing the Charlottenburg firm to withdraw one of its machines, or enter it as a reserve. Should the "Progress" Gesellschaft decline to give way, the Neckarsulm people will voluntarily retire. The "Brennabor" Works have entered a 5 h.p. motorcycle, with Carl Müller (Berlin) as driver; and the Neckarsulm Co. have entered a 3 h.p. motorcycle, with Martin Geiger as driver.

We are still open to consider applications for the post of Business Representative of this journal, in the London district, which we announced last week was vacant.



A 72 lb. 2 $\frac{1}{2}$ h.p. Touring Motor-bicycle, which has been made to our design and specification.

NEWS.

The International Motor-bicycle Race.

When the newly-founded "Motorcycle Club de France" conceived the idea, about six months ago, of promoting an international motorcycle race, little did its members think that it could be made a real success, at least for the first year. It was generally thought that all that could be done in 1904 would be to launch the idea, and that this year's race would be little more than a contest between French makers.

However, things have assumed an entirely different aspect since last spring, as will readily be understood when we remind our readers that the race on Sunday next will bring together

TEAMS OF FIVE DIFFERENT NATIONS, namely, France, England, Denmark, Italy, and Germany.

The absence of Belgium is much to be regretted, since this country has made quite a hit in the manufacture of the motor-bicycle and, on paper, had a splendid chance of winning the race. It is to be hoped that next year's contest will see their colours represented. The course for next Sunday's race is exactly the same as that published a week ago in "THE MOTOR" for the French eliminating trials.

The conditions of the race allow three machines only to each nation (as in the motorcar Gordon-Bennett) and each machine must be provided with two brakes and pedals. Five laps of a 34-miles' course have to be covered, and three controls (representing a delay of 16 minutes

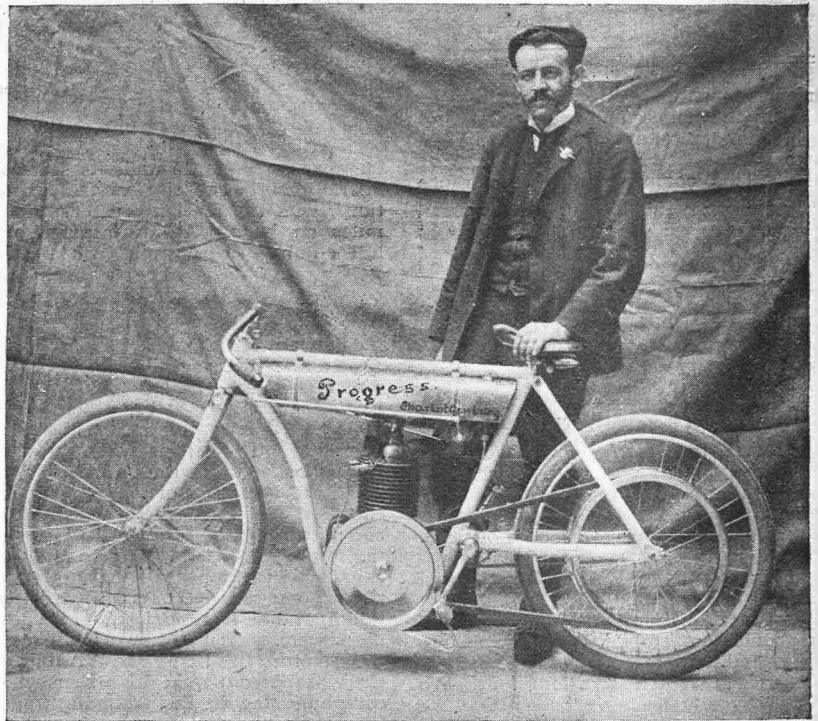
each lap) are included in the triangular course. Competitors will be started at one minute intervals. Teams and colours are as follow:—*Austria* (black): not finally selected. *Denmark* (red): Mich Petersen (Danish Humber motor-bicycle). *France* (blue): Lamberjack, Inghilbert

and Demester—all on Crifton machines. *Germany* (white): Tolksdorf and Mraz (Progress-Charlottenburg motor-bicycles). *Great Britain* (green): Harding (Lagonda), Hodgkinson (J.A.P.), and Silver (Quadrant).

We give photographs of Mr. Hodgkinson, one of the English competitors, and the J.A.P. motorcycle which he will ride in the race; and of Adolf Mraz, the German, standing behind his Progress, which is identical with that of Tolksdorf. Late information has been received to the effect that Laurin and Klement are building machines to represent Austria.

No Further Trials.

Messrs. De Dion Bouton, Ltd., write us as follows:—"In your leading article dealing with the recent 600 miles Hereford small car trials, organised by the Automobile Club, we notice that in commenting on the performances of the two 6 h.p. De Dion cars you hint that there has been some 'suggestion of a private attempt to repeat the trial without official supervision,' on account of the ill-luck which attended the 6 h.p. De Dion driven by Miss Dorothy Levitt throughout the trials, during the last round. This was one of those unfortunate circumstances which we feel sure could not have been foreseen by anyone. We were quite aware of all the rules and conditions under which the trials were run, and prepared to abide by same, and we now accept the position as the only one which could be assigned to us under the rules. We feel sure that the reports of the trials themselves, and the performance of the individual cars, have been so closely watched by the public as to render any private unofficial trial unnecessary. We can only put down the suggestion to which you refer as one of those idle rumours which has not the slightest foundation in fact."



Adolf Mraz and his Progress-Charlottenburg motor-bicycle.



Mr. Hodgkinson and the J.A.P. motor-bicycle which he will ride in the International Motorcycle Race.

NEWS.

THE MOTORCYCLE "GORDON-BENNETT":

The French Eliminating Trial.

The "Little Gordon-Bennett," as they are calling it in France, is attracting increased interest as the eventful day (September 25th) draws near. The eliminating trial, to decide which of the 15 French entrants should represent France, was held on Sunday, September 11th, over the same course as that selected for the cup race itself. Three Buchets, three Peugeotts, three Griffons, three Lamaudieres, one Aiglon, one Rigal, and one Mayeski made up the sum total of the competitors. The Peugeot people were fortunate in being able to command the services of three such capable motorcyclists as Cissac, Lanfranchi and Yourassof; the Griffons had an equally powerful team in Lamberjack, Demester and Inghilbert; and the mighty Anzani held out hopes of at least one Buchet machine qualifying for the international race. Nevertheless, the trial really resolved itself into

A STRUGGLE BETWEEN GRIFFON AND PEUGEOT.

At the outset the supporters of the latter machine were dealt a cruel blow. Early on the morning of the trial—indeed, within an hour of the actual start—Cissac's bicycle was put hors de combat: a careless smoker set the petrol tank ablaze, and before the flames could be extinguished irreparable injury had been done. The Peugeot "star" had to play the part of onlooker, and the Peugeot firm's chances were reduced from 3 in 15 to 2 in 14.

The course, of which we gave a diagram in last week's issue of "THE MOTOR," is a triangular one of some 34 miles, situated in the Dourdan Forest vicinity. Starting near St. Arnoult, in the north, the road runs south-east to a point beyond La Forêt-le-roi, and then turns sharply westward through Boutervilliers, Authon-la-plaine, and Paray, previous to turning north for Ablis, and thence north-east back to St. Arnoult. By covering this triangle five times a total distance of some 170 miles is achieved.

In spite of the earliness of the hour, a large number of spectators, including many ladies, had assembled at the starting point when, at 6 a.m. precisely,

MONS. TAMPIER GAVE THE SIGNAL.

to Balajat, on a Buchet. He was followed at one-minute intervals by Louchet (Buchet), Anzani (Buchet), Lanfranchi (Peugeot), Yourassof (Peugeot), Lachiche (Aiglon), Demester (Griffon), Lamberjack (Griffon), Inghilbert (Griffon), Canesse (Lamaudiere), Manger (Lamaudiere), Berger (Lamaudiere), Rigal (Rigal), and Mayeski (Mayeski). Anzani lost the best part of a minute, and Rigal the best part of half an hour in starting; the rest got off promptly. Lanfranchi and Yourassof, on the Peugeotts, and the three Griffon representatives gave early evidence of superiority; but two of the Buchet machines were travelling well, and had to be reckoned on in case of mishap to the leaders. By the end of the third round, however, there were only five machines practically in the running, three Griffons

and two Peugeotts, the former having a ten minutes' lead. The actual leader was Lamberjack, who was

TRAVELLING WITH GREAT REGULARITY,

and doing his laps in an average of 58 minutes, including control time. In the third lap Inghilbert put in a marvellous piece of running, and though he did not succeed in passing Lamberjack, he actually led, being within 30 seconds of him, and having started one minute later; his fourth lap, however, was a slow one, and Lamberjack established a clear lead of ten minutes. By this time all the other competitors except the two Peugeotts had dropped out, and the three Griffons had a clear lead of half an hour on their rivals. Lamberjack eventually finished in a net time of 3 hrs. 30 mins. 14½ secs.; Inghilbert was second in 3 hrs. 38 mins. 34½ secs.; and Demester third in 3 hrs. 41 mins. 21½ secs. Yourassof was the first Peugeot rider to finish, his net time being 4 hrs. 4 mins. 42½ secs.; Lanfranchi (who broke his saddle in the second lap and had to finish on the pin) taking 4 hrs. 20 mins. 22½ secs. Thus the

GRIFFON TRIO QUALIFY FOR THE CUP RACE.

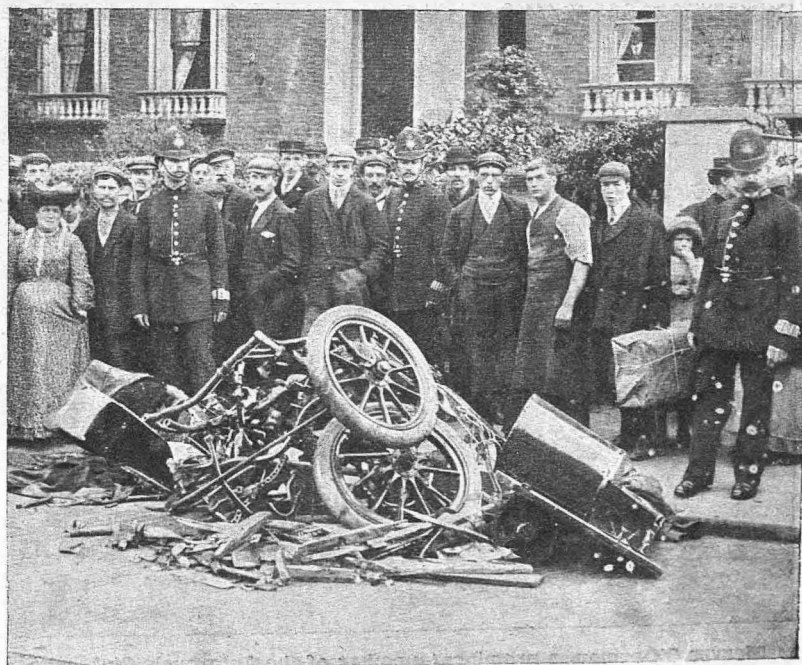
Lamberjack's average speed works out at 74.88 kilometres (about 47 miles) an hour. His net time (deducting 16 minutes each lap for delay in controls) for the various laps were:—(1) 41 mins. 30 secs.; (2) 39 mins. 54 secs.; (3) 43 mins. 51 secs.; (4) 43 mins. 19 secs.; (5) 43 mins. 39½ secs. The average speed of the second lap is within a fraction of 50 miles an hour.

The arrangements of the French Motorcycle Club were very satisfactory.

The Smash at Shepherd's Bush: Car Crushed Between Trams.

The dangers of the electric car tramway system were still further exemplified on Friday last by an alarming accident in which a motorcar was pinned between two tramcars. In view of the

nature of the accident and the brisk speed at which all three vehicles were moving, it is matter for congratulation that no fatalities actually occurred, although we regret to say that one of the passengers in the motorcar was badly hurt both internally and on the head, and (at the time of writing) is in a serious condition. The scene of the accident was Goldhawk Road, Shepherd's Bush. The motorcar, an 8-h.p. Bouchet, was being driven from Kew by Mr. Gilbert Gracie, and accompanying him were Mr. James Gracie, his father (the owner of the car), and Mr. Albert Whaile, of Wembley. The car was travelling behind an electric car. No evidence of excessive speed is forthcoming, and in view of the fact that the motorcar was keeping well behind it is reasonable to suppose that the pace was about 12 or 14 miles an hour. Suddenly the electric car slowed up, as these cars invariably do, without any warning. The driver of the motorcar swung out to the right to get past, and was immediately confronted by another electric car from the opposite direction—this vehicle too (presumably) giving no indication of its advance. The speed of the oncoming electric car was such that a disaster was inevitable; indeed, under these circumstances, the tram-line system constitutes a death-trap from which there is no possible escape. The motorcar was caught between the two trams, and literally crushed to bits. The driver was found to be comparatively uninjured, and Mr. Gracie, sen., sustained only cuts and bruises about the face and legs, but Mr. Whaile did not escape so luckily; he was pinned under the debris of the motorcar, and had apparently received a bad blow on the head, as well as internal injuries. The drivers and passengers on the tramcars were not hurt. Mr. Whaile was taken to the West London Hospital, where his condition on Saturday was described as critical.



The debris after the smash at Shepherd's Bush.

NEWS.

THE AUTO-CYCLE CLUB MEMBERS' RELIABILITY TRIAL.

Thursday and Friday last were the dates fixed for this sporting event, which an irreverent person promptly christened "the bob a nob trial." The rules governing the event were commendably simple: a maximum and minimum time schedule were given for the intermediate and total distances; each time a man stopped or dismounted outside the luncheon and tea controls he was fined one shilling, and the last man in on each of the two days was fined five shillings; these fines, with a contribution from the Club, being devoted to prizes for the leaders. An entry of 15 was received.

THE FIRST DAY'S RUN

was via Basingstoke to Salisbury (64½ miles) where a stop of one hour was made for luncheon; then on to Shaftesbury, Sherborne, and Yeovil (tea stop of 30 minutes here, 105¾ miles), and thence through Crewkerne, Chard, and Honiton to Exeter (a total of 152 miles for the day). The minimum time allowed was 9½ hours, inclusive of meal stoppages, and the maximum 12½ hours. The second day's route was from Exeter back to Honiton, and thence to Axminster, Bridport, Dorchester (luncheon stop, 53½ miles), Wimborne Minster, and Ringwood, finishing at Southampton (100½ miles); minimum time (including one hour for luncheon) 6 hours 10 minutes, maximum time 8½ hours.

Thursday opened delightfully overhead, but owing to the deluge of rain which fell on Wednesday the roads from London

to the starting point (16 miles) were in that slimy, slithering condition that every motorcyclist abhors; one competitor before reaching Staines actually turned back to London and was seen no more. The greasiness of the roads doubtless contributed to reducing the number of starters, these being H. P. Rose, J. Leonard, H. J. Densham, Mervyn O'Gorman, M. Ponder, W. Hayes, and F. Applebee; but beyond Egham there was considerable improvement in the roads.

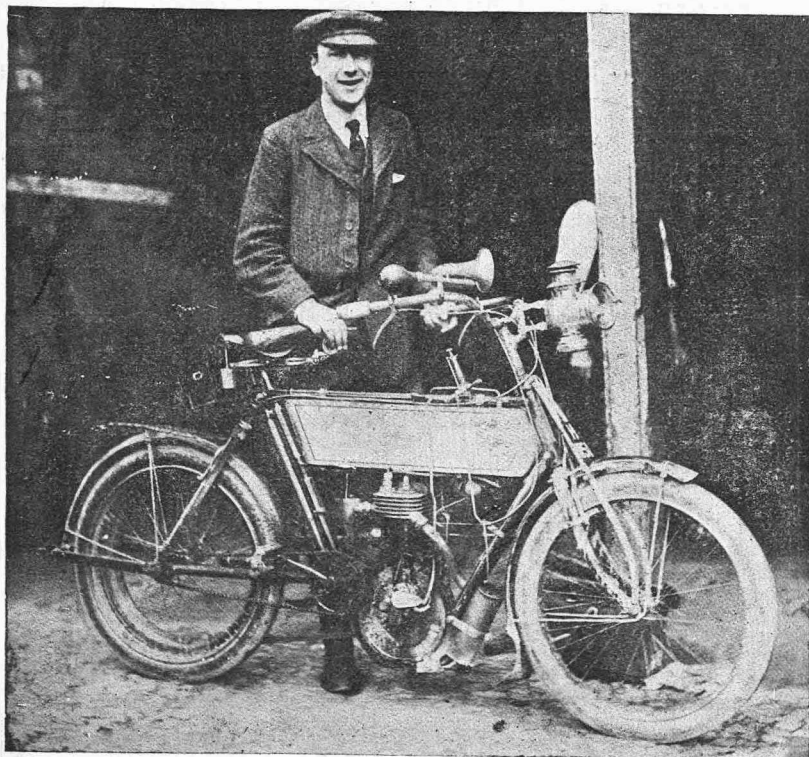
The sun was now shining brilliantly; and with the exception of occasional patches under the trees the going was very good. Mr. O'Gorman and Mr. Applebee spent a shilling each before reaching Salisbury through a broken sparking plug and broken belt hook respectively. Mr. Hayes retired from the contest at Salisbury; Messrs. O'Gorman, Leonard and Densham each disbursed a

shilling for Chard Hill. Mr. Rose was 45 minutes late, and as he dismounted on Chard Hill he was 6s. out of pocket.

Friday was a magnificent day, but it is to be feared that the six starters found little time for scenery, their energies being fully occupied in pushing up the fearsome heights they encountered at Bridport and onwards. Ponder had found discretion the better part of valour, and stopped at Crewkerne on Thursday night, not venturing to take risks on an unknown road in the dark. He decided to forfeit 5s. and had a good night's rest. Mervyn O'Gorman, Ponder, J. J. Leonard, H. J. Densham, and F. W. Applebee started at the proper time. H. P. Rose had some little trouble with the inlet dome of his machine, and followed on later, eventually retiring with a broken inlet valve. Applebee found the hills "a big order," and after reckoning up that if he went right through to Southampton he would find most of the prize money, he elected to retire. Amongst the tortuous questions looming in front of the Club committee is the poser herewith. Applebee, Rose and Hayes retired from the contest, and have all incurred sundry single shilling fines for stoppages, but as they are no longer competitors are they still liable to the other men who finished? And if not, why not? Rose was the last man to finish on Thursday, but as he did not get through on Friday, what happens to his 5s. fine as to the first day's proceedings? And as Ponder did not arrive at all on Thursday, do his single shilling fines continue to accumulate for finishing after schedule time? And is he liable for 5s.? Can the other men claim his odd shilling fines on Friday as well as Thursday? Does Rose pay 5s. for Thursday and 5s. for Friday as last man in on Thursday and dropping out on Friday? Does Hayes only pay 5s. for Thursday for retiring at Salisbury, and nothing at all for Friday? If so, why should he not pay as much as Rose, if Rose pays anything at all? And so on ad infinitum. But to return to the trial. O'Gorman, Leonard, Densham, and Ponder completed the run at Southampton at 4.15; but we are unable yet to give the actual official results. In conclusion, we should like to ask whether the club committee has seriously considered the necessity of having a non-stop sitting of its own for discussion of the delicate questions alluded to; and will a 1s. fine be imposed on members who go home for sleep at intervals during the week?



The Auto-cycle Club Members' Reliability Trial. Preparing to start at Exeter.



Mervyn O'Gorman, a prominent member of the Auto-cycle Club, who took part in the Reliability Trial.

THE MINERVA CO.'S NEW DEPARTURES FOR 1905.

Minerva Motors, Ltd., have several distinctly good things for 1905, of which we are able to give details and illustrations. These include the Minervette light two-seated car at £108, the Minerva two-speed motorcycle engine gear, motorcycle spring fork, motorcycle with magneto ignition.

THE MINERVA SPRING FRONT FORK

Two pairs of front forks are used. One pair, of oval section, is fitted to the cycle in the ordinary manner, and carries at the lower end two lugs. These lugs carry the front wheel, and are bored for the purpose of supporting vertically the second pair of forks of round section. These lugs have a vertical movement on the secondary pair of forks, and are kept in position by means of four spiral springs



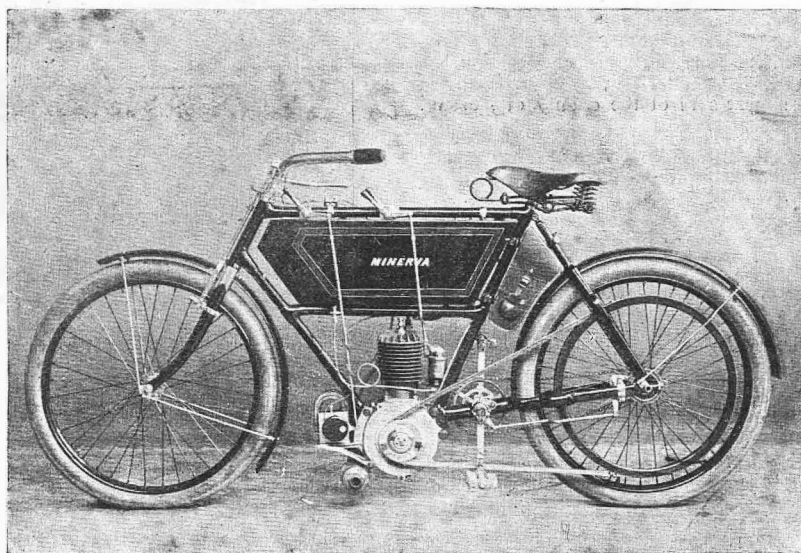
The Minerva Spring Front Fork.

which are placed inside the tube. At the crown of the cycle a laminated spring is attached, which extends some ten inches in front of the frame, and at the further end of this spring is fixed the second pair of forks.

THE TWO-SPEED MOTORCYCLE GEAR.

The gear is composed of two large gear wheels, always in mesh, and is fitted to the interior of the crank case of the motor. The same operation of lubricating the motor also lubricates the gear. The principle of the gear is to transform the vertical movement of the connecting rod to a rotary movement. Attached to the big end of the connecting rod is a small pinion. This engages with an internal toothed ring, the fly-wheel being recessed to take the latter. It will therefore be seen that the internal toothed ring and the fly-wheel are always revolving in the same direction at two different speeds. A hollow shaft fixed to the internal toothed ring is carried to the exterior of the crank case, and a solid shaft attached to the fly-wheel runs through the hollow shaft. Fixed to each shaft is a pulley to take a flat belt. To change speed, the belt is slipped by a lever from one pulley to the other. The width of the driving rim pulley equals the width of the two engine pulleys, so as to ensure the belt always running in line. The control of the two speeds is by means of a Bowden wire operated from the handlebar. The company will supply this gear during the 1905 season, at the buyer's option, with the 2½ h.p. motor, at an extra charge of £5.

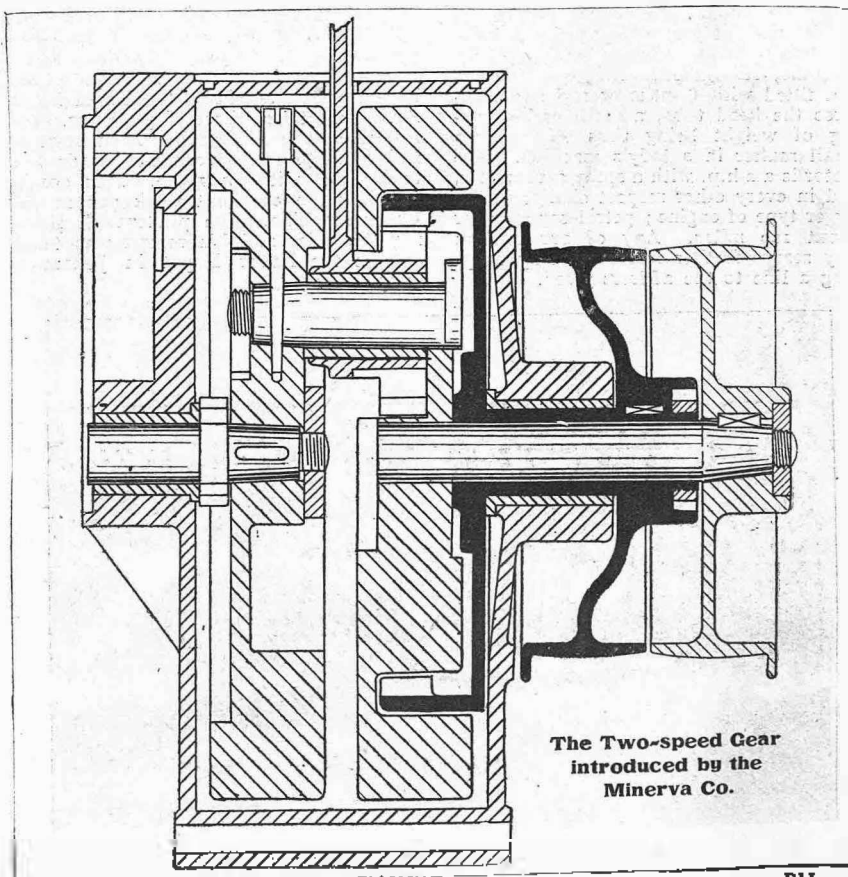
with the Eisemann high tension ignition. The coil is fitted in a compartment of the tank case. The dynamo is mounted on a bed plate alongside the engine, and is



A Minerva Motorcycle with magneto ignition.

The remaining feature of the new Minerva engine is the adoption of the magneto system of ignition, which can be obtained at a slightly different price to that charged for coil and accumulators. The illustration depicts a machine fitted

driven by a small chain. The company, however, have patented an entirely new method of transmission for driving the dynamo, which is claimed to be a great advance on the chain or other systems. We shall publish details shortly.



The Two-speed Gear
introduced by the
Minerva Co.

NEWS.

The Vanderbilt Cup course on Long Island has been handed over to the American Automobile Association between the hours of 5 a.m. and 3 p.m. on Saturday, October 8th, by the consent of the supervisors of the county of Nassau.

Mr. E. W. Wrenn, High Street, Alton, writes to say that a motorcyclist riding through Alton on Thursday, September 15th, at a quarter to 2, dropped an inner tube. Perhaps this may meet the owner's eye, in which case he is asked either to write or fetch the tube.

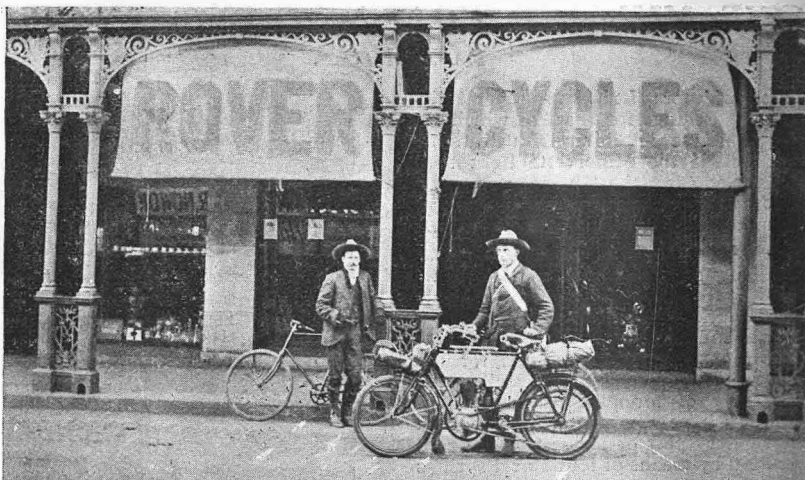
Milwaukee, the great beer city of the western states of America, is about to invest a million dollars in motorcars, in addition to laying down extensive plant for the manufacture of cars of its own. An irrepressible western editor remarks that this is calculated to give an immense impetus to the "bier" industry.

Strong Measures Advocated.

W. H. Hotchkiss, President of the Buffalo (New York) Automobile Club, proposes four remedies for the present epidemic of fast driving in Buffalo: (1) Publication of owners' names and numbers of all registered cars, lists to be supplied to the public for purposes of identification. (2) Prevent youthful and incompetent persons from driving. (3) Substantial fines. (4) Imprisonment. Mr. Hotchkiss thinks No. 4 would be the most effective.

A New Motor-bicycle for Ladies.

The Stevens Motor Co., Pelham Street, Wolverhampton, have introduced a special type of motor-bicycle for a lady. The bicycle is an ordinary lady's roadster machine, strengthened in various parts, and fitted with Cantilever forks to reinforce the head tube, a considerable saving of weight being thus effected—no small matter in a lady's machine. The motor is a 2 h.p. with a spray carburetter, and in every other respect similar to the larger type of engine; petrol capacity for about 100 miles. Any of our readers may secure further information by dropping a line to the address given.



Mr. Stanley Richards, who recently drove from Johannesburg to Durban on his Rover Motor-bicycle. Photographed at Johannesburg.

The projected International Motor Exhibition in Berlin (Ausstellungs-Park) is to be held from February 4th to 19th.

Going in for Heavy Cars.

The Brush Electrical Engineering Co. announce that they have decided to discontinue the manufacture and sale of light motorcars, and intend in future to devote their time to the manufacture of motor omnibuses and heavy motor vehicles. This work will be carried out at Falcon Works, Loughborough, Leicestershire.

Johannesburg to Durban on a Rover Motor-bicycle.

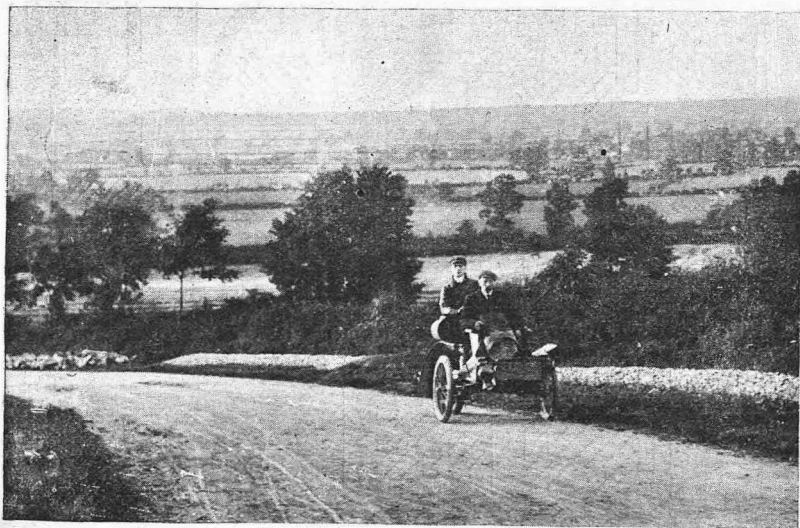
A very successful ride was recently accomplished by Mr. Stanley Richards, of Johannesburg, on an Imperial Rover motor-bicycle. He rode from Johannesburg through the hilliest parts of South Africa, a total distance of 480 miles. The machine gave no trouble from start to finish, despite the very bad roads and tracks met with en route. This speaks well for the excellent work put in the Rover machine. The photograph showing the rider and his mount was taken outside the Rover Depot in Johannesburg.

A Good Performance by the New Rexette.

The Rex Motor Manufacturing Co., Ltd., Coventry, are subjecting their new Rexette (1905 model) to a series of severe tests. One of these took place recently, when the small motor, with two passengers on board, successfully climbed Edg Hill or, as it is better known, Sunrising Hill between Stratford and Banbury. This is the test hill of the Midland Automobile Club, and is about 1,000 yards long, with a gradient in the steepest part of one in eight. The illustration shows the car making good progress up one of the steepest rises. That a small car of this description should succeed in mounting this hill with passengers and luggage on board is ample testimony to the splendid hill-climbing qualities of the 1905 Rexette. We hope to fully illustrate and describe the new model in an early issue. We had a Rexette under our own observation recently, and were thoroughly pleased with its capabilities and the evidence of its reliability.

Controlability Tests at Chicago.

Five motorcars of varying weights and horse powers took part in a demonstration at Chicago the other week, the object being to show how quickly a car can be pulled up at different speeds. The affair was organised by the Chicago Automobile Club, and several municipal officials were present by invitation. As the cars were of different weights and power, and were driven at slightly different speeds, the trial must not be regarded as a contest between one make of car and another, but rather as a demonstration of the capability of any make of car to be pulled up quickly even at high speeds. The following results were obtained:—Winton (24 h.p., weighing 2,380 lb.), 10 miles per hour, 6 feet to stop; 15 m.p.h., 24 feet; 20 m.p.h., 40 feet; 29 m.p.h., 84½ feet. Pope-Toledo (24 h.p., 2,300 lb.), 10½ m.p.h., 19½ feet; 14 m.p.h., 21 feet; 22 m.p.h., 64½ feet; 30 m.p.h., 120 feet. Apperson (60 h.p., 4,000 lb.), 10 m.p.h., 16½ feet; 26 m.p.h., 67½ feet; 37 m.p.h., 132 feet. Thomas (24 h.p., 2,250 lb.), 9 m.p.h., 9½ feet; 25 m.p.h., 84 feet. Packard (24 h.p., 1,900 lb.), 10 m.p.h., 9½ feet; 13 m.p.h., 24½ feet; 28 m.p.h., 82½ feet.

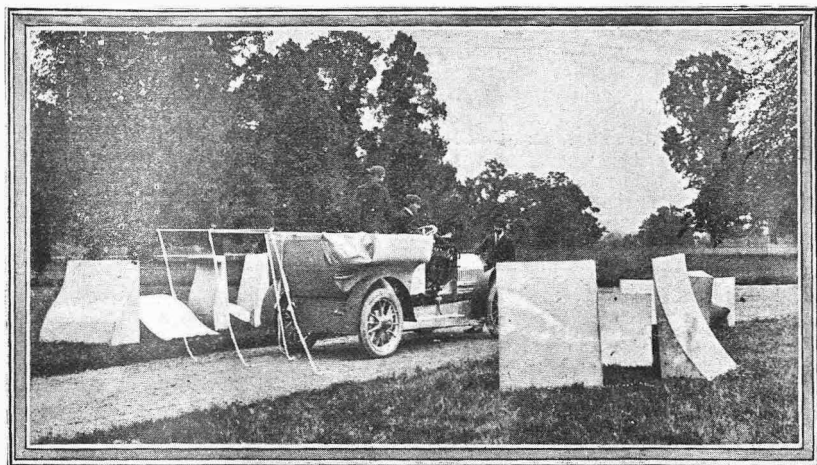


The New Rexette climbing Sunrising Hill.

NEWS.

A Fine All-round Performance.

With reference to the performance of the two 6 h.p. Wolseley cars in the recent Reliability Trials, it is interesting to note that these two cars went through without the slightest breakdown in any respect. The one non-stop run lost by one of the cars was entirely due to the fact that the driver forgot to take in petrol at one of the calling places.



THE DUST TRIALS OF THE AUTOMOBILE CLUB.

The Dennis Car used in the trials with a trial body attached and with the speed-denoting ribbons. Other trial body shapes are standing by the roadside.

Dust Trials at Guildford.

The dust trials organised by the Dust Committee of the Automobile Club have started. For the opening day a road at Sutton Place, Guildford, lent by Sir Alfred Harmsworth, was utilised, several photos being taken. Differently shaped sides and backs, constructed by Dennis, Bros., of Guildford, were employed on the same chassis, as will be seen in one of our illustrations. The other illustration shows the car travelling at full speed over the prepared surface.

The nature of the material spread over the prepared surface of the road has not been made public, nor will the results of the trial be known until the various photos have been developed and examined by the judging committee. We may add that in addition to the evidence afforded by the photographs, the amount of draught created by each different shape of body was indicated by an arrangement of ribbons hanging from the back of the car.

The Light Car Trials' Report.

The Automobile Club has agreed to the suggestion that it should issue to the public copies of the report of the judges in connection with the recent light car trials, and on receipt of three stamps a copy will be sent post free to any address. Application should be made to the Technical Secretary, Automobile Club, 18, Down Street, Piccadilly, London, W. The report is so full of interesting matter that we strongly recommend all who use or who contemplate the purchase of a light car to apply for a copy, because the information is so voluminous that no journal could hope to deal with it fully.

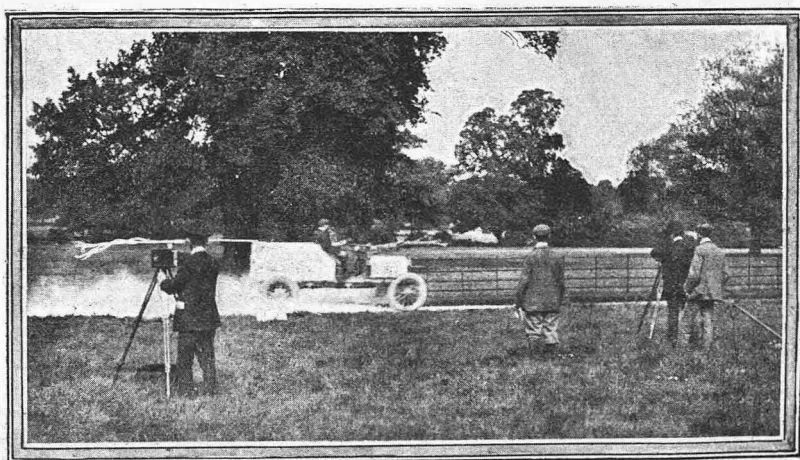
Earl Kiser, who has jumped into fame in American motor racing circles as the result of one or two sensational wins on Winton Bullet cars, is referred to as "a machine-made man. He certainly has an iron nerve.

The Triumph motor-bicycle was successful in a 200 mile road ride between Belfast and Dublin, promoted by the Motorcycle Union of Ireland, on September 10th. The machine was a 3 h.p. one, and ran from start to finish without a hitch. The rider, Mr. J. S. Garrett, was the only candidate to finish inside the time allowed.

dured by the competitors in previous runs, such as the Irish Cyclist Prize, the Ariel Cup, etc., a number of members were choked off this run, so only six competitors turned up at the start, to be sent off by J. B. Dunlop, junr. These were T. K. Turpin (2½ F.N.), C. F. H. Lewis (2½ F.N.), L. D. Harty (2½ F.N.), J. H. Cathcart (2½ F.N.), J. L. Dixon, junr. (3 h.p. Hobart), E. Oakes (2 h.p. F.N.) The first four riders mentioned kept together throughout, and completed the 100 miles without a stop of any kind, except the official stop of 30 minutes at Maryborough, where they were entertained by Mr. D. K. Turpin, whose residence is in Maryborough. Dixon arrived at the turning point late, reporting two stops, Oakes arrived outside the time-limit and so retired. Turpin, Harty, Lewis, and Cathcart finished together at Inchicore Bridge within a minute of the minimum time, timed by C. G. Grey (the hon. sec.) and Mr. Coleman O'Connell, and so divide the prize. This is the last long competition of the year for motor-bicycles that will be promoted by the M.C.U. of Ireland. On Saturday, Oct. 8th, however, there will be a 100-mile reliability run for motorcycles built for two (fore-carriages, side-cars, trailers, or coupled-cycles). The prize will be a valuable challenge cup presented to the Union by Mr. Lewis, of Dublin (to be won twice) and a prize equal in value to double the entry fees, presented by the Union to the winners. The M.C.U. of Ireland will be glad to receive entries from English (or Scottish or Welsh) motorists who care to compete (subscription to Union 10s., entry fee 1s.) It is accepted as an axiom in Ireland that 100 miles of Irish roads will find the weak spots in a machine sooner than a month's driving in England, and in view of the number of makers who still insist on turning out tri-cars and so forth without any springs except for the passenger's seat it would be interesting to see how English competitors would come through in comparison with the native riders who have acquired the knack of saving their machines on Irish roads. The Hon. Sec. of the M.C.U. of Ireland (C. G. Grey, 15, Marlborough Road, Donnybrook, Dublin) will be pleased to furnish further information.

Motor Cycle Union of Ireland.

On Saturday, Sept. 10th, the Motor Cycle Union of Ireland brought off their consolation run, commonly called the "Crock's Competition," for those riders and machines who have not as yet won a prize of any kind during the 1904 season. The run was from Inchicore Bridge, Dublin, to Maryborough and back (100 miles in all) for a prize subscribed for by members of the committee of the M.C.U. of Ireland. Owing to the hardships en-



THE DUST TRIALS AT GUILDFORD.

The trial car at full speed. The speed denoting tapes will be observed streaming in the wind and two of the photographers at intervals will be seen.

NEWS.

Brooklyn (U.S.A.) boasts of a 12-year-old girl, Miss Olive Ready, who rides a motor-bicycle.

The Winner of the "Albert Brown" Trophy.

W. King, of Cambridge, was awarded the "Albert Brown" Trophy as the winner in the Motor Cycling Club 150 miles reliability trial held at Redbourn on Saturday, September 10th. The machine had, as a condition of entry, to be British made in every detail. The photograph depicts the winner and his machine. This is a $3\frac{1}{2}$ h.p. "King" fitted with M.M.C. engine and belt transmission. It is a powerful and strongly-constructed mount, scaling about 180 lb. The feature which mainly contributed to its success, apart from general reliability, was the rapidity with which it could be controlled in the starting and stopping test.

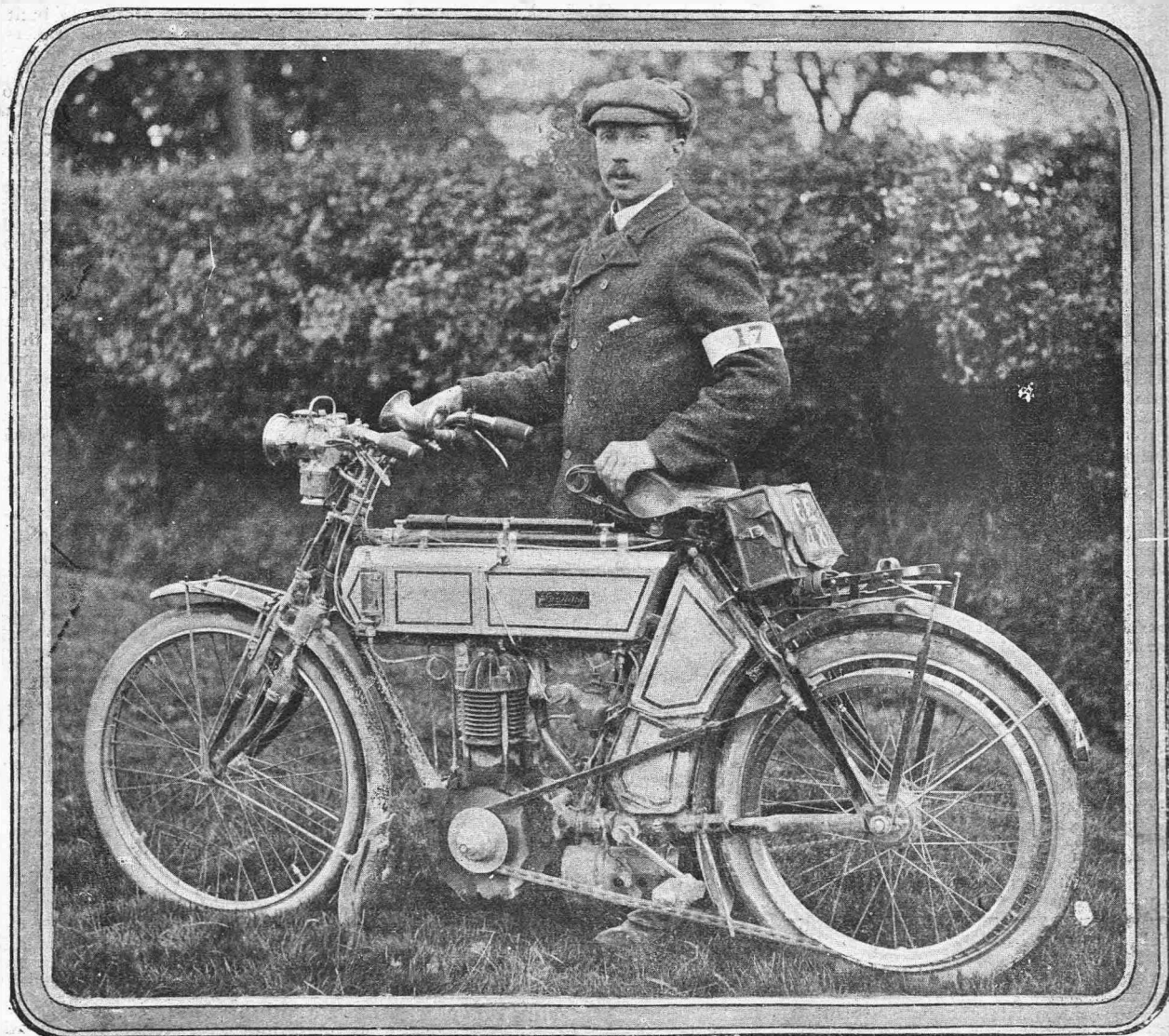
They have big ideas in America, but when we read recently in a New York motor journal the headline, "Solar Planet to be Enlarged," we confess we thought for the moment that some enterprising Yan' had bitten off more than he could chew. On reading further, however, we concluded that the compositor had been playing the giddy goat again, as the par referred to the enlargement of the "plant" for manufacturing "Solar" motor lamps.

The recent sad moting fatality at Kenilworth, in which a car ran into a horse and trap, killing the driver of the latter and severely injuring the passenger, the coroner's inquest was again adjourned last week. The driver of the car (Mr. Stevens) has been arrested in connection with the charge of feloniously "killing and slaying" the occupant of the car, but has been released on bail. We understand that Mr. Stevens's father has been very generous in regard to compensating the family of the deceased and also that of the injured man.

A hill-climbing trial was held last week in Italy at Florence. The distance climbed was 15 kilometres (9½ miles). The heavy car section was won by Lancia on a Fiat in 13 mins. 20 secs. Teste (Panhard) won the medium car class in 14 mins. 17 secs., in spite of a punctured tyre; and the light car prize fell to Hemery, on a Darracq, in 16 mins. 8 secs.

An Observation Car.

The Fischer Motor Vehicle Co., of Hoboken (New Jersey), has introduced a "Terrace" motorcar—so-called because the seats are arranged in tiers, each tier being five inches higher than the one in front of it. It constitutes, in fact, a motor "char-à-banc." The new car has eight rows of seats, holding five passengers each; a gangway runs up the centre from the front, so that there is no difficulty in reaching any given seat. This "observation automobile," to give it its American name, has been built for the New York Auto Transfer Co.



Mr. W. King and his $3\frac{1}{2}$ h.p. "King" motor-bicycle on which he recently won the "Albert Brown" Trophy in a series of starting and stopping tests, after having travelled 150 miles without a stop.

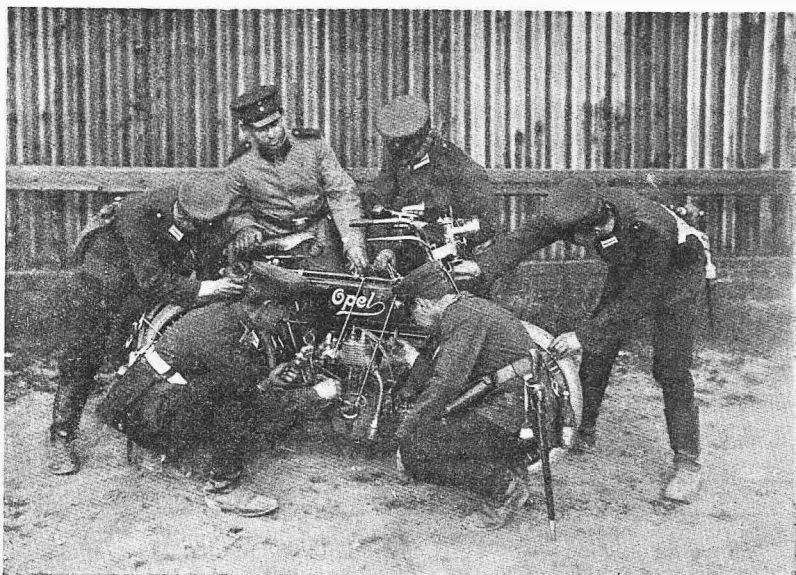
NEWS.

Perilous Position of a Point Policeman.

The risks which a policeman on point duty incur are exemplified in the following accident, which occurred recently in Sunderland—fortunately without serious results. A police constable on duty at the junction of High Street, Fawcett Street, and Bridge Street, signalled to a motorcyclist who was coming down High Street at a brisk bat to stop to allow two trams coming up the other two streets to cross the corner. Robert, after signalling to the motorist, turned his back on him, and devoted his attention to the trams. The next thing he knew was that he had been violently punched in the back and thrown in the path of one of the approaching cars, the life guard of which was just coming into contact with him when the car was pulled up. Though considerably shaken, he was none the worse for the accident—the cause of which was the failure of the motorcyclist's brakes.

Accident to Baron von Brandenstein.

On September 6th Baron von Brandenstein, the secretary general of the German Automobile Club, and upon whose shoulders rested the main burden of the work of organisation connected with the recent Gordon-Bennett race, was the victim of a regrettable accident while motoring down to his father's country seat in Mecklenburg. Shortly before reaching Friesack, a woman wheeling a perambulator came towards him. At the sight of the car the woman stood irresolute on the road. He tooted and slowed down. As the Baron was about to pass her, she turned the perambulator in the very direction taken by the car. With great presence of mind the secretary general steered into the ditch, where he was pitched out, and lay for some time unconscious. While the children in the perambulator came off with a few scratches, the Baron was cut about the face, and sustained concussion of the brain. His chauffeur fell under the car, but received only slight injuries.



GERMAN MILITARY MANŒUVRES.
German "Tommies" studying the Motor-bicycle.



One of the German motorcyclists engaged in the manœuvres.

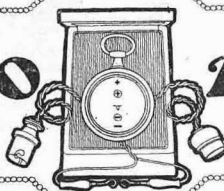
A German Expert on Tyre and Belt Troubles.

An engineering expert who frequently contributes to the Berlin papers popular scientific dissertations under the nom de plume "Hans Dominik" figured in the recent motorcycle reliability run held in connection with the annual cycle road race of the German Cyclists' Association. Whatever chances the expert may have had of finishing amongst the first arrivals were spoilt by nails. He "fished up" three en route, the last—which might be described as the coffin nail of his hopes—piercing the tube as he was gaily pom-pomming within three or four miles of home. In point of fact, about a third of the competitors had to give up in consequence of visitations from nails; perfect machinery and precise timing were reduced to nothing by the vulnerability of the "pneus." The old saying that a machine is never stronger than its weakest part holds good for motorcycles too. And, observes "Hans Dominik," in the run round Berlin "this weakest part was decidedly the pneumatic tyre." That being so, closer attention must be given to devising increased protection for tyres. Wire (or other practical) "nail extractors" are to be recommended, also a tougher packing between outer cover and air-tube. On the other hand, he hesitates to recommend the buckling on of a leather jacket round the tyres in reliability trips, for the obvious reason that such jackets greatly retard the speed of the cycle. The driving belt, too, caused many a competitor a lot of trouble. Rubber belts, interlined with some fabric or another, answered the best. Belts of this kind seldom need to be shortened, and are less susceptible than leather to the influence of moisture. "Hans Dominik" remarks on this point, that in view of the fact that 1905 machines will be fitted with wedge-shaped belting, rubber belts will probably push the leather article to the wall. With flat belting, which is at any rate very reliable if a tension-roller is used, leather will continue to be employed,



The motorcars engaged in the German Military Manœuvres about to leave the barrack's yard.

OTHER PEOPLE'S VIEWS



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

If the Brakes Should Fail!

Sir,—It would be interesting to hear some opinions on the following:—(1) If the driver of a car when ascending a steep hill finds that the brakes and sprags suddenly fail to act, and the car commences to run back at a great speed, what is the best possible thing to do to avoid a smash. (2) Supposing a car is descending a hill with all brakes on, and it is necessary to suddenly supplement the brake power by some means, how can this be effected?—Yours faithfully,
"CATERHAM."

Gudgeon Screw Troubles.

Sir,—If I may repeat Mr. Hubbard's words in a recent issue of "THE MOTOR," "I am pleased to see that 'he' has taken up the 'gudgeon-pin set-screw trouble.'" I have one of the 1904 3 h.p. standard machines, in which the gudgeon pin is secured in the manner last named by Mr. Hubbard—that is, the piston ring prevents it from turning. My experience of this method is unsatisfactory. I have found that very considerable leakage of the exploded charge takes place past either end of the gudgeon pin. The piston rings are a good fit; yet this leakage takes place. New piston rings have not improved matters. In fact, the crank-case gets so abnormally hot that I cannot keep a hand on it after machine has run a couple of miles. I trust it will be possible to discuss the matter further in "O.P.V.," and to name any other make of machine in which this method of fastening the gudgeon pin is adopted. "THE MOTOR" has been very useful to me on more than one occasion in helping to elucidate apparent mysteries.—Yours faithfully,
H.G.B.

The Garrard Tri-car.

Sir,—In reply to your correspondent's letter in a recent issue re above, I should be very glad to be of any service I can to him, and to hear his experience of this machine. I may say frankly that I have been troubled by some little details beyond the usual tuning up every new motor requires, where its owner likes to obtain the very best possible results, but I very much question whether at present any tri-car or motorcar on the market is entirely free from what the public term "breakdowns." When all has been well, the driving of this machine has been to me a great pleasure, the driver's seat being really luxurious, even on rough roads, a great contrast to other tri-cars I have ridden, the three speeds enabling one to go anywhere, and I should be sorry for any other make of tri-car which was tried against mine either for speed, hill-climbing, or comfort. I also find it very steady in grease. The silencing of the engine is not nearly sufficient, in my opinion, and there are one or two other defects, which,

as the makers are rectifying for me, it would perhaps be ungracious to refer to. One matter I might refer to, however, and that is in respect of the timing gear. Why cannot this be made more accessible? Most engines require to be taken right down to get at this, and yet one tooth one way or the other makes a great difference to the running. Now, if this was easily get-at-able, one could experiment and find out on the road the best position. At present the time and trouble incurred prevents this being tried, as a rule.—Yours faithfully,
G. H. PEAKE.

Belt Transmission for Tri-car.

Sir,—I have been thinking for some little time of writing to ask for your advice and that of any fellow motorcyclists who use belt transmission, and the letter of "H.W.C." in your issue of August 30th decides me to do so. I note that he asks for experiences of Perry's chain belt. But surely, if they are to be of use to him, he should state the stamp of machine he uses. One sees advertisements of belts that have run long distances without stretching, etc., but those advertisements do not state the power and weight of the machines on which the belt was used. I should be very thankful if anyone could tell me of a really lasting and efficient belt for a heavy fore-carriage machine—4 h.p. on the high gear, and much more powerful of course on the low (B.S.A. change speed gear). I began with a first-class leather belt, but it was nothing like strong enough, stretched like a glove, and, despite dressing, began to break up long before it had run 500 miles. I then tried a large size canvas and rubber belt. I don't think that it has yet run quite 300 miles, and it has to be shortened about every 30 miles: the outer rubber covering has cracked all over, and now I begin to find incipient breakages in the canvas material. Is there any V belt that is efficient for a machine like mine? I shall be grateful for the advice of any fellow motorists who have belt experiences with a machine similar to mine.—Yours faithfully,
"FORFEX."

"THE MOTOR MANUAL"

has had a larger sale than any similar publication devoted to the instructive side of motoring. The reason for its phenomenal sale and continued demand is apparent at sight. It is clear, concise, well illustrated, accurate, and cheap.

Is. only!

Formula for Rating Horse Power of Motors.

Sir,—I should like to hear through the columns of "THE MOTOR," the formula which makers of motors are supposed to apply in rating the horse-power of their engines; also the mean average pressure, taking into consideration the back pressure due to compression. I find in testing several engines by the usual formula for indicated h.p., and making an allowance of 25 per cent. for engine losses, that the mean pressure varies very much. An engine, two-cycle, quoted me, with 5 in. by 6 in. cylinder 400 revs., is rated 4 h.p.; another, same size, 750 revs., but four-cycle, 7 h.p. This point seems to be a very important one to buyers.—Yours faithfully,
"PUZZLED."

Air v. Water Cooling.

Sir,—I have read "K.B.'s" letter in your issue of the 6th inst., and my experience with fan-cooling, as fitted to the 3½ h.p. spring frame two-speed Phoenix Trimco, is as satisfactory as his. I have had my machine running since the middle of July last, have had no overheating, and am thoroughly satisfied with it. There is plenty of speed available, and I have taken off the pedals and chain, as they were never really wanted in this district, although the Suffolk roads are fairly hilly and far from good. It seems to me that water-cooling, with its unavoidable weight and trouble, is quite unnecessary, when as good, or better, results can be obtained with a fan, and all the bother of leaky joints, etc., avoided.—Yours faithfully,
T. H. HOWARD.

A Good Performance with a 2 h.p. Engine.

Sir,—With regard to a statement made by you in a recent issue of "THE MOTOR" to the effect that a 2½ h.p. motor would not take a fore-car, I should just like to state for the benefit of the readers of "THE MOTOR" that my little 2 h.p. F.N. motor takes a fore-car with every satisfaction. It has toured all round Ireland with passenger up. Weight of each passenger, respectively, 9 and 10 stone. Very stiff hills, of course, cannot be negotiated with both passengers, but then one does not object to this when there is no great weight to pedal. But ordinary hills are negotiated with ease. This little machine has beaten many of the high-powered fore-cars round here. In conclusion I may say that it was the identical machine shown at the Stanley Show. Would any of your readers kindly give their experiences with similar horse-power and fore-car?—Yours faithfully,
G. C. POHLMANN.

[It would be interesting to know what the gear of this machine was, also the steep-est gradient it would take unaided, and the average speed per hour.—Eu.]

O.P.U.

A Correction.

Sir,—In my notes on acetylene lamps, printed in your issue of September 6th, the sketch of the generator is not quite accurate. The upper and lower halves of the generator should be represented as screwing into each other just above the spring disc.—Yours faithfully, B.H.D.

More Complaints from Riders.

Sir,—I have noted with pleasure the impartial manner in which you conduct the correspondence columns of your journal, and I consider that this policy is benefiting not only the motorist, but the whole trade equally. I can sympathise with "Suttonian," because since May my motor-cycle has cost me over £10 for repairs. I am now completely hung up, and have waited one month for a new piston. I sent cash with order to the makers of, I believe, the most popular engine. Two misfits were sent; then I was informed they were in course of manufacture, and I should receive one last week without fail. I telephoned them later on, and was informed that they knew nothing about the matter. I may state, in conclusion, that I am now greatly disposed to sell cheap, and go back to the ordinary safety.—Yours faithfully, SURREYTONIAN.

Tri-car Experiences.

Sir,—I cannot speak too highly of the convenience and general handiness of that delightful little vehicle the tri-car or carette. I have travelled about 2,000 miles this season upon mine; which was built to my specification (Fafnir engine, $3\frac{1}{2}$ h.p., water cooled, rotary pump circulation, foot lever clutch and brake) and have several times run 150 miles and over on a Sunday's tour with a passenger. Compared with a carriage driving tour it seems incredible that such a little machine can take two passengers, starting from Sutton, to Chichester, Havant, Farnham, over the Hog's Back to Guildford, winding up with a spin along the Ripley Road and so home to supper the same day—to mention one of my little trips. From experience I should recommend a two-speed gear. Broad rubber-covered platforms and mudguards (mine has large car wings) are of the greatest comfort upon a ride, and for side lamps the simplest and most effective are ordinary pony carriage candle lamps. Pedals on a machine of nearly 3 cwt. are, I have found, absolutely useless—my platforms now run from end to end. On the stiff hills it is the easiest matter to run alongside, giving a little push at the worst parts and stealing a little ride from time to time as the engine picks up speed. Of course at times one strikes misfortune, and I ran into a particularly bad piece of it last Sunday with a burst tyre, both on the way out and home from Eastbourne. About four miles out of Forest Row I had the most generous assistance from two gentlemen, ardent motorists, who spent nearly two hours helping me with an awkward repair. As I am sure they will see this as been readers of "THE MOTOR," may I take this opportunity of again thanking them for their kindness. They will be sorry to hear that the tyre again broke down just as we came to Forest

Row village, where, as darkness had set in and I had not a decent pump with me, I put up the motor and trained home.—Yours faithfully,

HORACE W. H. VAUGHAN.

Sutton, Surrey.

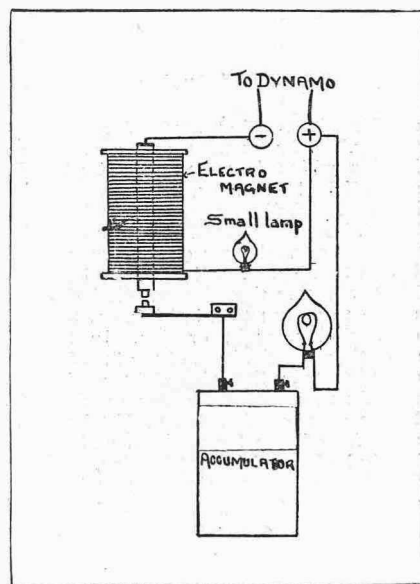
A Car Starting Difficulty.

Sir,—Two months ago I received my 11 h.p. Clement-Talbot car, but though I had a driver for three weeks I was never able to start the magneto. Then I had a low tension auxiliary ignition fitted, with no better results. The company said it only wanted "knack," so I practised to get this knack for five weeks and rarely started. Then the driver would turn the crank round two or more times and get the engine going, then the car went splendidly. Since he left, I have never got the car out of the yard, simply because I cannot start. At last the company condescended to send an expert. After seven hours' work on it I was still unable to start. He came next day, and after another seven hours at it I could start on a quarter turn—sometimes. He could always start, of course, if he turned round twice or more, but there was no certainty on the half turn. He pronounced both ignitions good. Can any of your readers give me any hint as to cause of this annoyance? I have been used to single-cylinder, two and four-cycle engines.—Yours faithfully, R. HARMEN.

Automatic Charging Device.

Sir,—I had an idea that my battery ran down when the dynamo was stopped, that is to say, the current discharged itself through the dynamo, as it is only run during the dark hours, and consequently I could not switch it off directly. To overcome the difficulty, I have rigged up a successful arrangement to cut it out directly the current ceases. The action is so simple that it does not need much explanation from me. When the current is going through the electro magnet coil, the iron core — draws up the small disc of steel at the end of the spring and makes the circuit complete through the large lamp and battery.—Yours faithfully,

"AC25."



Illustrating letter from "AC25."

The Barilite Lamp.

Sir,—Re inquiry on page 79 of "THE MOTOR" of August 23rd last by "P.B.C." respecting Barilite lamps. Like him, I tried acetylene lamps by most well-known makers, and after using same on motor-cycle and Humber Olympia tandem, had to give them up, owing to their failing me so often when most wanted, and I had to fall back on oil lamps, which are nearly, if not quite, useless for two or three-wheeled motor vehicles. I, in consequence, for a time gave up night riding, until I saw the advertisement of the "Barilite" lamp in the motor papers. Having been had so often by the apparent advantages of these new lamps, I ordered two on approx. from the Metropolitan Machinist Co., of Bishopsgate, and received in due course the first two sold to a private customer. These were of the combined type, and I found them exceptionally strong, well-made, and most reliable on bad roads (those who drive a three-wheeler will know and appreciate this), the light being nice and steady, owing to the fact that the supply of gas is spring controlled at the bottom of the container. I have since had these altered so that the generator is apart from the lamp, thus giving the lamp bracket only about a third of the weight to carry, and find this much more convenient. I am informed that Messrs. Bartlett (the makers) are now making a lamp with separate generators, and I would recommend "P.B.C." to try one.—Yours faithfully, H. 465.

Trembler v. Non-trembler Coils. An Interesting Experiment.

Sir,—We think the following experiment which we are having carried out for us will be of interest to readers of "THE MOTOR." We wished to test the life of our Hellesten Dry Cell Ignition batteries working with trembler and non-trembler coils. A small shaft was fitted up on suitable bearings with make and break contact breaker at one end and a wipe at the other. These were connected up in the usual way to a non-trembler and trembler coil respectively, each taking current from a Hellesten motorcycle battery and having a spark plug—with good wide gap—wired up to high tension terminal of each coil.

The apparatus is run by a small electric motor driving the shaft through a gut band, and the experiment is being carried out by Mr. John Hewett, B.A., M.I.E.E., at his office, No. 5, Budge Row, E.C. The speed has been regulated to approximate closely to actual working on a motorcycle, and a daily record is kept of the hours working, voltage of batteries, etc.

On inserting an amperemeter in the primary circuits it was found that the non-trembler coil takes an ampere .37 mean current, but the trembler coil takes just under one ampere. The spark gaps are the same in both cases. After nearly three weeks' running (average about 5½ hours daily) the battery on trembler coil is already exhausted, whereas that on the non-trembler is still going strong, and the spark seems as good as it was at the start. The trembler coil gave a better spark, but the question which will occur to motorists reading this, is whether there is a really perceptible increase of power, or any other advantage, derived from this better spark, and whether, if so,



it is sufficient to warrant the extra expenditure of current and rapid exhaustion of batteries which it involves?

To those riders who have charging facilities close at hand it may be that it is not a matter of great moment whether their batteries are good for 200 or 600 miles, the cost of charging being so trifling. But for others not so conveniently situated, and especially in the case of those residing abroad, the matter assumes quite a different aspect, and we think our experiment most conclusively proves that for all such a non-tremblet coil is a "sine qua non."

As soon as the second battery is exhausted Mr. Hewett has kindly promised to place the results at our disposal, and if you deem them of sufficient interest we shall be glad to communicate them to you in due course.—Yours faithfully,

FULLER, MACLEOD AND CO., LTD.

[We shall be pleased to publish the results referred to.—ED.]

The Hub 2-speed Gear.

Sir,—I shall be glad if I can offer through your pages a few words of advice to those contemplating having a Hub 2-speed gear fitted for tri-car work. I have a letter from the company stating that their larger pattern is too weak to stand the $3\frac{1}{2}$ h.p. Kelecom engine, and that it is not guaranteed to stand more than a 3 h.p. engine. The gear reduction is also small, so that if the high gear is 5 to 1 the low is only just about 7 to 1. Any one who has run a tri-car will agree that this reduction is too small for a practical touring machine if fitted with a 3 h.p. geared with a lowest gearing of 7 to 1.—Yours faithfully,

J. HORACE REEVES.

The Light Machine—U belt drive, etc.

Sir,—In reply to A 4190's letter in issue 135, I have taken your advice and had V belt transmission fitted on my Werner machine by Messrs. Atkeys', of Nottingham. The alteration, which has been carried out in a very workmanlike manner, has given me quite a new feeling of confidence in the machine, the only weak point previously, to my mind, having been the flat belt transmission. I can now take long trips without any fear of belt slipping, etc., which was never entirely absent before, and kept me near home always. With regard to the double belt idea, I communicated with Messrs. Werner some time ago, but they could give me no information upon the point. Messrs. Werner deserve credit in that they have always tried to supply as light a machine as possible. With my 2 h.p. Werner, in a hilly country as this is, I have never had any difficulty in getting up hills. If one reads the reports of the recent Reliability trials, more than one instance will be noticed in which riders of heavy machines have reached the top of test hills in an extremely exhausted condition. It must be admitted that the light machine requires more skilful driving on hills—a little muddling of the spark advance or the air lever, and you may have to get off on a hill which the machine would have taken easily if skilfully manipulated. To my

mind, the lines upon which experimenting should be done are such as will lighten the numerous accessories which go to make the complete motor-bicycle, the engine remaining at 2 h.p. and of reasonable strength, i.e., as far fool-proof as possible. It will be quite obvious that if these accessories are cut down, then the dead weight the engine has to propel is much less, and the hill-climbing (and luggage-carrying) capacity of the motor-bicycle as a whole is much increased. As an example, taking the engine power of the Torpedo and the 2 h.p. Werner as about equal, it is fairly obvious that the former, being a good deal lighter, will be able to climb hills better and carry more luggage—the two chief points in touring.—Yours faithfully,

H. M.

The Light Weight Machine.

Sir,—Re your comments on my letter of reply to the Rev. A. J. MacKinney, I may say I have had experiences of what a light machine will do in surmounting hills—and also of what it will not; e.g., not a month ago I rode a very light 2 h.p. in the pink of condition from Folkestone to Worthing—and I have owned several in my time. You mention the two-speeded 2 h.p. You will notice I suggested this, if low weight at any price was a consideration to Mr. MacKinney. I understand he requires a machine to carry him (his weight is unknown) and a full touring kit, not only in the hilly parts of England, but in Germany and Switzerland (presumably Alpine roads and passes). He describes four hours' pushing on one continuous gradient. The most you, as a practical exponent of the light 2 h.p., can adduce in its favour is the climbing of 555 yards of 1 in 10 with 10½ stone up. There is a big gap between what it will do, and what, as I take it, Mr. MacKinney requires. He could, of course, improve greatly on this performance of yours by pedalling, but any doctor, I think, would tell him that this is quite as injurious to the heart as an uphill start with a so-called "monster." I must say a hand-started, powerful machine seems to be what he requires. The 30 lb. powerful machine is not yet with us.—Yours faithfully,

(REV.) B. H. DAVIES.

A Rejoinder.

Sir,—I noticed a letter in a recent issue of "THE MOTOR" entitled "A Dangerous Corner." The writer makes a statement in this which is most misleading. He says Mitchell Bros. (or, as it should have been, Mitchell Bros., of Palmerston Street, Romsey) refused help to a motorist who had a breakdown on the ground that it was Sunday. In all fairness, I should like to mention that Messrs. Mitchell never refuse to go out to a breakdown, Sunday or week-day, night or day. In fact, a short time ago the head of the firm fetched a car in late on Saturday night, worked all night, and most of Sunday on the job. In the case mentioned, Mr. Mitchell was away from home for the day, and so can hardly be blamed for not helping. I know from long experience that Messrs. Mitchell are a most obliging firm, and trust that you will kindly insert this letter to remove any wrong impression that might have been conveyed about them. There are other motorists, doubtless, who could endorse what I say.—Yours faithfully,

"FAIR PLAY."

Compression when Motor is Reversed.

Sir,—Would any reader of "THE MOTOR" kindly let me know through O.P.V. the reason some engines have good compression when the machine is wheeled backward, but very little if moved forward? I find it on different makes of engines that have run about 1,000 miles.—Yours faithfully,

Pretoria.

Concerning Dogs on the Road.

Sir,—From an advertisement I have seen in the daily papers, it appears that a campaign is about to be commenced against motorists by an organisation entitled the National Canine Defence League on behalf of dogs, which constantly endanger a motor-driver's life, and are not infrequently the cause of fatal accidents. In bringing this matter to your attention, I may state that I am particularly interested in this question as a dog-owner as well as a motorist, the more so as I have been brought down twice on my motorcycle this summer by dogs rushing out in front of my machine, fortunately without serious result on each occasion. Although, no doubt, owners are merely thoughtless who allow their dogs to use main roads as playgrounds, it is time, I think, that some steps were taken to insist on dogs being kept under control on the public highways. I much regret that the National Canine Defence League is not exerting its influence with dog-owners in this direction, in order that the safety of dogs might be ensured, and what is evidently regarded as of secondary importance by the League, that the greatest danger to which motorists (especially motorcyclists) are liable on the road, should be removed.—Yours faithfully,

"A.4112."

Points of the Zedel Engine.

Sir,—In reference to the letter of "R.R.J." in a recent issue, enquiring about the Zedel motor, I have had one of these engines on a Griffon motorcycle 18 months. It has been at work every day during that time and the only trouble or expense has been one broken exhaust valve which I replaced in ten minutes. One of my friends bought a Griffon machine last year, and two have bought Star motorcycles this year, fitted with the Z.L. engine. All are going well. The motor is very light and beautifully made inside and out. The piston rings are the same that were fitted at first, compression is still good, and the machine rated as $2\frac{1}{2}$ h.p. takes a trailer up our stiff hills easily. The points of the motor seem to be a very thin cylinder, well radiated with very thin ribs, very large exhaust valve with good lift (a ball takes the lift from the cam shaft), very hard and tight bearings—mine have not the least shake yet—fairly long stroke, and heavy large fly-wheels. If it was not for tyres and belts, I believe I could say that the motorcycle is as cheap as a pedal cycle to maintain. I think when our English makers use a much lighter casting for the cylinder they will have far less overheating troubles, and get much more power and better results all round. I have no connection with the Z.L. firm, and do not know how they would treat a breakdown, as I have not need to ask them. Hoping this letter may be of some help to "R.R.J."—Yours faithfully,

"C.B.29."

O.P.V.

Perry's Chain Belt.

Sir,—I shall be glad if you will insert the following in O.P.V. for the benefit of "H.W.C." and other readers of your excellent paper. In answer to "H.W.C.'s" enquiry re Perry's chain belt, I have been using one for over four months on my $3\frac{1}{2}$ h.p. Excelsior machine, fitted with fore-car, and can only speak in the highest terms of its behaviour. It drives perfectly under all conditions, even when quite slack. I have oiled the joints once, and that only when I found them very rusty after riding in rain and mud. I have also adjusted it about three times. It seems in good condition still. I cannot give the exact mileage, but probably it has done 1,500 miles, and seems quite capable of as much more. In my opinion, it completely solves the problem of chain v. belt in favour of this excellent compromise. I have already recommended the chain belt to several of my friends, who endorse my opinion.—Yours faithfully,

JOHN T. BETTANG.

The Peugeot Motor-bicycle.

Sir,—In looking through "THE MOTOR" I find "F.W.F." is in trouble with a 2 h.p. Peugeot motor-bicycle, and as I ride one of these machines and have had similar trouble, I thought I could assist him. The knocking noise I think he will find is caused by broken pin in exhaust cam. This he can ascertain by taking off contact plate. I cured mine by putting in a new spindle, and fitting gear wheel and cam on same by right and left hand thread, and have had no trouble since. Crank chamber getting hot is caused by slack piston rings I think he will find also. I had a good bit of trouble with exhaust lifter. As this was rather small and complicated I took it off and fitted a plain lever, which has been a great improvement. Now I can go at any pace I want. I don't think there is a machine about here that can go at the speed. I can get out of mine even up to a 3 h.p. I have done six miles in 12 minutes, and I can say I am well pleased with it.—Yours faithfully,

E. W. HUDSON.

Langley Road, Luton.

Automatic v. Mechanical Valve.

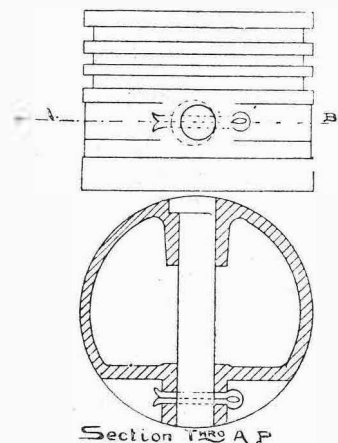
Sir,—I am more than pleased to see the article of your able contributor, "Magnet," in your issue of August 30th, on the subject of "Will the mechanical inlet valve survive?" I have come into contact with many riders of 1904 mechanical valve machines, who state that they cannot get the same efficiency as with their 1903 automatic valve engines of the same dimensions. It is also worthy of note that it is not altogether the alteration of design that accounts for the difference, as I know of riders of 1904 M.M.C. and Werners who have obtained very much improved results by merely converting the mechanical valve into an automatic. I have read the effusions of many very able "theorists" on the value of the mechanical valve, but I have proved absolutely conclusively to myself in actual practice that better results can be obtained from the automatic valve. It bears some significance that the latest pattern Werner engines have automatic valves. I contend

that better results could be obtained with a properly-designed valve of the automatic type, namely, one of very light construction, large in diameter, and with small range of movement to obtain maximum opening necessary, thus ensuring quick opening and quick return.—Yours faithfully,

FRANK ARNOTT.

Fixing the Gudgeon Pin.

Sir,—In view of the troubles experienced with the usual set screw arrangement of securing the gudgeon pin in the piston, we beg to send you an illustration of the system adopted on the Alena motor-bicycle. The pin has an eccentric head which locks itself in a hole cut to suit it. The other end of the pin has a



hole drilled through it, and an ordinary steel split pin fixed through the bearing and pin. There is no other screw or nut inside the motor with the exception of two on the driving axle.—Yours faithfully,

THE ALENA CO.

Haarlem.

Back-Firing on Humber Cycles.

Sir,—In a recent issue of your paper I noticed in a letter from "Brightonian" that he has trouble with back-firing on a Humber cycle, when he slows down in traffic, by not being able, in a tight corner, to get the half compression into action. Allow me to say that I ride a similar make of machine, $2\frac{1}{2}$ h.p., which I can control to four miles an hour without switching off, or retarding the spark, except in a very tight corner, where it is absolutely necessary. I had the same trouble till I fitted a twist handle control on the throttle of the Longemare carburetter. When riding in town I nearly shut off the extra air, and work entirely on the throttle, as by this means the speed can be either increased or decreased in a second, and as it is very seldom necessary to go more than 10 miles an hour in thick traffic, one is perfectly safe. If I want to go slower, I admit more air, which, of course, weakens the mixture, and necessitates the throttle being opened wider, to keep any pace. Let "Brightonian" have a twist handle fitted to his machine, and let him work entirely on the throttle, and he will find that he will be able to slow down to the merest crawl, and defy unreasonable police, and feel absolutely safe in case he runs suddenly on to wet patches, because both hands are in the place they should be—on the handles. In my opinion, all motorcycles should have them fitted. Incidentally I may mention that I covered 165 miles on

one gallon and three pints of Pratt's A spirit recently, which is not bad with a $2\frac{1}{2}$ h.p. in hilly country (Derbyshire), and with a Longemare spray, is it?—Yours faithfully,

"B.953."

Motors in Australia.

Sir,—In your description of the motorcycle designed and built by me and illustrated in "THE MOTOR" of April 26th, 1904, there is a slight error concerning the drive of same, probably owing to myself not giving a proper explanation of it. A flat two-ply double copper sewn belt is used, $1\frac{1}{2}$ in. wide, and having had such satisfaction from this arrangement I use nothing else. There is one at present here that has been in use for 30,000 miles, and while others have had to make changes, I have not yet had occasion to do so. I am about to try the V pattern belt, as I have heard good accounts of it of late. Large stocks of motorcars and cycles are on hand and due to arrive in Melbourne. The makes most in evidence are De Dion, Humber, and Oldsmobile, and although the business is slow just now, big things are expected when the winter is over. The mail steamer "Australia" had three cars on board when she foundered on the rocks at Phillip Heads. Hopes were entertained of their recovery, as she did not sink, but while taking the salvage out she caught fire. There was no hope of saving anything, meaning a loss of about £5,000 worth of merchandise, including a lot of B.S.A. fittings and other cycle and motor material. Wishing "THE MOTOR" continued success.—Yours faithfully,

Melbourne.

EDGAR TOZER.

An Experience with a Broken Frame.

Sir,—The following incident may be of interest to your readers. While riding a motor-bicycle from Portsmouth to London on a recent Sunday, the head of the frame gave way without any warning whatever. The down tube snapped off close to a joint, and let the frame down with it. The engine did a bump on the road about half-a-dozen times before I could pull up. When I stopped I happened to be opposite a house where building operations were going on, and I borrowed some sash line from the man in charge, and lashed the frame together as best I could, intending to take it by train, I being then at Petersfield. But, having a very stiff gradient to negotiate, I thought I would get on and ride the machine if possible, and I was so pleased with the running of the machine that I rode it all the way home without any further mishap, and my friend who was with me, being on a Peugeot machine, and wanting to test my nerves and, presumably, foolhardiness, challenged me to a race home. The machine is a $3\frac{1}{2}$ h.p. one, weighing about 160 lb. So I took my friend's bet, and we both started on a "Gordon-Bennett" from Petersfield to London (Dulwich). The pace travelled at was—well—certainly up to the legal limit (and a little over), and I can say I never had a more enjoyable time before, as the broken frame acted as a spring drive for the belt. At slow speed the engine swayed a little in the frame, but the belt never came off and never slipped. The curved tube, on gauging it, only measured 17 gauge, and as there was no double top bar to take the shocks, no wonder it broke.—Yours faithfully,

A. DURANT.



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.

J.W.T. (Ely).—You could have either a Smith's or Bates' band (see advts.) vulcanised on the tyre. The work could be relied on, as the bands are fixed by a special process.

T. D. Moffett (Invercargill, New Zealand).—We think you could safely place the matter in the hands of the Civil Service Motor Agency, Featherstone Buildings, High Holborn, London.

R. S. King (Stratford, E.).—(1) We should say that the trembler coil you have is a very poor specimen to require adjusting every ride. A first-class coil will run from 500 to 1,000 miles without requiring the trembler adjusted. (2) The platinum contacts require setting fairly close, but there must be sufficient play for the trembler—that is to say, if the regulating screw is adjusted too close, it will prevent the trembler working.

Buying a Second-Hand Car.

"Jack Tar" (Grimsby) writes:—A dealer in second-hand cars is very anxious to sell me one at what seems to me a very low price. I have been on a trial run in the car, but although it would do 18 or 20 miles an hour on a good level macadam road, it would only go up hill at almost a walking pace. Now the special point I want information on is this: how can I prove that the engine is a 6 h.p. one, as the dealer assures me it is?—There would be some difficulty in doing this. If the car was by a standard maker and a modern type, you could verify it by enquiring from the maker. If you knew the cylinder dimensions, it would be a fair guide also. The best plan would be to get to know someone understanding a car who would inspect it. Otherwise you might make a very bad bargain. We are inclined to think it is an unknown make, with about a 3½ h.p. engine. Any decent 6 h.p. car will climb a 1 in 12 hill at 10 miles per hour with two passengers.

J. C. Roker (Exmouth).—The attachment you enquire about is rarely met with. If you made your enquiries through "Cyclings," it is quite probable you might hear of a maker of such an attachment, however.

"Bert" (Gt. Bridge).—(1) Try lubricating the fibre cone with some vaseline and graphite. (2) You would not gain anything at all in substituting a 1-inch pitch chain for your present half-inch. The clutch and chain wheel must be very badly fitted to behave as you say. (3) The gear you have is not too high for all-round work, but for side-car work, reducing it to 5½ to 1 would be an advantage.

"Rudolph" (Exeter) writes:—Would there be any advantage in having a tube to pass right through the petrol supply tank of a motor-bicycle, so that by passing some of the exhaust through it the petrol would be warmed up to some extent before it passed into the spray carburetter. It seems to me it would volatilise more readily.—It would not be any advantage, in fact, otherwise, as the petrol would be volatilising in the tank, just the place you do not want it to volatilise.

Heating up of the Switch.

A.R. (Lincoln) writes:—On my "Bat" motor-bicycle I have a two-way switch. While riding recently the firing gradually ceased, and the switch became so hot that my finger on touching it was blistered. On examination I found that the wire from the positive pole of the accumulator to the coil (a trembler coil) was "shorting" through the metal accumulator case. The coil was not "buzzing." Can you explain why the switch became so hot?—The explanation is as follows: There being a short circuit from the positive wire of the accumulator to the frame the coil would thereby be completely cut out of circuit, and there would be practically no resistance in the path of the current. It would be just as if you took a piece of wire and joined the terminals of the accumulator; there would be a "dead short." The switch not having enough metal in it to carry the excessive rush of current, and the switch contacts being of small surface, would heat up immediately.

A NOVELTY!

"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.

W.H.G. (Northampton).—(1) If you fix a spring supported jockey wheel to the under side of the chain, it would take up the slack of the long drive, and then there would not be so much risk of the chain jumping the cogs. (2) One inch pitch by three-quarters wide would do very well.

W.L.E. (Oxford).—It is not possible to utilise paraffin in an ordinary carburetter, even if it is placed close to the engine. You could use, say, 25 per cent. paraffin and 75 per cent. petrol easily enough, but you would find this mixture tend to foul the combustion chamber valves and plug.

H.D. (Balham Hill).—Your best plan would be to put a small advt. in the "Wanted" columns. Of course, there are many agents who would be prepared to teach you how to drive one of their machines if you undertake to purchase one, but it is a different matter simply requiring one to learn on.

Water-Cooling System.

F.W. (Leicester).—(1) There is not much scope for water-cooling on motor-bicycles, but many makers of tri-cars are adopting it. (2) Depends on what you call an efficient system; the present arrangement of radiators and pump adopted on cars works well, but there is always more or less trouble possible through leakages occurring in the system, or a block in some of the tubes from deposits such as lime in the water. (3) Some diagrams of simple water-cooling systems have appeared in O.P.V. recently, and may be of some assistance to you. (4) Does not come within our scope. Your best plan would be to advertise for a firm of manufacturers to take up the idea.

A Short Circuit.

H.J.S. (London, S.E.) writes:—I have a 2 h.p. Minerva motorcycle, with trembler coil and make-and-break contact, and have connected up in the usual way. If I make contact at the make-and-break the coil starts buzzing, and there is a continuous stream of sparks at the sparking plug (E.J.C.), and when I break the contact this still continues, until I either switch off or withdraw the interrupter plug. The sparking is rather brilliant at the trembler on coil. The insulation of wires seems all right. Are my connections right, and can you tell me the cause and cure of above? I might mention that I found a piece of very fine wire (not insulated) on top of core of coil, which stopped the coil buzzing, but on removing it the coil buzzed all right. Do you think it is the coil at fault.—The only possible explanation, it seems to us, from a study of your diagram, is that you have a short circuit somewhere between terminal E on coil and the contact screw. Perhaps some part of the firings of insulated contact screw touch the engine when the rocker is moved.

BUREAU.

H.E. (Morley) wishes to know where he can obtain without delay standard spare parts for the 3½ h.p. Hewetson's Benz car. Can any reader oblige him with the information?

Preignition.

H.E.S. (Hants).—(1) Can you tell me what causes the knocking heard in so many motors when they get hot? Is it the piston rod hitting the end of the slot at the base of the cylinder? Or is it the piston jamming in the head of the cylinder? Or is it the explosion occurring before the dead point at the top of the stroke, and causing a knock in the bearings? Some engines never seem to knock; they only slow down when overheated.—The knocking or thumping is due, as a rule, to pre-ignition of the charge. If there is any backlash in the connecting rod bushes or bearings, the noise is accentuated. The design of the combustion chamber of some engines is such that no part of it becomes sufficiently heated to explode the charge spontaneously, as it were. Very often the deposit of carbonised oil on top of the piston becomes incandescent, or even the spark plug points may do the same thing.

F.F.T. (Frome).—Wash out the cells and put some fresh acid in them. Then give a prolonged charging at a low current. If the sulphating is very bad, you will not be able to do much with it.

"Purchaser" (Forest Gate).—You cannot rely on cylinder dimensions to give a reliable guide as to what the horse-power is, as there are other factors come into the calculation. The majority of the best firms guarantee their engines to develop their stated brake horse-power at the pulley or fly-wheel at maximum revolutions.

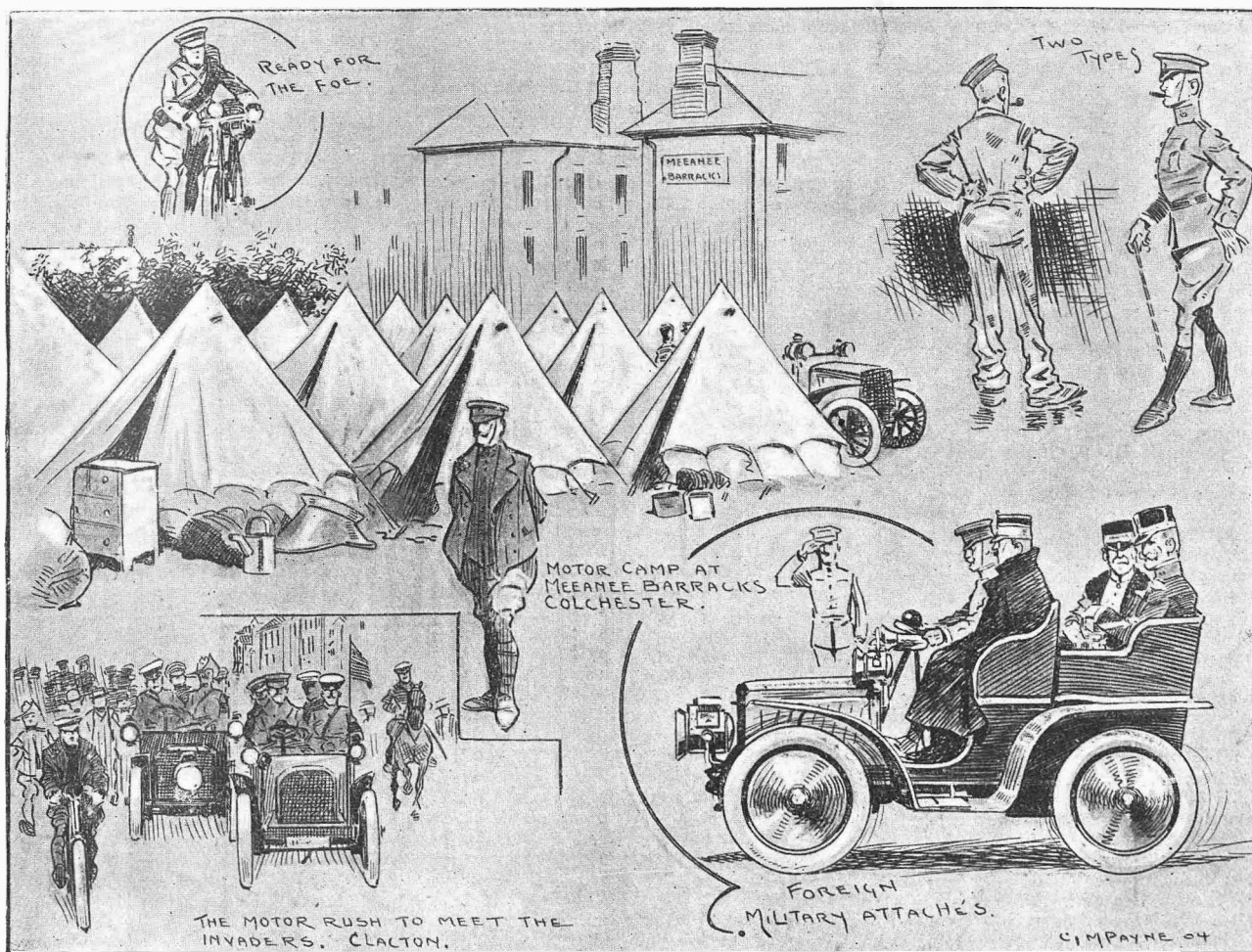
New Piston Ring Wanted.

R.E. (Mossley) writes:—I have a Minerva 2 h.p. cycle, 1903. The trouble is overheating. One piston ring shows brown discoloration 1½ in. wide near slit, and seems to have lost elasticity. Please say (1) does this call for a fresh ring? (2) Will the new ring of standard size, as supplied by Minerva Company, require any preparation in the way of rubbing on emery cloth, etc., before fitting?—The discoloration of the ring is a certain sign that the exploded charge has been escaping past it into the crank case. A new ring is required. It would be best to send the old ring to the maker as a gauge for the new one. It should not require any treatment with emery, except in the event of its being too good a fit in the piston groove.

"An Irish Reader."—No. 1 machine would not be a good investment at all, on account of its age. It is practically an obsolete pattern. The No. 3 is the machine for you. Of course, we are assuming you would get a new one, this year's pattern.

Difficult to Start.

A.C. (Urmston) writes:—I have a De Dion 2½ tri-car, fitted with a Longuemare carburetter. Every time I want to start the engine, I have to flood the carburetter (by moving the spring tappet up and down for a few seconds). If I don't do this, I cannot get a spark. After once starting, engine runs well; but, whenever I stop the engine, no matter whether it is hot or cold, I have to flood the carburetter again if I want to start anew. I have seen Longuemare carburetters on other machines which do not require flooding every time like mine. Do you think my carburetter is defective, or, if not, can you suggest some means by which I may avoid the annoyance? The exhaust pipe is close to the carburetter in the ordinary way. It is possible that the supply pipe to carburetter is restricted through grit accumulating. It would be as well to see that it is clear. The float doubtless could do with weighting a trifle, and a size larger jet fitted. The petrol does not appear to rise quite high enough in the jet.



OUR ARTIST AT THE MILITARY MANŒUVRES IN ESSEX.

BUREAU.

J. C. Parker (High Wycombe).—The Micrometer engine clutch or Lloyd's clutch, both of which have been described, might suit you. If neither of these clutches would meet your requirements, the only way out of the difficulty would be to have one specially made.

H.D.W. (Carnforth).—(1) Yes; spark must be timed to occur on the *make* instead of the break for a trembler coil, because the coil gives sparks the instant current passes through it. With a non-trembler coil the spark occurs at the instant the current is stopped. (2) A brush contact is better than retaining the make-and-break.

E.T. (Birkenhead).—(a) Average compression in that particular type of engine is 60 lb. sq. in. (b) You could fit a slightly longer connecting rod and increase the compression that way. (c) There are small pressure gauges sold which can be screwed into the spark plug aperture. This forms a ready method of determining the compression.

Carburation and Ignition.

George Parry (Dorset) writes:—(1) I have a petrol motor having a De Dion pattern contact breaker; the accumulator showed four volts, the voltmeter on being applied to the two terminals on the contact breaker also exhibited four volts, thus proving the wiring circuit and switch all perfect; yet it was impossible to get a spark on the trembler blade. Hours were spent in trying to do so; on replacing the accumulator with one showing 3.8 volts, a capital spark was at once obtained. Two days after I again tried the four-volt accumulator after proving it for amperage, of which it exhibited ample, and a very satisfactory spark was obtained. Would the proximity of the high-tension wire to the connections between accumulator and coil have had anything to do with the failure? I am fairly puzzled, especially as the contact breaker was taken off and dismembered and found to be in perfect order on testing before replacing. (2) On my last run, as the evening became cold, I noticed the copper inlet pipe began acting as a condenser, and quite little streams of water were running down it; the motor commenced to misfire, and got worse and worse till it stopped. My carburettor is an old Roubeau fitted vertically at the bottom of the inlet pipe, and was not only covered with condensed globules, but the lower rim, just at the air inlet, was covered with large drops of water which had run down the pipe. Do you think that some of this water was drawn into the carburettor by the suction, and, if so, would it have produced the misfiring and stoppage? Nothing else seemed to be out of order, and everything has worked well since.—(1) It is difficult to account for the behaviour of the accumulator and contact breaker, except on the assumption that the accumulator was practically run down even though showing 4 volts. With a rest it would recover considerably. It is just possible you had a bad connection somewhere on the make-and-break, probably between the terminal on the vulcanite base and the contact screw. You speak

of getting a capital spark on the trembler blade; strictly speaking, this is the place where you do not want much of a spark. The spark at the plug is what is wanted. Theoretically, no spark should be visible at the make-and-break if the coil has a well-balanced condenser. (2) The few drops of water condensing about the carburettor would hardly stop the engine, although it might upset the mixture for a few charges and cause misfires. But it would not stop the petrol spraying. If you have gauzes fitted in the supply pipe and a film of moisture or frost deposited on them, it might cause a stop, but, on the whole, it is more likely to be the failure of the ignition that caused the stop.

A Brake Question.

"Minerva" (York) writes:—Am I compelled by law to have two distinct brakes fitted to my motor-bicycle? I ask this, because of a doubt I heard expressed on the matter in a discussion with some motoring friends. I hold the opinion that it could be legally upheld that the engine is in itself an effective brake, so that with a front rim brake and engine compression in reserve I would be complying with the law.—No, this would not be so; you are legally compelled to have a brake acting on each wheel. The idea of the engine acting as an efficient brake is a fallacy. It has a slight braking effect on the machine at slow speeds, simply because the momentum is not sufficient to overcome the compression and internal friction. It must be remembered also that a good proportion of the power used up in compression is given back on the expansion stroke.

Tyres Blowing off Rim.

B.R.B. (Upper Clapton) writes:—Could you give some reasons for bursts in inner tubes? I have Dunlop 26 by 2 in. tyres fitted to my 3 h.p. Fafnir motor-bicycle, and have already experienced two bursts, which neither I nor the Dunlop Company can explain. The rims are the "James" type, and seem to me to be a trifle too wide, or is this because they are made flatter? I think the outer cover must come off first, as the first burst was in the front tyre, so I changed it to the back wheel, and got a second blow-off. These are the only items on my motorcycle that are unreliable. Does it injure the rim or cover much to drive on a completely deflated tyre for, say, five miles? I read that one man in the recent 1,000 miles drove 13 miles thus. If this is bad, what is the best thing to do? Are the tyres big enough? Do you advocate clamps?—The rims are probably a slightly different section from some makes, but the circumferential measurements of the grooves for the wires should be the same as any other Dunlop rim. The usual reasons for covers blowing off are: (1) the rims slightly out of gauge; (2) the rim is intended for a size larger tyre; (3) the wires have not been seated securely in the groove when replacing cover on the rim; this is liable to occur at the valve seating; (4) the inner tube is too large in section or slightly too long, and thus blows out or gets nipped. If the cover goes on with very little effort, it is a proof that the rim circumference is small. It certainly ruins an outer cover to ride it deflated. The beading of the rim cuts right through the rubber and fabric, and

the side of the cover tears itself against the back forks. Very often the rim flattens out as well. The best thing to do is to dismount machine at once and walk it to the nearest repair shop. The two-inch tyres should be large enough. A few riders prefer $2\frac{1}{2}$ inch, however. We think clamps are a safeguard against creeping and blowing off, but they are not indispensable. Any number of machines are not fitted with them.

ANSWERS BY POST.

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

Thursday, September 8th.—J. W. Webber (Chiswick), W. Baxter (Earl's Court), W. Robb (Keith), C. J. Sim (Wroxall), E. Barnett (Swansea), E. F. Bindloss (Royston), H. H. Kent (Sandgate), J. H. Pye (Moreton), A. Brown (Eltham), Tozer, Kemisley and Co. (London), R. A. Horsfall (Dewsbury), W. Hucks (Herne Bay), W. R. Flinck (New Barnett), D. Duguid (Port William), F. Playle (Ashford), J. Tinniswood (Workington).

Friday, September 9th.—F. L. Bennett (Longton), H. L. Roberts (Lichfield), F. G. Alden (Oxford), A. Sellick (Peckham), G. E. Whalley (Aylsham), R. M. Matthews (Walmers), H. Beckwith (Altrincham), H. C. Visick (Clifton), G. H. Bray (Sheffield), M. O. North (Worcester), P. W. Hobbs (Blandford), F. C. Gasson (Hurst Green), G. R. Offiler (Nottingham).

Monday, September 12th.—W. Stone (Chesster), H. T. Morgan (London), H. Hunter (Felton), J. J. Durant (N. Tawton), C. R. Cooke (Limavady), J. Linnet (Coventry), J. Caffryn (Ashford), W. E. Cooke (Alderley), W. R. Collins (Enfield), G. Jardot (Forest Gate), C. B. Baker (Waltham Abbey), H. R. Haigh (Featherstone), A. Hodgson (Leicester), D. Robertson (Ayr), R. C. Goddard (Totton), J. A. Briggs (Whitby), E. Hughes (Tonbridge), W. Wright (Pickering), W. H. Savery (Exmouth).

Tuesday, September 13th.—B. Hile (Watchet), T. W. Tame (Newport Pagnell), T. Flynn (Brecon), W. Robb (Keith), H. Thorn (Holloway), W. Arbie (Cotes), T. Hunt (Loughton), J. Brownlie (Glasgow), H. Denny (Longtown), W. A. Jacobs (Haverstock Hill), E. H. Phillips (Dresden), E. H. Snowden (Leicester), J. E. Newing (Walthamstow), T. D. White (Catford).

Wednesday, September 14th.—A. Smart (London), W. James (London), C. S. Thomas (Ilkley), H. Chaffey (Gerard's Cross), A. E. Burton (East Ham), T. Emery (Battersea), E. Robinson (Bristol), C. Braggirdle (Manchester), J. Wood (Stockton-on-Tees), H. Randall (Farnboro'), F. C. Ogilvy (Portsmouth), H. Lankester (Kingston Hill), A. Convey (Enniscombe), W. C. Stewart (Chelsea), R. Vaughan (London), F. E. Wilson (London), A. H. Spicer (Eastbourne).