The Motor
INCORPORATING Motor Cycling & Motoring
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THE NEW MACHINE. (Concluded).

By "Petrolia."

We already know that the power of the engine is derived from the explosion of a gaseous mixture in a confined space (the combustion chamber), and the resultant rapid expansion of this mixture giving an impulse to the piston. The word explosion is used advisedly, although until quite recently opinions differed as to whether the effect of the ignited mixture partook more of the nature of explosion or combustion. In the course of the past year, however, a committee of eminent French scientists decided to solve the question, and as a result of their investigations, it was decided that the mixture was not merely burnt in the cylinder, but actually exploded. This goes far towards supporting the view that increased power is derived from the admixture of picric acid and other detonating substances with the petrol. The explosion of the mixture of petrol vapour and air is, nevertheless, so nearly akin to rapid combustion that it takes an appreciable period for completion, and this period depends upon two factors:—

1.) The perfection or quality of the mixture.
(2.) The igniting power of the energy or force producing the explosion.

Considering the first of these, it has already been pointed out that there can be only one perfect admixture of petrol vapour and air, assuming that the calorific value, or, in other words, the quality of the petrol, be constant and the second factor invariable. Roughly speaking,

TEN PARTS OF AIR COMBINED WITH ONE OF PETROL

produce an explosive mixture. If, therefore, this proportion be decreased or increased the mixture becomes less explosive, till a point is reached where it ceases to be so altogether. It will also be evident that the perfect or most easily exploded mixture completes the process in the shortest possible time. The explosion is caused by the ignition of a part of the mixture by various means, of which the electric spark alone survives to-day in the case of motorcycle engines. It is not in the province of the present series of articles to discuss the other means by which the same end may be attained, and indeed, they vary from the old-fashioned torch ignition to the latest form of ignition by compression and self-combustion—a system which is only beginning to be thoroughly studied. Suffice it to say that electric ignition in several modifications is the only suitable form for motorcycle engines, offering, as it does the advantages of safety, compactness and efficiency with proper attention. The electric spark, then, ignites a small portion of the mixture, which in turn ignites the entire charge as the explosion spreads. The action may be compared to that set up by a stone thrown into a pool of water, and setting up ripples which gradually spread. The spark is the stone and the mixture the pool which is rippled by the waves of the explosion. If the petrol and air be thoroughly mixed, and not in unequal strata, the explosion, like the ripples, will spread equally in all directions from the point where it first took place. Hence an

EQUAL PRESSURE IS EXERTED ON ALL SIDES.

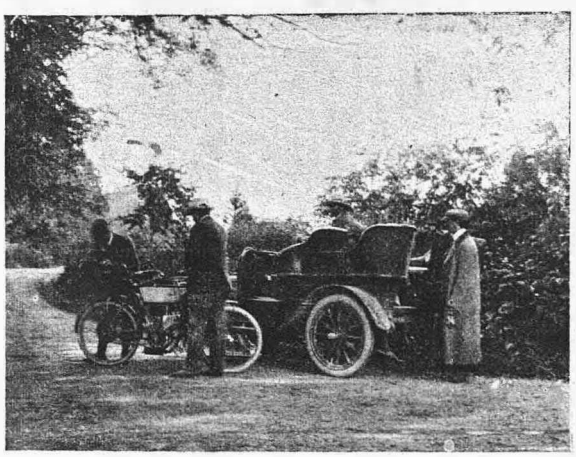
Incidentally, this is an argument for placing the sparking plug in the centre of the cylinder head, thereby exploding the charge in its vertical axis, and allowing at least equal radii for the expansion and consequent application of force. There are, however, certain disadvantages inseparable from this position which render it inadvisable. It has already been said that the explosion, like the ripples, takes a certain period of time to spread. Now, in order to obtain highest effect and greatest power from the explosion, its maximum effect must take place at the moment when the piston and connecting rod pass the dead point between the compression and firing strokes.

As the number of revolutions of the crank shaft increases (or, in other words, the speed of the engine) so does the piston speed rise. The time taken for the propagation of the explosion, however, remains constant, for nothing has arisen to affect it, provided the mixture remain perfect. (Actually this is not the case, but we may assume it meanwhile). Now, after a certain point, the piston speed might conceivably be in excess of the explosion speed and, consequently,

THE MAXIMUM EFFECT OF THE EXPLOSION WOULD NOT BE EXERTED

on the piston at the right point (as already indicated) but only when the piston had already traversed a certain distance on its downward path in the firing stroke. On the other hand, if the explosion exerts its maximum force on the piston before the latter has passed the dead point, this force is exerted in the wrong direction. Moreover, if the momentum of the fly wheels and reciprocating parts be insufficient to overcome the energy thus expended, a reversal of motion and what is commonly, though wrongly, called a "backfire" may be the result.

From all this it follows that, if the spark be too far ad-



A WAYSIDE SNAP.
The motorcyclist lends a helping hand.

vanced, or, in other words, the explosion premature, energy is wastefully expended. Hence the vital necessity of determining the exact position of the advance spark lever in relation to the speed of the engine and the conditions under which it is working. To advance the spark may be right and proper under certain conditions, while under others it may be positively harmful and dangerous. Properly used, the advance spark lever serves to accelerate the speed of the motor and consequently its power—bearing in mind all the time that, for a given explosion force, the power of the engine varies as its speed. This brings us to a point which the rider should constantly bear in mind if he wishes to get the best results from his engine and attain to proficiency as a driver, viz., the lack of flexibility in the petrol motor, more especially in the motorcycle type, as compared with the steam engine or the electric motor. Briefly, it may be stated that the motorcycle engine is

EFFICIENT ONLY AT COMPARATIVELY HIGH SPEEDS,

the power given off falling rapidly as the revolutions decrease, although this may be compensated for to some extent by introducing the maximum charge of gas by opening the throttle to the full, thereby increasing the force of the explosion. Hence it follows that the best results will be attained by allowing the engine to run at the maximum number of revolutions possible with a minimum explosion force. We have seen how the speed may be varied by the advance spark lever and, in a lesser degree by the throttle, and it likewise follows that both of these should be used with discretion, for reasons which may now be briefly summarised. If the spark be too far advanced it will cause a premature explosion—always wasteful of power and possibly resulting in serious damage to the engine, such as a broken crank shaft or connecting rod.

If the throttle be opened unnecessarily wide, admitting an excessive charge to the cylinder, overheating is encouraged, particularly in the case of an air-cooled engine.

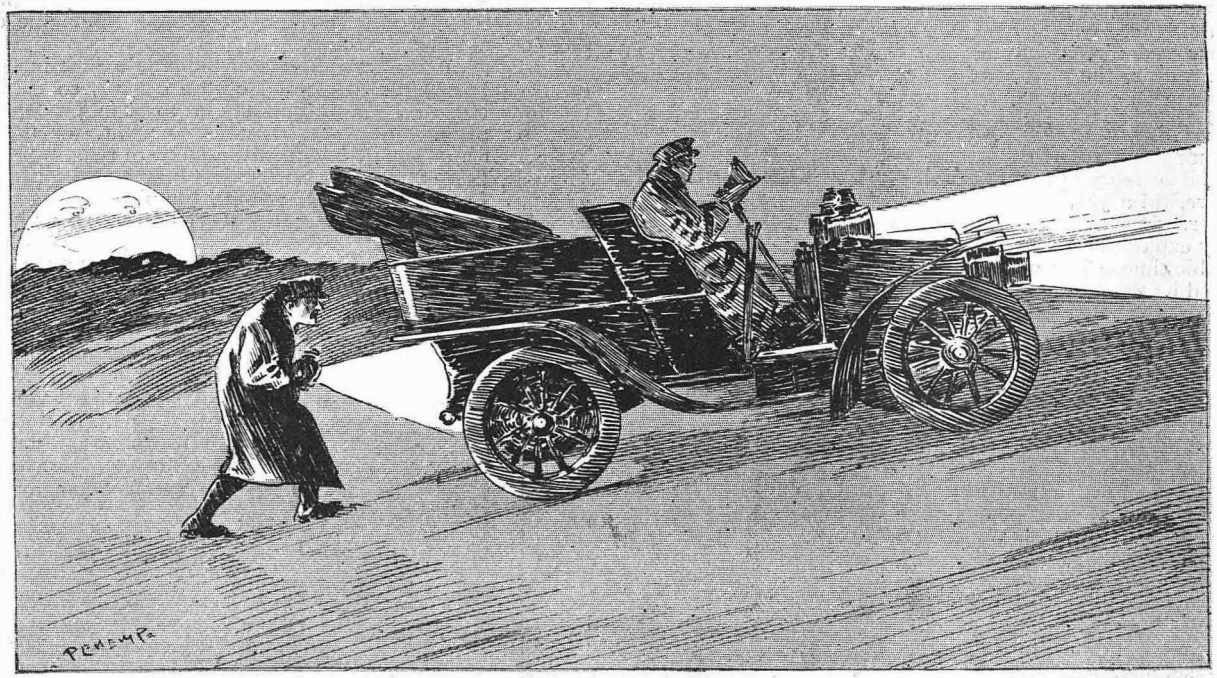
An intelligent appreciation of the theory of the action of the engine will make evident the close and intimate interconnection which exists between the throttle and the advance spark levers, and also the relation of carburation to the latter of these. It is interesting to note that if the mixture were always a perfect one the value of the advance spark apparatus would be much lessened and its use, broadly speaking,

RESTRICTED TO RETARDING THE SPARK AT STARTING

(more especially in the case of a car engine, where a "back-fire" is a serious matter) and advancing it slightly for very high speeds. For all other speeds there would be one point and one only at which the spark should take place to ensure maximum efficiency; any advance on or departure from this point being attended by a loss of power. The entire control of the engine speed would be by regulating the admission of the charge, either by means of the throttle, or, as is usual now with all the best designed modern cars, by acting on the mechanically operated inlet valves now generally fitted. Throttle control has the merit of simplicity, but involves the disadvantage of "wire-drawing" the charge at times. This disadvantage need not, however, be considered in the case of the motorcycle. The novice should endeavour to thoroughly grasp the main principles involved in the action of the various means of control, as by applying these theories only can the best results be obtained in practical driving.

A Monster Racing Car.

Mr. F. A. La Roche, manager of the American branch of the Darracq Company, has divulged to "Le Monde Sportif" some details of a new Darracq racing car which the company intends to race in America this year. The car will be fitted with two independent four-cylinder motors, one in front and one behind, and which will develop 180 h.p. A straight mile in 36 seconds, and a circular mile in 43 seconds, are the estimated speeds of this giant—nearly fifteen seconds a mile faster than the present American champion racers. The car, which will be christened the "La Roche Comet," is being built with a double chassis which will reach to within eight inches from the ground. In the event of a broken wheel, this will permit the car to "slide along the ground," an expedient which, as our Parisian contemporary hints, is "quite Yankee!" The car is being built in France.



BACK NUMBERS.

Poor Miggs (who is dreadfully nervous, and never drives himself) discovers that wretched chauffeur has forgotten the rear illuminating light! and adopts this method of complying with the law. True, there is five miles to go; but any steps are preferable to facing the dread penalty and possible loss of license!

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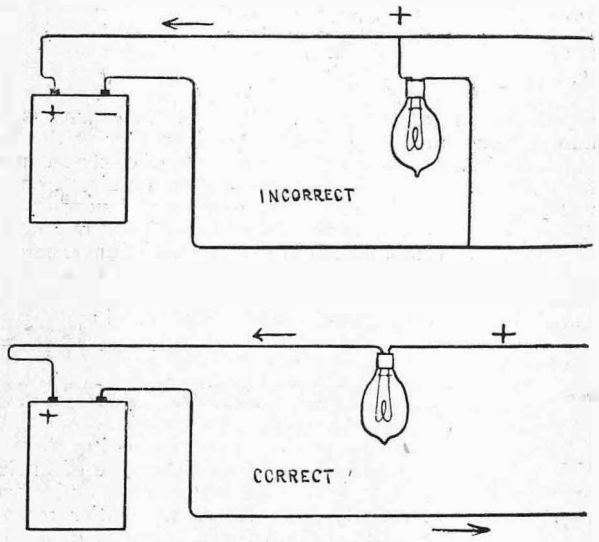
MAGNETO'S POINT OF VIEW.

Causes of Skidding.

Undoubtedly the ever-present danger of a bad side-slip with a two-track motorcycle is one which tells against winter riding as a whole: that is to say, when the roads are in a chronic state of muddiness. From one week to another the macadamised road surfaces have been in that state of thick pasty mud and slime which demands the most careful riding over. I often think of the old adage, "Fools rush in where angels fear to tread," when I see an evident novice on a brand new machine careering over a slimy wood pavement at 20 miles an hour, and with a fine scorn for tram-lines and round-topped pave. My advice to the rider who wishes to keep clear of a skid is in the first place to take no risks in the matter of speed. On wood paving intersected with tram-lines the pace should not exceed 12 miles an hour, although once clear of the traffic and providing one keeps on the crown or centre of the road and steers straight a faster pace is permissible, but go dead slow at corners, and make as wide a sweep round as possible, keeping away from the extreme sides of the road. The reason for this being that there is very often a line of stone setts at the gutter, and if the back wheel gets in the groove between two rows a skid is almost certain to occur. When crossing tram-lines I find it safer to switch off and let the machine run on by its own momentum, and the same in taking a very sharp corner, except where there is heavy traffic, to get through in which case I switch off some distance before the turning and pedal the machine till on the straight. As to the degree of inflation of the tyres, my motto is have them dead hard, even the front one, at the cost of some discomfort from vibration. There are certain minor details which should be seen to, as neglect of them may to some extent contribute to a skid. One of these is to take note that the tyres are true or "in plane" with the rim. I observe some motorcyclists are very careless in replacing a cover, with the result that the tyre when inflated wabbles badly. I always very carefully set the tyre true before it is fully inflated. A tyre that is out of plane in two or three places is particularly treacherous when riding over setts where there are considerable spaces in between. Another matter to see to is that the back wheel is adjusted centrally in the forks, and not making another track with the front one. I find that there is a considerable tendency for the wheel to be pulled over to one side owing to the strain of the belt. In one instance I came across neglect of this matter resulted in one side of the tyre becoming worn down to the canvas from its chaffing against the rear stays.

How Not to Charge Motorcycle Accumulators.

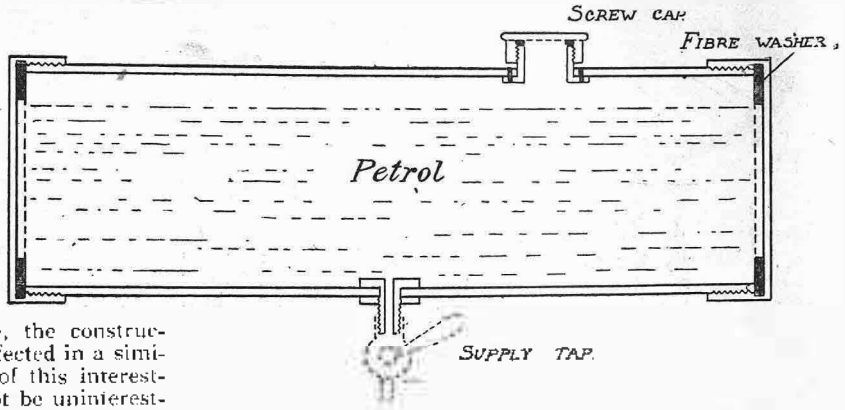
In glancing through the advice columns of a recent issue of a motor journal I came across the following gems which I should say must have sorely puzzled the readers. Put briefly, the points are these: presuming the accumulator requires charging at 2 amperes, it is best to use on a 200 volt circuit either two 16 c.p. lamps in series or one 32 c.p. lamp. Then the further lucid advice is given: "the negative wire from the lamp must be connected to the negative terminal of the accumulator, and the positive wire of the lamp to the positive terminal of the battery." This arrangement (of which I give a diagram) is absurd and useless. The correct way to join up is given alongside. Then the advice goes on to say that the average time to charge a 20 ampere hour accumulator with the lamps mentioned in circuit will be from ten to twelve hours. How this would work out in practice is as follows: a 16 c.p. lamp of 100 volts allows just 6-10ths ampere to pass, and if two are placed in series on a 200 volt circuit the amount is exactly the same; hence to fully charge an *actual* A.H. battery at this rate would take nearer 40 than 10 or 12 hours. To do it in the time stated the two lamps should be 50 c.p. each, and if a single 200 volt lamp be used it would have to be no less than 100 c.p. I should just like to mention that if any reader tries the connections in the first diagram he will have a grand flare-up and spoil his accumulator, unless the circuit fuse goes. This is obvious, as the cell forms a dead short circuit.



More Use for Aluminium.

Although aluminium now costs little, if anything, more in the mark s than the best gun-metal, it has struck me as very strange that motorcycle makers practically neglect it altogether, w ien they really could make a good deal of use of it in the equipment of a machine. The only part of the motor in whi c it is made use of is the crank case. I have seen very few carburetters constructed in aluminium, they are mostly made of brass, whereas the lighter metal is admirably suited for this fitting. All the fittings from the carburetter to the inlet valve could be made of it, and so also could the silencer and fittings, contact breaker base plate and cover, vacuum valve, and many minor parts. Exterior to the motor, such parts as the following could very well dispense with steel or brass: lubricator pump, coil and accumulator case (which could be made of riveted sheet), control levers, mudguards, etc. I have been thinking on what lines an aluminium petrol tank could be made. There is the apparently insuperable difficulty of soldering or brazing the seams to be got over. Although we are continually hearing that a soldering process has just been perfected, somehow or other they never seem to get beyond the newspaper puff stage. At present we should not be able to make an aluminium tank out of the sheet in the way that a brass tank is made. It struck me that as it is possible to readily obtain aluminium tubing up to four inches or more in diameter that a very excellent light and handsome tank could be made in this way, have the ends of the tube screwed with a fine thread, and on to these have aluminium caps to screw up. These caps would be, of course, castings, and inside would be fitted a fibre washer to make a petrol tight joint. A further security, as far as making the ends perfectly petrol-tight could be obtained by cementing up the thread, although I really do not think this would be necessary in the least, as the fibre washer would, I think, make a

perfect joint. The inlet aperture and the tap fitting to connect to the carburetter would not present any difficulty, as screwed joints could be used. Such a tank, I venture to think, would be very strong through being of tube construction, and it would give a better finish to the machine. I have seen some very fine work done in the way of screwed aluminium tube fittings, chiefly in connection with lens mounts and optical work. I give a sectional diagram of my method to make it clear. The fixing of a tubular tank to the frame tubes would, of course, be done by means of aluminium bands encircling it. Of course, the construction of a lubricating oil reservoir could be effected in a similar manner. Reverting to properties, etc., of this interesting metal, a few facts concerning it may not be uninteresting to my readers. Within the last few years the price of the metal has come down from something like 14s. a lb. to 2s. a lb., thanks to the discovery of a method of reducing it from certain minerals by an electrical process, which is a wonderfully interesting one. There is an enormous aluminium works at Niagara Falls, and another at the Falls of Foyers in Scotland, and a vast amount of electrical energy for the furnaces is obtained for next to nothing from the waterfalls, hence the metal can be produced very cheaply. The relative weights of an equal bulk of steel or iron and aluminium is 1 to 3, that is to say an aluminium crank case would be just one-third the weight of a cast iron one. Compared with copper or brass, these are nearly three and a half times as heavy for a given volume. The metal makes beautifully smooth and clean castings, as can be seen from the exhibits at the Shows, and being extremely ductile it can be rolled or pressed into innumerable forms. The melting point is 1,209 degrees Fahrenheit, that of copper being 2,000, and iron 2,370, so that it will stand a considerable heat. It is possible to electroplate it with copper, and then ordinary soldering can be done on the copper. Fittings made of the metal have the disadvantage that if they get badly bent or strained in any way there is danger of breakage in bending them back, as the fibre of the metal seems to get very brittle. I have thought out this idea of an aluminium tank in connection with a scheme of mine for a light 2 h.p. motor-bicycle. This tank, it should be noted, will weigh less than one-third that of a brass one.



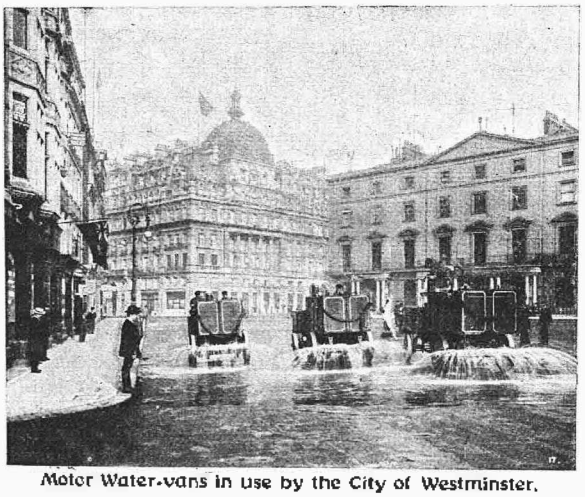
THE NEW LOCOMOTION—AND THE OLD.

"The joy of the motorcar!"—says a writer in "Le Velo"—"The delight of controlling that piece of intricate machinery! of taming time, enslaving space, and mastering matter! A railway train exacts a scantier mead of admiration: it wants a special track, a crowd of officials, numerous mechanics, many tons of coal, and certain fixed stopping places; and then it always goes the same way, at the same time, and the same speed; and no one has invented a practicable method yet of warming a railway carriage, nor of keeping our hair and our eyes from cinders and smuts—to say nothing of bumps and jolts which upset the nerves, if nothing worse. Now look at the motorcar. I have before me the itinerary of a tour recently taken by Mons. Cormier from Paris to Tunis and back: it totals up to some 4,400 miles, and some of the places visited on the way were Madrid, Carthage, Oran, Algiers, Constantine, Tunis, Sicily, Italy, The Alps, Strasburg, and Brussels. Imagine such a tour taken by the non-motorist: think of the worry and the trouble of it! The endless calculation of distances, the struggles with railway guides and railway companies, the frequent changes of train, the compulsory stops in certain fixed towns, and at certain fixed hotels—to say nothing of the fact that in a good many places there are no railways; even with the help of the best touring agent in the world, the thing cannot be done without a thousand difficulties and ten thousand annoyances. And how many months would have been needed to traverse this mighty arc covering a fifth part of the circumference of Europe! Mons. Cormier was back in Paris a month after he started.

"In front of me is a pile of photos which convey to me in more impressive language than the traveller himself can employ the kind of countries and scenes which the motorcar passed through—roads in Spain which recall the roads of our own sunny land of France in the days of the Druids,

BOGGY, PRECIPITOUS, AND BOULDER-STREWN;

over these the car went, if not without difficulty, at any rate without destruction—Italian roads, where the mountain torrent has torn away a wide strip of the causeway, and left a narrow bridge which a horse would have shied at and refused, but which the motorcar took without a tremor—here a swollen stream floods the highway to a depth of several feet; the '10 h.p.' swam it like a duck; show me the train that would have done this. The one manifestation of nature which the car could not contend against was snow, and that only when it was six feet deep, a mere three feet was hardly noticed. And what of the thousand and one dangers of even a civilised road—let alone those in the wilder regions; the tortuous turn, the steep descent, the unexpected obstacle! Finally, what of the triumphant return, safe and sound, with the same car, a living proof of the speed, strength, and reliability of the new locomotion!"



Motor Water-vans in use by the City of Westminster.

TO READERS.

Although we have a large staff of regular contributors, we are always pleased to consider contributions from readers, either literary, artistic or photographic. MSS. should be on one side of the paper only, typewritten for preference, and if return is desired in case of rejection a stamped directed envelope should be enclosed.

SOME INTERESTING NOVELTIES.

New Wicker Body.

A new type of wicker body has just been introduced for the Trimo fore-carriage. It has rolled arms and a handsome appearance. The Phœnix Trimo can now be supplied promptly, to fit any well-known make of motorcycle. All that is necessary is to fill up a measurement form when ordering and the fore-carriage, complete with brakes, is despatched from the works ready to be fitted. The task of fitting is easily within the powers of the average amateur.

A New Glove.

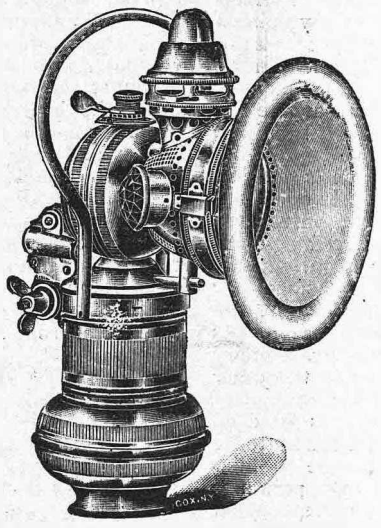
Calling at Lovegrove's in Piccadilly, to make a purchase, we were shown something original in gloves. It is a kind of semi-mit, well made in leather, and while giving the warmth of a mit, allows movement of the fingers and so prevents them from getting cramped. A comprehensive show of motoring requisites was on view, and the prices marked appeared to be moderate. After two years of experiment Mr. Lovegrove is satisfied that he has now secured a perfectly wind-proof as well as wet-proof cloth.

Henwood's Rubber Hub.

This drawing has been prepared by Mr. E. H. Henwood, of 22, Great St. Helen's, to show the proposed application of a patent rubber hub to a light motorcar. A is the axle. B is the axle box flange holding the carrying and driving bolts CCC, eight in number, also forming the chain wheel and brake drum. CCC eight carrying and driving bolts, unitedly, equally and simultaneously operating to carry the weight and spring-drive the wheel. DDD eight rubber annular cushions 3in. long 1 13-16ths inches in diameter, forming the rubber bearing surface for the eight carrying and driving bolts. E hub casting holding the steel tubes G in place and also the spokes. F space allowed for compression of rubber cushions. G steel tubes holding the rubber cushions in their places. It is submitted that by this means metal or solid rubber tyres can be used, so that punctures and skidding cannot occur. At the same time it is claimed that its properties of absorbing vibration equal those of a pneumatic tyre. Most powerful brakes may be used in conjunction with these hubs, without fear of injury. The patent is capable of adaptation to a motorcycle, and in this case a much larger cushion could be employed. We understand that several Midland firms have the patent under consideration, with a view to fitting it to cars and cycles.

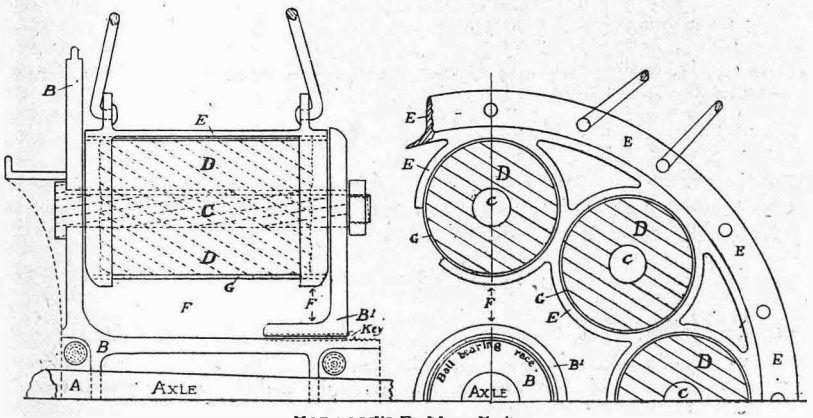
20th Century Lamp.

The acetylene lamp illustrated is designed for use on voiturettes, fore-carriages and high powered motorcycles. It is 110 candle-power, well-made throughout and finished in either brass, nickel or



black. It retails at 25s., and is regarded as the best value of any on the list of The 20th Century Lamp Company, 114, Fore Street, E.C., who are the makers.

Readers of "THE MOTOR" desiring information as to patents can obtain same on stating full particulars required and addressing to "'Patent,' c/o Editor 'THE MOTOR,' Rosebery Avenue, London, E.C."



Henwood's Rubber Hub.

A Reflector for Number Plates.

Messrs. Elworth and Hill, 3, Vincent Street, Walsall, have invented a number plate reflector for which they make the following claims:—(1) It will cause a good light to be thrown on the number plate. (2) It will not interfere with the headlight. (3) Can be fitted to any existing motorcycle or car lamp. (4) Ease of attachment. (5) Cheapness. At the moment the firm are unable to fix a definite price, but they inform us that it will be much cheaper and more efficient than any other similar device on the market. They also state that it has been thoroughly tested on motorcycles and cars by the Walsall police authorities, who speak in very high terms as to its efficiency. The reflector has been provisionally protected and will shortly be placed upon the market. Messrs. Elworth and Hill have promised to supply us with one for testing purposes.

New Things in the West End.

A remarkably fine display of lamps is to be seen at the showrooms of The United Motor Industries, Great Marlborough Street, W. One named the "Alpha" has a double lens, is distinguished for its power, and gained a prize in Paris. Another on the "Bleriot" principle is fitted, with an attachment to enable the driver to shut off light as desired when passing restive horses or traffic. A powerful headlight is priced at £4 10s., while for cheapness a brass acetyloid De Nich French lamp at £2 10s. is a marvel. A full range of "Castle" acetyloid lamps, including types with separate generators, is also displayed. The "Scout" motors are a recent addition to the list of the company. These are of West of England manufacture, are for fitting to bicycles, and are of 2½ h.p. and 3 h.p. Immediate delivery can be given. The "Scout" carburetter can be supplied with the motor. This is a single chamber, floatless, spray and is said to be perfectly efficient.

Improved Number Plate.

We have had sent for inspection a number plate from H. Monks, Raleigh Cycle Depot, King Street, Nottingham. It has been designed to meet the requirements of the motorcyclist both for an illuminated plate and a plate to use in the day time. It is provided with two small hinges which can be fitted to any lamp by the simple means of drilling two holes at the top and bottom of the lamp front. In cases where two or more lamps are used separate hinges can be supplied, at a nominal cost, so that the name plate can then be used in conjunction with any lamp. The back with clip for lamp bracket of machine can be attached very readily by means of the hinges, thus forming a thoroughly rigid and sound plate for use in the day time. The chief features claimed for this plate are simplicity, minimum trouble in fixing and adaptability for day or night time use. It can be supplied from the address given at the present time, enamelled with the number painted on in accordance with the regulations, at 4s. 6d.

CYCLOMOT'S CAUSERIE.

A Year's Experience with Chains. An esteemed reader, writing me from Staffordshire, asks me to give the conclusions to which I may have arrived after a year's experience with chains in the driving mechanism of a motorcycle. He says that I used occasionally to refer to my chain-driven machine, but that, latterly, I have been silent on the subject; and he kind of silly hints that, perhaps, I have exhausted the good points of chain-driving. I am sorry if I have given any such impression, but as a matter of fact, I had been rather afraid that my enthusiasm for a well-designed, well-made and very complete machine had run away with my pen, and I considered that I had already said enough to show what I really thought of chains; but here is a man who actually craves for more! Perhaps the best and briefest way in which I can convey my opinion on the matters which have been so much disputed during the past year will be to say that the specification for a little 2 h.p. motor-bicycle with Minerva engine, which is now being built for me, includes the items spray carburetter, trembler coil and chain-drive. These three have been features on a motorcycle which, during the whole of 1903, from January to December, never gave me a moment's anxiety. And of these three items I have already placed it on record that they were entirely free from trouble, the only cause for a road stoppage being a clogged petrol feed pipe between the tank and carburetter. So with the ignition system, the only attention required was the occasional recharging of batteries; and, with the driving chains, the only call was for an occasional oiling. Now these results were not obtained by the exercise of any extraordinary amount of care or by constant attention. On the other hand, I consider that I was saved an immense amount of trouble during the year because my machine was fitted up with these labour-saving appliances. I had no belt to be constantly punching and joining up; no change in mixture on the tricky part of a hill, and no contact points to be adjusted at every ride. My Staffordshire correspondent may order chain-drive with confidence, provided he sees that the chains are good and in correct alignment. One of the heartiest laughs that I had at the recent Shows was when I noticed, in running over a chain-driven machine, shown by a firm which had hitherto confined its attention to the belt, that, whereas the engine sprocket and the chain ring were approximately in line, a countershaft being placed mid-way between them caused the two chains to run at an angle that would have resulted in constant snapping and throwing off, if anybody had attempted to ride the machine!

Is a Flexible Drive Necessary? The idea seems to be generally prevalent that the chain-drive is so rigid that it is absolutely essential for some slip or give to be introduced somewhere into the transmission system, but for the life of me I cannot bring myself to see the need for anything of the kind. The usual argument is that without this slip the chain may be broken through some sudden spurt on the part of the engine, and that the "harsh" driving of the chain will wear the back tyre. But are these sudden spurts on the part of the engine ever felt on a belt-driven cycle, and why should the thrusts of the engine be destructive of tyres when transmitted through one medium and not through another? Surely nobody will contend that, under driving load, the top run of a belt is at all elastic. Moreover, I cannot find that any such slipping device is provided in the transmission system of a car, and with a powerful engine and a heavy vehicle, if there were any force whatever in the argument, it should apply more in the case of the car than in that of a motorcycle. As a matter of fact, he must be a very bad driver indeed who would permit his engine to sustain shocks such as a slipping clutch would provide against; and anybody who might be in the habit of starting his engine with the ignition advanced would soon learn enough to drop the practice or give up motorcycling. As for the assertion that the alleged harshness of the drive causes flats to wear on the tyres, I think that there is much more truth in the contention that the wear is caused through the road wheel being called upon to overcome compression and so start the engine. If free-wheel clutches are introduced into the system, as is done on the Humber, this is entirely obviated. As a result of a season of fairly hard wear (over good roads, however), my tyres scarcely show a scratch, whilst of signs of wear I can find none. My main reasons for objecting to the use of a slipping clutch are: firstly, it is entirely unnecessary; and secondly, to be effective in the hands of any chance driver amongst the buying public who might be prone to using his engine badly, there must always be the chance of a loss of power uphill, because the slip would occur on the engine pulley, and so be disadvantageous, whereas, to be of use by reason of the slip lowering the gear, it should occur on the rear pulley. On my motorcycle and on my car I have chain-drive direct from engine to road wheels when the clutch is in, and in neither case is there any slip between the faces of the clutch when fully engaged. With neither vehicle has the need for a slip or for a spring-drive ever obtruded itself. Why, then, suffer its possible disadvantages if nothing is to be gained from its adoption?

Registration in London. Quite a number of readers have gone to the unnecessary trouble of dropping me a line to call my attention to a presumed error in my recent note upon numbering, wherein I referred to the prospect of a double index letter being issued for London, because the first 999 numbers were then nearly exhausted. It is pointed out that the London County Council has not stopped short of the thousand, but has gone right on. But there was no error on my part. It happens that I had seen a copy of the letter issued by the Local Government Board to the various registering authorities, in which the advisability of confining the size of each number to not more than three figures was urged, and this was followed by an announcement that a fresh index letter would be issued to any Council which should reach the figure 999. But it has since become obvious that London, where already nearly 4,000 vehicles have been registered, would only complicate such a scheme, because it would require so many different index letters, and as all of these identification marks, after A had been filled up, would have been of the double-letter kind, there would have been no advantage gained, and so London is running into the thousands with its numbers, and, as the four-figure number is not proving to be difficult to read, I have no doubt but that the Local Government Board's recommendation will either be withdrawn or disregarded throughout the country.

Motorcyclists are not as numerous as umbrellas in or near London just now, and this may account for the fact that we have not had much opportunity of seeing how the average motorcyclist is endeavouring to comply with the Act. But I must say that the efforts to light the front plate which I have so far seen have been very poor. Even on cars the number plate is not very legible at night, but the electric broughams, with their transparent figures illuminated by powerful electric lights, are doing the thing very well—a bit too well, in fact, because we may all be asked to follow their example.

AMERICAN TOPICS.

NEW YORK, *January 5th*, 1904.

Records at Daytona.

Records have been going to smash again, and the famous "Gray Wolf" had quite something to do with the smashing. It took place on that peerless path, the beach at Daytona, Florida, where the great race meeting will take place later on. The Packard record pathfinder had the weather perfect, about 70 degrees on the beach sands. A sluggish breeze was blowing from the south, but changed to south-west, so that it was of an advantage to the driver after records. The course was in only fair condition, being a little heavy. S. M. Butler, Secretary of the Automobile Club of America, had a well-drilled corps of timers assisting him, and his electric timing clocks were in fine working order. Going two miles south, Charles Schmidt turned the "Gray Wolf" around and was off like a shot. Before one could shift his position, he had flashed by the timers. He had broken the American record for one mile by going the distance in 51 secs. Fournier's Coney Island figures for one mile were 51 4-5ths secs., and Alexander Winton's mark over the Daytona course was 52 1-5th secs. The two latter drove 60 h.p. machines, but the "Gray Wolf" was only 24 h.p.

Again, Schmidt went over the mile, and splinters flew from it; the second attempt being 50 2-5ths secs. In making the first mile, Schmidt was also electrically timed for the kilometre, about 5-8ths of a mile, and lowered the former Winton record of 32 4-5ths secs. to 31 3-5ths secs. A third attempt at the mile showed 50 4 5ths secs., and at the kilometre a new record was made in 31 2-5ths secs. A fourth mile was done in 50 3-5ths secs., and a new kilometre record of 31 1-5th secs. was set up.

* * *

Then the speedy machine was tuned up for a more prolonged effort at five miles against the record made by Barney Oldfield at Los Angeles early in November last year. Owing to the disconnecting of the water-cooling pump, this effort was a failure. In his next attempt Schmidt made a world's record for this class of machines, his time being 4 mins. 21 3 5ths secs. He made four more attempts to lower the one mile record. Once he equalled it, and three times he came within one second of equalling it.

* * *

First American Motorcycle Champion.

The first hall-marked American motorcycle champion is G. H. Curtiss, of Hammondsport, New York, and he won the title at the Empire City meet at Yonkers, New York, on last Decoration Day, when he defeated the pick of the "Simon pure" motorcyclists in a fast five mile race. Curtiss rode the 5 h.p. two-cylinder belt-driven "Hercules." There was no semblance of a race; Curtiss took the lead at the pistol-shot, and no one ever got within hailing distance. The race brought out many of the men who had participated in the hill-climbing contest of the New York Motor Cycle Club in the morning. Curtiss had won that, and it was fully expected by the cognoscenti that he would duplicate his performance.

The men were lined up near the head of the straight, and came to the tape at a fair pace; but the starter refused to give them the signal, as two or three men were somewhat in the rear and they rode around for another start. This time they "bunched" finely and, getting the pistol, dashed ahead. Half a mile had not been covered before it was seen that, barring accidents, Curtiss was the winner. He opened the gap between himself and the nearest man at once, and steadily increased it. At about three miles he lapped the tail enders and eventually won in 6 mins. 34 secs., G. W. Holden being second and F. W. Rogers third.

* * *

A Successful American Machine.

The public have come to look for great and ingenious improvements in the motor-bicycle from the makers of the Thomas "Auto-Bi," who are the originators of the first motor-bicycle roadster, and are to-day the largest and most popular manufacturers of this useful machine. An illustration of this machine is unavoidably held over till next week.

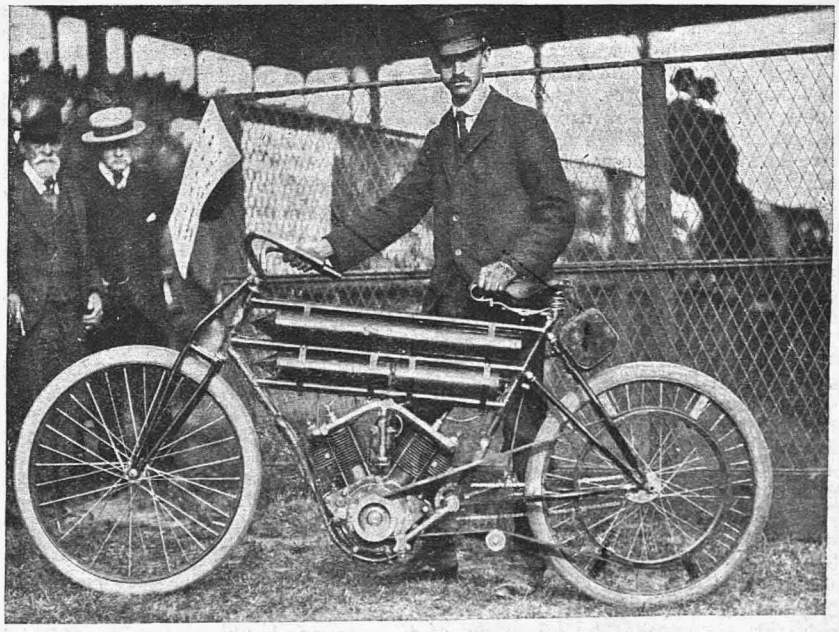
* * *

A New Vehicle.

An automobile possessing many novel features was given a private speed test recently on the Coney Island Boulevard.

The machine was designed by Walter Christie, and was constructed in the factory of the Christie Iron Works in this city. Its designer believes he has solved the problem of the least possible weight with the greatest possible power. In the racing trim in which it was tested yesterday the total weight is only 1,200 pounds. Even with a tonneau the weight is said to be only 1,350 pounds. The motor is of the four-cylinder type, developing 35 horse-power. With Mr. Christie and a driver up yesterday the machine is said to have travelled several miles at the rate of 55 miles an hour. The engine is forward with direct drive to the front wheels. There is no front axle, and the machine, which is built low, has a compact, snug appearance. The wheel base is 7 ft. The machine may be used in speed competition. If further tests to which it is to be put be successful, it is the intention of the constructors to enter extensively into automobile manufacture.

WHEEL.



G. H. Curtiss and the "Hercules" racing motor-bicycle on which he has won many events in America.

The Motor
INCORPORATING Motor Cycling & Motoring

The Circulation of "The Motor" exceeds that of ALL other motor papers combined.

Conducted by
EDMUND DANGERFIELD
and WALTER GROVES.

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ERNEST PERMAN.

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OPINION

The Club and the Press.

We have sufficient knowledge of the position of affairs not to be misled by what appears to be mere coincidental publication in two of our contemporaries of articles attacking the Automobile Club. No less than five and a half columns in the two journals are devoted to the purpose; and whilst one paper expends its entire vocabulary mainly upon the "Club Journal" (about the future of which it professes great concern "for the Club's own sake"), the other evinces such poverty in invective that it descends to the merest trivialities, for instance attacking the Club for its lack of action in regard to the dimensions of the County Council licensing form!! What the article lacks in substance, however, is made up for in the title, which is "The Decadence of the Automobile Club." The real situation is perfectly clear to us because, after the Club had—whether rightly or wrongly does not matter—arrived at the decision to continue the "Club Journal" on the lines that have been objected to in a few quarters, there was talk of establishing a concerted policy of aggression towards the Club—a policy which found no favour in our eyes. Our own criticisms of the Automobile Club have—of necessity, we regret to say—been frequent and more often adverse than otherwise; but they have been without any *arrière pensée*, and we intend to continue to criticise or to praise in the future with a perfectly open mind and without promptings from outside sources. The position, briefly, is this: It is said that the majority of the motor Press resent the opposition of the "Club Journal." They have—perhaps rightly—expressed the opinion that it should cease taking advertisements, and revert to its original form. Our own view concerning the "Journal" is that it should be a paper for intercourse amongst Club members, and we are of opinion that in its present form it is open to very considerable improvement, but we stand aloof from any attempt to dictate the business policy of the "Journal." The Club has, after due consideration, refused to discontinue the "Club Journal" on its present lines and, apparently, the two journals mentioned have started out, in a manner quite their own, to do the Club all the mischief possible. We can only characterise this policy as a misuse of the Press and unworthy of journalism. Whatever may be the feelings that prompt their action, even the combined influence of the two journals cannot be regarded as likely to seriously affect the future of the Club, as the objects and intentions of the parties should be sufficiently apparent to engender disgust in the mind of the unprejudiced observer. It is surely pertinent, however, to repeat our question whether it would not be wise for the Club to rid its councils of those representatives of Press and Trade whose personal interests seem to be paramount over those of the club they profess to serve?

Local Road Reform.

The average road user, making use of the senses given him, must often marvel at the general neglect or maladministration of the roads in this country. There are instances, of course, where the control is in the hands of a surveyor with ideas and with the energy and organising abilities to carry them out, and in such districts it is a pleasure to use the roads, but these examples but serve to throw a lurid light upon the other and more general picture of wasted opportunities. In this country we are in possession of a network of roads, but surprisingly few of them are really available for through traffic, and yet the exercise of a little common sense would make them so, and enable them to relieve the congested main roads. There is work in this matter for a vast organisation. The Roads Improvement Association has, for some time now, devoted its attention to the larger considerations of new roads, of wider roads, and of the protection of the interests of ordinary road users against the monopolising tramcar. These are important matters demanding urgent and constant attention, but we do think that what might be termed local road reform is deserving of careful consideration, and, moreover, it possesses this merit—that a little work may secure rapid and tangible results. Perhaps the most important of these matters, so far as cities and towns are concerned, and particularly with regard to the metropolis where the traffic is so heavy, is the proper cleansing of the streets. Any form of locomotion is unpleasant in London after rain, and this is simply due to the fact that London is never washed down. One or two streets here and there are done, but the good effected is on a par with a single swept crossing met in a mile of muddy walking. We look forward to the time when water will be brought down from one of the watersheds, be laid on to conduits in every street, and then be used to flush the roads every night and to wash away the material that goes to form mud. In Paris the authorities are not sparing with the water for this purpose, and as there is no need to use filtered water from the drinking supply, London should be able to afford the luxury of clean streets secured in this way. In the country, how many roads are rendered almost useless because of their narrowness, when if hedges were trimmed back, the greenswards at the sides were reduced, and the space thrown into the highway, they could be made of service to the community? We know of many a road with wide greenswards, but even the latter cannot in some cases be resorted to in an emergency, because they are used for the storage of flint stones and road material, whilst they are rendered treacherous and dangerous by the "cut outs" made for drainage purposes. If the drainage into the ditches were taken through pipes, and the greenswards levelled and cleared and reduced, the roads would be immensely improved at very small local cost. These matters must be dealt with locally, but with some general system and organisation, and we should like to see either the Automobile Club or the Roads Improvement Association take the matter in hand. The local work could be carried out by special road committees appointed by the various provincial automobile clubs, delegates from which could attend a general conference periodically and compare notes and receive the assistance of experts who, having made a study of such matters, could advise upon the powers held by the authorities and upon the best methods for securing reforms, and of putting them into practice. Automobilists must remember this: the railway era caused the road question to become neglected; the motor era makes it one of supreme importance again; and they are the ones who must seek to effect the needed reforms. They must not, therefore, shirk their responsibilities.

NEWS.

The Anniversary Number of "THE MOTOR" will be a big surprise.

Attention is drawn to a striking testimonial which appears in a special inset in this issue.

Snow ploughs fitted to motorcars in America during the recent snowstorms are stated to have done excellent work.

At the recent Liverpool Assizes a Wallasey motorcyclist named Wells obtained £50 damages for being run down by a cab.

A motorcycle "chain belt" which "will revolutionise the motoring world" is announced to be marketed shortly by a Paris firm.

C. J. Glidden, the globe-trotting motorist of Boston, will drive a 24 h.p. Napier on his forthcoming tour of the world.

Augieres, the well-known Continental chauffeur, has been selected as one of the drivers of the Pipe cars in the Gordon-Bennett.

The new launch motor acquired recently by the Paris river police captured several boats engaged in illegal fishing on the Seine last week.

The Auto-Cycle Club is taking action on the matter of the Inland Revenue tax on the ground that it is excessive, and that it may not be legal.

A new two-seated car is about to be placed on the market by the Vulcan Motor Co., Ltd., Southport, price £105. We hope to illustrate this shortly.

The Car and General Insurance Corporation, Ltd., ask us to state that they have moved into permanent head offices at 1, Queen Victoria Street, E.C.

Mr. Charley has arrived in New York for the American Shows. One of his objects in going to the States is to push the trade in Mercedes cars in that country.

Mr. Hewett's new car for the Gordon-Bennett race will embody some novel features, chief of which is that the radiator, instead of being placed in front, will be in the centre.

The cup presented to the Automobile Club of France by the Marquis de Chasseloup-Laubat—as a memorial of the late count—is primarily intended for "light car" competition. Owing to the difficulty of arranging a suitable competition this year for light cars, the club has decided to present it (for this year only) to the car which wins the eliminatory Gordon-Bennett trials.

The next election at Hastings will be a tussle between two great sports—the ancient game of cricket and the modern pastime of motoring; for it is as a motorist that Harvey du Cros, the Conservative candidate, is now best known. His future opponent, the present M.P., Mr. Freeman Thomas, is the old Cambridge and Sussex cricketer, who in the days when Sussex were considerably lower in the list of first class counties than they are to-day contributed many a dashing innings.

On Choosing a Car.

("Earl Russell's car 'is registered A1, which should indicate that it is the finest car in the kingdom.'"—"The Free Lance.")

When you purchase a car as a second-hand "spec."
Be wary, dear reader, be wary.
For your purchase may turn out an absolute wreck,
Or, of course, it may prove the contrary.
You may get hold of one whose appearance is nice,
Although it was never to budge meant,
So in buying a car, take an expert's advice,
And don't risk an error of judgment.

If you can't manage that, then a safeguard you'll find
Is to look for the name of the makers.
On heavy steam tractors, and things of that kind
For Thornycroft's name-plate, or Straker's.
For touring, a Wolseley or Lanchester car,
A Panhard, De Dietrich, or Humber
Should suit—but the safest of methods, by far,
Is to turn up its registered number.

O, the expert's opinion mistaken may be,
And the name-plate may turn out a fake,
But the register's open for buyers to see
And no one need make a mistake.
A1 is the best—so the "Free Lance" opines,
Though *why* may appear a bit vague—
But a car that is numbered ZZ and four 9's
If you're wise, you will shun as the plague!

"Cycling" makes some interesting announcements in its current issue.

The Motor Union intend proceeding against a police constable for perjury.

An another page we give an interesting photograph of the Duke of Connaught on his motorcar.

A large Stirling motor omnibus has lately appeared in Liverpool, conveying passengers to the football grounds on Saturday afternoons.

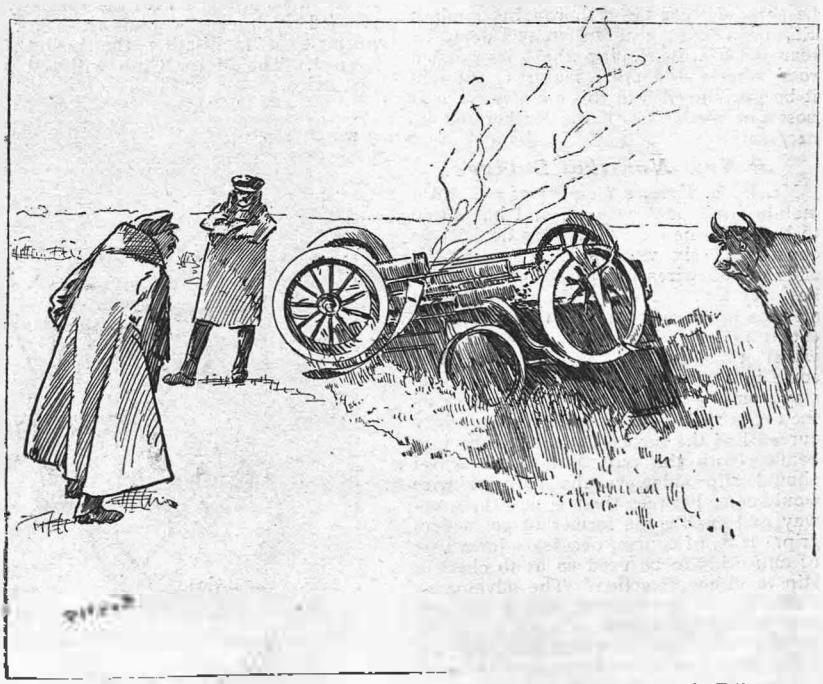
The second anniversary number of "THE MOTOR" to be published during the Crystal Palace Show will contain some striking innovations.

Mr. St. John C. Nixon has been appointed motor engineer to the General Accident Assurance Corporation, whose offices are at 13, Pall Mall, London, S.W.

Mr. Henrik Arctowski, a member of the Belgian Antarctic Expedition, considers that a properly constructed motorcar would do better work in polar exploration than dogs.

At its meeting to-day (Tuesday) the Automobile Club of Belgium will propose that the Circuit of the Ardennes shall take place at the beginning of May, in consequence of the early date of the Gordon-Bennett.

By a coincidence which is really less remarkable than appears upon the surface two motor journals attack the Automobile Club and the "Club Journal" in their respective current issues. We deal fully with the subject in our editorial columns.



COMMERCIAL TERMS ILLUSTRATED.—"OUR ANNUAL TURNOVER."

Motor Exhibition in Rome.

From February 6th to 16th an alcohol motor exhibition will be held in the Adriano Theatre under the patronage of the Italian Minister for Agriculture. There will be three sections: one for motors under 2 h.p., a second for motors from 2 to 6 h.p., and a third for motors from 6 to 10 h.p. Gold and silver medals are to be awarded.

Motorist Stops Runaway Horses.

A correspondent to the New York "Automobile" relates an exciting tale of how he stopped a runaway team when on his motorcar a short time ago. "The horses were going about 20 or 25 miles an hour, but the old Winton held them easily. Just below 81st Street I managed to get the reins but saw it was impossible to stop them that way, as I was pulling them right on top of the car. When we got near 72nd Street I managed to get the rein on the inside horse and pulled them into the kerb in front of the Majestic Hotel. When the wheels hit the kerb it was like holding an iron on an emery wheel, the sparks flew so fast, but they stopped without doing any damage except breaking one of my small lamps." The fact that the motorist was alone in the car must have added considerably to the difficulty of the feat.

The American "Dawson" Car.

A new two-seated car has been placed on the market in America by the J. H. Dawson Machinery Co., of Chicago. We are able to give an illustration of one of the first of the type to be turned out, but we are awaiting technical details about it. It is driven by a two-cylinder slow speed engine placed forward and driving through a gear-box which gives two forward speeds and a reverse and thence by a central chain to the rear live axle. The engine has a range of speed from 150 to 1,200 revolutions per minute, and at its normal rate of 1,000 revolutions the car can travel at 30 miles per hour. As will be seen, the car is on thoroughly modern European lines with its shaped seat, its rear tool box, its sloping wheel, its wooden road wheels and other features. Should it be introduced into this country we will post our readers with the further details necessary.

A New Non-skid Device.

Mr. H. S. Eyre, a member of the Automobile Club has designed and had fitted to his car a new anti-skidding device. It consists of six wide loops of wire, the ends of the wires being attached to clips half-way down the spokes of the wheel and the loops over-lapping the tyre to the extent of two or three inches. As the wheel revolves the loops successively come into contact with the ground a little way from the point of contact. As long as the car is running in a straight or slightly curved line the device does not come into contact with the tyre, but if the wheel should slip sideways the loop of wire would come between the tyre and the roadway and enable the former to get a firm grip. It is, of course, necessary for a pair of anti-skids to be used so as to check a slip in either direction. The advantages claimed are: no contact with a tyre except during the course of a slip; can be rapidly folded out of action altogether on a dry day: very little wear and each component wire is readily replaced.

D6

Rather Monotonous.

The Rev. Arundell Whatton expresses the hope that a greater number of riders may devote themselves to motorcycle racing this year, for, as he points out, the changes have up to now been rung upon comparatively few names. This is true. One journal is apparently going to devote half a page weekly to photos of one particular racing man taken in different positions! Two have already appeared.

Highway Reform in America.

The Rhode Island Automobile Club is about to put in hand a most important piece of highway reform. All the roads in that State are to be marked out with notice and guide boards; and the information conveyed by these is to be of the most practical and comprehensive nature. In addition to the usual details as to direction and distance of each individual town, the character of the road surface and the nature of any hills or unusual curves will be indicated; level crossings, bridges and any dangerous portions of the road will be pointed out: supply stations, repair shops, etc., will be noted.

Gordon-Bennett Items.

Respecting the German eliminatory aces for the Gordon-Bennett contest, at the last sitting of the Gordon-Bennett Commission of the German Motor Club it was decided to fix the entrance fee at £150, the payment of this sum entitling the maker to enter as many as three cars. The original intention of the club was to charge this amount for every car entered. It is expected that a stretch in the neighbourhood of Lueneberg will be selected as the course of the eliminatory races. The Commission also resolved to have parts of the Homburg course sprinkled with "Westrumite," as this dust-layer was found to answer very well in Ireland. A shield bearing the letters "G.B." is to be affixed to all cars, home and foreign, attending the Gordon-Bennett Race, in accordance with the specially expressed wish of the authorities for the purpose of facilitating the business of control. The Motor Club will sell it at cost price.

The Police have a Clue!

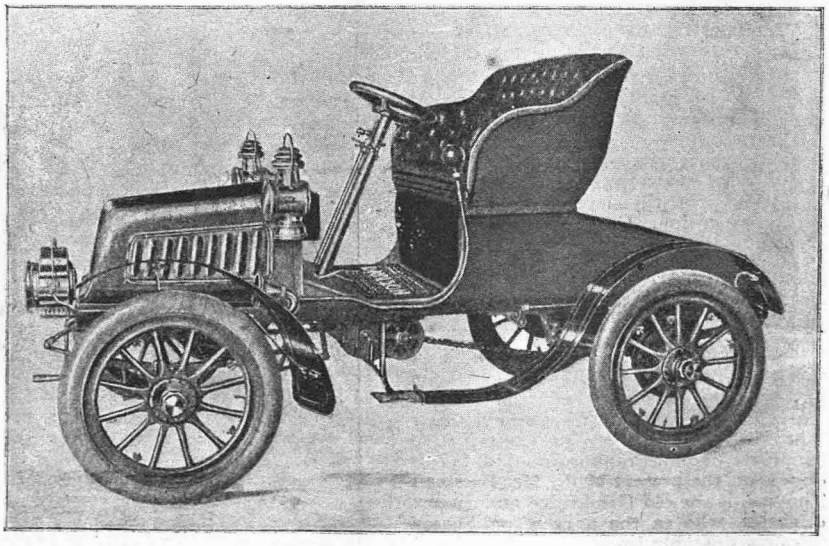
The police of Columbus, Ohio, are in possession of a fine Derby hat, which they are anxious to restore to its lawful owner. One second before it came into their possession, says a local journal, a huge red motorcar, smelling like a distillery and snorting like a Corliss engine, dashed past at 50 miles an hour. The hat blew from the chauffeur's head. In return for a detailed description of same, and some information as to velocity per hour at the time of the loss, the police will hand over the property.

An Interesting Paper.

The Auto-Cycle Club have arranged for the reading of Mr. O'Gorman's paper on "Desirable Improvements on Motor-bicycles" (given *in extenso*—and exclusively so—in "The Motor" of December 9th) at the Automobile Club on Friday the 29th instant. Those who are not members of the club but who would like an invitation to the reading and the discussion which will follow should drop a line to the secretary at 18, Down Street, Piccadilly, W. The proceedings will commence at about 8.30 p.m. The dinner which will precede the paper will only be open to members and their guests.

Sp. Gravity Test Unreliable.

The specific gravity of motor spirit has from time to time caused considerable stir in the motoring world, and the advice often given to those in trouble has been to get a densimeter and test for themselves whether they are procuring .680, .700 or .720 spirit. We understand, on the authority of an expert, that a .680 spirit can be manufactured which would be absolutely useless for motoring purposes, while a .720 spirit can be produced which will give excellent results. It is not the specific gravity, but the vapourising point which is the all-important factor and the densimeter, it is said, is useless as a guide. There is no easy test by means of which this vapourising point can be determined, and it only remains for the ordinary man to find a brand of spirit which suits his particular motor and stick to that as far as circumstances will allow.



The American "Dawson" Light Car, showing how the American car has come round to accepted lines.

CULPRIT (No. P216): "I—er—fail to see anything—to laugh at, constable; this ill-timed—levity —"

P216: "Ha, ha, sir! It do seem so funny, sir. Why, sir, you an' me 'as got the same number, sir!" (Explodes.)

(Nevertheless the bit of blue paper duly turns up.)

Elastic-Grip Pulley.

The new engine pulley, illustrated, is designed by Messrs. J and H. Brown, of Peterborough. As will be appreciated from the diagram the two flanges are adjustable in relation to each other and the power for adjustment is applied through a ring of rubber which introduces a certain elastic element into the grip which the pulley takes of a driveing belt. Should the belt be slipping, the lock nut is loosened, the cover to rubber ring given a turn, lock nut tightened and the pulley should be again free from slip.

The Police were on the Alert.

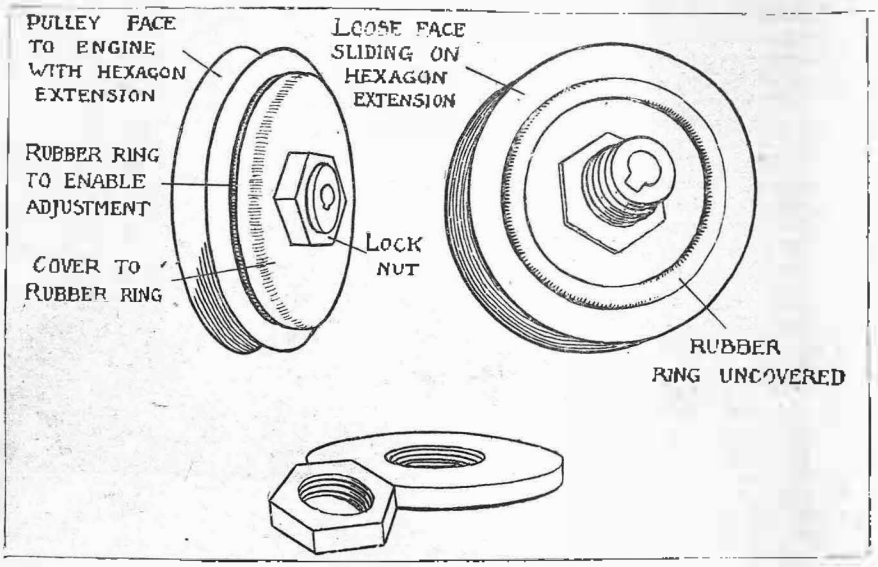
In the north eastern part of the Metropolis the police are keeping a watchful eye on motorcars with a view to observing whether they complied with the new Act in the matter of numbering. On Sunday one of ours whose front number plate had been wrongly made and was, therefore, not fitted, was called on to stop by two constables who were evidently specially posted for the purpose of stopping cars. The sight of the rear plate and an explanation of the circumstances evidently satisfied them. However, the days of grace would seem to be either numbered or over.

Departmental Committee for Heavy Cars.

That the Local Government Board is inspired with a desire to give the interests of the motor industry fairplay is shown by the recent appointment of a Departmental Committee whose business it shall be to inquire into and report on any regulations which are proposed or seem desirable for heavy motor vehicles of every class in respect of increasing maximum weights, and in respect of the construction of vehicles made under such regulations, and the use to which they shall be put. The committee includes the Right Hon. Henry Hobhouse, M.P. (chairman), Sir William Arrol, M.P., Mr. H. C. Monro, C.B., Mr. H. H. Law, M.Inst.C.E., Mr. George Deacon, M.Inst.C.E., and Mr. H. Graham Harris, M.Inst.C.E., with Mr. R. J. Simpson, of the Local Government Board, as secretary.

The 1904 "Motor Manual."

The 1904 (sixth edition) of the "Motor Manual" is now in the press, and its publication will be announced shortly. This new edition has been very largely re-written and brought right up-to-date and, moreover, an extensive addition of new matter will be found. These new features comprise descriptions of the two-stroke engine; all the standard methods of wiring cars and motorcycles; chain transmission and friction clutches; how to charge accumulators and keep them in order; various types of pneumatic tyres; construction of silencers; points on driving a light car; the regulations of the new Act, etc.; types of 1904 motor-bicycles and fore-carriages. All these features are illustrated with diagrams and photographs in the fullest manner. The information given in this new edition we can confidently say is unobtainable in any other book on motors published, and no motorist—whether he drives a car or cycle—can afford to be without it for purposes of reference and instruction. In view of the heavy demand for this issue, orders should be sent in at once.



A New Elastic-Grip Engine Pulley.

The Auto-Cycle Club now has over 130 members.

The forthcoming trials of devices for the prevention of side-slip are likely to be well supported by inventors and manufacturers. Busy brains are at work in the endeavour to overcome a great evil.

A. G. Fentiman, at one time a crack racing cyclist, has become an ardent motorist. Last year he drove a 16 h.p. Decauville, and for this season has purchased the 12 h.p. Peugeot which showed such excellent results in the recent 1,000 Miles Reliability Trials.

The Chevalier René de Knyff and some other members of the French Automobile Club inspected, on Saturday last, the Circuit de l'Argonne, which is one of the proposed courses for the French Gordon-Bennett trials. Their verdict was, on the whole, a favourable one, although they expressed the opinion that in places the roads were dangerously narrow.

The Frankfort Exhibition.

So many applications for space have come in to the organisers of the coming Motor Exhibition at Frankfort-on-the-Main that the original area has had to be augmented by some 450 square metres. We hear that the exhibition will be officially opened on March 19th in the presence of the patron, Prince Henry of Prussia, and other notabilities. The inimitable brush of the great "Schnauferl" artist, E. Kneiss, has been enlisted for the purpose of the exhibition posters.

Motorcycle Taxation.

On Saturday a case was before the Bridlington Bench against a motorcyclist for driving a motorcycle and drawing a trailer, having only paid the Inland Revenue tax on one vehicle. His defence was that he had made enquiries from the Post Office and the Inland Revenue officer and had been informed that they did not know what to charge him. The summons was, therefore, dismissed. As the Auto-Cycle Club are approaching the Board of Inland Revenue in order to get motorcycles exempted, a policy of waiting may be best, especially in view of the Bristol and Bridlington verdicts.

A vapour-propelled motor-bicycle has been invented by a young French naval engineer, Mons. R. d'Espujols.

The week-end was splendid in the Metropolitan district and, taken all round, the roads were in very good order, the cold wind having dried them up wherever their character permitted. In some parts where the mud is always a mass of grease the good effects of the change were not so greatly felt.

Forthcoming Racing in Florida.

Dominique Lamberjack, the crack French motorcyclist, arrived in New York last week for the purpose of competing in the Daytona Beach races in Florida. Most of his racing will be done on a car and not a cycle. He has taken over a light 60 h.p. Clement-Bayard and is anxious to match it against W. K. Vanderbilt's 90 h.p. Mercedes, Barney Oldfield's Winton "Bullet," M. A. Le Roche's Darracq "Blue Streak," and Charles Schmidt's Packard "Gray Wolf."

The Auto and the Trotter.

For the purpose of keeping down the pace of motormen the President of the Government Board of Hanover ordered on July 16th, 1903, that their maximum speed when passing through the streets of towns should not exceed—there's nothing like a clear definition!—that of a "horse at full trot," or when deflecting from one street into another that of a "horse at short trot." A motorist named Zaehringer has just found out to his cost that, if nobody else can accurately gauge the speeds covered by these standards, the Hanover "Robert" can. Herr Zaehringer took his motor through all the courts of appeal available, but one wig after the other decided against him and took the policeman's word for it that the car was being driven faster than the aforementioned measures of pace. "A horse," says the regulation. "Yes, but which horse—what horse?" (a race horse, a 'bus horse, a cart horse, or an ancient cab horse) inquires the motorist. "Ask a policeman!" replies the Government Board of Hanover.

The New 7 h.p. Swift Car.

As we were the first to announce a few weeks ago, the Swift Cycle and Motor Co., Ltd., Coventry, have for some time past been engaged in the construction of a new light car. The company have been so encouraged by the reception accorded to their deservedly popular little 4½ h.p. voiturette, which, it will be remembered, was the only two-seated vehicle to secure an award in the recent reliability trials organised by the Automobile Club, that they desired, to use a colloquialism, to go one better. Accordingly, after exhaustive experiments, they have been able to embody in their latest production a number of new and interesting features, with the result that they have succeeded in turning out a vehicle, built on the lines of higher powered and heavier automobiles, which cannot fail to eclipse the remarkable success achieved by the earlier model. The 7 h.p. engine, which is of the De Dion single-cylinder type, with especially heavy fly-wheels, developes its full power at 1,800 revolutions, and is placed vertically in the fore part of the chassis, under a very small bonnet. Experience has proved its efficiency, and it will be found to meet every requirement of a two-seated car. The gear box is of the sliding Panhard type, and provides for three speeds forward (approximately 8, 17 and 25 miles per hour) and a reverse, while a direct and silent drive is obtainable on the top speed when the pinions are thrown out of action. The gear is strongly made, and is

OPERATED BY A SINGLE SIDE LEVER,

and we noticed that it possesses exceptional long bearings, at the end of which lubricating rings are fitted. The transmission of power is from the engine through a universal shaft to the differential on the live axle. We closely examined the back axle (which had been subjected to a stringent test of over 750 miles without showing the least sign of wear), and were particularly struck with its design. The thrusts of the drive are taken up by four abnormally large ball-bearings, and it is supported by two stiff tie rods. The balance and driving gears are of steel, and these possess remarkably strong teeth. A couple of large phosphor-bronze bearings support the driving shaft, and an additional tie rod prevents any twisting tendency. The friction clutch is a sensitive but stout mechanism, and is self-contained, that is, it provides for the taking up of all the thrusts. The clutch is, as usual, released by a pedal, the action entailing very little pressure from the foot. The brake work is quite in keeping with the rest of the car. Two band brakes acting on drums on the rear wheels are manipulated by a side lever, which, at the same time, disengages the clutch. A metal to metal brake is also provided; this operates on the driving shaft, and is brought into action by a pedal.

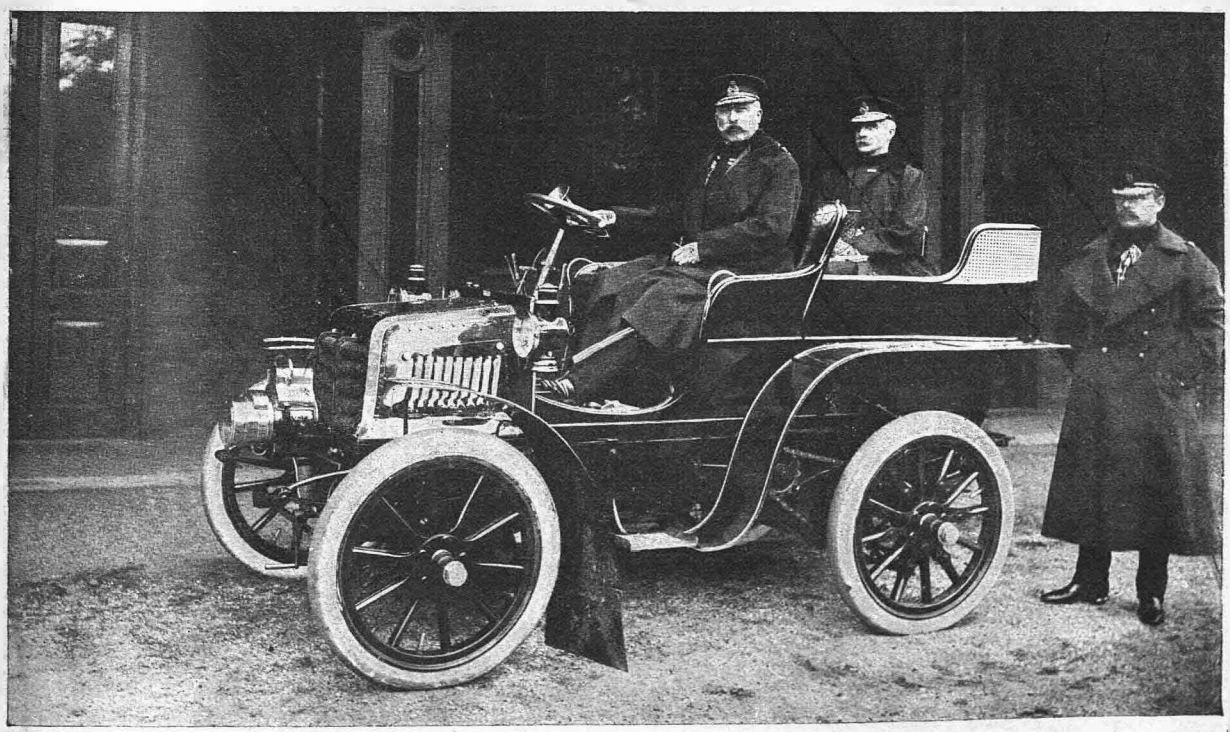
THE STEERING

is of the irreversible worm and segment type, and under the wheel are three levers for controlling the engine. A compensating rod with ball joints is attached for the purpose of minimising the vibration resulting from road shocks. The circulation for cooling is effected by an eccentric wing pump, gear driven off the crank shaft, and the radiator and tank are combined. The water tank has a capacity for 3½ gallons. As to ignition, this is of the high tension type, with wipe contact, trembler coil and accumulators. The lubrication is in accordance with the best practice—the oil reservoir (holding half a gallon) being fitted to dashboard. The petrol tank holds 3½ gallons, and is placed beneath the seat. The body is roomy, whilst ample provision is made for luggage. It is hardly necessary to say that the carriage work is all that can be desired, and the upholstery excellent. The tubular constructed frame is slung on four long and flexible springs, and it is also worth noting that the fore part of the body is independently sprung on four cushion springs, which eliminate all vibration at the footboard.

THE WHEEL BASE

is 5ft. 10in., and the artillery wheels, to which Dunlop pneumatic tyres are attached, are 28in. by 3in. The price of the car has not been definitely fixed, but it will range somewhere near £200. The vehicle is to make its first public appearance at the forthcoming Crystal Palace Automobile Show, and we have no hesitation in asserting that it will create a most favourable impression. Indeed, it is yet another noteworthy addition to the light car category, and the Swift Cycle and Motor Co., who are to be congratulated upon the excellence of their production, are bound to reap a just reward for their enterprise. We shall give photographs of the car in an early issue, together with some supplementary details.

The amount of work entailed on the committees of the Auto-Cycle Club is shown by the fact that two members of the general committee of that club, Messrs. Mervyn O'Gorman and G. F. Sharp, have each attended 21 meetings in about eight months. It is interesting to note that the latter was the originator of the scheme for the formation of the club, whilst the former suggested the title.



[*Photo by H. C. Visick, Clifton.*

The latest portrait of H.R.H. The Duke of Connaught, on his car. Seated with him in the car is General Sir H. Trotter.

Aluminium Silencer.

Silencers made of aluminium should not be fitted close to the engine, but should be at least a foot away. It is also better to sling them in a metal band rather than leave them to be supported by the exhaust tube alone. It is not uncommon for an exhaust pipe to get red hot and at this temperature aluminium becomes rotten, and unless the silencer is well supported, the vibration will cause it to drop off.

Winton in a "Huff."

It is rumoured in the American Press that Alex. Winton's failure to enter for the Gordon-Bennett is due to "pique." It is alleged that in view of his past record and his previous interest in the Cup, Winton felt that he might have been specially invited to enter a car. This sort of conduct, if true, is not the highest form of sportsmanship, and will rather serve to confirm the opinion which Englishmen formed of Winton after his excuses (as reported in the Press) for his failure in last year's race. The winning of the Gordon-Bennett Cup should be regarded not in a personal, but in a national, light.

To Protect the Visitor.

The constituent sitting of the "Arbeits- und Wohnungskomitee" (headquarters: Reisebureau Schottenfels, Frankurt am Main) has taken place at the Imperial Hotel, Frankfort-on-the-Main. This committee's (Anglice, Work and Rooms Committee) main function is to look after the accommodation of guests at the time of the race, and especially to prevent the "fleecing" of strangers by hotel, lodging and boarding house keepers in a hurry to get rich. Herr von Brandenstein, who represented the German Motor Club at the sitting, put special emphasis on this latter function, because should the palm be again taken by Germany the same district would very likely be selected for the next race, and it was hence of the utmost importance not to put visitors out of temper by exorbitant demands. What happened in Ireland is not forgotten, and it is not at all desirable that there should be a repetition of such rapacity. The festivities will last from June 16th to 22nd, and after this date an alcohol motor race will presumably take place at Kiel.

A "Mutual Benefit" Club.

A Physicians' Automobile Club has been formed in New Jersey. Only medical men are eligible. It is the intention of the organisers to have a series of social meetings at which the members will discuss subjects pertaining to the automobile and its use. The rumour that a minimum speed limit of 30 miles an hour is enforced has not been confirmed officially.

Liverpool and the New Act.

The Liverpool authorities have always dealt very leniently with motorists, and very few cases of any anti-motorist feeling have occurred. Under the new Act no limit is to be enforced in the city, and it is unofficially declared that there will be no demands for the production of licenses except in case of accidents. About 150 cars and 100 motorcycles have already been registered, although even now some cars may be seen travelling without their numbers.

Under the New Regulations.

Taken on the whole, the police are not falling over each other in their efforts to strictly interpret the letter of the law—under the new regulations. It seems to be understood that time will be given to the motorist to get his house in order (even if "time" be given him later on for breaking the law). We hear of one automobilist having been stopped by a constable, who proceeded to measure the figures on his number plates. As well as binoculars and split seconds chronograph, the outfit of the up-to-date copper must now include a foot rule.

The Motorcar as a Road Inspector.

"Inspection of roads from an automobile has always produced more practical results in the way of new roads and reconstructed highways," says the New York "Automobile," "than any other method, and added to that is the advantage of completing the inspection in a shorter time. Every imperfection in the surface is not only seen but felt, and such evidence has usually proved much more effective than scores of photographs, many pages of type-written matter, and the frantic appeals of interested farmers made in the warm well-carpeted committee room in the new marble capitol."

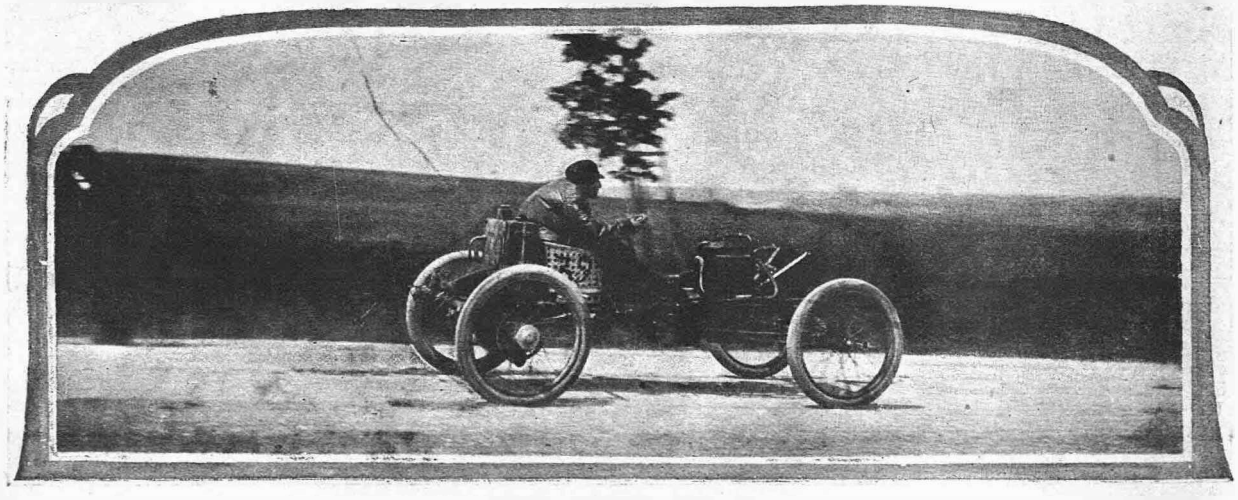
The Mayor of Versailles has informed the Automobile Club of Seine and Oise, who are holding an anti-side-slip trial at the end of February, that the town has decided to present a valuable "objet d'art" in "Sevres" as the first prize.

For Homicide.

An echo of the ill-starred Paris-Madrid race of last spring reaches us in the announcement that Mr. Porter, driver of Car 243, has been fined £8 for homicide. It will be remembered that this car broke down and caught fire, the chauffeur being pinned under it and burnt to death. The court at Chateaudun, where the case was tried, was of opinion that reckless driving contributed to the accident.

The Wolseley Light Car Works.

During the course of a recent visit to the Adderley Park Works of the Wolseley Tool and Motor Car Company we found them exceedingly busy. The new workshops which have been added have not sufficed to fill the needs and so further buildings are about to be erected on a site adjoining the present works. During the past year over 450 cars have been turned out, an average of nine per week, and besides this excellent output a large quantity of special work has been carried out for the War Office, the Admiralty, etc. The company are now contemplating the introduction of a night shift, so great is the press of work. A very interesting branch of the company's business is being established at Crayford in Kent, where magnificent works have been acquired and equipped with a plant of modern machinery for the manufacture of the new 6 h.p. light Wolseley car which was illustrated in the last issue of "THE MOTOR." Of this and other special types of cars the output will be at the rate of 20 cars per week, and with both works in operation the Wolseley Company claim that they will be in the happy position of controlling the largest motorcar manufacturing business in the world. At the Crayford works which, by the way, occupy 25 acres, a testing track is being laid down. A prolonged road test can thus be given to every car, and its behaviour can be noted at all times by the heads of the various departments.



SPEED ON THE HIGHWAY.

A reminiscence of the last Ardennes Circuit. One of the light, stripped racers going at full speed on a straight stretch of level road.

W. K. Vanderbilt, the millionaire motorist has announced his intention of presenting the Automobile Association of America with a cup to be raced for over a course of two or three hundred miles. Detailed particulars will be announced in due time.

Alcohol Mail Collecting and Delivery Van.

Our Berlin correspondent writes:—At my request the Berlin Motorwagen Fabrik, Tempelhof-Berlin, has sent me for reproduction in "THE MOTOR" a photograph of its mail collecting and delivery van which the Berlin postal authorities have been trying for some time past. The van has a single-cylinder alcohol motor in front, transmission being effected through belting to the differential axle at the back. It can travel at about 12 miles an hour and carry a load of 15 cwts. All the machinery is protected by cases from dust. The cost of alcohol per day—the car being in service from 9 a.m. until 7 p.m.—has averaged between 2s. 6d., and 3s.; a very economical working. The postal people are very pleased with the motor, which has never had a "panne."

The New Princeps Motorcycles.

The following are particulars of the several types of Princeps motorcycles handled by Messrs. J. E. Hutton, Ltd., 81-83, Shaftesbury Avenue, London, W.:—These comprise single cylinder 2¾ h.p. motor-bicycles fitted with Lincona belt drive or chain drive. Twin cylinder 4 h.p. motor-bicycles fitted with belt or chain drive. Single cylinder 2¾ h.p. single motor-tricycles fitted with belt or chain drive. Two cylinder 4 h.p. single motor-tricycles fitted with belt or chain drive. Two cylinder 4 h.p. fore-carriage machines fitted with belt or chain drive. The 2¾ h.p. motor-bicycles are fitted with the Princeps single cylinder air-cooled engines, 70 mm. bore, 72 mm. stroke. The power is transmitted to the road wheels by means of a Lincona belt or by a Hans Renold chain. In the latter case the drive is taken from the engine to a friction clutch fitted on an intermediate shaft behind the usual bottom bracket (this method is used on all the chain driven machines). The clutch provides a free engine for starting purposes or for coasting hills. The engine is fitted with a special arrangement for adjusting the tension of the inlet valve spring. It can be adjusted while the engine is running and the best results secured. The 4 h.p. machines are fitted with the Princeps two-cylinder engines, bore and stroke, 70 mm. by 72 mm. respectively. These engines are fitted with the Princeps inlet valve adjuster, and the Princeps twin cylinder contact breaker, which allow the use of only one coil to fire both cylinders and does away with trembler blades. The light motor-tricycles are fitted with either the single cylinder 2¾ h.p. or two cylinder 4 h.p. engines. These machines are not fore-carriages with the body removed and called tricycles. The position of the engine is the same as on the bicycles, the drive is taken to a belt rim or chain wheel fixed to the differential on the back axle. The fore-carriage machines are fitted with two cylinder engines, the transmission is by Magna Lincona belt, or by chains through the Princeps friction clutch. The side tubes of the fore-carriage run from the front axle to back hub spindle, making the complete machine very rigid.

As a result of a recent article on comfortable touring from the pen of Mons. Baudry de Saunier, of "La Vie Automobile," "Le Velo" has promised to offer an annual prize towards the encouragement of suitable "body" work on French touring cars.

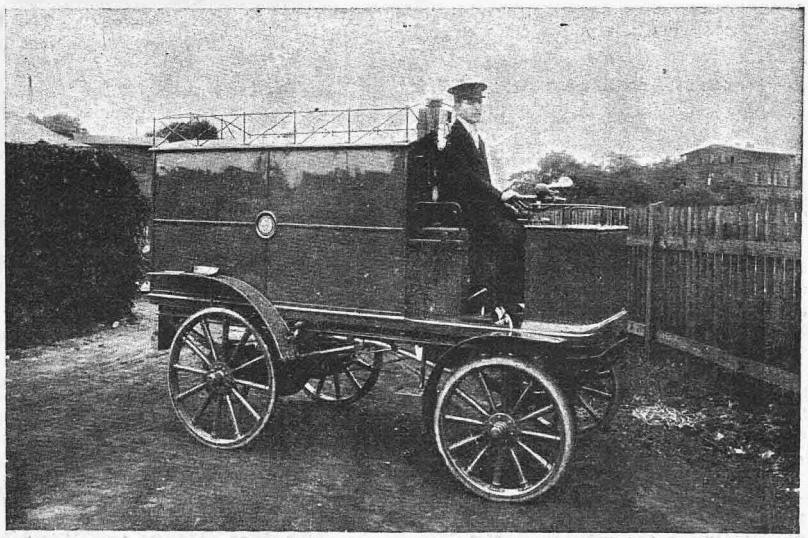
The Motor Industry in Russia.

Odessa, on the Black Sea, is one of the chief centres of the Russian automobile trade, a trade which although it is increasing has not yet assumed any considerable dimensions. In Odessa French cars are the most numerous, notably Peugeots, Darracqs and Decauvilles, the latter company having supplied the Russian Army with some vehicles. A few motorcycles are to be seen, and there is undoubtedly a market for these, although road facilities are none of the best. Imported motorcycles pay an impost of from £8 to £16 according to horse-power.

A meeting of motorists will be held at the Abbey Arms, Barking Road, at 8 p.m., January 19th, to decide upon the formation of a district motor club for West Ham.

First Offender.

Harry Smith, who claims to have been the first victim of the new Act, was charged one day last week with being drunk when in charge of a motorcar and not producing his licence when asked. The case, regrettable as the cause of it was, provided a good deal of amusement in court. Defendant pleaded that he had left the licence at home and offered to fetch it. Mr. Marsham, the magistrate, pointed out that the court would rise in an hour and he doubted the ability of the defendant to cover the distance in the time without exceeding the legal limit, "which," concluded the magistrate, "I cannot advise you to do." "Then I will take a cab!" exclaimed Smith, "and leave you the car as hostage." This course was adopted, and the case was eventually concluded by a fine of £10 5s. with privilege to appeal. "Then I appeal to you"; retorted the wicked but witty motorist, "it's a lot of money." "But you are driving your own car," said the magistrate, adopting the usual argument of the outsider; "you must be well off." "When I bought that car," rejoined Smith, sadly, with an obvious recollection of the various expenses which beset the sport of automobilism, "I was better off than I am now. I have only got a "fiver" with me; but if I may be allowed to go out I can pawn this pin for £10." And so the matter ended.



Alcohol Mail Collecting Van which the Berlin postal authorities have had in use for some time.

To Encourage Road Reform.

In some of the States of America the Legislature has sanctioned the State Highway Commission to construct every year a certain number of sample or model roads, the object being to show local authorities what a good road ought to be, and how it should be maintained.

The Improvement of Tyre Inflators.

A tyre-inflating competition, restricted to inflators not actuated by hand or any other human agency, was held recently in France, and the results have just been published. The report mentions the following three pumps:—First, The "Girip" Inflator (De Dietrich), 80.9 marks out of 100. This is not strictly a pump but a device which makes use of the exhaust gases: total time of inflation, 5 mins. 15 secs.; weight 4¼lbs. Second, The "Gelaverand" Pump (Morin), 74 marks out of 100; actuated by the motor; time of inflation, 2 mins. 40 secs.; weight, 5¾lbs. Third, The "Touzelet" Pump; time of inflation, 3½ mins.; weight, 17¾lbs. The 100 marks were awarded in the following proportion:—Adaptability to all kinds of cars, 40; reliability, 30; weight, 10; Bulkiness, 10; price, 10.

A Sale of "Wearwells."

The Wearwell Motor Carriage Co., Ltd., Wolverhampton, are offering a large number of their standard pattern machines and fore-carriages at prices from £10 15s. to £32. These machines are guaranteed to be in perfect condition for riding. Many of them are quite new machines and others have had very little wear. This is a good opportunity to obtain a reliable mount at a low figure. Full descriptions of the various machines on sale will be found in our advertisement pages.

DII

The Riley Cycle Co., Ltd., Coventry, are so busy in their motor department that a night shift has been necessary for several weeks past.

Motorcars for the Chinese Court.

A report, which we reproduce for what it is worth, has been going the round of the dailies to the effect that the Dowager Empress of China has placed an order with a German firm for 50 motorcars of assorted shapes and sizes. The "door" will have to be opened "very wide" if these all arrive by the same delivery.

"Carburine."

A motor spirit refinery and stores has just been established near London, at Pacific Wharf, West Ham, E. The Gas Lighting Improvement Syndicate are the proprietors, and their well-known brand "Carburine" will be distilled at these works, from the Sumatra crude spirit which they import. The refined product is sent out in cans, cases and steel barrels, and the special claim for it is its rapid vapourisation.

Birmingham Motorcycle Club.

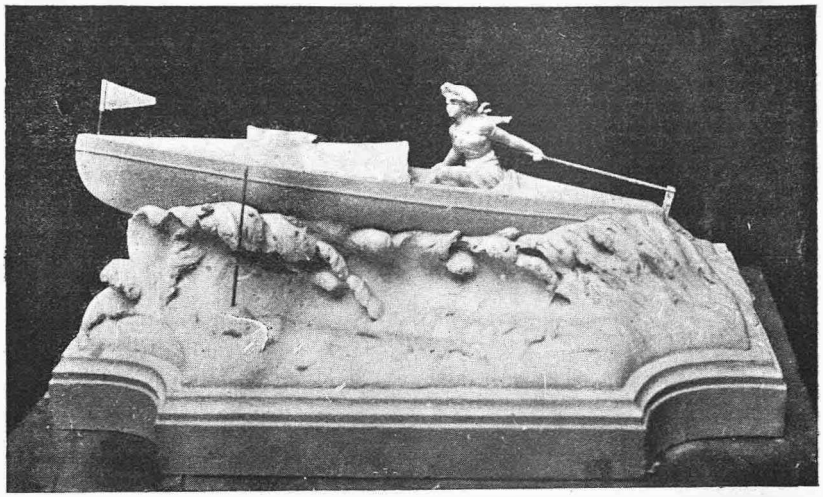
There will be a social gathering of members of the above club held at the club headquarters, Crown Hotel, Corporation Street, on the 29th inst., at 7.30 p.m. The club, we understand, have a very strong programme mapped out for the coming season. The first annual dinner of the club will shortly be held. Further particulars from the honorary secretary, J. R. Bedford, Haigh Villa, Hunton Road, Gavelly Hill, Birmingham.

Collecting Numbers.

The "collecting" hobby springs eternal in the juvenile breast (if that is the part of the human anatomy in which one carries one's hobbies!). One of the favourite pursuits of the genus small boy has been collecting the names of railway engines: a more up-to-date hobby has now presented itself to the mind of the enterprising youngster, in the collection of the numbers on motorcars. On a drive through Surrey during the first week of the year, we noticed several lads who had taken up positions by the side of popular roads, and, notebook in hand, were carefully taking down the numbers on passing cars. However, anything tending to interest the rising generation in motors is good for the cause.

Speed and Consumption Trials at Antwerp.

The Automobile Club of Antwerp held a series of trials on January the 10th. A spell of wet warm weather had made the roads muddy and heavy. In the speed trials the Gobron-Brillie and the Clement cars came out best, and in the consumption trials the Clement was easily first. Result:—*Speed*—500 metres, standing start and finish; 1st—Elskamp (20 h.p. Gobron-Brillie) 50⅘ secs.; 2nd, Joostens (12 h.p. Clement) 59⅘ secs.; 3rd, De Beukelaer (16 h.p. Vinck), 61⅘ secs. *Consumption*—(One litre of petrol allowed for every 2,204 pounds of weight) 1st, Joostens (Clement) travelled 11⅘ kilometres (just over 7 miles); 2nd, De Beukelaer (Vinck), 7 1-10 kilometres (4⅓ miles). Both cars weighed approximately the same—about 2,250lbs.; so that they practically covered the above distances on one litre of spirit.



THE PAUL MEYAN CUP.
The new Motor Boat Trophy to be competed for in France.

The Italian drivers for the Gordon-Bennett cars are to be Lancia, Nazari and Storero. Messrs. Storero, Lancia and Felice were formerly put forward as the possible drivers.

In addition to sparking plugs, carbide, oils and grease, repair bands for tyres are now stocked at the "White Lion" Hotel, Cobham, Surrey. How long will it be before other hotel proprietors follow C. A. Smith's good example?

A New Motor Boat Trophy.

We give an illustration of the Paul Meyan trophy given by the gentleman of that name to the Yachting Club of Nice to be competed for by motor boats and to become the property of the yachtsman who should win it two years consecutively. The race will be confined to boats not exceeding 12 metres in length, and will always be contested at Nice over a course between Nice, Antibes and Monte Carlo. It will be international in character, each nation being represented by one boat which must be built in the country of its own nationality. The shell of the boat may, however, be built in France. The first trial is fixed for the 17th April, and entries close on March 30th. The address of the club is 93, Quai du Midi, Nice.

The Keen-eyed Gabriel, who won the Paris-Bordeaux stage of the ill-fated Paris-Madrid race, driving his way through nearly 150 competitors at 65 miles per hour. He drove a Mors car in the Gordon-Bennett Race.

Ford's motorcar record of 39⅘ secs, for a straight mile on ice, made on January 12th at Detroit, U.S.A., is equal to a speed of 91½ miles per hour. The track was strewn with fine cinders and is said to have afforded splendid going.

Jenatzy and the Mercedes.

The "Tageblatt" states that it has authoritative grounds for saying that Jenatzy will drive a Mercedes in the race, reports to the contrary notwithstanding. Jenatzy himself has written to this effect to the directors of the Continental Caoutchouc and Guttapercha Co., Hanover. What the horsepower of the Mercedes will be is not known—outside the Daimler Works.

France and the Gordon-Bennett.

The latest proposition as to the French Gordon-Bennett trials is to run them over the "Tour du Pas de Calais." This starts at Arras, about 70 miles south-east of Boulogne, and goes through St. Pol and Montreuil to Boulogne, and thence, via Therouanne and Houdain, through Arras again, finishing up with a short triangular loop through Frevent and Doullens to Arras once more. The total mileage is about 200. This course would afford a splendid opportunity to enthusiasts in the South of England who wish to witness the trial of some three score of the fastest cars in France, as Boulogne is so readily accessible from London.

The Gordon-Bennett Arrangements.

Our Berlin correspondent writes:—In a former note of mine I drew attention to the formation of a "Wohnungskomitee," or a committee formed for the purpose of facilitating the accommodation of visitors to Homburg and the neighbouring towns during the Gordon-Bennett week, and I send you further particulars respecting it. The chairman is Consul Christ, Frankfurt-am-Main, Oderweg 20, and this gentleman will give information respecting rooms and prices in Frankfurt-am-Main, Wiesbaden, Mainz, Nauheim and Oberursel. A point to be noted is this. Up to May 1st the prices of rooms are to remain at a fixed price; but after that date extra will be demanded.

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 veiled advertisements are not admitted.*

The Editor invites correspondence on any motor subject, but owing to the very large number of letters received he directs attention to the following rules:

1. Plain Writing. Type-writing for preference.

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

3. Letters to be kept as brief as possible.

4. For the purpose of illustrating any letter, rough diagrams may be sent, which will be worked up by one of our artists.

The Editor is not responsible for opinions expressed by correspondents in this section.

Gudgeon Pin Troubles.

Sir,—Having read several letters on the above I should like to make the following suggestions to prevent the pins from working loose:—My idea is to remove the split pin and thread a piece of 15s gauge spoke wire through the holes of both screws and then hook the ends. In the case of there being only one set screw, a hole could be drilled in the opposite boss and through into the pin. This should then be tapped and a screw fitted in tight.—Yours faithfully,

"PISTON."

A Fore-Carriage Hint.

Sir,—I have a 2¾ h.p. motorcycle with fore-carriage, and found that when travelling with a passenger the wicker body (which is hung on C springs) had a tendency to tilt back on to the head of the machine with the least jolt, thereby cutting into the wicker work of the front seat. I have remedied this by fixing a fairly strong spring between the back of the carriage and the head of the machine, and this may be of interest to others with the same trouble.—Yours faithfully,

R. J. PETERS.

1902 Werner Hints.

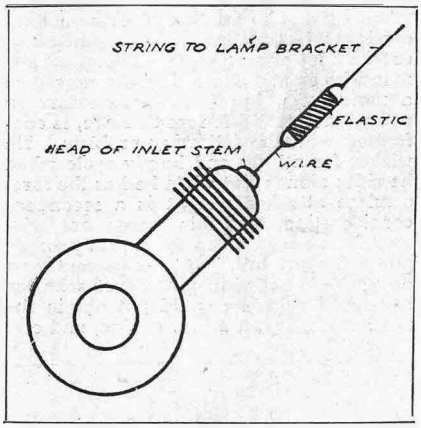
Sir,—I have myself experienced the trouble "A.C.C." refers to; but once I found the cause the remedy was easy. The little rod, which is used to depress the float in order to determine whether there is any petrol in the float chamber, passes through an exceedingly small hole in the top of the carburetter, and is very likely to stick. In nine cases out of ten when the right mixture cannot be obtained, it will be found that the little rod is depressing the float, thereby causing the carburetter to flood continually. The remedy is to use a little spiral spring in order to keep the little rod up, away from the float, or to fasten it with a copper wire hook to the tube of the frame underneath the tank. After flooding the carburetter at the start, it can then be hooked up in position where it will give no further trouble.—Yours faithfully, A.G.

Relief Cams for Small Motors.

Sir,—Can any of your readers kindly tell me where the compression relief cams for small motors may be obtained? They were described in a letter in "THE MOTOR" of November 18th, signed "P. W. W." I am unable to start my motor—a 3½ h.p.—except on a downward slope, and it would be a great comfort and help to me to have the appliance described.—Yours faithfully, (Rev.) EDWIN NOYES.

An Inlet Spring Substitute.

Sir,—I had the misfortune to have the spring of my inlet valve break on my motor-bicycle. Having no spare spring with me, I thought I was to have some hard work. I found I had about a foot of india rubber tape with me, which I



doubled and used as per sketch. This I found answered well and I rode home without trouble. I think the adoption of this tip will carry your readers home if they should be in the same trouble as I was; and many shops sell elastic, but few sell springs.—Yours faithfully,

CHAS. E. ALLSOPP.

Motorcycle Improvements.

Sir,—With reference to Mr. Canning's reply to my remarks concerning his ideas of improving the motorcycle, I can but point out that the only firm who fitted the engine in the position favoured by him have abandoned it. Taking for granted that a firm does not unnecessarily go to the expense and labour entailed in redesigning a machine, it appears difficult to consider a discarded engine position as an improvement. I would also remind Mr. Canning that I did not for a moment question the advantage of the position as adopted in the Phœnix. We were discussing improvements, and I think that the facts above mentioned leave little doubt on the matter.—Yours faithfully,

J. VAN HOOYDONK.

Belt and Chain Transmission in Motorcycles.

Sir,—In reading "THE MOTOR" one cannot help being struck with the multiplicity of opinions expressed by various correspondents on the question of which is best—the V belt or chain for power transmission in motorcycles. From a purely mechanical standpoint, the leather belt is doubtless the best drive of the two. In a motorcycle, however, the reason the belt fails to be a perfect drive is because it is compelled to perform its work under extremely adverse conditions. The adverse conditions are:—Firstly, a very short drive. Secondly, a very high ratio of pulley diameter (viz., the great difference between the diameters of driving and driven pulley): thirdly, the tight, or pulling side of the belt is at the top instead of at the bottom—resulting in a reduced arc of contact from the bottom belt sagging instead of the top (I am sure this error cannot be avoided, but the fact of its being indispensable does not make it correct mechanically). The foregoing trouble is also accentuated by the rigidity (or inherent resistance to bending) of a belt of V section; for the bending of this belt to suit the curves of the two pulleys cannot take place without absorbing a certain amount of power supplied by the engine. The belt is also specifically heavy; though being so short its maximum weight is small and the effect of the centrifugal force of the belt is slightly felt, to the certain detriment of the efficiency of transmission. I mean, that a belt of heavy section and of limited length, when running at a high speed, tries to leave the pulleys. This has also the certain effect of perceptibly reducing the adhesion of the belt and decreasing the value of the V belt as a means of transmission. Now the chain, with its positive drive, faithfully transmits the undesirable intermittent motion of the engine crank; and it must be carefully borne in mind that notwithstanding the application of the usual balancing accessories, the intermittence referred to is inherent to the oil or gas engine constructed on the Otto cycle principle—but is a valuable expedient; and though the pleasure of riding a motorcycle with a chain drive is not nearly so "sweet" in my opinion as when on a machine with V belt drive, it has its numerous advocates from the fact that it is positively free from the trouble of slipping. After careful study of the subject I have arrived at the conclusion that what would be a great boon to those deeply interested in motorcycles (and pedalling cycles also) is a belt possessing the qualities of each and the defects of neither—a belt with a positive grip yet possessing no links—a belt which is by no means a chain, but which cannot slip—a belt with almost unlimited gripping power, and yet

sufficiently elastic to enable it to absorb the fluctuations of engine drive—and also possessing only the very minutest resistance to bending—and of limited specific weight. I think that a belt possessing all the above qualities can be manufactured at a price within easy reach—in fact, while penning this letter I have designed one which I think comes pretty close to this ideal and which I hope to give you particulars of as soon as I have protected the idea.—Yours faithfully,

J. E. TOWLSON.

Wilkinson Treads: Some Electrical Queries.

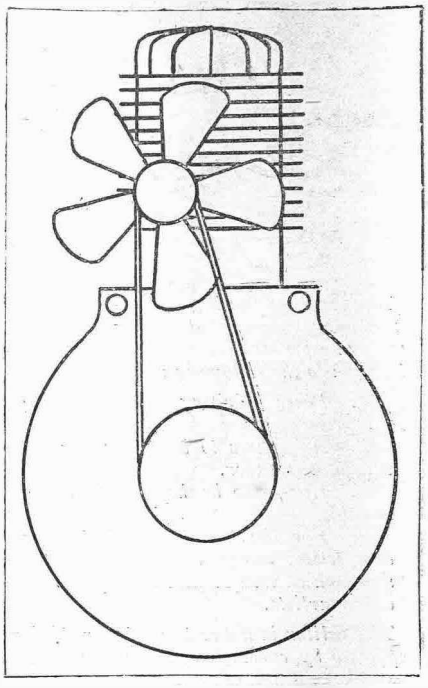
Sir,—Referring to the correspondence some time ago on these non-slipping treads, I enclose for your inspection pieces cut off a pair which I ran about 150 miles on a 3 h.p. Quadrant. You will notice that the wire points no longer protrude through the rubber except the two outside rows. As I found that they also took all the resilience out of the tyres, and had begun to split at the sides, I stripped them off. On placing them in the scales I found they weighed no less than seven pounds avoirdupois! The wires appear to have been pushed back into the rubber by road friction and probably they would have eventually worked round until the points punctured the inner tube as described by one of your correspondents. No doubt they might answer better if vulcanised on. I am rather glad mine had only been solutioned as I was able to remove them easily with petrol; a rubber non-slipping tread costs far less than this (they are 30s. each), and, in my opinion, remains effective much longer, and does not materially reduce resilience. I wonder if any of your readers have been puzzled by Messrs. J. C. Meredith, Ltd.'s directions for altering ordinary trembler contact to wipe. You will observe from the enclosed paper that, having fitted fibre cam with trembler blade to act as a brush and removed contact screw pole (in my case an M.M.C. engine), I am instructed to connect + on coil to — on accumulator, and + on accumulator to switch, while the M or "earth" terminal on coil "has no further use." Surely this is incorrect! I tried it and got, as I expected, no result. Do not the coil connections remain as before, merely with interposition of trembler? The Garrard Company connect M to + on their coils instead of to frame, contending that it makes no difference. Is this so?—Yours faithfully,

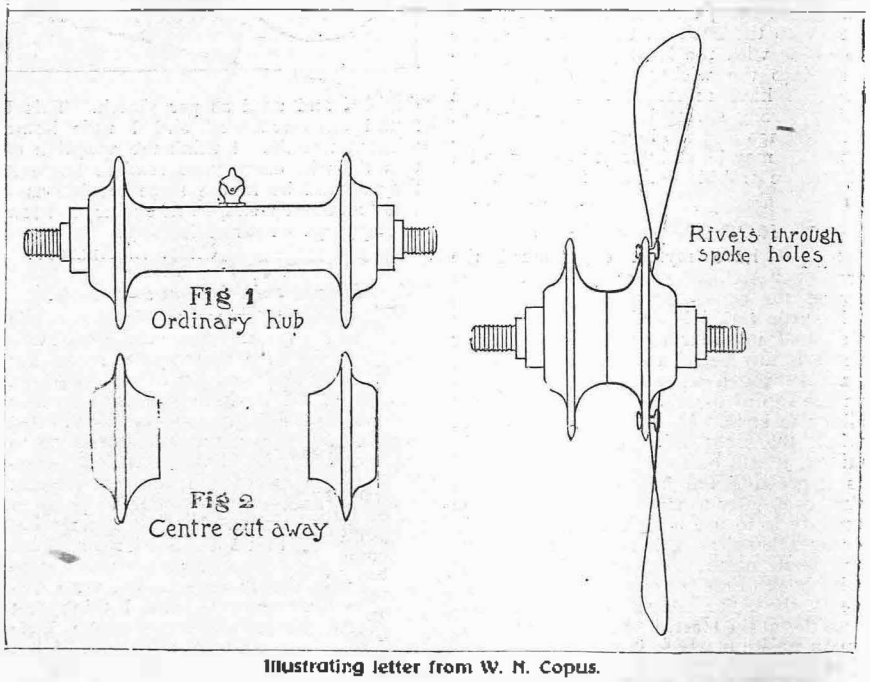
"EXCELSIOR."

[The Auxrater having only two terminals will simply have to be joined up in series with the primary winding of the coil. The J. C. Meredith diagram is right in this respect, but undoubtedly if there is a separate "M" terminal on the coil this *must* be connected to the frame, for the simple reason that one end of the secondary winding is connected to it, and unless this connection is made there will either be no spark at the plug, or at any rate, a very feeble one. It comes to nearly the same thing if you make a connection from the M terminal to the C terminal on coil, as then the secondary circuit is completed through the brush contact. This is done in trembler coils having three terminals only. We do not at all agree with the advice to connect negative of accumulator to + of coil. A coil will always work better with current circulating in one particular direction—hence makers mark the positive terminal. With regard to the C. G. Co.'s method of connecting up this is practically the same as connecting M to the C terminal. Personally, we do not see the advantage, as with a make and break contact the secondary spark has got to jump the platinums as well as the plug. —ED.]

How to Make an Efficient Fan, etc.

Sir,—Although just now it is decidedly unseasonable to talk about cooling engines by means of a fan, it may be of slight service to your many readers to know how a cheap and efficient ball-bearing pulley suitable for a fan may be constructed. An ordinary front wheel hub must be obtained; the spindle is taken out, and the middle of the hub is then cut or filed away as per sketch. This will leave the two ball races remaining. File up the two ends true, and then replace on the spindle, and you will have a ball-bearing pulley just the right size, and very suitable for riveting or soldering a small fan to. To make a good job of it, the two ends of the ball races should be tinned, and then soldered together, although this is not absolutely necessary. If I may further trespass on your space, might I ask your readers' opinions on the following? It is admitted that to attempt to drive a fore-carriage with an engine of less than 3 h.p. entails a lot of hard work. Therefore, the man who cannot afford a tri-car as well as a motorcycle, but finds it necessary to possess a detachable fore-carriage, is confronted with the following problem. He wishes for a light and handy cycle when he rides alone; but when he has the fore-carriage attached weight is a secondary consideration, and his wants are adequately summed up in the words "ample power for any hill." At the present time the above is impossible, and even with the two-speed gears he could not obtain the result with, say, a 2 h.p. engine, and certainly nothing over that size in engines can be used on what we may term a *light* and handy motorcycle. Briefly, we require, when on the cycle alone, not more than 2 h.p., but, with the fore-carriage, 4 h.p. is none too much. Why should not an auxiliary engine be attached to the fore-carriage, quite independent from the engine on the cycle, and when the fore-carriage is attached to the cycle, then at the same time it could be coupled up tandem-wise. It would have the following advantages. Ample power with economical running, as by the simple means of a clutch the auxiliary engine would only be running when needed; a reserve of power in case of a breakdown of either en-





Illustrating letter from W. N. Copus.

gine; a light and handy cycle; easy running and no loss of power. Its disadvantages are, however, increased complications and cost—although nothing in comparison to the cost of a tri-car and a motor-cycle. There are, of course, difficulties in the way, but these are by no means insurmountable; and it would be interesting to hear others' views on the subject.—Yours faithfully, W. H. COPUS.

Butt-ended Air Tubes.

Sir,—I notice in "THE MOTOR" of December 23rd an article entitled, "My Impressions of the Recent Shows," in which the contributor speaks of the Michelin butted air tube very hopefully. I tried a tube of English make in my front wheel which is practically a facsimile. After using it about a week it was punctured by a nail, which, as ill luck would have it, went through the stop in tube, against which stop the closed end has to press. It was, I found, quite impossible to repair it, as it was at the junction of the edges of stop and the inside of tube, and as soon as the other end was inserted and blown up it tore right off. I have had to solution the two loose ends of tube into one another, and now have an ordinary tube, non-divisible.—Yours faithfully,

G.L.

Benz Cars.

Sir,—In answer to "One in Eight," and seeing several queries lately on the above subject, perhaps my experience may be useful. The M.O.I. valve in my opinion is of great importance on these low-powered cars. I was one of the first to fit the Ratcliffe inlet valve, and must say it has been a great improvement. I was quite astonished at the increase of power; it keeps jumping away on fairly stiff gradients, and does away with the nasty jerks experienced with the old automatic valve. I can also run much slower in traffic on top speed, which is a great advantage. I could never get the automatic valve spring the right tension to suit the different speeds of the engine; if tight, the suction is not enough to overcome the spring and makes the engine hard to start, and when running slow does not allow of the cylinder getting the full charge of gas; and if I weaken the spring the valve does not close quick enough and loses compression. By using the M.O.I. valve this is obviously overcome, and makes starting easy. Care should be taken in fitting the cam in the right position, so that the valve is full open on the commencement of the stroke, and closed up at the end of the stroke: with these precautions no trouble should be experienced. The air valve spring at the back of the cylinder may require re-adjustment to suit. Re belt slipping, I see that Ratcliffe's are now supplying a patented rubber ring to spring tight on the pulley; this increases the gear slightly, which I should think will be an advantage. I am thinking of giving this a trial and will let you know the result. I fitted an advance spark apparatus to my car 18 months back, and would not be without it on any account: by this, one is enabled to suit the firing to the speed of the engine. My small driving pulley is 5½in. diameter. I timed it up a two miles' hill about three weeks back and we did the two miles in 15 minutes. One of the main points, I find, in these cars is to see that the exhaust gear is doing its full work.—Yours faithfully,

"AN EVERY-DAY USER."

The Binks Four-cylinder Motor-cycle.

Sir,—Referring to your issue of the 16th of December my attention has been drawn to an article on page 486, in which your contributor says that he is afraid that in my motor-bicycle where the cylinders are fitted lengthways, all but the most forward cylinder would overheat, as the others are sheltered far too much for efficiency. I think that before making these statements it would have been only reasonable and fair to enquire somewhat into the matter, as such statements cannot fail to do me considerable harm. The writer seems to have overlooked the fact altogether that the cylinders being only 1 13-16ths inches in diameter there is not the same tendency to overheat. Now I shall be pleased to show you or anyone interested one of these four-cylinder motors running on a bench in a hot room at 1,800 revolutions a minute, and it will run for half an hour at a time or more if necessary without showing any tendency whatever to overheat, whereas a single-cylinder engine of 3in. diameter will overheat itself and stop it running for five minutes in the same position. Then he refers to a one-cylinder giving trouble enough without the complication of four. Now, I contend it is a well known fact that single-cylinder motor-bicycles are always more or less uncertain of starting, or giving trouble, whereas in four-cylinder motorcars it is a very poor one that will not start with one or two turns of the handle with almost absolute certainty.—Yours faithfully,

C. BINKS

Cars for India.

Sir,—During the past few weeks several letters have appeared in "THE MOTOR" in regard to the above subject. I myself am an old "qui-hai," having spent some 16 years in India; and having travelled about a good deal out there may claim a pretty intimate knowledge of the country and its climate. Also, I am an old motorist, being one of the few persons who had the privilege of riding in the steam carriage made by Mr. Charles Randolph, of Glasgow—that would be "away back" about 1878—an illustration and short history of which appeared some few years ago, when the carriage (or all that remained of it) was being exhibited at the Crystal Palace. It is now six years and a bit since I said farewell to India, but I can remember that one or two cars had been imported previous to that. One at least I can remember which was taken out by a certain Maharajah and caused much excitement at the time, but owing to the practical impossibility—at that time—of getting petrol, I fancy that unfortunate car, or at least all but the metal work of it, has long ago been devoured by white ants. There is undoubtedly plenty of scope for motorcars in India, but there are many difficulties in the way of their introduction; and anyone who sends one out without knowing all about the local conditions is likely, in my opinion, to find it an expensive experiment. It is true that petrol is now obtainable in certain of the large towns such as Bombay, Calcutta, Madras, etc., but it costs in Bombay 20 rupees, or say 26s. 8d., per three gallon drum, an almost prohibitive rate for ordinary folks. Steam cars, having wire wheels and solid rubber tyres, and fitted with furnace suitable for burning kerosene oil (anglice paraffin) would do very well in and around the big towns or more important mofussil stations, but the water capacity would have to be specially large, and I fear that in a shade temperature of anything between 90 and 110 degrees it might not be so very comfortable to be sitting on top of a boiler as in the locomobile type of cars! I have just had a long letter from a friend in Bombay who has been badly stricken with "motor fever." He says, quoting an Americanism, that he is "clean gone on a motor karr!" and he has commissioned me to get him a second hand one suitable for Bombay conditions. He goes on to say—which may interest previous writers on this subject—that he had been riding on a 5 h.p. Benz car which a friend of his had got out, and he was delighted with the experience. In a journey of 30 miles the machine gave no trouble at all. The owner of this car had altered it to use kerosene instead of petrol. He starts up with petrol or methylated spirit, and when it is warmed up changes over to kerosene. Presumably, a new carburetter was fitted, but my friend was bound down to secrecy in regard to this detail, which is a pity, as apparently the device was successful and would, if published, no doubt enable many people to import cars to India who are at present deterred by the difficulties and dangers connected with petrol. The owner of the above mentioned car has reduced the cost of propulsion to one "pice" (equal to one halfpenny) per car mile. This is doubtless cost of oil only, but even so it is extremely moderate, and as kerosene oil is procurable in every little village throughout the length and breadth of India there can be no doubt that, given a carburetter which shall enable kerosene to be used in high speed engines designed for petrol, we shall find that India will soon be importing cars in large numbers. It is interesting to read what my friend has to say about petrol. He says: "it is only on kerosene that cars can be driven cheaply here. The restrictions by the railways on the handling of petrol are something too awful. But apart from that in the hot weather petrol simply boils! boils!—please understand that. I cannot afford to carry an icebox to keep petrol cool on a car!!" Further on, referring to the many little troubles to be encountered, he refers to the rainy season or "monsoon" when, he says, "they (the cars) appear to cease running in Bombay." This is doubtless owing to the fact that the atmosphere is almost fully saturated with moisture, so that it would be unable to combine with the gas, but this difficulty should not be experienced I fancy in using kerosene, at least not to such an extent. It will be apparent, I think, that a petrol engine with carburetter suitable for kerosene is what is wanted, and I should say water cooling is essential. In the radiators a very large amount of extra cooling surface should be allowed to compensate for the much higher atmospheric temperatures, and a larger water tank should be provided, as loss by evaporation will be greater, whilst opportunities of replenishing the supply may, in certain districts, be few and far between. Wire wheels with solid tyres are called for, whilst in the body of the car nothing but teak, oak or other good hard wood should be used.—Yours faithfully,

"MAC."

619

The Bat Spring Frame.

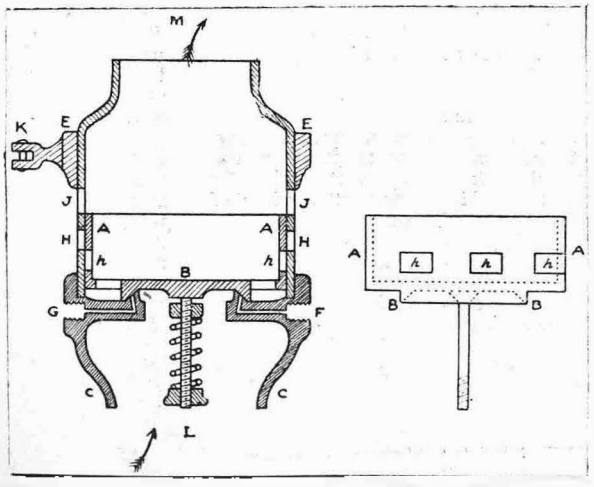
Sir,—I note that in a recent issue you ask those who have had experience of the Bat spring frame to give their opinion of it. I have ridden one all this season, and have nothing but good to say of it. A friend of mine who rides another well-known make always complains that I ride too fast over bad roads, and I often notice that on medium roads, when I am riding at luxurious ease, he is bobbing about like a cork in a mill stream. I would point out what I consider one advantage in the Bat spring frame. In all other spring frame machines the frame proper is not rigid. In the case of the Bat this frame is absolutely rigid and therefore as strong as an ordinary machine, but the seat and footrests are on a supplementary frame which is hung on the other by means of arms and springs. Thus whilst the driving part of the machine is perfectly stiff, the rider is well insulated from road bumps.—Yours faithfully, H.A.C.

The Economic Carburetter.

Sir,—I beg to send you sketches of my Economic carburetter, mentioned in a recent issue in "O.P.V." These sketches show sectional view and elevation of valve. This, together with previous description, will, I think, enable all your readers who are interested to thoroughly understand its working. A = top of valve, with slots h for extra air. B = valve controlling petrol and water inlets. C = valve seating and casing. E = band for regulating opening of slots J. (This is used instead of throttle valve). K = handle for operating E. F = inlet for petrol or oil. G = inlet for water. H = slots for allowing extra air into mixture. J = slots for allowing air into cylinder before mixture is taken. (This instead of throttling). L = main inlet to carburetter. M = outlet from carburetter. To get best results from the device used in place of throttling, the carburetter should be fixed close to the inlet of the engine, as any length of connecting pipe used would take in that amount of good mixture before pure air cushion. The closer to inlet of engine the better for using paraffin oil. A two-way cock being fitted to inlet, for starting on petrol, and then turned on to paraffin oil. I hope the above will make the description sufficiently plain to those who have written me, and also any others interested. I need not say I shall be only too pleased to give any further information desired.—Yours faithfully,

JAMES GIBSON.

42, Nicolson Street, Edinburgh.



Illustrating letter from James Gibson.

An Australian Motorcyclist's Grievance.

Sir,—As a subscriber to your paper I would like to detail to you the recent experience of my brother and myself in the matter of the execution of orders by English and Continental makers. Some few months ago we each decided to import a motor. My brother sent his order through my firm in London for a 2 h.p. Belgian-made motor-bicycle, I sent mine through the same firm for one of the best known 3 h.p. English motor-bicycles. My brother's came out in perfect order, complete to specification, and was run with its own accumulator as received from Belgium within an hour of our unpacking it; its spanners and everything complete. My own I received recently. I took the precaution to send home specifications amongst which was included a throttle valve. The English firm quoted me on this specification and now I receive the machine without the throttle valve. It is 3 h.p. and cannot be controlled without this valve, and I suppose I shall have to have one fitted here. When I unpacked it I found the accumulator broken, the trembler broken, and some spanners missing; the oil can leaked its contents away into the pouch, the spanner sent broke the first time I used it, and the spare valves sent had never been greased and were red with rust. The machine itself was not properly greased, and the rust is appearing in many parts through the nickel. It has a V belt which is supposed to have been stretched, and in my first run of about 25 miles it had to be taken up three times. The lubricating oil leaks badly out of the crank case, it splashes the tank and guards, drops on to the belt, lubricates both pulleys, and increases slipping. This machine cost me over £20 more than my brother's, and I must admit I would rather have my brother's at the price I have paid for my own. I have seen several complaints about English manufacturers in your columns, and if they cannot execute orders better than in my case they will lose their business here, in these States, in motors as they have already done in other things, to the American and Continental manufacturers.

Your issue of 23rd September is just to hand. On page 148 you give an article entitled "The Importance of the Throttle Valve." It is rather curious that this should come just as I am regretting the omission of this (for which I have already paid) from my machine.

Yours faithfully,

"AUSTRALIAN."

Melbourne.

[The contents of this letter show the damage done to the English trade by lack of attention to orders, though, happily, the failing is not a general one.—ED.]

Experiences with the Trusty Carburetter.

Sir,—In reply to "Stand" (Bangalore, India), *re* Trusty carburetter, I purchased a Trusty carburetter some little time ago for a 20 b.h.p. stationary oil engine. I tried it, but could not get it hot enough to take paraffin on this particular engine, and not having this engine at liberty to try it further, I took it off and tried it on a 7 b.h.p. oil engine (a very old one), and I must confess I was surprised at the results. I keep the engine running on petrol or benzoline about five minutes, and then run it on a mixture of benzoline and paraffin for about fifteen minutes, and, before the carburetter is really warm, I turn on the paraffin, get the right mixture, and the results are excellent. I find it works very clean, and with no disagreeable smell. The only thing I had to alter was the lift of the needle valve, this being too much in my case. I think if the makers would explain this to purchasers it would save trouble. I may say the engine works with electric ignition, and the carburetter is fitted between the fly-wheel and an open door, and with iron induction and air pipe, which same does not tend to improve matters, yet it works well. I trust this will help "Stand" or any other would-be purchaser. Please note I have no interest in this carburetter further than its services to me. If "Stand" cares to write me I may be of some help.—Yours faithfully, TALBOT C. CLIFTON,

Malmesbury, Wilts. Engineer.

Trials for Amateurs.

Sir,—With reference to the letters which have appeared in your paper on this question, I think that your correspondents have overlooked the fact that in the recent 1,000 miles reliability trial prompted by the Auto-Cycle Club there was a separate class for private owners, in which purely amateur riders, having no trade interest whatever, could enter, and thus test their skill against drivers interested from a trade point of view in the particular make of machine used. The support, however, which was given to this private owners' class was very slight indeed, and this is hardly to be wondered at, seeing the expense, time and trouble involved in the trial, and it is extremely doubtful whether at any time any appreciable number of amateur riders would go in for the test purely for the fun of the thing. Doubtless this private owners' class will again be included in the Auto-Cycle Club's reliability trials for next year, and it will then be seen whether there is any field for this class of competition. Those private owners, however, who are interested in the reliability trials, and who do not care to go to the time and expense involved in a trial extending for some ten days, would find that the shorter trials, such as those prompted by the Motor Cycling Club during the past season, and confined to its members, will give an opportunity to the purely amateur member of testing his skill against the rider interested in the trade. As a proof of this, it is interesting to note that Mr. Leonard Jones, who ran in all five of the non-stop 200 miles' trials, and was only knocked out in the final through a puncture, besides being an amateur in the truest sense of the word, rode a three-year-old motor-tricycle.—Yours faithfully, J. VAN HOOYDONK.

[The question is, do private owners desire to test their skill against trade drivers?—ED.]

OUR INFORMATION BUREAU.

SPECIAL NOTICE.

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

1. Plain writing. Type writing for preference.

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

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

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

A. E. Hodson (Cradock, Cape Colony).—An English-built car will suit the work perfectly well. You should certainly have a gear or chain transmission, and not less than an 8 h.p. engine. When ordering, state the conditions under which the car will be worked.

In reply to J. Jackson (Basingstoke), who enquired in a recent issue as to the possibility of obtaining parts for an old pattern Beeston motor, the London Autocar Co., 182, Gray's Inn Road, London, W.C., say that they have a number of these parts in stock, and it is quite possible they may be able to supply the special part wanted.

Fault in Battery.

G.N.R. (Maesteg) writes:—I have a Minerva accumulator, 20 amperes hours, 4 volts. Recently it was washed out with water and refilled with acidulated water in proper proportions of 5 to 1. I then connected in series with a 16 c.p. lamp, the current being reduced by this means from 110 volts and 60 amperes. After allowing accumulator to remain in series for about four hours, no current whatever would pass from terminal to terminal when connected by wire; but on connecting positive to negative on one part of the battery I find current passing. Apparently only one cell is charged. Will you be kind enough to explain the causes of such behaviour, and how I may rectify same?—We presume you made certain that you had the connections right, that is, positive of accumulator to positive of circuit. If so, it is very probable that one cell has either got badly sulphated, or short circuited. Probably the former. The remedy is prolonged charging. You must replace the 16 c.p. lamp by a 32, as it will take about 30 hours to charge otherwise. If you find that you can still get no current out of one of the cells after a long charge, it may be due to bad short circuiting between the plates. This may be caused by loose paste, or the plates themselves may be buckled and making contact.

A. A. Harris (Wolverhampton).—We do not doubt that the alteration to the 3½ h.p. De Dion motor could be made safely enough by fitting a new cylinder and piston. It is not likely to run quite so smoothly, however, on account of the fly-wheels being specially designed to suit the lower power.

A.L. (Wood Green).—The rust that you find in the channel of the back rim is most likely due to wet having got through the nipple holes. It is, as you presume, destructive to the inside of the tyre, and rapidly rots the fabric. What we should advise you to do would be to thoroughly clean inside the rim, and give it two coats of black enamel; and do the outside similarly, taking care to enamel well round the spoke holes or nipples. Be careful to clean away any rust that has got on the tyre cover.

W.A.P. (Hull).—(1) Both engines are well made. The Brown has hard bronze bearings of good length and diameter, and should wear very well. (2) If you find that the top end of the exhaust pipe gets red-hot when going fast it is quite possible you are throttling the exhaust, either from too small a pipe, or from the silencer not being free enough: try the effect of making some more holes in the outer casing. (3) You should be able to make a good job of attaching the non-slipping bands by following the directions given in "Magneto's" article.

Driving Twin-Cylinder Engine.

"Twin Cylinder" (Wimbledon) writes:—I should like to know if it is good practice to run on one cylinder of a twin-cylinder motor-bicycle on level roads, and when the work is easy? It seems to me that there would be an advantage in so doing, because one cylinder would be quite cool, and thus, when a hill has to be climbed, this cylinder would be in its best condition to give full power. I should also like to know if there would be much difference in the petrol consumption between a single-cylinder and a twin-cylinder engine working on one cylinder, but with the other cylinder running free; that is, with the exhaust valve up?—It is not a general practice to run on one cylinder: the best results are obtained by throttling both cylinders down. You can, of course, run on one cylinder if you wish, but the running will not be so smooth, and neither will the petrol consumption be as small as in a single-cylinder engine, for this reason—a considerable amount of energy is necessary to keep the piston running in the free cylinder, and this energy is taken from the working cylinder, which means so much less to propel the machine, and unless you have a switch for each coil the non-working cylinder will be using up your battery power. A very small amount of gas will run a twin-cylinder engine on the level, and they are not at all likely to overheat.

C.F.K. (Southampton).—To preserve your spare covers we should advise you to keep them wrapped up, away from the light, and in not too dry a place. It is beneficial to give them a rub over with a damp cloth occasionally.

H.L.E. (Devonport).—It is largely a matter of opinion as to which of the two systems of brakes is the best. Many riders favour a band brake by reason of its neater appearance, and because it does not interfere with the removal of the air tube, as a rim brake does. As a rule the firms that fit band brakes to their machines make them as a special fitting; they are not things you can adapt straight away to any machine, as is possible with a rim brake. As to the relative power of the two systems, this again depends on the fitting. A well adjusted rim brake would be difficult to improve on for power, owing to the great leverage obtained at the wheel rim.

"Accumulator" (Newport).—(1) It will hardly pay you to construct your own plates. We know for a fact that home-made cells go to pieces in a very short time. The paste in the positive plate is per-oxide of lead; in the negative it should be pure spongy lead after being formed: the best oxide to make this is ordinary litharge (yellow oxide of lead). The lugs from the plates should pass through an ebonite cover, with a suitable vent-hole in the centre. Ordinary paraffin wax is of no use as a filling; you require to use bitumen, or ordinary pitch is not amiss. (2) The trouble you have with your belt hooks pulling out straight is, we suspect, either because they are made of too soft a quality of steel, or are not stout enough.

The Effect of Advance Ignition.

L.L. (Bradford) writes:—Whilst wheeling my motor-bicycle along previous to mounting it on a recent occasion, I was rather surprised on switching on the spark to get a sharp back-fire, which stopped the machine dead, and each time I pushed the machine forward this occurred. I do not think the spark could have been too much advanced, as I generally move the lever a good deal further when riding at speed. When I mounted the machine in the usual way by pedalling I did not experience any difference in the running, but I am rather curious to know the explanation of the back-fire.—We think this can be explained simply enough as follows: If the ignition lever is in such a position as to produce the spark even very slightly before the piston has commenced its down stroke, and the mixture is a good one, it is almost certain to drive the piston back, for the simple reason that when the machine is being walked along slowly there is very little momentum in the fly-wheels to carry the piston up against a slightly early explosion. The same effect can often be noticed in trying to start an outside fly-wheel motor up by hand. Remedy: have ignition fully retarded.

H. Gander (Banbury).—A tore-car is classed as a motorcycle. The front number only is required to be illuminated.

H.L.H. (Bristol).—The owner of the trailer will have to pay the 15s. tax. You will, of course, pay the 15s. tax for the motor-bicycle. You will either have to fix a duplicate number on the trailer or detach the rear one from the motor-bicycle and refix it to the back of the trailer.

"Doubtful" (London, S.W.).—We did not succeed in getting good ignition with one of the miniature dry batteries used in pocket lamps. It is quite correct that these small batteries give a pressure of over four volts; but you can get very little current out of them, as the internal resistance is rather high. We found that by adjusting a trembler coil rather sensitively the trembler would buzz, but the secondary spark was a painfully thin one. We are not prepared to say it is impossible to get a motor to fire with these cells, but in the majority of cases they would not work.

Loss of Power in 6 h.p. Car.

"Puzzled" (Nottingham) writes:—I shall be glad if you can give me advice as to loss of power. The car is a two-seater, 6½ h.p. governed Aster engine, fitted with Longuemare carburetter, and until two months since ran perfectly. It is very variable in power, and difficult to pick up speed on the level. When a fair speed is attained it will maintain it until a slight rise in the road occurs. The power is then lost, and it is difficult to pick up speed when again on the level. If I find it necessary to change the gear on a rise, the engine does not pick up speed again on the lower gear for a few seconds. It will not run with the spark retarded when on the top gear. The ignition is all right, and the accumulator fully charged. It is a plain coil, and I have also tried with an auto-trembler in circuit. The valves are in good order, and the engine has good compression. The lift of the exhaust is correct, the stem being just clear of the tappet when the valve is on its seating. I have tried the inlet spring with various tensions, but that does not seem to improve it. The petrol is all right and fresh. It appears to me that the engine is not getting gas properly from the carburetter. The carburetter is fixed, with the float and mixing chambers parallel with length of car, and symptoms pointed to flooding when on the rise (as it misfires on going uphill, but not on descending a hill). I have now slightly altered the lift of the needle valve to shut off petrol sooner and give a lower level in the carburetter, and it has certainly improved the running on the flat, but it is nothing like what it ought to be, and will not climb at all on the top gear. The carburetter seems to be clean and in good order. The needle valve shuts off the petrol at about the level of the bottom of the cone of the jet plug. The air mixture seems to be all right.—The symptoms seem to show that the engine is overheating. This may be attributable to a defect in the water circulation from an obstruction in the tubes, or—probably less likely—is it the carburetter not giving a good mixture? It would be as well to make sure that the float is not punctured, and that the needle valve is ground in petrol-tight. By making a few adjustments it should be easy to judge whether the carburetter is to be relied on. In similar cases we have generally found that the fault has been either poor compression or bad circulation. These are factors that are much more variable than the carburation. As to the ignition, you would be able to satisfy yourself on this point.

CHARMING!
The other day a gentleman driver was observed to be engaged in languidly but only his gloves. Meanwhile, the most amiable motor was kindly picking out a course for itself.

B. and P. (Keswick).—The loss of compression may be caused by ring slots not being properly spaced out and the rings too slack a fit in the groove. The compression may improve after a while if you can get the engine to run and use plenty of thick lubricant. It is rarely that new rings are perfectly gas-tight.

Chain Breakage.

H.F. (Stockport).—It would hardly be possible for anyone to state the exact reason for the chain breaking without actually inspecting the machine. If the chain was a strong one of high grade make, and the spring clutch in order, it could hardly be the motor which caused it, especially as you say the ignition was fully retarded at starting. It may have been that the chain was too slack, and jumped the large chain wheel, and the consequent strain, of course, would break the best of chains. Then again, what is the condition of the chain wheel teeth, or what wear has the chain had? If it was out of pitch with the teeth it would tend to ride them.

A. L. Farrow (Oldham).—A 4 to 1 gear is much too high for a 2 h.p. machine. Have your 4½in. engine pulley altered to 3½in. This will give you nearly 6 to 1 gear. (2) If your contacts are genuine platinum and the coil is high grade it should not be necessary to have to touch them once in 100 miles, let alone 20 miles. (3) The trembler coil and brush contact would be a good investment.

Timing the Exhaust.

J.Y. (Poplar).—You must not time your engine by the spark; timing must always be set by the exhaust cam in the first instance. Mesh the wheels so that the exhaust valve is just beginning to lift by the time the piston has got to within ⅛ths of its firing stroke; and then if the valve shuts dead by the time the exhaust stroke of the piston is completed, the exhaust is set rightly: if the valve shuts too early, set the large gear wheel back just one tooth. It is then simply a matter of having the requisite amount of range for moving the contact quadrant, so that for the maximum advance the spark occurs about an inch and a half down on the compression stroke, and for the full retardation the spark should occur about one and three quarter inches down on the firing stroke.

W. B. Conquest (Gravesend) enquires whether the identification plates for motor-cycles are required to be the same size as those used for a car.—No; in the case of a motorcycle the dimensions of the plates are half those necessary for a car.

"Motor Student" (Greenwich).—The first gas engine that achieved any measure of success was invented by M. Lenoir in 1860. In this engine the charge was not compressed, but a very long piston stroke was provided for, and on half of this the gas was taken into the cylinder, and fired during the other half. This engine, as might be expected, was not economical in fuel. Although tube ignition became standard in after years, it is very interesting to note that Lenoir used an electric spark to fire his charge, indentical with the method of to-day.

"Winter Rider" (Surbiton).—The chain drive undoubtedly does score when the weather conditions are unfavourable to the belt. At the same time we cannot too strongly deprecate any tampering with machines that have been specially designed for belt transmission by standard makers. If these machines are handed over to any local repairer to experiment on, and work out his new chain ideas on, it is more probable than not that the result will be anything but satisfactory, and a converted machine will not have the same value secondhand. There are, of course, a few firms that can do the work well, as they have the necessary tools and plant and know how to alter the frame and rebraze it if necessary. A belt machine of really good make will do good work in winter if a suitable guard is fitted.

Hill-climbing.

G.L.P. (Axminster) writes:—I cordially endorse "Magnet's" request in a recent issue. I am well pleased with my Clyde 2¾ h.p. and have improved it by Dr. McMurphy's modification of Fairfax silencer, and the new automatic Longuemare carburetter. My trouble is that hills round here are very steep, many of them too steep to ride up, and it is dangerous and exhausting work to try to push 112lbs. up them. Cannot it be arranged with a two-speed gear that the machine will walk itself up on the low gear? My gear is standard, about 3¾in. by 20in. How low could this be reduced with overheating and good belt? Would a Watawata belt be better than a Lincona? I do not want more than 20 m.p.h. on level ground. As you say, a 3in. pulley is the smallest practicable, I suppose the back one will have to be increased to 24? Can any reader give me experience of the Princeps two-speed gear, which was lately illustrated and mentioned in "THE MOTOR" as one of the best for belts? Your answer will interest many Devonians, as the majority of us are thus situated. I prophesy trade will go back to the lighter machines.—The best plan for you to adopt, and the one involving the least alteration to the frame or the motor, is to have a larger belt rim fitted. Your present gear is approximately 1 to 4, and if you fit a 24in. rear belt rim—it is hardly likely there will be clearance for a larger one—you will have a 1 to 6½ approximately. This will be a distinct improvement for hill work. We do not advise you to reduce the diameter of the motor pulley. As to the belts, either will give you good results; it is only a question of flexibility.

R.W. (Salisbury).—You will not be well advised to alter the crank shaft. The make of engine you have is a well-known one and considered of good design. If it was possible to fit a heavier fly-wheel it would give you steadier running.

R.A.B. (Manchester).—(1) For town work a Locomobile would suit very well. (2) There is rarely any trouble with the engine. (3) The boiler, of course, requires very careful handling to prevent scorching. They are, as a rule, exceedingly well made and tested to a very high pressure: with care it should last a long time. (4) More expensive to run than a petrol car as far as cost of fuel is concerned.

J. C. Herbert (Wolverhampton).—(1) The F.N. carburetter with throttle will suit you very well. (2) Messrs. Bates, St. Mary's Mills, Leicester, will fit a good non-slipping tread to your tyre. (3) For platinum try Derby and Co., 44, Clerkenwell Road, London; probably half-a-crown or three shillings' worth will suffice. (4) As to the distance you could run on an 8-ampere hour battery, it is a variable quantity, and depends on your coil and contact adjustment and speed. About 350 miles is a fair average.

Engine Cooling.

E.S.R. (Woodstock).—The device you refer to, namely, a double tap to cut off the gas and allow air to be drawn in to the cylinder through the inlet valve, was fitted, we believe, to the 1900 Werner machines (front drivers). The only advantage in this, it would appear, was that the petrol was economised when running down hill with the compression on, as the valve then admitted air instead of petrol vapour and air. It is questionable whether the effect would be to cool the inside of the cylinder more rapidly than admitting gas would, as this has a very strong cooling effect. It would not be practicable to have an opening from the cylinder direct into the air, for the reason that it would be likely to leak, and no matter how well protected with gauze, a lot of dust would get drawn in to the cylinder and damage the inside.

A Specification.

E. Worthington (London, S.W.)—(1) A 2 h.p. machine should suit you very well, as you say that you would only use a trailer occasionally on very level roads. (2) A 2 h.p. machine would certainly take a 1 in 12 hill without any pedal assistance, if the engine was in good order. (3) 26in. wheels are standard. A 28in. front wheel would doubtless give slightly better steering, but this you would have to get specially fitted for you, as we do not think any firm fit odd-sized wheels. You must remember that with odd-wheels the advantage of interchangeability of the tyres is lost; and this feature means a good deal as far as tyre economy is concerned. (4) As to the spare parts you should get, the principle ones would be a spare inlet and exhaust valve, a couple of piston rings, asbestos washers for the joints, contact blade and screw—if brush contact get a spare brush. A spare engine pulley is desirable, as with a season's hard work the engine pulley may get worn out. A spare 4-volt accumulator can be carried in a leather case, if there is no provision for it in the tank case. (5) There are several really good combined stands and carriers on the market to select from: look up the advertisements.

G.J.D. (Hendon).—The Darracq quad with Soncin engine should be good. The make of tyres you refer to is unknown to us. You must be very careful in coming to a decision re this mount, as we are inclined to think it is an old pattern.

F.H. (Warminster).—The cause of such a serious loss of power (2 h.p.) in an 8 h.p. engine should not be difficult to locate. If you find that the engine slows up after running for some time, we should suspect the fault was overheating, may be through a defect in the water circulation. If you have fitted new rings to the piston, the compression is not likely to be perfect for some time. You will require to see that your carburetter is acting well, and giving a constant mixture. Also have a look at the inlet valve; see that the spring is in order.

Friction Transmission.

"Simplex" (Birmingham) writes:—(1) Will you please say if there are any disadvantages in driving from the motor direct on to the tread of the tyre by a friction wheel, as this method seems to me to offer the feature of simplicity. (2) If this method would not be a success, would it be possible to use a fibre wheel gearing into a deep V section grooved rim, the insides being lined with leather to get sufficient grip?—(1) The method of driving direct on to the tyre by a friction wheel was exhaustively tested some years ago. It was found to act fairly well as long as the road conditions were good, that is to say, dry and not very hilly, but on a wet road the friction between the tyre and pulley was greatly lessened and slipping occurred, which, of course, made hill climbing difficult. The wear on the tyre was also considerable owing to grit continually abrading the surfaces. (2) As to the method of driving by friction wheel and pulley there is nothing new in this. The area of contact to get sufficient friction to drive is necessarily slight, which means that considerable pressure has to be used to get a drive. We think, however, there would be some scope for improving on this idea.

Lighting a Car.

"Car Driver" (Chelmsford) writes:—I have decided to adopt, if possible, electric light for the headlight of my car. I have experienced considerable trouble through using oil and acetylene lamps. Will you please tell me (1) What voltage and candle-power lamps I shall require? (2) The amount of current in amperes (for two lamps) that will be used? (3) I have two sets of 4-volt accumulators having 30 ampere-hours' capacity each on my car; could I utilise these for lighting as well as for the ignition, or would it be better to go in for a new cell? If so, what capacity?—(1) By using a couple of 8-volt or better still 7½-volt lamps, taking something like one ampere of current each and mounted in suitable projectors having a reflector and lens, a very good light could be obtained. The lamps if slightly overrun might give 10 c.p. each. (2) The two lamps would, of course, takes two amperes of current to light them. (3) It would be better to use a separate accumulator giving 8-volts. If you get this of full 40 ampere-hours' capacity you could rely on this giving you a good 18 hours' light before it would require recharging. With this method of lighting the car you would have no trouble at all, simply having to switch on the current.

"High Tension" (Tunbridge) asks if an exposed coil—that is, one fixed behind the frame of the machine—is liable to be damaged by the effect of damp or rain.—Well, it depends: some coils are very well cased in, and it would take a lot of rain to get inside; but as a matter of precaution it pays, with any coil, to have a waterproof cover fixed over it in bad weather.

H. Haddon (Cardiff) writes:—Please say if the following specification is a suitable one for motor-bicycle for use in a hilly district:—M.M.C. 3½ h.p. motor, Chater Lea fittings, B. and M. coil, Pfluger 800 mile accumulator, special Clincher tyres, Lycett's saddle, 26in. wheels and latest pattern Longuemare carburetter. Also, am I compelled to show a rear red light on a motor-bicycle?—(1) The specification is a good one. (2) You are not compelled to have rear light.

Charging Accumulators, etc.

"Headlight" (Glamorgan) writes:—(1) I am told that it is not right to charge my "Eclaire" accumulators with a compound wound dynamo. Is this so? Can I charge with either a shunt or compound wound continuous running machine? Can you give me any rule for the number of lamps to put in circuit for charging? I have a 110-volt current available. When charging two or more cells do I require the same number of lamps for resistance? (2) Will you please give me a rule for the proper piston speed for petrol motors? My car runs up to a very fair speed by advancing the spark, but I do not want to injure the engine by racing. What damage does racing do, beyond the tendency to shake parts loose? (3) I have a difficulty, when the car is standing, in getting the engine to run slowly, although I retard the spark to its utmost and throttle down the gas supply as low as possible without risk of misfiring through insufficient petrol. I have a throttle on the exhaust. The contact breaker is a Nilmelior, and the car an 8 h.p. De Dion. Should I try to retard the spark still further? (4) Will it make any difference if I place the trembler coil in the locker under the seat with the accumulators? I now have the coil in front with the engine, but it is rather in the way, and I would prefer having it in the locker, if it will not affect the spark in any way.—(1) You must use a shunt wound machine for charging. The main thing to see to is that you have lamps of suitable candle power to pass the required current through the cells. If the charging rate marked on the cells is two amperes, you would require two 32 c.p. lamps connected in parallel or a single 50 c.p. If you have two sets of cells of 4 volts each, set by connecting up in series; it is not necessary to connect up any more lamps. Look up page 474, issue 96, and you will find a useful table on charging. (2) Not clear what you mean; the piston speed may be anything according to the conditions. When the car is standing it is obviously best to run the engine as slow as it will keep going; it depends on the regulating properties of the carburetter. (3) You may be able to put the spark further back, but you will probably have to reduce the air supply at the carburetter. If you retard too far, there will be a tendency to fire into the exhaust. (4) You can place the coil anywhere, as long as it is out of the heat and damp. It will have no influence on the spark.

"A Cyclist."—You can obtain the binding cases from our publishing department. Price 2s. 6d. each.

A. E. Foster (Liverpool).—You can use a 20 per cent. mixture of glycerine with the water. It is satisfactory as far as being proof against freezing, but it is very objectionable stuff to have in the radiators and tank, as it makes a sticky mess of everything it touches.

Height of Frame, etc.

A.V. (Bradford).—A 24in. frame will be quite high enough. It is not desirable to have as high a frame as is usual in the case of an ordinary pedal bicycle. For one thing a motor-bicycle saddle is a specially deep one, and with a high frame it would be a difficult matter to mount and dismount. With a low frame a satisfactory position for the saddle is to place it well back and, if anything, slightly tilted in front. It should be possible to place both the feet on the ground in case of emergency. The handlebar should be at about the same level as the top of the saddle. (2) A luggage carrier and stand is specially useful, as it enables the back wheel to be jacked up for testing the engine or repairing a puncture. (3) The self-sealing air tube is certainly effective; it is slightly thicker and heavier than an ordinary air tube, but does not noticeably affect resiliency.

Ignition and Gearing Queries.

C.E. (Brompton) writes:—Please say (1) Under what conditions is it possible to get good ignition with a simple cell accumulator 2-volts? (2) Which are considered the best forms of sparking plug of the following:—(a) Mica; (b) De Dion with rounded porcelain; (c) the several types of plugs with hollow porcelain like the Pognon and Oleo plugs? (3) What is the lowest gear I can safely fit to a 2 h.p. Minerva engine? I am quite content with a maximum speed of 18 to 20 miles an hour if the motor will take hills of 10 per cent. grade without pedalling.—(1) The chief condition is to set the plug points very close, say 1-40th inch, but this distance is so small that there is always a risk of them being short circuited by a particle of carbon, or even touching with the expansion of the porcelain. (2) It depends on the conditions. If the plug does not get fouled up with over-lubrication of the engine they are all equally good. The Mica plug is unbreakable, however, and if one gets a good specimen they are very satisfactory. Under bad conditions the Pognon and Oleo plugs are doubtless best, as they cannot short circuit. (3) With careful driving you might gear as low as 1 to 7½ or 8, but this would be risky in hot weather; the motor would tend to overheat. But with very skilful handling it might do even then.

ANSWERS BY POST.

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

Thursday, January 7th.—F. E. Brown (Birmingham), F. W. Daw (Ebbw Vale), S. Edmonds (Birmingham), H. B. Wilson (Sunbridge Park), H. Bottoms (Oldham), T. C. Sharrott (Tamworth), J. Cook (Redhill), J. C. Saull (London), H. Edwards (Markyate), F. W. Grimshaw (London), E. J. Grizzell (Worcester), G. J. Philpot (Leytonstone), J. M. Eadie (Paisley), R. G. Boyden (London), F. Mullett (St. Ann's), J. J. Tennant (Clayton-le-Moors), T. Carlyle (Waterbeck), W. A. Fielder (London, N.), W. Goulding (Liverpool), J. Berry (Sale).

Friday, January 8th.—A. E. Reynolds (Sheffield), A. A. Pitcairn (Uxbridge), R. Smellie (Easterhouse), P. Fitzpatrick (Killarney), A. Richardson (Northampton), G. Knibb (Frome), R. G. Heyn (Belfast), H. M. Teasdale (Wakefield), W. H. White (Stroud Green), J. Lamonby (Lesmahagow), G. H. Clubb (London), A. H. Kellett (Burnley), J. G. Thompson (Tooting), W. Whitsed (Wisbech), C. Metcalfe (Sale), R. H. Carew (Waterford), H. Phillips (Dulverton), J. Wain (Stoke), N. H. Brown (Bebington), R. D. Cochrane (Galashiels), B. H. Brunton (Cezia, Spain), P. L. Seed (London), G. W. Matthews (Walmer), G. E. Badeley (Wakefield), D. Hagon (Seaton Delaval), G. Clark (London, W.)

Saturday, January 9th.—J. Penan-Smith (Dingwall), C. Wade (Boscastle), F. W. Daw (Ebbw Vale), S. Everitt (Brighton), C. Warren (London), H. Gray (Rugby), C. W. Dieseldorff (Wimbledon), G. Emmerson (Southampton), J. Kilsey (London), E. Pearson (Sevenoaks), T. Scowscroft (Pembroke), A. Fielding (Stoke-on-Trent), A. G. Elder (Tewkesbury), J. Penfold (Arundel).

Monday, January 11th.—J. Hossack (Ipswich), A. Winslow (London), H. Bond (Knockholt), D. Hughes (Sunderland), F. H. Mullett (St. Ann's), A. Kingstone (Oxford), E. Hurman (Portsmouth), J. W. Holland (Haslingden), Stone and Turner (Dorking), W. Edwards (Newcastle-under-Lyne), E. Porter (Scredington), A. B. Prowse (Portsmouth), A. Wood (Mitcham), G. Pinker (London), H. G. Elliott (London), V. Liddell (Pershore), F. Wimbash (North Finchley).

Tuesday, January 12th.—A. Durant (W. Dulwich), J. Wilson (Anstruther), J. Hethrington (Moffatt), H. Grover (London), A. C. Stewart (Chelsea), E. Guthrie (Liverpool), A. Meigh (Stoke), W. E. Meeke (Birmingham), Godwin Bros. (Woking), H. Wise (Wandsworth), W. Warburton (Liverpool), A. G. Elder (Tewkesbury), C. F. Jackson (Hull), T. Freeman (East Dulwich), G. Jupp (Portslade), R. Farkes (Shrewsbury), R. G. Priest (Southampton), A. Davidson (St. Leonard's), L. Cooper (Broxbourne), C. France (London).

Wednesday, January 13th.—J. L. Ryding (Tottenham), G. Cheetham (Boarhills), A. L. Harrison (Galway), F. Greswell (Spilsby), G. Flemmich (Teignmouth), H. Callard (Streatham), H. Tomlinson (Southport), C. H. Whitelegge (London, W.), H. Munchton (Bournemouth), C. Beesley (Exmouth), W. T. Westwood (Croydon), D. Jones (Abergwili), H. Malyan (London), E. Thorpe (Barnsley).