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THE FLYWHEEL, AND ITS EFFECT ON TRANSMISSION.

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The flywheel regulates the motion of the engine by absorbing the surplus energy of the working stroke of the piston, and afterwards giving it out in overcoming the resistances to motion, until the next explosion takes place.

The amount of kinetic energy * which a flywheel can store up depends upon its weight and its rate of movement in the following manner, i.e., the energy which can be stored is proportional to the weight (*w*) of the wheel in pounds and is also proportional to the square of the linear velocity (*v*), in feet per second, of a point which is near the centre of the rim of the wheel.

Now, since the weight of any particular wheel is constant, the only way in which the wheel can store energy is by increasing its rim speed, and conversely when giving out the energy it must decrease in speed.

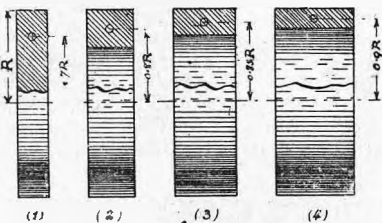
The way in which the size and weight of the wheel affect its usefulness may be understood from the three examples as follows. Let there be a wheel which we will call A, making 500 revolutions per minute, whose store of kinetic energy may be 100 foot-pounds. Now if we double the weight (say by keying a precisely similar wheel beside A), we shall have *twice* the energy stored at the same revolutions. If, instead of doubling the weight we were to

DOUBLE THE NUMBER OF REVOLUTIONS

of A, the value of (*v*) would be doubled, and since the kinetic energy varies as (*v*²), it would be *four times* its first value. Again, if we were to construct a wheel of equal weight to A, the centre of whose rim was twice the diameter of that of A, then this wheel, when running at 500 revolutions, would also have *four times* the kinetic energy of the first wheel A.

The effect of the shape of the wheel is illustrated by the following drawings, which show a half-sectional view of four wheels, each of the same weight, and having the same outside diameter, but having the metal of the wheel distributed in a different manner, (in order to simplify the problem, the arms and boss have been omitted from the calculation).

In these drawings it is shown that the radius of the circle from which the velocity is calculated varies from about 7-10ths of the outside radius in the first case to 9-10ths of it in the last case. So that taking into account the squaring of the velocity, the values of the four rims will be in the pro-



portion of the squares of their *effective* diameters, or approximately as 49, 64, 72, 81, counting from the left. In the same way it could be shown that if the wheel were made twice the diameter, keeping the same weight, it would be one-fourth the breadth and would store *four times* the energy that it previously would at the same number of revolutions, and if it were made three times the diameter it would have one-ninth the breadth and

WOULD BE NINE TIMES AS EFFECTIVE.

considered as a flywheel. It therefore follows that, given a fixed diameter and weight of wheel, the best effect will be produced by having the material as far from the centre of rotation as possible, or, if the weight only is fixed, the larger the diameter the better. The surface speed of the rim of a cast pulley or wheel should never exceed 80 feet per second, because beyond this speed the tension in the rim rises dangerously high.

The foregoing considerations apply to all flywheels, whether of fixed engines or of the engines of cars and cycles, but in these latter cases there is a further effect which must be dealt with, namely, the energy stored in the moving machine, and this matter is closely bound up with the method of transmission. It will be quite evident that since the weight of the engine of a motor-bicycle is cut down as much as possible, it will generally have flywheels which err on the side of lightness, and therefore, in order that they may store the energy of the working stroke, the rate of revolution of the engine-shaft must increase considerably during that stroke of the piston.

If the engine-shaft is connected to the road wheel by a rigid and non-slipping device (of which the plain chain is a type), then the acceleration of the engine-shaft by the explosion *must* be accompanied by a corresponding instantaneous advance on the part of the machine (or else a partial skid). Now since the weight of the machine and rider is very great compared with that of the flywheels, it follows that, under the above conditions, much of the energy of the explosion will be

TRANSMITTED INSTANTANEOUSLY THROUGH THE ROAD WHEELS to the machine and rider, and thus the flywheels of the engine will not increase so much in speed, since they are not called upon to store so much energy per working stroke.

It would therefore appear at first sight that a great advantage should accrue from the above method of transmission, because the machine as a whole would exercise a steady effect upon the rotation of the engine.

It is here that we come upon the crux of the whole matter, as the following considerations will show. Let us assume a machine whose engine flywheels make 1,000 revolutions per minute, and weigh 16lbs. the pair, having an *effective* rim speed of 1,800 feet per minute, when the machine is running at 20 miles per hour. The velocity of the rims round

* Kinetic energy is the capacity for doing work; it is measured in foot-pounds.

The formula for the kinetic energy of a moving body is

$$KE = \frac{W V^2}{64} \text{ approximately.}$$

their axis will, in this case, be the same as the speed of the machine along the road, viz, about 30 feet per second.

The kinetic energy stored by the flywheels is 225 foot-pounds, and that stored in the moving machine and rider, whose weights may be taken as 160 pounds each, will be about 4,500 foot-pounds, or twenty times as much as in the flywheels at the above speeds. Now it will be evident that when the charge is fired, the surplus energy, which amounts to about three-quarters of the total produced by the explosion, will (with a rigid drive) be divided in the proportion of 20 to 1 between the machine and the flywheels, and it should be noted that this storing takes place in 1-2,000th part of a minute, and occurs 500 times a minute.

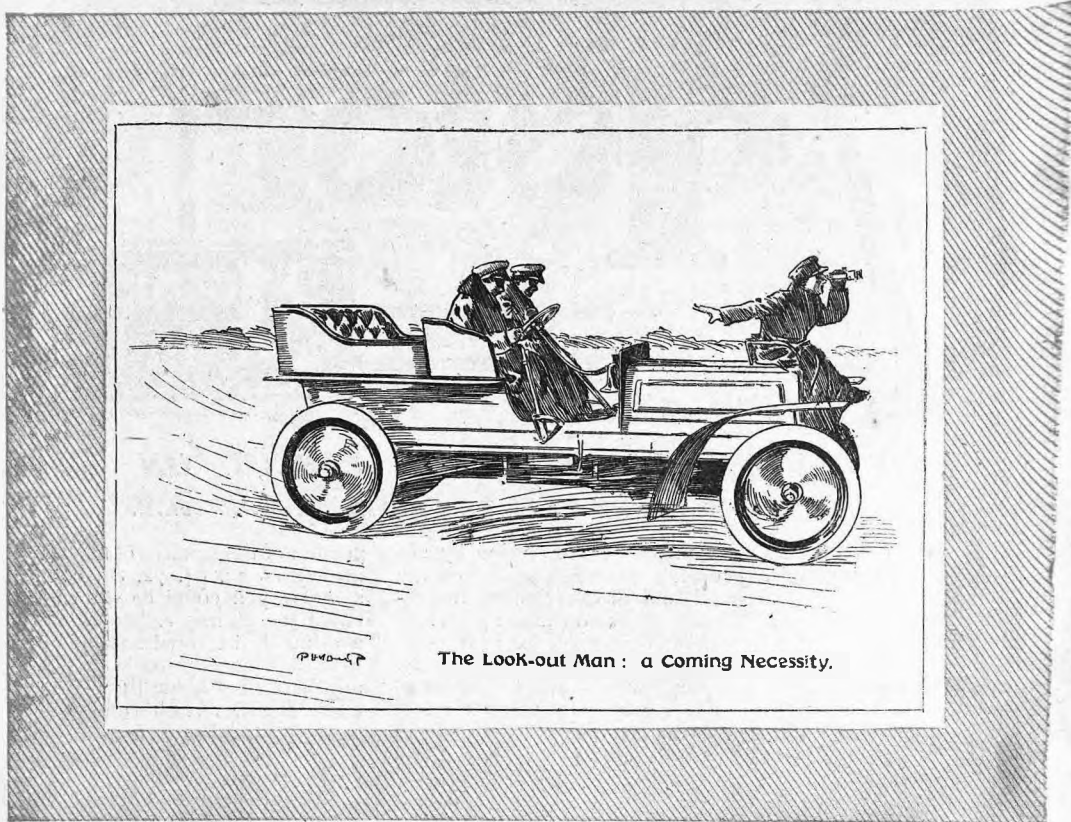
The sudden application of this load, equal to nearly the whole force of the explosion (taking account of the leverage of crank over pulley) comes upon the chain like a blow, which is the more destructive because

THE CHAIN DOES NOT SENSIBLY STRETCH

(see chain makers' advertisements). It is, of course, this necessary quality of the chain which may cause trouble with this system of transmission.

In the case of the belt, the conditions are different, because the force of the explosion is a little better stored by the flywheels if a little slipping takes place at the pulley, and also mainly by reason of the fact that the belt itself stretches momentarily, and thus absorbs the surplus energy, and though it restores it again almost at once, yet it effectually does away with the sudden nature of the imposed load.

It should not be forgotten, however, that any slipping of the belt or of clutches means power lost in friction, although motorcyclists generally are prepared to waste a little petrol, if by doing so they obtain sweeter running. They also waste more than they know of by unsuitable belts, etc., but that is another story. The incipient slipping which is men-



The Look-out Man : a Coming Necessity.

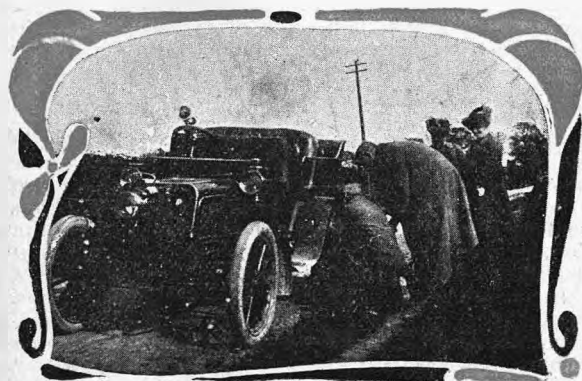
tioned above as slightly advantageous and unavoidable, tends to destroy the grip of the belt on the pulley, and so become chronic, a state of things well-known to some belt users.

The necessity of providing elastic elements when chains are used is now generally admitted, and when the foregoing considerations are taken into account, it follows that this element should be between the engine and the belt or chain, that is, in or about the engine pulley or chain wheel, and if such a contrivance is forthcoming, designed on sound mechanical engineering lines, it is practically certain to replace the belt altogether.

The cycling gossip of "The Lady" has been telling the story of her first lesson in motorcycling. It will not fire her sex with a burning desire to acquire the art. When the only possible means of getting off "the strange beast" is by "slowing up gradually, bending the legs, and slipping down into a kneeling posture to accommodate the entangled skirt—which has got tightly wedged behind the stay of the dress guard—and then (owing to the impossibility of maintaining this cramped position by reason of the superincumbent weight of the machine) gently giving way, and half-lying and half-sitting on the ground with the machine quite comfortably lying on the top"—we think ladies will pause before getting on.

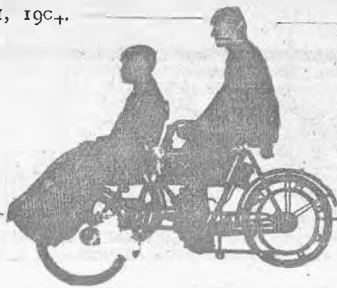
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In a recent report of a fire at a motorcar stores at Newmarket, the "Daily Express" stated that "a number of valuable race-horses were placed in danger by the fire. Fortunately, however, the outbreak was confined to the motor works, which were destroyed, as were also six or seven cars, the damage being estimated at £2,000." The value of these things is, of course, according as one looks at them, but the words quoted above would form a welcome addition to Mr. Punch's collection of "Things One Would Like To Have Expressed Differently." It reminds us of the story of the hostess at a dinner-party who, when a footman spilt twopennyworth of tinned mock-turtle soup on to a guest's fifty-guinea gown, exclaimed: "What a waste of soup!"



Punctured!

THE MAN OF MODERATE MEANS.



Who is he? Well, he is the man in the majority. The wealthy man must be a good customer; the man of moderate means will prove a better, if he be properly catered for. There is power in numbers, and the man of moderate means undoubtedly has numbers on his side—ergo, as a power in the land his importance must not be disregarded. He is the man who, graduating from the cycling school, passes into the motoring arena the possessor of a motorcycle. He has received considerable training in the school of cycling mechanics, and he passes up to higher things. The idea of attaching an engine to that already interesting machine, the bicycle, appeals to him as a means whereby his interest in things mechanical may be vastly increased. It opens up to him a vista of new ideas, new theories, new sensations. First he wants to know: knowledge brings the desire for possession and he procures a motor-bicycle. Experience brings more knowledge, but not enough. He devours information omnivorously from many sources. His own experiences are not sufficient: he must know how others fare with machines which differ from his own. The time arrives when he is all but an expert. He knows things. He can get every ounce out of that wonderful little engine, and troubles that were once stupendous are now minor things easily and quickly overcome.

He tires of solitude on his speedy trips, and would like to share his pleasures with at least one other. So he now seeks knowledge concerning fore-cars, and eventually becomes the possessor of one. More new ideas, more new theories, more new sensations. He has advanced one other stage, and is now proud to display his knowledge to others. There is a certain fascination in talking learnedly and technically to a friend who evinces an intelligent interest in motor matters, one who is impressed by the wonders of the little petrol motor and all that it performs. The man of moderate means counts men of moderate means among his acquaintances, and the motor fever is infectious. Friends who are taken spinning in fore-cars desire to become something more than mere passive passengers. To use a colloquialism they "soon want to have a go at it themselves," and so it happens that one motorist of moderate means makes many.

It is a strange thing, this wonderful, fascinating desire for engine driving which possesses most of us. I wonder how many of those who are now experiencing the delights of motoring, have, like myself, in very youthful days expressed their fixed intentions of "being engine drivers"? I recall that, as a youngster, no soldier in the finest uniform ever impressed me so much as the begrimed individual on the footplate who held all the might and power of a panting steam engine in the hollow of one hand! The man who by the movement of a lever could set the overawing monster into motion, urge it to a swifter and yet swifter pace, and stay it at his will. And now the faculty is mine, with the added power of controlling the course of the vehicle at my will.

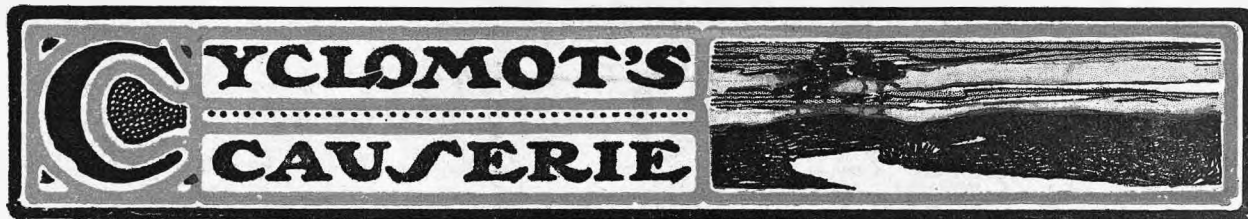
But I am digressing. There comes a time when the motorcyclist tires even of mere "tap twiddling" and the bicycle: when, if his means permit, he will feel a yearning to grip the steering wheel and to know the reason for the calm, comfortable control which the man on the car possesses over his vehicle. He himself will want a car. He has graduated as a motorcyclist. All the fundamental knowledge of motoring is his. He makes the plunge, and gets a car and this opens up a still wider field of interesting possibilities. He can now bring more friends to a proper appreciation of the pleasures of motoring, but his departure from the motorcycling fraternity has not depleted its ranks, for he has interested and converted others who are already passing through the initial stages of motoring with the motorcycle.

If you will endeavour to fix in your minds when this movement first started, you will, I think, agree that it dates back just two of "THE MOTOR." The mission of ultra-technical, to be the medium subjects between reader and reader, from the point of view of the man of day of "THE MOTOR" I feel no com- Has its mission so far succeeded? be in the affirmative.

years—it dates back in fact to the start this journal was to educate without being for an interchange of views on motor to follow the motor movement always moderate means. On the second birth-punction in asking you the question:— For I feel assured that your answer will

THE EDITOR.





Mr. O'Gorman's Flight of Fancy.

Beerbohm Tree says to one of the characters in "The Darling of the Gods," "Will you honourably enter my unimportant torture chamber?" and somehow the request, so politely put, came irresistibly to mind when I noticed filing in amongst the audience for Mr. O'Gorman's lecture at the Auto-Cycle Club on "Desirable Improvements on Motor-Bicycles," certain gentlemen prominent in the trade. Fancy being invited to a paper and discussion in order to have one's favourite ideas pulled to pieces and to hear that, in some people's opinion, the methods and devices adopted for 1904 should be discarded in favour of something which has never been heard of before, and which may not actually materialise for months—or, maybe, centuries! The title of the paper was a very attractive one, and it was, at first, thought that there would be wonderful scope in it for a skilful engineer. Certainly I could not name anyone more fully equipped for dealing with it than Mr. O'Gorman, and I attended the discussion with the full intention of carefully studying all the new ideas put forward, of taking a discriminating choice from the extensive list which would probably be the outcome, and then adopting such of them as were available in my 1904 machines. With somewhat mixed feelings I left the room without having heard of anything or any suggestion that could be put into practice: in fact, a responsive chord was only touched when any of the speakers talked about the desirability of absorbing road shocks.

Now, does it not speak rather well for the motorcycle of to-day when clever engineers and experienced riders can find so few pegs upon which to hang their criticisms, and when they are compelled, when asked what improvements are desirable on the machine, to start talking about turbine motors, self-ignition by means of high compression, and feather-weight machines, and to indulge in similar airy flights of fancy? And yet, we must remember, it is but two years ago that we were grumbling at some very absurd methods and crude details in our motorcycle, and even objecting to the need for dismounting after every fifteen or twenty miles for the purpose of oiling up. With a tin measure we used to carefully gauge a charge of oil, then, unscrewing a plug, we used, with painful slowness, to pour the lubricant into the crank chamber. If we recall the motorcycle in use at the time when this journal was launched, that is to say, two years ago, and then compare the picture with one of the up-to-date machines, we must confess that the advance has been prodigiously rapid, and that both makers and users are entitled to more than the usual amount of credit for the thoroughness with which the problem has been tackled and its difficulties overcome. Mr. O'Gorman could only point to the need for a good system of insulating the rider from the vibratory effects of travelling over rough roads with a heavy machine having a small wheel base. The attempts to accomplish this have not been many, and I can only recall the Bat spring frame in an attempt to remember the successes, and, even in this case, the head of the machine is not in 'ated, the backward position of the rider obviating, however, some of the need. The general adoption of spring frames will enable us to maintain a better average of pace, and will overcome an objectionable feature—most objectionable to the rider who has much suburban macadam (always badly kept) to tackle before he reaches the country roads. Mr. O'Gorman also got back from the clouds when he touched on the desire for freedom from side-slips, but his turbine motors and his silencers that produce a deathlike stillness for fifty yards around made me wonder whether he was going to suggest aeroplanes and a carburetter that used

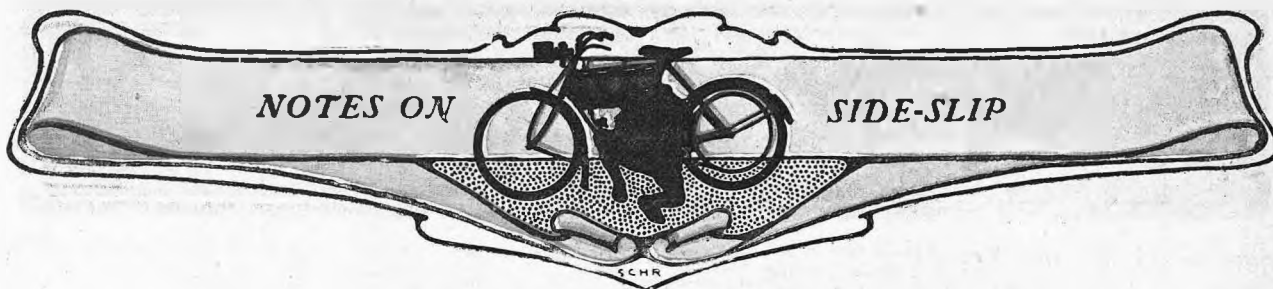
only air, and so saved the expense of petrol and tanks to contain it!

A Long-felt Want.

Now, the man who wants to make a fortune and earn the gratitude of thousands should turn his attention to the production of a patent non-soilable hand. Sometimes, when I have had three or four hours on the machinery of the car, I find myself wondering whether I'm only a common engineer's labourer, although I very much doubt whether even such as he would get himself into so filthy a state. What we want is a hand that has no projection of the finger-nails to gather dirt, that has no soft tissue round the nails to become as black as the chimney grate, with a skin which, instead of becoming begrimed in the pores and lines so that caustic alkali is necessary for the removal of the dirt, shall, with a mere swill in petrol, come forth as white as the lily and as soft as a young girl's cheek. If the man feels that my ideal is far and away beyond him—as far away as the clouds which Mr. O'Gorman explored—let him provide us with a pair of gloves, thin enough to enable us to work in them, and impervious to the inroads of dirty paraffin; and, in my experience, they should be provided with a sort of time-lock, so that the wearer should not be able to discard them in the middle of an interesting task, and, later on, come back to earth to find his hands gloveless and filthy, as I have done on more than one occasion.

The Spring-drive.

My innocent enquiry of a fortnight ago with regard to the need for a spring connection to be introduced into the transmission system when chains are used has resulted in a certain amount of misconception. The correspondence which has reached us is interesting, and the first batch of it will appear, so the Editor tells me, in "O.P.V." next week. In going through it, I observe that some people in the trade would appear to have formed the idea that I am suddenly doubting the need for a friction clutch, and two or three friends, as well as some esteemed readers, have spoken and written about the friction clutch, pointing out its value in allowing the power to be gradually communicated to the road wheels. I was afraid when these opinions reached me that I had not succeeded in making myself clear, but I can find no references to a friction clutch in my note, and I do contend that there is a world of difference between a friction or cone-faced clutch and a spring-drive. The former is used on almost every make of car, and is to be found on the Humber, the Jehu, the Bowden, and other makes of cycles, and is practically indispensable. The spring-drive or a clutch which has a couple of faces held together by a very powerful spring, so that, in the event of an unwonted shock, the clutch will give, is a different idea entirely, and this is the article of which I am asking, "Is it necessary?" I know that the one I had in use for the first six months of last year only slipped twice, and it emitted a fearful shriek each time. So had it slipped on any other occasion I should certainly have heard it. And, having observed the faulty method of driving which had produced the "shriek" on each occasion, I set myself thereafter to studiously avoid it, and succeeded. Afterwards, when the spring drive was replaced by a clutch, which first engages by friction and when fully home is locked mechanically, I never once felt the need for any spring or give of any sort. Personally I have no feeling one way or another with regard to a spring device being introduced. My only idea in putting the question is to find out whether others think it necessary, because, if it should not be necessary, so much expense can be saved on chain-driven machines.



After the first few bad tumbles through skidding I made up my mind to study this bug-bear, to work it out scientifically, its causes and its cure, but, alas! to-day, though a giant in experience, I'm but a baby in understanding. Yet it looks so simple. Two given surfaces to be made to rapidly grip. Vexed souls, bruised bodies, ardent minds; the little problem has defied them all. Still that nerve tension, that lack of ease, that constant dread whenever there may be grease where there ought to be grit. The fact is, rubber and grease are not to be reconciled. No half measure will do. Lately I have been wearing boots with rubber discs inserted in the soles, and everybody knows that opportunities have not been lacking for making experiments on greasy roads in all their greasy stages. Day after day during my walks patches of mud have so attracted me to tread upon them that my experiments have become quite fascinating. Rubber and road mud, how do they behave in contact?—that is the question. And it's a question that depends upon more conditions than at first appear. It depends upon: (1) the consistency of the mud; (2) the depth of the mud; (3) the nature of the surface upon which the mud rests; (4) the gradient of the surface; (5) the weight bearing upon the rubber; (6) the direction of the approach of that weight; (7) the rapidity of that approach; (8) the inertia of any weight bearing off from a common direction (such as the rear wheel of a bicycle).

I forget how many hundreds of thousands of tunes may be got out of eight bells, but the fact is suggestive of how impossible it is to tell

WHAT OUR TYRES ARE GOING TO DO

when all the above conditions depend intricately upon one another, acting and reacting till a confusion of laws gets worse confounded. As an example: a given weight, upon a given thickness, upon a given surface, from a given direction, at a given speed, upon a given gradient, and some Euclidean mind may conceivably work out the result. But alter one of these conditions by ever so little, and the result must be mathematically different; it may be so different as even to determine whether I should be upright on my motor or stretched flat upon the mud. I know it for a fact.

You cannot get away from natural law, but the laws of rubber and road grease seem past finding out. As no rule can be exactly formulated, we have to fall back upon experience, and that's a dear game. So dear that with the roads in this chronic state of slush and paste and puddle I for one am not inclined to purchase any more just at present. I cave

in. I acknowledge myself beaten. I dread skidding, yet cannot or do not avoid it. Of course, by going dead slow and dead sure, one may get there, but I prefer to stay at home and bear the ills I have rather than skid to those I know enough of, for, once in the saddle, I cannot creep. But it's humiliating, and it's a reproach to our faculties that the problem has so long beaten us. We are confronted with two necessities:

WE MUST RETAIN THE RESILIENCY OF THE PNEUMATIC TYRE

and we must absolve its rubber from all necessity of grip upon muddy surfaces. To do that it is clear, to my mind, from grim experience, that no contact can be trusted or allowed when moisture is upon the roads. It is little consolation to run a hundred miles upon bad roads and not have a single slip. That's due to good luck, or your skill, or your tense watchfulness. We want a dead certainty of grip under all possible conditions, and we shall not have this as long as grease greets rubber with the kiss of Judas.

It is shown that other surfaces slide on mud of a certain consistency also. To show the imperviousness of thick mud to a weighted flat surface I have seen even a loaded cart wheel skid. There is nothing for it but to pierce the paste, for where there is the least resiliency that yielding surface makes for utter unreliability. Certain non-skidding devices meet the case only so far. Accidents are occurring with each one. The interstices must be incapable of filling up. It seems too unfortunately clear that nothing short of a piercing power of one inch length is necessary to ensure reliability upon country roads under varying wet conditions.

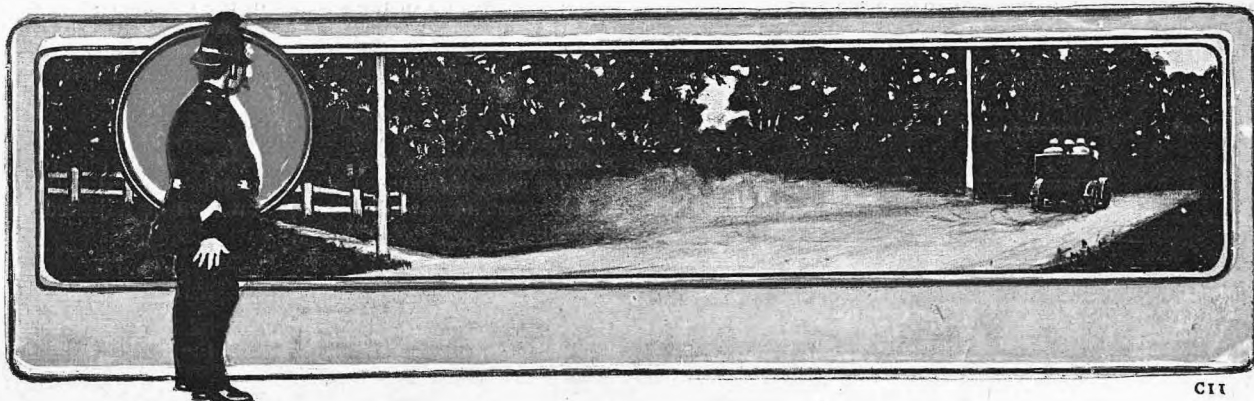
On the other hand, though nothing is so treacherous as

A THIN FILM OF GREASE

on a smooth road—as those who walk with rubber soles know—a quarter of an inch would suffice a town. Yes, a film of mud is sufficient. It's a fallacy to blame wet tram rails. Rubber does not slip on a *clean* wet surface.

I have thrown no light on the matter, I know. Yet, by eternally writing and talking we shall some day, perhaps, hit upon something—or suggest an idea to someone which will bring comfort and safety to thousands. And my one fixed idea upon the question—be it fallacy or not—is that some band system of blunt headed piercers must do the business, and be adjusted to the tyre, so as to be easily removed or renewed.

J. BERRYMAN.





Adjustment of Contact Breakers.

The positive make and break, in which two platinum studs are brought into firm contact by a cam, and then through the agency of a spring suddenly separated, is undoubtedly, when perfectly adjusted, one of the most effective spark producers that could be devised, and from my own observation and experimenting with the help of some very accurate current measuring instruments I have come to the conclusion that a plain coil and properly adjusted make and break are very much more economical in the quantity of current used out

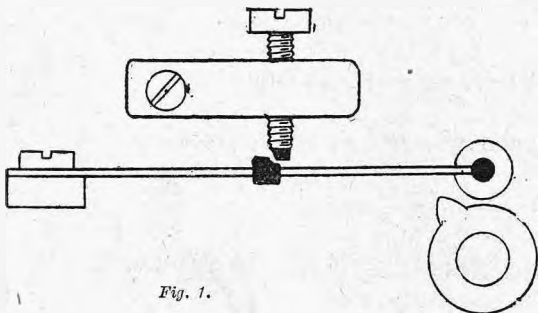


Fig. 1.

of the accumulators. For instance, to put the results in plain understandable figures, it comes to this: whilst a given size and make of accumulator with a make and break will spark the motor well for 600 miles, if the same battery is used with an average trembler coil 400 miles would be a very good distance to run with this. I am quite prepared to have the figures criticised, the results are given as I found them. On the other hand, I am firmly convinced that the rotary contact and trembler coil have advantages which fully compensate for this, for this reason—there is very little trouble indeed in setting a rotary contact, and it keeps in order for a very long time; in fact, a whole season is not an unusual period, and what adjustment has to be done at all is at the trembler of the coil, hence, for the novice or the motorcyclist who does not want to be bothered with making of nice and delicate adjustments, even at the expense of current, it is the right system for him. By this I do not mean to suggest that with a trembler coil it is impossible to have any trouble. On the contrary, a cheap and carelessly constructed trembler coil will often prove a source of unending worry till it is thrown on the scrap heap. It will swallow up current at a 10 or 15 amperes rate, and the trembler will stick on the core, connections inside will break, but more of coils anon. Now, as to the question of adjustment of the positive contact. It is possible to so adjust the screw that the platinum studs keep in contact for a long or short period. The shorter the period the less will be the quantity of cur-

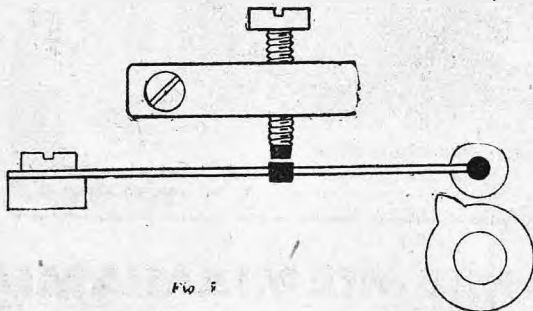


Fig. 2.

rent taken out of the cells. The ideal adjustment to aim at would be the lightest possible contact that would give good sparking at the highest speed of the motor. At a high speed the greatest economy of current will be attained in running a given distance. If the contacts are too lightly adjusted misfiring will occur when the motor runs beyond a certain speed for one of two reasons, either the pressure between the platinum studs will not be sufficient to bring them into actual metallic contact by squeezing out the film of oil between them, or the current will pass for too short a time round the core of the induction coil, and thereby fail to magnetise it fully. The amount of pressure between the platins will also to some extent affect the timing of the ignition, as a little consideration will show that with a hard contact the actual break will occur later in the firing stroke than if the contact was a lighter one.

Adjustment whilst Running.

This can be proved by running the motor on the stand and giving the contact screw a turn or two with the screwdriver, it will be found that a part of a complete turn of the screw will make an appreciable alteration in the speed. This method of adjusting a make and break is a very good one if the platins are set approximately right beforehand, then if the advance lever is put well forward, after the motor has been started up, so as to get the motor running up to a good speed, the contact screw can be turned backwards, at a certain point missing will occur; then if the screw is turned forward just a little past the point where the firing becomes perfectly regular again it will be about rightly set for

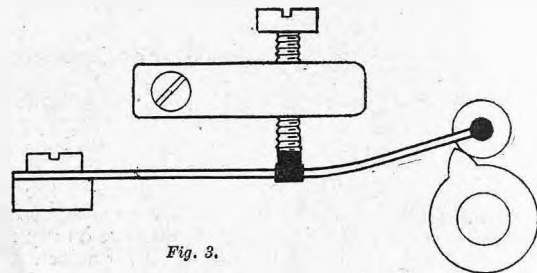


Fig. 3.

economy of current. Now, with respect to the actual "lining" up of the platinum studs, I show in my first diagram how the studs should *not* be adjusted. This is a very usual way to find them, and it is a prolific cause of misfiring troubles. The platinum stud on the screw only bears on a very small portion of the surface of the trembler stud. This results in the screw sooner or later touching the steel, and when this occurs missing is bound to begin. In the second diagram the studs are shown as they should be, exactly opposite each other. If it is found that the spring cannot be so moved on its support to bring the studs exactly together it is an easy matter to very gently rivet the platinum a little to one side by means of a small hammer, or, what is probably a better way, is to draw-file the screw-hole very slightly with a fine round or rat-tail file. It can then be adjusted quite accurately.

Broken Tremblers.

The third diagram explains what will happen if excessive pressure is brought to bear on the trembler. This accounts for the many broken trembler blades the novice experiences now and again.

STEAM CARS FOR THE MAN OF MODERATE MEANS.

By "AF 50."

Despite the pronounced slump in steam as a motive power for pleasure cars there are still many motorists who look for some revival in this direction. There can be no doubt that public opinion on the matter has been prejudiced by the dumping in considerable numbers of steam cars designed without sufficient experiment on the road, and with neglect of certain details, apparently slight in themselves, but on which the successful running of steam engines is known to depend.

The matter is at least worth some consideration when it is borne in mind that the least expensive steam car, costing say £150 to £200, possesses, inherently, qualities which at present are only obtained approximately in petrol cars at a cost of five or six times that amount; I refer to complete silence, freedom from vibration, and simplicity of control.

Before proceeding to review the existing types of steam car and venturing to forecast what improvements the successful steamer of the future will have to include it will be instructive to consider side by side the relative claims which may be put forward on behalf of petrol and steam respectively.

PETROL CARS.—1. The petrol engine requires no boiler and no pumps (except the simple one used sometimes for the cooling system). **STEAM CARS.**—1. The steam engine necessitates a boiler or steam generator and pumps for fuel and water feed. On the other hand it requires no clutch and no change gears and has an absolutely elastic drive. *There is no electric ignition system.*

PETROL CARS.—2. The explosion engine is more economical in petrol consumption and can run farther on a small supply. **STEAM CARS.**—2. The steam car is uneconomical when using petrol as fuel, and when the engine from any cause wastes steam. When a good paraffin burner is employed and the engine is working efficiently the cost of running approximates to that of the petrol car. The amount of fuel used is confessedly greater. However, paraffin can be obtained anywhere.

PETROL CARS.—3. The petrol car uses very little water. **STEAM CARS.**—3. The steam car must stop for water every thirty or forty miles, unless fitted with special apparatus to recover the condensed steam and separate the oil from it.

PETROL CARS.—4. The petrol car requires very little attention when driving, and is more fool-proof than the steamer. **STEAM CARS.**—4. For very many the greater attention required to drive a steam car provides a greater interest. In practice the driving soon becomes quite automatic.

PETROL CARS.—5. The petrol car, more especially the heavier kind, is an insatiable consumer of tyres. **STEAM CARS.**—5. The steam car, from the nature of its drive, is decidedly economical in this respect.

A general consideration of the above indicates that the petrol car will hold its own with people who desire

TO COVER LONG DISTANCES WITHOUT STOPPING,

and who are somewhat indifferent to noise and vibration if kept within limits. But it would seem that an efficient steam car must appeal to those who do not object to a stop of five or ten minutes at intervals of thirty or forty miles, and who value smooth running combined with entire absence of noise and vibration.

The steam cars put on the market up to the present fall naturally into two classes, viz.: those which employ flash generators and those in which the steam is raised in a fire-tube boiler. It will be seen that the type of engine used, and to a large extent the style of the car, is determined by the means employed to produce the steam.

THE FLASH GENERATOR CAR.

In this type the ordinary boiler is replaced by a long coil of tubing, having a bore very small in proportion to the external diameter. This coil or generator is kept at a very high temperature by the fire, and the water is fed through it in jets. Each jet is instantly converted into steam and delivered to the engine. It is obvious that in this system there is no reserve of steam and also that the risk of an explosion is nil.

THE STEAM SO RAISED IS SUPERHEATED,

and at very high pressure. The ordinary double-acting slide-valve engine is of little use with such steam. Among the practical objections may be mentioned lubrication difficulties and the impossibility of maintaining packed glands against the heat and pressure. The engine actually employed is a single-acting trunk engine resembling in design the gas or petrol engine. The slide-valve is replaced by mushroom valves worked by cams. A little reflection will show that at least three cylinders must be used. The impulse on the piston being in one direction only a dead centre might be arrived at with one or two cylinders, and to start at such times it would be necessary to get out and push the car. In these engines the cranks can be enclosed and the cylinders lubricated by splash as in the explosion engine. To this fact, coupled with the substitution of the mushroom valve for the slide valve, I attribute the present ascendancy of cars employing the flash generator system. I shall be able to refer to the point again when considering the boiler type of car. Examples of flash generator cars are the Serpollet, the Miesse and the White. The last-named employs a combination of the generator and the boiler and

THUS HAS A CERTAIN RESERVE OF STEAM.

In most of these cars the steam is completely condensed after passing the engine and the water returned to the tank. It is advisable first to free it from the lubricating oil which it brings over, but this can be accomplished simply and automatically. Thus equipped a car which carries a good supply of paraffin can travel as much as a hundred miles without stopping either for fuel or water.

The makers of this type of car show a tendency to copy the general form of the petrol car, usually placing the steam generator under the bonnet in front. So far I have not seen on the English market any light car employing the flash system. The great weight (involving heavy expenditure on tyres) and the high original cost place such cars outside the range of the man of moderate means. A Miesse or Serpollet can now be picked up second-hand, however, at a price much below its real value. The motorist who has a leaning towards steam and does not mind taking a little trouble may do worse than invest in one of these. He will at least have a car that in actual running cannot be excelled, or perhaps equalled, for comfort, pace and hill-climbing power. We come now to the Fire Tube Boiler Car. The car employing this pattern of steam-raiser is

EXEMPLIFIED BY THE AMERICAN STEAM RUNABOUT

of which so many have been seen here, and which can now be bought second-hand for a mere song. As every engineer knows, the fire-tube boiler is practically a kind of drum, with the tubes running through it. The fire is drawn into these tubes by natural or assisted draught, and thus a large surface of water is exposed to the heat. The steam delivered is moist and actuates an ordinary double-acting slide-valve engine. Two small cylinders are generally used, giving four impulses to each revolution of the crank-shaft. Compare this with the

STEAM CARS.—Contd.

single cylinder petrol engine, which, with one mighty punch, has to turn the shaft through two revolutions! Now, in slide-valve engines proper, lubrication of cylinders and valves is of the utmost importance to secure efficiency. In the double-acting engine splash lubrication is not possible, and the oil has to be introduced against the steam pressure. Add to this factor that damp steam is very uneconomical in use.

With these details in mind, let us consider the steam run-about one has been accustomed to see. The steam-raising capacity of boiler and burner is just

SUFFICIENT FOR CONTINUOUS RUNNING AT A FAIR PACE

on the level when the engine is efficiently lubricated and working at its best. There is no margin. But the lubricating arrangements supplied, instead of being positive in action, are of various primitive hit-or-miss kinds. The oil is not fed at all, or is fed at such a rate that none remains after a few miles. Then also the external gear, such as cranks, eccentrics, etc., is exposed to mud and dust under the centre of the car.

The result is not difficult to foresee. Such a car soon becomes worse than useless. It will run fairly on favourable gradients, but whenever a slight rise is encountered or even an adverse wind, the gauge shows a rapid diminution in pressure, and frequent stops have to be made in order to give the boiler time to make more steam. With petrol burning merrily away at more than 1s. a gallon, the running cost becomes prohibitive. Then there is the question of water. Very frequently no superheater is fitted, and the steam is carrying over with it much useless and even objectionable water imperfectly vapoured. The car

MAY HAVE TO STOP EVERY TWENTY MILES FOR WATER

under such conditions, and yet there is supplied no rapid means of feeding the tank, such as a pump, or, better still, a steam water-lift.

Enough has been said to explain why the ordinary

American steamer has been a failure. It cannot be too strongly insisted that the popular judgment on steam, which is undoubtedly founded on experience of this type of car, is not a final one. Whether a car with the flash generator and trunk engine can be produced at a moderate price, I will not venture to say. There seems no reason why the slide-valve engines should not be successfully employed, and I proceed to enumerate some of the points to which designers must give attention if the confidence of the public is to be regained.

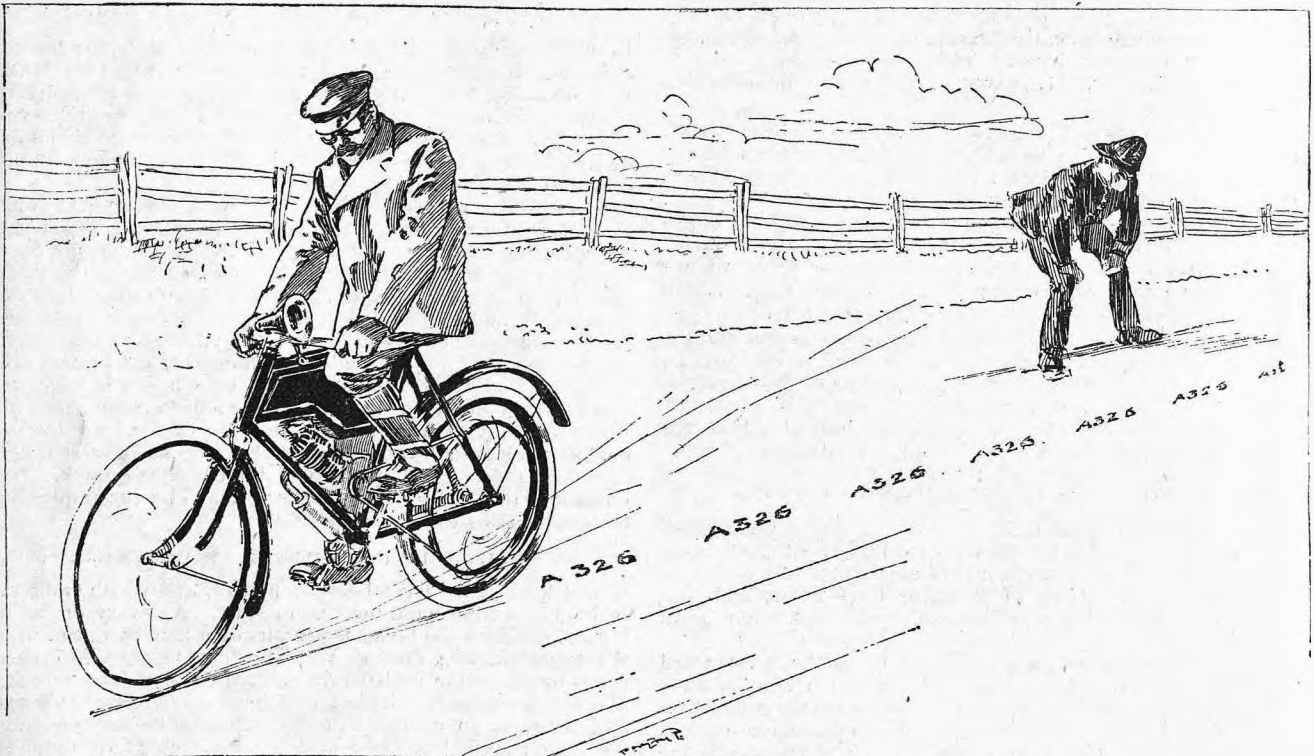
1. The engine and burner must be readily accessible.
2. The burner must use paraffin, not petrol, and must be unaffected by the direction of the wind.
3. If the flash generator is not employed, the boiler must be of ample capacity. The steam must pass through a super-heating coil after leaving the boiler.

THIS ALONE GIVES AN ECONOMY OF AT LEAST 10 PER CENT.

in both water and fuel. The coil must not be too long, as slide-valve engines will not work efficiently with steam super-heated beyond a certain point. Above all, the cylinders must be kept constantly lubricated by a positive device, such as a small pump worked from the engine or live axle through reducing gear. 4. The working parts of the engine must be protected from mud and dust. 5. The car must be fitted with a steam water-lift.

In conclusion, let me state my conviction that the future will produce a steam car, at a price within reach of the mass of moderate means, which will approach the petrol car in economy while surpassing it in silence and smoothness of running.

That the price of horseflesh (using the term in a sporting, and not in a meat-purveying sense) has dropped in consequence of the rise of the motor, and will drop still further, admits of no doubt; but still one would have thought that a horse and cart, however antiquated their condition, would have fetched more than an English "dollar" if put up to auction. The Loughborough police, however, recently stated that *five shillings* was an exorbitant value to set on a horse and cart, which was offered to them in payment of a 20s. fine.



A NUMBERING SUGGESTION FOR HELPING THE WORRIED POLICE.

SOME INTERESTING NOUVELTIES

Something New in Ignition.

We are privileged to be able to announce that something entirely new in accumulators—an adaptation of a new principle, in fact—will be shown at the Crystal Palace by Messrs. Peto and Radford. For convenience and other advantages we know of no method to equal it and we prophesy a large demand for the new type of accumulator when it is placed on the market.

The New Garrard Fore Car.

The well-known Garrard Manufacturing Company, of Birmingham, have for some time been perfecting the design of a new fore-carriage which would have special and distinctive features of its own. The basis of the idea has been to so design the machine that it could be used under the most adverse weather and road conditions—an all-the-year-round machine in fact. The engine is a water-cooled one developing more than 4 h.p. on the brake test. The transmission is by a pedal operated clutch and thence through a variable gear box, the same as a car. From this there is a jointed or Cardan shaft driving on to the rear axle by a worm and pinion gear. The frame is built up of tubing and the front wheels are specially well sprung. The rear part of the frame is also spring supported by a spiral spring between the rear forks and seat lug. The engine is of the water jacketed pattern, the radiator being mounted forward of the steering column. Special attention has been given to the accessibility of the various details of the engine and the front wheels will be fitted with splash guards designed in such a way as to protect the driver and passenger as much as possible. Band brakes will be adopted and the principal control movements will be done from the pedals. It is the intention of the company to put this vehicle on the market at a price easily within the reach of the man of moderate means. An illustration of the new vehicle appears on the next page

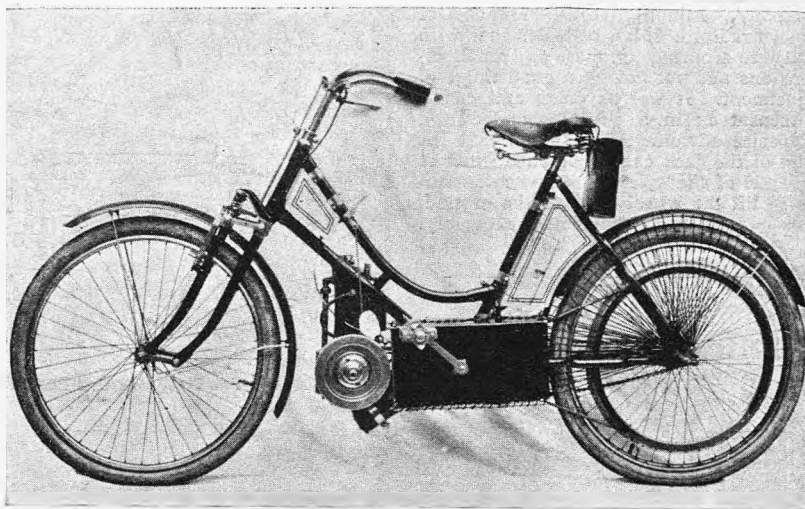
The Eagle Runabout.

The Eagle runabout will be shown at Stand 225. It is an entirely new type of vehicle—in fact, a one-seated car. From the illustration it will be observed that it is built on the same strong framework as the Eagle tandem, and is driven in exactly the same manner. Just behind the two front road wheels the engine of 5 h.p. is suspended, above it being the radiator, which is of the coil type. The power from the engine to the countershaft and from that to the single driving wheel at the

the levers actuating the carburetter and the commutator. Under the seat is fixed the coil and accumulator, and there is ample leg room. The makers are the Eagle Engineering Co., Altrincham, Cheshire. This is a vehicle well worthy of inspection.

A Smart Lady's Motor-Bicycle.

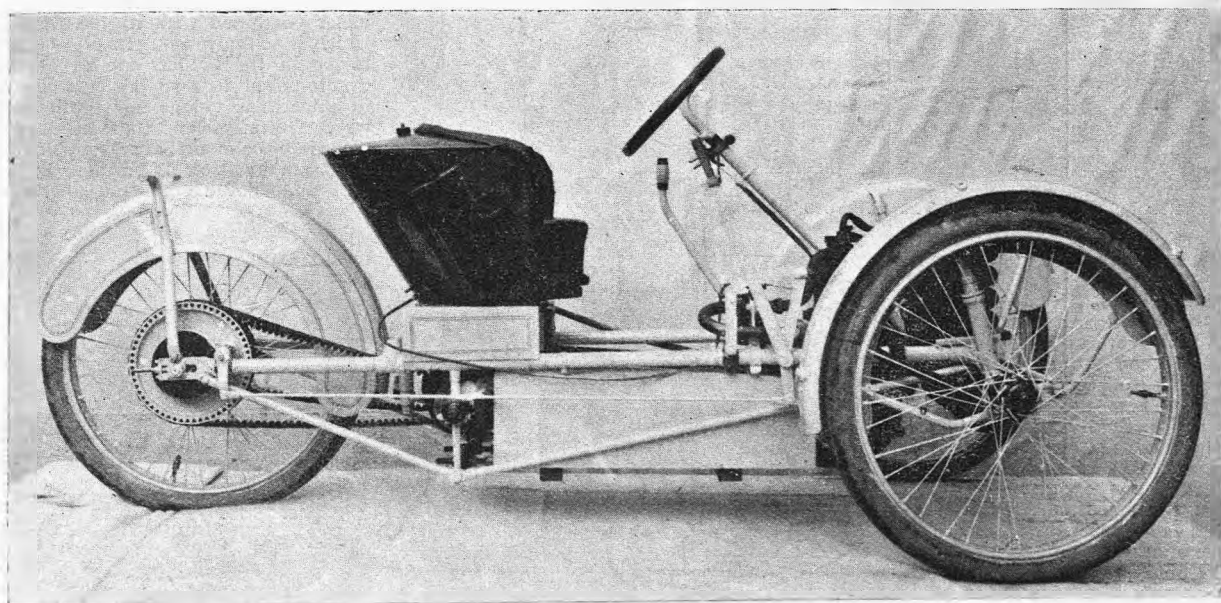
We illustrate on this page a lady's motor-bicycle that has been in constant use for several months past, having been ridden by Miss Garrard, of Birmingham. The machine was made by the Garrard



The Garrard Lady's Motor-Bicycle.

back is transmitted by means of Renold's silent chain. The seat is broad and deep and comfortably upholstered. Its back forms the petrol tank which holds about four gallons, and there are also fixed on it receptacles for water and oil. The carburetter is a De Dion type. Fixed on the steering pillar in a convenient position are

Manufacturing Company, Ryland Street Birmingham. It is fitted with the firm's special spring forks, and a $1\frac{1}{2}$ h.p. engine. The working parts have been made as simple as possible. A spray carburetter is fitted, and there is only one lever to manipulate, this being the exhaust valve lifter and advance spark combined.



THE EAGLE RUNABOUT WHICH WILL BE ON VIEW AT THE CRYSTAL PALACE.

NOVELTIES—
Contd

"Kutquick" is the name of a powder specially prepared for grinding-in valves, taps, etc. It is used mixed with water to form a paste and it is claimed that 70 per cent. less labour is required than when emery is used. The sale is in the hands of The United Motor Industries, Ltd., 45, Great Marlborough St., London, W

A New Jack.

The illustration depicts a new jack placed on the market by S. Holmes and Company, Albion Works, Manchester Road, Bradford. It has been designed with a view to securing lightness and small dimensions and yet having a good range of adjustment. It weighs 5lbs., and closed up measures 7½in. and fully extended 18in. A special advantage claimed is that the head of the jack can be at once lifted to the level of the axle and a few turns suffice to lift the wheel clear of the ground. It should prove a very useful accessory.

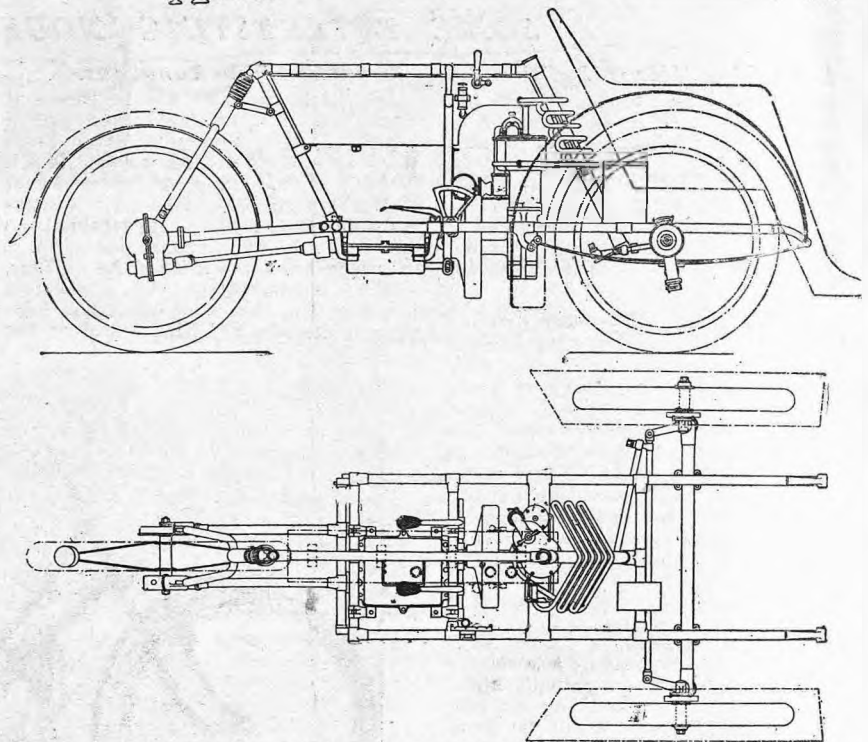


The "Holmes" Jack.

Tube Spanners for Motorcycles.

Messrs. G. T. Riches, 4, Gray's Inn Road, London, E.C., have sent us a sample of a set of tube spanners they have just introduced for motorcycles. These are made of tempered steel tubing and are supplied in sets of three. They are four inches in length and slide into one another thus making a compact set. With this type of spanner there is no danger of damaging the corners of the nut. The set is being retailed at 6s. 6d. Included in the set is a screw-driver and an awl, useful for enlarging holes.

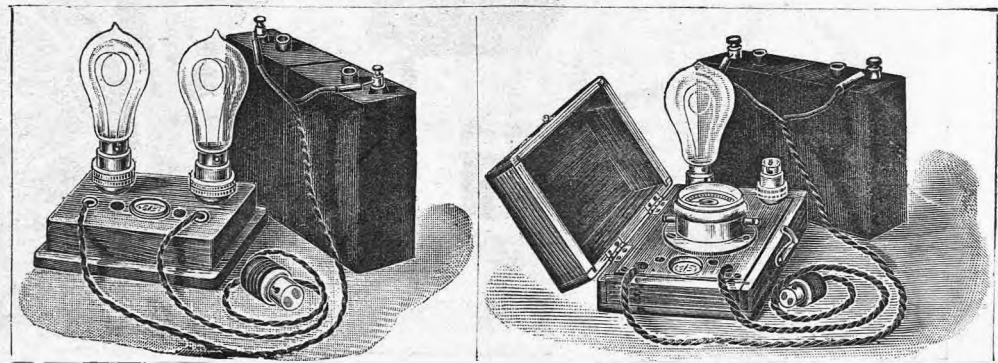
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The New Garrard Fore-Car (referred to on preceding page).

The "Everight" Charging Set.

We have received from Messrs. Everett, Edgcombe and Company, the well-known firm of electrical engineers, 151 and 152, Great Saffron Hill, Holborn Circus, London, samples of their Everight accumulator charging sets in two patterns as illustrated. One of the sets is of simple construction having two lamp holders, pole tester and adapter for connecting up to an ordinary pendant. There are permanent leads for connecting to the accumulator marked with distinctive colours to avoid the possibility of making a wrong connection. The other set is of more elaborate design. This has a nicely finished ammeter combined with it, the purpose of which is to show at a glance whether the lamps in the holders are of a suitable candle-power to give the correct current in amperes to charge any particular battery. We understand these sets are to be placed on the market at reasonable figures. They are handsomely finished in all details and should command a good sale.



The "Everight" Charging Set.

THE CRYSTAL PALACE SHOW.

Some Interesting Details Concerning the Great Motor Exhibition which opens on Friday Next.

On Friday next the Automobile Show organised under the auspices of the Society of Motor Manufacturers and Traders will open its doors at the Crystal Palace, and it will continue to be open to the public daily until Wednesday, the 24th inst. When dealing with the Show of last year we advanced the opinion that in future the Show should remain open for a fortnight instead of the paltry week which has always been the practice. We based this opinion upon the fact that the Paris Show remains open for sixteen days, whilst it was fully apparent last year that the time allowed for the Show at the Palace was insufficient. It will be seen that the advice given in this journal has been followed, and we feel sure that the exhibitors will reap an advantage therefrom.

As was to be expected, the list of exhibitors this year shows a great increase over that of either of the two previous Exhibitions held under the auspices of the Society, and it is gratifying to note that by far the greatest proportion of this increase is from the home industry. Every branch of that industry will be represented, the modest motor-bicycle showing up in comparatively small numbers because of the general agreement amongst the motorcycle trade to exhibit at the November Shows. However, motorcycles will be seen on about ten or a dozen stands. The light car also will be seen in moderate numbers, whilst the higher-powered four-seated car will no doubt carry off the honours of the Show, the other sections for heavy commercial vehicles, for agricultural implements, for marine motors, for clothing, and for the thousand and one articles which go towards the complement of a motor vehicle, being supported by the best firms in the trade.

THE MOTORCYCLE EXHIBITS

will include machines by the Rover Cycle Co., Ltd., Chase Motors, Ltd., Bat Motor Manufacturing Co., Ltd., Griffon Motors, Ltd., Jehu Motor Co., Humbers, Ltd., the Rex Motor Manufacturing Co., Ltd., J. Leonard, and others. The Rover Co. will show three motor-bicycles and two fore-carriages, with several new features. The Chase motor-cycles will have a new foot brake of unique design, and one which will be suitable for fitting to other makes of machines. They will also have a new design in the way of an air lever for the Longuemare carburetter, which gets over a difficulty in an admirable manner. The Bat Co. make a speciality of their fore-cars with air and water-cooled engines, the latter having the water circulated by pump. A fore-car with a two-speed gear and a free engine will attract attention now that this type is becoming regarded with general favour. The Bat standard and spring frame motor-cycles will be shown with one or two new

features. Griffon motorcycles will be shown by the Star Motor Co., with the Star cars. The Jehu Carrette shown by the Jehu Motor Co. will be novel in construction. With a 4 h.p. water-cooled engine automatically governed on the inlet, and driving through a free engine clutch, a two-speed gear and chain drive, it will be admitted that efficiency and convenience have been fully studied. The Carrette with a 3½ h.p. water-cooled engine, a fore-car and a motorcycle each with 3 h.p. air-cooled engines will be shown. The Binks four-cylinder two-wheel cars will be exhibited.

Three-wheeled cars of the tandem type will be shown by the Century Engineering Co., and the Eagle Engineering Co.

Messrs. Humber, Ltd., will show a complete range of their chain-driven motorcycles, including the 2 h.p. light weight machines, the 2½ h.p. with free engine clutch, and the 3½ h.p. Olympia tandems with water-cooled engine and free engine clutch. One of these machines will have a two-speed gear box, which takes the place usually occupied by the bottom bracket of the frame. The gear box is a replica in miniature of that fitted to Humber cars. Messrs. Humbers say that after two-years' experience they are satisfied that chain transmission has advantages which place it right in front of any other method yet employed.

THE LIGHT CAR EXHIBITS

include the new Vauxhall car, which will have various improvements over the 1903 model, notably a 6 b.h.p. motor instead of a 5 h.p., with increased bearing surfaces all over and changes in design which render the crank case and other parts more accessible than before. A reverse speed has been added to the gear-box, being brought into action by friction and applied by a foot pedal. Artillery wheels with larger tyres are now used, and the general finish is to be bright brass instead of nickel-plate. The framework being widened, a more roomy seat can now be fitted. The price will be £150 complete and ready for the road, with lamps, tools, etc. The Speedwell light car will appear in two forms, namely, the Speedwell and the Speedwell de Luxe. The former will be driven by a 6 h.p. De Dion engine with two speeds and reverse, and has been brought up-to-date in all respects: it should prove a popular car at a very moderate figure. In the Speedwell de Luxe the aim has been to make the car not only smart in appearance but satisfactory in every respect in the matter of running and handling. The engine is of either 6 or 9 h.p., according to customers' choice, and is a genuine De Dion. The gear-box provides three forward speeds and reverse, and when the pedal is depressed for the purpose of disengaging the clutch it automatically throttles the engine and so checks unnecessary noise. The throttle is independently operated

THE SHOW AT A GLANCE.

The Show is held under the auspices of the Society of Motor Manufacturers and Traders.

It will be open to the public from Friday, February 12th, till Wednesday 24th.

Over 240 firms representing Great Britain, United States, France, Germany, Italy, Belgium and Switzerland are exhibiting.

The exhibits comprise Motor-cycles, Light Cars, Cars de Luxe, Heavy Tractors, Motor Boats, Tyres and accessories generally.

The electric lighting will be on a larger scale than ever before attempted.

Two days, Wednesday, Feb. 17th and 24th, will be set apart as Special Days and the admission to the Palace will be 2s. 6d. On all ordinary days the price will be 1s. as usual.

Trial runs will be made in the Grounds of the Palace every day.

"THE MOTOR" will be the first automobile journal to publish a report of the Show next week. It will deal with those exhibits which particularly appeal to the man of moderate means, and its report will be novel, interesting and copiously illustrated.

MOTOR SHOW—Contd.

by the usual hand lever on the steering column. Ease of starting the engine has also been greatly increased by the adoption of a high-speed trembling coil, together with a positive contact with roller bearing, which is controlled by a neat switch inserted in side panel; half compression is also provided. The water cooling is of the latest approved system and design, having the self-contained radiator with improved honeycomb pattern tubes and fins mounted vertically in front, and circulation by centrifugal pump driven off the fly-wheel (the only car under £250 that has this). Not only is the cooler more efficient and lighter, but it has a much better appearance, and is more convenient for filling. The back axle is much strengthened and improved, and a roller is now inserted at the back of the large gear-wheel opposite the driving pinion, thus preventing any whipping or straining motion, with consequent loss of power and noise. Lubrication is efficiently provided for, having an oil reservoir on dashboard, with a three-way pump attached, enabling oil to be sent at will into either the back axle, gear-box, or motor. A light clutch of the usual cone type is fitted, operated by the left-hand pedal, the right-hand pedal actuating powerful band brake on driving shaft as well as disengaging the clutch. A long chassis and a comfortable body are provided, the two-seated cars having ample accommodation for luggage on the rear platform. Brass finish has also been adopted on the Speedweel de Luxe, and the general fittings and the finish of the wood and metal work will be of a quality usually only seen on expensive cars.

The De Dion light cars to be shown are the 6 h.p. voitures, which will be practically identical with last year's model, and the new 8 h.p. cars, with three forward speeds and reverse. Messrs. Alldays and Onions will show their Traveller voitures; Douglas Cox will probably show the new Emerald light car; J. J. Leonard will have on exhibition the new Leonard light car which we briefly referred to in a recent issue; whilst Messrs. Humbers, Ltd., will have two very interesting exhibits in the new 6 h.p. Humberette and the 8½ h.p. light car. The former we have already described; the latter is a four-seated car weighing 11 cwt., driven by a two-cylindered engine through a gear-box giving three speeds and a reverse, and thence by a propeller shaft to the differential on the rear live axle. The latter is exceptionally strong, and has very wide bearings, whilst ring lubrication has been adopted. The car bears every evidence of having been most carefully and thoughtfully designed, and those interested will notice many novel and useful features about the cars staged. For instance, the steering wheel has but a single arm; the control is of the simplest description and yet is absolutely complete; the pump is positively driven, and the utmost accessibility has been provided for. The car will sell at 250 guineas, and we feel sure that Messrs. Humbers will not need to seek a market for it at this price. The Mobile Motor Co. will show their moderate-priced Mobiles; the Motor Manufacturing Co. will show the 8 h.p. M.M.C., with various designs of body, and we are certain that the chassis which will be shown will attract attention for its perfection of workmanship and finish. The Pick light cars will be exhibited by the Pick Motor Co. These have horizontal two-cylindered engines placed forward under the bonnet, and possess many novel features. Attention should particularly be paid to the control on the air induction and to the brakes on the rear wheels. The new Siddeley, the new Wolseley, the Swift, the Little Star, and others which have received full attention in our columns from time to time will all be shown, and their latest improvements and modifications will be deserving of the fullest inspection and the most careful study of the man of moderate means.

OTHER EXHIBITS.

Amongst the more luxurious cars there will be many which will be new to the English market. For instance, the

Martini car, one of the earliest of which was driven up Rochers de Naye last October by Capt. Deasy; the Hutton car, with the new Barber variable speed gear; the Crossley car, made by the famous gas engine makers; the Spyker cars, driven on all four wheels by a six-cylinder engine (these will be shown by the Elsworth Automobile Co.); the Minerva cars, with their three-cylindered motors and their moderate prices; the Windora cars, shown by Stephen A. Marples; the Lea and Francis, a beautifully designed car with a three-cylinder horizontal engine, planned and made entirely in Coventry; the Rykneild, an up-to-date car made at Burton-on-Trent and others.

THE NEWEST TYPES OF WELL-KNOWN CARS

will also be on show, and in this respect it is worth noting that many makers are now refraining from showing their latest patterns at the Paris Show, because the opportunity is thereby given to their competitors to copy or imitate any suitable feature for the ensuing season's trade. The English shows, however, come very much closer to the actual start of the season, and so there is not the same danger, and thus it comes about that the real novelties of the season are only making their first bid for notoriety at the Crystal Palace and the Agricultural Hall. It is probable that the new Mercedes cars will be shown with the new season's features, and the prominence attained by this car recently will result in a large amount of interest being centred in the specimens to be displayed. The new Panhard cars, with their clean and simple machinery, will be well worth a careful study, as will the new Talbot cars, made by Adolphe Clement and shown by H. E. Hall and Co., of Tonbridge. The new water-cooled Lanchester cars are deserving of the closest attention, as are also the James and Browne cars, and the Wolseley cars, all of which are typical of British motor engineering. The new Ariels will be found to be on somewhat big lines, the 15 h.p. car being the smallest now made by the company; they are rich in new features.


THE M.M.C. CARS

will appear in the chassis form and with various types of body; the magnificent saloon car will attract as much attention here as it did in Paris. The large Humber cars are made in two powers, 25 h.p. and 14 h.p., and for excellence of work and finish they should be unbeaten. The new Duryea cars are now being built in this country, and they have been very slightly modified and improved; they will be admitted to be exceptionally fine specimens of engineering.

To attempt to give more than a suggestion of the exhibits would entail a lengthy task and would, for some, spoil the charm of novelty hunting; so dear to the motor lover.



If the numbers on cars go up in proportion to the number of cars put on the road, Robert will have to improve his memory.



The Motor
INCORPORATING **Motor Cycling** & **Motoring**

The sale of "The Motor" exceeds that of any FOUR motor papers combined.

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OPINION.

Progress of "The Motor."

To-day "THE MOTOR" completes the second year of its existence. At this time last year we expressed the hope that when the history of another year came to be written, we should be able to record prosperity for the industry and continued progress for ourselves. As to the realisation of our aspirations, we leave this issue of "THE MOTOR" to speak for itself. Last year we stated that our circulation was over 25,000. This year it is nearly 40,000. If we wrote on to the end of the column we could say nothing that could more distinctly emphasise the fact that we have continued to progress as we hoped to do. Before passing on to the topics of the day, however, we must express thanks to our readers for their support.

First Blood to the Motor Union.

It is interesting to note that the Motor Union has been successful in its first case under the new Act, and it must be regarded as significant that the first victory gained was in the hitherto prejudiced county of Surrey. The case was fully reported in "THE MOTOR" last week, and we need not reiterate the details here. The evidence was enlightening. It proved to be a complete exposure of the peculiar timing methods adopted by the police, and it was sufficiently conclusive of the utter unreliability of those methods to prompt the dismissal of the charge concerning the automobilist against whom it had been brought. It is as well that it should be known thus early that a stop-watch of no quality whatever in the hands of a police officer of no ability or experience as a timekeeper is not sufficiently reliable in evidence against motorists under the new Act. The system of "trapping" was in this instance shown to be not only the despicable thing that we have always regarded it, but it was proved to be quite an impossible and unjust method of ascertaining the speed of a motorist for the purposes of a police prosecution. The evidence of the official timekeeper to the Automobile Club in regard to the watch used by the police evidently impressed the magistrates, and we notice it has been stated that, as a result, the authorities have decided to supply the Surrey police with better watches for future use. We can only regret that the ratepayers' money should not be put to better use. The Motor Union is to be congratulated upon this first victory and its hand should be strengthened by every motorist in the land to continue a campaign so auspiciously commenced. The moral effect of a first victory is great, and especially should it be so in this case, because the success has been achieved in what most of us had come to regard as the stronghold of prejudice.

Sandy Beaches for Motor Tracks.

In view of the difficulty of obtaining road or park courses of a sufficient length for motor speed trials, it would be worth while to explore the British coast in search of suitable stretches of sand such as that at Daytona Beach, on the east coast of Florida, where the American Automobile Association held its championships and speed trials at the end of last month. This beach stretches for some thirty miles in a dead level, giving a width of from fifty to a hundred yards of firm, non-slipping surface. It has been very favourably spoken of by those American and French motorists who competed in the events referred to. The beach abounds in the shells of a small variety of cockle, which, as they dissolve under atmospheric influence, form a kind of slimy cement, which binds the sand into a firm surface. Sand, under ordinary conditions, would, of course, afford only an indifferent surface for a motor vehicle. When dry and powdery it would be too "shifty," whilst when wet and heavy it would militate against speed, or perhaps refuse altogether to support the weight of a large car. But there may be many stretches of good firm sand or sandy beach on the coast-lines of Great Britain and Ireland which would form ideal motor tracks. The golfer—who is frequently also a motorist—would be the best man to apply to for further information.

No Need for Panic.

Those who have the future of the motorcycle trade at heart will regret to see it embark upon any attempt to increase output by selling machines at prices which, on the face of them, are far from profitable. The trade is too young to withstand such tactics, the market is yet too limited, and with strides being ceaselessly made towards improvement and ultimate perfection there can be no hope for some years of the motorcycle becoming as standardised as, for instance, is the present-day bicycle. In these circumstances it is obvious that the price to be asked for a motor-bicycle must be a fair one, calculated upon strictly commercial lines to yield a fair and reasonable margin of profit, and we do contend that the average user of a motorcycle is content to pay that fair price and does not ask the trade to work for him at unremunerative prices. We honestly believe that the day of the cheap motor-bicycle has not yet arrived, and we doubt whether we shall see it for some time to come. Neither has the day arrived when the average motorcyclist will be able to flatter himself that he can, with his own senses and his accumulated experience, pick out the wheat from the chaff, and therefore reputation for skill, quality and excellence of workmanship and material will continue for many years to be demanded of the manufacturer. At the same time the rider will be better satisfied to pay a reasonable price—one which will leave the proper margin of profit to the maker—in return for the confidence which he would feel in the machine and in the desire of the maker to rectify any fault for his own credit's sake. This being so, we feel sure that the better portion of the trade would rather base its business policy upon sound commercial lines, seeking for the good of the trade, than rush in panic-wise to secure business in thoughtless competition and with a total disregard for the ruinous consequences that must inevitably follow upon such a course.

THE NEXT ISSUE OF "THE MOTOR."

Next week's issue of "THE MOTOR" will be a very special one. The paper will be enlarged to allow of a mass of interesting articles and illustrations. "THE MOTOR" will be the first motor journal out with a full report of the Show, from the point of view of the man of moderate means. The descriptive matter will be interestingly written and copiously illustrated. All new things will be described and depicted.

ONE PENNY, as usual!

NEWS.

SUMMARY.—Our News Section this week contains many interesting items and illustrations, notably a photograph of their Majesties the King and Queen of Italy (p. 15); report of the Berkshire A.C.'s inaugural dinner (p. 16); photograph and description of new motor mail van in use in Warwickshire (p. 18); description and diagram illustrating a proposed extraordinary somersault through space on a motorcar (p. 19); description and photographs of the Liverpool Show (pp. 20 and 21); description and photographs of a motorcycle race from Milan to Nice and back. Interesting motor novelties are described and illustrated on pages 9 and 10, and a summarised forecast of the Crystal Palace Show will be found on pages 11 and 12.

"THE MOTOR" will be the first paper published next week with an illustrated report of the Palace Show.

We have again to express our regret that many pages of most interesting illustrated correspondence are crowded out.

The Motor Union is to be congratulated on having won its first case under the new Act in the erstwhile prejudiced County of Surrey.

The New York Motor Show at Madison Garden Square is generally reported in the American motor Press as a great success. We comment on it elsewhere.

Mr. Rudyard Kipling is the latest poet to deal poetically with the motorcar. He is contributing a series of poems having motoring for their theme to the "Daily Mail."

The Centaur Cycle Co., Ltd., have experienced such a rush of business for their motor-bicycles that they were reluctantly compelled to give up the idea of exhibiting at the Crystal Palace Show.

The Manchester and District Cycle and Motor Trade Association are this year organising two Shows at the St. James' Hall, Manchester. The cycle and motorcycle exhibition closed on Saturday last and was a great success. The motor Show opens in the same hall on March 7th, and so great has been the demand for space that already the available accommodation has been applied for eight times over.

The recently formed general committee of the Motor Union is doing good work: it meets every month and discusses a very substantial agenda.

Dufaux Bros., who have entered a Dufaux car to represent Switzerland in the Gordon-Bennett, have almost completed the special car designed for this event.

It is now stated that Mr. Charles Jarrott has decided to drive a Wolsley car in the Gordon-Bennett preliminary trials. With apparently more than one country and many makes of cars to choose from we should have thought that he could have fixed up earlier than this.

A driver of a wagon who refused to move to one side at the request of a driver of a motorcar is to be prosecuted by the Motor Union for obstruction and it has been decided to follow up all cases of negligent or wilful obstruction of the highway by drivers of horse-drawn vehicles.

The old question of universal lights is to be opened up again by the Motor Union. Now that, at the instance of the cycling associations, most counties have enacted by-laws compelling all vehicles to show lights at night time it might be possible that, with the greater influences in Parliament possessed by motorists, the Government could be induced to introduce a short Bill. The whole of the ground has been gone over so thoroughly that everything contentious or impracticable can be readily avoided.

Don't miss "THE MOTOR" next Tuesday morning. First out with its Show report.

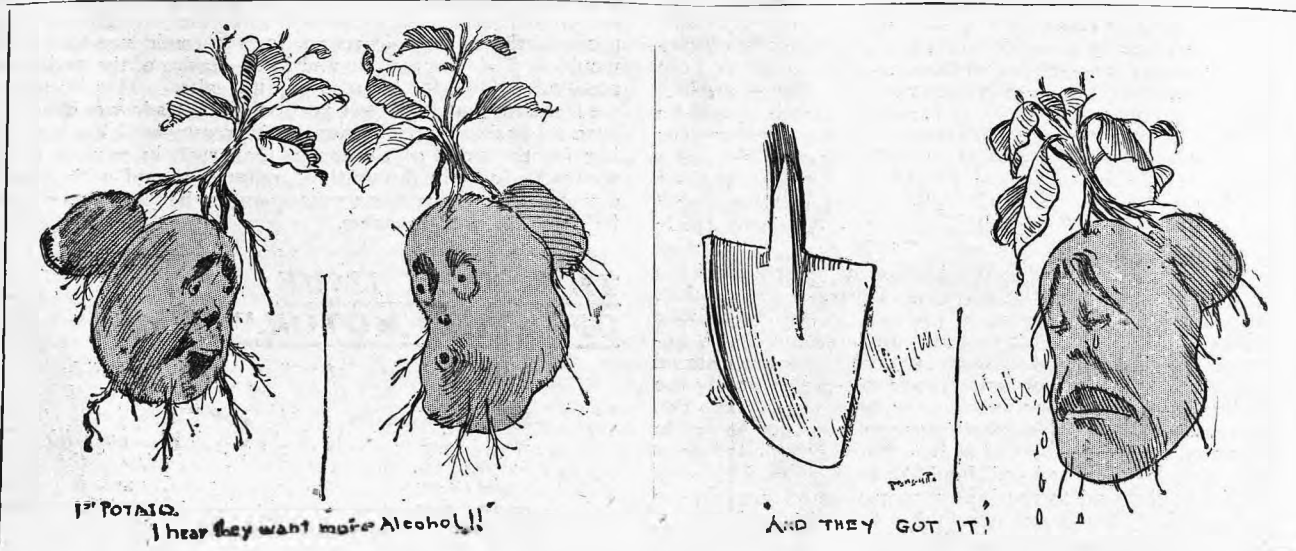
The Blackpool authorities have given notice of their intention to apply for the ten-mile limit in the town.

Messrs. Singer and Company, Coventry, will be pleased to send any reader a list of secondhand and shop-soiled machines of their make. These are being offered at prices from £30 upwards.

The London agents for the motor spirit made by Messrs Whittaker, of Manchester, are Messrs. Millar and Company, 19, Hanover Square, W. They can supply any quantity of .680, .700 or .710 sp. gr. in two-gallon tins.

The Turin Exhibition opened on Saturday last, February 6th. All the principal Italian cars and motorcycles are represented, and some well-known French firms, notably De Dietrich, Mors and Serpollet. The Bowden Brake Co. has a stand.

February is a busy month in the motor world. No less than seven important Shows in various parts of the world have been or will have been held before the close of the month. The big Shows at New York and Brussels are just over. The Turin Show is in full swing, as is also one at Rome. Across the herring pond an automobile exhibition is going on at Chicago. On Friday next, the 12th inst., Amsterdam follows the example of Brussels, and the Crystal Palace Show opens on the same date.



The "Daily News" recently gave to the world the startling information that petrol could be obtained from potatoes. Of course, alcohol was meant.

NEWS—Contd.

Good News!

Some of the dailies last week came out with the news that it had been decided to supply the Surrey and Metropolitan Police with better watches, so that the Marks fiasco should not happen again. This is cheerful news for the ratepayers of the County of Surrey. They, doubtless, are only too glad the police will have good timekeeping instruments.

Motorcar Justice.

Much has been written on the justice and, indeed, on the alleged lack of justice meted out to owners of motorcars, motorcycles, etc. In "Cycling" for this week there appears an illustrated interview with his Honour Judge Arthur Becher Ellicott, M.A., J.P. "I have recently taken lessons on two different makes of cars—a De Dion and a Decauville—in order to be the better prepared to give a decision on the various cases when they are brought before me." So says his Honour. We cannot help commending, and heartily, too, the honest attempt made by the gentleman in question to *personally* get at the root of matter so to speak.

The Recent Automobile Show in New York.

The New York Automobile Show which opened on January 16th and closed on January 23rd was the most successful exhibition of motorcars held hitherto in America. The main floors, balconies, restaurant and basement in the large Madison Square Garden building were crowded out with exhibits, and an average daily attendance of 10,000 of the public (making a total for the week of 70,000) testified to the general interest taken in automobilism. The motorcycle was not represented, the exhibits being mainly composed of touring cars, runabouts and commercial vehicles. In touring cars the tendency is towards larger and heavier vehicles, more attention being devoted than in the past to comfort and protection from the weather. The number of 24 h.p. engines, and the increase of four-cylinder motors, were most marked. The two-cycle engine was almost conspicuous by its absence. As regards transmission, the sliding gear was most in evidence; and the two most popular forms of frame were the pressed steel and the plate steel and angle irons. Longer wheel base, heavier tyres and improved springs, were noticeable features. Runabouts were in heavy demand; those exhibited could have been sold many times over, and orders for this type of car came in thick and fast. The total number of stands was 185, of which all but 13 exhibited vehicles of American make: the foreign cars were chiefly French and German. One hundred and ten American cars were actually sold, and the dealers estimated orders resulting from the Show would mount up to twelve thousand, representing a money value of between fourteen and fifteen million dollars. Of the 258 complete vehicles exhibited 185 were petrol cars: water-cooled motors predominated over the air-cooled type to the number of 156 against 29. The general impression created by the Show was that American manufacturers are inclined to follow the French and to produce a fast heavy car.

Colours for the Gordon-Bennett.

Of the eight competing nations, five have already chosen their colours for the big event next June. The four teams which competed in Ireland last July will keep to the same distinctive colours, viz., America, red; France, blue; Germany, white; Great Britain, green. The Italian cars will be painted black, whilst Austria, Belgium and Switzerland have not yet made their choice.

Tax in Germany.

The City Fathers of Frankfort-on-the-Main have resolved by a large majority to tax or, rather, to propose a tax—since the power to impose taxes does not lie wholly with the town council—on motors de luxe at the rate of £10 apiece yearly. There are some 80 such motors in the possession of Frankforters, so that the tax would bring in £800 a year to the municipal coffers. So far as we are aware, motorcars have not yet been taxed in Germany.

Birmingham Motorcycle Club.

At the invitation of the captain, Mr E. H. Humphries, the members of the above club to the number of about 40 attended an "At Home" on the 29th ult., held in the club room at headquarters, The Crown Hotel, Corporation Street, at 7.30 p.m., when a most enjoyable evening was spent. The following members were amongst those present:—Messrs. W. W. Champness and L. C. Davis (vice-captains), J. R. Bedford (hon. sec. and treasurer), G. Dennison, R. W. Hartley, D. McLagan, W. Hutt, A. E. Wilby, A. Fazey, C. G. Garrard, H. P. Barker, G. F. Heath, R. Gould, A. P. Maxfield, R. Tingey, R. W. Duke, D. G. Sangster, — Carpenter, M. Bernstein, V. W. Heeley and following friends: Messrs. Gadsby, Olly Oakley, Frank Costello, James Watson, etc. The captain, at the commencement of the proceedings, called upon the honorary secretary to read letters from

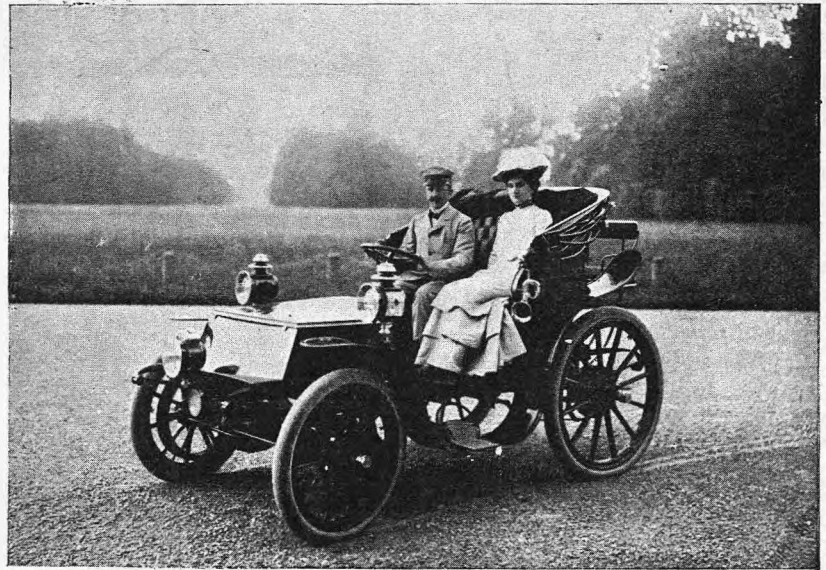


Photo by]

The King and Queen of Italy in their Motorcar.

Guignot & Bossi.

The "Referee" on Motor Vehicles.

The writer of "Sporting Notions" in a recent issue of the "Referee" dealt at some length with the motor vehicle as a road user. After pointing out that the pedestrian of to-day has a very much more complex problem to deal with in crossing the road than he had before the cycling and motoring eras, the "Referee's" "horsey" man goes on to deprecate the glaring headlights used by some motorists and points out that what should be a protection often creates "a most painful and dangerous embarrassment." Concluding with the dust problem, he questions the view held in some quarters that the motorcar destroys the road, giving it as his opinion that—like the bicycle—it tends to reduce the road surface to a billiard table smoothness. "If," he says, "the automobiles are not metal grinders, how shall we be placed if they (the motorists) take first run and lodge protests against councils, boards, surveyors, and the rest concerned for letting the plague be there, latent, a more or less potent danger to comfort all round?"

members regretting their inability to attend, and in the course of a short address he (the captain) mentioned that the approximate value of the machines owned by members of the club amounted to over £2,000, and that prizes to the value of upwards of £30 were already offered for the coming season in competitions. He also mentioned that he hoped that all members would strictly adhere to the Local Government Board's regulations in order not to bring the club into disrepute. The honorary secretary, in a humorous speech, gave a brief outline of the history of the club, and mentioned that it was proposed to hold two or three runs each month during the coming season, also occasional smoking concerts and week-end runs, and that the annual dinner will be held shortly. Several new members were enrolled during the evening. The committee has decided that the subscription be reduced from one guinea to half a guinea, and the entrance fee from 10s. 6d. to 5s., which will now include silver badge and book of rules. The address of the secretary, Mr. J. R. Bedford, is "Ashmount," Hillaries Road, Gravelly Hill, Birmingham.

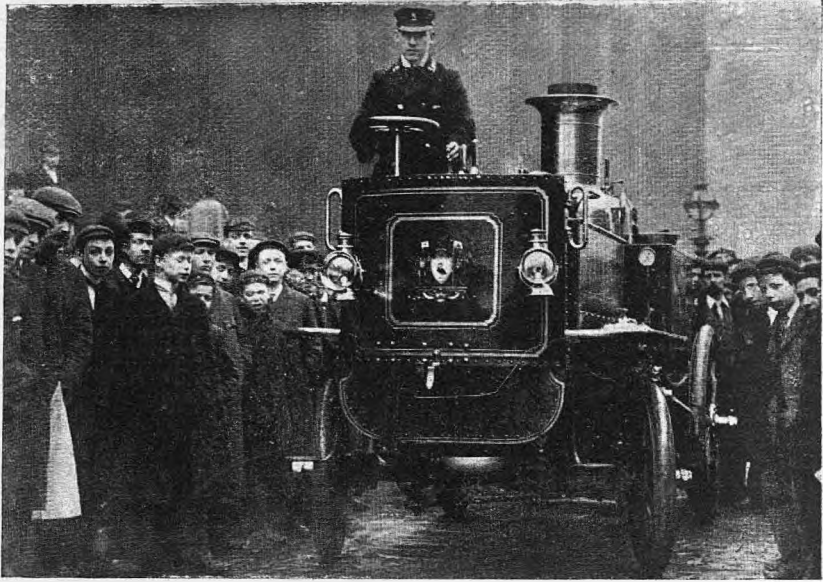
NEWS—Contd.

The Berkshire Automobile Club.

There can be no doubt that automobilism all over the country is making important developments, and judging from the success already achieved by the above club Berkshire is likely to prove itself no mean leader as regards position. The inaugural dinner took place at the Great Western Hotel, on Friday last, when upwards of 40 members and guests were present, and a most pleasant evening was spent. The chair was occupied by Sir Gilbert A. Clayton-East, Bart. (chairman of the Berks A.C.), who was faced by Mr. E. Shrapnell-Smith (hon. treas.), and there were also present Lieut.-Col. W. Waring (honorary secretary), Hon. Eric Rolls, Major Poulton (Chief Constable of Berks), Mr. W. Rees-Jeffreys (secretary, Motor Union), Mr. Ernest Gardner, M.P., Mr. Roger W. Wallace, K.C. (chairman, A.C.G.B.I.), Mr. E. B. Portal, Mr. Julian Orde (general secretary, A.C.G.B.I.), Mr. J. F. Ochs, Hon. Caryl-Baring, Sir Arch. J. Macdonald, M.P., Mr. T. Staplee-Firth, Dr. Langmore, Mr. J. Scott-Smith, Mr. A. C. Arnold, Dr. Hawes, Mr. J. M. Napier, Mr. B. Hughes, Mr. C. B. De la Salle and Dr. Norman Joy, whilst the Automobile Press was fully represented. The toast list included "The King," by the chairman; "Automobilism: The Sport, Pastime and Industry," proposed by Mr. T. W. Staplee-Firth and ably responded to by Mr. Roger Wallace and Mr. Rees-Jeffreys, who eulogised the work of the honorary secretary. "The Berkshire Automobile Club" was proposed by Mr. Julian Orde and replied to by the chairman; "Our Guests," proposed by Mr. Portal was responded to by Mr. Ernest Gardner, M.P., who admitted that he had not enjoyed much motoring, and Major A. F. Poulton, who said he tried at all times to carry out his duties in as fair a way as possible to all classes who used the roads, and to the people of the country who must have consideration.

HE DID NOT COUNTENANCE POLICE TRAPS at all, but it was perfectly fair that the law must be carried out, and they only wanted to do what was right. He heartily wished the club every success. "The Press," given by Mr. Ochs, was replied to by Mr. Chas. Cordingly, who fully explained the somewhat personal relations between the "parent" club and the Press, and also by Mr. H. J. Swindley. "The Chairman," proposed by Dr. J. H. Walters was responded to by Mr. Portal, Sir Gilbert-East having previously left. The club is to be congratulated upon having so enthusiastic a chairman, who, it was stated, is a motorist and a magistrate. He said he would like to see a gymkhana held at his grounds, with trials especially in intricate driving. The club has had an extremely satisfactory beginning, its membership already reaching 66. The toast, "The Hon. Secretary," given by Mr. Carew-Gibson, was drunk with musical honours, and it was, he said, as he understood it, entirely due to the gallant colonel that the great success of the club had been achieved. Col. Waring briefly replied, stating that he should do all he could for the club in its future work.

E.S.



The Liverpool Fire Brigade's Motor Fire Engine, which was on view in front of St. George's Hall during the Show. It was built by Merryweathers, and is capable of pumping 500 gallons of water per minute. The motor is of 50 h.p., and capable of travelling at 30 miles per hour.

The Æolus Self-sealing Tyre.

An error crept into the description of the Æolus self-sealing tyre which we gave in our issue of January 27th. The tyre was described as a "single tube"; but it is intended to be used with an outer cover in the ordinary way, being simply a thick self-closing air tube. In inflating the tyre by means of the hollow needle described, the outer cover need not be removed, as the needle may be pushed through both cover and air tube: whilst, if the piercing of the cover is considered objectionable, the needle may be introduced to the inner tube by a small pin hole in the rim.

Suggested All-day Runs for Motorcycles.

The Auto-Cycle Club has circularised the trade in order to ascertain opinions upon the proposal for a series of occasional all-day runs conducted somewhat upon the lines of the Automobile Club's non-stop runs. The trade are being asked whether they are in favour of such trials and whether they would support them if held, and they are also being asked their opinion upon the form of the trial—whether it should be a non-stop run or, in order to meet the difficulty of observation on a non-stop run, it should be a run between two well-known towns within a specified time. The *raison d'être* of the Automobile Club's quarterly trials has no application to the motorcycle trade because there is no use or need in having an official test of a single machine, but there can be not the slightest doubt but that a series of well-supported all-day runs, carried out by the leading motorcycling organisation would create a very favourable impression on the public, affording a continual demonstration of the reliability and efficiency of the motorcycle. In fact, extending as it could do throughout the season the proposal might do infinitely more good than is done by the annual reliability trials, the interest of which only lasts for a few weeks.

A Popularising Effort.

Mr. Esdale who uses the *nom de theatre* "Cargill Gentry," has prepared a lecture to be illustrated by cinematograph pictures and lantern slides, showing the many uses for the motor vehicle, the various types from the motorcycle up to the heavy lorry and illustrating the ease and perfection with which the latest form of locomotive force may be controlled. He read his lecture before the members of the Automobile Club on Thursday last, giving it the mysterious title "Why Motor Cars?" and in the subsequent discussion many suggestions were put forward in order to increase the utility and interest of the lecture. Mr. Esdale said that he had already anticipated some of these but had not been able to get the photographs in time for the lecture; the others would be adopted and he would willingly adopt a suggestion made by the chairman to submit the completed lecture to the club committee for final revision.

On Licences for Motorcyclists.

It has come to our notice that some of the local authorities, on being applied to for licences by motorcyclists are issuing to them the "limited" licence, and declining, in spite of protests, to change them for the ordinary licence. This is an altogether irregular proceeding, as the only disability under the Act is the age of the applicant, who should be under 17 can only be granted the licence limited to driving a motorcycle. No motorist whose years are seventeen or over should apply for or accept a limited licence because whilst there is not the slightest advantage there is the great disadvantage that the holder may not drive a quad or a car or even a three-wheeled vehicle which weighs over three hundredweight. In the event of a local authority, through imperfect knowledge of the law, persisting in the course mentioned above, the motorist should put the facts at once before the Auto-Cycle Club.

NEWS—Contd.

The opening run of the Motor Cycling Club is to take place on Saturday, March 13th. On account of its memorable associations, Brighton has again been selected as the venue and the club will leave Purley at 3.30 p.m. for the Old Ship Hotel.

Count Recopé's cup for paraffin launches is a very artistic affair, and represents a nymph or a goddess rising from a sea shell. The cup will be open to all nations, and must be raced for over a course of 22 knots. The first competition will be on August 13th next, from Calais to Dover.

A Deserving Case.

Mr. A. Goodwin, of the Ormonde Motor Company, 79, Wells Street, Oxford Street, W., is getting up a subscription for Mrs. Adams, widow of the late James Adams. It will be remembered that Mr. Adams was killed whilst riding an Ormonde motor-bicycle on the Canning Town track last season, and Mr. Goodwin has heard that Mrs. Adams and her young child are in straitened circumstances owing to the sudden calamity which made her a widow. The case is a very deserving one, and Mr. Goodwin will be glad of the smallest contributions to the fund from motorists. All donations should be sent direct to the address given above.

Although not particularly interested, the Motor Cycling Club has decided to send two delegates, Messrs. Perman and Jackson, to the meeting of clubs called by the A.C.G.B.I. on Monday next, in connection with the affiliation scheme.

The Trials: a Hitch.

The feeling throughout motoring circles in connection with the eliminating trials for the British cars entered for the Gordon-Bennett race has been in favour of a long run which would be a more serious test of the cars than were the mile rushes at Welbeck and on Dashwood Hill last year. Hence the proposal that the Automobile Club should endeavour to arrange for the testing of the cars over the Ardennes trial course was favourably regarded and an attempt has been made to arrange matters with the Belgian authorities. However, the scheme is seriously imperilled by the decision of the Belgian Automobile Club to demand a fee of £250 per car, for with 14 competing cars the fee alone would amount to £3,500, whilst in addition there would be the enormous expenses of transport to and from Belgium, as well as the cost of preparing and driving the cars with their army of attendants, engineers, etc., whilst a number of officials would have to be sent over. The additional import will, therefore, be prohibitive and the Automobile Club is now faced with the problem of selecting its three representative cars for Great Britain in the forthcoming event. It is useless to even dream of obtaining a course over public roads anywhere in these

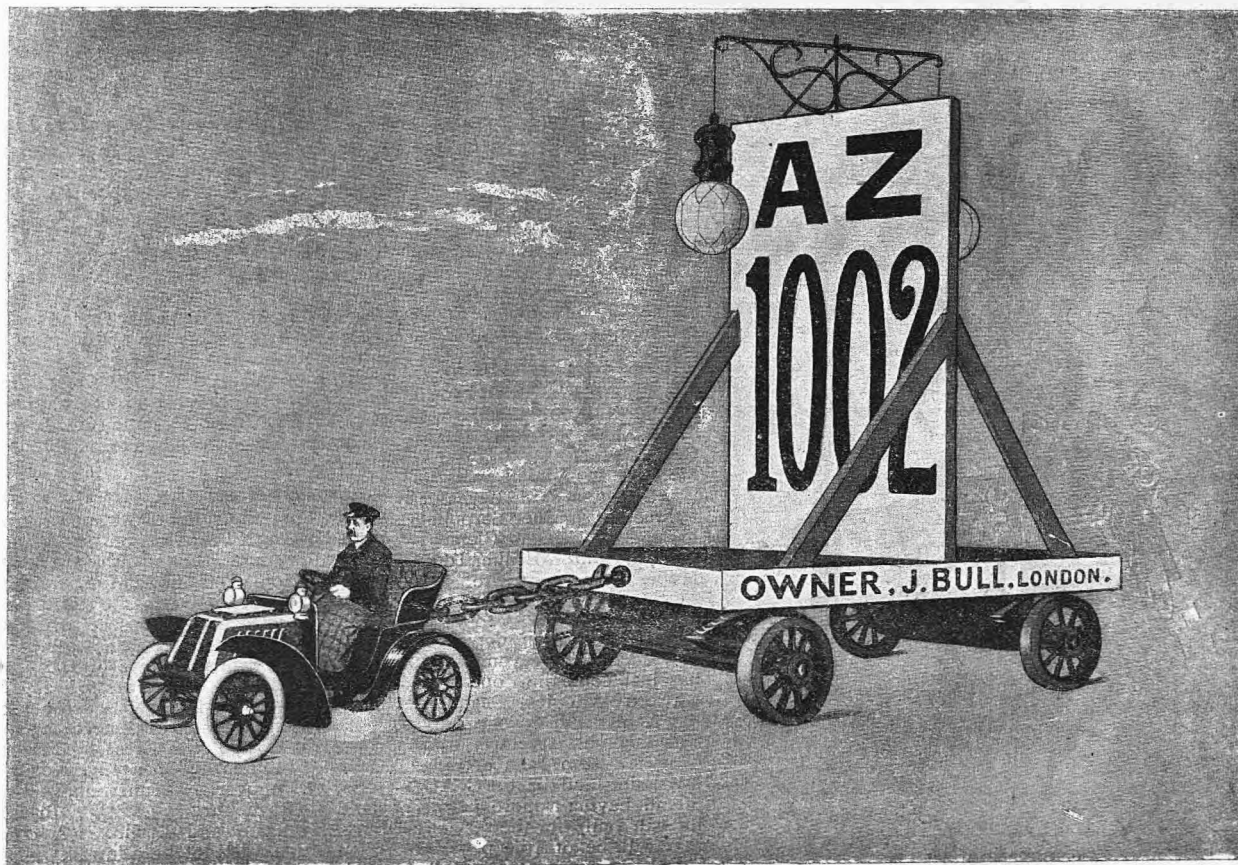
islands, because of the time that would necessarily have to be spent in the negotiations, and in all probability the effort would be a wasted one. Failing the possibility of a genuine road trial, perhaps the next best proposal is for an examination by a specially appointed committee of experts qualified to select the most suitable vehicles to form the team.

Prices at Frankfort: a Denial.

A member of the Frankfort Hotel-Keepers' (Gastwirte) Union writes to the "Frankfurter Zeitung" to say that he knows nothing of an arrangement between the Union and the Gordon-Bennett Apartments Committee for fixing the price of a single-bedded room at 15s. a day and that of a double-bedded one at twice this amount. Some hotel keepers may have agreed to such a tariff, but not the Union as a body.

Capital to Capital.

What we think will prove to be one of the most interesting and popular events of this year is the all-day run from London to Edinburgh which the Motor Cycling Club has now definitely decided to organise for its members. It is to be from General Post Office to General Post Office, starting at midnight on the Friday before Whitsun. The route of some 400 miles will be scheduled and the pace will at no time exceed 20 miles per hour. Those riders who accomplish the journey according to the time table will receive suitable mementoes of this probably historic event.

**A PRACTICAL LIMIT TO SPEED.**

The above suggestion is offered free of charge to the authorities. The weight of the trailing trolley bearing an adequately lighted number would serve the double purpose of preventing furious driving.

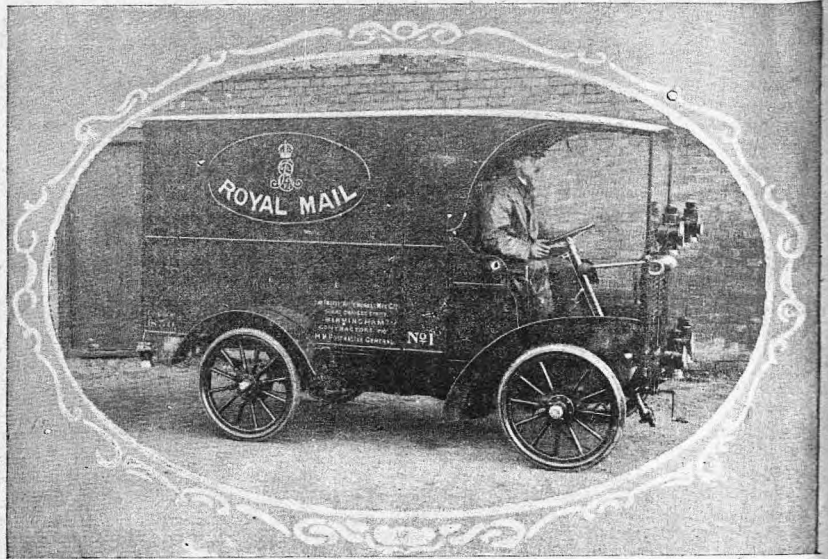
NEWS—Contd.

A Motor Drivers' Union.

To the numerous trades' unions already existing in Berlin the development of the motor industry has added yet another, a Motor Drivers' Union. It will comprehend motor van and cab drivers—all, in short, who earn their living by driving automobiles. A committee of five has been formed to agitate on behalf of the new-born organisation.

Madame Du Gast and the Gordon-Bennett Race.

Commenting on the intelligence respecting the participation of Madame du Gast in the German eliminatory races, the official "Allgemeine Automobil-Zeitung" thus expresses itself:—"In a contest with numerous starters a lady or two may pass. But Madame du Gast in the German eliminatory contest for the greatest race of the year—Madame du Gast emerging triumphant from that contest, and, finally, Madame du Gast winning for Germany the Gordon-Bennett race—no, that we cannot imagine, and for the simple reason that in the regulations for the Gordon-Bennett race there is no mention whatever of lady drivers. But what we can indeed imagine is the clamour in the motorphobic Press if Madame du Gast should meet with an accident. As it is, one has great difficulty in making the general public understand that it is nobody's business if a racing man risks his skin and the skin gets damaged—how much more difficult may it then be to declare an accident to a lady in the race as a consequence of 'tu l'as voulu!' We



A Motor Mail Van, which is now being used regularly in Warwickshire.

will avoid touching upon the chapter of 'Equal Rights for Women,' but we must candidly confess that the news about Madame du Gast's starting in the German eliminatory contest is not agreeable to us, and we will hope that the report may prove to be without foundation or that, if true, it may not become true. To ladies at the wheel of the touring car—all respect; to ladies at the wheel of the racing car—we say, 'Hands off!'

Messrs. James and Brown, of Hammer-smith, inform us that they are opening New West End premises at 395 and 397, Oxford Street (close to the Bond Street Tube Railway Station) as showrooms. These will be fitted up with a large lift, for taking cars to and from the basement, and every other modern garage convenience, and should be found very convenient by West-end motorists.

Vienna Exhibition.

Amongst the well known Continental firms who will exhibit cars or launches at the forthcoming Alcohol Exhibition in Vienna will be found Panhard et Levassor, Darracq, Gardner-Serpollet, Mors, De Dietrich, Clement-Bayard, Gobron-Brillie, Tony-Huber and Longuemare.

A Motor Post Van.

The illustration depicts a new motor mail van which has just come into operation between Warwick, Leamington, Kenilworth, Coventry, and Birmingham. It starts from Warwick at 9 each evening. We understand that the G.P.O. intend having a more powerful van built for the service; this will be of 16 h.p. The present one is scarcely powerful enough for the work. The driver of the van illustrated is a well-known racing cyclist.

The New Manual.

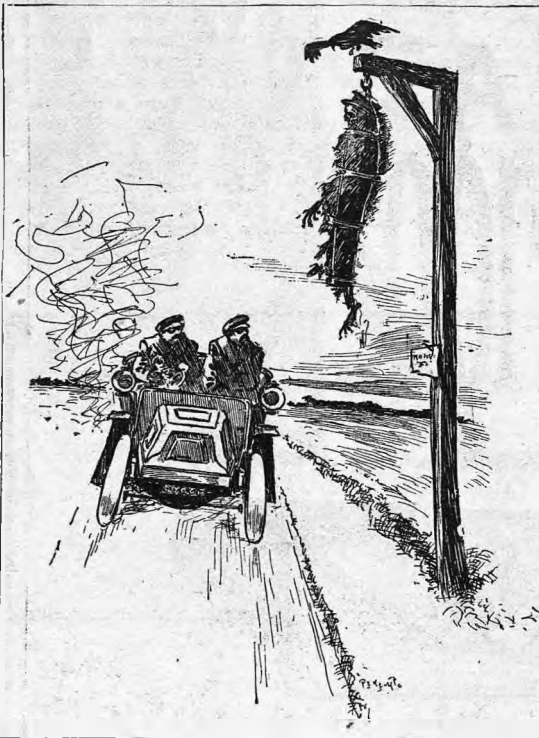
A special feature of the 1904 "Manual" will be the large number of specially prepared illustrations, totalling upwards of 100, each one being lucidly described in detail. This will prove very valuable, for instance, in solving the little worrying troubles that arise now and again with carburettors and electric ignition including the magneto system. The interiors of several engines are shown. The new edition will be ready in the course of the week.

Transparent Cylinders!

In describing the new French express passenger locomotive which made its trial trip on the G.W.R. the other day the reporter of one of the London dailies launches forth as follows:—"There it stood, admired by a great crowd, its huge boiler polished black and contrasting strongly with the glistening steel rims of the wheels, the polished rods and *shining piston*." Presumably the cylinders of this new engine are made of glass. We are making enquiries. If so, we confidently anticipate that the idea will be applied to petrol engines for cycles and cars. It would be an immense advantage to be able to see the piston!

Frankfort on the Main Berlin.

Touching the reliability run for motorcycles between Frankfort-on-the-Main and Berlin on June 4th and 5th, the participants are to be classified in four groups:—(1) Members of the German Cyclists' Association (Bund) with cycles of 2 h.p.; (2) Members with machines of 2-4 h.p.; (3) Unattached with machines of 2 h.p.; (4) Unattached with machines of 2-4 h.p. The start—which is in no sense a race—will take place in Frankfort, and the course is to go via Giessen, Marburg, Cassel, Minden, Göttingen, Northeim, Elze, Hanover, Brunswick, Helmstedt, Magdeburg, Burg, Brandenburg, Potsdam and Berlin. A change of machine will not be allowed. A gold medal and two silver medals will be given by the Bund to the three best drivers and manufacturers. There are good prospects of the run being a brilliant success.

**"SUSPENDED!"**

Rural Councillor writes: "Highwaymen of former times were hung in chains. Pity 'tis some of the modern highwaymen motorists can't be caught and suspended over the scene of their exploits as a warning to others."

NEWS—Contd.

"The Motor" brings Orders.

The inventor of the Brittain Duplex pulley writes to tell us that he can testify to the world-wide circulation of "THE MOTOR." As the result of his advertisement he has received orders from the remotest parts of the Kingdom, including the far North of Scotland, the extreme West of Ireland and Channel Isles. Recent orders from abroad are from South Australia, Italy and the Gold Coast. The scope of "THE MOTOR'S" circulation is a surprise to many, but our own correspondence columns testify to it each week.

Front v. Rear-driving.

A curious point in relation to the above question may be noticed with regard to the electric broughams now so common in the streets of all large cities. As is well-known, these vehicles possess no change speed gearing, the flexibility of the electric motor rendering this unnecessary. It occasionally happens, however, that a gradient too steep for the vehicle to surmount in the ordinary fashion is encountered. Under such circumstances, by turning the vehicle round and reversing the motor, it may be possible to mount the gradient, owing to the fact that the tractive force exerted by the rear wheels in their new position is greater than when they are placed behind, as in ordinary use. This might seem a strong argument for placing the motor on the front wheels of electric vehicles, and there is no doubt that the gain in tractive power is strongly marked. The disadvantage of this position is, however, that the steering is affected thereby and for this reason it is gradually being abandoned. It must not be overlooked that the electric motor, although small in size, is to all intents and purposes a solid mass of metal, and, therefore, very weighty. So far as the front driven motor-bicycle is concerned, this principle seems to have been permanently abandoned. Nevertheless the forward position of the motor had some good points, among which efficient cooling was not the least. Still, with such an unstable vehicle as the motor-bicycle, anything which tended to affect the steering had to go in the natural course of events.

The Metropolitan Fire Brigade has placed an order for Parsons Non-Skids. These are to be fitted to motor fire engines.

The Belgian Automobile Club has addressed a circular letter to all its members, and to motorists generally throughout the country, urging them to exercise great care in observing all the police regulations and restrictions, and to issue stringent orders to this effect to all their mechanics.

Another revolution—this time in the motor launch world—is announced from Paris. Mons. Cazes will enter a boat for the launch races at Monaco which will—*it is said*—do its 50 miles an hour on the ocean wave with ease and regularity. The motor will be of 60 h.p. and will actuate two turbines.

A "Record" Beach Track.

C. L. Charley, the Continental representative of the Mercedes cars who is now in America, gives it as his opinion that the Daytona Beach track, Florida, on which the recent speed trials and championships have been held, is the fastest in the world. The immense stretch of straight smooth surface makes it an ideal course for racing, and the light sandy mixture has little deteriorating influence on tyres: the tendency of these latter to over-heat at great speeds is minimised on the sand. Vanderbilt's tyres after his ten miles' record were only just warm.

Peto and Radford Developments.

In consequence of rapid developments and extension of business a company has been formed with a capital of £40,000 to acquire and take over the business hitherto carried on by Messrs. Peto and Radford, Ltd., and the P. and R. Storage Battery Co., Ltd., the old companies being wound up, Mr. Peto acting as liquidator. We understand that the whole of the capital has been privately subscribed so that there will be no public issue. Except for the extension of the manufacturing premises no changes are being made in the methods or control which have made this firm famous, whilst the increased capital will permit of greater efforts being made to cope with the rush of orders which always occurs in the motor season. We wish the new concern a continuance of the success attained in the past by Mr. William Peto and Mr. F. W. A. Radford.

Lectures on Petrol Motors.

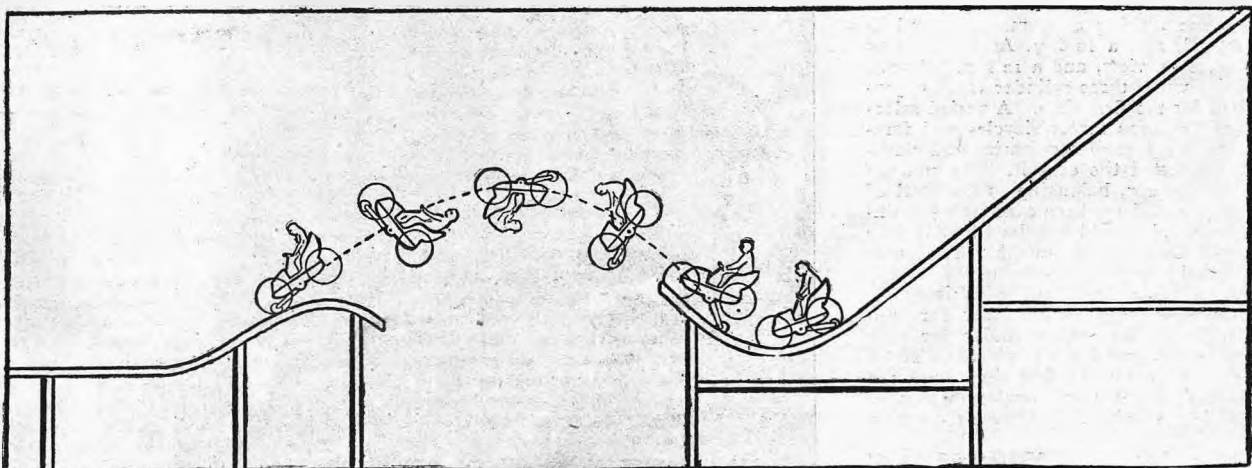
A special course of lectures on internal combustion engines will be given at the Hartley University College, Southampton, commencing February 5th and continued on successive Friday evenings. The fee for the course is 5s. A circular giving full details of the lectures can be obtained from the secretary of the college.

Powerful Launch Motors for America.

Messrs. Pratt, of Glencore, U.S.A., have just ordered two motor launches, the smaller of which will have a single screw actuated by a six-cylinder standard motor, and the larger (whose hull will measure 60ft. in length) a twin-screw and a 500 h.p. standard motor. Both motors will work on petrol.

The "Somersault in Space."

Many of our readers will have seen or heard of the lady cyclist who "flies the flume" or in other words coasts down a steep pitch on a bicycle and leaps a ten yard gap in a sort of switchback railway. The sister sport has been responsible for most of these trick acts—wherein, it must be confessed, the tendency is more towards sensationalism than skill—but the motorist has not been slow to copy them, the added size and momentum of the car imparting to them perhaps more excitement and danger. "Le Velo" announces that the patrons of the circuses and music halls of France and the Continent are shortly to be electrified by a new sensation—no less than an automobile flume-flyer. But in borrowing this sensational cycling trick the motorist will add to it a sensation quite of his own imagining. By means of a lever actuated by a powerful spring the car will, at the moment when it leaves the first part of the track for its flight through space, be violently propelled upwards from the back wheels so that it will rotate around its front wheels—in plain English the car will *turn a somersault in the air* before alighting on the second part of its track. The name of the individual who will first perform this preposterous feat has not been made public, but it is announced that the Belgian loopist, Mondt, who has recovered from his recent accident, will "give the motorist a lead" on his bicycle.



THE "SOMERSAULT IN SPACE."

It is rumoured that this preposterous feat is being arranged for on the Continent.

NEWS.—Contd.

THE LIVERPOOL MOTOR SHOW.

St. George's Hall, Liverpool, was last week the scene of the eighth Cycle and Motor Show, held under the auspices of the Liverpool Self-Propelled Traffic Association and of the Automobile Club. The Show was opened on Tuesday, February 2nd, at an inaugural luncheon, which was attended by the leading members of the Liverpool Traffic Association and the Show Committee. After proposing the health of the King, and referring to him as a motorist, the chairman, Mr. J. C. Robinson (chairman of the Show Committee), submitted "The Self-Propelled Traffic Association." In responding, Mr. T. Thorncroft Vernon gave a history of the work done by the association, pointing out that it dated back beyond the Automobile Club itself, which had become the parent body. While the Liverpool club had dealt with heavy traffic, however, the Automobile Club had devoted itself rather to the pleasure side of motoring. After Mr. Beckett Hill, in a humorous speech, had proposed "Success to the Show," the chairman formally declared the exhibition open.

One of the

STRIKING FEATURES OF THE SHOW,

which was on a larger scale than ever before, was the Spencer airship, which was suspended from the ceiling. The inventor, Mr. Spencer, daily gave from it a short discourse about the machine and the future of aerial navigation.

The increase in the number of motors of every class was very marked, there not only being a great display of motorcycles, but also a varied selection of cars of every description and price; some of the locally built cars were entered for the Sir A. Jones' Cup Competition, the result of which will be announced after the end of the Show:

One of the finest stands was undoubtedly that of the Road Carrying Company, of Liverpool, who occupied the whole of the Crown Court. Several Georges Richard 8 and 12 h.p. cars were shown, also a 16 h.p. four-cylinder chassis of the same make, exhibited for the first time in England.

Daimler touring cars, manufactured in Liverpool, and a 12 h.p. Argyll delivery van were on view, and a 12 h.p. Minerva chassis with three-cylinder motor, exhibited for the first time. A varied selection of Princeps motor-bicycles and fore-cars, with a line of accessories and clothing, completed the exhibit. The new 28 h.p. Bollee car, belonging to the Earl of Derby, was to have been exhibited, but unfortunately it could not be brought into the hall owing to its width. The same fate befell a 16 h.p. Lanchester.

Mr. Francis Weighill, of Liverpool, showed specimens of the Ader cars, including a 12 h.p. two-cylinder car with walnut body, and a 9 h.p. chassis. These cars, on view for the first time, have the cylinders set at right angles, which is claimed to considerably reduce the vibration.

William Lea, "The Motorcar Depot," of Liverpool, made a special show of Darracq cars, which are having a great sale.

Er 2

These ranged from the 8 h.p. tonneau at £195 to the 24 h.p. brougham at £700. The 8 h.p. car seems very good value, and should be included in the list for "men of moderate means." The Baby Rochet, 5 h.p., was also shown here.

An interesting exhibit was that of the Provincial Electric Construction Company, of Liverpool, who showed a 12 h.p. two-cylinder tonneau car, entered for the challenge cup, and a 6½ h.p. two-seated car, both of their own make. In addition a 16 h.p. Maxim car with spacious tonneau was shown, and a Hermes motor-bicycle with N.S.U. engine, price £38.

A. E. Wright, of Liverpool, had a fine 14 h.p. four-cylinder Gladiator chassis and two finished cars on view; and a 10 h.p. Vulcan two-seated car, price £200. Several new model Ormonde motor-bicycles were shown, also a selection of the Wolf motors, including a fine-looking Wolf fore-car, with 3½ h.p. water-cooled engine and chain drive. These latter machines were fitted with the Bowden handlebar control.

Other motorcar exhibits were those of Lawton and Company, Liverpool, who showed several 7 and 10 h.p. Panhards, and also an electric brougham. The Protector Lamp Company, Manchester, staged numerous 5 h.p. Bijou cars with many types of bodies. These little cars are

PRICED AT 95 GUINEAS

and are commanding a ready sale.

Kelly, Bournemouth and Company, Bournemouth, showed De Dion cars in several types, and the 3 h.p. Wirral motor-bicycle with chain drive and Bowden clutch. A number of Ariel motors were on show, including a side-carrige with 3½ h.p. Minerva engine.

The 20 h.p. Belsize car, three-cylinders, was shown by the company of that name, and a Belsize Junior light car with 7 h.p. engine, three speeds and reverse, price £175, was to have been present, but was not ready in time.

The Oldsmobile, White steam car and several 1904 pattern Argyll cars, including

a new three-cylinder chassis, were on another stand of the Road Carrying Company, of Liverpool.

THE MOTORCYCLE EXHIBITS

were as varied and interesting as those of the cars, the following being the stands of chief interest:—

Hitchings, Ltd., Liverpool, showed a variety of motors—five different makes. There was a Quadrant fore-car with two 2½ h.p. engines, and a Quadrant motor-bicycle with spring front forks. The Bat motorcycles were shown, one with the spring frame. The hill climbing powers of this machine were demonstrated by Mr. J. Edge, of the Liverpool Motor Club, who daily, during the Show, climbed Havelock Street, set with cobbles, and with a gradient of 1 in 5½. The Royal Enfield chain and belt-driven motors, a Triumph fore-car with 3 h.p. water-cooled engine and honeycomb radiator, and a 2½ h.p. F.N., were also on view at this stand.

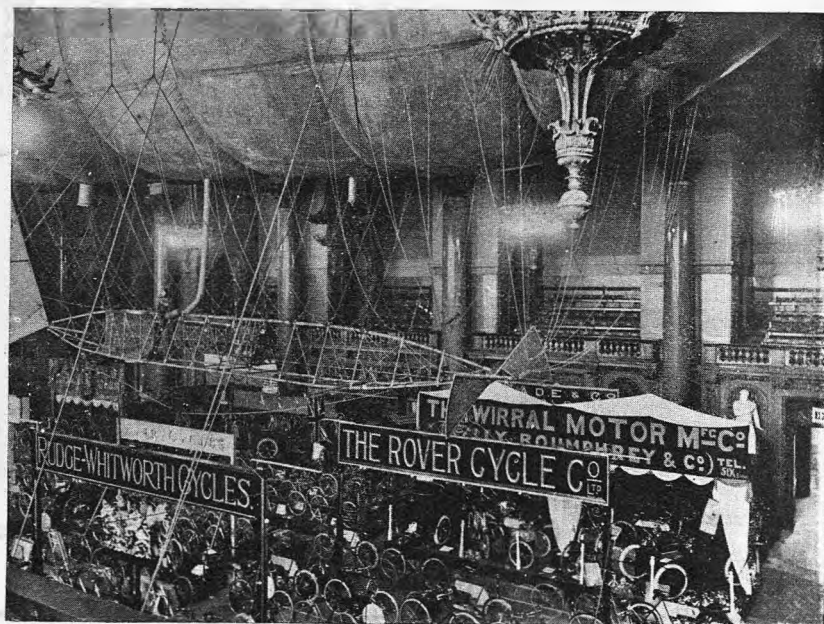
Robinson and Price, Ltd., had a display of their famous motors, including the 2½ and 2¾ h.p. motor-bicycles—the latter weighing 115 lbs.—a 3 h.p. Trimco and a 3 h.p. belt-driven tricycle with two wheels in the rear. At another stand they showed

THE LATEST 6 H.P. WOLSELEY LIGHT CAR, with Panhard type bonnet and three speeds and a reverse, price £175; also a facsimile of the car driven by Messrs. Ducros and Sangster up Snowdon.

Several types of Iris motor-bicycles were shown by Messrs. Guy and Wheeler, of Liverpool, including a 6 h.p. two-cylinder racing bicycle weighing only 90 lbs. They also had on view several 3½ h.p. Rex motor-bicycles, a 3 h.p. Calvert, several Raleigh motor-bicycles, and a good stock of parts, including their "picrator" and sparking plug. The little one-seated car illustrated in last week's "O.P.V." was on view here.

Messrs. Alldays and Onions showed several of their new 2½ h.p. motor-bicycles, and also their new improved Traveller.

Humber specialities were on Stand 10



Section of the Liverpool Show with the Spencer Airship suspended.

NEWS—Contd.

and these included a Beeston 3 h.p. bicycle with improved clutch, and the latest pattern 1904 Humberette, which looks very attractive, and contains many improvements over former models.

A fine tonneau car, several Minerva bicycles with B.S.A. spring frames, and a two-cylinder Clement-Garrard were on the stand of C. Lucas, Liverpool. Among other motor exhibits must be mentioned a display of Singer belt, chain, and gear-driven motors on R. Hardie's stand; several Rover motorcycles, one with fore-car, on the Rover Company's stand, and a 4 h.p. water-cooled Excelsior fore-car and a 2½ h.p. Bradbury, which were staged by Slade and Company, Bold Street, Liverpool. Messrs. Timson Bros., Liverpool, displayed in the entrance hall every class of motor components, accessories and fittings.

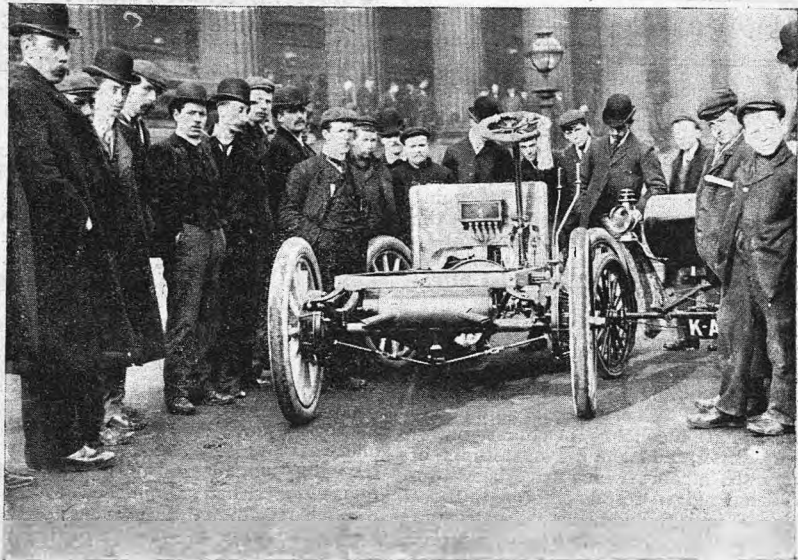
Probably the bad weather was responsible for the large display of warm motor clothing at the stands of Dunhills, Nicol and Company, Turner Bros. and Lewis's, these last three being Liverpool firms.

From the above description it will be seen that the Show was a thoroughly representative one in every respect. The exhibition ended on Saturday last, and the result of the cup competition will be announced in a few days.

The Motor Union is carefully watching all applications from local authorities for powers to close certain roads to motorcars or to reduce the speed of motor vehicles to the ten-mile limit on such roads, and in every case objection is being lodged with the Local Government Board; whilst local opposition is also being secured.

Talk of the Motor.

The members of a club which has been known for many years as the Bristol Bicycle and Tricycle Club have voted in favour of changing the name of the club to the Bristol Bicycle and Motor Club. A writer in the Club Gazette who evidently strongly opposed the move has contributed a very clever article as a "last word." Dealing with the language of motorists and the technicalities which are contained therein, the writer good-humouredly remarks:—"On appearance, no inducement is needed to immediately switch the conversation on to the all absorbing topic of motors, the merits or demerits of this and that engine, its adjuncts and accessories, and this is kept going until the ordinary and self-contained cyclist fancies he can detect the odour of boiled oil about the roast lamb, and a suspicious flavour of petrol in the mint sauce. Vain any attempt to turn the conversation. The fiscal policy, the theatre, Marie Corelli, club chatter, the weather even, one and all have to go under for uninteresting piffle, to the cyclists, anent motors. . . . Their conversation is so larded with motor terms that they will ask solicitously if your *cafe au cognac* is a good mixture," and suggest that 'the cabbage isn't sparking freely' if in a moment of abstractedness you require two matches to light your *L'avana*."



Taking the Chassis of a Georges Richard Car into the Liverpool Show.

Motor v. Express Train.

The "Berliner Tageblatt" relates that Fritz Opel, who has been selected to drive one of the German-made Darracq cars in the Gordon-Bennett trials, practises by racing an express train every day. Between Frankfort and Mayence there is a five mile stretch of road which runs by the side of the railway: line and road run side by side straight and level. Opel waits at Ramsheim for the arrival of the Ostend-Vienna express, and when it has thundered past him he dashes off in pursuit. As a general rule, especially if the wind is with him, he overtakes it before reaching Kelsterbach where road and rail part company. The engine driver enters into the fun of the sport and puts forth his best efforts to avoid being overhauled; but our German contemporary preserves a discreet silence as to the attitude adopted by the police.

The International Motor Boat Race.

Three challenges have now been received from France for the British International Cup for Motor Boats. Two of these entries are for boats driven by petrol motors, one from M. Clement and the other from Messrs. G. Pitre and Company, and the third is a Gardner-Serpellet steam launch entered by MM. Legru and Gardner. No less than seven boats have been entered to defend the cup on behalf of Great Britain, two being from Mr. S. F. Edge, the present holder, three from Messrs. J. E. Hutton, Ltd., one from Messrs. Thornycrofts and one from Lord Howard de Walden. This will necessitate an eliminating race being held to decide upon the three boats which are to represent England in the race itself. Further entries, it is hoped, will yet be received from France, which will also necessitate an eliminating test, and if, as is confidently expected, some entries are received from Germany and the United States the race will be the most representative and important international contest for motor boats that has ever taken place. The actual date of the race, which will be held probably in the Solent, is to be July 30th.

The's Complaint.

Marius Thé, who was beaten for the second time by Cissac in the motorcycling "brassard" at the Paris Winter Track as reported in another part of this paper, has written to the Paris Press complaining that Cissac "cut in" on the inside illegally during the course of the race. Thé suggests that in future track umpires should be stationed at various points to see fair play. On the track in question two blue lines are drawn, and so long as the leading man keeps his wheel within these lines he may not be passed on the inside; but, as Marius Thé points out, in the absence of umpires it is difficult to prove the relative positions of any two machines at the moment of passing.

The Motor Union.

A well attended meeting of the general committee of the Motor Union was held on Tuesday evening the 2nd February at 119, Piccadilly. Representatives of the Automobile Club of Great Britain and Ireland, the Nottingham and District Automobile Club, the East Surrey Automobile Club, the Kent Automobile Club, the Auto-Cycle Club, etc., were present. Upwards of £40 was voted to defend members of the Union, including two charged with offences under the new Act. It was decided to file notices of objection to the applications by the Borough Councils of Blackpool and Newbury for a ten mile limit of speed within their districts. The propriety of taking steps to secure legislation for the universal lighting of vehicles upon public roads was considered and Mr. Rees Jeffreys was requested to prepare a report. It was resolved to prosecute a waggoner alleged to have been obstructing the traffic by driving his waggon on the wrong side of the road. The secretary of the Union was instructed to prepare, after consultation with the honorary secretaries of the bodies represented on the general committee, a list of questions for Parliamentary candidates, for the consideration of the committee. It was resolved also to take steps to represent to local authorities the dangerous and destructive nature of the practice of using small flints on hard wood pavements.

NEWS - Contd.

The Automobile Club proposes to purchase the necessary plant for conducting tests of carburetters, ignition, etc.

The apparatus for measuring road friction, consisting of a car with dynamometer and recording apparatus, belonging to the Road Resistance Committee of the British Association, is to be brought to London and housed with the Automobile Club, which will conduct a series of experiments with it.

A Substitute for Petrol.

Motorists, scientists and Government Ministers have devoted considerable attention of late, in France, to the question of alcohol as a fuel for the automobile motor. Pure alcohol is, of course, out of the question, and the various forms of carburated alcohol which have been produced have given results inferior to those of petrol, with the additional drawback of increased cost. A French scientist, M. Durupt, claims to have discovered a method of carburating alcohol by distilling it at a high temperature—a difficult and delicate operation—and to have produced a spirit, which he calls "Duruptine," so well adapted for the purpose that he predicts that it will replace petrol entirely, provided that the manufacturers can construct the right kind of motor for it.

Motorcycle Road Trials in Italy.

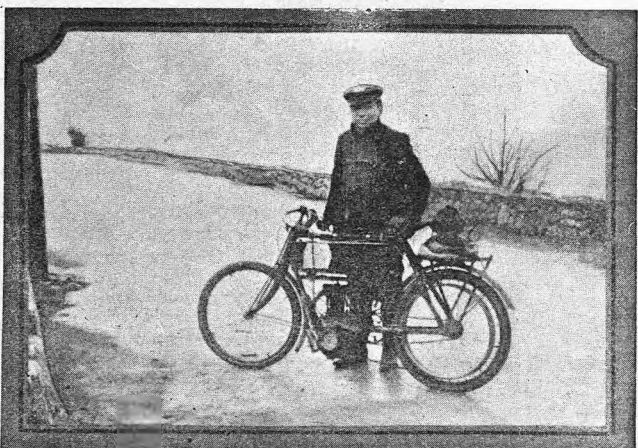
The motorcycle road trials organised by the Italian journal "Gazetta dello Sport" began on the 27th of January. The trial comprised daily runs on an out and home course from Milan to Nice and back to Milan by way of Turin, the total mileage being about 450. Eighty-seven entries were received, many well-known Continental machines being represented, e.g., Bianchi, Adler, Zedel, Peugeot, Stucchi, Turkheimer, Quagliotti, Motosacoche, etc. Amongst the riders best known to English readers were Lanfranchi, Tommaselli and Zucchi. The first half of the trial, the run from Milan to Nice, was split up into the following stages:—Milan to Genoa; Genoa to San Remo; speed trials at Oneglia; and Oneglia to Nice. Sixty competitors started from Milan, 52 completing the day's run within the minimum and maximum time limits allowed. By the time Nice was reached on the fourth day, this number had diminished to 44, of whom Tamagni and Zucchi had done best. The speed trials at Oneglia on the third day resulted as follows:—1st, Tamagni (Marchand), 59½ secs.; 2nd, Brambilla (Turkheimer), 62½ secs.; 3rd, Cerizza (Stucchi), 62¾ secs. The distance was 500 metres (about 550 yards) with a flying start of 32 yards allowed. The weather during the out journey was favourable on the whole, but the roads were heavy in places.

The Civil Service Motor Agency, Featherstone Buildings, High Holborn, hold the sole London agency for the new Garrard tandem. A sample machine will be on view at their showroom at an early date.

The New York Police have issued a warning to motorists against leaving cars and cycles unprotected on the road. The notice points out that a small percentage of the criminal classes have sufficient acquaintance with the working of an automobile to seize an opportunity of driving off.

Cissac retains the Brassard.

Marius Thé, who recently lost the motorcycling "brassard" at the Velodromé d'Étival in Paris to Cissac, made an effort to recover the "Kudos" and its accompanying money benefits on Sunday, January 31st. The distance of the race is ten kilometres (about six miles). The challenger got off quickest and held the lead and the inside berth. At the end of the first lap he was 50 yards to the good, but on the completion of the second kilometre Cissac had made up the lost ground and was at his rival's wheel. Shortly after the completion of the third kilometre Thé rode wide at one of the bends and Cissac dashed in on the inside and took the lead. Marius Thé eventually retired after doing seven kilometres, leaving the holder to finish alone in 6 mins. 8 secs.

**MILAN-NICE AND BACK MOTORCYCLE RACE.**

Carlo Quagliotti arrives at Menton.

3rd stage, Oneglia to Nice. Zucchi (Peugeot) on the road

The Control at Menton.

Cerizza (Stucchi) on the road in the 3rd stage.

THE LIGHTER SIDE OF MOTORING.

By MARCUS W. BOURDON.

If you are taking up your copy of "THE MOTOR" with the idea of learning something in connection with motors—something useful, practical, not to say technical—I must tell you, before going any further, that it will not be the slightest use reading this article. It contains *no* information that will be of use to you; I shall not explain how to build a motor house; I shall not give any dogmatic opinion as to how far apart your sparking plug points should be set—some experts say the "thickness of the thumbnail," but I should imagine thumbnails differ considerably in thickness—nor shall I lay down any golden rules as to what to say and what to think when a policeman—I mean, what to eat and what to drink when motoring. All these points are dealt with elsewhere.

MY IDEA

is to deal with the lighter side of the sport. For motoring is not *all* worry and trouble; motors are not always in a state of "breakdown"; although, judging by the correspondence, articles and queries usually met with, an outsider might imagine that such is the case. With motoring it seems that the public see only the bad side; they pass a car stopped at the roadside, perhaps merely at the passengers' wish, or maybe to lubricate (engine, of course!); and they, the public, do not know of, and cannot appreciate the splendid run that car may have made—perhaps 50 or 100 miles—but remark "Another motor broken down!" They see a car with occupants in goggles, and they notice only the latter and say "Fancy being compelled to wear those awful things!" They do not think of the exhilaration and enthusiasm which those same occupants feel, and to obtain which they would put up with half-a-dozen pairs of goggles.

Have you never noticed that the men who eventually enjoy motoring most are those who, of their own appointing, are our worst enemies before they become converted? I remember fetching a colonel or general—or someone big, at any rate—from a garrison town once. I had to transport him to inspect some Volunteers at a camp some 40 or 50 miles away. He was a most rabid motor hater and sceptic, and I am of opinion that he accepted the owner's offer of the use of the car, believing that I should not arrive from the camp in time to fetch him. I do not think he was pleased to see me when I called for him, and before we started he gave me a most fatherly lecture. He instructed me to stop immediately we approached horses which showed the slightest sign of fear; I was not to drive at any speed above eight or nine miles an hour; I was to approach corners with the utmost care; I do not think he ordered a cab to follow us, but he enquired as to the longest distance we should be from a railway station at any point of the journey! Above all, he was most emphatic in his directions as to speed and passing horses.



"It's alive, man, alive; and that's the pleasure!"

I had visions of being charged with loitering and with being compelled to stop at the sight of anything on four legs; but my fears were groundless. Before we had completed half the distance, and were travelling at—well! say over the legal limit, my passenger was asking "Is this as fast as you can go? If not, let me see what your top speed is like!"

Even when a horse tried to jump with cart and driver over a hedge I was not told to stop but urged to take no notice. I did take notice, however, getting down and leading the horse past the car; but instead of the general, or whatever he was, blaming the motor, he spoke disparagingly to the man with the horse as to his want of control of the animal. An hour before he would have consigned motors to the North Pole or the Equator!

And so it is with 19 out of 20 such persons. They hate motorcars—until they have ridden in one; then—well I will not say they come to dislike the "hay motor," but they are rather inclined to despise those who are satisfied to ride behind a horse. Mind, I do not say there is no pleasure in driving horses. I am told there is a peculiar fascination in, as it were, feeling their pulse, coaching and humouring them, talking to and encouraging them. A "horsey" individual said to me once, "It's alive, man, alive; and that's the pleasure! Your motor will go no faster or slower if you speak to it." No! perhaps not; but at the same time to an enthusiastic motorist his engine is as good as alive; it answers his touch, he feels when it is labouring and eases it. Personally I am never lonely when driving by myself.



"Sat on the edge of the pathway with his leg in a sling."

THE ENGINE IS MY COMPANION

and, in a way, it talks to me; complains when it is forced; hums gently when going easy, and at times rushes off, perhaps at the brow of a hill, as if it were enjoying itself. At the same time I always know and feel that I have it entirely under my control. This, in itself, is a pleasure; for who does not like to feel that they have power under their command?

Of course there are times when your motor jibs or sulks; but what about the spirited horse? When it shies, the driver does not call down all the curses of heaven upon it, and swear he will sell or burn it. No, he delights in humouring it. So with a car; when it sulks, do not always blame the motor or the man who made it. Ten to one it is your own fault through forcing it and not having any consideration, perhaps in the matter of oiling—or rather the lack of it, at the last stopping-place.

I met a lady once who was a little too considerate towards an engine. I was on a very small car with a friend—quite a miniature one in fact—and the lady remarked: "What a shame to make that poor little thing pull you two great fellows!"

Until recently the public had an idea, which prevails to a lesser extent even now, that a motor was a wild, ungovernable, fiendish sort of thing, which was wound up, and when started could not be stopped until it ran down or blew up, or something of the kind. A passenger on one occasion said

to me quite innocently, "I see you have no brakes (!) like a carriage. How do you stop?" My word, this was ignorance indeed! It was an opportunity for a little fun which I could not allow to pass. So I replied quite seriously, "Oh, we control this machine entirely by force of will. It is a case of the superiority of mind over matter. See, I wish it to stop" (at the word jamming down the clutch and foot brake) "and it stops!"



Four ostlers studying a motor paper.

We stopped rather suddenly, I admit; and the passenger, after getting off the bonnet, where he had been thrown by the sudden pull-up, on to his seat again, said "Wonderful!" Then I explained.

It is a peculiar thing, but there is a sameness in the remarks and antics of the person whom you are taking for his first motor ride. If you wish him to ride next to the driver he invariably attempts to get in on the off side, that is to say past the steering wheel. Ladies, of course, catch their dresses on the brake lever; or, if they pass that before you notice what they are doing, they get entangled between the sparking lever and the wheel. Then, when they eventually get seated, they smile a sickly smile and commence—

"You're sure it won't blow up?"

"It won't start before you get in, will it?"

"Where do you wind it up?" and perhaps—

"Why do you have to wind it up?"

When you have seen them comfortably settled with rugs, etc.—which they nearly always allow to trail in the mud, or get under the clutch pedal if you do not watch them—you start the engine: they say "Oh!" and make a grab at something to hold on to. I remember one lady to whom I gave notice that I was going to start the engine saying, "Oh, have you an engine, then? I thought you said the car was driven by petrol?" Now, what can you say to a question like that? If you try to explain that the petrol is formed into gas and mixed with air by means of the carburetter, and then—oh, you know, about ten minutes' lecture—well, there's ten minutes off your drive, and the passenger is none the wiser.

When you get the clutch in and the car is moving, your "first rider" observes, "Now you won't run over any dogs, will you?" Just as though we always, invariably and without exception, made a practice of, delighted in, and went for a run with the fixed idea of

SLAYING DOGS!

If there is one thing more than another we motorists dislike it is having trouble with dogs.

But what is a man to do when one rushes at the car like a whirlwind? Pull up sharp on the chance of saving the dog—which is, perhaps, a mongrel worth about half-a-crown—pull up and ruin a tyre, probably worth a ten-pound note? Is one to do this, or go on and risk the wrath of the owner and others looking on? No, but really dogs are a —. But I think I had better drop this subject. Dogs are my sore point.

There is one little incident, however, which I should like to mention. For months I had been worried by a fox terrier, which belonged to a house I often passed. The animal would rush straight out at the car, and when about two-and-a-half inches away from the front wheels would turn about and run for fifty or a hundred yards just in front, barking and snapping for all it was worth. To save fuss, which always ensues when one does run over a dog, I used to pull up; but others, apparently, were not so considerate;

for when mentioning the animal to a friend one day I was told that it had been run over by a car and one of its legs hurt. Sure enough, the next time I passed, there it was on the kerb, looking very disconsolate, with one leg bandaged up. "Now, my friend, thought I, you have learnt a lesson. I shall not be troubled with you any more." The next day, to my surprise, the terrier had brought up his reserve in the shape of a large collie. The former sat at the edge of the pathway, with his

LEG IN A SLING,

wagging his tail, and watching his chum the collie attacking the car. The larger dog, however, was not quite so agile as his friend, for the dangers of the sport soon laid him low. A 12 h.p. Panhard caught him broadside on, causing a retirement from active life. Some dogs will not see their danger. One I know of, belonging to the manager of some public service cars in the South of England, has been run over four times by motors, and still lives.

I believe it has been said by some poet or prophet or someone that

"ALL MEN ARE LIARS,"

and really I am beginning to think that this rather broad statement is not far out. It seems to me that most men are truthful on all but one subject, and that subject varies according to the habits or pursuits of the individual.

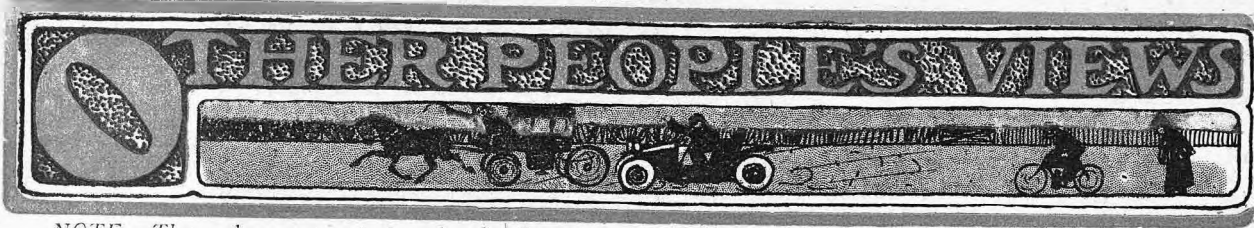
Now we have a new description of tall stories—viz., "Motor Yarns"; and in the way of ignoring fact, inflating the truth, or whatever one may call it, some of these yarns compare very favourably with dog, fish and other stories. The fault is contagious too. How can one keep quiet or give best to the man who tells you that his $3\frac{1}{2}$ h.p. car has carried him four miles in seven minutes; or to the man who says that such and such a hill, with a gradient of 1 in 8 and a mile in length, he always climbs on top speed? There is a great temptation to try and go one better, but if you get into the habit of doing so you will find that before long you are anticipating the extravagance and leading off with a tall story yourself. If you happen to go out with one of these men and they find—I will not say they know it beforehand—that they cannot prove the truth of their statements, they say "Oh! she's not pulling well to-day." Then there is the man—and I violently object to him—who runs into a hotel yard and boasts to all and sundry that he has done the last ten miles at an average speed of—oh, anything from 30 to 50 an hour!

IT IS ALL "BUNKUM"

I know, but it does a lot of harm.

Talking of hotel yards reminds me of an incident which shows the interest taken in motor matters nowadays by those who two years ago despised anything and everything in that direction. I drove into the yard of a hotel in a large Kentish town one Sunday afternoon this summer, and there, seated in a group, were four ostlers in their best clothes, each studying a motor paper most intently, and reading the comparatively technical articles too! When I expressed surprise, they said "Oh! we want to keep in touch with these things. We're not going to be left." Often and often have I been asked by such men "How could they learn to drive?" or "How could they get into a motor works?"

But what peculiar ideas they get into their heads when they have learned to drive! I spoke to the three months' old driver (I mean, of course, that he had been driving but three months) of a small steam car on one occasion. This man had been a coachman until his master bought the motor. We spoke on the subject of chains, and I asked him if he had had any trouble in that way, remarking that a friend of mine, who owned a similar car, had his chain break three times on one journey—and not an old chain either. "No, sir," replied the man, "I ain't 'ad no chains break yet. But then, what does it matter if the chain does break; it's the steam what drives the car, ain't it—not the chain!" Great Scott! Reminds me of the servant of another friend, who was watching him pump his tyres. She stood some moments with mouth wide open, evidently surprised at something. At last she said, "Lor', sir, it's only common air you use after all. I thought it was horse 'air!"



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.

Help!

Sir,—Will any Benzite help me on the following?—I am riding a small Star Benz car, $3\frac{1}{2}$ h.p. It has a Crypto low gear on. When the lever is down—that is, to put the gear off—the car moves slowly forward, although the strap that the lever is fitted to appears to be very slack round the pulley underneath when the lever is down.—Yours faithfully,

W. W. EVENS.

Gudgeon Pin Troubles.

Sir,—I have suffered badly from loose set screws. On one occasion my engine was smashed into small pieces from this cause. "Piston's" idea is good, and was the method adopted in my new engine at the makers' suggestion. My experience is that the screws come out, not by unscrewing, but by what one might call wriggling. The only remedy is to tap out the holes and put in a larger sized screw. I have known these screws get loose in the very best makes of engine, and there is no limit to the havoc wrought in the course of a few seconds.—Yours faithfully,

C. COURTENAY LORD.

Steel Cylinders.

Sir,—I should like to make the following observations with respect to your remarks on page 608 (13-1-04) as to the merits of steel cylinders. Mild steel of 10 to 18 points carbon can be made infinitely more suitable for working together than cast-iron or almost any other metal. If anyone cares to construct motors with steel cylinders, they can have them so carbonised on the surface that no seizing, wear or dragging will take place. Both piston and cylinder liner may be successfully made thus. The Garrard Company, of Magneto Works, can do this. All their brakes, spring fork joints, etc., are metal to metal "Garrardised," and they can guarantee no measurable wear under the "B" process for several years. Whereas under "A" process (to replace cast-iron) they guarantee longer life than cast-iron and no seizing.—Yours faithfully,

C. R. GARRARD.

Belt Slip.

Sir,—With reference to Mr. A. Verney Cave's letter in your issue of December 30th, 1903, would he kindly explain his idea to prevent belt slipping more fully as there seems to be something in it, and I daresay there are plenty of others who would like to know how to prevent this bugbear of the motorcyclist.—Yours faithfully,

"ANTI-BELT-SLIP."

Belt v. Chain Drive.

Sir,—In this controversy it seems to me that each correspondent booms up his own make of machine and class of drive on principle, and endeavours to further his arguments by running down "in toto" every other. This is not a fair or sporting way of going about the matter. A thing may be good or bad in itself without it being necessary to decry everything else. In your issue of the 13th January the Hon. Leopold Canning sweepingly denounces the chain drive. It would appear to me that his assertions on this and other subjects he writes of show an inclination "to rush into print" rather than any real desire to enlighten riders by giving helpful information. These remarks are not to be taken in a personal sense, as, having met the gentleman in question, my opinion of his courtesy and kindness is very favourable, especially on an occasion when he rendered assistance during a compulsory stoppage. The "shocks and jars, buckling of rims and breaking of spokes" he speaks of, in connection with a chain drive, must exist in his own imagination. And in reality as regards the Humber machine (which one always thinks of when chain driving is mentioned) none of these things occur under ordinary circumstances, or have occurred within my personal knowledge. The same correspondent speaks of the difficulty in dealing with a broken chain along the roadside. The heavier chains now fitted by Humbers make this breakage a remote possibility; but if it does occur, the pedalling chain, being an exact counterpart of the other, can be transferred in 10 minutes easily, and the snapped chain carried in the tool bag till the first repair shop is reached, when 15 minutes' delay will suffice to make all right. My machine (a Humber) is now in its third year and going magnificently; the chains are the very light make as originally fitted, and yet have broken but twice, and have never required any adjusting or care other than occasional greasing. The breaks were dealt with in the manner named on both occasions. Where does the roadside bugbear come in here? My first experience of motorcycling was with belt drives, and again last autumn I had off and on a month's use of a belt driver. My opinion is emphatically in favour of the chain drive. There is an ease of mind and absence of care about

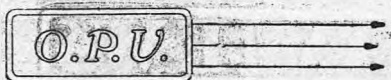
it, on this head, that one does not fully appreciate till he returns for a time to the older method. The same remark applies to the free engine for coasting, and in traffic there is simply no comparison as to ease in handling, as the machine, not having to drag the engine around all the time, permits of its being driven as slowly as an ordinary bicycle, even at a "snail's crawl." The spring clutch does effectually prevent jarring at starting, or when misfires occur. As to the mechanical advisability or otherwise of chains being used for transmission of power, I do not feel competent to express an opinion, but as to convenience and comfort I have no doubt which is the better drive. In conclusion, I will add for the benefit of intending purchasers, do not be guided by agents as to which drive you will have; they invariably boom up the machine they sell (and quite rightly). Ask riders of both kind of drives, and get a run on them and then judge for yourself.—Yours faithfully,

"SHAMROCK."

Sir,—In reference to the Hon. L. Canning's letter on the above subject, I have ridden a Humber tri-car during the past season, and I must say that in my opinion none of his objections to the chain drive are applicable to the Humber. It will run smoothly at all speeds down to five miles per hour, and will start on the second stroke of the pedals without any jerk. I have never heard of any broken spokes on a Humber, and with a 2½ in. tyre on the rear wheel there is hardly any more wear than with a belt. The chains never show any signs of breaking, and even in the unlikely case of this happening the pedal chain can be substituted for the broken chain in a few minutes. Absolutely no care is necessary for the chains except a little tallow and graphite brushed on every 1,000 miles. The advantages of a chain drive are too obvious to need mention here. By the way, was not Mr. Canning a staunch supporter of the Century tandem about two years ago? This surely has the chain drive. Why the sudden change to favouring the belt?—Yours faithfully,

JOSEPH A. MACKLE.

Sir,—I am content to let others thresh out the much-vexed question of chain versus belt for motorcycles. For myself, I intend to stick to the belt. But I should be glad, if I may, to give you my experiences with the latter up to the present. The original belt on my machine bore a very well-known name, and I freely admit that it gave thorough satisfaction. But when through stress of work it finally gave way I found, as a "man of moderate means," the cost of replacing by a similar one to be prohibitive. On the other hand I was averse to getting a cheap article, lest it should prove to be also nasty; so



I compromised and selected another well-known article at a price one-third less than that of the first. Perhaps this particular specimen was exceptional, but it proved to be utterly disappointing: it went altogether to pieces in about 300 miles. I then sought counsel in the pages of "THE MOTOR," and found a certain belt highly recommended in "O.P.V." The cost of this was only half that of my second venture, and only a third that of my original belt. I tried it, and for proof that it gave satisfaction I need only mention that I have just procured another similar one. I am quite as satisfied with its behaviour as I was with the first one, which cost three times as much. The maker is Pollin, Spalding, Lincs., and particulars are to be found week by week in a modest advertisement in "THE MOTOR." I have no interest in the article other than as a rider, my sole object in writing this letter being that it may perhaps be of benefit to other men of moderate means, for whom your excellent paper especially caters.—Yours faithfully,
J.M.

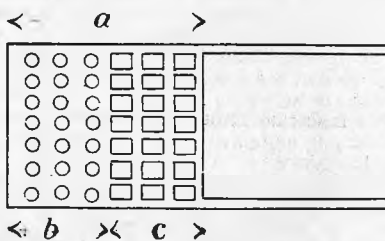
Sir,—In reply to the Hon. Leopold Canning, who writes on the subject of chain drives, I might say that personally I have ridden many thousands of miles on a chain-driven machine during the late summer, and I have never once had the least bit of trouble in any shape or form with the chains, and I consider them the very best form of transmission; in fact, I would not even think of drawing a comparison between the chain drive and any belt drive on the market. My riding has not been done on level or even dry roads, but hills and wet roads have no terrors for me, which I believe is entirely due to the chains. Why, sir, my chains have never even required adjusting, which, I think, is due to the manner I look after them, viz., about once in two months I soak them in warm paraffin for a few hours, followed by a soak for at least six hours in melted suet. As for road-side repairs which Mr. Canning mentions, I find it is the belt that requires the repair, not the chain. If Mr. Leopold Canning only knew the pleasures of riding a chain-driven machine, he would hardly go so far as Italy to keep his belt dry during our good old English winter.—Yours faithfully,
G. C. VAUX.

Sir,—I am a regular reader of your column, and notice the many letters from the pen of Mr. Leopold Canning. This gentleman seems somewhat bitter against the chain drive. I wonder if he has given a well-designed one—say a Humber—an extended trial on the road. I have had an experimental machine in use for some months, having travelled over 3,000 miles on it. It has two of Perry's Victor chains in the engine drive, incorporated in which are two ball ratchet clutches, which allow of a coasting with the engine stopped, and of starting it when required. Victor chains are not made for engine drives, but are the cheapest English chain I have found, and are for pedal cycles. I have not had a backfire: the rear cover is in good order; and the frame is still in perfect alignment.

I have not been "hung up" for a broken chain, piston rod, or spoke, etc.; the motor is not ruined, and I have no trouble with adjusting the chains, as I could not adjust the one on the engine drive if I would, and it is still running. I do not claim that my combination of fittings is a mechanical miracle, as the better part of them—including the engine—were second-hand when put together.—Yours faithfully,
"MECHANIC."

Petrol and Paraffin Carburetter

Sir,—In reply to your correspondent, Mr. Wilson, in your issue of January 13th, I may say I have thoroughly tried the carburetter as described by me; the results of which have been very satisfactory and encouraging. The results are as stated in my letter appearing in your issue of December 23rd. I have had it tried on an air-cooled cycle engine, 2 3/8 in. bore by 2 3/4 in. stroke; also on a water-cooled car engine 5 in. by 6 in. stroke, slow speed. The result of allowing water to enter the cylinder has been very decided with the car engine, but not so pronounced in the air-cooled engine, increasing speed as water is allowed in up to certain point, and then decreasing when more is allowed. Mr. Wilson does not seem to grasp my method of putting in air in place of throttling. As he says, "I have invariably found, both



with petrol and paraffin oil, that as soon as you let more than a certain proportion of air into the mixing chamber, or in amongst the mixed gas you get back explosions." This I quite believe. What my carburetter does is to allow a quantity of pure air to pass into the cylinder before the mixture is drawn in, and the air is taken past no obstruction except the inlet valve of the engine, so that it is practically stationary when it arrives into the cylinder. As previously described, the amount of air thus allowed is controlled by hand or by the governor of the engine. The correct mixture coming in after this does not mix with it to any extent, and coming in last it is always in the region of the spark; and being a correct mixture, however small in quantity, it fires. Diagrammatically it may be looked at as follows:

- a = cylinder capacity.
- b = correct mixture.
- c = pure air only.

I think the above covers all the points raised by Mr. Wilson. I have only to thank him for his letter and criticism and to say, that, with your permission, I shall be very glad to hear the opinions and criticisms of others. As giving a rough comparative test of the carburetter, the car on which it is fitted has no pump and the water capacity is about eight gallons. Working with its original carburetter the water begins to give off steam in about seven or eight

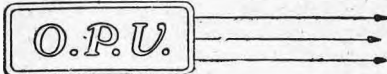
miles; the water is very hot, and it goes through about two gallons of water in ten miles' run. With the new carburetter it has run a distance of over 12 miles, using a very small quantity of water internally, and showing scarcely any loss of water in the cooling tanks, the water being very much cooler than with the old carburetter. This test was carried out on a day when the roads were very soft owing to heavy rains the previous day; and this necessitated a larger proportion of driving on the slow speed than with the roads in normal condition.—Yours faithfully,

JAMES GIBSON.

42, Nicolson Street, Edinburgh.

The Binks Four-cylinder Motorcycle.

Sir,—I feel constrained to take up my pen in defence of the criticism of his machine of which Mr. Binks complains, be it only to refute the allegation of unfairness. Dealing first of all with the question of overheating, am I to understand from Mr. Binks' statement that, when the motor is fitted lengthways and the machine in motion, an equal cooling effect is exerted on all four cylinders? Perhaps Mr. Binks could illustrate by means of a diagram of the air currents how this effect is attained; for, failing convincing proof to the contrary, I must abide by my expressed opinion that each cylinder, with the exception of the foremost one, is partially shielded from the cooling draught. That the motor will continue to run for a certain space of time "on a bench in a hot room" (as Mr. Binks asserts) is no proof that overheating does not take place. Mr. Binks should be aware that if only one cylinder in a four-cylinder engine is working, the motor will still run. When a four-cylinder car engine is running free, if all but one of the high tension wires be disconnected from the plugs, the remaining cylinder will still cause the crankshaft to rotate; so that, for all I know to the contrary, three of the cylinders in Mr. Binks' engine may be only offering a useless resistance to the fourth in the test he offers. This brings me to the extra complication to which I have referred. Mr. Binks will surely not deny that he has four times the usual quantity of sparking plugs, exhaust valves and their gear and parts, inlet valves with ditto; and, in fact most of the usual details of the motor which are liable to "go wrong" and give trouble. So that in his engine he has quadrupled the chances of derangement in the motor, and deliberately set aside the golden rule in the construction of the motorcycle—simplicity. In return for all this extra and abnormal complication, I gather that Mr. Binks offers additional ease in starting! Well, he is a poor motorcyclist who cannot start an ordinary single-cylinder motorcycle with ease, and I must most emphatically refute Mr. Binks' assertion that such machines are "uncertain of starting." As for "giving trouble," as I have said, four cylinders are just four times as liable to do this as one. I am always glad to welcome an innovation where it appears to be a distinct improvement, and from the fact that I have refrained from criticising the multifarious details of Mr. Binks' machine, he may rest assured that I am not actuated by motives of animosity.—Yours faithfully,
"PETROLIA."



Non-Slipping Bands.

Sir,—I am about to order a motorcycle with A Won Clincher tyres. Can any of our readers tell me their experience of the best non-slipping device for same. Have any of them tried Lovelace bands, and are they efficient?—Yours faithfully, A.B.

Light Cars.

Sir,—There must be many private owners among your numerous readers who have had experience last season with the "light car." I am sure there are many besides myself who would be glad to hear their experiences. Personally, I should like to know the cost of keeping such a car, i.e., running expenses—including petrol, oil and repairs to tyres and car for 1,000 to 2,000 miles per annum. There seems to have been little information on the subject up to the present and what there is gives one the impression that a car is not the sort of vehicle for the man of moderate means. I should also like to know how much time one must give to a car between rides in filling with petrol and oil, making adjustments, pumping tyres, cleaning, etc., as I should do all the work myself if I purchased one. With regard to the up-to-date car, this in my opinion should have solid rubber tyres, magneto ignition and should be capable of running on petrol or ordinary petroleum lamp oil.—Yours faithfully, "FORWARD."

Two-Speed Gears and Chain Drives.

Sir,—Perhaps my experiments with two-speed gears may interest Messrs. Seal and Ellis and others. My machine has a countershaft with chain drive to the back wheel. At first I had two free-wheel clutches on the engine shaft driving on to two chain wheels fixed to the countershaft. The ratios were 20 to 40 and 20 to 28. When the machine was pushed the engine was turned by the high gear (1 to 5), when the engine fired it drove the machine on the low gear (1 to 8). The starting clutch was locked to give the high gear. This arrangement gave neither a free engine nor a free machine, so I took off the high speed chain and chain wheels and fitted wood pulleys and a flat belt with fast and loose pulleys on the engine shaft. This was nice for coasting, but the machine was more trouble to start and drive. I prefer the first system because of (1) its easy starting; (2) its easy driving; there is no fear of stopping the engine when slowing up in traffic; with the second system every time the engine was stopped the high gear had to be put in to start it again. My second arrangement is very similar to that of Messrs. Seal and Ellis except that they have no belt troubles. I intend to put my chain gear on again as before, and when I put in a friction clutch as a luxury I shall put it on the countershaft or in the back wheel to let the chains be at rest when coasting and also to give a free engine. It may interest those who disbelieve in chain drive to know that although I have no spring or slipping devices and have broken a connecting rod through advancing the spark too far when going down 1 in 25 with full gas on, yet I have never had a broken chain (1/4 in. pitch, 3-16ths inch B.S.A.) nor are the tyres (Clincher B) worn or cut.—Yours faithfully, K. H. EVANS.

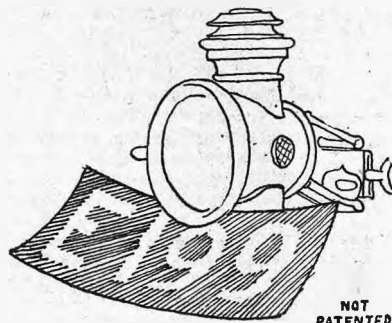
Numbering.

Sir,—I do not know whether my plan would be useful to others, but I have got my "number" cut out of a grooved tin plate which is painted black, and I slip into the groove a piece of opal (photographic) plate. The whole is fixed on the front mudguard so that the light of my lamp shines through the opal and stencil plate and over it on to the road.—Yours faithfully,

"A COUNTRY MOTORIST."

An Illuminating Hint.

Sir,—Until some really good attachment is put on the market, let those who are in a difficulty as to illuminating their front number plate try the following:—Get a piece of thin patent leather of the correct size, and on it paint in white oil colour

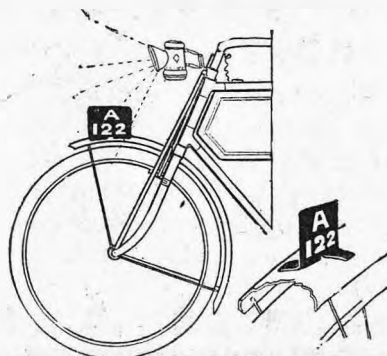


Illustrating letter from "Mere Tyro."

the regulation letters and number. Open the front of your lantern and shut it to with the edge of the leather in it, much as a paper is put into a spring file. You will be surprised at the way the number shows up. During the day it can be easily carried in the pocket. The fault of those plates projecting at right angles to the lantern front is that on the least deflection one side is thrown completely into the shade. In case I have not made myself perfectly clear I enclose a sketch.—Yours faithfully,

"MERE TYRO."

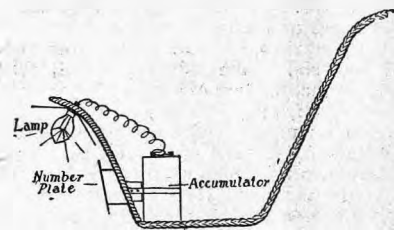
Sir,—As the unhappy possessor of the mystic sign "A.R. 163" I have been at some pains to discover a place to fix this brand of Cain so as to comply with the law as regards illuminating it at night, and without spoiling the efficiency of my lamp for its proper purpose of showing up



Illustrating letter from W. Pemberton.

the road. I think I have done the trick and found a position which has not to my mind been suggested by any other of your correspondents. The rough sketch enclosed will explain my plan, which consists of affixing the number plate to the extension piece of the front mudguard in a perpendicular position parallel to the plane of the machine. I find that in this position the plate comes nicely into the light from the lamp, and the shadow thrown strikes the road so close to the front wheel that it is not noticed by the rider even when picking his way over bad going. A friend to whom I recommended this plan finds that with an ordinary Perfecta lamp plenty of light strikes the plate to sufficiently illuminate it. The plate itself can be readily affixed to the guard by cutting it up the centre for an inch, and then bending each half at right angle in opposite directions so as to form two feet through which to rivet it to the guard. I am quite at a loss at present as to where to fix the back number. To those who carry a stand this is easy, but personally I do without this luxury as I find it in the way; and if I fix the number behind the saddle, the long coats necessary in winter will entirely cover it up. Attached to the right step it is liable to damage when leaning the machine against a wall or trying it at home on a stand, and in the only other apparently practical position—the extreme end of the rear mudguard—I find it liable to catch one when mounting from the step. Just now it looks as though I should have to wear it myself behind, a not very desirable alternative! Can any reader suggest something feasible?—Yours faithfully, W. PEMBERTON.

Sir,—Perhaps the method I have adopted for lighting the front plate on my tri-car may commend itself to some of your readers. The plate is bolted to the lower forward part of fore-carriage and



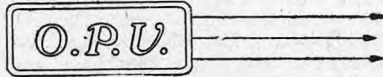
Illustrating letter from "A 926."

from it projects a steel prong to hold a small 4-volt lamp. I have a separate accumulator for it strapped into well of fore-carriage, but this could, of course, be placed in any convenient place on the machine. The lamp with reflector is easily attached and detached as required, and a switch is not a necessity.—Yours faithfully, "A 926."

Remedy for Petrol Valve Leak.

Sir,—I should like to tell J. St. A. Jewell (page 584, 6th January) how to stop the petrol leaking from the tank into the surface carburetter. File a cut in the top of the valve stem to take a screw-driver; then grind well with a screw-driving bit and brace. It stopped my leak effectually.—Yours faithfully,

G. E. MEARS.



Unclean Petrol Vessels.

Sir,—The following is an example of an agent's carelessness:—Arriving at B—, I stopped at a cycle agent's to get fresh petrol. On pouring the same out of a half-gallon measure I found that the person who had used the measure before me had left half a pint of lubricating oil in it; this mixture got in my spray carburetter, and for the next 15 miles I had a lot of trouble with the needle valve sticking. This only shows how careful a rider should be to see that clean utensils are provided by agents.—Yours faithfully,

J.B.S.

Frozen Up: an Interesting Point.

Sir,—I shall be interested to know if any of your readers have experienced a choking of the suction pipe with ice. I have twice been held up on very cold nights through this. I found the ice was water ice, and it was a puzzle to me where the water came from. I am informed by an expert that petrol will dissolve or absorb a small proportion of water; if this is so, and our petrol does contain water, it is worth investigating, as this must decrease its calorific value and the power of the engine. I use a spray carburetter warmed with a jacket through which passes part of the exhaust.—Yours faithfully,

R.P.G.

Petrol and Paraffin Carburetter

Sir,—The following are the particulars of an automatic turbine carburetter that I have just patented and which may be of interest to readers. A is the inlet valve for petrol supply to float chamber. B is the float. C is the connection on float and lifts valve A, closing it when sufficient has entered and depressing same as fresh supply is needed. D is the nipple in one with supply pipe. E is the spraying valve having flanges or eccentrics on lower end rim, or so from bottom end. The white zig-zag line shows the way for petrol, this gives perfect mixture at all speeds—at high speeds the friction of the petrol or paraffin, on its upward journey, prevents excessive supply. The milled headed screw F regulates this, for any powered engine. G is the throttle. H is the hot air entrance, the air encircles both float chamber and spraying chamber, and enters spraying chamber through hole in inner wall which is closed by valve L, and the amount of air is first regulated to suit engine by milled headed nut O, which depresses spring by sleeve W. The valve L works in a guide M and is a good fit in air entrance, but does not have a seating. Sleeve N, as shown detached, has holes in it, to correspond with those on air entrance, and these may be opened to admit the outside air, or closed so that the whole amount of air comes through H from around engine, or the air may be taken in partly or wholly through entrance by turning sleeve N. This sleeve is secured by a screw which works in a slit to allow sleeve to turn just the width of air holes. J is the jacket which extends all round. P is wire gauze. The arrows show the way the air takes when sleeve N is closed and valve L is opened by suction stroke. Of course, the valve is shown closed. The carburetter I claim is perfectly automatic

C22

—is easily set to suit different powered engines—cannot choke up in the valves; both spraying and petrol inlet valves are $\frac{1}{8}$ th inch diameter. The float lifting arrangement gives a perfectly level supply, being engaged with the T piece. The drawing shows float chamber empty of petrol. A plunger, not shown, for depressing float is fitted, but there is no need for this, as there is always enough suction in spraying chamber to supply enough gas first turn of pedals, or engine. The construction of this carburetter is such that any kind of petrol, paraffin or mixture of same gives excellent results. The carburetter is cast in aluminium, with brass fittings.—Yours faithfully,

J. H. WILKINSON.

34, Jubilee Road, Doncaster.

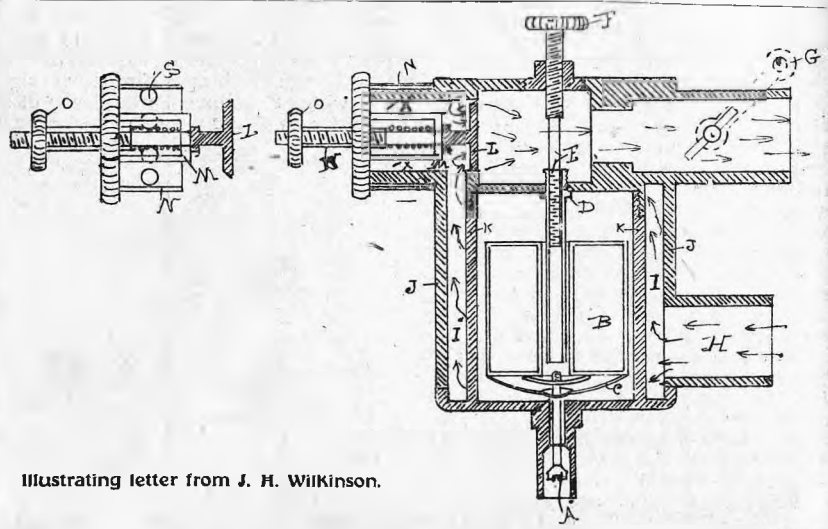
Weight of Motor-Bicycles.

Sir,—Now that this controversy is going on re high and low powered motor-bicycles, may I be allowed to ask a question? How is it that English motor-bicycles are so heavy as compared with foreign makes, the powers being equal? Phoenix Motors, Ltd., are taking a step in the right direction by placing a 2 h.p. motor on the market weighing only 110 lbs., but then they are beaten by a well-known French maker whose 2½ h.p. motor only weighs 95lbs., and their 3 h.p. motor only 105lbs., and there is no gainsaying the fact that these machines are good and reliable. When I am able to purchase a motor-bicycle I shall want one of at least 2½ h.p. but not weighing 130lbs. or so. I must add that I am not interested in the sale of any make of motor, but have been a reader of your fine paper from almost the beginning. I shall be glad to see this point discussed.—Yours faithfully,

H.P.

Sir,—It would appear from your able editorial on this question that you are inclined to blame manufacturers for fostering the high-powered motor-bicycles which at present are the fashion. It is all very well for you to throw the greater part of the blame on the poor manufacturer. In the Ariel and other motor-bicycles, the designs of which I am responsible for, it was my original idea to keep weight down, and to appeal to the class which even yet exists, who desire to possess an easily handled speedy and non-convertible

motor-bicycle, and who are even so much opposed to high-powered machines as to have actually caused me to call the Ariel motor, giving 2½ in. b.h.p. every time, by the nominal name of 2½ h.p., with the idea that the general riding public would give preference to machines which in actual use behaved very well and exceeded expectations. Sad to relate, though you take us poor makers to task, by far the majority of the public seem to prefer a bicycle called 3½ h.p. which they can only dawdle along on at the same pace as an actual 2½ h.p., and then again, most buyers want a motor-bicycle powerful enough, if need be, to take a fore or side-car. This, of course, brings the bicycle pure and simple into the realm of a convertible machine and, as we who have been in the cycle trade so long know, nothing of a convertible type has stood the test of time or even survived. Obviously, it is wise to have a highly-powered machine if a second passenger has to be provided for, while motors are in a transitory state and there seems to be no well tried and thoroughly satisfactory two-speed gear; but to those who only wish to have a motor-bicycle for their own riding I thoroughly endorse your comments. A first-class machine developing 2½ b.h.p. is big enough and fast enough for anybody, and while the weather is reasonable and the roads good, in an expert's hands 30 miles per hour can be and has been averaged time and time again, while with the lightest of pedal assistance there are perhaps not a dozen hills in all England which are insurmountable. Then why, oh, why, general riding public, spoil your riding on the thousands of miles of average roads you have for the sake of those few hills, when they can be, with few exceptions, so easily avoided. It is idle to deny that these machines, such as I have described, are not in active demand. The cry all the time is for higher and higher power. Then arises this aspect of the case which has not been touched upon by you—it is a fact, deplorable perhaps, that the aim of all makers is to make money first and press their own convictions afterwards. Multiplicity of patterns in ordinary cycles must be avoided as the plague in every factory: when multiplicity of patterns occurs in motor-bicycle manufacture the



Illustrating letter from J. H. Wilkinson.



difficulties of organisation and the complications which run away with profits are far, far greater, and it is more than ever necessary to avoid them. It, therefore, follows that if the demand for these higher-powered motors continues, it will not pay makers to manufacture the reasonably powered machines at all, and I am afraid that the select few, very much in the minority, who do not know what is best for them will have very great difficulty in getting their wants filled in the near future. I think the question you raise is one of profound interest to all your readers, and as a maker I thank you for drawing attention to this most important subject.—Yours faithfully,

CHAS. SANGSTER.

Fore-carriages v. Motor Tandem.

Sir,—I think it might be interesting if some users of fore-carriages during the past year would give their experiences. After overcoming the initial difficulties of motorcycling, the desire for companionship arises. The trailer was first introduced, but it was found wanting; and side-carriages and fore-carriages were put forward as improvements. The side-car is a doubtful quantity, and the fore-carriage appears to suffer from a large number of drawbacks. The storage question need scarcely be mentioned as it is most obvious to everyone. Almost every private owner of a fore-carriage whom I have met has admitted that his engine overheated at hills, and we must, therefore, consider water-cooling necessary. Again, belts are not strong enough to use with the high-powered engine or the increased weight of the fore-carriage, and we, therefore, arrive at the necessity for chain drives and two-speed gears. This, again, will lead to increased wear on tyres and greater expense of upkeep; and, moreover, with all these improvements, the weight will be very great and the initial expense high. Only the passenger on a fore-carriage is comfortable; the driver suffers considerable discomfort from vibration; so would it not be better to pay a little more and have a small light car with both people comfortable? Tricycles were improved till they had water-cooling, two speed gears, hand starting, and a high price; since then they have practically become extinct. Without making invidious distinctions we may, I think, take the Raleighette as the latest type of fore-carriage, but it is very similar to the early Century tandem, which machine is now to all intents and purposes a light car. Now motorcycling first appealed to people because of the small expense involved as compared with other forms of motoring, and if the cost is not kept low the pastime will be spoilt. Therefore, I believe in an early reversion in favour of the single tracker, and the most popular form will be the tandem-bicycle. The tandem will beat the fore-carriage on every one of the above points and will also beat it as a winter machine. Having ridden on most Sundays during the present winter, I have been surprised at the entire absence of fore-carriages on the really muddy days, and can only suppose it is due to the fact that, however well mudguarded, the front wheels of a fore-carriage will persist in

throwing mud over the engine and driver. My machine is a lady-back tandem, and many people will at once say that the position of the passenger on a fore-carriage is preferable, but apart from the fact that the fore-carriage passenger catches all the wind, he or she is liable to be badly damaged in case of an accident. Two fore-carriages were entered in the reliability trials of 1903, and both were withdrawn on the first day. In the passenger trial of the Motor Cycle Club I believe a tandem-bicycle was the only machine to go through without being assisted by pedalling. A hill climbing competition with passenger up would be very popular; and I think two classes are necessary in these tests, one for private owners and the other for persons connected with the trade. With reasonable inducements the private owners' class would be very popular, but it is obvious that few private people can spare a fortnight for a reliability trial, with the chance of having their only machine spoilt as well.—Yours faithfully,

E. HODGES.

Motor to Drive Fore-car.

Sir,—I was pleased to see "Storage's" reply to my letter asking that my specification for a Trimo be criticised. Water-cooling is just now under discussion, and any information from one who has tried it will be especially useful. In this connection, as "Storage" has bought a Daw water-cooled engine and, I presume, fitted it to a Trimo type, his experience should be of great value. Will he kindly describe his machine—say total weight, kind of drive, and especially how he finds the water-cooling? Is it much trouble? Has he a pump? How often does he require to refill with water? And—most important of all—will he describe in what manner the cooling is effected—the type and position of his radiators and tank? Again, it would be most instructive to learn if he finds that he can take all hills without assisting the motor. This will help to solve the question of a two-speed gear; for if it is possible to dispense with such an added expense, it should be done. Also, it would throw light on the question as to the size of the engine required; for if a 4 h.p. water-cooled engine will take

hills as desired without a two-speed gear, it points to the fact that a smaller engine such as a 3 h.p. water-cooled, if fitted with a two-speed gear would fully meet the case. I see that "Storage" suggests a Bozier two-speed gear, but I think this type of gear needlessly complicated. I incline more to simplicity, and there is no doubt that before the year is much older we shall see quite half a dozen gears which can be fitted to a motorcycle. For instance, there is the "Hub," which I believe is being adapted to the motorcycle; also the "Paradox"; and I do not see anything to stand in the way of the "Raleigh," the "Sunbeam," and the "Pedersen" doing likewise. If any reader has used any of these gears fitted to either an air-cooled or water-cooled motorcycle, his experience would be most interesting. "Storage" says that he knows little of the magneto ignition beyond that he saw it working in the air at the Shows. Personally I have ridden a motor ("Singer") fitted with magneto ignition for the last two years, and I can safely say that I will never be bothered again with tremblers, coils and accumulators. One objection to the magneto up to the present has been the fact that the engine must be specially designed for it, and this in itself put it out of count, as the great majority of motors are at present designed, but the improvements recently introduced by which the usual design of engine can be fitted with magneto ignition without alteration has removed the main objection to it. This is evidenced by the fact that Panhard's are about to fit their new machines with the Eisemann ignition, and furthermore to rely on this form of sparking absolutely—i.e.—to fit no other ignition as a stand-by. Another objection to the magneto is the extra expense, for it costs £3 more than the usual high tension type. As, however, £3 more or less is not of the greatest importance, I am certain that so soon as motorcyclists realise the look of it, they will insist on having it, despite the extra cost. A sign of the times is that the M.M.C. now offer a choice of ignitions; they will fit either kind to their engines. I have gone into the different points raised at some length, as I am sure that the finding of a machine competent to satisfactorily drive a fore-car is of the greatest importance to a large number of your readers, and if a few more of them who have had experience of fore-car driving would give in their experience, it would greatly assist in the solution of the question. Personally I have gone through these stages of the bicycle—cheap sort—best make—then fitting it to fore-car and finding it under-powered. My next move is to be for a fully-powered engine to drive a fore-car, but I do not want to experiment any more.—Yours faithfully,

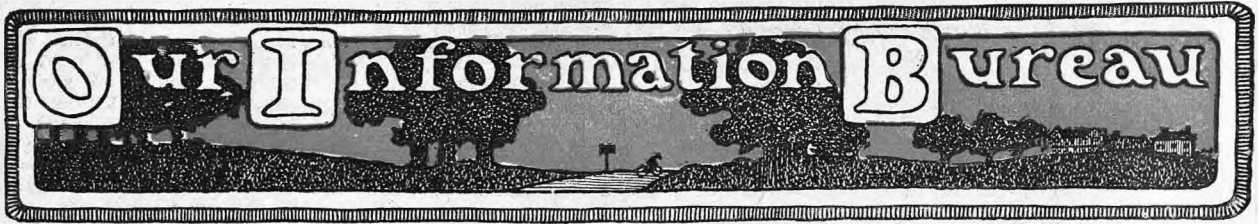
"SPARKER."

Is Flexibility Necessary for Chain-driving?

Following upon the query which "Cyclomot" has asked in "Causerie," we have received a number of letters, but we have not, in justice to other correspondents, been able to publish these out of their order. They will, however, appear next week and they include very interesting letters from the Jehu Motor Co., Ltd., and the Bowden Patents Syndicate, Ltd., and several other correspondents.—ED. "THE MOTOR."



"Heard you smashed up the other day. Not your Aster car, I hope?"
 "No, thank goodness; it was only my dis-aster car."



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.

P. Bentley (London).—No, we do not publish such a list. You would find it in some of the Motor Act handbooks published.

W. Cartwright (Lo'boro).—You can as a rule obtain a set of working drawings from the people who supply castings. Try the London Autocar Company, or the Motor Castings Company.

G.G.J. (Newcastle-on-Tyne). — We should say you would be well satisfied with the No. 1 machine on your list. The makers have had a longer experience than the other makers you refer to. You will have ample power with 4 h.p., and the belt should not give any trouble—more particularly as the machine is to be used only in good weather. The framework is a very good design.

A Special Tri-car.

M.D. (Nottingham) writes:—I do not want a motor-bicycle with the risk of slipping on our greasy roads, but I do want a tricycle with a comfortable seat for one. Your advertisement pages show plenty of machines with a saddle and pedals for the driver, and a comfortable fore-carriage for a passenger; but I submit that there is a distinct want for a tricycle to carry only one, in which the driver can sit (as in a perambulator) in a proper seat, and with the legs protected by an apron. I believe such a tri-car, light, handy and inexpensive, would be welcomed by scores of doctors and others who want to go about their business in all weathers, and cannot afford, or have not room to house a car. Can you tell me whether such a machine is on the market? It seems to me a real want.—The nearest class of machine to the one outlined, and one favourably spoken of, is the Kyma car, which was described some time ago in these pages. Another vehicle something on these lines is the Morette, which has the engine driving on to the front wheel. A one-seated motorcar was exhibited at the Paris Show and described in our Show issue.

c26

"A Novice" (Bloxwich).—Write to our publishing department for a copy of our "Motor Manual," 1s. 1½d. It will meet your requirements exactly.

H. G. Elliott (London, S.E.).—We have gone carefully into your suggestion, but would not advise you making the conversion into a petrol car. As the car is in good running order it would be much better to dispose of it. There is a demand for such a car, for town work.

"Mechanic" (Wellingboro').—We question if you will get any sort of machine at the small figure you have available. There are occasionally some front-driving Werners to be had very cheap fitted with 1½ h.p. engines. But you say you would wish to dispose of the machine at the end of the season for a reasonable figure; and we are not in a position to say you could do this. The 1900 Werners were undoubtedly more powerful than the 1½ h.p. Minerva's and much better hill climbers.

An Electric Tandem.

G. Watkins (Chippenham).—You will not find it an easy matter to construct an electric motor pacing tandem. If you will look up the back issues of "THE MOTOR" you would see in one of the numbers an illustration of the Humber electric tandem that would illustrate the lines on which such a machine could be constructed. These machines have been tried on the track, but the enormous weight of the accumulators was a great handicap against speed. Twenty cells were used, giving over 40 volts. The motor was series wound, and took about 30 amperes when developing 1 b.h.p.

A Damaged Coil.

G. H. Broadley (E. Grinstead) writes:—I ride a 2 h.p. machine, the coil of which, after three months in my possession, has collapsed. The accumulator has only been charged three times. I had it sent to the makers, but they decline to make it good free of charge, because they say the coil has been burnt up by passing more than 4 volts into it. As I have only used it in conjunction with their accumulator, I am told that it would be impossible to put in a higher voltage than the accumulator is designed to accommodate. As they are charging me 7s. 6d. for repairing it, and as I wish to avoid this expense every three months, I shall be glad if you can tell me the name of a reliable coil. It would also be interesting to know the correct cause of this one going wrong so soon.—It would be possible, even with 4 volts, to damage some coils if the current was kept on the primary continuously, in the event, say, of the contact breaker points sticking together. If the winding was a low resistance one, the insulation would be spoilt. We hardly think this has happened, however, in this particular instance, or you could not get it repaired for 7s. 6d. It is more likely that it is a connection that has broken inside. You could rely on an E.I.C. coil, or a Basseé and Michel and a Thompson are also good.

H.F. (Malvern).—You are not required to illuminate the back number on your machine: the front one suffices. You must, of course, carry the rear number in any case.

J. McK. (Cumnock).—You might communicate with the makers of the Phoenix machine and enquire about their two-speed gear: there is also the Cobbe gear recently described.

T. Scowcroft (Pembroke).—The inner end of the winding on the magneto armature is connected to the armature itself, and the other end is well insulated from any of the magneto framework. We should think that the weak spark was more likely to be due to a weak interrupter spring, or else fouled contacts at the plug. We do not say it is impossible for the magnets to have become weak, but, as a rule, they keep strong for several seasons.

"Tric" (Coventry).—The reason each wheel of the tricycle will turn independently is on account of the differential gear being fitted to the axle. You will find the principle of this fully explained in our Manual, a copy of which you certainly should have. The twisting off of an axle may be due to one of several causes, such as a back-fire, locking of the gears, a flaw in the steel, or the steel being of too weak a section or of soft quality.

Transmission, etc.

J.B.D. (Stratford).—(1) We should advise the belt drive in preference to the speed gear and combined drive. (2) You could not have the low tension magneto fitted. The Eisemann high tension or new Simms Bosch magneto could be fitted as a special thing, we believe; but ask the makers. (3) Yes; spare parts easily obtained. (4) Those parts you mention are the principal ones. (5) Yes; it is a good all-round machine, and with the belt drive should take a 1 in 10 hill. (6) Not perfectly silent, of course, but as quiet as the average.

Weak Compression.

T. D. Trew (Perth) writes:—I have a gas engine, 3in. bore, 3½in. stroke, water-cooled cylinder and head, which I have converted to electric ignition, wipe contact, trembler coil, and am now working it with petrol. The carburetter is the latest F.N. pattern. I am troubled by the engine misfiring; generally three or four cycles elapse before an explosion occurs, and the engine has no power. Opening the extra air inlet at the carburetter stops the engine. The electric ignition is perfect: carburetter seems in splendid order; compression, however, is poor. Could the latter be the cause of the misfiring?—You must certainly have the compression good. See to the valves, joints and piston rings. You will find it an advantage to fit a throttle on the air supply of carburetter, and keep this partly shut at starting, otherwise mixture will be too weak.

BUREAU.

A. Harris (Leyton).—(1) Yes; the Fafnir engine is a nice piece of work. (2) The 3 h.p. will be quite equal to the task of drawing a trailer. (3) Difficult to make comparisons. The two engines you mention are undoubtedly good reliable ones, though not quite so well finished in the details as certain others.

A. Sewell (Dagenham).—(1) You can illuminate the rear number if you wish in preference to the front one. (2) An agent or manufacturer can take out a general licence at £3. (3) You can now legally run a trailer at 20 miles per hour. (4) There are any number of people who make a speciality of supplying number plates. Look up the advertisements.

Starting Troubles with a 2½ h.p. Motor.

A.W. (Mitcham) writes:—Following your advice of January 11th last, I put the small collar on valve pin of my F.N. carburetter higher up. This has entirely got over the flooding, and my 2 h.p. machine now goes as well as ever. I wish to ask you another query re a 2½ h.p. motor which I fit on same frame at times, using the same carburetter. My trouble is at starting, after it has been standing, for, say, half an hour. It is useless getting on machine and pedalling unless on a down grade. What I do is to flood carburetter, lift the exhaust, and make a run, and when the motor fires I jump into the saddle. But the trouble is to get it to fire. I did this running for quite a mile recently, and at last got going when all was right, the motor going for 15 miles without a misfire. On making another call, and trying to start, I had the same trouble, and so on every time. I may say the motor has a very high compression, for unless I give a terrific run before dropping the exhaust the back wheel skids along the road, and I have already worn pieces of the cover through this skidding. The engine pulley measures 5in., and belt rim on a 28in. wheel is 20in. dia., both measurements over all. Pedal gear is 70in., with 7½in. cranks. I may add that the carburetter gives plenty of gas when once going, for I dare not have throttle more than half open, for even then and with the spark retarded half way it flies up everything, and on the level I have to almost shut the throttle. Now, with my 2 h.p. motor and same carburetter, I simply push off, drop exhaust, and off it goes first time. I don't suppose I have ever run a dozen yards to start this 2 h.p. however long it has been standing. I never squirt petrol into the head of either motor on starting. Should I do so? I may say that with the 2½ h.p. motor on stand it starts up almost at once. I hope you will be able to help me out of this trouble.—You certainly should inject some paraffin and petrol mixed into the cylinder. It facilitates starting undoubtedly. It is not clear whether you are able to reduce the air supply at the carburetter or not, but it is necessary with some machines to start. You should see that you are getting a really good spark at the plug, and have the make and break well adjusted. See that there is no sticking of the inlet valve by pressing the stem down at starting. Providing the belt does not slip, and all the above points are seen to, the motor should start well.

W. Miller (Bootle).—In addition to the makers you mention who supply petrol there are Messrs. Whittaker, St. Mary's Mills, Lower Broughton, Manchester, and The Gas Improvement Company, Devonshire Street, London, E.C., who make "Carburine." The agents for the Matchless Spirit are Messrs. Jones and Co., Lichfield.

F. P. Chapman (London, S.W.).—It will take 12 hours to fully charge No. 1 accumulator, and 14 hours for the No. 2, using a 32 c.p. lamp—assuming they are quite discharged to commence with. No. 1 will run 500 miles; No. 2—700 miles, or near it. Order a new "Motor Manual." It gives the fullest information on the subject, and will be a great help to you.

A.D. (St. Leonards).—We have carefully considered your idea for a high-speed rotary steam engine. It would not work in practice unless you provided a mechanism to cut off the steam at three-fourths of the stroke automatically every revolution. If this were not done the steam pressure would keep the flap valve shut, and the rotary piston would only move a small distance, as there would be a cushion of compressed air in front of it.

Launch Query, etc.

M.H.R. (Ironbridge).—For running the launch you would get good results by using an 8-volt accumulator of, say, 40 ampere hours' capacity. Of course, you would find the Castle dry battery also very good (8 cells). (2) Rather out of date, but sound, reliable vehicles, slow and noisy; all of them pretty much the same. We have heard of the 4½ Benz going up 1 in 8 when in good order. (3) Yes; belt driven. (4) If a 1903 make, it is good; if earlier make it would be poor at hills.

Compression Weak.

E.N.W. (Sheffield).—(1) If, as you say, there is a persistent loss of compression, and no amount of grinding in of the valves and packing of the joints effects a remedy, and you cannot trace any leakage at these points, we can see nothing for it but to have the piston out, and see what condition the rings are in. There have been cases of cracked cylinders; but, as a rule, you would have found this out by close inspection. (2) The shaking loose of the nuts on the engine may be due to them being a slack fit on the threads. If there is room, fit a lock nut over each nut. Another method, of course, is to cross-pin them. This means drilling a small hole right through the nut and pin. (3) Unless you have a good release valve in crank case oil is sure to get blown out.

W. L. Edge (Ludlow).—The correct specific gravity of the acid in the cells previous to the charging is 1.170 for any type of cell. When fully charged, the density should increase to 1.215.

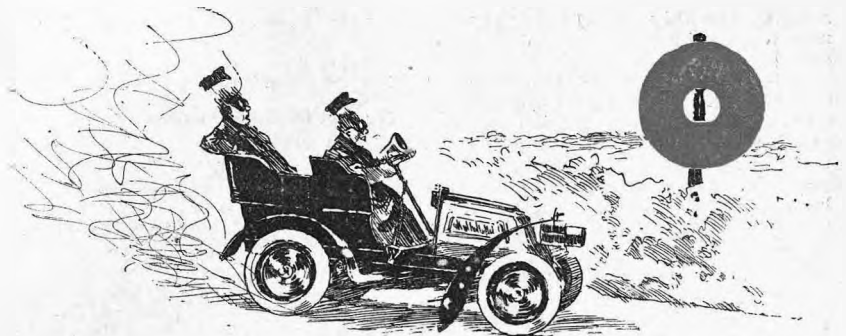
A. Wood (Mitcham).—We can only think that the petrol supply is choked in some way—perhaps a small particle of grit in the jet. All other details being in order, the motor is bound to run properly if the petrol supply is kept up. If you have ground the valve in rather deeply it may be necessary to have the collar moved further along the stem.

M.E.Q.—Have you examined the spark plug and seen that the inlet valve is not sticking? If you get a charge into the cylinder and have a spark the engine must start. Do not have the ignition lever too far back, try giving it a gradually increasing lead and have most of the air shut off to the carburetter to start with. Dry batteries will not effect a remedy, if the accumulators are in order.

H. Eachin (Glasgow).—The small De Dion engine fitted to the make you mention was certainly a fine piece of work, but for some reason or other not much is heard of it now. In fact we believe that the makers have discontinued its manufacture. There was one obvious fault we considered with this engine, and that was the pulley was too small in diameter, causing the belt to slip. General equipment of machine was first-class.

Lubrication, etc.

E. L. Vincent (Belfast) writes:—(1) I have got a quantity of gas engine oil. I would like to know how to utilise it for an air-cooled 1½ h.p. motor-bicycle. How would it do if I boiled it and let it cool slowly? (2) When I give my engine a charge of oil, and after it has run for a minute or two, the oil seems to run out over the crank-case. How can I remedy this? (3) Sometimes my motor seems to lose power on hills. At other times I have to put the petrol supply on full and advance the spark before it will go at all. (4) Also my accumulator seems to run down very quickly—it is an F.N. make, four-volt. How long should it last with a non-trembler coil? My motor is a 1½ h.p. Minerva (Excelsior).—(1) Not possible; special process for making air-cooled engine oil. (2) See to the air release valve, or it may be the joints are leaking. (3) Fault of either overheating or weak compression. (4) Accumulator run down, probably through an internal short circuit. The new "Motor Manual" would help you greatly on all these matters





G.A.T. (Streatham).—We do not think you could possibly get a belt rim to fit the narrow space in the forks. Even if it was possible, the belt would foul the tyre. It would not be a serious business to get the stays set out sufficiently to clear a standard rim. Brown Bros. stock several varieties.

F.C. (Burnley).—(1) You will have to pay somewhere about £70 for a good mount for two. (2) 4 h.p. would be the most suitable power, but nothing less than 3½ is advisable. (3 and 4) Both desirable. (5) Chain transmission. (6) Have two rim brakes at least and a band brake in reserve. (7) A new mount will be the best.

F. H. Burgess (Eccleshall).—(1) You should have no difficulty in manipulating a spray carburetter. (2) Entirely a matter of opinion which system of ignition is best. Each has its specially good points. There are some good dry batteries on the market now, so that you are not tied to accumulators necessarily. (3) The Minerva is good sound work and accurately fitted.

H. Gray (Mobberley).—It would be best for you to see the diagrams of the cycle of operations in chapter 1 of the new "Manual." The induction valve (ordinary type) opens shortly after the piston has descended on its down stroke. The exhaust valve should open a little before completion of firing stroke.

Timing.

P.F.S. (London) writes:—For some months I have been wrestling with an old pattern 1½ h.p. Royal Enfield motor: it can run decently when it pleases, but that is much too seldom to please me. But, spite of my absorption of a year's tips from "THE MOTOR," I have been unable to alter its gait. I was assured by an expert that timing was correct, but from measurements I have just made with a spoke through compression tap I find it as follows:—Length of stroke is 2 13-16ths inches, exhaust lift has lead of ½ inch, exhaust closes 7-16ths before completion of scavenging stroke. Will you please tell me how much, if any, alteration, to make?—Reduce the lead to ¼ inch or 3-16ths, and the exhaust setting should be about right. Better to reduce the lead than shut the exhaust valve too early.

Speed Gear.

H. W. Smith.—Particulars of the various two-speed gears adaptable to motor-bicycles appear from time to time. As to whether they can be fitted to certain makes of machines is a question for the gear makers to settle. The new "Hub" gear seems to be one of the most readily adaptable. (2) The Longuemare carburetter. (3) Carless' .680 petrol is considered equal to any for quality and for certain types of surface carburetter is indispensable. There are any number of good lubricating oils obtainable. To mention a few, there are "Motorol," "Jackdaw Oil," Salsbury's "Exceline," the De Dion Company's "D" oil, and Lucas's special brand. (5) The licence 5s.; registration 5s.; revenue tax 15s. For tri-car the fees are the same as for a motor-bicycle. All these points are fully dealt with in the new "Manual."

C22

H.R.—(Deanshanger).—It is the driver's licence that you are required to be able to produce on demand.

F.C. (Manchester).—There is no carburetter made as yet for motor-bicycles that comes exactly up to your standard. The Longuemare and F.N. are the nearest.

F. Hilton (Oldham).—Yes, it can be done. Explain your wants to a good local motor mechanic. A Longuemare carburetter is what you require.

J. Foster (Plymouth).—(1) The Excelsior. (2) Revenue tax 15s. (3) Order copy of new edition of the "Manual." You will find the standard machines described there.

E.F.G. (Liverpool).—The 30s. referred to in the query was for two separate machines, viz., 15s. revenue tax on each. Both a side and a fore-carriage are reckoned on the same footing as a motor-bicycle.

E. E. Nicholls (Stourbridge).—The present Act is in force for three years. There is no likelihood of your hopes being realised meanwhile. (2) If you find it more convenient you can illuminate the rear number.

L. J. Vosper (W. Malling).—Yes, the "Castle" dry cells are very good. (2) Two sets can be coupled up to a two-way switch in the same way as a double accumulator. (3) Gear 1 to 5. Motor pulley 4½ in., back rim pulley 22 in.

"Spark" (Leicester).—You evidently have a very inferior piece of high tension cable if the sparks get through the rubber. Get a new length and see that it is of the best obtainable quality and then you should have no further trouble.

R. J. Richardson (Stockton-on-Tees).—Although the 2 h.p. motor you refer to is a very good one, it is not at all suitable for the extra load of a fore-carriage. The least power you can do with for this type of machine is a 2½ h.p., and even then you will have to pedal hard on certain hills.

"Erg" (Woolwich).—The compression tap hole should be plugged up with a short bolt. You will get better results with a valve lifter fitted. As the inlet valve is directly over the head you could have a small hole (⅛th) drilled in the dome for admitting paraffin. You can either work the valve lifter with a jointed rod or Bowden wire.

J. Alien (Willesden).—(1) We should not advise you to alter your present pulley of 4 in. diameter unless you can fit a larger belt rim—say, 22 in., and then with a 5 in. engine pulley you would get a good drive for the Trimco. (2) Yes, it is desirable to have the hot air connection made to the exhaust box. You can have a tap fitted in to regulate it if you wish.

Tricycle Conversion.

J. A. Dixon (Bury).—Hardly possible for us to do more than express an opinion on the matter. The conversion of a tricycle to Trimco would certainly involve a lot of work, and would require to be done by an experienced man. We really think the more satisfactory way would be to sell the tricycle, as it is of a good make, and running well. If converted it will be but a compromise between the two types, and you would have to risk finding a market for the differential axle.

ANSWERS BY POST.

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

Thursday, January 28th.—A. S. Gibbs (Hornsey), R. B. Cranwell (Auckland, N.Z.), W. Albiston (Oldham), H. J. Walker (Leytonstone), W. Peek (London), J. A. Briggs (Whitby), R. Sumner (Bolton), M. Hall (Louth), H. Eachin (Glasgow), H. R. Fussell (London, W.), W. Mills (Kirby Malszeard), W. Whitlock (London, S.W.), J. D. Jones (Cheltenham), J. A. Mearns (Aberdeen), S. Wilkinson (Birkenhead), H. Holland (London, S.W.), W. J. Akerman (Acton, W.), J. W. Tomlin (Ely), W. W. Genn (Wimbledon), G. Alderson (Northampton).

Friday, January 29th.—L. T. Roberts (Birmingham), E. Anderson (St. Ives), S. R. Hall (Ealing), H. E. Aldridge (Harrow), R. Archer (Wicklow), R. Toomer (Swindon), G. Bartholomew (Gloucester), J. C. Pownall (London), C. Wood (Wilton), A. D. Beetham (Sedbergh), F. B. Waide (Southampton), W. L. Cook (Heathtown), L. Penwarden (Longhope), D. Marsden (Sunderland), J. C. Frank (Kirbymoorside), A. Warnery (Westcliffe), A. Hudson (Worthing), C. Mackinder (Sheffield).

Saturday, January 30th.—W. R. Murdoch (Eskbank), F. Donovan (Sheffield), H. Tutte (Fareham), Bellchiffe, Clegg and Co. (Burnley), E. Holroyd (Morecambe), P. Turner (Quorn), T. Parker (High Wycombe), R. M. Lambert (London), J. Scott (Southampton).

Monday, February 1st.—J. B. Wilkin (W. Hampstead), Reynolds Bros. (Barnsley), H. J. Beresford (Camberley), Drake and Co. (Penge), A. C. Benham (Lyme Regis), C. N. Stuart (Catford), H. B. Hooper (Salisbury), C. S. Edmonds (Birmingham), H. Butler (Helmsley), B. C. Wade (Norwich), J. Woodside (Belfast), J. H. Wilkinson (Doncaster), H. T. Steed (Leytonstone), J. Paterson (Glasgow).

Tuesday, February 2nd.—J. Dengate (BATTLE), F. Orbell (Clare), G. H. Brochie (London), A. E. Gibbs (Leamington), C. W. Crafter (Plais-tow), C. T. Spanton (Wimbledon), H. T. Barnes (Sevenoaks), J. Crawford Woods (Banbury), E. Middleton (Broadway), E. Kerridge (Darlington), E. Cocks (Weybridge), G. F. Tingley (Lincoln), W. F. Milns (Stamford), C. Seelig (Ascot), A. G. Heckman (Henley), A. K. Brandreth (Crewe), G. E. Hennigan (Fulham), C. Archer (Manchester), F. Stevens (Kingston), D. Marsden (Sunderland), A. Illingworth (Paisley), T. Scowcroft (Pembroke).

Wednesday, February 3rd.—J. Sheen (Stourton), F. Home (Egham), A. E. Adams (Stoke Newington), G. B. Ibbetson (Newton Abbott), Thompson Bros. (Aberlour), G. Docker (London), T. A. Elmore (Maidstone), R. W. Mitchell (Wandsworth), W. E. Barrett (London), J. M. Hotchkiss (Carlisle), J. J. Walne (Dorchester), J. Mealing (Yorktown), E. C. Trant (Devonport), J. H. Wilkinson (Doncaster), H. D. Squire (Stratford), W. Johns (Llanbedr).