

# Motor Cycling

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## & Motoring

### THE LIGHT SIDE.

Somehow or other the motorcycle gives one the appearance of topheaviness, perhaps because the eye has not yet familiarised itself with the machine. We look on it as a bicycle with a lot of heavy gear stuck about it, instead of as a motor with cycling attachments. No doubt some of the motorcycles one sees are merely clumsy bicycles which have broken out in an eruption of machinery, but the better made machines are really beautifully proportioned and symmetrical. In a year we shall have learnt to know them, and they will then look no more like a topheavy bicycle than the well-designed motorcar of to-day looks like a horseless carriage; and yet two or three years ago the sight of a motorcar instantly suggested the absence of the horse.

F. T. Bidlake has been examining a plain-clothes policeman's watch, and has unearthed a few plain-clothes facts, one of which is that a plain-clothes policeman's chronograph action jams three times out of four. That is to say, dear reader, you have one chance in four of having your speed justly assessed, assuming that the rest of the plain-clothes policeman's preparations, observations, and calculations are free from jamb; if they are not, your chance will be a still smaller one, or, in other words, seventy-five out of every hundred cyclists and motorists will be unfairly assessed. Or, again, if you

make four journeys from London to Brighton, your true speed will be recorded once, and on the three other trips you will be credited or debited with a hypothetical plain-clothes velocity which the chronicles of the police intelligence of the day will duly note.

If you want to know the speed at which a bicycle revolves,  
Ask a peeler; every member of the force  
Has a method mathematical, by which he slowly solves  
Great problems which the magistrates indorse.  
With a course exactly measured, and a Wortleberry watch,  
Adjusted to the level of his reason,

He skulks behind  
the blackthorn,  
passing motor-  
ists to catch,

A game for  
which as  
yet there's  
no close  
season.

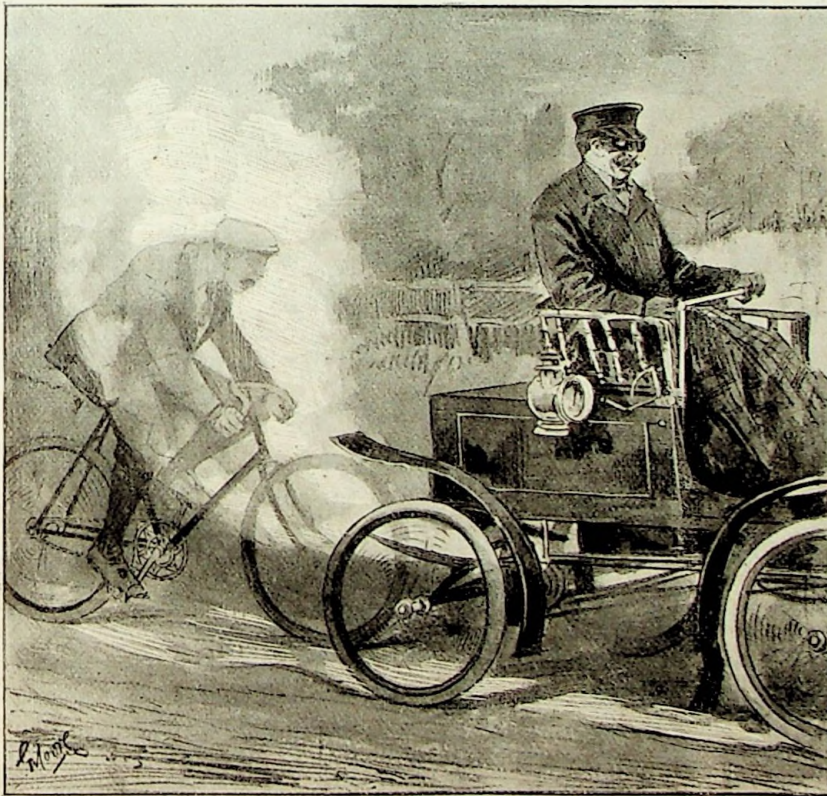
We've trusted so  
in Robert, that  
with something  
like a shock

We learn  
that his  
chrono-  
meter's a  
rotter;

But its rotten-  
ness won't help  
you, dearest  
reader, in the  
dock,

Unless the  
Bench  
should  
chance to  
ride a  
motor.

From the bi-  
cycle a dog, pro-  
vided that he be  
of a robust con-  
stitution to start  
with, has little  
to fear; indeed,  
the apprehension  
is all on the side  
of the cyclist.  
One has seen a  
dog run over  
fairly and  
squarely (or,



*A martyr to bronchitis who has been ordered to inhale steam thus gets over the difficulty while cycling.*



rather, roundly) by a bicycle, get up, shake the dust off its hide, and lie down again in front of another. But when it comes to the added weight of the machinery of a motorcycle, to say nothing of a car, the average dog feels a sense of satiety after the first dose. The legend "Beware of the Dog!" which one sees on a gatepost will have to be altered, and put inside the gate for the benefit of the dog—"Beware of the Motor!"

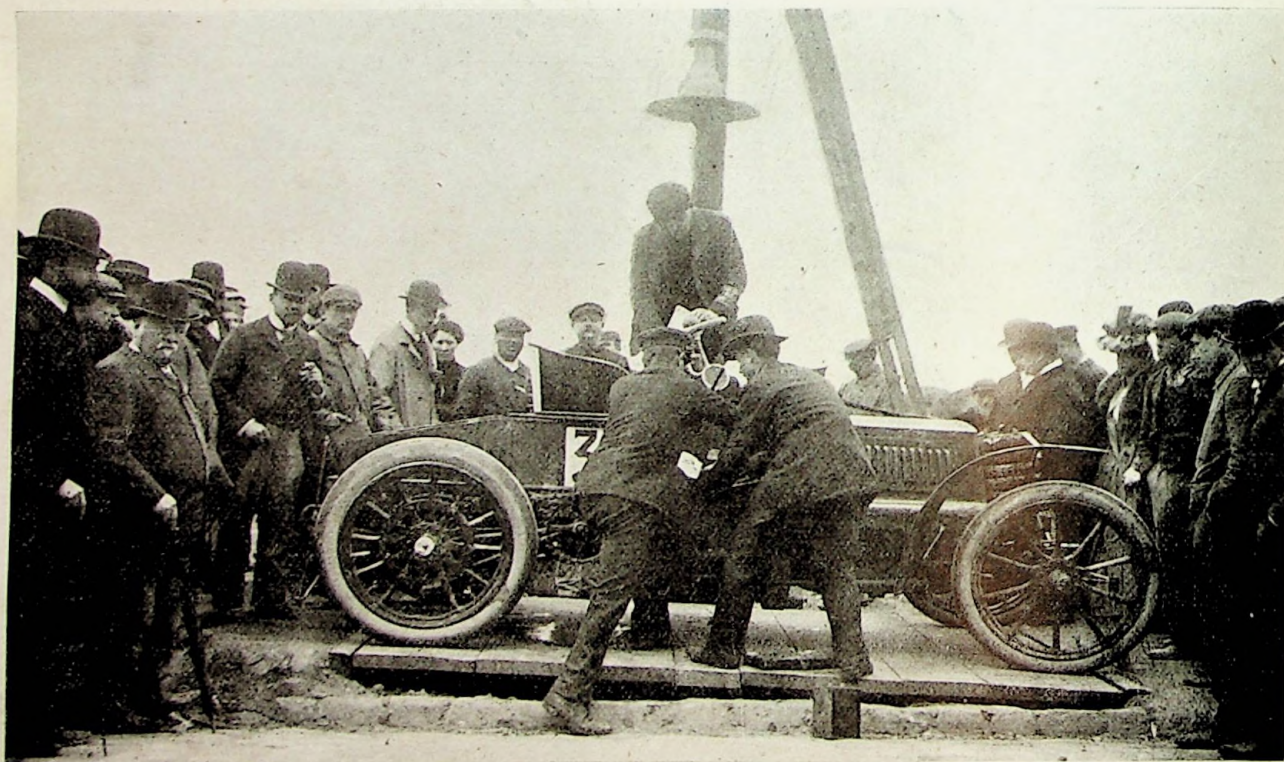
The cycle "jotter" of the "Athletic News" has had a marked copy of a French paper sent to him which appears to have alarmed him, as he proceeds to inveigh against the dangers of motor pacing. Such expressions as "terrific speed," "dreadful accident," and "bad cropper," lead the reader gently on to the writer's ultimatum on the question, which is that he "has always failed to realise what earthly good can arise out of the pacing business except for trade purposes." The same remark will apply to almost any of the existing games and sports of the nation. They are all of them good for trade, and good for nothing else, according to Kipling and gentlemen of the "Athletic News" persuasion.

And this is especially the case with a sport which has, like most good sports, a spice of danger attaching to it, or some element in it which takes it a little beyond the reach of the ordinary untrained and inexperienced spectator. The "alarmist" seldom attacks croquet or blind man's buff—their value to the state as innocent and healthy recreations is obvious; but he is down, ever and again, like a load of bricks, on football, polo, mountaineering, cycling, motoring, air-navigation, and other pursuits of an equally foolhardy and futile nature.

As regards motor pacing, it is, of course, the pace that kills it in the estimation of its opponents. Forty miles an hour is just a wee bit too quick for some folk's wits to take in, and when you argue that speed, speed, and more speed is a necessity of the age we live in, they retort, as a matter of course, "More haste, less speed: remember the hare and the tortoise!"—as though that taught us anything. The races of to-day and to-morrow are between *not* hare and tortoise, but hare and hare. "Slow and steady" was a good enough maxim for our grandfathers, but we have altered it to "swift and steady"; and any sport which, like motorcycle racing or pacing, tends to the gradual evolution and perfection of a swift and steady vehicle, deserves encouragement rather than disapprobation.

Motorists on the other side of the Channel have apparently as many grievances about the dangers and discomforts of their streets as we have. A provisional code of reformed traffic regulations is published in the current number of the French Touring Club's monthly review. Dogs are to be warned off the road altogether, but no explanation is offered as to how this most-devoutly-to-be-wished consummation is to be effected. Perhaps the Parisian "gendarme" has more time on his hands than the London peeler, and will see to the moving on of canine trespassers.

A la bas! gare! get out of ze vay!  
Make room for ze motor, n'est-ce pas?  
Ze poog and ze poodle have bese had zare day.  
And ze leetle dorg Tray must not "trespass."



#### WEIGHING IN.

An interesting snapshot showing a racing motorcar being weighed preparatory to the start for one of the big French races. The photo was taken at the start of the recent Alcohol Trials.



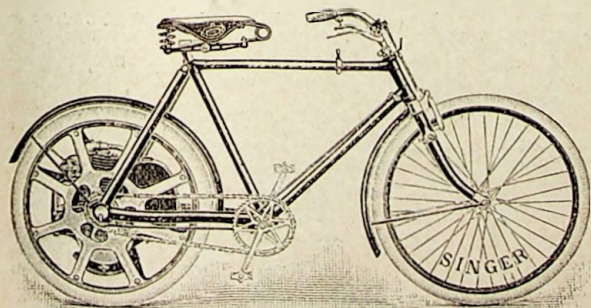
## THE SINGER MOTOR WHEEL.

The "Singer" Motor is claimed to be the first engine of purely British design and manufacture to be applied to bicycles, and sold in any quantities. The Singer Company still retains this design, as the result of two years of practical testing. Various minor improvements have been effected during that time, and the makers consider that their system offers distinct advantages. If they did not believe so, we presume they would put their engine (which is by itself a very fine piece of work) in some other position, on their various forms of cycles, instead of within the wheel. Indeed, we believe that their engineers have tried many positions for the motor, before adopting the novel and compact arrangement which gives it such a marked individuality. The Singer motor has many good points in its favour.

### Some Special Features.

The following special points are claimed for the system, and justified by severe road tests, extending over many thousands of miles:—(1) Engine protected from damage and cooled by revolving wheel. (2) Magneto ignition, with positive interrupter gear. (3) Vertical engine and high-class roller bearings. (4) Combined spray and surface carburation, giving economical and consistent results. (5) Absence of batteries, accumulators, coils, tremblers, sparking plugs, and wiring. (6) Positive driving, giving great power at hills. (7) Simplicity of control and management. (8) Ease of detachment and carriage of complete motor engine for repairing purposes.

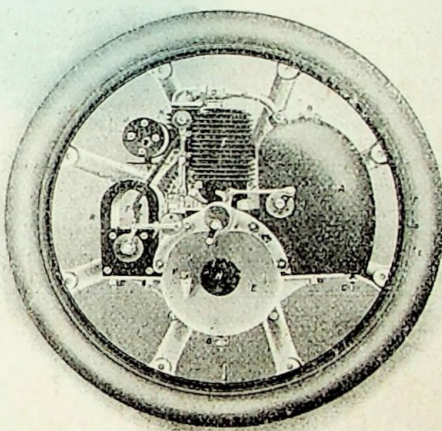
Dealing with these various claims in turn, there can be no doubt that the engine and all its appurtenances are well protected from almost any damage which could result from a fall. This is testified to by many of the firm's agents, who employ the machines for trials and hiring-out purposes. Under these conditions, they are subjected to treatment for which very few motors are designed. When the engine is properly oiled, overheating is an unknown thing, an advantage accruing from the continual current of air which is whirled about the cylinder by the revolving wheel sides—the whole engine, of course, being stationary. With regard to the magneto ignition, this is a remarkable instance of its absolutely successful employment. Messrs. Singer attribute this to the adoption of a special interrupter gear of their own design, which has been tested to give effective sparking at anything between 200 and 2,500 revolutions per minute. The slight adjustment of the contacts, required about once in a thousand miles, is a matter of comparative simplicity. Owing to the absence of batteries, coils, wiring, plugs, tremblers, etc., the chances of electrical troubles are practically abolished, and those of breakdown thereby reduced to a minimum.



THE SINGER MOTOR-BICYCLE.

### The Bearings.

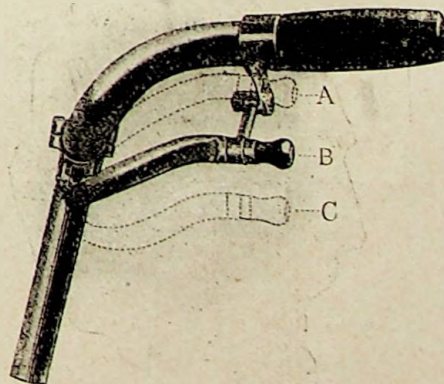
A special feature is made of fitting very highly finished roller bearings. These are over one inch wide, and have never been known either to break or to seize; and after road running on test machines for upwards of 5,000 miles, they show no signs of wear, the grinding marks still being visible in the main bushes.



THE SINGER MOTOR WHEEL.

### The Carburetter.

Another special feature is the carburetter, which is shown in the diagram on next page. This at one time created considerable interest as to its construction, but it is in reality very simple, as will be seen. The petrol is sprayed from the upper tank on to a fixed cork block in the lower chamber, whilst a shallow level of petrol is kept at the bottom. The level is regulated by the lower cork and float valve. This small amount of petrol is splashed by road vibration over both corks, thereby assisting the spray in vaporisation. That the combination gives great economy was proved at the recent Crystal Palace trials, when the Singer showed less petrol consumption than any of its competitors. In the same trials it will be remembered that the Singer was the only machine that accomplished the complete hill test without pedal assistance, thereby pointing to the advantages of direct driving. It would seem that a system which embraces positive driving may yet play an important part in the settlement of the much-debated transmission question. Simplicity of control may well be claimed for this—the first one-lever machine. All necessary regulation, except the mixture, is actuated by a lever on the handle, as shown in the diagram. There is therefore no necessity to remove the hand from the handle grips, and the whole attention can be given to the steering, and the speed regulated under any conditions. Carburation is far less sensitive than the average, and consequently the engine



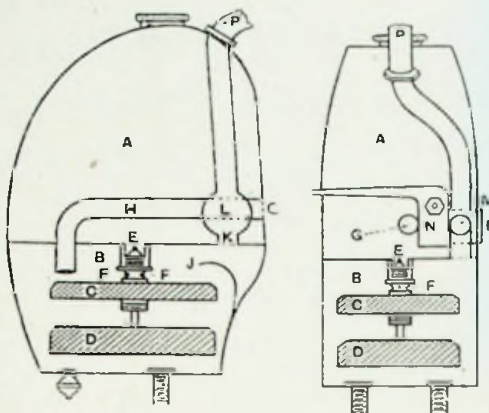
THE CONTROL LEVER.



practically is governed by the throttle and exhaust valve lifter. Both these appliances are in their turn fully controlled by the single lever, as shown, the upward pull raising the exhaust, and the downward twist gradually opening the throttle to the carburetter.

#### *Ease of Attachment.*

Yet another feature is the ease with which the motor wheel, containing the engine and all its fittings, can be detached. The main illustration shows the wheel with one of its sides removed. These sides resemble a couple of saucers placed edge to edge and held there by bolts. The bolts at the same time cause the edges (which are suitably shaped) to grip the internal periphery of an extra strong Westwood rim of standard section. One wheel side is therefore obviously very easily removed, when all parts are readily accessible. This operation, however, is not at all necessary for minor purposes, such as cleaning the valves or adjusting the ignition. All details have been carefully worked out to allow of these being performed without dismantling the wheel. It must be remembered that every part of these well-constructed machines (with the exception of the magneto) is manu-



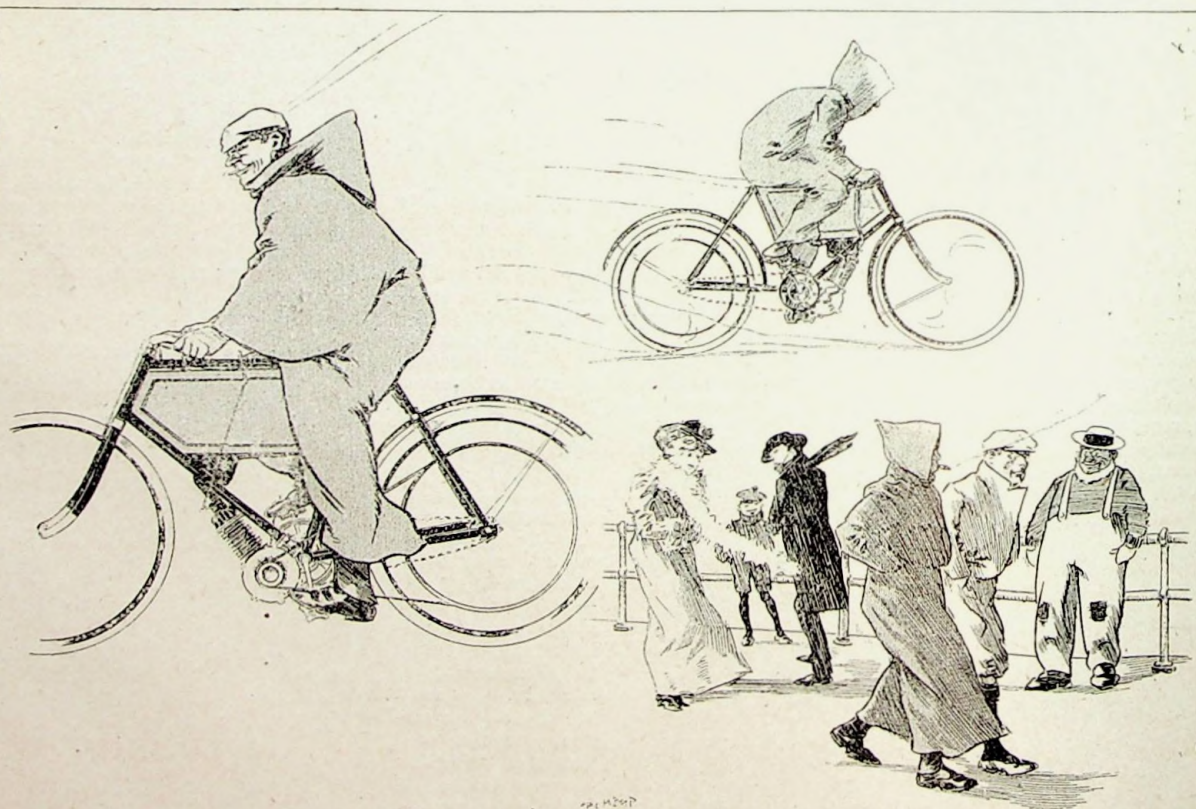
THE SINGER CARBURETTER.

This consists of tank (A) for petrol; in the lower compartment is fixed the carburetter proper, this consists of two flat corks, the upper one (C) being fixed and on to which the petrol is sprayed through the holes (F F) in the sprayer; the lower cork (D) regulates the level of petrol by controlling valve (E); the road vibration splashes petrol over the corks, thus assisting vaporisation.

factured in the works of the Singer Cycle Co., at Coventry, and the workmanship is quite up to the reputation which the cycles of that well-known firm have enjoyed for so many years.

We are informed that the company are frequently receiving testimonials from both old and new riders of their motorcycles, which are very gratifying, and that the introduction of the motor wheel to tandem tricycles and tri-voitures for carrying two riders is proving a great success. The single tricycle ever since it was manufactured has been an unqualified success. The motor being in the front wheel, great luggage capacity is given behind. The Singer motors are really made for touring and general all-round road work. The speed element is not specially catered for, the makers considering that reliability and power at hills are the most essential points, and these have been particularly studied. At the same time, a speed of well over 20 miles an hour can easily be attained.

The frames of all the machines are specially constructed to stand the extra strain put upon them by the driving of the powerful engines, and in this respect they differ from other pattern of motorcycles which are designed on conventional lines.



*Suggestion for a motor over-costume evolved during the recent arctic month May-vember. Just fancy how comfortable it would be "on the front" after a stormy and blizzard-some mote!*



## SPARKING PLUGS.

*The Features of Various Types Described.*

The purpose the sparking plug is intended to serve is that of forming a convenient means of producing the electric discharge in the combustion chamber of the motor. It must be remembered that the sparking plug has nothing to do with the actual generating of the electric current—this is done either by the coil and battery or the magneto dynamo—but we have to conduct the current right into the combustion chamber, and then provide what is termed a spark gap or break in the continuity of the conductor, so that the current will leap across it in the form of a spark, and thus ignite the mixture of petrol vapour and air in the cylinder. Now, as the current which produces the spark has a very high pressure or voltage, it will be quite evident that one of the first things we must provide for in a sparking plug is efficient insulation, because the tendency of the current to escape or leak away without producing a spark is a very strong one. We moreover have to select an insulating material that is capable of resisting the heat produced in the combustion chamber by the rapid ignition of the charges. The materials

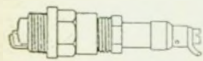


FIG. 1.—USUAL PATTERN  
DE DION PLUG.

we are confined to are porcelain, mica, and glass. Porcelain is generally adopted, as it is capable of withstanding a very high temperature with but a slight deterioration in its insulating properties; however, there is always present the risk of this material cracking, due to expansion by the heat; and a cracked plug is generally useless, as the spark will get through it in preference to jumping across the points. But it must be admitted that there are many thousands of these porcelain plugs in use and giving every satisfaction.

The breaking of plugs, indeed, seems to be mainly a question of chance. There are numerous instances of porcelain plugs running 1000 miles and over without requiring renewal. One or two attempts have been made to compensate for the expansion and contraction in a porcelain plug by employing a spring in the construction. One of these was illustrated in a recent issue of "MOTOR CYCLING."

### *The Construction of the Porcelain Plug.*

The insulating sleeve of porcelain is mounted in a screwed boss or plug; into this fits a threaded nipple which screws down on to the porcelain, an asbestos washer being placed top and bottom to avoid cracking and ensure a gas-tight joint; in fact, we may regard the arrangement as being somewhat like a stuffing box. Passing through the centre of the porcelain core, we have the high tension wire; this terminates in a platinum point (though not in all types) at one end, and the other is provided with a screw or connecting terminal to which the wire from the coil is attached. In practically all patterns the metal case or boss of the plug forms the other conductor, and the insulated point is generally bent over so as to come within  $\frac{1}{16}$  inch of it.

### *A Novelty in Porcelain Plugs.*

In Fig. 2 will be observed a porcelain plug with the insulating core made in two sections. These are reversible, and in the event of the inner one becoming injured, or in the event of deposits of carbon effecting a short circuit, they may be turned round without stopping to remove the deposit.

A hexagonal nut is placed in the recess, and mica washers are placed between the metal and the porcelain. The central wire, it will be observed, is threaded so that accurate adjustment of the spark gap can be obtained. This plug is manufactured by the Mosler Co., Broadway, New York.



FIG. 2.—A REVER-  
SIBLE PORCELAIN  
PLUG.

### *The Question of Single or Double Insulated Points.*

There are some authorities who contend that the employment of two insulated points in the sparking plug would be an advantage, inasmuch that certain short-circuiting troubles would be removed. This system is, in fact, adopted on one or two patterns of motors for car work. It, of course, dispenses with the use of the frame of machine as the return conductor; on the other hand, it increases the amount of visible wiring, but from an electrical point of view it is certainly an advantage to have two distinct circuits. The dimensions of a two-terminal plug would also have to be considerably larger than the present single pole plug as used on motor-bicycles. A type of double pole plug is illustrated in Fig. 3.

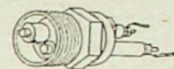


FIG. 3.—A DOUBLE  
POLE PATTERN.

### *The Use of Mica for the Insulated Core.*

The strongest rival to the porcelain plug is undoubtedly the mica unbreakable plug. Mica has long been used in electrical work as an insulating material of the highest quality: it is able to withstand the temperature of the combustion chamber without cracking or losing its insulating power in the slightest—in fact, many users of these

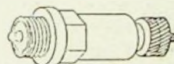


FIG. 4.—MICA PLUG.

plugs say that they improve as the temperature increases. Another advantage they possess is that they are built up without any packed joints, the insulating core fitting into a tapered hole so that the effect of the pressure of the explosion is to wedge it in perfectly gas-tight, there can consequently be no loss of compression: this material, not being of a brittle nature, stands rough handling better than the porcelain. The Electric Ignition Co. have recently brought their unbreakable plugs to a high degree of efficiency, and in one of their latest patterns they have adopted a neat method of adjusting the wire—which by the way is made of pure platinum, so that the exact sparking distance between the points can be readily fixed. The central wire in the majority of plugs is made of nickel, terminating sometimes in a silver point; but there can be little doubt that platinum is the best material.

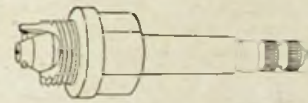


FIG. 5.—E. I. C. UNBREAKABLE  
PLUG. THE POINT IS NOW  
MADE ADJUSTABLE.

### *The Use of Glass and Quartz as Insulating Materials.*

There is at least one sparking plug in use in which a specially annealed core of glass is used; the main idea in adopting it is because it is possible to see the ignition actually taking place, and thereby judge the working of the motor accordingly. A material that we do not remember being used for plugs is *Quartz*. If it were not for the difficulty in working this material, it would seem to be the ideal insulator; it is capable of standing wide variations of temperature, is intensely hard, and its insulating properties are unequalled. A plug made of this material would, in our opinion, be practically everlasting. To soften it, or liquefy it, the heat of the electric furnace would be necessary. Of course it is possible that the plug could be ground into shape and the central hole for the wire drilled. We make this suggestion, because it would be interesting to hear of some experiments in this direction, as doubtless many users would be willing to pay a good price for an absolutely indestructible sparking plug.

(To be continued.)





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## OPINION.

### *Motorists and Magistrates.*

¶ We are glad to see "Truth" espousing the cause of the motorist. In the current issue attention is drawn to a rare instance of a Bench of magistrates taking a reasonable and dispassionate view of a charge of furious driving against a motorcar driver. At Llanrwst a gentleman was summoned for driving his motorcar furiously in the district, and a policeman deposed that in his opinion the car was travelling at a speed of 15 or 16 miles an hour. An innkeeper and a farmer corroborated the constable's evidence, and, as "Truth" remarks, in nineteen country police courts out of twenty this evidence would have been sufficient to ensure the conviction of the motorist, in spite of the fact that he and two other passengers in the car denied that the speed was anything like so much as 15 or 16 miles an hour, or that there was the slightest danger to anyone on the road. Not only did the Llanrwst Bench weigh the evidence with care and intelligence, but they actually visited the spot, and, having assured themselves that the constable had occupied the worst possible position for judging the pace of the car, and feeling sure that his evidence was the outcome of error, they dismissed the summons. Our contemporary further comments on the subject generally, and we make no apology for quoting the following, which we should like to think would be taken to heart by the police and magistrates nearer home than Llanrwst :

"There is scarcely a pretence at an impartial hearing of such cases in many country police courts, particularly in some of the home counties. The bias of the magistrates is undisguised. They hate the new method of locomotion even more furiously than their grandfathers hated railways. All progress is detestable in their sight—in fact, as the 'Times' said the other day, they are the sort of people who, if they had the logic of their opinions, would still be wearing woad and champing acorns. The flimsiest evidence is considered good enough on which to convict an automobilist for furious driving. Nothing is more difficult than to estimate correctly the speed at which any object is travelling, and the noise made and the dust raised by the average motorcar greatly intensify the difficulty. Only expert timekeepers, with exact measurements to work upon, can arrive at an accurate judgment. Yet the word of a rustic constable that a car was going 20 or 30 miles an hour is generally accepted as though it were gospel, no matter what evidence to the contrary is called. By any simple test—such as guessing the speed of a man walking or running, or of a railway train or a carriage and pair—magistrates could easily satisfy themselves of

the possibilities of error in making such calculations. But many of them do not want to know anything of the kind. What they desire is to drive motors off the road, and in pursuit of this purpose they commit the most flagrant injustice."

This is all very true. We would undertake to say that if the average individual were taken for a ride on a motorcar and asked what he considered the pace, he would nine times out of ten inaccurately estimate it. It is a preposterous thing that constables should always be believed and motorists punished on evidence that is often not only flimsy but utterly and positively absurd.

### *The Increasing Popularity of the Motor-bicycle.*

That the motor-bicycle is rapidly advancing in public favour we have every day abundant evidence. Innovations that have marked epochs in the history of cycling have generally had to pass through a trying period of probation. It was so with the first safety bicycles; then came the pneumatic tyre and it will be remembered the hard time it had to pass through before it became firmly established in public favour. Within quite recent times we had the example of the popularising of the free-wheel as evidence of the innate conservatism of the cycling public in taking up anything new.

But the motor-bicycle appears to have jumped into favour at a single bound; its advantages are so patent to every one; even that important personage known as the "man in the street" has become favourably impressed with it. And there is every reason why this should be so; as a handy and highly efficient means of locomotion, the motor-bicycle stands unequalled. Its working and general manipulation are being simplified to such an extent that it is the easiest thing possible for the practical cyclist to transform himself into a motor cyclist. For touring and long distance riding, the motor-bicycle is speedily proving that it will become the ideal machine, and it is a surprising fact that even for short distance jaunts and business purposes, the machine is becoming a rival to the pedal driven cycle. As evidence of this, let anyone take observations along a busy London thoroughfare, and it is quite a common sight to see a motor cyclist negotiating the traffic with an ease and freedom from danger that gives a striking answer to the question so often asked by the general public—Is the motor-bicycle a dangerous machine?

### *On the Road: Sampling the Orient.*

We recently had an opportunity of examining and subjecting one of these machines to a short trial. As is already known, a high-powered motor is used—namely, a 2½ h.p. "Aster"—but a 3 h.p. is being fitted to some of the latest models. The workmanship of the whole machine is good, ample strength being provided in all the parts. A very simple and effective belt-tightening device is fitted, but it is rarely necessary to use this except when climbing steep hills, the flat belt of special material giving a good drive with a very moderate tension. The carburettor is of the spray pattern, with float feed and air and throttle valve combined in it. Control is effected by means of the advance spark lever, and the power can be quickly shut off by means of the handle switch. There is very little noise from the exhaust, as the silencer is of large dimensions, and vibration is also very slight.

Owing to traffic on the road it was not possible to put the speed up to any extent, but even at the slowest speed the machine swings along with powerful impulses, indicating the great amount of reserve power for speed and hill-climbing. To those who do not mind the manipulation of a heavy machine, and who want a motor with power enough to take any hill it would be possible to meet on a road, we should say that the Orient would meet their requirements well.

*The Editor of "MOTOR CYCLING" is at all times pleased to give his best consideration to the contributions of readers, either literary or artistic. The experiences of practical riders of motorcycles are always welcomed, and their publication assured if they are of such a character as to be helpful to others. In submitting MSS., drawings, or snap-shots, it should be stated whether remuneration is expected.*



## IN TRANSIT.

*Some Experiences of a Cyclist in the Transition Stage.*

### **The Motorcycle on Hills.**

Until quite recently the non-motorist would consider that, whatever the motorcycle might be capable of doing on the level, it would come near to failure on hills, whilst a stretch of country that was at all hilly would be fatal to its sphere of usefulness. Of course, this has been proven to be an utter fallacy, and it is precisely on hilly ground that the motor-bicycle best displays its merits. No cyclist of my acquaintance, including, as they do, some of the crack speed men, has yet held for more than a few miles the back wheel of a motorcycle that was really being set to show its best pace. And as for hills, why, with a little assistance on the part of the rider, a speed can be attained at which no cyclist can live; and as for descents, the motor again romps away at a pace which few cyclists dare follow, or can ever hope to attain.

Invariably do I find that the assistance which is generally given to me by the motor on any gradient steeper than about 1 in 20 is misunderstood. "What!" says the onlooker, "must you pedal that heavy thing up the hill? Won't it go up by itself?" But, as a matter of fact, with the engine working well, the act of pedalling does very little indeed towards the actual propulsion of the machine. The good [that is effected is indirect. Momentum is maintained, and the engine is kept working at near the speed which gives the greatest efficiency, this being at the highest rate of revolution. The power that the rider is required to put in for this purpose is not a quarter of that which would be required to propel a cycle up the same hill. Just recently I took part in a test run up a hill nearly a thousand yards in length which is to be used for a climbing competition very shortly, and the pace attained was an eye-opener.

### **How to Mount a Hill.**

My method of attacking a hill is to work up for it by first getting the right mixture, and by approaching the hill with the sparking fairly advanced and the pace as high as possible. This pace is maintained as far as can be by pedalling and by a gradual opening of the throttle valve. When this is fully advanced and no more can be done in that direction the sound of the explosions is carefully observed, because the mixture has a way of altering between the top and bottom of a hill. Usually, if any alteration in the mixture tap be required, it is for the admission of more air, but as a mistake would be almost certain to be fatal, the mixture should not be experimented with. Sometimes the sparking must be retarded when the hill is really steep, in which case a greater impetus may frequently be given if a favourable moment be chosen for suddenly, as the engine is pumping away, advancing the ignition and then pulling the lever back again quickly. This permits the engine to race a

little bit, and to pick up its speed again. I have noticed the benefit of this kind of manipulation when taking a car up a hill. By careful handling of the belts the pace up hill can be accelerated.

### **A Changing Mixture and a Slipping Belt.**

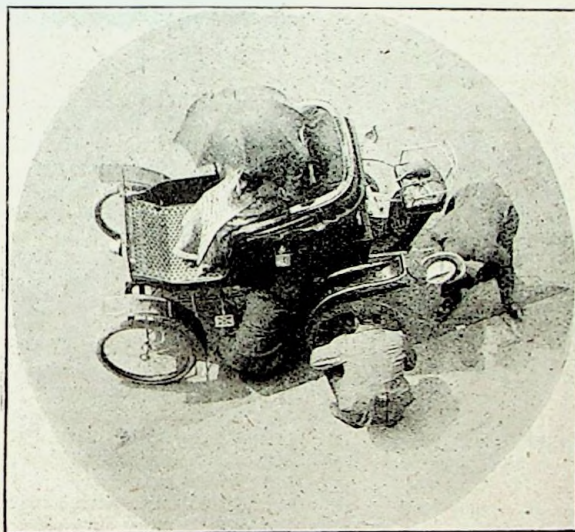
There are two difficulties which become more apparent when negotiating hills than at any other time. I have had my engine suddenly cease firing near the top of a hill—an occurrence which was due to the changing of the atmosphere, necessitating an alteration of the mixture tap. On my last week-end trip this happened twice, and the cessation was so sudden in each case that at first some more serious trouble was anticipated. The machine was kept going by pedalling on the first occasion whilst a rapid

survey was made, and it was quite by chance that the mixture tap was shifted. The sudden stoppage and the occasional firing afterwards were by no means suggestive of defective mixture, but this is what proved to be the sole cause of the trouble, and, when an identical cessation in the firing occurred later on on another hill, the mixture tap was at once shifted, and thereupon the motor worked well. No doubt a different stratum of air was entered, causing the defect in the mixture on each occasion. The slipping of the belt is another cause for worry. I give my belt a careful dressing with castor oil occasionally in accordance with the instructions of an acquaintance who has had a large experience with belts, so I presume the belt is in good condition; but it seems to have contracted, and, moreover, the groove of the engine pulley is practically smooth. The result is that a lot of slipping takes place, whilst, if the belt be tightened, the other trouble of breaking at the joint commences. I

am wondering if [the groove of the engine pulley could be lined with leather, cemented in. If the leather would wear long enough it might give a better grip. One maker in London has improved his own machine by making cross cuts all round the pulley. The sharp edges do not seem to chafe the belt, which is practical proof in itself that the belt is prevented by this method from slipping. This question of the effective transmission of the power demands the urgent attention of makers.

A little device which I am trying on my machine just now is one of Hooydonk's spring seat pillars. The pillar is supported in an outer shell from which it is insulated by a strong spiral spring, friction between the two parts being taken on the roller bearings placed at the top of the shell. A second spring absorbs any jar that would otherwise result from a recoil. I must say that it makes the machine much more comfortable over rough macadam roads such as we have in London's suburbs.

CYCLIMOT.



A NOVEL SNAP.

*Taken by Mr. H. G. Wray, one of our readers, from an upper room in his house, last Sunday. The car is a light one, and Mr. Wray says the man who is doing all the work was a passer by who volunteered his help; the owner is stooping down at the back of the car, while the gentleman in foreground comprises the audience.*



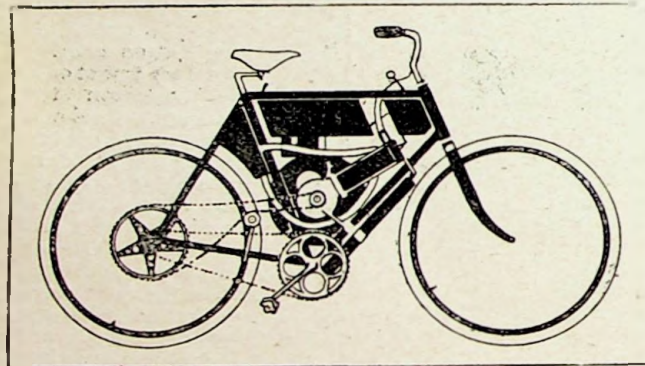
## SOME INTERESTING FEATURES OF AMERICAN MOTOR-BICYCLE DESIGN.—Continued.

### *The Steffey.*

This is one of the very few motor-bicycles fitted with water-cooling. The power of the motor is  $1\frac{1}{2}$  h.p., and it is specially designed with a one piece crank and shaft, and large diameter outside fly wheel. The position of the motor is inside the frame and inclined over the main tube. Chain driving is employed direct on to a large sprocket mounted on the rear wheel axle. For tensioning purposes, a small idle pulley is provided. This is carried by a bracket fixed to the rear stays. The petrol tank will be observed carried below the horizontal tube, and between the diagonal and back forks the water tank is fixed. The ignition is electric, on the coil system. Control is effected by the advance spark lever and gas throttle. A silencer of effective dimensions is fitted just below the main tube. This machine is made by the Steffey Manufacturing Co., 2,722, Brown Street, Philadelphia.

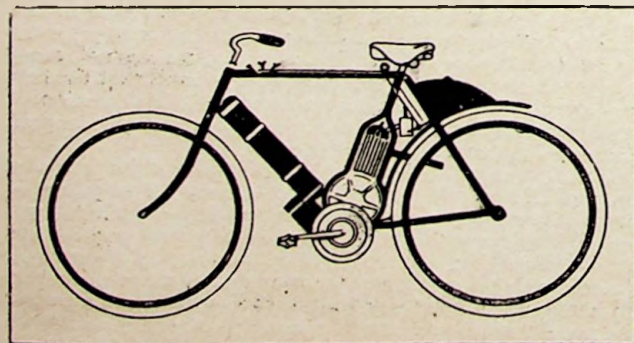
### *The Royal.*

The Royal Motorcycle is manufactured by the Royal Motor Works, Spalding-Bidwell Building, New York. It is designed on very neat and symmetrical lines, and has some special features worthy of note. Amongst these might be mentioned the build of the frame. The seat post is divided above the cylinder and joined again at the bottom bracket. The motor, of  $1\frac{1}{2}$  horse power, is fitted in the space thus formed, and it is very



THE STEFFEY WATER COOLED PATTERN.

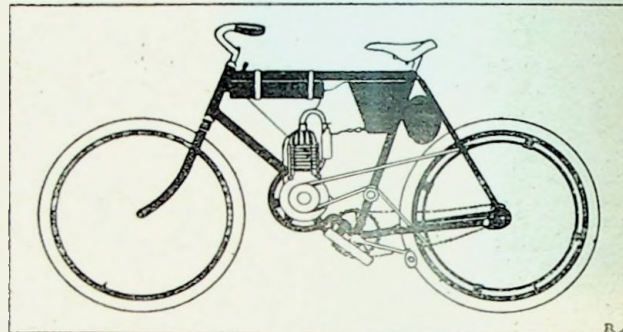
rigidly clamped to the tubes. The radiators on the cylinder, it will be observed, are of a special shape, and these ensure very effective cooling. The drive is by gearing on to the bottom bracket, and from thence by chain to the rear wheel sprocket. The carburetter is of the spray pattern, and is supplied from a tank carried by the back forks. The controlling levers are mounted forward of the top tube and communicate by rods to the throttle and spark advance gear. The ignition coil and battery are clamped to the main tube.



THE ROYAL.

### *Stahl's Motor-bicycle.*

The Stahl Motor-bicycle is made by the Home Motor Manufacturing Co., 2,047, Ridge Avenue, Philadelphia. Either a  $1\frac{1}{2}$  or 2 horse power motor is fitted. It will be observed that the motor is fixed in a vertical position, and clamped to a loop made in



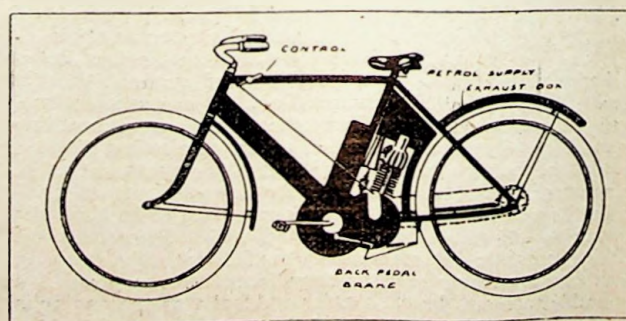
STAHL'S MOTOR-BICYCLE.

the main down tube, and the width of tread is not thereby increased. The drive is by means of a leather belt on to a pulley mounted by stout arms to the rear wheels. A tensioning pulley is provided, and this is manipulated from the saddle. The speed is controlled by a single lever, and the range is from six to 30 miles per hour. The ignition batteries are carried in the usual case behind the saddle, and the coil is carried under the top tube. A spray carburetter is fitted, and the petrol tank has a capacity for 100 miles.

### *The Keating.*

The manufacture of this machine has been continued by the Eisenhuth Horseless Vehicle Co., and in the 1902 model many original features are embodied. The motor is mounted at the rear of the diagonal tube, and drives by chain and reduction gear to the rear wheel. A clutch for motor connection and disconnection with the chain drive is fitted. Instead of a float feed carburetter, a vaporiser, which is arranged directly underneath the petrol tank, is used, and this works perfectly through a very large range of temperature. At an actual test it was run indoors at a temperature of  $65^{\circ}$ , and then run outside with the temperature  $8^{\circ}$  below zero, without requiring alteration in the adjustment.

Another novelty is the utilisation of the rear mudguard—which is made hollow—to serve as the exhaust box. The petrol tank is fixed in the angle formed by the rear stays and diagonal tube, and an extra supply can be carried in a tank fixed over the rear guard. Single lever control is adopted, and when the lever is pulled right forward the power is shut off, and the machine is set ready to start.



THE KEATING.



## IGNITION AND SPEED REGULATION.

The characteristics and properties of an electric spark vary according to the method by which it is produced and the kind of atmosphere it takes place in. Thus, for instance, a feeble spark can be obtained by making and breaking the circuit of an ordinary Leclanche battery. This would not, however, be able to ignite ordinary gas, but if we take a rod of vulcanite and electrify it strongly by friction with the hand, it will give a spark that will ignite gas easily; this principle is adopted in the electro gas lighter. Ordinary gas can be ignited by a spark of high pressure but of small volume and

### THE LOWER THE PRESSURE OF THE GAS

the weaker the spark required to fire it. Now, in the cylinder of the motor we are dealing with a gas under compression—say from three to five times the pressure of the atmosphere—and under the most severe conditions for firing, the higher the compression, the greater force or pressure is requisite to make the current break through, but we may actually produce what is known as a "thin" spark in a highly compressed mixture and yet not fire it. This fact is often strongly evidenced when a cheap, badly wound coil is fitted to the motor; in air it may give a spark half an inch to three-quarters long, but this is no criterion of what it will do in the combustion chamber. A good coil wound with the theoretical number of turns and thickness of wire, giving a  $\frac{3}{8}$ -inch spark in air, and of a thick flaming nature, is quite sufficient with A1 millimetre spark plug gap to fire the strongest compression likely to obtain in a bicycle motor. A good spark for firing is always characterised by being brilliant and emitting a vicious snapping noise in air.

With the ordinary form of De Dion break on the motor

### A SINGLE SPARK

only takes place at the instant of breaking the circuit, but when a trembler is fitted to the coil and a positive contact on motor, a stream of sparks takes place across the plug points, this proving of greater certainty of ignition. Another point worth noting is that sparking at the platinum means invariably bad or intermittent sparking at the plug; there should be practically only the faintest spark at the contact maker if the coil condenser is large enough.

The constructing of a compact and highly efficient coil suitable for a bicycle motor demands theoretical and practical electrical knowledge of a high order such as is not likely to be employed on some of the cheap coils on the market and the best device possible is to have this part of the motor equipment of the highest grade. A coil is not a thing that can be repaired on the roadside and must, above everything else, be relied upon to act at all times.

### A FEW HINTS ON SPEED REGULATION.

There are three methods by which the speed of the motor may be governed, (1) by adjusting the throttle or quantity valve (2) altering the time of sparking; (3) altering the strength of the gas mixture. It would be well, first of all, just to consider what is the ratio of the power given out to speed. These small engines are not capable of governing themselves like an electric motor or steam engine—in the sense that they automatically supply themselves with more or less gas according to the work demanded—the rider himself has to become expert in manipulating the regulation gear. Now these

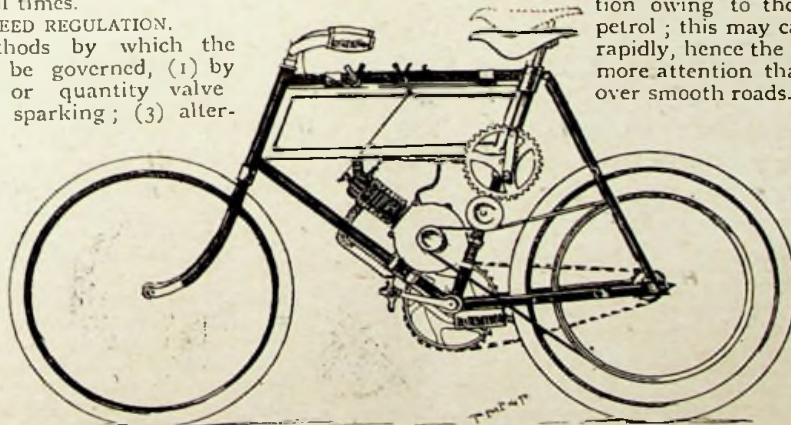
small engines only develop their maximum brake horse-power when running at a high speed. Therefore we get less and less power as we reduce the speed and the power by no means falls off in proportion—thus taking the top speed of a  $1\frac{1}{2}$ -b.h.p. motor as 1,800 revolutions per minute, on reducing to 900 revolutions—other factors being equal—the power will be much below  $\frac{1}{2}$ -b.h.p. and at last we could reach a certain critical speed if we went on testing at still lower speeds where the power would be nothing. In actual riding it may be taken as a general rule that on smooth level roads the motor will develop sufficient power for a 12 miles per hour speed, at about

### HALF ITS MAXIMUM REVOLUTIONS.

To attain this, the adjustment of the mixture tap must allow of the passage of a correctly proportioned charge into the cylinder, the sparking should be advanced to about three-quarters of its limit and the throttle valve be half open. On coming to slightly rising ground listen carefully to the beat of the motor, and keep it steady by advancing the spark a shade farther. A short but steep hill must be "rushed," at about 150 yards from it advance the spark to almost its limit and shut off a little of the air, giving a stronger mixture, and don't open the throttle any wider than absolutely necessary. With a long, stiff hill in front of the motor the sparking must be advanced to its full limit, the beat of the motor must be kept steady by altering the mixture and throttle gradually opened to the full. If there are signs of the motor "labouring"

### A LITTLE JUDICIOUS PEDALLING

for a few yards should bring it up to pitch again. This is only likely to be necessary on a very severe hill; as soon as the top is reached, shut the throttle and open the exhaust, so as to get as much cold air into the cylinder as possible—of course, this is presuming there is a descent for the machine to run down with power off: if not, you must run with the weakest mixture possible and compression tap open for some little time. Now to get very slow speeds—say five to eight miles per hour for traffic riding—is rather difficult, because we shall be somewhere near the critical speed of the motor, but it is possible with skilful management of the throttle valve, spark well retarded and compression open to get a slow speed; if the mixture is strong, late firing will be necessary to avoid a jerky motion. The assistance of the brake will also be found valuable for low speeds, just sufficient pressure being applied to put a perceptible resistance against the motor. On riding over rough ground the carburation is very liable to alteration owing to the splashing about of the petrol; this may cause the speed to rise very rapidly, hence the regulating gear will require more attention than is necessary when riding over smooth roads.



### THOUSANDS IN IT!

Perhaps one of the most serious items in motor-cycling is that the rider is given but a small amount of exercise. The above suggestion is a simple remedy and almost explains itself. A jockey pulley and two cogged wheels actuate a piston-like saddle pin, raising and lowering the saddle about three inches, thus imparting a horse-like motion to the rider. Highly recommended for the liver.—(Our Tame Inventor.)

The Automobile Club of America held a meeting on the 31st ult. at Long Island, when various attempts were made on the mile and the kilometre. Walsh, on Fournier's car did the best times, covering the distances in 55 $\frac{1}{2}$  sec. and 34 $\frac{1}{2}$  sec. respectively. Baker, on an electric car, took 36 $\frac{1}{2}$  secs. for kilometre; Davis on a "Steamobile" 46 $\frac{1}{2}$  secs., and Metz on a motor-bicycle, 43 $\frac{1}{2}$  secs. The last-named also rode a mile in 1 min. 10 $\frac{1}{2}$  secs.



## NEWS.

### The M.C.M.

The "Motor Cycling Manual."

Order a copy of it in good time.

A motor gymkhana will be held at the Ranelagh Club on Saturday.

The fifth annual Motor Exhibition will be held at the Crystal Palace, Leipzig, from the 18th to the 27th October next.

German-made motorcycles do not appear to be in great favour in the Fatherland, very few being on view at the recent motor show.

The Gordon Bennett Cup will probably be competed for in the Paris-Vienna race—between Champigny and Belfort, it is said, about 250 miles.

No less than 139 nominations have been handed in for the Paris-Vienna race up till June 1st; all late comers have now to pay double the entrance fee.

Out of the 111 mayors through whose territory the Paris-Vienna contestants will have to race, 106 have agreed to permit the cars to pass at racing speed.

The Emperor of Germany has ordered an inspection of the new Daimler-Mercedes car, with a view to placing an order. These cars are the ones which gained so many victories at Nice.

Continental electrical experts do not believe implicitly in Edison's new battery; they say that 100 miles have already been covered with one charge, and they look forward to the 5,000-miles trial to show the defects of the system.

Mons. Cudell, of Aix-la-Chapelle, who intended to start with Dr. Lehwess on the motor journey around the world, has committed suicide. He was the founder of a big motorcar concern, and a well-known and esteemed engineer.

### A 5,000 Miles Run.

Just as we were going to press yesterday (Monday) the start was to have been made of a 5,000 miles run, by Mr. H. Hewetson, on a Benz car. The idea is to drive the car 100 miles a day for 50 consecutive days, and thus show the reliability of the present-day car. At the completion of the task the car will be sold by auction, and the proceeds given to the Prince of Wales' Hospital Fund.

### Fines for Speed on the Road.

The bench of magistrates at the Uckfield (Sussex) police court had a busy day last Thursday, hearing a number of summonses for furious driving of motor-vehicles. The captures were made on the steep hill in the town of Uckfield, the delinquents being on their way to Bexhill just before Whitsun. The first defendant pleaded guilty to a charge of driving furiously and was mulcted in a fine of £10 and costs. Other fines of £5, £3 and £1 were inflicted, the bench chopping them about so that it was difficult for later defendants to know which was the cheaper course—to plead guilty or not guilty. Two motor-cyclists were fined 7/- and costs, and 10/- and costs respectively, whilst two car owners, who were defended by Mr. Staplee Firth, succeeded in establishing their innocence. A further batch of summonses will be heard on the 19th inst.

### Infectious!

[Six miles an hour is the limit of speed allowed for motorcars at Kimberley, where it is the duty of the sanitary inspector to see that the regulation is not infringed.]

In Kimberley, that far off town,

They're rather out of date,

They keep the speed of motors down

To something under eight.

And if the ruthless motist just

Allows his pace to swell,

The sanit'y inspector must

Locate the noisome smell

He's just the sort of man, of course,

To counteract such crime,

As fever spreads with startling force

In that far-distant clime.

For should you get the petrol germ,

Defying his detection,

It's bound to lead, that's what I learn,

To dangerous infection.

And so the Sanit'y Inspect—

Or, as is right and proper,

Assume the duties of detect—

I've, like our far-famed "copper."

Meanwhile, we hope that some great mind

(By some benign inflatus)

Some potent motor lymph will find

With which to vaccinate us.

Motor-bicycles are becoming very popular in the Stafford district.

Messrs. Merryweather have just introduced a steam-propelled fire engine capable of travelling at 30 miles an hour. It can get up sufficient steam to start within two minutes of a call. Oil fuel will be used.

The Sporting Club of Rome will organise a race—or, rather, a series of races—for motors, divided into five classes, for the last day of the World's (Cycling) Championships, the 15th inst. The distance will be one mile, flying start.



### Sparking Plugs.

Read the interesting article in this issue.

An important article on lubrication and lubricating oils will appear next week.

The Welbeck speed contests will be held on August 9th, and the Bexhill meeting on August Bank Holiday.

We understand that the New Premier Cycle Company, Coventry, are arranging to put a motor-bicycle on the market at an early date.

All Midland motor cyclists should make a point of visiting the R.W. meeting on Saturday next. The motorcycle racing should prove interesting.

Three special prizes of 3000, 2000 and 1000 francs respectively are to be given in the Paris-Vienna race for motors actuated by alcohol in place of petrol.

Motorists, generally, and cyclists will do well to be careful when riding in the Isle of Wight, as the police there are, we learn, to be supplied with stop watches.

"Cycling" this week contains an excellent portrait of Wattelier, the winner of the great Bordeaux-Paris race. Also many other interesting illustrations of passing events.

The Starley Challenge Cup, which was competed for at the recent meeting at Coventry, will be again put up for competition at the Rudge-Whitworth race meet at the Butts, Coventry, on Saturday.

The Italian kilometre record for motors was beaten on the 23rd ult., by Signor Dobelli on a 30 h.p. car, his time being 30½ secs. He also rode 5 kilometres in 3 mins. 18½ secs., a record for Italy.

An exhibition of cycles and motor-bicycles is to be held in the Market Hall, Stafford, on the 9th, 10th, and 11th July, this year. Any of our readers requiring further information should communicate with M. Mitchell, Cycle and Motor Engineer, Royal Bath Buildings, Stafford.

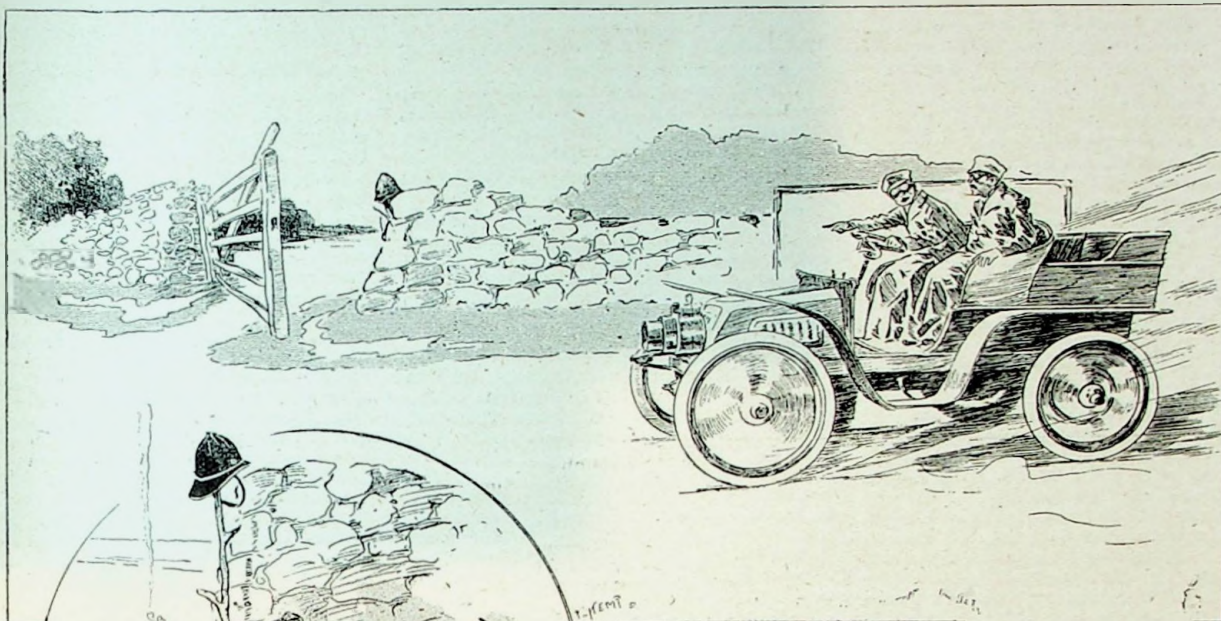
### A French Congress.

A congress of French motorists was held at Dijon from the 6th to the 8th inst. The three chief questions considered were the customs formalities, the duty payable on motors, and the issuing of certificates to qualified repairers, the last-mentioned being a matter which the A. C. G. B. & I might well take in hand for the United Kingdom.

### A Club Engineer.

The Automobile Club have made a notable departure in engaging a motor engineer, in the person of Mr. E. H. Lancaster, who has had a large and varied experience with all patterns of cars, and has been thoroughly trained to the work in the best workshops. It is obvious that the services of Mr. Lancaster will be of the greatest value to the members when mishaps occur, or when expert advice as to the purchase of a car is required. In his spare time, the chief engineer will undertake the training of men to become motor servants to members.



**WEARY VIGIL.**

*How Robert preserved the dignity of the law,  
and also had his siesta.*

At a recent club committee of the A.C. it was decided that the fee for the registration of motor-cycles under the competition rules should be reduced from £1 rs. to 5s. This is a step in the right direction.

**Motors for Ambulance Work.**

A motor ambulance has just been successfully tried in Marseilles. It is driven by two 6 h.p. motors, so arranged that each motor can be driven separately, and in the event of one failing the other can be utilised, while the faulty engine is being put right. The engines, reservoirs, etc., are placed on the fore-carriage, and the rear part of the ambulance, which will carry four persons, is mounted on rubber cushions, so that vibration is almost entirely eliminated. As soon as one or two slight modifications have been made, the vehicle will be placed at the disposal of the military hospital authorities.

**Jarrott Third.**

On going into figures more carefully it has been found that Marcellin, on a light car, was second in the Circuit du Nord, instead of Jarrott, who takes third place. The average pace of the winner, Maurice Farman, a son of the Parisian correspondent of the "Standard," by the way, was just over 45 miles an hour, Marcellin and Jarrott covering about 41½ miles an hour. Bardeaux, who rode a De Dion-Bouton tricycle, covered slightly over 33 miles an hour, and Bucquet, on a Werner motor-bicycle, 17 miles. The actual winner takes an object of art and £120, Jarrott a silver-gilt medal and £80. The last mentioned was unfortunate enough to knock a commissioner of police down, near the finish. No great harm was done only a few bruises resulting.

**Won't Tolerate Petrol.**

A regulation has been made which would seem to bar motor-bicycles and cars from using certain boulevards and parks in Chicago. This rule says that "No machine which leaves a trail of offensive odours behind it will be admitted to the parks and boulevards." Cyclists riding the ordinary machines will not be allowed to use squeakers or whistles, only bells will be tolerated.

**Perpetual Motion?**

An American machinist of Chambersburg, Pa., claims to have invented a "rotary impact centrifugal motor" on an entirely new principle. The arrangement is that of two tanks, from the smaller of which to the larger gas is admitted by an ingenious mechanism, and a large fly wheel is caused thereby to run 5,000 revolutions per minute. The gas is generated by a process, so far not divulged, and is kept in circulation by means of mercury. By adopting this motor it is said a street car can be run 10 miles at a cost of a halfpenny. A company has already been formed to push the invention.

**The King's Solution.**

A tale is going the round of the papers as to the King's experiences when motoring in Germany. It is stated that when he was driving near Wiesbaden the "automobile ran out of water," and no other water being available the boiler was filled from a spring. All went well for a time when the motor stopped, and the cause of the contretemps could not be ascertained by the driver. At last the King suggested that the water might have contained some mineral properties, and that the boiling might have caused crystallisation, and so "choked the piston." On investigation the theory was found to be correct, and it was not until the piston-rod was "sandpapered" and fresh water obtained that the journey could be continued.

The Automobile Club will hold a trial of tyres in September next.

Two motor cyclists were fined 40s. and costs the other day at Brentwood for furious riding.

Motorcars decorated with flags were a feature of the London streets during the "Peace" festivities.

The hill-climbing competition organised by the A.C. for last Saturday was abandoned, owing to the refusal of the Richmond Park authorities to allow the use of the test hill for the purpose.

**Motor-bicycles and Insurance.**

Two fire insurance offices have replied to the inquiry of the Automobile Club, referred to last week, as to the feeling of these companies in regard to bringing motor-bicycles into dwelling-houses. The Westminster Fire Office prefer the machine not to be brought into the house if there is any petrol in the tank. With a condition that refilling or emptying should not be done in the house, and that the stock of spirit should not be stored there, they would be prepared, in certain cases, to partially adopt the suggestion made by the club. The Yorkshire Insurance Co. are not prepared to allow motor-bicycles in any private house, the building or contents of which they have insured; but they would consider any proposal on motor-bicycles if housed to their satisfaction.



### An Eccentric Car.

The Mayor of Boston appears to have had some exciting experiences on a second-hand car which he recently purchased, and on which he was making his initial journey from London to Boston. It is not stated whether alcohol was used to drive the car or not, but certain it is that after travelling some 35 miles it got decidedly frisky. It got out of control, ran after a cyclist and smashed his machine, then jumped a ditch, dashed through a hedge, and finished up in a potato field. At least so a voracious newspaper report states. The case has gone into court, and Mr. Simonds is suing the vendors for damages for breach of warranty and for not providing a competent driver.

On Saturday, Mr. Simonds was awarded £58 3s. 9d. damages against the British Automobile Syndicate, Ltd., which firm supplied the car and driver.

### The Dashwood Hill Trials.

A letter recently to hand from Mr. H. Martin gives us details of his performance in the Dashwood Hill motor trials, such details, naturally, only being available to anyone who accompanied the rider and watched his performance from start to finish. Moreover, the work of recording these details, which was relegated by the Automobile Club to "observers," was not perfectly performed, so that newspapers who desire to give full information to the public have been compelled to take their information from competitors themselves, as being the only ones who really know what was done. We now learn that the Excelsior made a non-stop run both out and home, climbed the hill seven times at 18 miles per hour without assistance, and that the machine showed the lowest consumption of petrol of any bicycle or vehicle in the trials. Since then, of course, Mr. Martin has beaten the five miles amateur motor-bicycle record in addition to other notable performances. By this it will be at once recognised that the Excelsior is an exceptionally fast machine, and at the same time does not consume much petrol.

No less than six Gardner-Serpollet cars are to be seen daily in Teheran, two being reserved for the personal use of the Shah of Persia, and the others having been presented by him to various Court officials.

Wilford, on a 5 h.p. Soncin tricycle, beat all the other entrants in a two kilometres hill climb at Namur, on the 1st, his time being 2 min. 48½ secs. The next best time on a cycle—3 min. 59½ secs.—was made by Mullens on a 2 h.p. bicycle.

We read that in more than one suburban district the news of peace was conveyed and spread abroad by means of a placard affixed to a motorcar. It is in this way that the twentieth, century vehicle justifies its title of a promoter of peace.

### Sweden as a Touring Ground.

A tour on a motorcycle through Sweden can be highly recommended as one of the finest possible in Northern Europe. Travelling is very cheap, and the people honest and obliging. The scenery is grand, and the extensive pine forests make it one of the healthiest spots on earth. Those who want to find a cool and perfect summer resort can not do better than spend three or four weeks in Sweden, where the good roads permit of easy riding, and the sight-seeing appeals to all tastes.

The motor cyclist summoned for not "sounding his approach" should, at any rate, feel proud of the fact that he has a good silencer.

### A Powerful Bicycle Motor.

Messrs. Brandes and Perkins, 192, Lockhurst Lane, Coventry, are now able to supply their new bicycle motor of 2½ h.p. In designing it the aim has been to get the maximum power for the smallest size and weight, and to attain this an entirely new practice in construction has been resorted to; thus the valves come right opposite the centre of the piston instead of being cast on the sides, allowing the gases to have a perfectly straight course in and out, saving power and helping to cool. The motor can be fitted in various positions on the frame, a strong 7-inch aluminium clamp being provided. An outside fly wheel and detachable pulley are fitted, so that customers can suit themselves as to gear. The makers say that the motor is not suitable for mounting to an ordinary bicycle frame without specially strengthening it. The weight of the motor comes out at 25 lb., which is remarkably light for the power. The bore is 2½ in., and stroke 2½ in. Spray or surface carburetter and round or square coil can be supplied, as desired.



### EXPERT VIEWS.

*First Moting Enthusiast:* "Can't say I think much of this local Paderewski, old chap."

*Second Moting Enthusiast:* "What do you expect? The fellow's got his clutch out all the time!"  
(Poor pianist! He is addicted to the frequent use of the soft pedal.)



The Calvert "Seer" plugs will be made in platinum only in the future. It has been found that the iron ones are not reliable enough to please the maker, owing to the unequal expansion of the iron and glass. This does not occur with platinum.

The firm of Ishikawa and Co., of Yokohama, have taken over the Japanese agency for the Mitchell motor-bicycle. W. C. Vaughn, the American trick rider, is now over there "popularising" the machine, and incidentally astonishing the natives in the different parts of the empire.

The Automobile Club of America has just elected four members, who constitute probably the richest quartette in the world. These multi-millionaires are: Messrs. A. Belmont, A. G. Vanderbilt, H. C. Frick, and J. W. Gates. Three ordinary everyday millionaires were also elected.

#### *In the Event of War.*

France can commandeer 975,000 cycles and 5,000 motorcars if war should break out. Every vehicle can be claimed for military service in an emergency. Quite a large number of military cycles are kept during peace time at the frontier garrison towns, to permit of a speedy advance in case of need.

#### *'Ware the Police.*

☞ A reader issues the following note of warning to fellow motorists:—"All motor cyclists coming down to Brighton by the main road through Cuckfield should drive carefully through St. John's Common to Burgess Hill, as the police have measured a portion of the long slope going to Brighton, and hide at the end of the same and time all motors, cars, and otherwise, and a cyclist was pulled up on this two weeks since. The timing method, as usual, is very rough, as a plain-clothes policeman with the uniformed one in hiding tells him when to start and stop timing.

#### *Manchester Automobile Club.*

The Manchester Automobile Club has a run two or three times each season to Nantwich. Such runs are invariably well attended and successful in every respect, and it is not surprising that such is the case, as Nantwich lies about 40 miles outside the Manchester district (which is neither too far nor too near for a Saturday afternoon spin), and is reached by means of grand roads from a motorists' point of view, winding through beautiful scenery, and is further blessed by having in the Brine Baths Hotel, a hostelry peculiarly suitable for a motorcar meet, possessing as it does extensive grounds and a gravelled drive in the front of the hotel capable of holding a large number of cars.

This season's second run was to Nantwich, on Saturday week, and was attended by 20 cars, which made a brave show in front of the hotel, drawn up in a semicircle ready for photographing, Mr. W. E. Rowcliffe officiating at the camera.

Over 20 motorists and their friends sat down to an excellent dinner at 6 o'clock, and shortly after 7 o'clock the majority of the motorists made a move for home, a few going on to Chester for the week-end, and several staying over Sunday at Nantwich.

During the run, with the exception of the usual and somewhat unwelcome mishaps, attended, happily, with but inconvenience to the members concerned and their passenger friends, there was nothing which called for special notice. Mr. Higginbotham was much involved in a multitude of punctures, which, it was discovered on removal of the outer cover of the tyre, were due to senile decay of the inner tube. Owing to this, unfortunately, he was unable to arrive home before 5.30 a.m. Sunday, losing en route part of his pump.

It is only fair to his guest to place it on record that he stuck to his captain and the ship, which, by the way, was the one in

which Mr. Sturmev made his journey from Land's End to John o' Groats.

Mr. Stocks also had similar troubles with his tyres, the repairing of which he deferred until after most of the members had taken the road in various directions, with a result that he was unable to follow before 10.30 p.m. Mr. W. E. Rowcliffe sustained a broken inlet valve, and was fortunate in obtaining immediate assistance from Mr. Whittaker, who came up with him at the right moment. We give an interesting photo of the motors taking part in the run on this page.

#### *Belts and Fasteners.*

Quite a number of Midland firms are experimenting with various kinds of leather, etc., with the view of securing a more efficient belt than we have at present. E. Lycett, Ltd., 164, Deritend, Birmingham, have now quite a number of their special belts in use, and they are giving entire satisfaction. The peculiar feature of this belt is that it is made from a leather which is said to be impervious alike to both water and oil. It therefore does not stretch anything like as much as the ordinary type.

#### *A Remarkable Hill Climb on a "Werner."*

Many favourable reports have been published, from time to time, of the hill-climbing performances of both the old and new pattern Werner motor-bicycle. Particulars have just reached us of a smart climb made by Mr. H. Egerton, of Norwich, on a standard pattern 1½ h.p. Werner. The hill is known as Gas House Hill, and is considered one of the worst in England, both for gradient and surface. The steepest part is about 1 in 4½ and the length considerable—far too long to rush—nevertheless the Werner went up in fine style. So far, the only vehicle to get up it has been a 50 h.p. Napier and a Locomobile steam car.



THE MANCHESTER AUTOMOBILE CLUB'S RUN TO NANTWICH.

A group of all the cars and motists who took part in the successful trip described on this page.



## INVENTION.

*The latest improvements in motors, motorcycles, and accessories.*

### **The Jackdaw New Lubricating Oil.**

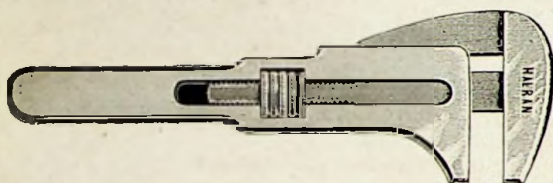
We have received a sample of the Jackdaw Motor Oil. This claims to possess the special features of a high flash-point, good viscosity, endurance under heat, non-charring, and absence of grit. It is prepared from the finest Pennsylvania crude petroleum, and is a pure vaseline oil. It is put up in quart, half-gallon, and gallon cans, and is sold at a reasonable figure considering the high quality of the oil. We shall shortly be giving this lubricant an extensive trial in one of our machines.

### **Improved Sparking Plug.**

The Electric Ignition Co., Birmingham, the makers of the well-known E.I.C. plug, have just introduced a new pattern, which is made especially for motorcycles. This plug only measures  $2\frac{3}{8}$  in. over all, and is claimed to be absolutely unbreakable. It is fitted with screw adjustable platinum sparking points which, when the motor is working, will get red hot and burn all the oil or dust off that may accumulate. We are placing one under test, and will report as to its behaviour in due course.

### **A New Spanner for Motorcycles.**

The Halran motor spanner has been specially designed with a view to the jaws getting a perfectly firm grip of the



nut, and without any chance of shifting. A breakage is impossible, because the spanner is provided with a special strong sliding guide in its centre, and a protector at the back of the jaws is made in one piece. It is made entirely of the best hammered Siemens-Martins steel, with the jaws suitably hardened. The case and all openings are not stamped, but are machined out of the solid. It is made in six sizes, from  $4\frac{1}{4}$  inches long. The spanner is sold by O'Halloran Bros. and Co., 184, Clerkenwell Road, E.C., and can be obtained through any agent.

### **Edison's New Storage Battery for Motorcars.**

If the reports that have come over from the States are only substantially true, we are upon the eve of a revolution in the method of propelling motorcars. It has long been admitted that electricity possesses advantages over petrol and steam as a form of energy, but unfortunately these advantages could only be made available to a limited extent. The storage battery up till now has laboured under the disabilities of heavy weight, bulk, and only moderate capacity for holding a charge of energy.

Mr. T. A. Edison has just announced that he has solved the motorcar problem by the invention of his new storage battery, upon which he has been working for a long time. In a trial run just made, an electric car, fitted with the new battery, ran the distance of 85 miles, taking many stiff gradients varying from 2 to 12 per cent., and the battery had still a charge left in it at the finish. The weight of the new battery is less than half that of the usual type, and it possesses great strength and capacity. So successful have the experiments been that a factory has just been started to produce the battery in large quantities. Mr. Edison states that runs of 100 miles without a change of battery is right in sight.

### **The Driving Belt seen at Bexhill.**

It appears that the belt which we observed fitted to H. Martin's  $2\frac{1}{2}$  h.p. Excelsior bicycle at Bexhill, and which favourably impressed us, was a "Lincona." The address of the makers will be found in our advertisement columns. We also show an illustration of the pulley section suitable for the belt.



### **An Endless Rawhide Driving-belt.**

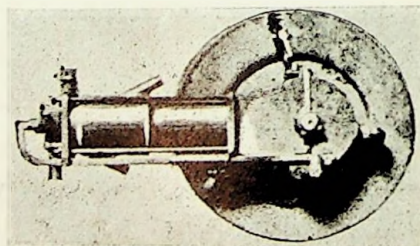
We have a sample to hand of a rawhide driving-rope for motor-bicycles. This is built up in the same manner as an ordinary hempen rope, and spliced endless in such a way that the splice does not alter the diameter in the least. Strands of rawhide are used, and after being twisted up they are stretched by a special method. These belts have great strength and elasticity, and take an excellent grip of a V-shape pulley. The adjustment of these endless belts is generally effected by means of a tensioning pulley. The agents are Davis, Allen and Co., 5, 5, and 7, Singer Street, Tabernacle Street, London, E.C.

### **New Dynamo Sparker for Motors.**

The Motsinger Device Manufacturing Co., Pendleton, Ind., U.S.A., have placed upon the market a compact little dynamo which can be driven by a friction pulley direct off the motor fly wheel. It is of the self-exciting type fitted with a drum armature. A special governing attachment is fitted which renders it impossible for the machine to get burnt out with excessive speed. The auto-sparker, as the machine is termed, makes it possible to start the engine without a battery simply by turning the wheel round by hand.

### **A Water-cooled Bicycle Motor.**

The Steffey Manufacturing Co., of Philadelphia, have just placed upon the market a water-cooled motor in  $1\frac{1}{2}$  and  $1\frac{3}{4}$  h.p. sizes. The weight comes out at 22 lbs. An outside fly wheel is employed and also a one piece crank and shaft. All gears and connecting rods are of bronze. We intend giving an illustration of the motor-bicycle complete in a future issue.



### **Supply Motor Repair Outfits.**

The old firm of W. Guest and Son, Sheffield, have long been known for their excellent cycle repair outfits, and especially their canvas-back patches, which we have never failed to carry in our tool bag in case of need. The repair outfit under notice, which is retailed at 5s., contains suitable various-sized patches for motor tyres, on the canvas-back principle, the firm's excellent rubber solution, canvas, French chalk, and valve rubbers. We have, so far, had little occasion to use the outfit for our motorcycle, but the Guest box provided the materials for a speedy repair, and we strongly recommend the sheet patching vended by the same firm.

Readers having ideas for Inventions can obtain free advice and particulars as to the best way to protect a patent by communicating with this Journal. All letters should be addressed "Patent," care of "MOTOR CYCLING."



## OTHER PEOPLE'S VIEWS.

*Correspondents are asked to write their views in a brief and concise form. We have again been obliged to hold over several interesting letters this week owing to pressure on our space.*

### **The Position of the Engine.**

ANOTHER RICHMOND IN THE FIELD WHO SUGGESTS THAT FULL TESTS BE MADE OF THE TYPES.

Sir,—I have read with great interest the articles published in your paper on the position of the engine, and if you will grant me space I should like to add my quota of criticism and ideas and point out a few of the errors and omissions which in my opinion Mr. Pullinger has fallen into.

Mr. Pullinger gives four clear sketches which represent matters quite fairly, though in Fig. 4 Mr. Pullinger has neglected to put in the "thrust," which, in this case, owing to the minus pressure inside the cylinder and the plus pressure outside, is, like the weight, acting in a downward direction.

Now, please, turn your "MOTOR CYCLING" upside down, and what was previously the upper side cylinder becomes the under side. This will alter the direction in which the engine is driving, but that can be arranged and is not a very serious matter—indeed, some prefer crossed belts. What is the result? I will take the figures in the order they are numbered.

Fig. 1.—The weight of the piston is now acting in the opposite direction to the thrust, and hence, according to Mr. Pullinger's own expression, the tendency to wear oval is nil.

Fig. 2.—The weight and thrust act in the same direction, hence here is tendency to wear oval. Fig. 3.—The weight and thrust act in opposite directions, oval tendency nil.

Fig. 4.—Mr. Pullinger, as I have already mentioned, has neglected to put in the thrust in this figure, but owing to the plus pressure outside and the minus inside, the cylinder and the position of the crank at this period, the thrust and the weight again act in opposite directions, and the tendency to oval wear nil.

Therefore, taking Mr. Pullinger's own method, we have three nils out of a possible four, hence the tendency to wear oval is only present in the one fourth of the distance travelled.

Now turn the drawings sideways so that the engine is vertical. I will analyse this.

First, there is no weight of piston or piston rod to deal with now. Merely thrusts.

Fig. 1.—The thrust is dead to the right.

Fig. 2.—The thrust is dead to the left.

Fig. 3.—The thrust is dead to the right.

Fig. 4.—The thrust is dead to the left.

In other words, there is no period when there is not a tendency to oval wear, and notice, please, first one side and then the other, whereas, in the horizontal engine, one side only need be subject to this, and then only during half every other stroke.

This, taking Mr. Pullinger's estimate, clearly establishes the superiority of the horizontal engine.

I can fully believe, Mr. Editor, you were right in suggesting that the whole thing (weight) is being made too much of. If the pistons and rods were of any weight, they might be made to do useful work in the horizontal engine by helping to neutralise the thrusts, though there is no hope for the vertical engine in this connection, it being doomed to thrusts for all time so long as

plunger pistons and the present connecting rods are used and these are not likely to be abandoned. But what is the weight of an ordinary piston and share of rod? Very little. Mine weigh 14 ounces, and can, therefore, have but little effect in either neutralising thrusts or wearing the cylinder, the small weight being spread over such a large area. But, as I mentioned before, what there is of it may be used with advantage during three-quarters of the cycle in the horizontal cylinder.

Next, as to Mr. Pullinger's remarks on lubrication. Suppose the vertical engine is fitted with a ledge arrangement for the piston to dip in, to obviate the acknowledged difficulty of the oil only being thrown on one side of the cylinder and piston. What happens? Assume the ledge full of oil and the engine then set running at 1,000 revolutions a minute. There will not be much evenly distributed oil on the ledge in a few moments, with the piston dropping into it at the pace, and the engine will then have to depend on the oil thrown on to the one side of the cylinder. I admit readily that the engine will and does run well enough under these conditions, but the point is that one side of the cylinder is better lubricated than the other, and, in fact, that one side has to depend for its lubrication on what is in excess for the other. This might be more or it might be less, but assume for a moment a dearth of oil in the crank chamber and it becomes a serious matter.

Now, with a horizontal cylinder, nothing need be left to chance. If the oil be introduced at the top it must necessarily run round the piston and cylinder to get to the bottom, and by running the engine as I have described, the oil is automatically thrown to the top of the cylinder by the fly-wheels, and lubrication is perfect and complete.

#### **COOLING OF CYLINDERS.**

This is undoubtedly better in horizontal engines, a point I have not noticed mentioned.

In the vertical cylinder, one side only and half the base or top of the cylinder meet the air. In the horizontal engine, properly designed, with radiators running in the long axis of the cylinder, the whole body of the cylinder is exposed to the rushing air, both base and sides.

So that to sum up—

1st.—The thrusts may be partly neutralised in the horizontal engine, but are entirely free to work their will in the vertical.

2nd.—The lubrication is a scientific certainty in a properly designed horizontal engine—a matter of chance, the most successful, in the vertical.

3rd.—Cooling undoubtedly better in the horizontal, if made properly, as at least twice the area can be exposed to the rushing air, and, as a result of this, lubrication is not such a difficult matter.

Referring to your invitation for suggestions for experimental work in this connection, I would suggest that two engines be made of the same dimensions throughout, the castings of which are made from the same metal at

the same time. Piston rings ditto. Connect the two engines to one carburettor, and run the engines coupled together so that the pistons are bound to travel the same distance, their strokes, of course, being exactly equal. Arrange one of the cylinders vertically, with a ledge arrangement for lubrication, and the other horizontally so that the crank and fly wheels throw the oil to the upper side of the cylinder. Arrange a fan to each cylinder so that the current of air strikes each full in the face as it would in riding. The fans to be of equal power and run at equal speeds; and, to make sure of this important matter, as it will affect lubrication and wear markedly, let the engine change fans at half time in the experiment. Let the engines, as you suggest, run at least 500 miles, and then let careful measurements be taken, and, last and most important of all, let these experiments be done by an unbiased scientific man—with no preconceived notions on the subject, and no engines to sell. I would suggest one of the Professors of Physics at one of the Colleges as most competent and least likely to have any leaning one way or the other.

In this tendency to oval wear, everything depends on the metal as to how soon it will be noticeable, and nothing short of the method I have outlined is definite evidence one way or the other.—Yours faithfully, S. B. S.

### **Making a Two-stroke Motor.**

Sir,—In your issue of "MOTOR CYCLING" for March 19 Mr. Westlake, in his able articles on the motor-bicycle, describes a two-stroke motor, and in the next issue says he would be glad to help anyone who wishes to make one. I have thought the matter over, and have decided to make a bicycle motor on this principle. I have designed one, and wish it criticised by Mr. Westlake, if he would kindly do so.

The motor is  $2\frac{1}{2} \times 2\frac{1}{2}$ , with a fly wheel 9 inches diameter, weighing 10½ lbs., 7½ lbs. being in the rim, exhaust port  $\frac{1}{4}$  inch by  $1\frac{1}{4}$  inch, inlet  $\frac{3}{8}$  inch by  $1\frac{1}{4}$  inch, opposite to other port. Exhaust is opened  $\frac{1}{8}$  inch before inlet, piston has the ring and lip to make compression good in crank chamber. This I have designed so as to get as big a compression as possible, to help to clear the cylinder thoroughly. I have not decided upon the size and pattern of deflector on piston—I should like information upon this. I am a mechanic in the motor trade, so could make a motor well, and would like to know the horse power I could get from it, and at what speed and diameter of pulley would air-cooling be satisfactory, and what form of carburettor would suit.

I am in favour of fuel being fed through seating of valve, similar to those at the last motor show. I have made a stationary engine, 3 inches by  $5\frac{1}{2}$  inches, fitted like this, and it works well. Probably Mr. Westlake has a design of his own he would like to submit. If so, with great pleasure I should like to see it. It seems to me there is a great future before this type, as it is so simple, and I think that it ought to come out at 18 lbs. at the most. Theoretically it can give off the same horse power at half the speed as on other motors of same dimensions, which means increased life of motor.—Yours faithfully, G. H. PHILLIPS.

P.S.—Let me congratulate you on your excellent paper. It's just what was wanted.



## OUR INFORMATION BUREAU.

A large number of replies have been dealt with through the post. Information on all subjects pertaining to Motors, Motorcycles, and Motoring generally will be given to readers who seek such information or advice. Any reader who desires to ask a question with a view of ascertaining the views of other riders based upon actual experience should send his query, which will be inserted, and replies to such questions will duly appear, if of general interest; if not, a reply will be sent by post; a stamp, therefore, must always be enclosed.

J.T. (Blantyre).—We can recommend the "Primus" as being a reliable motor set.

F.W.M. (Huddersfield).—You could get a speed indicator for your Singer at Gamage's, Holborn.

T. Randall Lewis (Swansea).—The address required is the Wilkinson Tyre Co., Princess Street, Huddersfield.

H.O. Butler (London, S.E.).—The diameter ratios you have at present are too low. Put a 3½-inch pulley on the motor shaft; if larger than this it may reduce your power uphill.

E.W.S. (Rotherham).—The machine that would meet your requirements is the single-lever Quadrant. You would also be well suited in other respects by either the Excelsior, Werner, or Phoenix.

P.C. McR. (Tadmorden).—It is a difficult matter to suggest the reason for the misfiring at high speeds. However, it is most probable that the electrical arrangements are slightly out of adjustment; see if something has not come loose at the connections, also see that the contact maker itself is quite clean.

M. Davis (Manor Park).—Your experience would seem to show that the accumulator was exhausted. It is a feature of an accumulator to recover itself slightly when at rest. You had better obtain a small test lamp—as described in No. 4 of "MOTOR CYCLING"—and try if the cells are fully charged. If you find the cells are charged, look to the contact breaker—see the platinum tips are quite clean and free from oil. If the motor still refuses to work, it may be a question of your carburation being wrong. The petrol may not be fresh or the air and gas mixture may not be correctly adjusted.

### Altering Carburetter.

H.G. (Cambridge) is about to modify his carburetter after the manner suggested in a recent issue of our paper. He asks: (1) Should the wicks go right down to the bottom of carburetter? It is not necessary for the wicks to go right into the petrol as it will splash up on to them. (2) Should the holes in the chimney be below the petrol, and is the end of the chimney straight up? The air that is drawn through the chimney must bubble through the petrol. The addition suggested we do not think would be much of an improvement. (3) How would it be possible to put in a gauge glass? H.G. does not see how a petrol-tight joint could be made except by using very heavy fixtures, such as are used for steam work. We are experimenting with a new gauge glass, and will publish particulars shortly. (4) Is a surface of petrol of 7 inches by 4 inches enough in the carburetter? The size mentioned should give an effective surface for the carburetter.

### Satisfied Subscribers.

We have received a very large number of letters from subscribers, who, while renewing their subscriptions, are kind enough to add words of congratulation upon our efforts, and, in many cases, bear testimony to the value of the information found in our columns. Here are a few extracts from the letters received.

W.M.G. (Broughty Ferry).—"It gives me the greatest pleasure to renew my subscription."

W.H.P. (Wellington College).—"It is a most interesting paper, and I wish you every success with it."

W.H.P. (St. Day, Cornwall).—"I might add I'm delighted with the paper, and it deserves the grand success it has so far achieved."

R.B.H. (Chelmsford).—"I think it is a very useful paper, and have learnt a lot from it, and I enjoy many an hour looking over the back numbers."

A.E. (Plumstead).—"From information obtained from your valuable paper, myself and a friend have decided upon having a motor tandem of Mr. Calvert's make."

J.N. (Helensburgh, N.B.).—"Allow me, as one 'in transit,' who has read all the numbers, to heartily congratulate you and wish you every success with your most interesting and useful publication."

F.B. (Lincoln).—"I can assure you there is an ever-increasing number of readers of your interesting and instructive paper in this city. I have lent my copies to several friends who now are taking it for themselves. Your 'Information Bureau' is particularly useful."

## "CYCLING."

Last week's issue contained further evidence of the enterprise of this popular wheel paper. Two unique photographs giving novel panoramic views of the Crystal Palace track during the progress of the Polytechnic meeting were given on the double-page centre of the paper, and these have been the subject of general comment during the week. You should read

### "CYCLING" EVERY WEEK.

It has a way of springing surprises on its readers in this way, and it may interest you to know that another startling photographic novelty is likely to appear in its pages shortly.

The current issue contains, amongst other most interesting matter, a complete report of

### THE WOODFORD MEET.

with interesting sketches by George Moore. In addition to this there is

### THE PRIZE PHOTO

taken at the Castle, Woodford. If you happened to be there you may be entitled to

### A PRIZE OF £2 2s.

J.G.W. (Guernsey).—To suit your special requirements in taking a trailer through hilly country, we should select the Excelsior 2½ h.p., or the Rex, either of which have ample power. At present we advise you to stick to the belt drive.

J.S. (Poulton).—You would be perfectly safe in selecting the Excelsior, Royal Enfield, or Humber. We have also a high opinion of the Quadrant, for its simplicity of manipulation. The New Hudson we also believe to be a reliable machine of the standard pattern.

R. Wood (Chelms, S.W.).—You will be able to charge your accumulator perfectly well from the mains if—as we expect—it is a continuous current and not an alternating one. Full particulars have appeared as to the method of connecting up the accumulator; these you will find in No. 2 "MOTOR CYCLING."

"Throttle" (West Hampstead, N.W.).—The throttle valve is being dispensed with by several makers, the motor being controlled by the spark advance lever and exhaust lift. The mixture is easily controlled on the Werner, and you could, of course, have a throttle fitted if you wished; personally, we prefer an exhaust valve lifter.

### Accumulator Charging.

W. C. Hodge (Redruth).—Several readers of "MOTOR CYCLING" have successfully used the Fuller battery for charging accumulators. It is quite doubtful whether the small dynamos you mention would charge accumulators; they are, as a rule, little better than toys. The Crypto Works, Clerkenwell, London, we believe, supply a suitable charging dynamo. For battery parts you might write Messrs. Orme, High Holborn, stating requirements.

### Charging Accumulators.

A.R.I.D. asks:—"Would a small dynamo (such as is used on a bicycle for lighting a small lamp; and driven off inside of rim of wheel by friction), if suitably driven by a 2½ h.p. engine when at its normal speed, be suitable for making spark for motor? The motor could be started by small accumulator, and current passed through ordinary induction coil." A small dynamo such as you mention would not be suitable, as it gives an alternating current. It would be quite possible to have one made for the purpose, however, and there would be ample power to drive it from the 2½ h.p. motor.

### An Accumulator Mystery.

W.T.E. (Shrewsbury) has a Van Raden woven glass accumulator. It shows 4.2 volts, keeps its charge, behaves excellently, in fact, until required to produce a spark, either at the plug or trembler. He knows his wires, coil, etc., are all right, because another smaller accumulator which at present is only showing 3.2 volts produces a stream of sparks either at trembler or plug. The smaller accumulator is one of the Borm Battery Co.'s. What is the matter? The only explanation we can offer is that the internal resistance of the battery has increased in some way, and shows voltage but will not give a current. At the same time, his battery may be in reality discharged, as it is well known that an empty accumulator often recovers itself on standing, and shows a fictitious voltage; he should have it thoroughly re-charged.