

# Motor Cycling & Motoring

## THE MOTOR BICYCLE; HAS IT COME TO STAY?

By G. LACY HILLIER.

*In cycling circles Mr. Hillier may be numbered among the "old guard," and figures therein most prominently as an authority on matters pertaining to the sport and pastime. He holds strong views on many subjects; is part author of the "Cycling" Badminton, and has written several books on cycling topics. That he has studied motor questions will be seen in the following article.*

The above question has been put to me, and others, many times of late, and it seems worth while to consider the answer carefully, in view of the great interest taken in the new type of machine.

I do not mind dealing with it because during the past 26 years I have usually had an opportunity of expressing my views on all novelties that have been introduced into cycling, and as the records in the files of the cycling press will testify, I have been much more often right than wrong; I of course lay no claim to infallibility. Sometimes novelties have been introduced about which there has been some mystery, or some misleading data—unintentional, no doubt, which resulted in conclusions being arrived at which were not borne out by ultimate experiences. For example, when the first pneumatic tyres came to London—the mummy tyre, which required cutting, unwrapping, re-sewing and solutioning to deal with a puncture—we were warned not to over-inflate them lest they should burst. Naturally we rode the tyre in a half-inflated condition, to which state the feeble air-squirt used as a pump and the primitive valve contributed, and as a result we failed to recognise the speed of the new contrivance, though its anti-vibratory qualities and proneness to side-slip were very apparent.

The question: Has the motor-bicycle come to stay? is best answered by another: Is it wanted? and the answer to the second question must be sought by considering the conditions obtaining.

Bicycle riding has been a pastime for some 30 to 35 years, steadily increasing in popular favour, and happily emancipated from the cad-on-castors slur of some years ago. The cycle is now recognised as a convenient means of locomotion by all classes.

There are, therefore, a vast number of cyclists who have more or less relinquished riding in the old fashion for reasons which, like Mr. Venus's bones, may be described as "various."

From some of these riders in the past came a bitter cry for some "auxiliary power" to assist them in the propulsion of their vehicles, and in response thereto ingenious, if misguided, inventors supplied them with Euclidean accelerators, levers, fly wheels, gears, Simpson chains, and various wonderful contrivances to store up power down hill, which was, in theory, to be available to assist them in climbing the next ascent. Practically only one invention really helped them—the pneumatic tyre; and how many cyclists who had practically given up riding were restored to a state of enthusiastic cycling juvenescence by that contrivance it would be difficult to say—but it must have been a very large number.

Now, once again, a point has been reached when a very large number of riders have to some extent lost interest in the sport, due to exaggerated gears, in many cases without

doubt, and in the motor-bicycle we have exactly the panacea for this malady, whether it be the result of increasing years, or gears, or sheer indolence.

The smaller motors provide exactly what the riders of some years back were asking for—auxiliary power.

It is, of course, a drawback that this power is decreasingly effective as the machine slows upon a hill, but, on the other hand, an occasional spell of hard pedalling will not be unwelcome to a rider who has sat motionless along the level. The speed generally will be faster than that of ordinary cycling, with a correspondingly exhilarating effect, and there is much to interest the rider in the skilful management of his mount. Thus I expect to see many a rider long missed from the haunts where cyclists most do congregate once more frequenting them, and no doubt a lot of new-comers will also take to the auxiliary-assisted cycle. In fact, I personally do not doubt that 1902 will be remembered as the motor-bicycle year, and that firms making motor-bicycles will find that department of their business largely increased before the season has long been open.

Further, I think that this type of cycle has come to stay—of course it will be greatly improved and perfected; no doubt the motor-bicycles of to-day will be regarded as "old crocks" twelve months hence, and also, no doubt, they have defects.

It is said to side slip; as I did not say so first, possibly the fact may be admitted. Pneumatic tyres do slip occasionally, not only with cycles but with cars, but a very great deal depends on the rider; old high bicycle men appear to suffer less from side-slip on the ordinary cycle than other cyclists, doubtless because to ride the high bicycle was a constant lesson in body balance, a matter I have dealt with in "The Art of Ease in Cycling," but the motor-bicycle must be regarded as in some degree a fine weather machine.

I have no desire to be plunged into an argument on this subject, but I think the reputation of the motor-bicycle for side-slip is greatly due to the fact that in the earlier types the front wheel was driven—the driven wheel is the most likely to slip—and when the driven wheel is also the steering wheel the chances of recovery by the rider in case of a slip are vastly diminished. Rear wheel driving having been now so generally adopted I expect to hear less of side-slip.

The mud plugging cyclist keeps himself warm by his work, but the motor-cyclist sits still and necessarily suffers from the cold, whilst he incurs some danger of chill if he pedals up a hill and gets warm and then sits still as he passes through the cold air. Therefore I do not think that side-slip will materially check developments in what is at present something of a fair weather mount.

Some people say: "I'd sooner have a tricycle." The tri-



cycle, to some extent at any rate, does away with the slipping, though on occasion the front wheel slips, but those critics overlook the special pleasure of a single track, which is faster, secures better going, and requires some skill—all attractive points to many.

On the point of cost.—The motor bicycle is, of course, much more within reach than a car; in fact, compared with the ordinary safety the motor-bicycle is already cheap, the results of keen competition in the cycle trade, thus benefiting the users of the new vehicle.

As to storage or stabling.—The motor bicycle scores heavily. Many cyclists, especially suburban residents, cannot stable even an ordinary tricycle, but the motor-bicycle is as easily stabled as a safety, and this point alone assures the motor-bicycle a large amount of popularity. Stabling-out involves expense as well as the possibility of the machines being interfered with, and rather than go to the expense and run the risk thus incurred with a tricycle or a small car many men will be content with a motor-bicycle, and as these conditions will always exist I think it fair to assume that the vehicle which meets them has come to stay.

The motor-bicycle, in fact, creates a new class of motor users, and a very large class too. For one man who buys a car costing hundreds of pounds, possesses storage for it, and keeps a driver in his employ, how many men are there who can afford to buy a motor-bicycle? Some of these men may in time become car owners; but the larger number will remain motorcyclists, keen only to possess the latest form of their chosen machine.

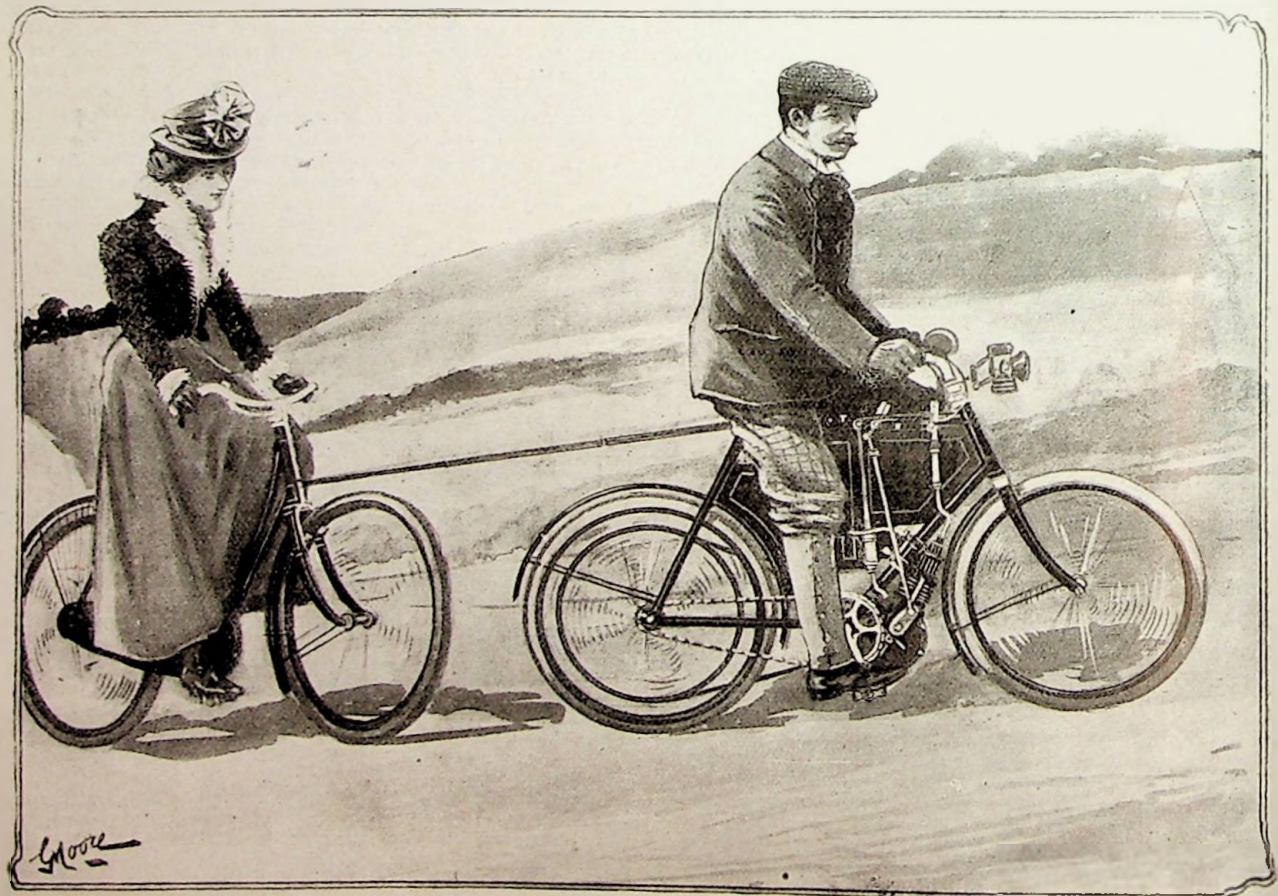
It is clear that the motor-bicycle, in classic phrase, fills a long-felt want. That it will find its own field and retain it,

that cycle making firms with a reputation for sound work who take it up will find that it brings grist to the mill, that it will induce many riders to again take an interest in the sport and bring in many new men—in short, that it has come at just the right juncture, when the trade outlook is improving and enterprise reviving, to secure careful consideration and to assist in the general recovery by broadening the field.

I suppose I must say something as to motor racing, the more so that practically every notable improvement in the bicycle from its earliest days has been tested, perfected, and demonstrated on the racing path. "Spider" wheels, ball bearings high ordinary, safety, pneumatic tyre, and the reduction in weight of bicycle, tricycle, and safety were all so tested, but though doubtless path tests, where conditions are approximately constant, or can be gauged, will play a large part in developing the perfect motor-bicycle, I hardly think that motor racing, as racing, will become popular. Variations in the power of the motor or the skill of the driver usually result in one machine being so obviously superior to the others that, barring accidents, the result of the race is a certainty, and it is difficult to see how the interest is to be maintained.

As to motor pacing, this, if permitted, would once again open the door to the old scandals, which, apart from the question of the danger, would quite outweigh any possible benefits to be derived from its introduction, and the men who failed to find adequate pacing last year might fail to secure adequate motor pacing were it permitted, unless they submitted entirely to the dictates of some employe of some trader who has wares to advertise.

My conclusion is that 1902 will see a boom in motor-bicycles, and that they have come to stay.





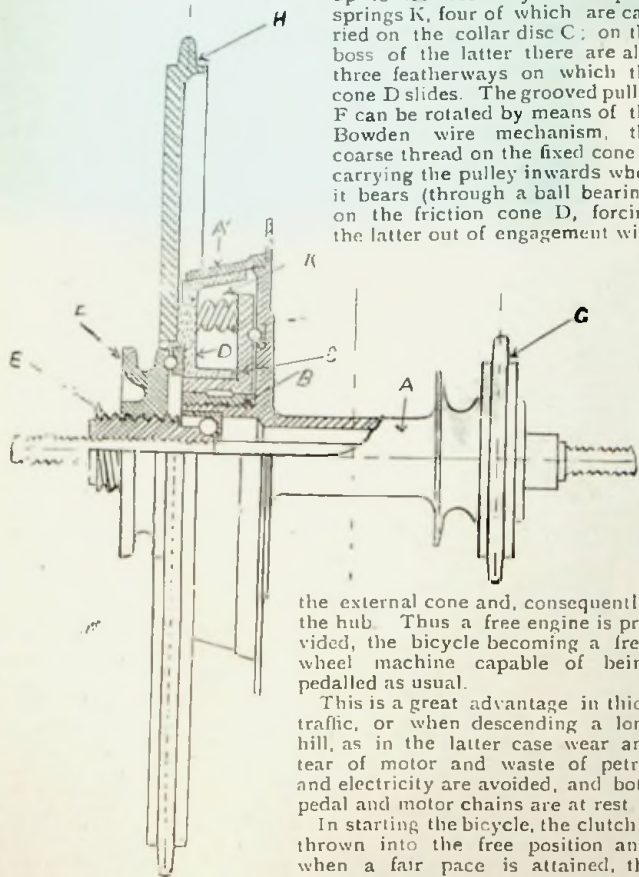
## INVENTION.

*The latest improvements in motors, motor cycles, and accessories.*

### **The Bowden Friction Clutch.**

Amongst the many efforts to introduce a reliable method of chain driving, the Bowden friction clutch has attracted a very great amount of attention. It is illustrated in the accompanying diagram. On the large flange of the hub A, is fixed an external friction cone C. The gun metal friction cone D has fixed to it the chain wheel H, which receives the power from the engine.

Friction cone D is normally kept up to its work by the spiral springs K, four of which are carried on the collar disc C; on the boss of the latter there are also three featherways on which the cone D slides. The grooved pulley F can be rotated by means of the Bowden wire mechanism, the coarse thread on the fixed cone E carrying the pulley inwards when it bears (through a ball bearing) on the friction cone D, forcing the latter out of engagement with



the external cone and, consequently the hub. Thus a free engine is provided, the bicycle becoming a free-wheel machine capable of being pedalled as usual.

This is a great advantage in thick traffic, or when descending a long hill, as in the latter case wear and tear of motor and waste of petrol and electricity are avoided, and both pedal and motor chains are at rest.

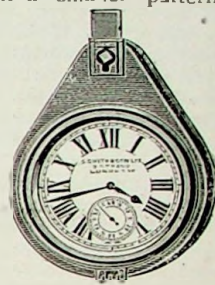
In starting the bicycle, the clutch is thrown into the free position and, when a fair pace is attained, the double-action Bowden lever rotates the grooved pulley and allows the cones to gradually engage. In the case of a back-fire the outer cone will slip on the inner one, chain breakages being avoided. The Bowden Patent Syndicate assert that on the same machine and with the same motor, an improvement of 30 per cent. over the belt was effected by using the chain drive.

### **The Kopaline Puncture-Proof Band.**

This band, which was put on the market last year in a somewhat experimental form, is now vastly improved and seems to be much more practical. The band in its original form consisted of a number of leather scales contained in a canvas pocket. But the leather became hard and cut through canvas and tyre fabric. A specially treated skin, which always remains lissom, is now used, and instead of scales, two or more strips of the skin are fastened together and they lay as an endless band between the cover and inner tube, being solutioned to the former to prevent movement. For motor-car tyres the new pattern has proved eminently successful, and in the lighter form for cycle tyres, selling at 7s. 6d. each, should prove invaluable as puncture preventers for motorcycle tyres. W. Lowen and Co., of 36, Aldersgate Street, London, will send fuller particulars on application.

### **A Useful Timepiece.**

The timepiece illustrated has been introduced by Messrs. S. Smith and Son, Limited, of 9, Strand, W.C., for use on cars, and it is to be sincerely hoped that a smaller pattern will be placed on the market for fitting on the handle-bar of a motorcycle. The outer case is entirely rainproof, can be securely locked and is irremovable without the key. The watch is of good quality, constructed to withstand vibration, and the method of fitting in the case prevents it from being shaken or damaged.



A MOTOR TIMEPIECE.

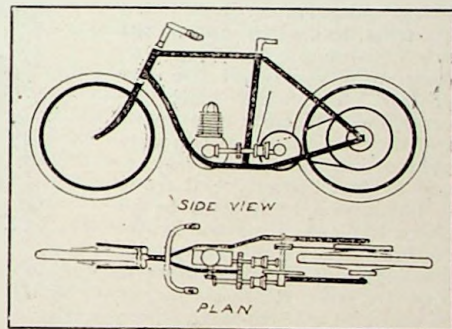
We learn that Messrs. Smith are preparing for the market a speed indicator, which will be suitable for use on motor-bicycles. Such an instrument should be invaluable and ought to enjoy a very ready sale.

An illustrated catalogue of the firm's productions will be sent on receipt of a card.

### **Freestone's Variable Gear and Starting Clutch.**

We illustrate a frictional variable gear and starting clutch suitable for application to motorcycles, recently introduced by G. Freestone, motor-car engineer, of South road, Saffron Walden.

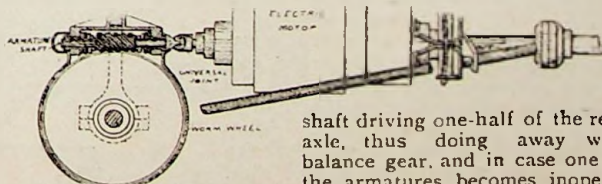
The driving belt is carried to a countershaft, at the opposite end of which is a disc. The engine drives through bevel gearing on to this disc by means of either of the small friction wheels, a mid-way position providing the free engine.



FREESTONE'S VARIABLE GEAR AND STARTING CLUTCH.

### **An Electric Motor-Car.**

An electric car has recently been produced in Chicago by Mr. W. A. Crowds, in which the motor is supported in such a way that when the vehicle is passing over rough roads the jolt or jar upon the under frame, due to the weight of the motor, will be reduced to a minimum. The motor is of the type comprising two armatures under the influence of one magnetic field, each armature



shaft driving one-half of the rear axle, thus doing away with balance gear, and in case one of the armatures becomes inoperative, the other assumes the entire load and develops practically the full power of the motor. The motor is provided at its rear with two arms, which are hinged to other arms carried by the framing of the vehicle, and at its front is supported by a spring. The armature shafts are provided with universal joint's in line with the hinges, and by means of worms gear with their own halves of the rear axle, upon which worm wheels are secured.

Readers having ideas for invention 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."



## A PLEA FOR THE MOTOR TRICYCLE.

BY C. A. SMITH.

"WHY do you ride a tricycle? Don't you ride a safety?" I know not how many times these questions have been addressed to me in my cycling career. The fascination of riding the tricycle rules me, I suppose. It really is a fascinating instrument. [*Entre nous*, didn't you tell me one day that you preferred riding the tricycle up and down the Ripley road, because if you did get "dropped" you always had that good excuse of the extra wheel? If you had been on your safety, &c.—Ed.] Really, sir, I don't think it quite fair to give me away like that. Certainly the advantages of the motor-tricycle appear to me to surmount all these objections. No kerbs, no lamp posts, and no walls. What would the motor-bicyclist do without these handy little things, which he finds, poor chap! so necessary to lean his mount against? Then, again, no dismounting in the traffic, and no fear of a beastly sideslip. Fancy riding in and out of London on a bicycle during the winter months, with the roads swamped with greasy surfaces. Ugh! On the trike, too, when one of the tyres collapse you can "jog" (?) along until you reach the next repairer. But what price the bicyclist with his back tyre down? And then, supposing it is a very cold morning and her majesty refuses to start instantly; there is no looking up to heaven to see where you can hang the brute. You simply get that empty box, which is always handy, and slip it under the trike. Really the fact of the matter is that those who have ridden bicycles cannot steer the three-wheeler. And that is the way the tricycle is abused and slanged. Once they are on it, it will run into the gutter, and then these ignorant creatures abuse the animal and call it a tricky thing. There is one thing very certain: the motor-tricyclist must never allow any of this class of vermin to mount his own machine. Of course, one is wise after the event. I took great precautions once to send a would-be rider out on my ordinary tricycle, so that he might have some practice before manipulating the monster later on. After an hour or so on this, he mounted the motor while I cycled along side him. All went well until coming to a rise. I told him to raise the ignition lever. His attention diverted from the steering, just for the moment, away he went into the grassy ditch at the side of the road. Result, new front forks. Tricky beast! Eh? I had not had my motor-tricycle many days before, of course, the club scorcher had heard the news. You know the kind of man I mean! "Passes it through" everything on the road, and that sort of thing. I met him accidentally not far away from Kingston. "Going back, Chawles?" says he, contemptuously. I murmured faintly, "Yes," and proceed at about the legal limit: We get clear of the houses, and then

my speedy friend inquires if the blank thing cannot go faster. Poor feeble crawler! I raise my ignition lever, and I was speedily 300 yards in front, and that is the last I see of him that day. One expects all sorts of adventures, and get them you must. Perhaps the biggest sell I recently had was seeing a car approaching which I thought I might have a spin with, and so I promptly turned round. Away I flew at top speed! Give them sox, said I to myself. A horrible grunt from a horn, and I see out of my right optic, without looking round, a black-looking thing going by me. I appear to be standing still! In another moment it is in front, and then, great Scott! the dust. I stop, and allow the 50 horse-power Napier to proceed on the even tenor of its way, and the dust

to return to its bed. It is evidently not my day out!! I was travelling rather rapidly one day from Farnham towards Odiham, when a nut off my saddle fell round the tank into the aperture where the chain circles the axle. There was a bit of a noise, and the machine stopped—the chain was broken and part of it wound round the axle, making a tremendous gash in the covering of this. Fortunately for me, a cart soon came along, and with some amount of trouble I was towed into Odiham. In the blacksmith's yard I quickly divided the tricycle in halves, and soon dislodged the broken fragments of the chain. On one of the teeth of the axle there was fixed that saddle nut. How the little creature dropped round the tank and into the axle at the pace I was going has always been a mystery to me. After an hour and a half's delay I proceeded on my journey without the chain. A push and a hop, and the trike would do without it for a day or two. My 2½ "Ariel" tricycle has been running now for over eighteen months, and at very little expense in repairs. I have re-wired it, fitting much stronger material,

so that short circuits are impossible. A two-shilling sparking plug has lasted for months, and the tyres, since visiting J. S. Smith in the Borough, have been standing triumphantly. Of course dry batteries have no charm for me now—

the ruins of 20 of these decorate my shed. Instead of carrying gallons of spare petrol in the brass tank behind, I find a little paraffin more useful. By means of a bit of tubing, which I have attached to this tank, I can quickly pour some of this excellent lubricant into the top of the cylinder, thus rendering starting the easiest of jobs. A little paraffin works wonders. Of course, no one nowadays goes about with out an exhaust valve lifter. And one piece of advice I should like to give to the user of a motor is: always carry a voltmeter.



THE AUTHOR ON HIS "ARIEL."



## IN TRANSIT.

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

**Engine Power.**

The editorial article in last week's issue, advocating moderation in the power of the engine on a motor-bicycle, seemed to me to be very sound, an opinion which, later in the week, I pressed upon a man in the trade who is somewhat "gone" on big powers. His argument in favour of the higher power is this: it is a big advantage when high speed is required or when hills have to be surmounted, whilst there is no disadvantage attaching to its possession. "Because one possesses the heavier power, its use is not necessarily entailed," said my opponent, "and a rider is still able to reduce speed by closing the throttle or retarding the sparking." That is precisely the sort of argument that would be advanced by a man who was anxious to dispose of a coach and four to somebody who only wanted to buy a carriage and pair. He might suggest that, "as you won't want often to make use of all four horses whilst you are out, you can easily let two of them run behind, and so keep them in reserve." In the case of the motor bicycle, see what is meant by this "reserve!" Not only is there an enormous increase in the weight of the vehicle, but the frame must be strengthened considerably. Moreover, the unwieldiness of the machine is not to be lightly regarded. In my opinion, the motor-bicycle of to-day is quite sufficiently heavy for any man to handle. In fact, if ten or twenty pounds could be knocked off the weight, there would be a distinct gain to users of the vehicle, of whom not all have the advantage of accommodation for the machine on the ground level.

**Efficient Brake-Power Wanted.**

Were it possible for me to go about amongst the readers of "MOTOR CYCLING," I should, without a doubt, find them agreed on one point—the need for ample brake-power. Ne'er a single one would be discovered who would dare to scoff at the necessity. And yet we find, in many

instances, that makers of motorcycles have given very little heed to the matter. Two brakes, they think, should be ample (some concerns seem to think that one is sufficient), and those which are most readily fitted stand the best chance of being used. Thus we find flimsy front rim brakes on a very large number of machines offered for sale, whilst the height of ingenuity consists in the fitting of the Bowden brake to the rear wheel. As if, forsooth, the hands of the driver have not enough to do—as if the brain did not already have to transmit a superabundance of impulses to those useful members! Then again, the makers have evidently laid themselves out to spare the legs of the cyclist all possible work or trouble.

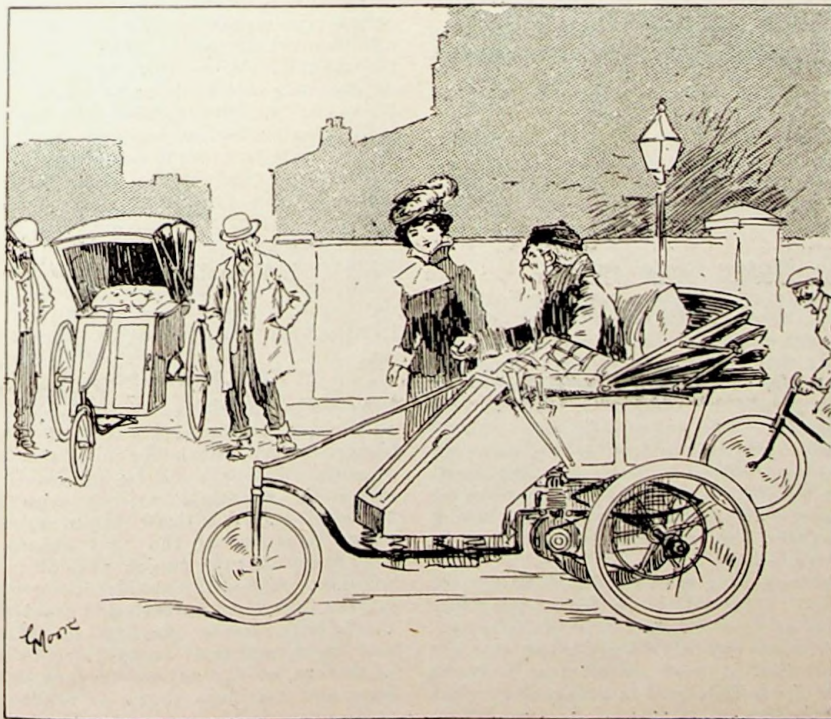
Barring mishaps, of course, when the legs might be useful for pedalling the machine home, the rider might well cast aside those redundant members.

To me, this is extremely objectionable, for I have always been a warm advocate of the back pedalling-brake on the ordinary bicycle—the present ordinary, not the *late* ordinary—and to be compelled to fly to the handlebar and grope for unscen levers whenever necessity arises for checking the pace of the machine is little short of detestable. My rear wheel Bowden brake is fitted to the left side of the handlebar, that is to say, on the same side as the switch. The front wheel rim brake is applied by the right hand. The left hand, in my case, is much the better and steadier steerer, and I suppose that the majority of riders have the same experience. In my opinion, a better arrangement could be made. The left hand being the steerer, it should also have control of the switch, and, by means of a lever operating through the Bowden wire system, it might also have control of the sparking. The right hand should have charge of the mixture tap, of the gas supply, the exhaust valve lifter, the auxiliary brake—whether applied on the front or back wheel—and also the speed lever, if the Bowden mechanism cannot be readily fitted so as to enable the left hand to control the sparking. A back-peddalling brake acting either in the hub or on a drum would provide the chief controlling power and would be manipulated by the foot.

**The Brake in Traffic.**

The advantage of this re-arrangement would be very manifest in traffic. One is very seldom able to do otherwise than keep the sparking at its latest point, speed being obtained or reduced by manipulating the gas tap. But, even when the gas supply is at its minimum, the speed of the machine is occasionally too great for the exigencies of the moment. To keep switching on and off is not advisable for fear of the explosion in

the exhaust box of an unfired charge—a noise which disturbs the fiery untamed hay-motor and which attracts scornful glances from the common or garden pedestrian. It is here that the brake is so useful. Speed is checked in an efficient and eminently practical way, even though the motor continues to do its work, whilst the hand is free to increase the supply of gas simultaneously with the release of the brake directly the opportunity serves for clearing the traffic. I find that in practice the front rim-brake gets used more often than not, and, personally, I would prefer to reduce the chance of side-slip by checking the back wheel instead of the front.



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## OPINION.

### The Automobile Club.

It is with pleasure that we learn the decision of the Automobile Club Committee to appoint a Special Advisory Committee for the purpose of considering what action shall be taken by the club for the encouragement of motorcycling, and that the Organising Committee is to be asked to take into consideration the provision of a class for motorcycles. This looks like business, and can only be regarded as a most satisfactory departure from what had recently appeared to be the policy of the club. Manufacturers and users of motorcycles, who are desirous of being members of the Special Committee, are invited to forward their names to the Club Secretary, Mr. Claud Johnson, which should be done without delay. This action on the part of the Automobile Club is yet another illustration of the energy and progressiveness which is the life and soul of the motor movement. It is a matter of importance that the public should be quickly given an opportunity of judging the possibilities of the motorcycle, not so much in the matter of speed as in that of reliability, and we can rest assured that this will be borne in mind.

A one hundred mile tour should prove a popular fixture, and the route selected should be ordinarily undulating, such as one would select for pleasure purposes. Apart from this there are a dozen tests which could well be considered, and upon which we shall have more to say in a later issue.

### Peddalling in Motor Cycle Races.

Among the questions to be decided by those who have the promotion of motorcycle races in hand will assuredly be the matter of pedalling—more particularly do we refer to the motor-bicycle events. At the Motor Cycling Club meeting, competitors were given *carte blanche* to pedal; and the result did not appear to please the onlookers, judging from some of the remarks passed. The question arises, Should pedalling be allowed after starting and, if it be allowed, to what extent should it be permitted? Various suggestions have reached us on the subject, the majority of these being summed up in the words of a well-known motorist—"Pedalling on a track should not exceed the amount requisite to get a good start, or decent "pomming" after misfires. Others suggest a "close" time for pedalling until the final straight for the finishing tape is reached. Our own opinion is that pedalling should be restricted as far as possible to the actual starting. The crowd undoubtedly resents the furious pedalling as "not being cricket," and certainly it is more satisfactory to make the contestants rely more upon their skill in manipulating the machine than in using their legs.

### The Motor Tandem.

Too little attention is being paid to the motor tandem bicycle, a type of machine which, to our mind, should receive more careful consideration. Its long wheel-base and its ability to carry two passengers are alone immense advantages. Upon the ordinary single cycle, it is easy for two or more riders to keep close company, but in the case of the motorcycle it is more the rule than the exception to fly from start to finish, and as no two machines can be equal in speed, the pleasure of a friend's company is at present somewhat uncertain. With the tandem, one has constant companionship and in time of trouble this is particularly welcome.

### Motor Patents in Suspense.

The announcement which has been made by the proprietors of the "Minerva" patents, to the effect that proceedings for infringement have been instituted against certain makers of motor cycles in this country, has created somewhat of a stir. The matter being *sub judice* we have no opinion to express one way or another upon the merits of the action, but it is welcome news that this much discussed question is about to be settled. For a long time it has been contended that there can be no valid patent for any particular position in which a motor can be attached to a bicycle frame and, as a consequence, the trade has been in a very uncertain frame of mind as to whether to take out a license or to contest the claim. All these doubts will be set at rest when the actions now pending are concluded, and, when the position is made clear, the industry will be able to go ahead unhampered by any misgivings on the matter.

### Instruction Wanted.

"Where can I go to learn all about it?" is a question which is being constantly asked us by would-be recruits, and slight reflection is sufficient to convince one of its reasonableness. Many a man is at the moment hesitating as to what course he shall pursue in order to become a motorist and, whilst being most anxious to do so, would prefer a certain amount of instruction upon the general principles involved before taking the plunge. If such instruction could be accompanied by practical experience of the machine itself, there is no doubt that many would gladly avail themselves of such advantages. The average man is slow to come forward where anything new is concerned, but if he is given confidence all hesitation and shyness disappear. The history of cycling has repeatedly proved this. When the pneumatic tyre was introduced every opportunity was afforded the public to become familiar with it; in the present instance the necessity of such assistance is far greater, and we suggest that it would be to the interest of the trade to at once recognise this in a practical manner. Throughout the country there is a large number of cycle riding schools, drill halls, open air spaces and so forth which could be turned to good account, and we shall be glad to cooperate by calling attention to any arrangements which may be made to meet the case. We shall also be pleased to give publicity to any enterprising firms who are prepared to let out motor cycles on hire, or who will afford facilities for prospective buyers to thoroughly test the most popular brands.

### The Motor-bicycle of the Future.

As we intimated last week, we start in this issue an article on the desirable points required in the motor-bicycle of the future. Mr. Westlake's article, the first instalment of which appears this week, will be followed by others containing the views of practical writers who have carefully studied the subject. We draw attention more particularly to the series because, at the first glance, many of our readers may fancy that the subject is dealt with in a dry and technical manner. When the articles are perused, it will be found that quite a different impression is created. We regard the solving of the many vexed questions in regard to the motor-bicycle and the blending of many fitments into a harmonious whole as it were, so far as makers are concerned, as a most vital one, and we hope that our readers will, from time to time write us on any point or offering suggestions.



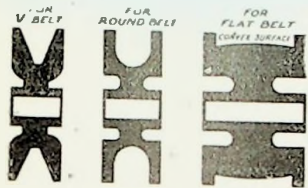
# BELT-DRIVING.

## ITS DIFFICULTIES AND HOW TO REMEDY THEM.

The method of transmitting mechanical energy by means of a belt or cord is—as is, of course, well known—of great antiquity. It is at once simple and efficient, and also capable of easy repair. Indeed, one has but to visit a modern engineer's workshop to see that belt-driving is even in these advanced days the system most used for transmitting the power from the engine to the shafting, and thence to the machines. It is quite true that a few up-to-date works are experimenting with chain-driving, but even this can only be used for the main transmissions from shaft to shaft, belts having to be used for sub-dividing the power to the machines.

### THE PROBLEM OF THE MOTOR BICYCLE "DRIVE."

Here we have a motor, the power of which depends in the main upon the speed factor, that is to say, to obtain a motor, small and compact and capable of developing considerable power, it must be designed to run at a high speed,



MOTOR PULLEYS.

then we can use a cylinder of small size, with a short piston stroke. The ideal motor would be one small in size and capable of giving out its power at a low speed, then we could drive direct without the intervention of belts or chains. There is at least one notable attempt being made to employ a direct drive, but here we have more than one cylinder so as to get a more equal turning motion, but still the fact remains that at least for the present we must use a small high speed motor, and gear down to obtain our power. The problem that has still to be solved satisfactorily is how can the power best be transmitted from the motor wheel to the driving wheel of the bicycle. We can employ one of four methods. (1) The belt running over grooved or flat-faced pulleys. (2) The chain running over toothed wheels as in a safety bicycle. (3) Cog or spur wheel gearing. (4) Worm and pinion gear, and (5) Direct contact or friction driving. We might say that eighty per cent. of the motor bicycles at present on the market adopt a belt-drive; of the chain-drive we have a representative in the Humber, of the spur wheel-drive the Singer, and the worm and pinion the Starley, and in the Derby motor we have a friction-drive.

### THE DISADVANTAGES OF A CHAIN DRIVE.

To the average rider it often seems that the chain-drive would at once be the most simple and effective; he will probably claim that the drive is a positive one; there is no slipping and all the power is transmitted, but as a matter of fact this "positive" drive is exactly what we do not require in one sense. We require something with a little elasticity about it, so that shocks and sudden variations in the speed of the motor are not communicated direct to the tyre. Then there are certain difficulties in the way of obtaining very large and accurately cut chain wheels. Smaller ones can of course be used, but this necessitates having an intermediate pair of wheels and two chains—undesirable complications; and if we require to free the motor from the

driving wheel, say in case of a breakdown so as to be able to pedal home, it means some trouble to unbolt the chain, and then we have to stow it away somewhere.

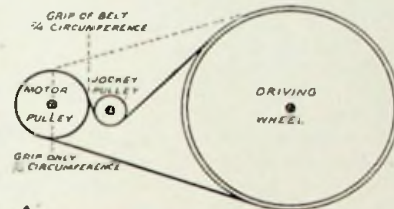
### WHERE THE BELT SYSTEM OF TRANSMISSION SCORES.

Its chief advantage lies in the fact that a belt possesses the desirable property of being slightly elastic in its drive, and so compensates, as it were, for inequalities in the running of the motor. That is to say, supposing the motor suddenly rises from 1,000 to 1,500 revolutions per minute, the belt is not liable to convey the increase of speed instantly to the tyre and cause it to slip on the road surface, which would prove disastrous for the tyre. The belt would also slip a little in the groove of the motor pulley and would take up the increased speed rather gradually; it also has the advantage

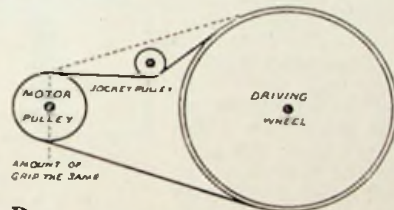
of being very easily detached from the wheels and not being heavy or bulky is easily stowed away somewhere on the machine in case it is necessary to pedal. It might just be mentioned here that some firms are endeavouring to get an elastic chain-drive by employing a special clutch on the motor pulley.

### THE BEST FORM OF BELT AND TRANSMISSION PULLEYS.

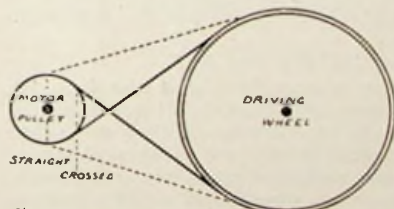
The belt may be of a flat, round, or triangular section; the relative advantages of these shapes are well known to practical engineers. If a large amount of power has to be transmitted from a slow-moving engine it is the rule to use broad flat belts running over pulleys having a slightly curved face; if the engine runs at a high rate or speed narrower belts may be used. Flat belt-driving is undoubtedly



A. SHOWING BEST POSITION OF PULLEY



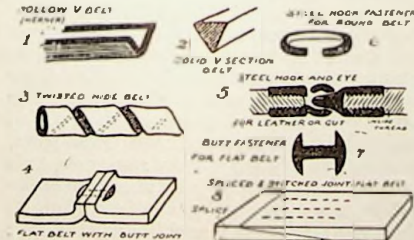
B. SHOWING PULLEY IN USELESS POSITION



C. GRIP INCREASED BY CROSSING BELT

DIAGRAMS ILLUSTRATING THE RIGHT AND WRONG POSITION OF JOCKEY PULLEY AND THE CROSS BELT ARRANGEMENT.

the best and most general system used in ordinary engineering practice, and it is remarkable how motorcycle designers are veering round and applying these old but well-tried principles. A good deal of light machinery is however run by means of round section leather, hemp, or gut ropes. By adopting this form of drive a much more compact and neat pulley system can be used, and it would appear that this fact accounts for its being so largely adopted by the present-day motorcycle designer. For a round belt the pulley only requires to be about 3/8ths inch in width, whereas in a flat belt-drive the pulleys require to be at least 1 1/4 inches inclusive of the flanges. It might just be stated here that flanges or guides to the pulleys are absolutely necessary for a motorcycle, because no matter how truly



THE ABOVE INDICATE THE BELTS AND JOINTS NOW IN USE.



they may be aligned, the risk of having a disaster through the belt coming off and catching in the spokes is very considerable, if they are not provided with flanges.

The present form of round belt consists of a long strip of raw hide leather. This is cut about an inch in width and then twisted into a thick cord of about  $\frac{3}{8}$  in. diameter. Raw hide is much more flexible and stronger than ordinary tanned leather, and does not get hard or rot so quickly. One other important advantage that a twisted hide belt has is its property of shortening in length when one end is held and the other twisted; this gives a ready means of tightening it.

Another form of belt that has proved very satisfactory in skilful hands is the hollow V section as applied to the front-driving "Werner." This gives practically the same grip as a flat belt owing to the large surface contact; this belt requires, however, care in making the fastening.

A material used to a limited extent for motorbicycle drives is twisted gut. This is largely used in preference to round leather for running light high-speed machinery. It is not so flexible, however, as twisted hide, and it also requires a special form of hook-and-eye fastening, which requires some practice in attaching.

THE STRETCHING DIFFICULTY.

All belts or cords made of leather are subject to stretching. This is very noticeable when they are new, but afterwards a condition is reached when the stretch practically ceases. One very good plan to take out this initial stretch is to firmly secure one end of the belt to a strong hook in the ceiling or on the wall and to the other end tie some very heavy weights (up to 112 lbs. if possible); these must hang well clear of the floor, and in about a fortnight the stretch will be all taken out.

BELT FASTENINGS.

With round belts these take the form of a simple hook of steel wire. This passes through holes bored in the ends of the belt; for V belts also a hook is used. For flat belts there are many forms, chiefly in the shape of a hinge or plate, having prongs at its edges; but from an engineer's point of view the best plan is to have the well-stretched belt carefully spliced and stitched together, thus making it jointless. If well done, and the belt is carefully dressed, this system answers well, provided an adjustable tensioning pulley is fitted.

METHODS OF ADJUSTING THE BELT.

To get the best results it is important that the belt be adjusted to the correct degree of tightness. If too slack it will allow the motor pulley to slip round, and thus no power is transmitted. On the other hand, if it is very tight, a great strain is put upon the pulley-bearing, which through binding and friction wastes much power, and also the fastening of the belt is very liable to pull through. With a twisted hide belt the correct tension is obtained by twisting it and then hooking it together; flat and V belts must have a small piece cut from one end to shorten it, and then the fastener replaced. This, at any rate, is the most general method.

JOCKEY PULLEYS

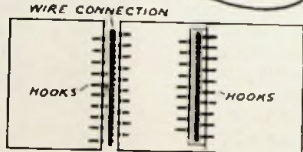
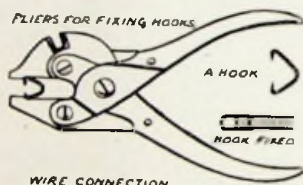
are fitted to some makes of machines, although these are not fitted always in such a manner that they serve their proper junction. From the diagram it will be seen that the jockey pulley is really intended to increase the "lap" of the belt round the driving pulley so as to get more grip; as a matter of fact it is often assumed that it is to simply serve as a means of putting tension on the belt (diagram B). The correct place for it is as close up to the motor pulley as space will allow, so that, if possible, 3-4ths of the groove circle of the pulley is in contact with the belt, a good drive can be got with just a moderate tension.

Another method of tensioning the belt is to have the driving wheel of the bicycle arranged to slide in slots so that

the pulleys can be relatively adjusted farther apart. Unfortunately this really efficient method is only applicable to a front wheel drive, such as the "Werner" or "Raleigh." In the latter this adjustment is provided by having the axle ends fitted with eccentrics. The difficulty of attaching this to the back wheel will be easily seen from the fact that the chain wheel centres would have to remain the same. The Enfield Co. in a recent model—in which the motor is supported on the steering socket—drives on to the back wheel. They get a long drive thereby, and as the belt is crossed and a good grip of the pulley is obtained, this arrangement means, of course, that the motor runs reverse to the wheel.

GENERAL HINTS ON KEEPING THE BELTS IN GOOD ORDER.

Remember that leather is affected by changes of the atmosphere. A tight belt will get tighter still in cold, damp weather, and may require slacking off a little in warm, dry weather, when occasional tensioning will be required. In fitting a hook or fastener remember to pinch or drill the holes, and do not slit them with a penknife, and also make the hole well back from the edge of the leather. The hook should be of steel wire for preference; if the hook-and-eye fastener is used they must be firmly screwed on to the leather or gut, first tapering it slightly with a file. Then as to dressing the belt. Tanned leather, if it gets dry, will become brittle and snap very easily. Avoid this by treating the surface with castor or collan oil, well rubbed in occasionally. Let it soak in and then clean the surface till dry. The use of resin is not recommended, although it certainly helps the belt to grip for a little time, but it destroys the fibre of the leather. In making a joint on a flat belt, a satisfactory one can be made, as shown in the diagram, by means of a "butt" fastener; this runs over the small pulley very easily, because there is no extra thickness produced at the joint. readily unfastens, being flat, and passed through a small slot punched in the belt ends.



NEW TYPE OF FASTENER FOR FLAT BELT SUITABLE FOR ANY WIDTH, AND READILY DETACHED.

Concerning Valves.

Upon the efficient working of the valves the power given out by the motor largely depends. These are two in number, and are called the (1) "inlet" or induction valve, and (2) the "exhaust" or outlet valve. These work in the following manner: The induction valve is fitted in the head of the cylinder, and is, in fact, complete in itself; that is to say, the valve head and seat with its spring and cage are easily taken out or replaced. The function of the inlet valve is to open with the suction stroke of the piston, and allow the explosive mixture to be drawn into the cylinder; it then closes by means of its spring, and must be perfectly tight and sound, so that none of the compressed gases can escape. On the completion of the firing stroke, the outlet or exhaust valve opens, and so allows the burnt gas to escape into the exhaust box. The work that this valve has to do is very severe, and is, therefore, more likely to give trouble than the easier-worked inlet valve.

To ensure the valve heads being a perfect fit on their seats, they must be ground in position. With a new machine, this will have been done by the makers, but it is advisable to take out the exhaust valve after, say, 400 miles and examine it. You will probably find the cone part rough and burnt-looking; if the stem looks dangerously thin, it is best to replace the old valve with a new one, in any case re-grind the valve head. To do this obtain some "flour" emery (or knife polish will do), mix it into a paste with a little lubricating oil, and smear it on the valve and seat; then with a screwdriver fitted into the notch of valve head, work the valve head firmly on its seat. Examine it occasionally, and grind away till all roughness has disappeared from the cone; if there is room to work it, the screwdriver can be fitted into a brace or drill stock—this plan is far quicker than working the screwdriver by hand alone. The inlet valve can be reground in a similar manner



## THE MOTOR BICYCLE: WHAT WILL IT BECOME?

By ANTHONY WESTLAKE.

*It is obvious that the most vital question to be dealt with in the near future will be the points touched upon briefly in our Editorial of last week. With a view to hastening this consummation, a series of articles on the subject will appear in our columns, and following is the first instalment of an article from the pen of Mr. Westlake. We invite the opinions or suggestions of our readers upon any moot point raised by the various writers who will contribute to the series.*

In attempting to draw definite conclusions from the chaos of indefinite experiments already in our hands, it is well to consider the most important factor, i.e., the future motor cyclist. Will he become something of an engineer, even an expert, or is he to be simply regarded as the controlling or steering element of an absolutely reliable and efficient machine? A minute's consideration will show how important a result will be effected, one way or the other, in or upon the machine itself by these queries.

A century ago, when the horse was the most convenient means for quick or individual transport, the average man knew a vast deal more of horse flesh in all shapes and forms than he does to-day. Indeed, he was, generally speaking, a bit of a "vet," more or less skilful according to his intelligence. Again, as pneumatic tyres and the improved bicycle made this once despised instrument a practical and safe vehicle for most of us, the common knowledge of its various ailments increased until the boy in the street and average school girl could repair a punctured tyre and adjust a bearing—things at one time of deep mystery even to the expert mechanic and rider.

If I may be allowed to draw any inference from these things, it is fairly safe to predict that our motorcyclist of the future will have as much comparative knowledge of his mount as his ancestral predecessor used to have of his horse one hundred years ago.

### "Efficiency First."

But let us assume for the sake of argument that both conditions are probable, and treat each in turn, dealing in the first place with that condition in which the motorist is a man with a thorough grasp of the technique of his machine. What is it we are all calling for in demanding increased "efficiency, reliability, and simplicity" in our future machines? Those three words come most glibly off the tongue, and, yet, to judge by achieved masterpieces in mechanical appliance, these three are not one, but are an Ideal—incompatible with the Real at our disposal. Take as our first example the bicycle. What could have been more simple than the dandy-horse. Watch its development into the tall bicycle of revered memory. Added efficiency was certainly gained by introducing cranks, at the obvious loss of simplicity. Then came ball bearings, and again a higher efficiency was attained, with distinct loss to the other two factors. Again was the machine metamorphosed and we had the safety bicycle, and added chain and crank bracket—thus once more was efficiency gained at the expense of simplicity. And then the crowning improvement which has really been the salvation of both bicycle and cars, to wit, the pneumatic tyre. This, which increased the efficiency of the bicycle perhaps fifty per cent, is most likely the least reliable part of the bicycle and motor, and certainly not the simplest. Remember too, that by efficiency mere speed is not meant, but greatest economy for given power, and surely this is the hidden end of all we mean. If the sceptic is not satisfied, let him turn to any class of power-propelled machinery, and examine carefully; the history is the same: the steam engine—how do water tube boilers, compound engines and the endless multiplicity of radial valve gears bear out our argument except to show that efficiency must take precedence over simplicity and reliability?

The locomotive, mining machinery, and the mills all tell the same tale. May we not then take this as being the first

aim in our future motorcycle, the two others always following in due proportion as far as compatible? For though most earnestly to be desired, they must not be attained at the expense of what I have endeavoured to show is all important.

Having come to these conclusions, let us leave them for a space and turn to the question of form or structure. We may be assured that the machine will be of a single track type, as this is far more efficient than any other. We may also take it that the steering will be much as at present, at least in general arrangement, as this has been well proved up to very high speeds, and is all that can be desired at low ones; thus we now have something to start on, though it is not impossible that a machine having three wheels in line for tandem fashion or heavy loads may find a future. This last surmise apart, then we have two wheels arranged more or less like those of the modern bicycle, and we come to other details.

Are we to have a saddle or a commodious seat? This again depends much upon whether the pedals are discarded or not. At this point we come to a juncture where there is very little indeed to guide one at present, for there are both patterns on the market.

### Excessive Weight.

Now my own actual experience has taught me that the most dangerous factor in a single track machine is excessive weight. All the early machines erred on this point, and one has only to spend a minute with anyone who has had experience of those early efforts to learn that weight was their most fatal point. Now as machines became lighter, pedals and chain were added, because the former make good foot rests, and save one from being cramped by the facility with which occasional movements may be made. The extra weight to be carried is only a few ounces, and if the machine is light their convenience is so obvious that it is unnecessary to dilate upon it.

I can give an instance in point. Last summer, I was riding between Barnet and Hatfield on my "Bluhm" motor (weight 130 lbs.), pedal gear 84. On our return, about eight miles from the latter place, the crank broke, the engine at once becoming useless. Knowing what had happened and seeing how unavailing it would be to dismount, I pressed the clutch which disengaged the engine and pedalled those eight miles in something under 45 minutes. Of course the run down Digswell Hill accounted somewhat for this good average on so heavy a mount. Now I contend that however perfect and reliable we may make our motors, accidents of this kind will always occur, even as they do on railways and steamships. One may go for years without such, but when it happens, how much one values the convenience of being able to get quickly and expeditiously to a resting place for the night or a depot for repairs.

Not only is the pedalling arrangement invaluable from that point of view, but one finds it a great convenience at times when it is not expedient to run one's engine.

In expressing the above opinions on the utility of pedalling gear, I have no intention of drawing any didactic conclusion, but rather to endeavour to make an opening for discussion; what is, however, very obvious to my mind is the simple fact that the pedalling gear, if present, must be subservient in its position and proportions to the best placing of the motor itself. If we were discussing a motor-assisted bicycle the reverse would obtain, but it is becoming apparent that the motor-propelled



bicycle has a larger sphere. And in this the secondary propelling medium must give way to the primary, in points that affect their mutual efficiency. For instance, take the first Minerva designed to occupy ordinary bottom-bracket space. The bearings of this machine were much too narrow, valves and piston were also inadequate for a motor-bicycle, and for a motor-assisted bicycle it was too heavy. But as I have hinted before, the question of weight will also probably determine the pedal problem. But the efficiency of a motor for a given power, or petrol consumed, is also largely dependent on the inertia and resistance of the mass propelled, so that to gain efficiency we must reduce weight to the proper level consistent with safety and convenience.

### Lightening Fly Wheel.

Let us now take the real meaning of this last sentence as affecting the design of engine, presently again recurring to the pedals, which we have relegated to the present to their proper subservient position on the machine. So it is determined that we first see how our propelling motor may be lightened. Let us assume the ordinary "Beau de Rochas" or four-stroke cycle engine is being dealt with—taking the heaviest item first, i.e., the fly wheel. How may this be reduced in weight, without impairing the power of motor? The facts to go upon are simple. The fly wheel should be capable of absorbing nearly the entire impulse from piston. Now the horse power of a cylinder may be calculated on many well known formulæ.\* And the power absorbed and given out by the fly wheel is, perhaps, best arrived at by taking 33,000 lbs. raised one foot per minute or one lb. raised 33,000 feet per minute as a horse power. Take the weight of the fly wheel and multiply by the velocity of the fly wheel in feet. This velocity is approximately obtained by measuring from the centre of the mass of the rim to the centre of fly wheel and multiplying the radius thus obtained by 6. For an example: a fly wheel 10 inches diameter, with a heavy rim 2 inches broad by 2 inches deep, weighing in all some 26 lbs.; then taking a measurement one inch inside rim from the centre of the mass of the rim to the centre of the wheel: this gives 4 inches multiplied by 6 = 2 feet. Multiply again by revolutions per minute, say 1,500 = 3,000 feet per minute, and weight 26 lbs., equivalent to the pound moving at 78,000 feet per minute, or inversely 78,000 lbs. moving one foot per minute, which equals nearly 2½ h.p.

Now it is obvious that if our fly wheel were 6 inch average weight diameter that it would have to weigh 33 lbs. to give the same power at the same number of revolutions; it is also equally obvious that if we were to increase our diameter to 16 inches that 13 lbs. would give the same h.p. at above speed, thus to decrease weight of our fly wheels, and keep power constant we must increase their diameter.

Now there are many who will say "stale news" to the above; I am perfectly willing to admit the charge. Watt worked it all out for himself, and his fly wheels were 12 and 16 feet diameter, but we are faced with the crank case problem, and a glance shows that the practice hitherto has been to enclose these fly wheels. If we are going to lighten our engine, this fashion must go, for we save weight immensely both in crank case and fly wheel by placing the latter outside; also the engine is actually simplified in many respects by so doing. Clement-Garrard, the Petrocyclette, Fabrique Nationale, Jooss and Calvert, of Mildmay Park, N., have already fallen into line over this. These are firms whose experience and knowledge are not to be lightly passed by, and their very boldness in acting contrary to accepted practice shows that they were influenced by the question of weight.

\* This formula applied to the cylinder of a properly proportioned engine and fly wheel will give the approximate B.H.P.

$$\text{B.H.P.} = D_2 \times (L + C) \times \left[ \frac{L + C}{C} - 1 \right] \times N$$

12,000

D.—Diameter of piston in inches. L.—Stroke of piston in inches.  
C.—Clearance volume divided by piston area in square inches.  
N.—Revolutions per minute.

My own opinions in materialised form will appear before long, and those opinions were formed independently some twelve months back, when the question of increased efficiency and decreased weight became urgent.

Let us make a resume of our conclusions. So far, very little progress has been made towards a complete machine (the bicycle of the future), but we have first our wheels, next probably pedals, and then the engine position undetermined, having "outside" fly wheels. Shall our motor be air- or water-cooled, vertical, inclined, or horizontal? There are reasons by which air-cooling on a bicycle is more perfect than on a tricycle, and as a slower running motor may be used let us assume it is also air-cooled.

The multiple-cylinder engine has, doubtless, a future, and it is my humble opinion that both types will develop side by side, even as we see in cars to-day. It is better, perhaps, to deal with these later, and proceed to evolve our standard type of single cylinder. Now it is position that claims our attention. This involves a double issue, viz., position in frame of motor and the position of the motor "per se."

### Engine Position.

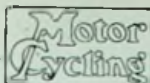
One sees how fancy has already played a large part in this, as scarcely two motors follow the same line. But it is well to recollect that there must be a "best." Now to help us to decide, we may turn to existing practice in high-speed engines of all types, where space is a consideration, and at once the vertical is "en evidence." As a matter of fact, there are many arguments for every position, but the matter of lubrication and balance seems to favour the vertical. There is also another item—"valves." These should in any case be upright, especially the inlet or induction, as the finding of a true seat on closing is largely effected if on a slant, especially if the spring is a bit weak. Another point in connection with the inlet valve is its position in cylinder. This should be such that the pressure of incoming mixture should be equally distributed all round the valve, and should not have a tendency to thrust it to one side. Such a position is attained if the inlet is placed in the centre of the cylinder head of a vertical engine. Mors, of Paris-Berlin fame, adopts this arrangement on all his large cars. At the recent Crystal Palace show, too, the vertical engine was much in evidence in all cases where the frame and motor had been designed in combination. It is hardly necessary to point to the New Werner, the Chapelle, the Rex, Precision, Vipen, King of Cambridge, and others.

The Humber, I think, endeavours too much to follow the usual bicycle frame, and my experience of long-stroke motors for cycles is not very favourable. It is well to remember that length of stroke means piston speed, which is obtained in a short-stroke engine by its adaptability to run faster. It is a moot point, and I should welcome a keen discussion on it.

Now for the position of engine in frame. This will be determined partly by what transmission is used, partly by convenience regarding other fittings. Somewhere about the spot now occupied by the bottom bracket seems at present to be favoured, and it is interesting to observe that nearly all the early motors were so placed, which seems to show that their designers and makers saw in it obvious advantages. Daimler's bicycle, Shaw or Crawley, Bluhm, and others recently illustrated in these pages demonstrated this. Much has been said and written about the weight of the engine being placed in front or behind. Some makers, in speaking of where they placed their engine, and talking of the centre of gravity being high or low, forward or back, appear to me to have overlooked the simple fact that the position of rider really determines the centre of gravity, and in most machines, if the engine is placed in front of the bracket, the saddle is far back, and instead of the engine bringing the weight forward it gives the rider, weighing perhaps twice as much as the whole machine, a tendency to sit more over his back wheel; and vice versa, if a machine has its engine placed far back, the rear triangle of frame is pulled out to such an extent that when "in situ," the rider is midway between the axles.

(To be continued.)





**NEWS.**

The King of Belgium has given his patronage to the Salon de l'Automobile which opened in Brussels on Saturday.

The German Automobile Club will organize a touring party on the occasion of the Paris-Vienna race, starting from Berlin in good time to see the finish of the competition.

With the view to encouraging the use of motors in Australia, the Government has abolished all customs duties, which were in vogue up to quite recently. New South Wales was the only one of the Australian colonies which allowed the free entry of motors.

**Belt Dressing.**

Experience has proved to one of the staff that although castor oil is excellent in some respects for preserving the driving belt, there is something lacking, and there is no doubt that the oil assists the "stretch" very considerably. The County Chemical Co., of Birmingham, will shortly place a special dressing on the market which we shall test at the first opportunity.

**The Youthful Motist.**

The "Tatler" says that the latest fad among New York millionaires is to present their three-year-old sons with motorcars.

What luck to be a millionaire  
 His heir!  
 According to our friend the "Tatler,"  
 This prattler,  
 On the eventful day when he  
 Is three,  
 Receives a present from his pa,—  
 A car,  
 A motor-car! He scarce can frame  
 The name!  
 The gift's a downright wicked act!—  
 In fact,  
 When there are chaps like me, who'd like  
 A bike,  
 And haven't any cash to buy,—  
 Well, I  
 Reckon they ought to execute  
 The brute!  
 Just watch that wretched little kid,—  
 He did  
 A thing I shouldn't care to do,  
 Nor you!  
 Diving beneath that horse's nose,—  
 He goes  
 Just where he likes, and doesn't seem  
 To dream  
 Of danger; as he passes the  
 P.C.,  
 Compares the way in which he scoots  
 To boots  
 Which (what he means I'll leave to you)  
 Aren't new.  
 How skilfully he works the steer-  
 Ing gear!  
 And perfectly controls his speed!—  
 Indeed  
 The kid must know a jolly lot,—  
 Eh, what?  
 Admiring him I seem to be?  
 Not me!  
 I don't admire the little brat—  
 What's that?  
 You reckon that I've got the hump?  
 You chump!  
 Here come along, and don't stand star-  
 Ing there!

SIDNEY J. TAYLER.

G. Lacy Hillier believes that the motor-bicycle has come to stay, and predicts a busy year in 1902.

Those readers residing in the Midlands and who desire to join a club specially devoted to their interests should send their names and addresses to us.

**The Question of the Hour.**

To mote or not to mote, is the momentous question that has to be decided at the Annual Meeting of the C.T.C. which will be held at Nottingham on Friday of this week. If the members present decide to admit motorists to the club, well and good; if not, the falling off in membership is likely to take an even more pronounced form than at present.

**The Right Lamps wrongly illustrated.**

We have been asked to point out that by an oversight the illustrations in the advertisement of the 20th Century lamps last week were incorrect and must therefore have conveyed an entirely wrong impression of the articles which the South British Trading Company have placed on the market for the use of motor cyclists and motorists generally. The matter has been rectified in this issue.

**Motor Cycle Racing at Aston.**

In connection with the usual Charity Sports Meeting which takes place at the Aston track on Wednesday, it has been decided to hold one or more races for motor bicycles. About two seasons ago when a series of motor-tricycle races took place on the Birmingham track, the spectators were very enthusiastic, and it is hoped the introduction of the now popular bicycle form of motor will do much to revive the interest in racing in the Midlands. We think it would be wise, however, for sports promoters to allow only riders who have had some experience of path riding to compete.

**Not Scorned, by any means!**

From the last "Automobile Club Notes and Notices" we note that the Automobile Club has not relinquished all interest in motorcycles. An advisory committee is about to be appointed to consider and report what action should be taken by the club with reference to their encouragement. At a recent club meeting, when a paper was read on motorcycles, one of those who took part in the discussion that followed made a point of the fact that there was no doubt owners of motor cycles would eventually blossom out into car owners. So, no doubt, some attention has been paid by the club to this speaker's wise remarks.

**The World's Motor Records.**

In recording the recent attempt by Jenatzy upon the kilometre record, when a speed of 65 miles an hour was attained, we were reminded of the speedy bit of work done by S. F. Edge on the English-built "Napier" car, which formed a focus of attraction at the recent Crystal Palace show. This smart performance was timed by H. J. Swindley, official timekeeper to the Automobile Club, the kilometre being covered in 32 2-5 secs., which works out at 69 miles per hour, the five miles occupying 4 mins. 44 3-5 secs., or at the rate of 66 93 miles per hour. England is now waiting for someone to beat these times.

The Motor Bicycle; what will it become?

This is one of the biggest problems that has to be faced.

Our readers should read carefully the series of articles on this subject commencing this week.

The King, it is stated, is sending one of his cars to Cannes for use during his "spring holiday."

M. Serpollet, the inventor and maker of the well-known steam car is experimenting with alcohol, in the place of petrol.

Mr. Cecil Rhodes is following up his Italian apprenticeship (with Dr. Jameson), to the art of motoring, by travelling each day from Muizenberg, a favourite seaside watering place, where he is having a house built, to his house, Groot Schuur, Rondebosch, near Cape Town.

**No Spare Plug.**

Mr. Joseph Pennell, on a trial spin last week, was fortunate in the fact that he was close to Cobham when his sparking plug gave up the ghost. Of course, the spare plug, which this gentleman usually carries, was not in the pouch, and so he was pleased to make use of the one soon provided by a sympathising friend hailing from the district.

**The Minerva Patents.**

Apropos of the statement made by Mr. Citroen on behalf of the proprietors of the Minerva patents, that legal proceedings have been instituted against certain firms for alleged infringement of those patents, we are advised by Messrs. W. R. Thomas & Co., of Brixton, that service has been accepted and the action will be fought by that firm and probably by other defendants.

**Extravagant Statements.**

The "Daily Mail" succeeded last week in surprising motor circles by publishing a prominent statement to the effect that enormous premiums are now being obtained by dealers in the best known cars, who are so packed with orders that they can practically get what terms they like and so on. Nothing is more likely to deter anyone from ordering than such nonsense and extravagance. Out of charity we suggest that the "Daily Mail" young man has been taken advantage of.

**Lamps for Motor Cycles.**

The need of a stronger made and more powerful lamp for motor cycling has been quickly recognised by the leading accessory firms. Joseph Lucas, Ltd., have a special lamp which burns petroleum and is said to be very satisfactory. Many riders have a great liking for the oil variety, however, and, if properly constructed, we do not see why this kind of lamp should not still retain its popularity. The writer is at present testing a sample of one of the best known makes of this class of light-giver and will give his experience as soon as possible.





*Motist (addressing his friends) : " I never knew such a day. The first man I overtook was stuck up with a short circuit; his wires had been shockingly insulated: then I came across a poor beggar with his carburetter flooded, and the next victim yelled out that his commutator-----"*

*Respectable old Ladies: " Oh! how horrible!—what awful language!!" (They hastily retreat).*

A correspondent suggests that the average motor bicycle should scale about seventy pounds, adding a proviso that it be properly made and of good material.

The surface along the North road lately has been literally inches deep in mud, and the motor bicycle rider has had to drive very carefully in consequence.

On Saturday a great many motorcycles were to be seen on the North road; five or six machines in a bunch were passed at the " Duke of York," Ganwick Corner.

**A License Hint.**

Do not forget that the license for a motor-bicycle costs fifteen shillings and that it is now due and overdue. It is better to make the best of it and pay up than to get summoned and have to pay a fine and costs in addition to the license. If you use a trailer attachment the license will cost £2 2s., that is to say, the same as that for an ordinary carriage. In many districts the inland revenue officers are very sharp, and are likely to be more so this year.

**In New Zealand.**

A rider in New Zealand recounts his experiences with one of the earliest motor bicycles—a Minerva—sent over. Taking it to Christchurch, where a big Cycle Carnival was in progress, he caused quite a sensation by riding it a few times around the track. A few days afterwards another race-meeting was held, when the first automobile race ever run in New Zealand was one of the events on the programme, and the Minerva had rather an easy win.



The Motor Show which opened at Chicago on Saturday week is a great success.

Eccles, Lancashire, possesses a motor fire engine for the use of the local fire brigade.

Mr. Harvey Du Cros, junr., is an enthusiastic motorist, and usually contrives to slip away from business on the Friday in order to spend the week-end touring on a car.

Mr. T. W. J. Britten will be glad to hear from practical motor bicyclists with their views as to the proposed N.C.U. championship for motor bicycles. Letters may be sent to him at 27, Chancery Lane, W.C.

#### A Week-end Potter.

On the slippery North Road, during last week-end we saw Hooydonk and A. F. Ilsey, the latter on a chain-driven "Humber." Further on, the Lord Advocate of Scotland on a "Phoenix," and C. W. Brown on an "F.N." were noted getting over the greasy ground with comparative comfort.

#### "C. A. S."

An amusing article appears in this issue from the pen of C. A. Smith, who in years gone by was one of our speediest road-men. If the phraseology appears in places to be somewhat strange, it is very largely attributable to the fact that Mr. Smith is a prominent member of the Bath Road Club, which is well known to possess a quaint vocabulary of its own.

#### A Variable Gear.

In a chatty letter we received the other day from that prolific inventor, P. L. Renouf, he tells us that he believes he has solved the problem of providing a graduated speed gear, working from zero to 1 in 4. He has been working on this for some years. In the working model, by merely turning a handle while the motor is running, the driving wheel can be started from absolute rest to any required speed and back again to rest. "The gear," he writes, "is simpler and cheaper than any two speed gear as yet made, has no slip, no friction clutches, cones, belts or toothed gears, is quite positive and can be made automatic, so that the vehicle will gear itself down on a rise and gear itself up again on the level."

#### The Selling Season.

Now is the season for disposing of second-hand motor cycles, and a careful buyer may pick up a bargain by studying our advertisement columns: there is one point, however, which we should like to mention, from the seller's point of view. A friend of ours had a quad which he wanted to dispose of, as he had a motor bicycle on order. An enquiry came along in due course from a party who said he wanted to buy a quad; an appointment was made, and the seller naturally (very naturally) spent the afternoon cleaning up his machine and dirtying himself, he drove to the appointed place and took the "purchaser" for a drive. On returning, the passenger said he had enjoyed the drive, that the quad was a very nice one—in fact, the nicest quad he had seen. "But," said he, turning to a decrepit and superannuated car which was lying in his stable, "I must sell my old car before I can decide on purchasing a quad." Thus ended the wasted afternoon of a busy man.

The United Motor Industries, Ltd., of 42, Great Castle street, W., and Paris, who for years have paid special attention to the accessory requirements of motorists, are not neglecting the needs of the motor bicyclist, but have made arrangements to furnish him with all he is ever likely to want from under one roof.

#### A Heavy Fine.

Furious driving of cars to the public danger ought most certainly to be put a stop to, but we cannot overlook the fact that the Bench is very often too severe on cases of so-called "furious driving" brought before them. At Gloucester one day last week the driver of a car was fined ten pounds and costs (thirteen and threepence) or one month's hard labour for driving a car from Gloucester to Cheltenham at a speed variously estimated by the witnesses who gave evidence, at from 14 to 40 miles an hour.

#### Storing Petrol.

Mr. C. Johnson of the Automobile Club writes as follows anent our statement that petrol can be stored without a license up to 60 gallons, kept in metal vessels securely closed and holding two gallons each. We are glad to give the further conditions:— "The writer of this paragraph may have overlooked the fact that it might lead cycle agents and others to believe that they could store 60 gallons of petrol for purposes of selling without a license, of course this is not so. Further, for those who keep petrol for use on an automobile, the vessels have to be specially constructed; they have to bear certain words legibly and indelibly marked upon them, and the place in which it is stored has to conform with certain regulations."

#### Open to Improvement.

The flimsiest fitment about the whole motor bicycle is the insulating block attached to the handle-bar socket, and to which the wires from the battery to the switch handle are connected. The design of this fitment in most cases is about on a par with what one expects in the cheapest electric bell outfits.

#### Motor Bicycle Races.

A motor bicycle race for professionals will be included in the Easter programme at the Parc des Princes track, and another at the opening of the new Velodrome Buffalo. The *preuve de resistance* at the latter meeting will be the 30 kilometres match between Bouhours, who has competed in the Century Cup race at the Crystal Palace, and Stinson the American flyer, at present in "la ville lumiere." Pacing will be by motor-bicycles.

#### How Grit Spoils a Joint.

The other day after a rather too generous dose of lubricant to the crank chamber, we noticed that oil was exuding very slightly from the joint between the cylinder and combustion head. All the nuts, however, were tight down, but on removing the head for examination later on, we found the merest trace of grit between the surfaces forming the joint. Since the removal of this we have found the compression and consequently the power of the motor distinctly improved. Too great care can hardly be taken in making these joints, particularly the one under notice. Another fruitful source of leakage of compression in engines of the De Dion pattern is through the compression cock, the nut on the end of which will frequently work loose.



The "Precision," a Northampton made machine, as it appeared during the trial runs on the Terrace at the recent Crystal Palace Show, where it attracted considerable attentions.



## OTHER PEOPLE'S VIEWS.

### Horse Power.

Sir,—I should be glad to know what is the meaning of the term horse power. We in our club notice this expression keeps appearing in all sorts of ways, such as "on the brake," "nominal," "actual," &c. A definition of each term would be welcomed by many.

Yours faithfully,  
C. S. G.

[We have an article on the subject in preparation.—Ed. "Motor Cycling."]

### A Testing Mart.

Sir,—I gather that you do not care to assert which is the best motor bicycle, but I see you have other readers besides me, who would like to acquire that information, and I hope you may try to accommodate them. Perhaps you will suggest that some of the marts, where motor-bicycles are sold, should provide a space where intending purchasers could resort, so as to test the motors before selecting or buying one.

I bought a motor bicycle in 1900 and another in 1901. I understood they were the best, but I found no one who could make them go any reasonable distance, and I should like one that will travel its thousands of miles without more trouble than the safety bicycle entails, which consummation makers seem to promise, but leave it to their customers to evolve, if they are capable of discovering in what way it can be done.

Yours faithfully,  
J. A.

[We had written an editorial on instruction and testing schools, &c., strangely enough, before the above letter came to hand. Our correspondent and many others should follow closely the important article which starts this week upon "The Motor Bicycle: what will it become?"—Ed. "Motor Cycling."]

### In Defence of the "Mitchell."

SIR,—Our attention has been called to an article in your edition of February 26th, written by Mr. Anthony Westlake in which he criticises his experience with the "Mitchell" motor-bicycle. Of course the motor which he had was one of our earliest models, and Mr. Westlake's idea was to get a speed of say 40 miles an hour out of it. He therefore tried it on the track, and although it easily did 25 miles speed, it was not built for racing, but was an ordinary roadster. We have machines which are capable of doing 40 miles an hour if properly adjusted, but these are quite impractical for ordinary riding, as it takes a rider of no mean ability to keep a bicycle on a track going at this speed. On this fact Mr. Westlake bases his assertion that the fly wheels are too light. We can only say on this point that the "Mitchell" engine is designed by Mr. Pierce, the best known American maker of gas and petrol engines, and as he undoubtedly tried heavier fly wheels we can only come to the conclusion that he did not approve of them.

As regards electrical arrangements, of course we supply accumulators if customers desire, although in America no one would use these.

As regards losing power, the transmission of driving pulley to back wheel: if proper belt

is used there should be no loss of power, and we claim that since we have used our own twisted gut belt the loss of power is reduced absolutely to a minimum; and it is certainly agreed amongst makers of motor bicycles that a certain amount of "give" should be allowed, to conduce to the safety of the amateur, who is, after all, the greatest user of a motor bicycle.—Yours truly,

DAVIS, ALLEN AND CO.

### Position of the Engine.

Sir,—Makers have adopted various positions for fixing the motor engines to the frame of the machine, and one company, Singer's, have gone to the length of placing theirs within the road wheel. Doubtless, with the exception of the last named, all have more or less been guided by the form of the cycle frame which has been presented to them as the best for the motorcycle, and I must say that it is a serviceable form and one not at all likely to be beaten. At the same time a question arises, is it advisable to retain this, or build a frame specially for the motor engine? One has to look at the position from many points of view, but the most important question above all others that has to be decided is one of wear and tear coupled with that of efficient lubrication.

#### WEAR AND TEAR.

Very few riders of the motorcycle as at present fitted have had much to contend with in the form of wear and tear, the engine being, comparatively speaking, quite new; when, however, the wear becomes apparent, it will be a matter of very grave importance to the rider, so that he may not lose the efficiency of his machine, and the task of taking up the wear will be a larger one than most riders will be capable of, being beyond their resources. The adjustment of the working parts, the turning of the valves to lift and close at the proper time, the compensation of the irregular wearing of the surfaces, will entail a large amount of trouble and care and at the same time tedious beyond the capabilities of ordinary riders. It therefore behoves them to make a study of the question as to the best position of the engine so as to get the least amount of wear and tear and at the same time facility for overhauling.

An engine working in a position out of the vertical must have a tendency to wear down towards its lowest side, and one of the most difficult points will be the wearing of the surfaces of the inlet and exhaust valves and their seats. In order to get the best possible results with valves of the type used in motors, engineers endeavour to keep the faces as narrow as possible, limiting the width to that which will be sufficient to bear the pressure upon them without undue wear. They also make it a point never to place a valve in anything but a vertical position, if they would have efficiency from it, the object being to prevent canting, as it is termed, which will in a short time produce wear in the form of the faces becoming elliptical in shape and the rounding of the surfaces. A valve or seat so wearing requires to be re-seated, that is, placed in the lathe and made true, and the seat bored in its place, if it is incapable of being taken out, operations at once expensive and intricate. Before use

again, the faces require to be ground to each other so as to prevent leakage past them. It is obvious, therefore, that in any engine which is placed out of the vertical and having its valves working in the same line, this tendency for the valves and faces to wear elliptical must be greater than where the valves are vertical. The same thing applies equally to all other of the working parts of the engine and the extra friction produced by it must increase the cost of lubrication and diminish the horse-power obtainable from the engine.

#### LUBRICATION.

Undoubtedly one of the greatest difficulties which presents itself in all engines belonging to the motor type is the effective lubrication of those parts of the engine which are subjected to the heat and flame of the explosion. How difficult this is may be gathered from some recent published facts in connection with a number of experiments carried out with heat engines, and where it was undoubtedly proved that the end of the piston next the explosion chamber became in a very short time nearly red hot, and that with an engine that was water jacketed, and a steady stream of cold water running through it. How much more so must be the internal state of a motor engine cooled only by air? These remarks apply mainly to motors used on cycles, as it is well known provision is made in the larger class of the to have water-cooling, but this can only be done where the question of weight is not so great a moment.

#### HIGH VELOCITY.

With an engine working at so high a velocity to obtain the requisite power from small cylinder, heavy pressures must be resorted to and consequently great heat, as I have previously pointed out, lubrication must be efficient as well as good. Given an engine which presents no difficulties in getting the oil to every part that requires it, it is so far from an easy problem to arrive at the utmost efficiency. Under these conditions the vertical engine appeals to me as offering the best type for the position to get the best results from, as naturally the oil injected into the cylinder will spread itself all over the walls of the cylinder in a far better manner than if the cylinder were inclined, and where the oil would go to the lowest point.

There is still a point that is worthy a little consideration before closing, that is the ease for adjustment, etc. must recognise that an engine running so high a velocity will have wear in bearings, and to place the engine in an awkward or difficult position is to court want of attention, for the easier an engine can be removed for overhauling; cleaning the better will be the results for it; and this point is urged on those who make and fit motors. The main question then points to the fact, that the vertical position is the one best suited for the results, and in order to do this it is proper thing to design a new frame to the engine, instead of designing the engine to suit the frame, and so out of a good arrangement only obtain a second rate result; it is an old proverbial spoiling of the ship for the sake of a pennyworth of tar.

Yours faithfully,  
"THE PHANTOM"



**Motor Cycle Experiences.**

Sir,—The motor cycling experiences of various writers in your columns suggested to me that a brief outline of some which have happened to myself and other people might be interesting.

The first which occurred to me, by the way, was not a breakdown. After having tried to start for about two miles, I discovered that I had forgotten to insert the interrupter. The second was meeting a man towing a motor tricycle up Barnet Hill. I found he had used up all the petrol in carburetter, and had not filled up from his spare tank; this was his first ride.

The next rider I met in trouble was on the Maidstone Road—he was going to Folkestone, had got as far as Wrotham and then stopped. Upon examination I discovered he had run the old oil out of his crank chamber and had not replaced the screw. I had to substitute this with a pin of wood. Then I found that he had had his accumulators charged, and in replacing them had not put any packing to keep them from shorting on the battery case, and every bump in the road jolted the terminals in contact with the metal can. Both troubles were easily remedied, but the latter had caused mis-fires, and the former resulted in seizure of the piston, which was eased with paraffin.

On another occasion I could not get my motor to start and on examination found that some dust had got in the switch handle so could not make a circuit, but this was a very simple thing to remedy.

On another occasion I met a friend pedalling his motor bicycle, and found his batteries were run down, so obtained some electric bell wire and coupled his coil to my accumulator (which is a Peto and Radford), and we came home together off the one accumulator, but I found riding side by-side very tricky, and every time we got a bit wide the wires parted.

Another time I had my exhaust box stolen, this, by the bye, was a large copper affair of my own design; then I realised how much help it is in passing horses.

Once whilst driving a quad, I could only go a few miles, then the thing would mis-fire. Tested batteries; all right; filled up with petrol, started all right—after a mile or two mis-fires. I then started to run out the petrol from the carburetter, when I noticed that it was very much discoloured, and upon examination found that the copper pipe from the exhaust, which passes through the petrol tank, had got a small crack in it, so disconnected it from exhaust and had no more trouble.

A good plan for anyone starting to ride a motor cycle without previous experience in motoring is to get a friend who has had experience to accompany him, when many little wrinkles might be picked up.

I think all motor manufacturers ought to send out a book on likely defects and their remedies.

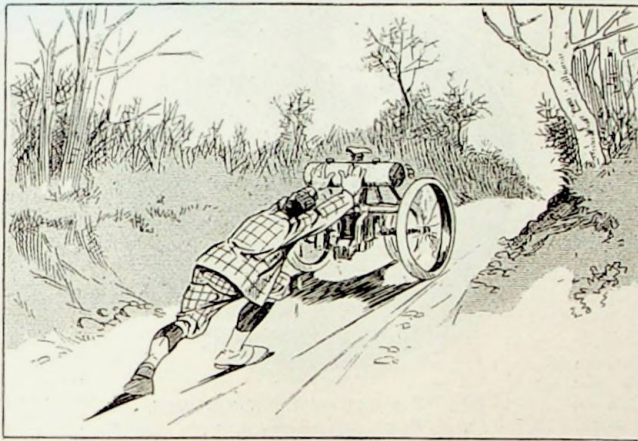
Yours truly,

HENRY KENNETT, JUNR.

**An Efficient Motor.**

Sir,—I have for months been looking forward to the publication of a journal on motor cycling, and I for one welcome the new arrival and wish it every success. I have been interested in the article on the various designs of motor bicycles now on the market. I don't know whether any of your readers have seen that excellent motor which has been described by Mr. Tyler White, in the "English Mechanic" during 1901, and I would like to give my experience in connection with it. Having had the opportunity of passing through the shops of an engineering firm, and receiving a good training as a theoretical and practical engineer, I undertook to make two of these motors, one for myself and a friend.

This motor eclipses any that I have seen, for its proportion in design and power. The cylinder bore is 2½ inch, stroke 2½ inch, fly wheels 7½ inch by 13-16th inch wide on the outer rim, the fly wheels and shafts weigh 25 lbs., width of bearing surface 1½ in.



A motorist who believes that a little walking exercise is beneficial during the winter.

The valves are in every way what is required. The induction valve 1½ inch, exhaust 1 inch. Speed (maximum) 2,000 revolutions, giving 1½ h.p. actual. One excellent feature of this motor is that it is free and chain driven, and can be started by a ratchet handle similar to a car, or pushed along in the same way that the various belt driven motors are. The engine can be put in and out of gear at will by a friction clutch acting on the drum of a very neat and substantial crypto gearing, which gears down and gives the necessary power.

The carburetter is an improved float feed, and gives excellent results. Even during the whole of the present winter it has given no trouble whatever, although the exterior has had ice frozen to it.

I use a Basse and Michall trembler coil, and find the wipe contact much more reliable than any other system of ignition. The plug is direct over the top of the cylinder head, which in my estimation is the proper place. The electric current supply is from one of Peto and Radford's 4 volt accumulators, giving through the coil a ½ inch spark in the air.

The motor is rather heavy, some would think; weighing about 55 lbs., but not too much, if one requires durability and power. What is the use of sacrificing durability for lightness? Many of the present motors appear to me as toys, and not substantial enough for what is required of them.

I have fixed the motor over front wheel, but it is also adaptable in the frame over bracket. Personally, I prefer the front driving; it is more satisfactory for cooling of the engine, also for the controlling levers to be on the handle bar.

I have a Garrard free-wheel back pedalling brake and find it very serviceable.

I have ridden this machine since last June and all through the winter with the greatest satisfaction.

It would be very interesting to me to know how the manufacturers of most of the motors for cycles get the power that is stated in their specifications, when the bore of the cylinder is so small and the fly-wheels so light, valves too small, etc. If some of the motors I saw at the recent shows give 1½ and 1½ h.p., the "English Mechanic" motor would be more like 3 h.p.

For a motor to prove satisfactory, both for durability and power, the fly wheels must have sufficient weight and other details receive the same attention in accordance.

Yours faithfully, "MECHANIC."

**A Midland Motor Cycling Club.**

Sir,—I am very pleased to see that some of your correspondents, "Avonian" and "A Motor Cyclist," have suggested the forming of "A Midland Motor Cyclist Club," to have its headquarters in Birmingham. I think it would be well supported, and there would be no question of its usefulness, especially to beginners in the grand sport. I for one should be very glad to become a member.

Wishing you every success with "MOTOR CYCLING," which is a very interesting and useful paper.—

I remain, yours faithfully, C. W. BURNELL.

**Silencers.**

Sir,—Allow me to congratulate you on the success of your new paper. It is supplying a very genuine want, and should do much to put England in the forefront in this particular branch of engineering.

I am glad to see in No. 4 that someone is writing *re* silencers, and the small amount of silencing they do. A good article on this point and the loss of h.p. resulting from absolute silencing would be very welcome, as this topic has been neglected, and most makers think it immaterial whether their machines can be heard for 500 yards or 5 yards. The non-motoring public do not, however, by any means, and quite rightly too.

Yours very truly, H. E. BENNETT.

**Tricycles.**

Sir,—Should be greatly obliged to any of your readers who would kindly give their experiences of the following motor tricycles:—The Ariel, Singer, and Quadrant. Each appear to have their good and weak points, and it would be interesting and instructive to have the opinion of riders who have put the machines to a practical test.

Yours, &c.,

"TRIKER."



## OUR INFORMATION BUREAU.

A large number of replies have been dealt with through the post. Information on all subjects pertaining to Motors, Motor Cycles, 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.

R. G. Mahon (Johannesburg).—Subscription duly received.

T. Desikachari (Trichinopoly).—Thanks for your subscription to our paper duly received. "Footbrake" (Clapham). We shall be glad if this correspondent will forward us his address, which we have mislaid.

E. W. T. (Peebles, W.B.) Can recommend Dupont two-speed gear, but doubt if you could fit it yourself. Our correspondent adds—To your query, "I think your new publication an ideal paper."

### Bands for Tyres.

J. F. W. (Lincoln) has a motor-tricycle, the bands or tread of which have become so much slit that he has stripped them off and wishes to stick new ones on. We advise him to get Smith's bands, fitted by Smith's Patents, Ltd.

### Volt and Ampere Meters.

A. D. (Edinburgh) asks if a watch pattern volt and ampere meter is suitable for measuring either volt or amperes, or can we give him any information how they work, and if he requires two meters, a volt, and ampere for motors—A watch pattern volt and ampere meter is suitable and very convenient. The United Motor Industries, 42, Great Castle Street, London, W., supply good patterns.

### Wydt's Catalytic Ignition Plug.

W. C. (Newcastle-on-Tyne) writes:—"Will you kindly inform me through the pages of 'MOTOR CYCLING' where I can purchase a Wydt Catalytic Ignition Plug as described in your first number? Other readers besides myself would no doubt be glad to have the same information. I am much pleased with 'MOTOR CYCLING,' which is just the paper for motor cyclists."—We have had several inquiries for this fitment. The agents are De Poorter and Co., 9, Great Tower-street, E.C.

### In a Quandary.

C. H. M. (New Romney) is a medical man who wishes, naturally, to use a motor-tricycle; and again, naturally, does not want one that will be continually breaking down. We advise an Excelsior made by Bayliss, Thomas and Co., Clincher tyres, thoroughly well guarded, and brakes as fitted by the company. "D" lubricating oil and Carless Capel's petrol will be right. We learn that the Phenomenon acetylene gas lamp is AI for motor-bicycles. A Turner bi-carrier is useful. As regards saddles, get a Brooks B 90.

R. Younger (Newcastle-on-Tyne).—You could use catalytic ignition on the machine you mention, but to our mind the ignition referred to is excellent.

### Purchasing a Motor.

H. A. Ward (Leicester).—Thanks for kind wishes. H. A. W. is about to purchase a motorcycle, and would like to know what we think of the 2 h.p. Simms Bosch engine for same. The Simms-Bosch is well made and very reliable; he asks about the New Werner. This is both well made and well designed. We had a trial on one the other day, and found it most satisfactory.

### Fancies the Phœnix.

"Davie" (Southampton) is a mechanical engineer, and after considering the good points of several on the market, asks us to choose one for him. Really there is no "best" among the patterns he mentions, but as he leans towards the Phœnix, we recommend him to have that one. He will find it, as he specifies, "comfortable and easy to repair."

### Oil Troubles.

A. W. H. (Birmingham) wants to know the cause of oil getting into head of cylinder and covering the sparking plug. He says that compression is perfect. "About how much oil should I put into the crank case of 1½ h.p. motor and about how often? Do I put too much? Will it interfere with sparking if oil gets on to the turning arm of a wipe contact?"—The trouble he complains of is probably caused by using too thin an oil—a charge of 2½ oz. should last twenty-five miles, but some engines require a lot, and experience is the best guide. Oil will penetrate where air or petrol cannot, keep the wipe contact clean: it is the dirt in the oil that causes the mischief.

### Catalytic Ignition.

G. J. Wilkinson (Lincoln).—Many thanks for kind congratulations. He writes:—"Allow me to heartily congratulate you on your new paper 'MOTOR CYCLING.' I have taken every number of 'CYCLING,' and feel sure the youngster will be well looked after."

A Treatise on catalytic ignition cannot be given in the small space at our disposal, but the Agents are De Poorter & Co., 9, Great Tower Street, E.C.

An accumulator should give after full charging 2.5 volts. This rapidly drops to 2.2 in a few seconds.



A STRIKE AMONGST THE MICROBES.

The Petrol Microbe (determinedly). "No, I shall not vaporise, it's too cold."

The Ignition Microbe (petulantly). "Very well, then, I'm not going to spark to please any lever puller."

### Fittings for Motor.

"Embla" (London, E.) congratulates us upon the success of our paper. He is a mechanic, and is building his own motor. For the "bicycle" part we advise (1) Chater Lea fittings, 26 inch wheels. (2) 2-inch clipper tyres. (3) A surface carburetter. The Presto people make a good one. (4) Front rim band brake. (5) Simms-Bosch. We are entirely of your views. (6) Hyde clutch is good.

### Horse Power, etc.

"Memo" (Cambridge) —(1.) How to test motor so as to know actual brake h.p. I fancy the main things to use are a piece of rope and a spring balance, as I overheard an engineer saying the pull on the rope was only 30 lbs. from a 6 h.p. motor engine.—Perhaps the best way to get the real h.p. of a motor is to couple it to a dynamo—of suitable dimensions; read off your power in electrical units, translate this into foot-pounds, and thus get the real h.p. Brake tests are often misleading. We shall have an article on the subject, probably next week. (2.) Opinion of the Precision motor.—The Precision motor was much admired at the Show. The carburetter is a good one, and properly designed.

## "CYCLING'S" GRAND SPRING NUMBER

Is one of the most interesting issues of the year. It contains a number of bright articles; tours, illustrated by maps and photos; sketches by all the best cycling artists; all the news illustrated, and interesting matter to the Cyclist and Motorist from cover to cover.

A special article, entitled

### "HUMAN PACING" versus "MOTOR PACING,"

By the Racing Hon. Sec. Polytechnic C.C., who makes out an excellent case for the adoption of motor-bicycle pacing in cycle events.

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