

Motor Cycling

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March 26th, 1902.

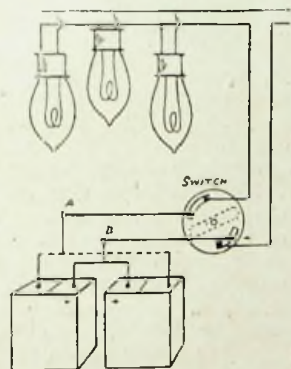
& Motoring

HINTS AND WRINKLES.

Handy methods dealing mainly with recharging accumulators, which will appeal to agents, repairers, and riders generally.

An Alternative Method of Charging Accumulators.

The following is a very convenient method of recharging accumulators and one that will commend itself to agents and repairers whose depots are electrically lighted is illustrated in the adjoining diagram. To make the connections it is important to make use of a switch controlling a group of lights preferably not less than three in number. The positive terminal of the switch must be joined by testing with two strips of lead in dilute acid as described in a previous article. Then obtain a couple of lengths of insulated wire and connect them through the back of the switch to the terminal plates. Staple them along the wall to some convenient spot where a number of the accumulators can be charged at one time; attach an ordinary terminal to each at A and B (ordinary screws and washers may be substituted at a pinch). To charge a single battery, simply connect positive to B and negative A, but first be certain the lamp switch is *off*, if more than one battery is to be charged, connect up in parallel, that is, positive to positive instead of to negative. This arrangement works well if there are lamps of 32 or 50 candle power in the group, and as the brilliancy is not noticeably affected, it has the advantage of enabling the lights to be used and batteries charged at the same time and at no greater cost, as they may be charged in several consecutive periods of lighting if desired.



AN ALTERNATIVE METHOD OF CHARGING ACCUMULATOR.

A Useful Hint.

Always make sure that the carburetter chimney is wide open before finding the "mixture." If partly or wholly closed, the suction is considerably affected, and the engine will work in a very sluggish manner. To test this, put the machine on a stand, and try the different speeds to be obtained with the chimney open and then shut. When closed, the quantity of air circulating in the carburetter is not sufficient to properly mix with the gas, and, as a consequence, the engine is "stified," and will refuse to climb the least hill. Recently the writer noticed a decided weakness in this connection, followed shortly afterwards by a series of fitful explosions. On bending down, he perceived that his coat had accidentally closed the air chimney.

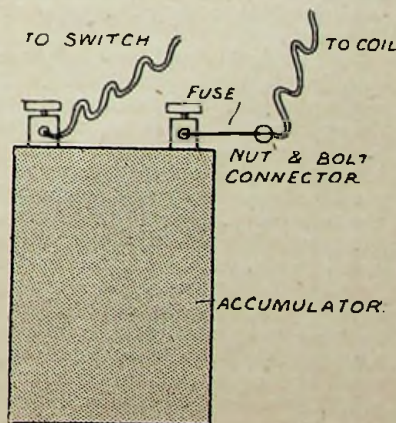
Platinum.

This rare and valuable metal is indispensable for contact breakers. It arises from the fact it is the only metal that will resist the fusing action of the spark to any extent and at the same time not oxidize or blacken and stop the current. There is no other metal that can be substituted and in purchasing platinum tipped screws and contact blades it is most important to see that it be absolutely pure platinum. Owing to its high price (above that of gold), there have been attempts to put an inferior alloy on the market, containing silver, nickel, and a little platinum only; contacts made of this will give trouble and the purchaser or dealer would do well to satisfy himself by applying a test for platinum. Obtain from a chemist a small quantity of the strongest nitric acid (aqua fortis) and a small test tube. Place a few filings or scrapings of the metal into the tube and pour a little of the acid over them, then boil over a gas (Bunsen) flame. If genuine platinum the acid will not affect it in the least; if an inferior metal it will speedily attack it, dissolving it and coloring the acid green.

A Valuable Ignition Circuit Idea.

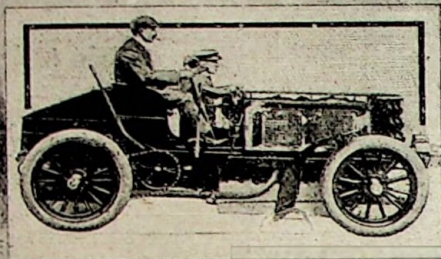
When accumulators are used to supply the current there is just a possibility of a short circuit occurring on the leading wires; if this remains undiscovered, even for a few minutes with the current on, serious damage may be done to the accumulator or some part of the circuit may burn out. To safeguard against this is very simple indeed; all that is necessary is to put an inch or so of "fuse" wire between one of the battery terminals and the wire that joins on to it. If an excess of current passes through the circuit this wire will quickly melt and break the circuit, indicating at once that something is wrong.

A good length of this wire can be got for a few pence at an electric-light fitter's shop. Ask for a piece to break with three to four amperes. A few inches in reserve should be carried in the tool valise. A small brass nut and bolt attached to the wire will enable the connection to be readily made.



HOW TO CONNECT THE SAFETY-FUSE.

A Run



on the "Fastest Car in the World"

Feeling that a little excitement would be a pleasant change to the languid pastime of turning out "MOTOR CYCLING," we took advantage of an opportunity, about twelve days ago, to test the speed qualities of the famous 50-horse Napier which S. F. Edge contends is the fastest car in the world. Its published speed works out at seventy miles an hour, but it is equal to well over eighty. Think of that—eighty miles an hour on an ordinary straight road! And therein lies the difficulty of our little outing, for strange as it may seem, there is scarcely a suitable spot in the whole country, much less near London. However, Edge knew of a secluded stretch about fifteen miles out, and for that we made.

As the "fifty" is by no means pleasant in traffic Edge ran us to the scene of action on an almost new "sixteen horse"—also a Napier—and the manner in which the smoothly running machine glided in and around everything was in itself an experience. A more comfortable, quiet, and splendidly controlled car could not be wished for, and it was with a sigh that we reached our destination and prepared to take over the impish-looking monster that had passed us with a cough, a "backfire," and a cloud of dust—a cloud which streaked up a gradient ahead of us in a way that made us groan when we thought of our humble voiturette at home.

"But are we going to let him get away like that?" we instinctively remarked, as a memory of the old road racing days flashed through our brain.

"Yes," said Edge, "that's something we *can't* hang on to," but a movement under the apron caused us to suspect that out of sheer instinct the man at the helm was endeavouring to work up his old heartbreaking sprint.

"This motor bustling business is the same old game, only more so, Edge?" we enquired.

"Yes, and the old experience has been very useful."

Arriving at our destination we handed our car to Cecil Edge and relieved him temporarily of the "demon"—a transaction which seemed to meet with the entire approval of a skylark which was warbling heavenward, gladsome as a Santos Dumont.

"All ready" brought us again to earth, and in quick time we were both garbed in the traditional speed "duds" and goggles and seated aboard in readiness for the fray. It will be noticed that both machines have the customary double seat, but that is only a matter of form, for although the driver manages to keep in position by crouching over the wheel, the passenger speedily learns that he is more sheltered and comfortable on the floor; in addition, the wind resistance is thereby reduced.

After having proceeded some distance up the road we turned, and in doing so the engine coughed, banged, and—stopped. In answer to our query, Edge explained that it wasn't running over well, as the stem of an inlet valve was bent. However, he hauled out a crowbar, turned the engine round, whistled a somewhat shaky tune to reassure us, but ultimately got a start, and away we jumped after the "sixteen" which was patiently waiting well ahead. Poor "sixteen," it was soon passed; it can only go a miserable forty an hour—ha!

But the flyer is a fiend. Fifty horse! It seemed like fifty thousand—tearing, pulling, fighting, to cover the ground.

Travelling at such speed the wind simply howled in one's ears with noise which deadened all other sound, whilst one felt it was necessary to hang on to cap and even hair itself.

"It means death if anything goes," we yell.

"Oh, yes," is the complacent but feeble reply.

Rain beginning to fall, we soon completed our sundry speed tests, and dismounting returned to mundane garb and prepared to toddle back to town. Cecil again took charge of the "fifty," but the taste for blood being still strong within us we scrambled aboard for a few miles of the homeward journey. Again she flies, for the downpour is increasing, and we sweep along stretches of good though deserted road.

"Have you ever noticed how crooked the roads of England are?" asked Cecil, as curve after curve is taken in rapid succession.

"Not until to-day," was our reply, and once more we hang on to our hair.

Cecil is a 'perfectly peacetul person,' and comforted us considerably by the grace with which he retained between his lips the drowned remnant of a cigarette. He wished us to believe he was enjoying a quiet smoke. He is very like his cousin.

By previous arrangement we dismounted upon reaching the outskirts of town, Cecil going on. In a few seconds "S.F." came up with the "sixteen," and the last few miles were covered at a pace which none could cavil at, but there was to be even more incident before the journey ended, for just as we were crossing from Regent Street to the Haymarket we heard a yell, and to our surprise the 'fifty,' which had missed a turning, came past us with an excited multitude in pursuit, and to our horror the back of the machine was ablaze.

"On fire!" exclaimed Edge; and it was unpleasantly true. "All up with my 'fifty' this time."

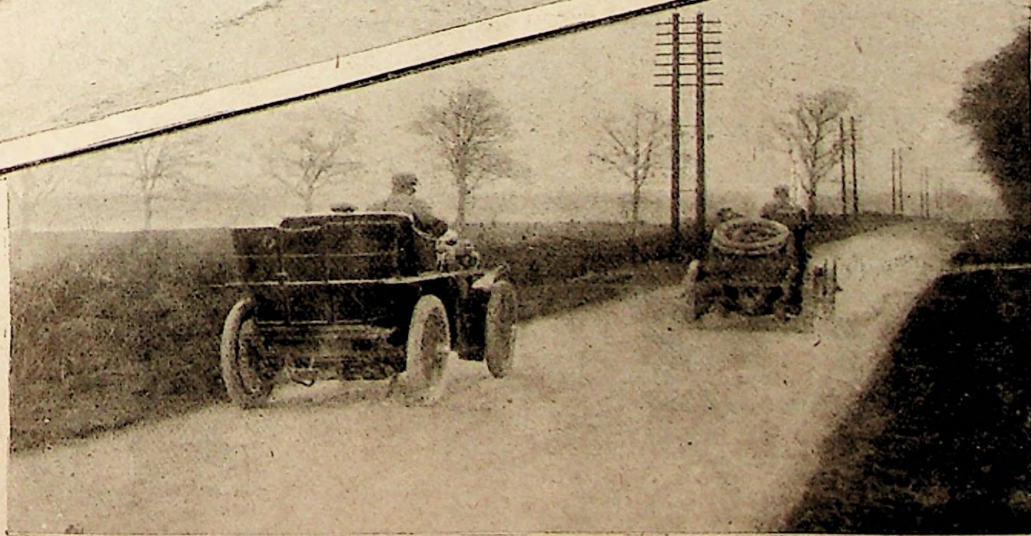
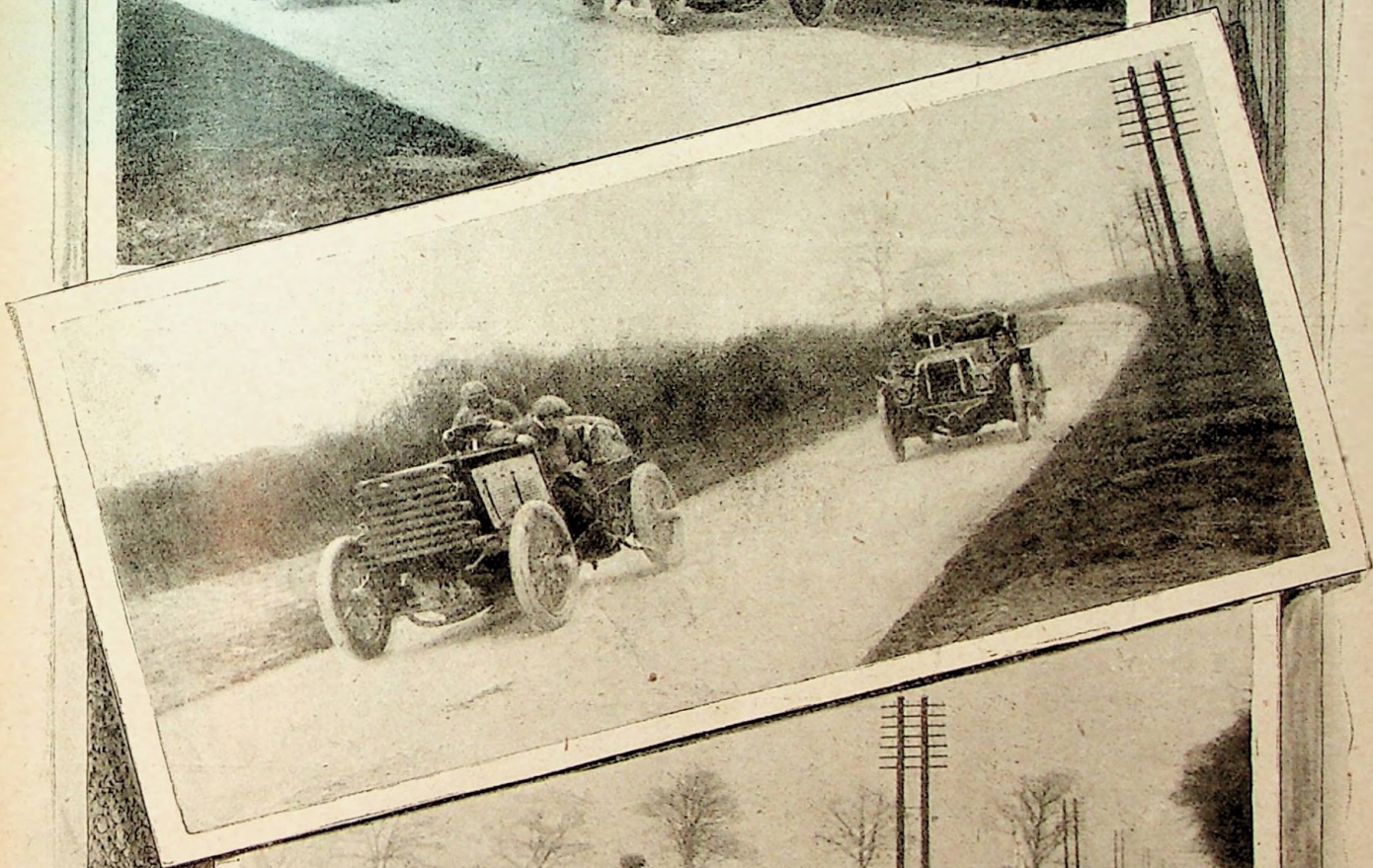
"Let's hope not," was our reply. "He'll have it home in a few seconds and will get help."

"Don't think he'll do it in the time."

But he did, for on arriving we found that a ready shower of sand quickly settled the matter, and to our delight the "speed instrument" was not only saved, but was comparatively little damaged. A near thing though. It was really pitiful to witness the disappointment upon the faces of the public as the car was pushed in all safe and the doors closed. The crowd had quite made up its mind that it was in for a novel and entertaining half-hour, but the trouble was caused by a leakage which fortunately was small.

Having thanked Edge for our few hours' excitement, we jumped into a hansom. Never before had we realised how frightfully slow a hansom is. It's time Napier looked into the matter. Napier? Yes. To think that the quiet, modest and obliging "Bath Roader" of years ago should have blossomed into the builder of the world's fastest motorcar, and that the speed man, S. F. Edge, should be handling it! Well, both have worked hard, and both deserve their success.

[With reference to the speed of the 'fifty,' it is necessary for us to mention that it is the claim made by Mr. Edge, who informs us that he is quite prepared to back it for a substantial amount at any time.]



A RUN ON THE "FASTEST CAR IN THE WORLD."

THE "QUADRANT" MOTOR BICYCLE AND TRICYCLE.

The following is the first of a series of illustrated articles descriptive of the best known types of motorcycles and their parts. The object we have in view is that of giving clearly the distinctive features of each production, all of which, we think, will be found valuable to our readers.

In reviewing the products of the "Quadrant" factory, one's mind reverts naturally to the good old days when the quadrant-steered tricycle gave its name to the company, and as naturally comes back to the more modern chainless type of bicycle claiming the same birth-place. So it happens that while paying a visit in search of what is afoot in motorcycles, and the latest and most promising development of the cycle industry, one feels that one is visiting old scenes to meet a new friend.

Dealing with the "Quadrant" motor-bicycle, apart from the engine, not much need be said. The frame is of ordinary diamond shape, strengthened at all points to meet the special strains. The wheel base is of normal length, the tyres are the 2 in. multicyle, and the company's patent two-point back-peddalling band brake is fitted, and also an all-steel front rim brake, and a large easy Brooks' saddle. The free-wheel is of the roller type, without springs or blocks, but with this peculiarity, that the rollers are very large, being 1-4 inch thick by 7-8 inch long, while the boss on which the rollers work is made of tool steel, hardened and tempered, and screwed into a strong hub. The object of this is to give great durability, as motor cycling is, of course, practically all free-wheeling.

The motor is the well-known "Minerva" taken as a basis, with several innovations introduced by the company themselves. If we look first at some of the minor details, we find no ragged ends of wires that may be secured by the novice in the right way or the wrong way, but all such ends are neatly soldered to substantial cyclets, while all terminals to accumulator, etc., are marked in such a manner that it is impossible to replace them incorrectly. The pump which oils the engine, without unscrewing anything, is provided with side lights, so that the cyclist can see whether he is really sending a charge of oil into the engine or merely pumping air into it, to be followed by disaster. The idea of all these minor details is to provide, as far as possible, against all preventable worries.

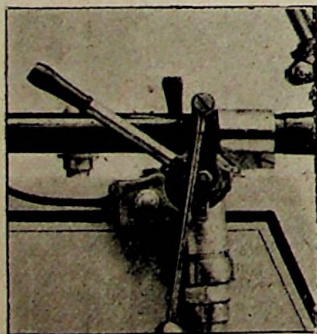
Now we come to a feature which is by no means of minor importance, namely, the combination lever, which was awarded pride of place in the recent Motor Show at the

Crystal Palace as the best distinct improvement exhibited. This not only regulates the supply of gas, but combines in itself three other distinct operations, to which we will refer. A glance at illustration No. 1 will show how simple it is in appearance, while the details are more fully shown in illustrations No. 2 and No. 3. The former shows the position of the various parts when the lever is at the extreme front, the others when the lever is at the extreme back. Commencing with No. 2, it will be seen that on the base of the gas lever, or working handle, is a small teat or projection, which, when it enters the adjacent copper plates, switches on the electricity. On the back of the switch block is a flat interrupter plate, which, as its name indicates, prevents the waste of electricity when the machine is not in use.

On the same gas lever is a small arm or bracket reaching forwards and upwards, to the end of which is pivotted a down rod connecting it with the commutator case—the small oval case on the engine which times the sparking. The manner in which the latter connection is made can be seen in illustration No. 3. The small bracket on the case ends in a socket in which the plunger pin works, this pin having a shoulder on its upper part above the socket and on its lower extremity a coil spring strong enough to hold it firmly in place, so that so far as operating the commutator case is concerned, it is like a fixture jointed to the rod, and thus advances or retards the sparking. The use of the coil spring and plunger pin comes in, however, in the next movement to be described, viz., the lifting of the exhaust valve to open it. The down rod for about three inches at the lower end consists of two flat bands of steel with an opening between them, and through this opening or slot is a flat lever which lifts the exhaust valve. When the down rod from the working handle has pulled the commutator case fully back the plunger pin commences to rise, and after travelling a certain distance, by which the quantity of gas is regulated, the exhaust lever comes into operation, and then, as the actuating rod at its top comes back



NO. 1. THE QUADRANT MOTOR BICYCLE—GENERAL VIEW. FROM THE ABOVE THE READER WILL GET AN IDEA OF THE SIMPLICITY OF THE COMBINATION LEVER, AND ITS POSITION ON THE MACHINE. IN THE POSITION SHOWN, THE LEVER IS AT THE EXTREME FRONT.



NO. 2. QUADRANT COMBINATION LEVER. HERE THE LEVER IS SHOWN RIGHT BACK.



NO. 3. COMBINATION LEVER. THE FITTINGS ON THE ENGINE SHOWN IN DETAIL.

slightly over the centre of the working lever or gas tap, the exhaust valve is held firmly open by the coil spring at the bottom. By reversing the order the action will be quite clear. We will suppose the working lever to be right back and everything off and we push the lever slightly forward. The first thing that happens is to switch on the electricity, next the exhaust valve closes, then commences the supply of gas at its lowest and increasing to full supply as the lever travels, and then begins the advance of the sparking up to the highest limit of the speed, so that whatever speed is on, the whole of the movements can be pulled off instantaneously by one pull of the lever.

The "Quadrant" motor-tricycle is not a motorcar reduced to a tricycle, but a tricycle converted into a motor vehicle by a cycle manufacturer. The difference is that it is very light in comparison, being only a pound or two over 100 pounds. The whole of the machine and the motor, up to the fork head, is the same as in the bicycle, except that the back wheel is 26 inch, as are also the two side wheels.

The interesting part is the new style of steering. The cross bridge shown in the illustration does not swing, but is a fixture, suspended on links which connect it with the columns in which the side wheels pivot when steered. When the machine is steered, one end of the bridge rises and the other falls by the action of the two levers, one on each side. The effect of this canting over is to give the rider exactly the same movement as when he leans over on a bicycle when turning corners or making a sharp curve. And, moreover, as the bridge is carried inwards by about an inch, the momentum is further counteracted, and a high degree of safety attained.

The side wheels, at the same time, cant over against the momentum. The charm and sweetness of the steering will be best understood when we say that the machine can be steered by the rider's body hands off, exactly as on a bicycle, and that in straight running it keeps perfectly straight, like a mild "automatic steerer." Each side mud-guard is firmly fixed by two sockets on long pins, and are detached by the slackening of two set pins. In addition to the back-peddalling band brake there is a Bowden brake on the back wheel rim.

Anticipating some questions which may arise out of the foregoing, we have questioned the makers on certain points, and append the queries and answers:—

(a) How can you obtain advanced sparking on a small supply of gas, when the working conditions are easy, such

as down a gentle slope, with a view to economy of petrol? Without entering upon elaborate theories which would be wearisome, the enquiry is best answered by the practical test made by two expert riders, side by side, over nearly 30 miles of rather hilly road. The result was an actual saving of about 4 per cent. in favour of the one lever, but estimated equal to 10 per cent. as ordinary riders would usually work the two.

(b) How about the overheating of the engine? As the heating is in proportion to the gas consumed, the gas used being less the heating must be less also.

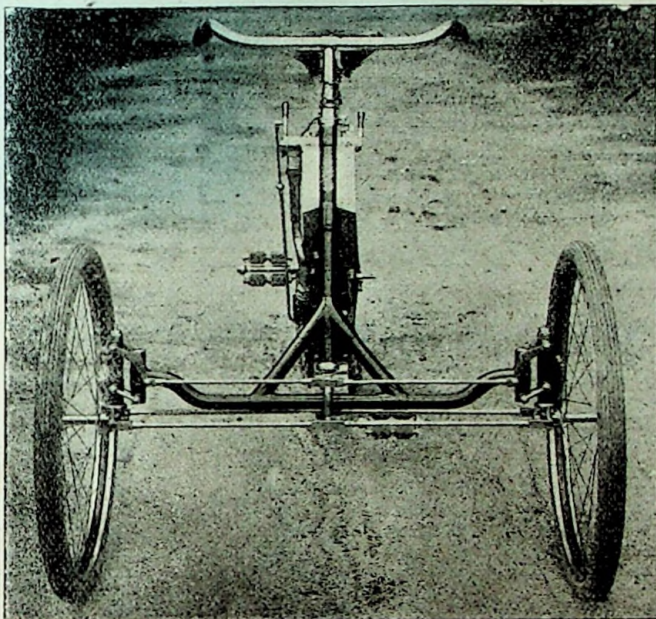
(c) How can you obtain slow sparking with a full supply of gas as is required when climbing hills? By adjusting the lever to that point where, while the gas is on full, the sparking advance has not begun, and is therefore at its slowest.

(d) When slowing at corners or in heavy traffic is it not better to be able to switch off the electricity by turning the handle-grip rather than by diverting the hand to pull the lever back? In turning corners the hand need not be removed from the handle, as the slowing to any pace can be done easily by the back-peddalling brake. In traffic or a tight corner one pull at the lever cuts off everything, and at the same time opens the exhaust valve, thus turning the machine into the ordinary bicycle action. On the other hand, if only the electric current is cut off by the handle-switch, and the valve not lifted, it is almost impossible for the rider to pedal against the compression of the present powerful engines. If, even by a combination, he could do these two operations, he would then be wasting unused gas, and if the sparking happens to

be advanced at all, he is exposed to back-firing and a dead stop.

(e) You proportion your air to the petrol vapour by the air lever as usual? Yes, but we put a mark indicating a mixture that will ensure a start in any temperature; the rider then finds the best point in a moment as he travels and as the temperature seriously changes.

(f) You stand then by all your published statements, without qualification as to the superiority of the one lever? To the last letter. We state, without fear of contradiction, that the one lever is as great a boon to the expert as to the beginner, and that hundreds of riders will take to a motor bicycle, which needs no learning, who would never tackle one with a number of levers to manage.



NO. 4. THE "QUADRANT" TRICYCLE—FRONT VIEW SHOWING THE SALIENT FEATURE, i.e., THE NEW STYLE OF STEERING.

THE NEW ENFIELD.

The special pattern that we shall describe next week will be the New Enfield, which has attracted considerable attention ever since its introduction. The distinguishing features, which include a pulverizing carburetter, crossed belt drive, and wide bearing engine, will no doubt cause this article to be perused with great interest. That it is speedy on the road we have found from experience.



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OPINION.

The Automobile Show.

Next month will undoubtedly be the last time for the motor exhibition of the year to be held so late, and there is also reason to believe that the Agricultural Hall will know it no more, greatly to the sorrow of the influenza microbe which in the past has laid many of us low year after year. It is an awful place, and a disgrace to London, which ought long ago to have had a central and suitable building for industrial exhibitions.

At a trade meeting held at the Automobile Club on Thursday last, the exhibition question was fully discussed. It had been previously agreed that the present date was too late in the year, and in the event of the present promoter being unable to meet the requirements of the trade, that other arrangements should be made, and it being stated that the Hall cannot be secured earlier than March, it has been necessary for exhibitors to look elsewhere. The National Cycle Show, Crystal Palace Motor Show, and Stanley Show have all come forward with propositions, but it having been resolved that next year the exhibition shall be held towards the end of January or early in February, the first and second are thereby thrown out of court. The Stanley people, with commendable enterprise, have jumped in and secured no less a place than the Earl's Court Exhibition for the fortnight commencing on January 10. We are informed that they have secured an option for the months of December, January, and February, over a term of years; this scheme, however, will not interfere with their cycle show, which will continue to run on present lines. As the said option does not include the Empress Theatre, the space available will not exceed 45,000 feet, whilst the Palace, we believe, is at least 75,000 feet.

After two hours' deliberation, the meeting of Thursday last arrived at a decision as to date, but beyond that it appeared unable to proceed, it therefore adopted a course not entirely without precedent, and appointed a committee to deal with the whole matter, the members of the said committee being representatives of twenty-four well-known firms in the motor trade. In addition to settling the show matter, the same body is to form a Motor Manufacturers' and Traders' Association, which shall in future deal with all matters affecting trade interests. In view of the divided nature of the opinions expressed, the committee has its work cut out, but we hope the matter will receive more careful attention than has been the case in the past. The Crystal Palace is magnificent for the purpose of an exhibition, but the terrible railway service ought to have ruined it years

ago. Nevertheless, it appears to us that so far as 1903 is concerned the choice is narrowed down to the Palace or Earl's Court. The former is in every way advantageous as a building and a trial ground, but the latter will beat it hollow for convenience, and therefore "gate," but whether it is large enough or can be worked with the Stanley Show management is yet to be seen. In any case, it is of vital importance that the Automobile Club has more than a passive interest in the matter, and that the exhibition is not conducted by the trade alone, for if it is the end will be early and disastrous. Whatever may be the arrangement, it is important for the motorcycle trade to remain free in the matter of exhibiting at cycle shows.

Who shall Govern the Sport?

The general feeling with regard to our suggestion of an association to legislate for and control the sport of motor-cycling was that the time was not yet ripe for its adoption—an opinion in which we share. But, since the article which appeared in our second issue was written, both the Automobile Club and the National Cyclists' Union have made certain steps towards securing that control, and it has therefore become urgent that the question should be at once decided. The need for a governing body is unquestioned, and in the present stage of the sport and pastime it would be expedient if it were also to become an organising body. Without some form of control the sport would quickly degenerate into a mere advertising medium—perhaps into something altogether too unclean for any decent sportsman to be connected with.

The governing body will be called upon to perform many duties. In connection with the sport, definitions must be framed, rules and regulations must be made. The pastime will call for the careful watching of the course of legislation in Parliament, of the action of railway companies and local authorities, and in its organising capacity there will be speed and efficiency trials to be promoted, so that, taken altogether, there will be no lack of work. The form which the governing body should take would probably be that of a central organisation, open to private members and clubs in affiliation, the various offices being filled by election.

To deal with the three alternatives, the Automobile Club, the National Cyclists' Union, and the projected Motor Cyclists' Association. The N.C.U., by its agreement with the A.C., now controls all sport in which pedalling is permitted during the race; it now desires to promote a motor-cycle "championship." In other words, it wants to run motor-cycling on precisely the same lines as those on which it runs cycle racing. The Automobile Club looks on the matter from the mechanical rather than the athletic point of view, and is willing to promote trials of machines, and to disregard any academic divisions of the riders into amateur and professional classes. The Club's view is the correct one. A "championship" as between man and man would be the height of absurdity, except on an impracticable scheme. For instance, that the championship be awarded to the man who obtained the best average results out of all competing machines. Moreover, the N.C.U.'s licensing scheme may or may not be necessary for cycle racing; it will be altogether out of place for motor racing. The only objection that can be raised against allowing the Automobile Club to assume control is that there might be a likelihood of the motorcycle interests being regarded as somewhat small beer, with the result that they became overshadowed by the interests of big car owners, and ultimately were relegated to an obscure corner and there ignored. But, provided a separate class, with its own individual officers and its own objectives, were established, then unquestionably the Automobile Club will be the proper body to control motor-cycling.

SPECIAL NOTICE.

Next week's issue of "Motor Cycling" (Wednesday, April 2nd) will be published on Wednesday evening, and will be on sale all over the country on Thursday morning.

IN TRANSIT.

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

On Lubrication

The article on lubrication of the motor, which appeared in our last issue, seems to have dealt with a somewhat different form of oil pump from that which is fitted to my Excelsior (and therefore the Minerva type); yet the illustration which accompanied the letterpress was in accordance with the system. Thus the writer of the article says that the small force pump has "two valves, one of which opens when the handle is drawn up, and allows a quantity of lubricating oil to pass up into the barrel; on forcing the handle down, this valve shuts, and the other one, which admits to the pipe leading to the crank chamber, opens, and consequently the charge of oil is sent into the chamber." Now the valves in my pump are not automatic, but are opened and closed by the stop tap shown in the diagram. Moreover, the oil does not pass up into the barrel of the pump so easily as is suggested; and the reason is sufficiently obvious. I noticed when fitting the lubricating apparatus to my machine that, apparently, no provision was made for air to get into the reservoir to replace the oil drawn out. My first thought was to drill a hole in the screw cap of the reservoir, but this would not have done, because then it would always be necessary to keep the outlet valve (outlet from the reservoir) closed, otherwise the pump would fill with oil, and in all likelihood there would be constant leakage — thanks to the aptitude of oil to get where not wanted.

On the other hand, it was obvious that the pump, having only a single washer, had no sucking power, and, even if it had, it could never have sucked oil out of a reservoir to which there was no air inlet. So the only way out of the difficulty seemed to be to pump air into the reservoir and then let air pressure fill the barrel with oil. I always lift the plunger and, with the valve open, force a charge of air into the reservoir; the plunger is slowly lifted up by the force of the oil being driven in, and, when the barrel is full, I turn the tap over, opening the inlet valve to the crank chamber, and so drive the oil down to the engine. One ought to be able, by listening, to tell whether the charge really reaches the crank chamber, but I must say it would be far more satisfactory if a glass barrel were provided for the pump, such as is used on the Ariel. The risk of breakage is minute, as I know from previous experience with the tricycle.

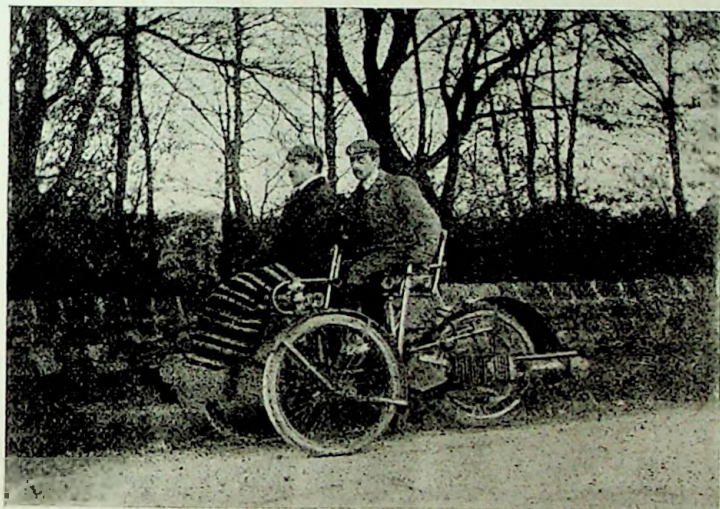
Whilst on this subject of lubrication, I might deal with a couple of matters on which experience has been gained. As in many walks in life, economy in oil is a bugbear. A cheap oil is not only the dearest in the long run, but it causes an infinite number of minor troubles. It does not retain its body or viscosity at the high temperature at which it is called upon to work, and besides failing to fill the enormously important parts which it is called upon to play, it causes fouling of the points of the sparking-plug and other engine troubles, and, moreover, it oozes out of every bearing and make

the exterior of the crank-case and the contact breaker in a lovely mess. Any rider who may be suffering from a dirty engine will gain relief by purchasing a better oil.

With regard to cleansing the interior of the engine, I always think that paraffin is best for the first "bath." I use a four-ounce measure, and pour in that quantity of paraffin, and then get on the machine and pedal it for about a dozen revolutions. It is not necessary, perhaps it would not be advisable, to set the engine running. The piston and fly wheels are worked quite rapidly enough by pedalling, and every part gets thoroughly sluiced. Then the drain tap is opened and more pedalling indulged in to force out the dirty paraffin. After that a small quantity of petrol is poured in and the pedalling repeated, the petrol being drained off, and a few moments allowed for it all to evaporate from the crank chamber. The new charge of oil is then inserted. The recommendation, given in last week's article on the subject, to lubricate the exhaust valve rod with graphite is exceedingly good. It overcame an occasional but determined squeak in my engine that had puzzled me lately.

Side-slip.

Following up this question, the Editor has shown me the letters which he hopes will appear in our correspondence columns this week, and I almost feel that I should like somebody to come along and oppose the new theory, because, until we get the opposition and are able to thrash out the pros and the cons, a definite conclusion cannot be arrived at, and we shall still be floundering in the dark on the matter of correct engine position from the point of view of stability of machine. Rather an interesting letter is that which I have received from Mr. H. V. Jesper, of Headingley, Leeds, who sends me the photo of his machine which is reproduced on this page,



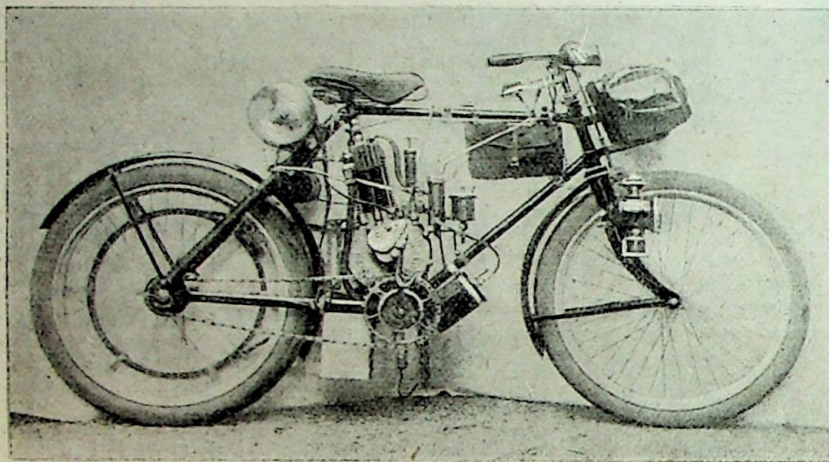
An English-made Bollee. This illustrates a Letter on Side-slip.

and the contents of whose letter is as follows:—"I should like to say that 'Cyclomot's' new theory is also borne out by my own experience. The car I ride is an English made Bollee (but altered considerably since it left the maker's hands), and I constantly notice when riding on greasy roads a much greater tendency of the rear wheel to side-slip when without a passenger on the front than when the complement of two are on board. My car is fitted with electric ignition, extra silencer and oil tank, and the body has been raised. This raising of the body, I might mention, has not made any appreciable difference to the skidding, which I regard as being the same as side-slip in the case of a two-wheeler."

In this case it will be seen that there is direct proof that the removal from the fore carriage of a large proportion of its weight, and the consequent relative increase in the weight borne by the back wheel, results in the skidding of the latter. A series of tests, under which extra weight could be placed alternately over the front and rear wheels of a motor-cycle with central engine, should be instructive and should go towards proving or disproving the theory.—CYCLOMOT.

Transformed into a Tricycle.

A French mechanic has solved the problem of how to make a bicycle out of a tricycle, and as the illustration shows it has been done with success. The construction naturally appears to be very heavy, but it must not be forgotten that all the material and parts were originally made for a 2½ h.p. De Dion motor-tricycle. Several of the tubes had to be altered, and the difficulty of arranging the bottom bracket and the crown pieces was considerable, until a method was found to overcome the trouble. The motor takes the place of the middle vertical tube and gives the frame great rigidity. The construction is on the De Dion principle. The machine has three brakes, one on the front wheel, the second works on the motor, and the third is a band brake on the rear hub; the two latter brakes



TRANSFORMED INTO A BICYCLE.

are worked by one lever. The three speeds of the motor-tricycle have been retained, and the motor works excellently in its new form. The owner has covered 2000 miles with the machine, half of which distance was done in its altered form.

Important to Tourists Abroad.**HOW TO SATISFY THE CUSTOMS ON THE MATTER OF MOTOR-BICYCLES.**

With the opening of the touring season, the following information on the matter of customs charges and formalities will be of more than passing interest. The cycle and motor touring clubs have succeeded in securing free entry for cycles, motorcycles and motorcars of members into Germany, France, Belgium, Italy, Norway and Switzerland. The free entry presumes only a limited stay of not more than two months, which time limit has been extended by France to three months. The club to which the rider belongs is responsible in case a proper re-export has not been certified in the given time. Most clubs make their membership ticket a document which carries right of free import, others issue special tickets to travellers for foreign parts. These tickets must bear the full name of the member, occupation and address, and must state type of vehicle, the use to which it is put, the trade marks, the maker's number, and the kind of tyres on the machine. The ticket must also bear

A PHOTO OF THE MEMBER

for identification, and have a proper stamp and official signatures affixed. The formalities at the different custom houses are nearly all alike, and it is well to know all details about them to avoid confusion. In Belgium and Switzerland, only the identification particulars are compared, and if found all right, the traveller is allowed to proceed at once, no fees being charged. The French "donanier" writes out a "Permis de circulation" for three months, for which document he charges about sixpence. In Austria and Italy the machine is stamped, and the owner receives his permit (called a "Boletta") which has to be kept until the country is left.

In Austria, the permit costs a few pence, and in Italy, nearly four shillings is charged. In Belgium, France, Germany and Switzerland, the country can be left without any trouble; but Austria and Italy

INSIST ON FORMALITIES

connected with removing the stamp and handing back the permit. Should one or the other of these have been lost, the full duty has to be paid before the export can take place. The duty and costs for stamp and permit would amount to 38s. in Italy, and from 50s. to 56s. in Austria. When touring with a large party, or when journeying back by rail, it is advisable to acquaint the custom authorities, as it simplifies matters for all concerned. If the machine is sent on by rail or steamer, and the free import privilege is claimed, the machine must be handed to the authorities to the owner with his identification papers, no other person being permitted to take it. If the owner desires to send his machine in advance of himself, the transaction at the customs station has to be personally conducted. Holland and Denmark place no difficulties in the way of the import and export of touring machines when in the hands of their owners; in Spain and Russia, the duty has to be deposited in full, and is returned when the machine is re-exported within the specified time limit. Spain charges £1 8s. 3d. per cwt. in the special tariff, and 13s. 6d. in the ordinary tariff; Russia charges £1 8s. 6d. per cwt., and the amount has to be paid in gold. We are sure that the above particulars regarding custom's regulations on the Continent will be found of value to intending tourists.

Improving the Details of the Motor.

These remarks will apply with special force to makers and designers. In the first place, an engineering expert is struck with the way in which good engineering practice is ignored in the construction of many bicycle-motors on the market to-day. Nothing could be more fatal to success. The want of efficient bearing surface is the reason, for many of these small motors simply knock themselves to pieces in a few hundred miles. Then how many motors are capable of adjustment for taking up wear of the running parts? Weak axles, and want of a really certain method of lubricating the cylinder are also much in evidence. Then the proper way to construct a silencer does not seem to be understood by many makers, and accessibility of parts and repair must receive great consideration.



Messrs. PAUL EICH and V. TRIER,
Who intend touring from Cologne to Zurich, with their machines equipped for the journey.

(See further particulars on News page.)

THE MOTOR BICYCLE: WHAT WILL IT BECOME?

(Continued).

By ANTHONY WESTLAKE.

The writer now proceeds to consider the two-stroke motor more fully, and also endeavours to call attention to the important question of Balancing. Water-cooling and Two-speed Gears also receive attention. Mr. Westlake's idea of a more comfortable machine will be illustrated next week

The Two Stroke Motor.

The action of the two stroke motor, illustrated in Fig. 2, which appeared in last week's issue, is very interesting, and is as follows:—Supposing the engine is started from "cold," it will be seen on reference to the drawing that the crank and piston are represented as being at the lowest point of the stroke.

Now, as the piston rises it closes the inlet port (M), also the exhaust port (N), and acts as a pump, drawing the mixture into the crank chamber through the valve (J). This is the only real valve in the engine. It will thus be seen that when the piston is at the top of its stroke the cylinder and crank chambers will be filled with the mixture. Now, as the piston descends again this mixture is compressed in the crank chamber until the lowest point of piston is reached, at which period the inlet port (M) is uncovered by the piston and the compressed mixture rushes through this port into the cylinder: again the piston rises, cutting off the inlet and exhaust ports as before, and compressing the mixture in the combustion chamber. At the highest point a cam on the boss of the flywheel completes an electric circuit, and the mixture is fired in the usual manner. The piston descends until exhaust port (N) is uncovered, and out rush the expended and burnt gases. But it is easy to understand that the piston in its ascent has once more renewed and in its descent once more compressed the mixture in the crank chamber, so that while the outlet ports are engaged in discharging the exhausted charge, the new charge of fresh mixture is rushing through the inlet port (M) striking the baffle plate (P) on the top of the piston, and being thus deflected upwards, the exhausted and the fresh charges are prevented from mingling. In actual practice, the incoming charge makes a complete circuit of the cylinder, running upwards from the baffle plate (shown in the sketch by the arrows), striking the concave combustion chamber, and being deflected downwards towards the exit port, thus assisting in "chasing" the burnt gases out and scavenging the cylinder. It not only does this, but a little mixture will also generally go out as well, showing how strong and complete the action is. This is the only bad point in the machine, as this fact renders it a little wasteful; but its immense power

for its size and weight, to my mind, more than compensates for this, and I consider it a type which might be much more studied than it is at present, as its simplicity and cheapness to make render it an ideal "cycle motor," fit to be placed in the hands of those who desire extreme simplicity. If two cylinders were used with their cranks at 180° we should have a perfectly balanced engine; also a movement comprising all the advantages of the present four-cylinder types. If anyone interested likes to consider its adoption, I shall be most pleased to lend my collaboration to the best extent of my ability.

Other Multi-cylinder Types.

Regarding other multi-cylinder types of bicycle engine, I have had experience of the Wolfmuller and the Jooss, the latter being really the outcome of the former. The Wolfmuller was an extremely cleverly designed machine, considering its maker had but little data or previous experience to go upon.

The causes of its want of success were, perhaps, first, its weight; secondly, its somewhat erratic impulses, due to two powerful cylinders coming into action at intermitted periods. The Holden has remedied this by lightening the machine, using about the same power, but dividing and regulating the impulses by using four cylinder acting on a much smaller driving wheel, thus securing a very uniform motion. I am much interested in this machine, as I regard it as the precursor of the single track car, with which I intend to deal more fully presently. Now, as to the Jooss. An illustration of this, showing its general arrangement, appeared in the conclusion of the article on "Motorcycle History." Its chief peculiarity lies in the fact of its using two horizontal cylinders superimposed, working on a beam or rocking shaft actuating a single crank. This gives a perfect balance, and,

indeed, this machine is the most vibrationless I have ever ridden. I show the arrangement of the cylinders and shaft in Fig. 3. I have been much impressed by this machine, as its regularity of running and power are remarkable considering the slow speed at which the engine revolves. Whether this type will survive is questionable, but the ingenuity of construction is certainly well worth considerable study.

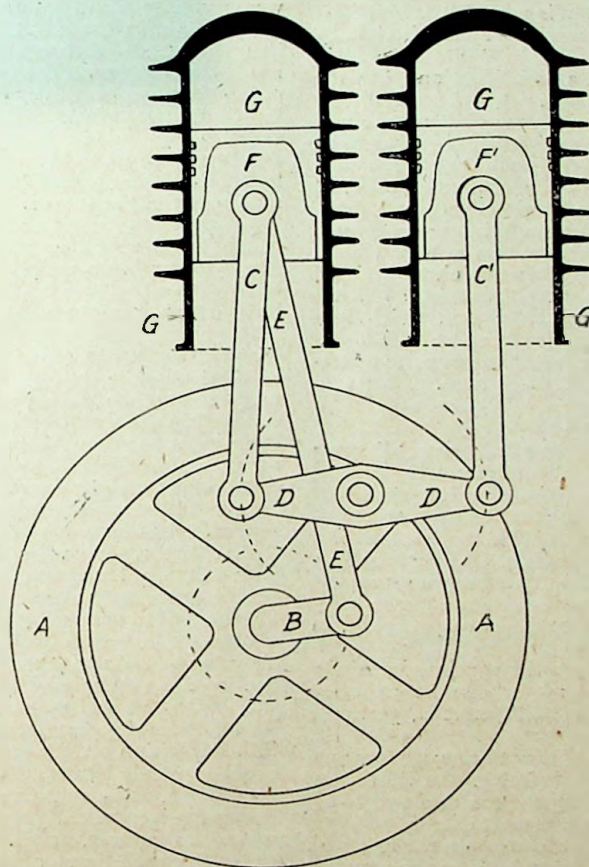


FIG 3.—THE BALANCED MOTOR. A MODIFICATION OF KOCH'S SYSTEM, USED IN THE "JOOSS."

AA Fly Wheel. BB Crank. CC¹ Connecting Rods attached to Pistons FF¹ and Rocking Beam DD. DD Rocking Beam. EE Long Connecting Rod from Upper Piston F to Crank B. FF¹ Pistons. GG Cylinders and Combustion Chambers. H Spindle of Rocking Beam D.

A Question of Balance.

Of course the presence of more than one cylinder does not eliminate vibration; but if these cylinders are arranged in such manner that their reciprocating masses balance each other, a very large disturbing factor is provided for. But the fact must be borne in mind that an internal combustion engine is a very awkward one to balance properly, as in the case of the nearly universally adopted "Beau de Rochas" type the explosions occur at such intermittent intervals that a proper balancing of the impulses is extremely difficult. There are two balances to consider, the first, explosion, and second, reciprocating masses. Such result can be obtained by placing two cylinders facing, each working on a shaft having two cranks at 180°. The explosions should occur simultaneously, then there can be no reaction due to the inertia of the fly-wheel. It is this very element which is difficult to allow for, as, if thought be taken, it will at once be evident that fly-wheel, crank and piston are one more or less detached and floating mass taking their movement from certain expanding gases, which in their turn are thrust in with exactly equal force in the opposite direction against the cylinder cover. Naturally this reaction is most felt at starting, as at that period the inertia of the fly-wheel has most reactionary effect.

The Jooss arrangement (really a modification of the Koch or Forest and Pers systems), as illustrated, is fairly effective, but in this only the reciprocating masses are balanced, the impulses taking succession exactly as in a Panhard engine. From the foregoing it will be seen that some nice problems await the designer of multi-cylinder motor cycles, as in these vehicles no arrangement can be directly copied from car practice, also the space at our disposal for "the engine-room" is more circumscribed. It is for this very reason that I have endeavoured to call attention to the "two-stroke" type of engine, as illustrated in the last issue of this journal. Having touched somewhat on the question of balancing, which is a most desirable feature, and also the types of engine which can possibly be employed with advantage, a few words as to water-cooling and two-speed gears may be in place here.

Water-cooling.

Water-cooling undoubtedly adds to the efficiency of all types of internal combustion engines; it also adds much to the complications already existing, and certainly increases the weight to be carried by some 10 to 20 lbs. It further necessitates continual vigilance on the part of the motist, and if I may go back to the opening of this article, and assume this motist to belong to the unmechanical minded who use the motor as a means of transport without understanding it, why then, in such case, water-cooling would prove probably, in his own words, "a deuced nuisance."

In the case of racing machines, where the appearance of the machine is not considered and the motor can be properly exposed to the rush of the air at high speed, then it is, perhaps, possible to do without it.

Also in the example of the man who does not know motors and does not want to, air-cooling would be desirable. In this latter case over-heating might be avoided by the use of a revolving fan placed in such manner as to direct a swift current of fresh air over the cylinder, or vanes might be formed on the flywheel to perform the same function. But to go back to the average conditions, especially in a case where a two-speed gear is employed, here, without hesitation, I think that water-cooling is necessary. If it prove possible to employ an engine powerful enough to carry up a grade of one in seven or so, and if it is also possible to make such an engine to run extremely slowly, then it may be possible to avoid two-speed gears and water-cooling, because given such an engine, it will be seen that, if this engine can drive the motor cycle at say, 30, miles an hour, running at 1,500 revolutions per minute, it is obvious that at such speed atmospheric cooling might prove effective. And if this engine can climb a steep hill of one in seven at a speed of 10 miles an hour, it will be seen that at such speed the engine only revolves at 500 turns per minute, and at a slow speed like that, large ribs might cool the engine sufficiently. Of course, in traffic, if one dropped to five miles an hour behind a crawling bus, the engine making only 250 revolutions per minute, it is also to be

seen that at such slow speed the engine would not overheat. But such an engine has not yet been made, although there is nothing impossible in the conditions. A proper step in this direction is much needed, and I may point out that heavier or more effective fly wheels and a means of varying the compression will probably help in attaining the conditions expressed.

Of course, whether two cylinders or one only are used, the result will be the same, except that a balanced two-cylinder machine will be more comfortable at slow speeds.

The Present-day Type.

But supposing this form of variable speed single cylinder engine to be impossible, let us take one much as we have them at present. It is obvious that unless of very high power it could not, under normal road riding conditions, surmount such an incline as one in seven unassisted. This gradient may appear an excessive estimate, but one must also remember that a grade of one in fifteen would present just as much difficulty unless properly surfaced, or even if such good surface were wet or soft, and grades of one in fifteen are fairly common.

Therefore, in the case of the ordinary type of engine being inefficient under such conditions, a two-speed gear is evidently needed, as with such the motor may revolve at 1,500 to 2,000 revolutions per minute when the low speed is in and the bicycle moving slowly. Under such circumstances air-cooling would be totally inefficient. Thus to my mind, water-cooling and two-speed gears are irrevocably coupled together, and will, unless that other engine is made by somebody, form part of the motorcycle of the future.

At present I know of a Belgian firm making a two-speed water-cooled machine, though it is not yet on the market. The cylinder has a water-cooled combustion chamber, and this has been cast solid with the cylinder and is beautifully tight. Large ribs are employed all over as in an ordinary case, and the advantages of these, even on an entirely water-cooled engine, cannot be over-estimated, as the radiating surface is, perhaps, doubled at least by such means. And I sometimes wonder why even on the big cars that this has not been done, because say we have a single cylinder 10 inches high and 5 inches in diameter, over the water jacket, and 50 square feet of surface are needed in the radiators, if we cast, say, 10 ribs an inch apart, each concentrically round our water jacket, and each rib 2 inches broad, we shall attain an extra cooling surface of 90 square inches for every rib, or 900 for the 10 ribs, equal to 6½ square feet, a very valuable and effective addition. To show how valuable I may mention last year's Nice races, in which nearly all the voituresses suffered from overheating. And the Darracq won, driven by M. Farman, who, seeing the trouble of the others, immediately removed the bonnet of his engine, allowing the air to play directly on the cylinder walls, thus keeping his engine cool and winning the race. There are on the market at this moment some radiators which I consider especially suitable for motor-bicycles. One which I saw at the late C.P. Exhibition on the stand of the United Motor Industries, of Great Castle Street, Oxford Street, struck me as being the very thing, as its form, a deep oval, would enable the sections to be most conveniently stowed in the frame. And its efficiency must be immense, as the surface of metal per cubic inch of water is much greater than any other that I am acquainted with. I think a pump will be best avoided by placing radiators as much above the head of the cylinder as possible.

(To be concluded in our next.)

Mis-fires.

These are in most cases due to the faulty adjustment of contact breaker. There are other causes, however, such as having a too weak charge of mixture. It requires a very powerful spark to ignite an imperfect mixture, hence if you are sure about the sparking being normal and mis-firing continues shut off a little of the air supply. Another fact that is sometimes noticed is that the motor will fire regularly if the compression tap is open; on shutting, it stops. This is a sure sign of a weak or thin spark caused by having plug points too far apart or a discharged accumulator not giving a current.

NEWS.

Wanted, good roads for Easter.

Why is the motor-bicycle bound to become popular?

Mr. S. F. Edge will answer this query in a special article next week.

Demester on a motor bicycle has covered a lap on the new Buffalo track, Paris, in 15.15th secs.

We hear that a new type of motor bicycle is being built in Geneva. We hope to give further particulars shortly.

The latest product of M. Buchet's works in Paris is said to be a two-horse power motor, weighing but slightly over twenty-five pounds and intended for driving motor bicycles.

In Handy Form.

The United Motor Industries, Limited, are packing their well-known "D" Lubricating oils in a new form especially for motorcyclists. The can is half a litre, equal to about one pint, and the price is 1s. 3d. the tin.

A Dictionary of Motoring.

A most valuable compilation of motoring terms is now running in the columns of our contemporary, "Motor News." Indeed it is no mere dictionary, but a complete guide to motoring, and should be preserved by all who are interested in the sport. Mr. R. J. McCreedy, the editor of "Motor News," is a most enthusiastic motorist.

Proves an Attraction.

The interest that is being taken in motor-bicycles is clearly indicated by little groups of spectators who can be seen every day peering in at the windows of some of the depots on Holborn Viaduct. It is particularly noticeable that the motor-bicycle is proving a considerable "draw" for the general public, and there is no question that the lay mind is fast grasping its generalities.

Motorcycle Touring in France.

The regulations and restrictions now placed on all motor driving in France affect the motorcyclist particularly, and foreign visitors wishing to travel on their motor-cycles when in France must be careful in their observance of the rules if they wish to avoid unwelcome acquaintance with the police. Every motorcyclist requires a driving permit like a car driver, and between the application for and the receipt of the permit a fortnight is sure to elapse, during which time driving is prohibited. The examination has to be made on a machine belonging to the police and not the driver's own. The provisional certificate issued at the examination is only available in the locality and not in other provinces. The application for a driving permit must contain all technical details of the machine, the name of the maker, etc., and the applicant has to add a declaration from the manufacturer giving all particulars about motive power and such details as the maker is personally responsible for. A tour in France on a motorcycle is scarcely to be recommended until a few of the rules have been amended.

It is expected that a large number of Automobile Club members and friends will muster at Cromer for Easter.

In our article on "The motor-bicycle: what will it become?" Mr. Westlake gave this interesting fact: A petrol engine consumes one pint of .680 petrol per horse power per hour.

The motorcycle will be used for both racing and pacing purposes in France this year. Some machines are under construction which are expected to attain a speed of 75 miles per hour!

Touring the Continent.

We give on another page photos of two riders, Messrs. Eich and Trier, with a belt driven Derby and front driving Trent respectively, who are about to ride from Cologne to Zurich, Switzerland. If successful their intention is to ride across the Alps. Mr. Eich is an experienced motorcarist, but he has given up the latter for a motor-bicycle. The two riders, we hear, have been laying in a good stock of "Possibles" and a few "Impossibles."

Can Motors Drink?

[An international competition of motors using alcohol as fuel will be held in France in May, under the official direction of the Minister of Agriculture; its object being to show the advantages of alcohol.—DAILY PAPER.]

Just look at those cars, how they frolic!

Their antics are quite diabolic;

One would certainly think

That they'd taken to drink—

Their breath seems to smell alcoholic.

Is it brandy, or black-and-white whisky,

That makes them so terribly frisky?

But it's rather too rich

When they roll in the ditch—

In fact, it's decidedly risky.

They can't pass the door of an inn

Without stopping to guzzle their gin;

And, highly elated

By neat methylated,

With reckless abandon they spin.

WM. C. BIRT WHITWELL.

A small syndicate, with a title of the Victoria Motor Company has been formed in Coventry to run a French motor in this country.

Mr. George Patterson, a director of the New Hudson Cycle Co., intends visiting Paris during the holidays, and reports state that he intends buying a small car.

Two well known members of the American Automobile Club, Messrs. W. Vanderbilt and David Wolfe-Bishop, are now in Paris. They may take part in the Nice-Abazia and Paris-Vienna races.

The A.C. Advisory Committee.

The Automobile Club recently decided to form an Advisory Committee on Motorcycles, and the following gentlemen have been invited to serve upon it:—Prof. C. Vernon Boys, Col. H. C. L. Holden, the Rev. Arundel Whatton, Messrs. S. F. Edge, C. Jarrott, Robert Todd, C. A. Smith, J. Pennell, M. O'Gorman, Campbell Swinton, and E. R. Shipton.

Motorcycles Included.

Motorcycles will be allowed to take part in what is known as the Big Trial of the Automobile Club, to be decided some time during the summer. The trial will consist of a series of runs, to start, it is suggested, from the Crystal Palace each day, the routes taken being to Folkestone and back, Worthing and back, Brighton and back, Eastbourne and back, and Bexhill and back. Another day will be spent in hill-climbing tests, and in connection with the Bexhill run there will be speed trials on the racing course.

Motorcycling Freed from Restrictions in Italy.

The Italian Government has decided that motor-bicycles and tricycles are not to be classed as automobiles. This welcome decision frees the drivers of these vehicles from the necessity of passing an examination and from following the strict regulations which apply to car drivers. Interference from the police and other delays are also avoided. But it is not certain whether the decision affects the customs requirements referred to elsewhere.



THE STEAM 'BUS IN LONDON.

An interesting experiment is being made by the Road Car Company with a steam 'bus, built by Thornycrofts, which is now running between Oxford Circus and Hammersmith. It is always well patronised.

Successful experiments with motor-cars have been made in the Russian Army.

The public service motor 'buses plying in the Reading district prove an undoubted boon to suburban dwellers.

More Competitions.

The Antwerp Automobile Club announce a competition over the kilometre, flying start, for motor-bicycles, motor-tricycles, and cars, the last named being divided into four classes. The date fixed is the 24th April.

Old Patterns Converted!

It may not be generally known that Messrs. Bayliss, Thomas and Co. are now prepared to convert the old 1901 pattern engine at a very reasonable cost. All further particulars can be obtained by dropping a line to the firm at Ford Street, Coventry.

The Taming of the Steed.

A motorist remarked to one of ours the other day that in the course of six months he 'cover many hundreds of miles and his experience is that horses are wonderfully docile towards motors than they were even a couple of years since. This in reality adds one more point of success to the motor's growing list.

Motors on the Reading Track.

At a meeting of the Reading United C.C. it was stated that the N.C.U. (local centre) were approaching the Corporation of Reading with regard to allowing motor-cycling on the tracks. An old resolution had been in force prohibiting such riding of any kind on the tracks, but they were now asked to rescind that decision. The Union felt that it would help to make the race meetings held there more attractive.

"Excelsior" motor-bicycles were first and second in the five miles' handicap at Aston, on Wednesday.

Strong in Motors.

Nottingham is probably as forward in the motor movement as any English city of equal size. During a recent run from Laccopolis to Newark and back, we met, in the course of of forty miles, no fewer than seven cars, one quad, one tricycle, and one motor-bicycle. Nottingham also possesses a very flourishing Automobile Club, which is affiliated to the A.C.G.B. and I.

His Present Hobby.

At a gathering of motorists, we were recently talking to a gentleman who is now the owner of two fine cars, and who is very keen on the new sport. He happened to mention that in the past yachting had been his great hobby. Owing, however, to his now being domiciled in an inland town he had had to give up his favourite sport, and had adopted motoring as the nearest approach to sailing. He very aptly described motoring as "land yachting."

Remove the Plug.

One would think it was hardly necessary to remind the novice to turn off his switch and remove his interrupter plug before leaving his motor for any length of time. However, a case has just come under our notice which shows that some novices still require this advice. We have heard of a man who had just purchased his first motor-cycle, leaving his switch handle turned on, his interrupter plug in its position, and, as the trembler happened to be in the notch of the cam, the natural consequence was that all his current escaped and his batteries ran down.

The Automobile Club, we are glad to note, is now giving due attention to the motorcycle.

Midland roads are in splendid condition for motoring, and Leamington, Warwick, Kenilworth, and Stratford will, doubtless, be well patronised at the holidays.

The new club-house at Birmingham is now being furnished, and will soon be opened. The Management Committee will extend a hearty welcome to motorists in general, but special attention will be paid to motor-cyclists.

An Interesting Case.

At the Newbury (Berks.) County Court last week before Judge Russell, Dr. Whitcombe of Aldermaston, was sued by Messrs. Stradling and Plenty, motor agents, of Newbury, for the sum of £24, balance due for three months' hire of a Renault car.

The facts lay in a small compass, and the hiring a specific one, backed by an agreement of a somewhat wide nature.

The car had been kept by defendant a month, during which time various repairs had to be done by the plaintiffs, as agreed. The car was then returned to them stating it was not serviceable to the doctor. The agents would not release him from the agreement and now sued for two months' hire. His Honour spoke to counsel as to the covering terms of the agreement which defendant had agreed to. Having listened to the long examination and cross examination, he assumed all that in the defendant's favour, yet he would give judgment for the plaintiffs, because it appeared to him that if the car broke down every half an hour the agreement said they were to make it good.

If the case was taken to the Divisional Court and considered wrong, they could send it to him to try again.



TWO O'CLOCK.

None would think to look at him that he was anything more harmless than the usual immaculate City man emerging for perhaps an afternoon's entertainment at "Ranelagh."



FIVE O'CLOCK.

Cheerful Friend: "What would the 'City' say if they could only see you now?"

Enthusiast: "Oh, hang the 'City'! I'll get this running in an hour. But I wish you'd get under here and look at this movement, it's awfully pretty and— (Disappears.)"

Motor Cycle Racing at Aston.

FIVE MILES HANDICAP FOR MOTOR-BICYCLES.

Some 12,000 spectators attended the Charity Sports at the Aston track, Birmingham, on Wednesday last, and it is not going too far to state that the most popular item on the programme was the five miles handicap for motor-bicycles. The handicap was such as to preclude anything like an exciting finish, and until the gentlemen who allot the starts have had a little more experience with regard to motor propelled cycles it is quite impossible to expect such close finishes as we are accustomed to witness in cycle racing. A few months' experience should, however, make a great deal of difference. In connection with the new racing movement, we wish to draw the attention of sport promoting organisations to two rather important points, as they may have a great deal to do with the success or otherwise of motorcycle racing. The first is that some means of identification of the competitors should be given to the spectators. Racing cyclists wear different colours, but up to the present racing motorists appear to think that a small card pinned at the bottom of the coat is quite sufficient. Different coloured bands on the right arm might answer the purpose, but certainly at the present time the onlookers quickly lose interest, as they cannot identify any of the competitors. The second point is the disqualifying of any competitor who should remove the silencer from his machine. The noise created by half-a-dozen machines cycling around an enclosed track without silencers being fitted would quickly kill such kind of racing. The public must be considered and the fractional extra speed obtained is not worth consideration.

And now as to the racing details:

The contest was run off in three heats and a final. The small-powered engines were quite outclassed by the larger variety. W. Heath, riding a Werner 1½ h.p., won the first heat. H. Stones, Lincoln, on a Rex 1½ h.p., easily accounting for the second, while H. Martin on a 2½ h.p. Excelsior took the third. Owing to the regulation which prevented a competitor from pedalling after crossing the starting line, several competitors were simply "left," as they had not found a suitable mixture by the time they reached the line. In the final, S. Wright, Coventry, on a 2½ Excelsior, and who got into the final by reason

of being fastest loser, simply raced away from H. Martin, and won in the grand time of 8 min. 34 secs. : Martin second, in 8 min. 39½ sec. Stones on the Rex had the mis-



An interesting glimpse of the back-markers getting ready to start in the final heat. The riders are Wright, Martin, and H. W. Stones.

fortune to break the belt of his machine after going a few laps. The last mile was ridden in 1 min. 39 secs.



MOTORCYCLE RACING AT ASTON.

Wright, Coventry (winner), in the last lap. The last mile was ridden in 1 min. 39 secs.



MOTORCYCLE RACING AT ASTON (A Corner of the Enclosure).

An Improvement in Pulleys.

During the course of a recent chat with a well-known London parts manufacturer he told us of a device adopted by Alfred Rivett, of Leytonstone, whose "Blizzard" cycles and motors are very well known, even far beyond the confines of his district in the N.E. of London. The driving pulley which he attaches to the engine of his motor-bicycle is, apparently, just slightly larger than usual and has about 40 saw cuts transversely, so that the belt is gripped by the semi-sharp edges of the teeth-like saw cuts and thus slipping is prevented.

The Government of the Sport.

The question as to whether or not the National Cyclists' Union shall continue to exercise control over a part of the sport of motor-cycling was discussed at the meeting of the Council of the Union on Saturday and it was decided to arrange another conference with the Automobile Club in which the whole matter should be thoroughly thrashed out. The feeling of the Council was evidently in favour of keeping a hold upon the sport if it be possible, but it was recognised that if it should ultimately happen that pedals are dispensed with on motor-bicycles the control must, under the present arrangement, pass to the Automobile Club.

Motorcycle Trials at the Crystal Palace.

A series of trials of motorcycles is arranged to take place on Saturday, April 5, under the control of the Automobile Club and the motor-cycle section of the C.T.C. The meeting will be open to motor-bicycles of any h.p., and to motor-tricycles not exceeding 2½ h.p. Entry of rider and machine must be made to the Secretary of the A.C. before noon on the day of the trials. The tests will consist of a run from the Club premises through South London to the Crystal Palace. Tanks will be filled up and the motor-cycles will then be ridden 20 miles on the track, the distance to be covered inside the hour, no pedalling being allowed. On the completion of the 20 miles the cycles will be ridden off the track without dismounting, and will proceed to ascend Rock Hill three times, turning at top and bottom, and returning to the track enclosure without dismounting. The consumption of petrol will then be noted. No prizes are offered, nor will certificates be awarded.

OTHER PEOPLE'S VIEWS.

Motor-Tricycle Experiences.

Sir—In reply to "Trike" in your issue of the 12th, I think I may say that I have had plenty of experience with an Ariel. Mine is only $2\frac{1}{2}$ h.p. and not water jacketed, but I find it quite powerful enough and it never over-heats. On my present one, I have ridden over 20,000 miles; have never had a breakdown, and only renewed one part, i.e., the small driving pinion on engine shaft. I invariably take a passenger with me on an Ariel trailer, and we do some big journeys. The last one was to London, in November, to the Crystal Palace Show, 127 miles in about eight hours (running time). Shall be pleased to give "Trike" any further information if he will write me.—Yours faithfully
GEO. W. BURNELL.

Uniformity of Piston Speed.

Sir,—I have taken in "MOTOR CYCLING" since it made its first appearance, and am most pleased with it. I notice, however, that a rather important point with regard to motors has been overlooked. That point is uniformity of piston-speed—I do not say piston-speed itself, but uniformity of piston-speed. There is really only one factor to be taken into consideration regarding it, i.e., the connecting rod (called by some piston-rod. In a motor, the two are represented by the rod working in a gudgeon-pin.) The facts are these: (1) The shorter the connecting-rod the less uniform the piston-speed; (2) the longer the connecting-rod the more uniform the speed. In other words, if the connecting-rod is short, the tendency of the piston is to move much faster along the centre portion of the cylinder than along the portion towards the two ends. If, on the other hand, the connecting rod is long, the speed of the piston is much more uniform over the whole length of the cylinder. This appears to me to be an important point when considering motors moving at from 1,500 to 2,000 revolutions a minute.—Yours truly,
C. S. STOCK.

Eye-sores on Motorcycles.

Sir,—I quite agree with your remarks upon the unsightliness of the terminal block and contacts for the interrupter-plug as generally fitted to motorcycles. Makers seem to have copied the original idea with very few attempts at improving a point, which is at once crude and easily lends itself to alteration. Some months ago, when I first commenced alterations to the fittings on my motorcycle, I designed an arrangement to replace this; want of time, however, prevented my carrying this out, but I give the idea for what it is worth.

I arranged to dispense with the handle-switch, and substitute one actuated by the lever of the Bowden brake—that is to say, the first movement of the lever opened the circuit, and a further movement applied the brake in the usual manner; upon the release of the lever it sprung back to its original position and switched on again.

This forms a safe and efficient means of stopping the machine, especially in an emergency, a touch of the lever with one hand being all that is required.

The switch was arranged to be within the handlebar tubing, and actuated by a pin which was to be passed through at the

point where the Bowden lever pivots on its clamp; in addition to this, this pin was to form the interrupter-plug, and only complete the circuit when inserted. The whole thing being inside the handlebar tubing would be protected from wet, and have no exposed terminals; and if the wiring of the handlebar was of the frame contact system, there would be only one wire coming from a hole in the stem.

The only objection that might be raised to this is that the plug would have to be removed or the brake lever slightly pressed at any time when the current was not required; this, however, could be obviated by still retaining the ordinary handle-switch and placing the one on the brake lever in series with it, when either could be used as desired.—Yours faithfully,

G. C. WESTON.



The last lap of the fierce struggle between steam and petrol on the Glasgow Exhibition Track, at the close of the 500 miles trials. The Locomobile (steam) proved victorious, after a most exciting "neck-and-neck" race. The issue of the race literally hung in the balance right up to the tape.

Belt Driving.

Sir,—I have read with much pleasure your interesting article on this subject. Such articles must be very useful to the motorcyclist possessed of little engineering knowledge, and may be studied with advantage by many makers of the motorcycle. Unfortunately the diagrams A, B, and C are not absolutely accurate. It is well known that a belt grips that portion of a pulley between radial lines drawn at right angles to the straight portion of the belt. If such lines be drawn on diagram A, it will be seen that considerably less than half the motor pulley is gripped by a direct belt. In diagram B, the amount of grip on the motor pulley is increased by the jockey pulley, as the upper radial line, drawn at right angles to the belt, is at least vertical, whereas in diagram A it slopes away to the left. A jockey pulley always increases the grip when it deflects one side of the belt towards the other side. It is only possible for the belt to grip half the motor pulley when a jockey pulley causes its side of the belt to be parallel to the other side of the belt. Now, assuming that the best position of the jockey pulley is as in diagram A, namely, with its axis on a straight line connecting the axis of

the motor and driving-wheel pulleys, it appears to me that it would be far better to take the belt direct from the driving wheel pulley to the motor pulley, and to pass the "loose" side up over the jockey pulley, as, by so doing, the amount of friction on the bearings of the jockey pulley would be greatly reduced, and the amount of grip would remain exactly the same, which, however is not as much as "three quarters." The speed of rotation of the jockey pulley would remain the same, but the "moderate tension" referred to in your article would cause much less side thrust than the whole power of the engine, as in the said diagram.

Yours faithfully,
CLAUDE K. MILLS.

A Midland Motor Cycle Club.

Sir,—In your No. 2 issue of February 19, 1902, "Avonian" suggests the formation of a Midland motor-cyclists' club. I think it would be a very good thing indeed; and to have regular runs, and people who possess quads could take non-motorists with them. There are so many people who are willing to buy a motor vehicle if only they could have a few runs on one, and gain a little experience. What could be better for them than to go out with a club and see the many different types of motors?—It would help them to form an opinion, and ultimately a purchase. I shall be pleased to see your readers take this up. I have heard of a "Midland Automobile Club," but whether it exists I cannot say. I possess an Ariel quad, and through carrying non-motorists, have induced two in four weeks to purchase.—Yours, etc.,

CLAUDE MAY.

Position of the Engine.

Sir,—With regard to the paragraph on the "Position of the Engine," I should like to suggest that perhaps the reason why a gas engine or locomotive can be worked satisfactorily in a horizontal position is, because the surface of the piston is far greater than in a motor-bicycle, and of course, it is therefore less likely to wear. The small size of the motorcycle engine, coupled with the very high speed, is certainly calculated to wear it in a one-sided fashion. One must also bear in mind that a locomotive does not wear so remarkably well, and perhaps this position contributes to the fact.

I should also like to say something about Mr. C. A. Smith's article.

I absolutely fail to see the force of his argument about the "empty box."

He puts down the unpopularity of the tricycle to bicyclists being unable to steer! He forgets that the steering of a tricycle is far easier to learn than that of a bicycle, and that bicyclist can learn to steer a tricycle far sooner than a tricyclist can learn the steering of a bicycle. Again, his misfortune with the nut off his saddle could not happen on a bicycle and yet he tells this incident in an article in which he is trying to praise the tricycle!

"A CONSTANT READER."

Sir,—In reply to your correspondent who asks if anyone ever saw a vertical gas engine, or a vertical locomotive, the answer is "Yes." Crossley's used to make a small gas engine (crank above and cylinder below), and at the tramway exhibition in the Agricultural Hall, in (I think) 1900, the Westinghouse Co. had a

vertical gas engine of about a hundred h.p. for driving the dynamo which supplied their specimen electric car. It had three or four cylinders and ran with remarkable smoothness and absence of vibration; in this case cylinders were above and cranks below. I might also point out that vertical engines are almost invariably used for motor launches.

There is also a vertical locomotive in existence in America, of which a drawing appeared in the "Engineer" not long ago. The cylinders are bolted to the side of the ordinary boiler and work on to a "fore and aft" shaft, from which the motion (somewhat geared down) is transmitted to the driving wheels by bevel gear.

As to the advantages of a vertical motor, I take them to be: even wear of cylinder and piston, as the weight of latter does not then rest on one side of cylinder; better lubrication, as oil does not tend to run to one side of cylinder (the circular channel mentioned in this week's article would be of little use except in a vertical engine), and there is less tendency for oil to accumulate above piston and so clog valves and sparking points. Perhaps someone else can name other advantages.

Yours faithfully,

S. F. ELLIS.

Side-slip.

Sir,—I have had a fair amount of experience in motor-bicycle riding, and I must say that my own observations tend to confirm the theory advanced by your contributor "Cyclomot." The steadiest machine in grease (of which, unfortunately, I get a lot, as I use the motor-bicycle and tricycle a lot for business purposes in and around London), is undoubtedly that with the weight about central, or, to be accurate, with the centre of the weight (man, motor, and machine) somewhere in the region of the crank bracket. Apart from this fact, a certain amount of the tendency to side-slip is in the rider himself. Fear of side-slip causes a somewhat tense gripping of the handles, with invariably bad results.

Yours truly,

Crouch End, N.

C. J. F.

Sir,—I wish to add my little contribution to the opinions which have appeared in your paper, *re* "side-slip." During the last three months I have used one of the New Werner machines continually, in all sorts of weather, without a single side-slip, so I mention my methods, as they have so far proved correct in practice. First of all, when on a dangerous bit of grease, drive gently and continuously—that is to say, retard the spark to slow the speed, and do not regulate the speed by switching on and off. Avoid all sudden turns, and on no account put the front brake on, and only use the rear brake if it is absolutely necessary; in fact, do everything gradually and gently, avoiding all jerks. I, however, do not think that everything depends upon the rider, and I believe that machines with the weight between the wheels, so that the front gets a fair proportion, are much steadier than the machines having the weight upon one wheel or the other. Another point, about which I feel quite convinced, is that, on a greasy road, a belt-drive is much safer than any other transmission, as there is more give and elasticity.

I think that, properly driven, a motor-bicycle is less liable to skid than an ordinary safety, and it is a great pity so many people are afraid to purchase motor-bicycles on account of the overrated bogey "side-slip."—Yours faithfully,

ERNEST H. ARNOTT.

Sir,—I am glad to see that you are devoting a certain amount of space to that bugbear "side-slip." I have ridden cycles of all sorts for over 20 years, and for a year or more have potted about with the motor-cycle, and my experience certainly leads me to the conclusion that the motor-cycle does not side-slip any more than does its humbler rival. I rather fancy that the added weight gives greater stability, and I believe that "Cyclomot" has struck the point very happily when he calls attention to the fact that heavy men side-slip less than the featherweights. The new theory strikes me more and more favourably every day I think of it, and I should not be surprised if it turns out to be correct. I certainly find that the Minerva is a much steadier motor-cycle than the original Werner was.—Yours truly,

Exeter.

"DEVONIAN."

Railway Charges for Motorcycles.

Sir,—In this week's issue I notice that Mr. C. W. Brown says that "by sacrificing the petrol one can compel the railway company to convey the machine at 50% above the charges for an ordinary bicycle," but the G.W.R. tell me their charges are just double that of an ordinary bicycle; now as I have frequently to bring my motor bicycle from Bristol to London I should be glad to know how I can legally force the G.W.R. to come down in their terms. Any information on this point will be thankfully received.—Yours truly,

HERBERT J. B. COGAN.

[We shall go thoroughly into the question of railway charges for motorcycles shortly. There certainly appears to be a good deal of discrepancy between the charges of the various companies.—ED. "MOTOR CYCLING."]



NO SYMPATHY.

The Hon. McJones (bringing home his new £900 car) has a mishap and shouts for water.

Indignant Old Party (looking over fence): "Water, d'yer say? Then yer won't have any. Coming here a-spoiling my washin' with yer wretched bonfires. Why couldn't yer take it somewhere else to burn?"

OUR INFORMATION BUREAU.

Bax (East Grinstead) asks:—"Is there a motor bath chair in the market?"

S.C. (Bolton).—In regard to motor parts, write to the Minerva motor depot, 158, High Holborn, W.C.

W. J. T. (Albemarle Street, W.).—We fear the vibration would prove too great for your ingenious idea. Better have a Humber chain-driven pattern.

L.A.W. (Newcastle-on-Tyne), who praises our paper, and likes it immensely, puts in a plea for news and description of runs around Newcastle and district. We shall bear his suggestion in mind whenever opportunities occur.

The Simms-Bosch System.

Thos. G. Crassingham (Bristol).—(1) Is the electro-magnetic system of ignition, in so far as your practical acquaintance goes or have any of your contributors, who have also tried it, found it reliable for any length of time, up to say six months or more of constant use? The magneto dynamo will give off a strong sparking current indefinitely if the magnets are strengthened occasionally. (2) Is there trouble of any serious nature, or considerable adjustment required in any of the moving parts of the "make and break" contact within and without the valve chest, and if the wear and tear of this portion is such as to require repeated attention and frequent replacements; if the insulated plug of mica (subjected as it is to extreme heat) breaks down frequently and requires replacement; and if the shield, oscillating before the fixed armature, is liable to get out of adjustment often, thereby affecting the maximum period which gives the best spark? The moving parts are, of course, likely to require attention, but there are instances of runs of 1,000 miles and more without any sign of wear. (3) Taking all the above liabilities and supposed troubles into consideration, is it far and away superior to the present accumulator, coil, make and break contact system with all its imperfections at present so much in vogue, and would, therefore, give considerable less waste of time, trouble, ill-temper, etc.? The coil (De Dion) system is adaptable to any motor, and electrically and mechanically nothing could give better results if its principles are thoroughly understood. With its own, particular type of motor the magneto is at least of equal efficiency.

Licenses.

"Curious" (Birmingham) asks for information in regard to the amount of tax to be paid on motorcycles. "Under what Act is the tax levied, and to whom payable, and under what class we would place a quad, (pedal propelled, not a free engine)." It has been decided that motorcycles are liable to duty paid at the Inland Revenue offices. The license is two guineas.

T. W. (Sheffield).—If you use your quad for pleasure runs at all we fear you must obtain a license.

Chasseur (Huddersfield).—The "Wayland" voiturette, made by J. B. Joyce, Watton, appeared to us a practical idea, and we think it would answer your requirements.

W. McC. (Devonport) is one of the "In Transit" motorists, and wants advice about the purchase of a motor. He visited the Palace Show and took a fancy to the "Derby" chain drive. We can recommend it.

Friction Clutches.

H.R.H. (Tredagar) wishes to obtain the address of the makers of friction clutches or similar mechanism for driving a motor-cycle by a chain instead of a belt. Brown Brothers, Great Eastern Street, E.C., would probably be able to supply.



The Yard of the "Red Lion," Hatfield.—This old Coaching-house is extremely popular with Motorists and Cyclists.

A String of Questions.

"Zero" (Oldham) asks: (1) How can I charge a two-cell four-volt accumulator from a small dynamo giving off about 16 volts current? If dynamo is shunt wound, join up battery across the terminals, positive to positive, with a yard or two of resistance wire in series. If possible, put an amperemeter in circuit, and speed up engine till you get two amperes through. (2) In making a "jack" to raise a motor-cycle off the ground, is it advisable to raise both back wheels off or only one? Better to raise both wheels. (3) Could the "milk can" type of carburetter, as is usual in Phoenix Aster tricycles, be replaced with advantage by a Meredith carburetter? Yes, the Meredith carburetter would give more uniform results. (4) Is there a motorcycle club in Manchester, and if so give address? The Manchester Wheelers have just opened a motor section; Address, 4, Albert Square, Manchester.

Motor Licenses.

J. W. K. (Battersea, S.W.) asks:—"About the licensing question. Might I ask if you could inform me whether, in the event of a person taking out a 15s. license for a motor-bicycle, and, after a week or two, purchasing a trailer, would that person be compelled to pay the full £2 2s. license, or only exchange the 15s. license for the higher one and pay the difference? I think probably a lot of people will not have trailers until after having had their machines a while, and in the event of being called upon to pay a full license, thereby rendering the first one useless, it would at once kill the trailer industry."

We are of opinion that the first license could not be exchanged. Have any readers had any actual experience of such a case as the above?

Then J. W. K. asks further:—"I might also ask, would a cycle dealer who had a motor-bicycle on his place for show and sale, or even running it on the road, be compelled to have a license? These are vital points both for the public and the trade."

A case has been decided in which it was clearly stated that motor vehicles for use in connection with one's business only, and not for private use, are not liable to duty. But we hear that an excise officer considers that a motor bicycle used by an agent for, say, week-end spins, would warrant a license being taken out.

A "Roadside" Query.

H.S.B. (Burgess Hill) writes:—"I have read the article on 'Roadside Repairs, and How to Effect Them' with the greatest interest, for being a motor-cyclist I have only a week's standing in the article appeals to me, and I am sure it will be of very great assistance not only to myself but to all who read it."

not, however, notice amongst your list of possible causes of stoppage, the accident that befell me on my first long ride, which was the breakage of the small triangular piece on the trembler cam, and which lifts the trembler. I presume this is a very unusual occurrence. This little cog was screwed in, and had evidently worked loose and been snapped in two by the trembler, as both the head and also the screw were both lying loose in the case. I find you state that no satisfactory tap has been found for emptying the carburetter, but I have found a quarter-inch good brass tap, quite satisfactory and petrol proof. So a breakage is unusual and would be difficult to repair on the road. The cam ought to be machined out of the piece of steel, and a breakage made impossible. Better get the piece screwed on with a steel screw and riveted, or even to have it brazed would be best. Glad the article has been found of so much assistance.