

The Motor

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

MOTORISTS I HAVE HELPED ON THE ROAD.

By "A CYCLIST."

Why the cyclist is commonly supposed to be the arch enemy of the motorist I am at a loss to see. There is nothing lost by trying to maintain friendly relations between the two classes of road users, and there is a great deal to be gained; each must have some consideration for the other, and the consideration need not be all on the side of the stronger. I have always held the view that it is the most charitable course to offer assistance whenever possible, whether to a fellow-cyclist or to a belated motor owner—the latter, alas! a far too common sight on our roads.

My first experience was an 8 h.p. car held up on the Sutton-Reigate road. A friend and I encountered the vehicle at the foot of a hill, where it had incontinently struck work. The driver explained that he had suddenly lost his compression; and, certainly, a turn of the starting handle made it very evident that such was the case. Unfortunately

A LOOSE JOINT IN
THE INDUCTION PIPE
PUT US OFF THE
SCENT,

and after wasting ten minutes in unscrewing and replacing the copper union to the carburetter, it suddenly occurred to us that the compression ought not to get past the inlet valve.

The fault was, of course, a broken spring; but, as the driver had no "spares," nothing could be done. He thanked us for our humble assistance, mentioning that he had always found people extremely kind, and willing to help him in difficulties. (I wonder how this agrees with the "popular prejudice" that we read so much about?) His chief consolation had been the interest shown by a rustic, who assured him several times that there was "a very good pub. just over the 'ill." He had been there for three hours, and was expecting a relief car, so we left him in the gathering dusk.

Our second "patient" was the light-hearted owner of a New Hudson motor-bicycle, who was cheerfully rubbing resin into a very hard and shiny belt. We pushed his

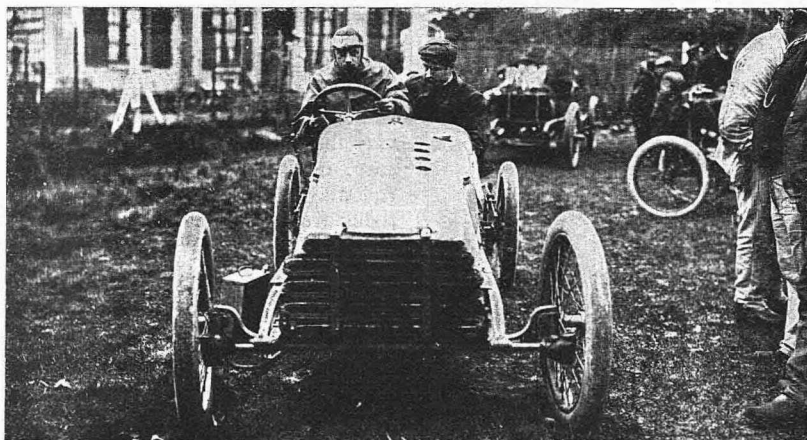
machine up Sanderstead Hill for him, after which he took us in tow to Upper Warlingham. Note.—

HE SHUT OFF THE AIR SUPPLY AT STARTING, AND FORGOT
TO PUT IT ON AGAIN,

in consequence of which the extra work proved too much for the engine, and we left it in a very heated condition.

On another occasion we encountered a novice, who, fully persuaded in his own mind that his tight belt was too loose, explained the misfiring of his engine by the astounding theory that the loose (?) belt acted as a brake and stopped the motor! We examined his contact breaker, and found the case full of dust, which had worked in through a convenient hole in the top. His plug was well sooted up, and

the screwed hole into which it fitted was coated with a beautiful varnish of oil. Putting these things right, however, made no improvement; so, as he was near home, he took to the pedals, and went off with the engine sneezing spasmodically. He said the machine had only run 20 miles, and he would be glad to sell it at a sacrifice; but an offer of ten pounds failed to clinch an excellent bargain.



A Clement-Bayard Racer, which competed at Dourdan.

A mysterious case was that of a motorcycle which suddenly struck work on the London side of Clayton Hill, Brighton Road. The owner and I went all over the wiring, but found all was in order. The accumulators were fully charged, and the coil was taken out and examined without any fault being found. The owner was positive that there was no short circuit. Ultimately he took off the belt and pedalled down into Preston Park. Here I was about to leave him, when, happening to switch on by way of experiment, he heard the coil buzz furiously. The belt was replaced, and a few turns of the pedals sent the engine off beautifully.

SYDNEY J. TAYLER.

A FEW WORDS ABOUT ENGINE BEARINGS. By "MAGNETO."

The bearings of a motor are the most important detail about its construction: they form the very foundation, as it were, upon which the whole complex structure is built up. All high grade makers recognise this fact, and the most scrupulous care is taken to ensure that they are accurate to the 1,000th part of an inch. To this end are adopted special jigs, gauges, and templets. The inner and outer surfaces of the bearings must be absolutely concentric and parallel with each other: if they are not, that most objectionable of all mechanical practices has to be adopted to use them, namely, "faking." It is in this class of work that the jerry repair man excels, and also the bogus motor expert, whose ideas of what constitutes a round hole are so wonderfully elastic. Bearings, in most cases, are made from phosphor bronze or gun metal, as these alloys work excellently against steel. But there is much difference in the quality of these alloys: the genuine stuff is extraordinarily tough, and by no means easy to work with a tool; hence it is that the jerry maker of "sets" of parts uses common soft brass; it looks the same, and the buyer of one of his motors has no means of judging. But

AFTER 100 MILES OF RUNNING THE QUALITY SHOWS UP,

and the novice wonders why his motor makes such a curious knocking sound, and whether there is a special reason for the pulley shaft having an up-and-down motion in the bearings. There is every probability that in the near future we shall have all the highest grade motors fitted with hardened steel bearings: the reason for this is that in a small motor suitable for cycle work a good length of bearing cannot be provided unless the width of tread of the machine is made awkwardly wide. Now for a minimum length of bearing there is nothing to equal hardened steel, and especially for high speed motors: phosphor bronze is excellent where a long bearing is available. Parts that have to take sudden and unequal thrusts, such as the gudgeon pin and crank pin bearings at the ends of the connecting rod, should certainly have steel, and so also should the 2 to 1 cam shaft be fitted. Consider the sudden downward thrust on these bearings every time the cam has to lift the exhaust valve; the reaction in overcoming the tension of the spring

MAY EASILY EQUAL 35 TO 50 LBS. FORCE.

When an engine that has had considerable service is taken to pieces it will invariably be found that the gudgeon pin end of the connecting rod has its bearing worn oval, and also the 2 to 1 gear bearings. Much, of course, depends on the design and width, but there are not many motors having phosphor bronze bearings in these parts that will keep true for more than 4,000 miles. When made of steel, and with both bearing and shaft flint hard, these parts will last indefinitely. Cases have been known where they were equal to new after 10,000 miles use. When phosphor bronze or softer metal is used for the main shaft bearings the pulley side bearing has to stand a specially severe strain, in most cases needlessly so, because the belt not being in good condition has to be run very tight; hence this bearing tends to wear oval rapidly, and the worst result of this is the main shaft being pulled askew. There seems an excellent opening for a really good design of ball bearing of large diameter to take this pull of the driving belt, and thus save the shaft bearing considerably. The question as to the liability of steel bearings seizing or suddenly binding has often been advanced as a reason for the somewhat limited use of steel; but, after all, if the bearing and shaft are properly designed, and both surfaces hardened, and the lubrication attended to, the risk is a very small one indeed.

WANT OF LUBRICATION WILL DESTROY A BRONZE BEARING, although it will not seriously affect the shaft. Of course, if a rider cleans out the crank case of his motor with paraffin, and then forgets to thoroughly relubricate with the standard oil, a seized shaft is not an improbable occurrence: when this happens the repair man has a task to get the crank case apart from the shaft that he is not likely to forget. When a new steel bearing has to be fitted, great care is necessary to see that the "fit" on the shaft is not too good: it must be a shade easier than a bronze bush. Looseness in the bearings of a high speed motor is responsible for most of the mysterious noises that worry the novice. For instance, when the connecting rod bearings have considerable play the bottom end may strike the lower part of the crank case, unless there is considerable clearance, likewise the rod may knock against the inner wall of the piston as it rocks from side to side. This fault can generally be detected by the appearance of a bright mark on the rod and piston where it touches the crank case or piston. A small amount of end play of the shaft, say 1-16th of an inch, is permissible: this rather helps in efficiently lubricating the bearings. All bearings should be provided with suitable oil holes and channels, so that the oil can enter and become distributed along the shaft.

SATURDAY, NOVEMBER 14th.

Will you please impress this date upon your memory? It is the date of "THE MOTOR" Light Car Run round London

HINTS AND WRINKLES.

The Composition Used in Semi-liquid Accumulators.

Enquiries are continually reaching us as to what the material consists of that is used for filling ignition accumulators of the semi-liquid type. To avoid having to repeat this reply so often we might mention that the composition is silicate of soda one part to dilute sulphuric acid of 1.170 sp. gravity three parts. It is as well to remember that this composition reduces the capacity of the accumulator by one-fourth or more.

Gashes in Outer Covers.

The life of a tyre largely depends on keeping out the wet and mud which are bound to work through to the fabric if cuts and gashes are not immediately sealed up. It requires care to do this: the gash must be cleaned first with naphtha or petrol, and any trace of mud removed: a small quantity of one of the various plastic rubber compositions sold is then pressed into the gash, the cut having previously been solutioned. The repair should be allowed to stand for some hours before use.

Why Exhaust Valves Break.

It is really surprising how long a time some exhaust valves will last; indeed 3,000 miles is not by any means an unusual distance: other valves have a very short life and the heads pull off in 150 miles or so. As a rule it will be found that the stem has simply got completely burnt through, and the broken parts of the stem show that they have lost all their metallic nature; this burning up of the valve stem results from throttling of the exhaust gases due to bad design of the exhaust port and silencer: when the exhaust has a clear passage the head and stem will not attain a higher temperature than just a dull red, whilst if the exhaust is throttled it will reach a bright red heat and burn the carbon out of the steel. It is interesting to know that a cast iron head works better than a steel one, although they are not often made.

A Good Hint about a Make and Break Contact.

Many riders, for some reason or other, dispense with a cover over the contact breaker, in some cases doubtless because it is then a simpler and quicker matter to make an adjustment. This fact of leaving the cover off resulted in the writer having a curious experience in the way of his motor misfiring on a recent run. Suddenly the motor would cease exploding altogether for a dozen yards and then, as suddenly, start again; this occurred several times in a dozen miles or so. An investigation showed that the cause of the stopping was a particle of grit that had got in between the platins and prevented them making contact. It was only necessary to slip in between the platins a visiting card and clear them to effect a complete remedy. A lot of oil gets about the contact breaker as a rule and, if the cover is off, a considerable amount of grit adheres. The moral is to keep the cover on and keep out the dust and mud.

A Tip about Fitting a Piston Ring.

When it becomes necessary to have to replace a damaged piston ring it is most important to observe that the new ring it is intended to fit has perfectly free movement in the slot in the piston. The exact meaning is that there should be about the 200th part of an inch difference between the width of the new ring and the slot in the piston—that is, the ring is so much smaller. If it is a tight fit the ring will not perform its function properly or will not be free to expand and accommodate itself to the walls of the cylinder. On the other hand, if it is an easy fit in the piston slot, a loss of compression is almost sure to result, as the high pressure gases will find their way behind the ring

and get out at the slot. If it be found that a ring is too tight a fit it can be eased down by the following method:—Obtain a new sheet of "double F" emery cloth, then get a perfectly flat piece of board—if not flat, have it touched up with a plane. Pin the emery cloth down on it, and take the ring and lay it flat on the emery. Put a considerable pressure on it, and work it across the surface with the fingers. A touch of oil will facilitate the grinding down. This process must be most carefully done, and the ring tried every now and again in the slot. Before the ring is finally put in the slot it must be thoroughly cleaned from emery, as this would have a destructive action on the walls of the cylinder.

WHY MOTE
'DOMINION OF THE
AIR'
EMPYREAN AIRSHIP
COMPANY LTD.
NO TAXATION
NO LEGISLATION
NO POLICE TRAPS
10000 BALLOONS
IN STOCK
INFLATION FREE
DEPOSITS
RECEIVED
SYDNEY
PRICE LIST



WILL IT COME TO THIS?

AN INTERESTING PERIOD IN THE LIFE OF A MOTOR.

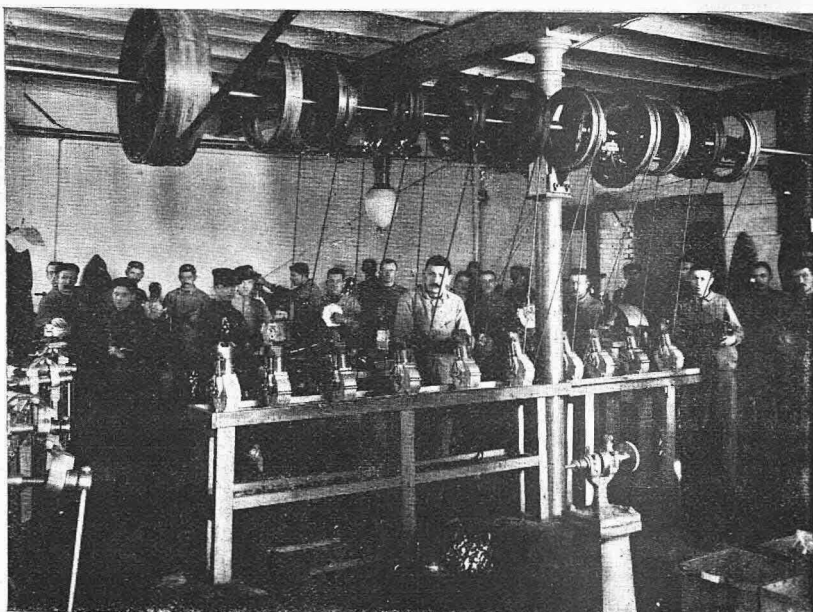
A bicycle can be made, its various parts passing through thousands of operations, and the whole of them can be brought together or "assembled" and there will be no need for any sort of testing. That is to say, no attempt is made to try the machine on the road. But not so the motor. So many minute variations of adjustment, the presence of some small protuberance may affect the power of the engine, that each one directly it is assembled passes through a series of testing operations, and as these constitute one of the most interesting phases in the life of a motor, we have taken an opportunity to gather, for the benefit of our readers, particulars of the operations conducted at Antwerp in connection with Minerva motors, because, in a case like this, where the output of engines is enormous, it is obvious that the testing arrangements can be very complete, and be conducted upon the best principles. The two illustrations accompanying these notes show the two processes. The

first illustration shows a portion of one of the assembling rooms at the moment at which a batch of motors just finished are ready for the first operation, which consists of running-in the engines by means of outside power, from the shafting overhead by means of small belts to the engine pulleys. In this manner the motors are run continuously for hours, thus ensuring that all the moving parts are working to perfection. During this operation the timing of the valves is carefully attended to, and a most important matter is the lubrication during the whole of the running.

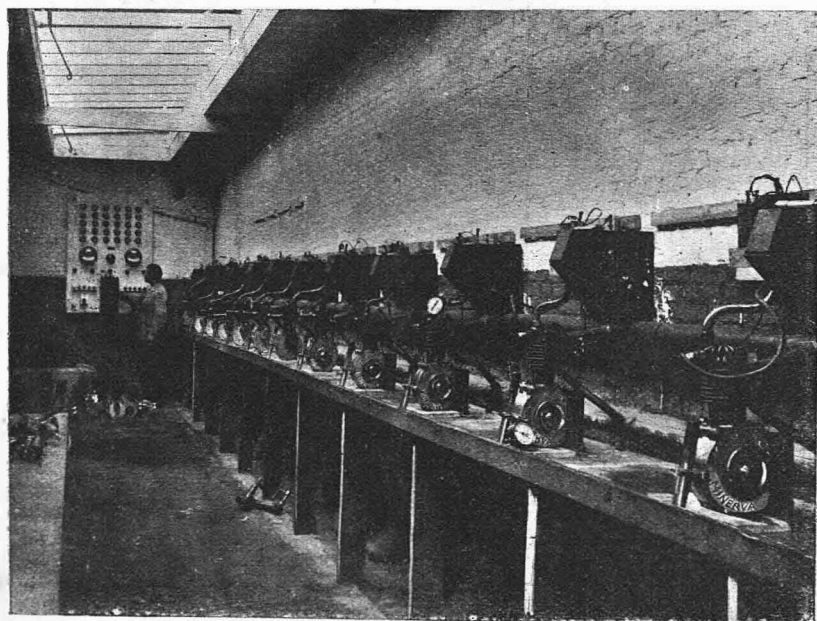
For the second test the motors are taken down from this bench and sent to the testing room proper, a view of which is given in the second photo. The engines here are again mounted, but on a wider bench, preparatory to being put under their own power. It will be noticed in the illustration that surface carburetters are in use. These are now replaced by the Minerva Longuemare—the new float-feed carburetter now supplied with these motors. The connections between the engine and carburetter, also the main

exhaust pipe, are by metal flexible tubing. The main exhaust pipe will be seen at the back of the bench, and its purpose is to carry the exhaust gases out of the building, thus keeping the atmosphere of the shop clear. Immediately above the exhaust pipe will be noticed a large diameter conduit, which is for the purpose of air-cooling the motor whilst the second test is in operation. A blast of air is driven through the pipe by means of a centrifugal fan which is worked by a water-cooled petrol motor, the air being directed against the motors through funnel-shaped tubes, which are fixed at regular intervals in the main air supply. This arrangement can be clearly seen by referring to the second engine on the right.

In order to start the engine, a shaft is fitted underneath the whole length of the bench, and is driven by the same engine which operates the centrifugal fan. Along the length of this shaft, pulleys having a clutch attachment are fixed



Motors ready for the first test.



Motors going through the electrical test.

at intervals immediately under each motor. The shaft is put in action and the motors commence to fire. The belt is then removed and the engines run under their own power for a considerable time, so as to ascertain that every part is in perfect order.

The third test consists of a thorough examination of the motors. They are removed from the bench and taken to pieces, when each part is subjected to minute examination by the most skilled mechanics in the factory. This is done to ensure that the piston is a perfect fit, that no flaws exist, and that the castings are sound, also to see that the cylinder is exempt from porosities, often invisible to the naked eye.

The engines, when once more fitted together, are ready for the fourth test, which is known as the compression test. The sparking plug is removed and a pressure gauge is fixed in position. The dial of this gauge is marked by a red line, which is the minimum compression of a perfect motor. The pulley of the motor is revolved by hand, and unless the indicator reaches the red line the motor is rejected.

The fifth and last test is the "electrical test," and is the most conclusive one for high speed motors. Each motor is treated separately, being placed at the end of the bench facing the test board, and coupled to a dynamo machine, the efficiency of which has been carefully established. To first set the motor in motion it is connected by a belt to the dynamo and an electric current is switched on to the dynamo, which, for the time being, runs as an electric motor. Immediately the engine begins to fire the current is switched off, so that now the motor begins to drive the dynamo. The speed of

the motor is gradually increased by the advance spawl lever. When the maximum speed is reached, the electric current produced is switched on to a number of 32 c.p. lamps of 110 volts each. The lamps are seen in the second illustration on the resistance board at the far end of the bench.

Every motor has to light a certain number of these lamps according to its size, and unless it performs its task well it is returned to the workshop and specially marked for further rigorous testing before it is allowed to begin its promenade through the world.

THE WEIGHT OF MOTORCYCLES.

It is somewhat remarkable that practical motorcyclists do not more persistently ventilate in the Press their desire for lighter machines than the standards set by the English makers, whilst still retaining the larger engines that have become so popular. That it is possible to produce light machines without sacrifice of adequate strength is proved by the fact that French models are much lighter than English models, taken power for power. The reason apparently is that English manufacturers, most of whom do not make their own, are handicapped by the limited market they have in which to buy their engines. There are very few makers who can turn out engines in wholesale quantities, and for the most part their models were originally intended for motor-tricycles; weight for such a purpose not being a factor of essential importance. Some of these engines are of excellent workmanship, no doubt, but not being designed for the motor-bicycle, are much heavier than there is any occasion for. The consequence is that the motorcycle manufacturer has to submit to this disadvantage, and

IS COMPELLED TO MAKE HIS FRAMES HEAVIER

to carry these engines than if he could buy others more nearly approaching his ideal. The finished cycle has, therefore, to bear excess of weight in two important parts without the least corresponding advantage, and the engine has to spend a considerable portion of its power in propelling this dead weight along the roads. The more hilly the district traversed, the more noticeable does this become, and it is often the case that a light 2 h.p. machine of, say, 90 to 100lbs., will climb a hill faster than the usual English standard 2½ h.p. machine, which weighs about 170lbs.

The leading French makers have not been handicapped in the matter of engines, as, for the most part, they build their own; and, as they have originated rather than adapted, their productions have been specially designed for the purpose for which they are used. Consequently, their engines being lighter, their cycles can be, and are, lighter. That they are strong enough is shown by the way they get through long distance competitions, that try to the utmost

the powers of even the largest cars. Such routes as Paris-Vienna, Paris-Madrid, Milan-Genoa, Circuit des Ardennes, could not be so successfully accomplished if the machine engaged were not constructionally strong enough to stand the severest tests. It almost appears that the motorcyclist has so many desires that he fears to put them all forward at once; so this season he has been contented to ask for increased horse-power from the makers—and he has got it.

NEXT SEASON HE MAY GIVE HIS ATTENTION TO REDUCTION IN WEIGHT,

and it will then be seen how far English makers can cater for him. Of course, it is a truism that a great deal more mechanical skill and knowledge are required to build light machines as strong as, or stronger than heavy ones; but it can be, and is being, done by the leading French makers. It will cost English manufacturers time and money in experimenting in this direction before they can guarantee the same reliability at the reduced weights as their French competitors, who, being in the field earlier, have got through their experiments before the English makers entered the lists.

The importance of the subject can be more readily gauged by frequenting motorcycle circles. It will be found that many an owner of a 2½ h.p. machine is highly satisfied with its speed and power, but bewails its unhandiness consequent on excessive weight. This fault—for fault it is—is accentuated when the engine is mounted high on the frame, as the machine then becomes absolutely top heavy; and many a one is damaged through over-balancing from this cause when being carelessly wheeled along. Again, in the case of a side-slip, the rider can often check a light machine and avoid a fall which he would find impossible to do on the heavier machine. So long as motorcycles of, say, 2½ h.p. weighing about 120lbs., of tested merits and with good names to them, can be bought, it is strange that riders are content to accept 170lbs. and upwards as a standard. The question of weight reductions will, in the near future, become a burning one, and the sooner it is brought to the front the better for the popularity of the motorcycle and, consequently, the industry in general.

H.T.A

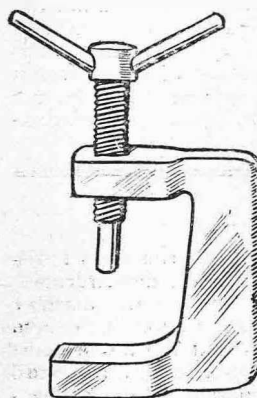


Military motor cycling despatch bearer of the United States Army.

SOME INTERESTING NEW THINGS.

The "Hercules" Belt Punch.

Messrs. Collier and Sons, Herbert Road, Plumstead, have recently introduced the useful little tool illustrated. It is a screw cutter or punch for making the hole to take the fastener of a motorcycle belt. It is very strongly made in tempered steel, nickel plated.



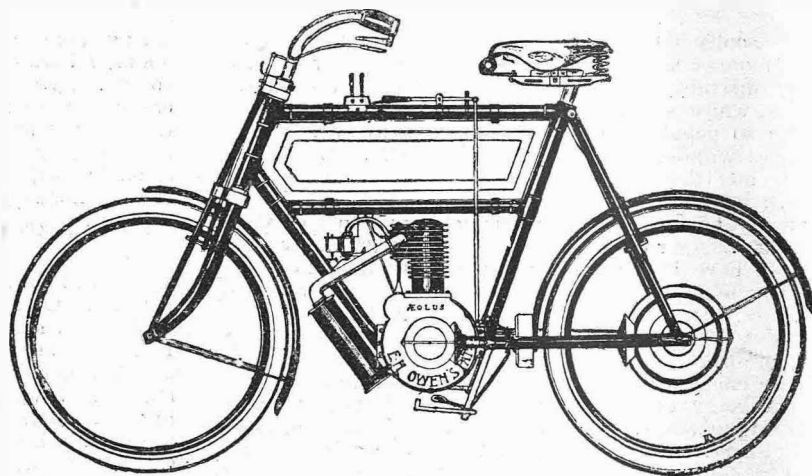
A neat rubber terminal protector to prevent corrosion, nuts shaking off, short circuiting, etc., has recently been introduced by M. Smith, 11, St. Mary's Street, St. Paul's Street, Islington, London. It is made in two colours, red and black, for the negative and positive terminals of accumulators.

It is probable that tyres for next season will have a protecting flap in the cover "a la Clincher." A great deal of the trouble experienced with motor tyres this season has been caused by the air tube blowing through the seam between the two edges of the cover. The tubes will find a way through the most minute opening owing to the great air pressure. Some such means of making the air tube absolutely secure is an absolute necessity, as the tyres of motorcars and cycles have to withstand so much extra pressure.

The Æolus Gear-driven Motor-Bicycle.

The principal points of interest in this machine are the novel means by which the transmission of the power is effected. The engine, which rotates in the same direction as the line of travel, is securely bolted in a vertical position to the frame. Upon an extension of the engine crankshaft is a bevel-wheel, at right angles to which is

fitted on the propeller shaft, operated by the hand lever in starting, and the speed is usually controlled by the foot pedal, providing a free engine for traffic, descending hills, etc. The transmission is thus direct to the road wheel with no appreciable loss of power, far less than by ordinary methods. Footrests are provided, enhancing the rider's comfort, but if desired, ordinary pedals and chain can be had in-



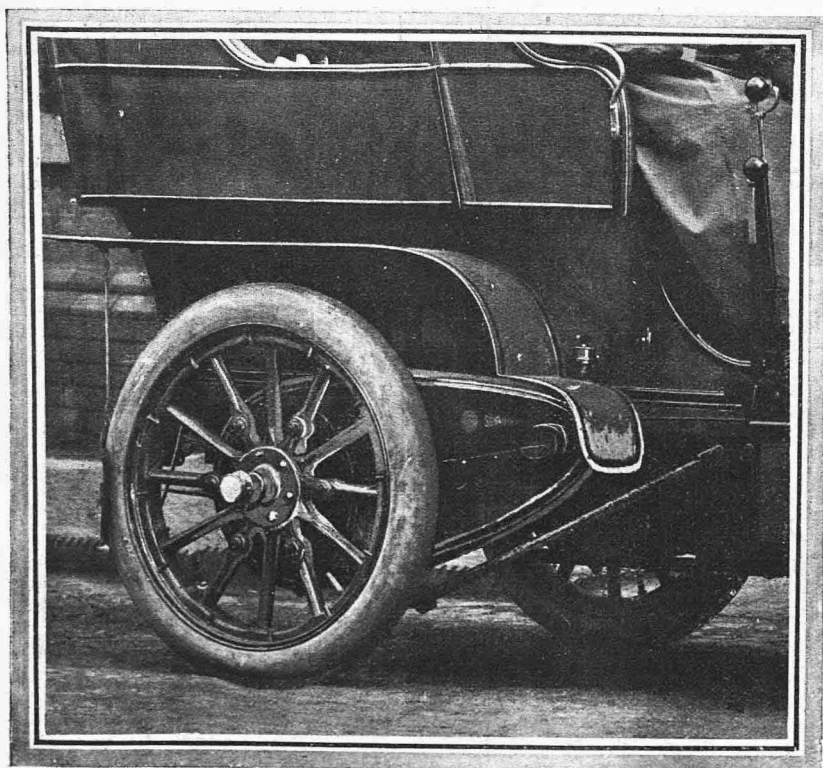
The Æolus Motor-Bicycle.

fitted a light shaft having at either end bevel-wheels in constant mesh with that on the crankshaft and a toothed wheel fixed to the hub of the rear road wheel. All these wheels are entirely encased and run in grease. A special form of clutch is

stead. The engine is of the company's latest type with extra strong crankshaft; and the valves, which are mechanically-operated, are placed across the front of the motor, instead of at the side as usual, consequently receiving a full current of air for cooling. The cylinder and head are a single casting. A spray carburettor of special design is fitted; and the ignition is by means of brush contact with accumulator and trembler coil. Silencing is effectively provided for by the use of a large exhaust box. The makers are the Motor Transport Co., 72, Comeragh Road, London, W.

Sunbeam Motorcar Chain Case.

The long experience which Messrs. Marston, Ltd., Wolverhampton, have had in the construction of gear cases for ordinary cycles has enabled them to overcome the difficulties encountered in fitting a metal gear case to the driving chains of a motorcar. The illustration shows the rear part of a Sunbeam four-cylinder car with the cases attached, and this is the identical car that did so well in the recent 1,000 miles' trials. The gear case in addition to being an oil bath is also arranged to allow for the up and down movement of the car springs and for the twist when running over uneven roads. Provision has also been made to allow of the chains being adjusted. There is no doubt that with the chains running in an oil-tight gear case a considerable gain in power must result due to the lessened friction, whilst the life of the chain is also greatly increased and periodical cleaning is unnecessary. Messrs. Marston have also brought out a patent gear case and internal brake which they hope to be able to supply shortly, and also grant licenses for manufacture to the trade. For winter riding a protection for the chains of a car is invaluable.



The Sunbeam Gear Case.



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

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OPINION

"The Motor" Light Car Run Round London.

We are glad to be able to announce that the forthcoming event promises not only to be a complete success, but to be memorable in the annals of the light car. We feel so assured that, whether the day be wet or fine, the competing cars will render a good account of themselves and gain so many friends that we are pushing ahead with the organisation of the Run, and are content to patiently wait until the public have witnessed the event before we go into the details of the curious undercurrent of opposition which we have disturbed. Further entries have been received, and by the time the closing day is reached we anticipate that some thirty-five light cars will be entered, a number of them being the new models and, consequently, of especial interest. We are pleased to be able to record the fact that the Automobile Club, whose prerogative it undoubtedly is to promote such events as these, has given us its cordial approval of the Run, and has granted us a license to run the event under its rules, and some of its officials have volunteered their services in connection with it. We appreciate these courtesies as we appreciate the deep interest which the Club is taking in the light car movement. The Club realises as well as we do that the popular-priced car and its votaries are going to constitute the backbone of the pastime, and it intends to do everything in its power to foster the movement. We believe that we are right in saying that, from the Club point of view, 1904 will be a "Light Car year." This shows how rapidly the face of automobilism has changed in the two years (or less) since this journal was established, and it also shows that we made no mistake when we extended our scope so as to cover the whole field of "motoring for men of moderate means." Our Run round London will prove to be not only the event which celebrates the independence of the light car, but will attract the attention of thousands to whom it never before occurred that motoring was otherwise than something quite beyond their means.

The Forthcoming Shows.

Next week the first Show special of "THE MOTOR" makes its appearance, heralding the very near approach of the two great London Shows—the Stanley, at the Agricultural Hall; and the National, at the Crystal Palace. From the motorists' point of view, it is safe to say that both shows may be expected to provide great object lessons of the general advancement in motor improvements since last year. Motorcycles

are certain to be exhibited in good numbers at the Agricultural Hall, but there being a restriction as to the number of other motor vehicles allowable to be exhibited there, cars will not be so numerous as at the Crystal Palace, where we may expect to see a good assortment of both cycles and the lighter forms of motorcars. In the latter direction we shall be greatly surprised if the light and moderately-priced vehicle is not in the ascendant, as everything points to 1904 being a light car year. All our experience indicates the great interest that is being evinced by the public in what may be described as the popularising of the movement, and, judging by our inquiry bureau, thousands of men of moderate means are on the qui vive for the moderately-priced, handy and reliable type of car. To prospective and potential motorists, therefore, the Shows of 1903-4 will be expected to open another chapter in the history of this wonderful new movement.

Applying the New Act.

During the past week we received from the Secretary to the Local Government Board a copy of the draft regulations which the L.G.B. is framing under the Motor Cars Act. The draft reached us in our private capacity and, as it was sent in confidence, we are precluded from referring in detail to any of the provisions. The proposals are being submitted to the various automobile associations, and criticisms and suggestions were asked for by Monday of the current week. The Motorcycle Trades Association met on Friday to discuss the proposals, whilst the Auto Cycle Club met early on Monday afternoon, and, in order that there should be unanimity of opinion between these two bodies, one of the members of the A.C.C. was invited to attend and take part in the Trade Association's discussion. Whatever may be the motives of the L.G.B., there is this to be said, that whereas the Motor Cars Act goes quite far enough, the draft regulations do not relax, in a single item, the stringency of the Act, but, instead, go even farther than was contemplated by Parliament. Moreover, in the matter of narrow roads, there is a complete reversal of principle. But we believe that the regulations have been drafted on the most extreme basis, and the Board are anxious to get full criticisms of them, and will then modify the regulations according to the extent to which pressure can be brought. Needless to say, automobilists intend to bring the utmost pressure to bear upon the L.G.B., and to point out the right and proper course that has to be pursued. We believe that if the regulations were put into force in their present form, motorists would rise in revolt. Motorcyclists may rely upon it that their interests are being well looked after—and here let us hint at a development: either the quad must be thrown overboard or motorcyclists must put up with the stipulations which will be imposed upon motor vehicles generally. A few weeks ago a contemporary criticised us severely because we urged the advisability of abandoning the quad, and because we pointed out the danger of even reminding the L.G.B. that such a close connecting link between the car and the cycle existed. Were those people in such close touch with affairs as we are ourselves, and could they have heard the remark made to us the other day by an official in high position, they would wish either that they had remained quiet on the matter or that they could withdraw their remarks. We shall come back to this point later on when the matter has been settled, and the motorcyclist has (as we hope will be the case) been extricated from the extremely awkward position in which the L.G.B. has seen fit to tentatively place him.

"The Motor" Light Car Run Round London.

This event is fixed for Saturday, November 14th, and further details of the scheme will be found on another page in this issue. Every reader of "THE MOTOR" will be interested in this run exclusively devoted to light popular-priced vehicles. Bear the date in mind.

SATURDAY, November 14th.

NEWS.

"THE MOTOR" Show Specials.

First Show Special appears next Tuesday. The Light Car Run round London takes place on Saturday, November 14th.

America has as yet made no move in the matter of next year's Gordon-Bennett race.

Mr. D. Elyard Brown has promised to read a paper on "The Care of Accumulators" at the Automobile Club.

An annual tax of £1 on motorcars and 2s. 6d. on bicycles has just been imposed by the revenue authorities of Guernsey.

American road-experts admit that most of their roads, costing the ratepayers from £1,600 to £2,000 a mile, are anything but durable.

The proposed clause exempting motor-cycles from the rear-lamp regulation in America will, it is thought, be approved by the authorities.

A Bohemian innkeeper utilises his 44 h.p. motorcycle in spare hours to bottle beer. One barrel, which formerly occupied a whole day, can now be bottled off in two hours.

The deferred speed trials at Dourdan, originally postponed to Thursday last (October 29th), have been postponed again—this time definitely—till Thursday, November 5th.

Barney Oldfield, America's automobile "Tod Sloan," was beaten recently in a five mile race by Louis Nueneman in a 40 h.p. Darracq. Oldfield was driving a 40 h.p. Bullet III.

The "Daily News" points out that cars every whit as good as and perhaps better than the French are being built in this country; and that although France got a good start of us in making automobiles owing to our stupid laws, the British trade is going rapidly ahead, and in a few years we shall be able to supply the demand for motorcars with a home-made product.

Tuesday, December 1st, is the date of the first annual dinner of the Auto-Cycle Club: the Automobile Club is lending its new committee room for the purpose: dinner tickets, 6s. (wine extra). After-dinner arrangements:—Paper on "Improvements Desirable in the Motorcycle," by Mr. Mervyn O'Gorman; lantern display on "Motorcycling Subjects" by Mr. J. van Hooydonk; followed by discussion on Mr. O'Gorman's paper.

The Begbie Manufacturing Co., Willesden Junction, London, W., inform us that they are removing to more central premises at 407, Oxford Street, London, W. They will have on view the latest types of "Aster" engine and spare parts for same. The new Thermo-syphon Begbie-Audin radiator, Aster three-speed and reverse gears will be shown. The company have taken the sole agency in London for the Coventry Motor Fittings Company's Automatic Pressure Feed Lubricator.

Coming Events.

Nov. 5. Paper at Automobile Club on "Heavy Motor Traffic," by Mr. E. Shrapnell Smith.

" 12. Paper at A.C. on "The Limitation of Cylinder Capacity," by Mr. C. W. S. Crawley.

" 14. "THE MOTOR" Light Car run round London, particulars of which appear elsewhere.

" 20 to 28. Stanley Show of Cycles and Motorcycles, Agricultural Hall, Islington.

" 20 to 28. National Cycle and Motor Show, Crystal Palace.

Thirty-nine motorcars and 54 motor-bicycles were observed to pass through Redhill on the Brighton Road between nine and one on the morning of Sunday, October 18th: during the same hours 34 cars and 34 motor-bicycles passed through Reigate.

Mr. Plowden's decision at the Marylebone Police Court recently, that a motorcar may be allowed to stand outside a house whilst its owner is inside paying a call, is the only commonsense decision which could possibly have been arrived at, although it seems to have astonished the prosecuting parties.

To mark the occasion of the forthcoming marriage of Mr. Frank Lanchester, the well-known motorist and motorcar manufacturer, the Midland Automobile Club have decided to present him with a wedding present. Subscriptions—limited to 5s. per member—may be sent to the hon. sec. of the Midland A.C.

"Hints and Wrinkles."

It will be procurable gratis at "THE MOTOR" stand at the forthcoming show.

Frank Gardner, of the Gardner-Serpoller Motor Manufacturing Company, is designing motor launches.

The 25 kilometres (15 miles) motorcycle championship of Austria has been won at Prague by V. Vondrick on a "Laurin and Kleiner" motor-bicycle.

In New Orleans, Louisiana, motorcars have to carry a number plate with figures six inches high, and four lamps—three white and one red.

Prince Henry of Prussia has inspected the proposed Gordon-Bennett route round Homburg, and is reported to have expressed his admiration in the words, "it is as flat as a bowling green."

A young French inventor, Mons. Lafferie, claims to have discovered a practical method of brazing aluminium. "Le Monde Sportif" has organised a series of expert trials of the method, to be followed by public exhibitions. The first trial was announced to take place last Friday, October 30th.

Some exceptional bargains in motor-bicycles, tricycles, quads and cars are for sale by private treaty at the premises of the Central Motor Company, 124, Euston Road, N.W. A 4½ h.p. water-cooled quad which cost £145 this year looks particularly cheap at £50. There are several good cars from £50 upwards. Photographs and particulars are sent to applicants post free.



Mr. L. Whately, the winner of the recent Bath hill-climbing contest, on his Excelsior Motor-Bicycle.

The Clement-Garrard Co. have been carrying out extensive experiments at their works in France and Birmingham to decide as to the improvements to be introduced in their motors for 1904. They have definitely fixed on the adoption of water-cooling for all motors exceeding a bore of 70 mm. Beehive pattern radiators will be used. The featherweight $1\frac{1}{4}$ h.p. motor will be a strong line, and many minor detail improvements will be adopted. The bearings fitted will be of great durability.

Volunteer Cyclists.

INTERESTING EXPERIMENT TO BE TRIED IN FRANCE.

In no other country is the soldier cyclist so highly prized as in France; and it is from long and careful testing of his powers that the French authorities give the matter so much attention. Commandant Gerard, who is mainly responsible for this development, has deeply studied the subject for years, and has invented the well-known Gerard folding bicycle, which is most suitable for military work. He takes an important part also in the new plan which is about to be given a trial by the French Army. This consists in forming territorial brigades of soldier cyclists all over the country. At first the experiment will be tried with volunteer cyclists, who will be specially trained in the military uses of the bicycle. Their local topographical knowledge will be further improved, and thus in time they will become invaluable as scouts, guides and sharpshooters. Over the large area which each territorial brigade can work, every road and passage will be thoroughly explored by the men until they have a minute knowledge of the entire region. Their rapidity and ease of mobilisation, the speed with which they can move from point to point, and the few incumbrances which such bodies need possess in the way of commissariat will, when coupled with their minute acquaintance with the locality, render them a very useful body. It is highly probable that if these experiments with the volunteer corps succeed, the formation of regular brigades of military cyclists will be started in each district, and in a short time they will no doubt become a very important arm of the service. In England military cycling has only been tested in a half-hearted fashion hitherto. The present example of France might well be followed. Clubs of cyclists in each county or district could be formed and trained in scouting and other duties which can well be performed by soldier cyclists. The lessons would be very quickly acquired, and the experience would be found most interesting by riders who do not care to join the regular regiments of volunteers. Special cycling corps should be established with the primary object of forming, not a highly trained military body, but rather a brigade of irregulars who would be the nucleus of other and more ambitious organisations. The general mass of good cyclists must first be interested and experimented with, and from their ranks might be picked brigades of strong riders, good scouts, and fair marksmen, who within their own territory would have an intimate knowledge of the country, its highways and by-ways. In any European warfare it is quite certain that the bicycle could be utilised to a considerable extent, and it is most important that the British Army be not wholly deficient in soldier cyclists.

We learn that a 4 h.p. water-cooled tri-car, and a 6 h.p. light car are being manufactured from original designs at works recently opened by the R. and L. Motor Engineering Co., Verulam Street, Gray's Inn Road, W.C.

Clipper Tyres.

The Clipper Pneumatic Tyre Company will in a few weeks be able to supply Clipper Continental motorcycle tyres. These will have a most effective non-slipping pattern and can be fitted to the same rims as those supplied for Clipper motorcycle tyres. The new tyre will be of the same high quality as Continental motorcycle tyres, at present very extensively used on the Continent. These tyres are similar in construction to the heavy car tyres on which the Gordon-Bennett race was won, on which the Hon. C. S. Rolls broke the world's record for one kilometre in 26½ seconds, and on which Captain Deasy made his remarkable ascent of the Rochers de Nave.

A Marvellous Motorcycle.

One generally expects to find something sensational in the columns of the half-penny Press, but as a choice specimen of clap-trap the following culled from the "Evening News" would be difficult to beat. The paragraph is headed "Bullet-proof War Cycles" and says:—"The German War Department has given instructions for the manufacture of 100 motorcycles of a peculiar character for scouting purposes. The wheels are protected by a covering of steel sufficiently strong to stop the ordinary rifle bullet. The motive power is to be a small battery capable of carrying the machine 100 miles without recharging. The cycles are to be attached to a corps numbering 500 men, with six machine guns." Here then we have what thousands of people are waiting for. The idea of a small battery storing a vast amount of electrical power is delightful. The best that has been done up to this discovery is a battery scaling about 1½ tons. Edison will assuredly now have to look to his laurels. The pity is that so many people believe such stuff as the above, and immediately worry the motor papers as to where such machines can be obtained, and full details as to price. We have only to say that the millennium is not yet!

The Midland Automobile Club.

The above club has recently arranged for permanent premises at Room No. 4, Grand Hotel, Birmingham. This room will be open to members at any time according to the hours of the hotel. A lock-up garage for a dozen cars with special stairway has also been arranged for.

Fore-carriages for Winter Riding.

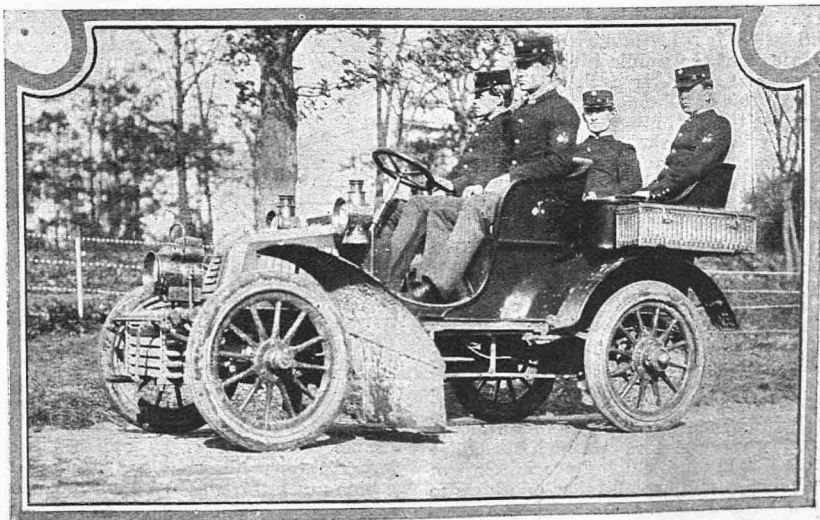
Werner Motors, Ltd., have a number of 3½ h.p. machines in stock to which they are prepared to fit fore-carriages with wicker cane or coach-built bodies. They hold the opinion that the three-wheeler is the most suitable vehicle for winter riding by reason of its greater stability on greasy roads than the single tracker. For a single rider the carriage portion of the machine can be readily taken away from the frame.

A Motor Fire Engine.

Hartford City (Connecticut, U.S.A.) has been running a big automobile fire engine for several months which has amply demonstrated its utility for the purpose. It cost £1,760, and weighs nine tons when fully equipped for the road. The motive power is steam, and it carries a 100-gallon water tank. The engine develops 125 h.p. with a speed of 25 miles an hour. The car is driven and worked by a crew of six men. Its average monthly upkeep is £5 10s. a month, as compared with £12 10s. for a similar car drawn by horses.

Practical Suggestions of a Stipendiary.

The Stipendiary of Manchester in dealing with a case of furious driving in Withington expressed the opinion that motors ought not to travel any faster than the ordinary traffic when passing through a village. If the stipendiary will provide the worried motorist with clear definitions of "ordinary traffic speed" and "a village," his suggestion will doubtless be attended to: failing that, at what pace is the bewildered motorist to travel? The village of Withington, it may be noted, is a flourishing and populous suburb some five miles from the centre of Manchester; its ordinary traffic includes electric cars, hansoms, four-wheelers, private carriages, tradesmen's carts, drays, lorries, pantechinons, and bicycles—rather a wide diversity of speed to choose from.



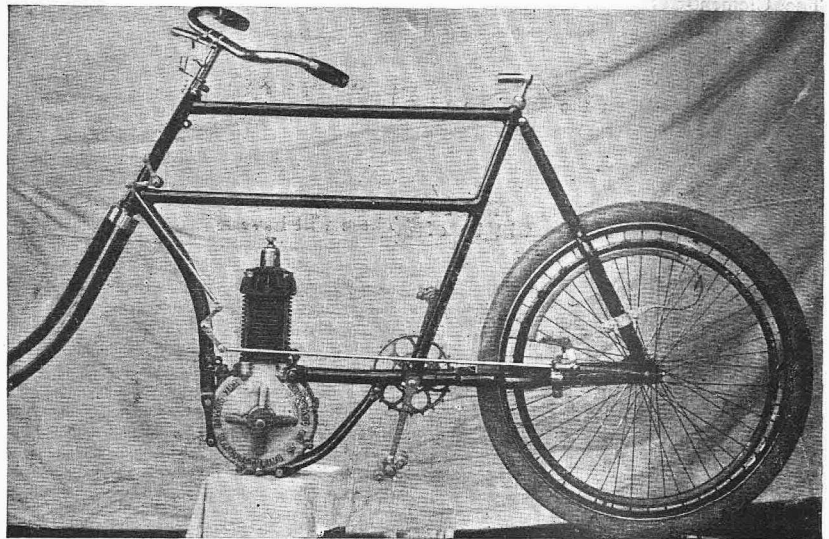
Motorcar used by officers of the United States Army.

Fully Appreciated.

"The lessons which we have learned to accept from European trials and European cars, combined with the chastening influence of our bad roads, have pushed American builders ahead," says "New York Automobile," "at double-quick step to produce vehicles in which simplicity, economy and efficiency are united in a degree not yet fully appreciated by the world at large, or by ourselves." That American manufacturers are recovering a good deal of leeway we do not doubt, and we congratulate them and the cause of motordom on the fact; but a careful study of the leading American motor journals and magazines for the last few months has not irresistibly impelled us to the conclusion that Cousin Jonathan does not fully appreciate the fact.

To Persecute or to Prevent?

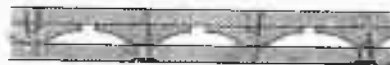
In a furious driving case which came before the Reigate County Bench lately the defendant—a motorcyclist—assayed to establish his innocence by what we think a not altogether worthless argument, namely, that several cyclists had overtaken him just before he was stopped, and had ridden unchallenged past the very same constable. Two blacks, we know, do not make a white; and it is no good excuse for a bona fide furious driver to plead the existence of a still more furious driver. But, in view of the difficulty of assessing the speed of a motorcycle—a difficulty which everyone who is not a policeman admits—it is not unreasonable to suppose that when your speed is manifestly slower than that of some other vehicle which is allowed to pass unchallenged, you are on the safe side of the law. This is, however, a minor point compared with that which we wish to comment on, and which was evoked by our motorcyclist's argument. The defendant alluded to above put a question to the constable who stopped him, a question which we think nine out of ten persons similarly situated would also have put, "Why did you not stop those cyclists just now?" The answer is not particularly instructive from the point of view of actual information, because every motorist knew it already, but it serves to show that the police have reached such a pitch of intolerance in their anti-motoring campaign that they no longer conceal their real object, which, of course, is to multiply convictions against the motorist, rather than to safeguard the public highway. "Oh! we are not out after cyclists!" was the reply of this enlightened constable, who—more, we think, through the instigation of his superiors than of his own stupidity—has formed so iniquitous a conception of his responsibility as a guardian of the public welfare. It is better that six scorching cyclists should be allowed to pass unchallenged, spreading danger and destruction in their path, than that one unregenerate motorcyclist should be allowed to slip through the meshes of the net. The question naturally arises whether, if this type of constable saw a pocket picked, or a house broken into, or, for the matter of that, a murder on his beat, he would consider it his duty to arrest the criminal if there happened to be a motorist about? Are there special days on which our police force is told off to catch a special class of malefactor, and are all other criminals to get off scot free on these privileged occasions? If not, how comes it that a policeman can make a statement like the above?



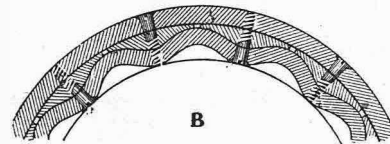
New expanding brake for motor-bicycles.

The "Watawata" Motorcycle Belt.

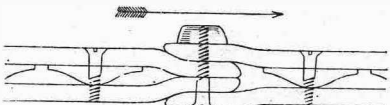
A motorcycle belt of the V pattern made on a new principle has been introduced by O. and W. Ormerod and Co., Railway Leather Works, Rochdale. The diagrams will give an idea of the construction of the belt. Instead of the belt being built up with a continuous middle layer separating pieces are provided at intervals which approach each other in passing round the pulley (diagram B). These separating pieces being shaped to the section of the pulley groove provide with the top and bottom layers the necessary contact surface. The makers claim that it gives greater efficiency of grip compared with



A



B



C

a solid belt, and a special feature is the pliability. The principle of construction relieves the belt from the strains arising from the buckling action on the underside of an ordinary solid V belt which in time disintegrates the leather causing it to lose its elasticity and grip. The method of fastening is also very simple, consisting of an ordinary screw passed through the ends and secured with a hide nut (diagram C). The joint passes as smoothly over the pulley as the rest of the belt. The leather is treated in such a way as to be quite waterproof.

A New Motorcycle Belt Rim Brake.

The Lion Cycle Co., London Road, South Lowestoft, have just introduced a new form of expanding brake for motorcycles. The illustration shows the construction fairly well. There is a shoe made of steel which embraces nearly a third of the circumference of the belt rim. This shoe is lined with leather or fibre and is put into action by means of a lever movement which can be operated by hand or foot. One end of the brake shoe is secured by a flat spring to a clip which grips one of the back stays. At the other end there is a lever movement which causes the shoe to expand and grip the belt rim. The makers claim that the brake has been thoroughly tested and will hold a fore-carriage with two heavy riders on the steepest hills with ease.

The Amende Honorable (?)

Mr. Robert Inglis, who achieved unwellcome notoriety last September by reason of a cowardly assault on the driver of a motorcar belonging to Mr. Weir, a member of the A.C.G.B.I. and of the Scottish A.C., has apologised. Mr. Inglis can hardly be said to have atoned for his conduct, since the apology was practically wrung from him by a threat of prosecution. It will be remembered that Lord and Lady Ailsa were guests in Mr. Weir's car at the time of the assault. Mr. Inglis, when he realised the absurdity of his conduct and the consequences which it might lead to, appears to have made a tardy apology to his lordship and Lady Ailsa, whilst plain Mr. Weir and the insignificant chauffeur, who was struck across the face with a whip, were left to look after themselves; a duty which, all motorists will now be glad to learn, they have successfully fulfilled. It may add a little to Mr. Inglis' well-merited mortification to know that the feeling against motorcars in his district has, in consequence of his conduct, been converted into an attitude of warm approval. Lord Ailsa, a prominent motorist, has been appointed chairman of a special committee formed to deal with the administration of the Motor Cars Act.

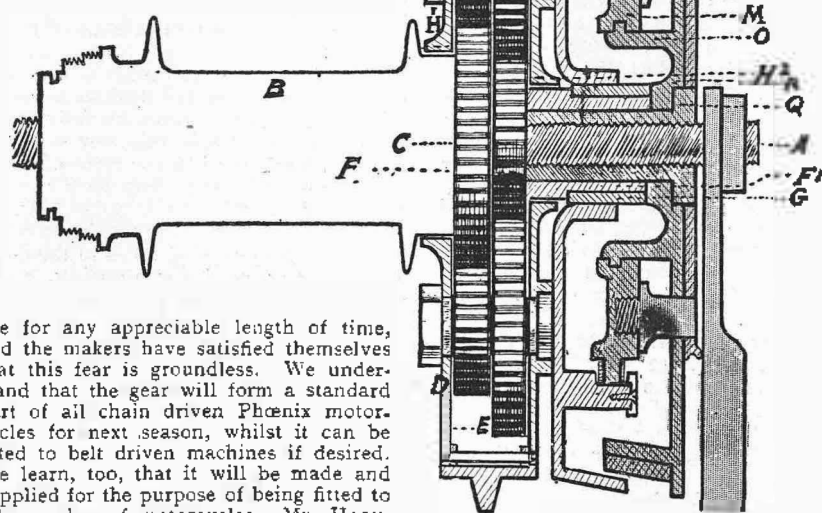
The Phoenix Two-speed Gear: a Notable Improvement.

As we have already remarked in this journal, directly a rider has gained confidence in his machine and in himself, he seeks companionship in the pursuit of his pastime. This has been all very well in its way, but it has introduced mechanical difficulties and, up to the present, the only acceptable method of overcoming them and enabling a two-seated vehicle to surmount all reasonable hills without entailing walking and pushing exercise on the part of the occupants has been the use of a high-powered engine giving a reserve of power for eventualities. But large engines are not always desirable and so the aim of motor engineers has been to retain the small engine and use a two-speed gear so that a lower gear ratio could be used for hill climbing. Mr. Hooydonk of the Phoenix Motors, Ltd., of Blundell Street, Caledonian Road, N., has for some time been experimenting with his two-speed gear, improving and lightening it until the company are now prepared to accept orders for it, and promise to have it on view at the forthcoming Stanley Show.

The device is illustrated in the accompanying drawing which gives a sectional view of the hub and gearing of the rear wheel of a motorcycle. We have for the sake of an easier understanding of the device shown the non-revolving portions of the mechanism in dark shading. These consist of the hub spindle A on which the sleeve Q is screwed. R is a fixed disc on the outer edge of which the cone clutch L is made a fixture, O is an internal boss on the disc R having a coarse-cut thread cut upon it to engage with a similar thread on the ring M. This ring has a number of arms carrying rollers M₁ which run in the groove K₁ of the internal cone clutch K, which now brings us to the revolving portions. B is the hub shell on to which is rigidly attached the 20-tooth pinion C. All the cog wheels are enclosed in the case H₁, H₂ on the outer periphery of which are the chain teeth I₁, which take the power from the engine. In place of these teeth a belt rim can be built up for a belt driven machine. The gear pinion C meshes with the 15-tooth pinions D, which in their turn are rigidly fixed to the 20-tooth pinions E. These latter then mesh with the central 24-tooth pinion F, which is carried on the sleeve F₁. The only other essential portion of the revolving mechanism is the feather G on the sleeve F₁. The clutch K has two fixed positions: it can be moved towards the left side of the hub where it engages by means of projections and slots with the gear box and it then locks, by means of the feather, the pinion sleeve F₁ to the gear box. This has the effect of preventing movement of the pinions and thus the whole of the gear revolves as a solid, and the high gear is in use. Clutch K can be moved to the right by means of the threaded ring M, which is capable of a very slight movement in this way: P is an outer disc with wires leading to the change gear lever on the top tube. By moving that lever P can be slightly revolved; it thus, through the studs N, revolves the ring M, and as this engages with O by means of the coarse-pitched thread already mentioned, P, N and M are made to move to the right and through the rollers running in the groove K₁ to move the clutch to the right,

the clutch, until it becomes held by the cone L, continuing to revolve against the rollers. When K is moved half way to the right it is freed from the gear box, and as it does not engage with the cone L the gear box is able to revolve round the hub, the pinions running idly the while. In this way the free engine is provided. When the clutch is moved to the extreme right it engages the cone L, and through the feather G and the sleeve F₁ the central pinion F is firmly held and then the pinions E are forced to revolve: these carry round the pinions D at the same speed, but, as they are so much smaller, their travel is small in proportion and, engaging with yet a larger pinion in the hub, the latter only travels at a reduced rate of speed, and so the low gear is provided. By only slightly engaging the clutch surfaces K and L, a certain amount of slip is provided which permits the engine to take up the load gradually. It will be seen that the mechanism is extremely simple, and that there is nothing to get out of order. The cog wheels are always in mesh and it is only at the point of engagement between the gear box and clutch ring that locking and unlocking takes place, and the projections for this purpose are made amply strong.

A series of experiments has been conducted in order to ascertain whether overheating is likely when the low gear is in



use for any appreciable length of time, and the makers have satisfied themselves that this fear is groundless. We understand that the gear will form a standard part of all chain driven Phoenix motorcycles for next season, whilst it can be fitted to belt driven machines if desired. We learn, too, that it will be made and supplied for the purpose of being fitted to other makes of motorcycles. Mr. Hooydonk tells us that he finds the low gear of as much use in traffic riding and negotiating awkward corners, such as a rising gradient behind a crawling vehicle, as it is for hill work. We believe that the Phoenix two-speed gear will add greatly to the pleasure of riding, making the motorcycle an even more efficient machine than it has hitherto been.

Sound Advice!

"... He should buy 'The Motor Manual,' 1s. 2d. post free, from Temple Press, Limited, Rosebery Avenue, E.C., and take in 'The Motor,' 1d. weekly." — Extract from a letter in the C.T.C. Gazette, November, 1903.

Nothing Equals Them!

The Quadrant New Specialities.

On Monday last we were afforded an opportunity of inspecting the 1904 specialities of the Quadrant Cycle Company. As the inspection was, however, of a confidential nature we must refrain from giving the whole details of the new features this week, although we hope to give an illustrated report of the same in our next issue. The leading novelties are:—A spring fork to the motor-bicycle, adjustable to the rider's weight, and a 5 h.p. tri-car having two engines each of 2½ h.p., which can be worked either together or separately. Double drive, three brakes. The vehicle is built on rather exceptional lines to carry two passengers. This combines the simplicity of the "Quadrant" motor-bicycle with the full power of a small car. It is certain to attract a considerable amount of attention at the forthcoming National Show.

A New Silencer.

The inventor of the "Stanley Silencer" claims that the adoption of his device does away with back pressure. Briefly, the idea consists of one or more tubes through which the exhaust gases circulate, being simultaneously broken up into small streams by a series of projecting studs on which they impinge; the arrangement of these studs is in the form of a spiral and they pass diametrically across the tube at convenient intervals. After passing from the exhaust pipe into one or more of these tubes, the gases are delivered into an expansion chamber from which they again pass into one or more of the studded tubes and thence escape to the outer air. An important point is that the gases are cooled during their circuitous passage through the tubes, and reach the external atmosphere at the normal temperature.

THE LIGHT CAR RUN ROUND LONDON.

Further Entries.—The Sanction of The Automobile Club.—How to See the Run.

It is obvious—or, should be—that, with so large a clientele of readers, we should be the last to organise an event if, on announcement, it proved to be unpopular either with the user or the seller; or if it were shown to us to be unnecessary or useless. But the reception accorded to our scheme has been so generally favourable and so palpably genuine that we have refused to be influenced by the self-interested opposition which has been directed at us from one quarter, and which resents the light car trade being afforded such publicity and such an advantageous opportunity of actual demonstration before the public. We have, by circular letter to the trade, given our view of this matter and, when the run is over, we shall place our readers in possession of the facts of the case.

Since penning our notes of last week we have received further entries, and it will please our readers equally with ourselves to know that the British-made car is becoming more and more numerous. Evidently our engineers are following the traditions of this country, and have set themselves patiently to work to produce a sound, reliable article, being perfectly content to take their time, and thoroughly determined not to spoil a reputation at the outset by putting shoddy stuff on the market. During the next ten days we shall ourselves have the opportunity of seeing some of the new cars, of which the knowledge that they were on the stocks was an important factor in deciding us to organise the contest. Others have now come along to extend our list, and to show what a vast amount of attention is being bestowed upon the popular-priced car, and how thoroughly the man of moderate means is being catered for. We believe that readers who are fortunate enough to be able to witness the run will be surprised at the vast strides which the Light Car Movement has made during the past few months, and they will be able to see actually in use on the road many of the 1904 patterns of well-known cars and many new types. We have every hope that a couple of two-cylindered two-seated cars will be ready in time to compete, whilst cars

with horizontal engines—for instance, the new Siddeley and the Vauxhall, will be running, and we are sure that spectators will watch their performances with interest, and closely compare them with the vertically-placed engines. Other interesting entries are the team of Humberettes, Mr. C. S. Rolls's new light car, and the O.H.B., an English-built car on American lines with an air-cooled engine. A great feature about this event is that it affords to quite a number of competitors an opportunity which has not previously been offered to them to publicly exhibit their vehicles in actual process of running.

That the run of 122½ miles which we propose is not of such length as to constitute a test of endurance we fully concede, but we put it in this way to both users and sellers: if a car were offered to a man desiring to buy such a car he would be wise to stipulate for a trial run, and if the car would accomplish a journey of 122½ miles in the day without any need for stopping, and without attention or adjustment, the customer would be perfectly satisfied; he would consider that the car was sound and reliable and up to his ordinary requirements, and certainly something more than a toy, as so many at present seem to think. We consider that our Run Round London fully meets the case, and at the same time it does not in any way encroach upon the objects of the Reliability Trial. The Club's 1,000 miles trial demonstrates the strong and the weak points of each car and its mechanism: in the operation of its scheme marks are awarded for such qualities as cheapness, silence, absence of dust-raising propensities, economy in running, and so forth, and this information is prepared for people who are already in touch with the movement, and who are seeking knowledge on those points. Our run is designed to appeal mainly to those individuals who have scarcely regarded the light car as being a vehicle capable of any such performance. We are taking the run through the districts in which such classes reside, and they will have their attention drawn, probably for the very first time, to the handiness and the usefulness of the light car.

The arrangements have made substantial progress, and everybody will be in perfect training before the day. The programme which we are preparing will contain the fullest details of the run, the conditions of the competition, the route and the stopping places for meals, a full detailed list of the competing cars, and other interesting information. A copy of this will be posted to each applicant on receipt of a penny stamp to defray postage.

Many of our readers living at a distance may like to know that it will be quite possible for them to see the run, and for that purpose we would advise those living on the S.E. and C.R. to make for Sevenoaks or Dunton Green (8.30 a.m.). Residents on the L.B. and S.C.R. should make for Redhill (about 10.30 a.m.). The hill test on Reigate Hill will be interesting. Other towns on the Brighton railway to be visited about midday will be Sutton, Epsom, and Leatherhead. Those living on the L. and S.W.R. could make for Leatherhead at about noon, or Stoke D'Abernon, Weybridge, or Chertsey in the early afternoon. From the G.W.R. system, Staines, West Drayton, or Uxbridge before 3 o'clock should provide a sight of the cars; whilst from the north, the G.C.R. will take spectators to Amersham or Rickmansworth (about 3.30 p.m.), the L. and N.W.R. to Watford, the Midland to St. Alban's, and the Great Northern to Hatfield (about 5.30 p.m.). Thus it will be as easy to see the run from outside London as it is from inside, because it will pass so close to important railway centres.

The Automobile Club, the Executive Committee of which has considered our scheme in all its bearings, has agreed to give its sanction to the holding of the event, feeling that it must exert a powerful influence on the future of light cars. We know full well that had the run been considered unnecessary or calculated to do no good, or to clash with the 1,000 Miles Reliability Trials, the Club would have taken steps to prohibit the run, or, at least, would have asked us to abandon it. The Club has thought well of the scheme, and both prominent members and officials will render assistance upon the occasion.

Endurance Trials in America.

A six days' endurance trial for touring cars was held, from October 6th to October 13th, in the States of New York and Pennsylvania. The trial consisted of daily runs of 100 to 140 miles, with stoppages overnight and for meals, as in our own recent reliability trials—with the difference however, that whereas our cars made the Crystal Palace their headquarters and radiated thence every day, the American competitors had to put up at and start from a fresh place every time. Thirty-four cars started from Weehawken on October 6th, only 15 of which set out for the sixth and last day's run of 104 miles from Erie to Pittsburgh. This percentage, however, is by no means bad, considering the awful nature of the weather experienced during the seven days; rain fell almost incessantly, and storms of wind and cloud-bursts occasionally threatened to sweep away car, occupants and all: as a matter of fact horse-vehicle and railway traffic was seriously impeded, and in some cases suspended during the time that the cars were more or less successfully battling with the elements. Full results and awards are not yet to hand; but sufficient information has already been published to indicate that the steam cars will come out as well as if not better than those driven by petrol: the weather conditions were, of course, all in favour of the former. The state of some of the town roads as well as those in the country is said to have been deplorable, cars frequently having to be dug or hauled out of sloughs of mud or river-swept gullies in the road. The competing cars were preceded each day by a pilot car which carried 200lbs. of white paper squares to scatter along the route at doubtful points. Innumerable side-slips on the first day's run gave the competitors a foretaste of what they might expect; and at Pinehill—the rendezvous for the first night—the available supply of straps, ropes and chains was bought up to wrap round tyres. The garage arrangements were primitive, the cars having to be stabled mostly in the open air in sodden fields with no protection beyond that of a tarpaulin. One lady started and rode right through, having on one occasion—in consequence of a breakdown—to sleep by the roadside. Great interest was taken by the natives of the various towns and villages passed, food and drink being freely offered to the drenched and numbed motorists as they passed: a bunch of grapes or a pork pie was frequently hurled into a passing car. Webb Jay, on a White steamer, F. P. Stearns on a Stearns, a

Packard, two Toledos and two Oldsmobiles showed up prominently all through; and as an instance of pluck and endurance it may be mentioned that the driver of a Franklin car stuck to his post until the car burned away under him; whilst the driver of another car of the same make fell through on a bridge and was half drowned, but continued the run when he had got his car clear.

Later details state that of the 34 cars which started 20 completed the trial by arriving at Pittsburgh within the official limit of time; and seven of these completed each individual day's run inside schedule time. Of the 14 unsuccessful cars, nine retired altogether from various causes—chiefly serious breakdowns, whilst five were still struggling on. The seven cars referred to above which made what corresponds to our "non-stop" run were: White No. 5, White No. 6, Toledo No. 10, Pierce Arrow No. 14, Pierce No. 15, "Old Pacific" Packard No. 16, and Stearns No. 35. The "Old Pacific" Packard was the car which recently did a sensational trip from Chicago to New York as reported in a previous issue of "THE MOTOR"; it was driven on both occasions by Tom Fetch. The other 13 successful competitors included a Columbia, a Toledo, two Ramblers, a Fredonia, a Knox, two Franklins, a Haynes-Apperson, a Locomobile, two Oldsmobiles and a St. Louis.

The "Regulation" Speed.

A correspondent to the current number of the "Automobile Club Journal" points out that on three occasions recently the notorious Sergeant Jarrett has stopped cars in or near Ripley and has charged them with travelling over a measured distance at the rate of 22 miles an hour. "Is it coincidence," asks the motorist referred to above, "that three different types of car driven by three different persons, on three different occasions achieved exactly the same rate of speed over a given length of ground in the same locality, or has the renowned sergeant a stock speed for all alike?" We fear that this appeal to commonsense will have little weight in constabulary and magisterial quarters. There are, it is true, individual policemen and magistrates whose commonsense would smell a rat in a "coincidence" of this kind; but with the vast majority of sergeants and J.P.'s the excessive speed of a motorcar is a foregone conclusion: the question with them is not "How is it, Sergeant, that you produce all these different cars driven

by different persons on different occasions travelling at the same speed?" but, "Why don't you produce more, Sergeant?"

Messrs. Bradbury and Co., Ltd., of Oldham, Lancashire, are in want of a foreman for their motorcar department. Further particulars will be found in our advertisement columns.

Another Humber Car.

Still continuing their vigorous policy, we hear that the Humber Company will shortly introduce a new car with a $7\frac{1}{2}$ h.p. two-cylinder engine, tonneau body and fitted in every respect up to the standard of the Humber reputation. This should be welcome news to the man of moderate means.

Another Small Car.

The Mobile Motor and Engineering Co., Ltd., John Bright St., Birmingham have now put on the market the small car we mentioned some two months ago in these columns. This has a 6 h.p. genuine De Dion engine, artillery wheels, 23 by $3\frac{1}{4}$ inch tyres, bucket seats and the special feature of the car is a Mercedes pattern bonnet and radiator. The price is 165 guineas. We hope to illustrate the car in an early issue.

Stolen!

The Streatham Motor Car Co., 27, High Road, Streatham, inform us that a motor-bicycle was hired from them by a person giving the name of Webb on October 9th, and same has not been heard of since. The following is a description of the machine:—2 h.p. F.N., 26in. wheels, Dunlop tyres, small piece chipped out of driving rim, lacquer on tank worn, small name plate on battery which if removed would leave two small holes $1\frac{1}{4}$ in. apart. Any reader coming across this machine should communicate with the owners who offer a reward for any news respecting it.

The Centaur Motor-Bicycle.

On Friday when at the works of the Centaur Cycle Co., Ltd., Coventry, we were afforded an opportunity of inspecting the new motor-bicycle introduced by that company. The most notable feature of the machine is that the engine is built up as part of the frame. This is arranged by the method of bolting the silencer to the bottom of the head-tube, and thus dispensing with the down tube. The engine is of 3 h.p., with mechanically operated valves, and it is claimed that the position of valves and silencer is so arranged as to allow of the maximum cooling effect being attained. We hope to illustrate the machine in our next issue.

Next Tuesday

the First Show Special of "THE MOTOR" will be in your hands. It will be a great number, containing many interesting details of novelties, and many special articles and illustrations. ONE PENNY.

Marine Motoring.

Mr. Bernard B. Redwood contributed a most interesting paper on Marine Motoring at the Automobile Club, last Friday, and, although the predominant note of the paper and of the discussion was the absolute newness of the science and the scantiness of information on the subject, yet it engaged the attention of an interested audience for an hour and a half. Mr. Redwood told of the enormous strides which have been made in the United States in the use of the internal combustion motor. The type of engine which has been in vogue over there has been the two-cycle single-cylinder variety, working at a low number of revolutions. Efficiency has not been the strong feature of these engines, and, although a good number were imported into this country, they have been entirely supplanted by the four-cycle engine. This, in Mr. Redwood's opinion, was due to poor workmanship, quite as much as to the fact that the two-cycle engine has its limits. There was not the least doubt but that for high speed work the petrol motor will surpass the steam engine. It is considerably lighter, power for power; it occupies smaller space, is ready to start at once, whereas considerable time must be



L. Jones, on De Dion Tricycle, who accomplished a 100 mile non-stop run on Saturday.

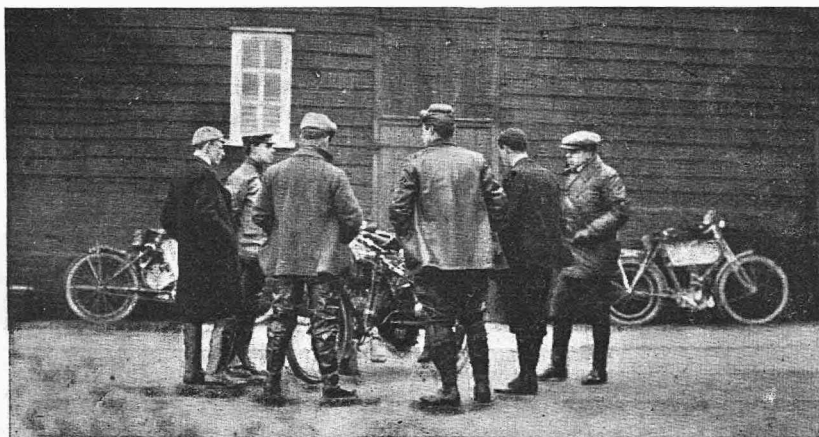
ing that a 40ft. racing launch costs about £2,000 to construct, and as a 50ft. boat would be double as expensive to build and handle and run, there was no need to exceed the length which has made such a good showing this year.

"THE MOTOR" Show Special No. 1 next Tuesday will be a great number! It will contain details of many novelties to look for at the Shows.

After allowing for debenture interest, directors' fees, depreciation, etc., the Co. have, with the amount brought forward from last year, the sum of £14,786 to deal with. It is proposed to pay 10 per cent. dividend, carrying £6,000 to reserve, and £1,702 forward.

The Motor Cycling Club.

It was intended to have finally decided the 200 miles' reliability trial for the S. F. Edge Cup on Saturday last, but although a start was made to carry out the test, circumstances arose which necessitated its postponement. Cowles was unable to start and this meant that Jones and Milligan would have had to compete by themselves. The lack of checkers on the route was also a serious disadvantage. The officials present at Hatfield decided to postpone the actual test for the cup, but Jones and Milligan elected to carry out the run as a reliability test simply, the distance to be 100 miles, concluding at mid-day. This they did successfully, making a non-stop run. The weather conditions prevailing up to mid-day were excellent, but later on a drizzling rain set in which increased to a steady downpour, turning the roads into veritable quagmires to the discomfort of motorists and cyclists returning home.



Group in the Red Lion Hotel yard at Hatfield, taken after last Saturday's run.

spent in getting up steam. Mr. Redwood described the motor launch racing which has been witnessed in British waters during the past season, and referred to the difficulties which have yet to be overcome before satisfactory rating and time scales can be produced. He described and illustrated, by means of the projecting lantern, the various craft which have figured prominently this year, and then referred to the projected reliability trials of motor boats, which may be instituted next year by the "Yachtsman". He thought that the Automobile Club, being the prime movers of motor launch racing in this country, should be the promoting body for these trials. In the discussion which followed, Mr. Linton Hope, the designer of the "Napier" launch, gave reasons for the superiority in speed of the petrol launch over the steamer, and particularly dealt with the value of this kind of craft for Government work. The Harmsworth Cup rules were generally discussed, and it was thought necessary that they should be revised, in order to give foreign owners more chance of competing. It was mentioned during the even-

We are informed that the Swift Motor Company propose taking over the manufacture of Mr. William Starley's gear-driven motor-bicycle.

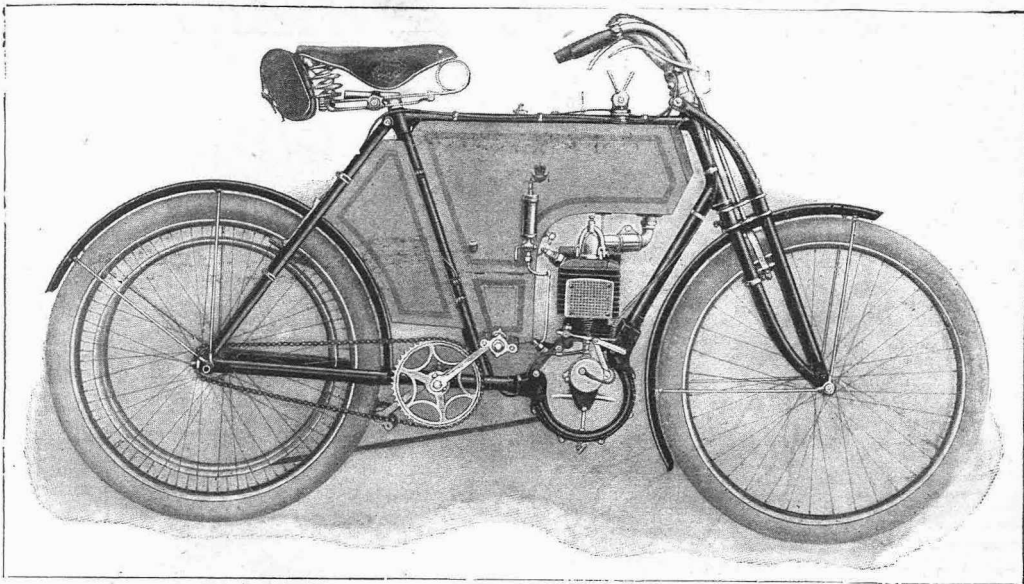


Milligan on 2 1/2 h.p. Bradbury Motor-Bicycle, who accomplished a 100 mile non-stop run last Saturday.

The 1904 Rex Motor-Bicycle.

There is no firm engaged in the motorcycle industry that has shown a greater confidence in the future of the motor-bicycle than the Rex Motor Manufacturing Co., Ltd., Earlsdon, Coventry. They were one of the first companies to arrange for a large out-put of this class of machine. Up to the present they have marketed four successive models, starting from the $1\frac{1}{2}$ h.p. to the 3 h.p. of the past season. The management has always held the opinion that a motor-bicycle, to be thoroughly efficient, should be of such power as not to require pedal assistance unless under the most exceptional conditions. Following the tendency of the times, the horse power for next season is increased to $3\frac{1}{2}$. The success of the Rex motor-bicycle during the past season has encouraged the company to increase their plant and to make every arrangement for providing a much larger output in 1904 than has been the case in 1903, although it is common knowledge that the Rex Company has during the past season sold an enormous number of machines. The accompanying illustrations afford a very clear idea of the general design of the newest model.

THE FRONT FORKS ARE OF AN IMPROVED DESIGN TO GIVE INCREASED STRENGTH with the additional weight of the machine. The forks are made from $\frac{3}{4}$ inch oval tube, well girded at the crown, and firmly secured at the ball-head clip. The engine is placed in a vertical position in the firm's registered design of cradle, and this has been improved in order to simplify the detachment of the engine which may now be done by removing three bolts fitting into slots in the cradle. The wheel case has been slightly lengthened, and the weight of the rider is now distributed



The 1904 Rex Motor-Bicycle.

in such a manner as the makers claim will obviate any tendency of the machine to side-slip even on the greasiest of roads. As a result of the firm's three years' experience and exhaustive experiments during the past season, the new Rex model embodies a considerable number of improvements. One of the most important of these is that of the new air draught device incorporated in the cylinder design, giving a clear passage between the exhaust port and chamber and cylinder wall. In addition to this the engine is fitted with extra cooling flanges (shown in the second illustration), which has been proved by experiment to keep the motor much cooler than any yet turned out by this firm, although the 1903 model had a deservedly high reputation for its cooling properties. It is claimed that

THE AIR PASSAGE MENTIONED WILL KEEP THE ENGINE PERFECTLY COOL under all conditions.

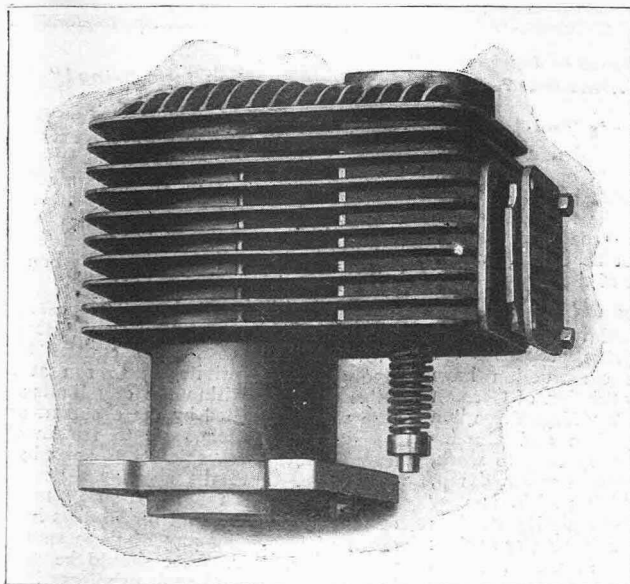
The valves have been specially designed and strengthened, having a diameter of $1\frac{1}{2}$ inches. A very simple method of removing the valve is provided, which is a reduced fac-simile of that adopted on certain cars, and will be readily appreciated in case of any more trouble arising on this score. The silencer is an improvement on that of the past season and should give every satisfaction. The Rex Company are firm believers in the merits and simplicity of the surface carburetter, but at the same time, they believe in perfecting this type as far as possible. As a result their new carburetter has been remodelled and improved and is

made to provide an ample supply of gas for the more powerful motor fitted. In deference to the demand for handle-bar control, as far as possible, for a motor-bicycle, the new Rex is fitted with an exhaust lever manipulated in a simple but efficient manner from the handle-bar. It is entirely independent of the ignition lever. A trembler coil is fitted, and accommodation is provided in the tank under the saddle to carry a spare accumulator. The dimensions of the tank have been enlarged, giving increased petrol and lubricating capacity. The petrol supply is now sufficient for about 125 miles' running under ordinary conditions.

As we shall shortly have an opportunity of examining samples of the machine referred to at the National Show, we hope to deal further with the improvements mentioned in the foregoing article at an early date.

Weatherproof Motorcars.

The weather during the recent American endurance run seems at times to have been of the most awful description: an observer on one of the cars described his experiences on one day's run as follows:—"We would dive into mud holes and the water would sweep over us as a wave sweeps an ocean steamer's deck. The mud dashed against us from in front and from behind and ran down our necks, and we had to sit in it too: sometimes the water would wash clean across the floor of the car." The condition of the cars became so filthy that the garage men who were appointed to look after the cars as they came in were christened "garbage" men. "What river is this?" asked a representative of the "Chicago Motor Age," leaning over his car and peering into the dark swirling waters below. "That ain't no river," replied a sympathetic farmer, "the river's half a mile from here: this is a crick, and it's dry most of the time: this is the worst storm we've had for years, and you fellers is likely to find some washouts to-night: better be careful and take it slow." "This car is 99 per cent pure, and it is supposed to float," remarked one driver as the water swished round the hubs of his wheels. Altogether the American trials proved endurance of drivers and cars alike!



Rex engine-head, showing cooling device.

Much attention is at present being paid by manufacturers of the electrical components of the motorcycle, particularly in the direction of making accumulators more reliable and efficient. Next season we shall have cells that will stand the roughest of handling, and the worry of leaking acid will be got over by using semi-dry electrolyte.

Sir Wm. Richmond, the eminent artist, is dissatisfied with the appearance of the present motorcar, and is stated to be about to model a design in wax showing his idea of an artistically beautiful car. Perhaps when Sir W. R. has finished this artistic labour, he will kindly go on to something useful, and model a level-headed magistrate, or an unprejudiced policeman.

Opinion of "The Motor."

Mr. M. D. Rucker has recently taken to the motorbicycle and speaks in high terms of the "Indian" which we illustrated about three weeks ago. Mr. Rucker says that "THE MOTOR" had a good deal to do with his conversion and remarks: "I look forward to it every week as it always contains some useful and practical hints, and to my way of thinking is a long way ahead of any other; moreover, I think you are quite on the right track as regards light vehicles for men of moderate means."

French Cars for England.

The report on French foreign trade issued by the British Consul-General contains some interesting figures about the importation of French motorcars into this country. In 1901 France exported to England "carriages, motorcars, etc.," to the value of £401,000; in 1902 the value of the exports under the same heading amounted to £855,000. The increase of £454,000 is attributable no doubt to the enormous spread of motoring in this country, as there cannot be any considerable sale here for French carriages other than motor vehicles. It would be interesting to know the value of British motorcars exported to France in the same period.

A Good Suggestion

Mr. S. Towtson, the district surveyor to the Sevenoaks Urban District Council, has addressed the following most sensible letter to the secretary of the Automobile Club:—

"The season is now approaching when extensive repairs will be carried out on the various highways; and for the benefit of traffic in general, and for motorcars in particular, it would, I think, be beneficial if some signal were placed at night at each end of a piece of road that is under repair, in order that drivers might reduce the speed of their cars and possibly prevent damage to the tyres. I have for some years placed a lamp, showing a red light, on the nearest street lamp posts at either end of a length of road under repair, and when the signal is known by drivers they are very glad of the warning. The defect is that the red lights are not general, and a stranger coming along would not know the meaning of the signal. If, through your club, the matter could be taken up, and every District Council be induced to give the warning, I believe the drivers and owners of many vehicles would be benefitted thereby."

C12



"Hark at the singing of the birds!"

"Birds! Is that what it is? I thought it was the bearings firing!"

"The Rich Man's Toy" (?)

Commenting on the awful nature of the weather during the recent endurance run for motorcars in America, the "New York Automobile" says: "The fact that autos can get through when railroads are washed out, and horses cannot be driven on the roads, opened the eyes of the farmers."

Aluminium Alloys.

Two alloys of aluminium which are claimed to have valuable properties for cycle and automobile construction have recently attracted the attention of German scientists. The first is "Magnalium," a combination of magnesium and aluminium; it is said to be very easy to work, and unaffected by the action of air, damp, or acids: it takes a high polish, is very ductile and tough, and slightly lighter than aluminium, its density being 2.5 as against 2.7: it begins to soften at a temperature of 370 degrees C., begins to melt at 600 degrees C., and liquefies at 630 degrees C.:

from 3 to 5 per cent. of magnesium is the best proportion for car or cycle tubes; with more than 10 per cent. the alloy becomes brittle: it costs about as much as copper. The second alloy, known as "Meteorite," is a combination of aluminium and certain phosphates: it has a density of 2.7; and can be readily brazed.

"When in Rome," etc.

Mr. W. J. West is the proud possessor of the only motorcar in Rome (Georgia, U.S.A.). This distinction entitles him, amongst other privileges, to run at six miles an hour within the city limits; to stop when signalled by the occupant of a horse-drawn vehicle, and to remain stationary until the vehicle has passed; to contribute £5 to the city for a license; and to pay fines ranging from £5 to £20 or to visit the city gaol for 30 days in the event of infringing any of these sporting regulations. Mr. West should be proud in the possession of such privileges in the land of the free.

OTHER PEOPLE'S VIEWS.

NOTE.—These columns are set apart for the discussion of motor topics by bona-fide readers of "THE MOTOR," and trade letters containing veiled advertisements are not admitted.

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

1. Plain Writing. Type-writing for preference.
2. All letters to be written on one side of the paper.
3. Letters to be kept as brief as possible.
4. For the purpose of illustrating any letter, rough diagrams may be sent, which will be worked up by one of our artists.

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

Chain versus Belt.

Sir,—I saw in the columns of your excellent paper a letter from "Believer in Chain Drive," expressing the hope that some users of chains would give their experiences. I might say that I possess a 3½ h.p. motorcycle, with fore-carriage. It is fitted with a chain drive and Bowden clutch, thus enabling a free engine to be obtained. I live on the borders of North Wales, and consequently have to negotiate many hills in the course of a few hours' run. I have completed over 1,000 miles, and find the clutch answers excellently; and I seldom, if ever, have to make any adjustment of my chain, in spite of the high power of the motor I make use of. On a wet day, after watching a belt-driven machine convert itself into a permanent free engine in attempting to push a fore-carriage up an incline, I go on my way rejoicing that I risked the experiment of a chain drive.—Yours faithfully,

"CLUTCH."

Experiences with the Belt Drive.

Sir,—In answer to Mr. D. Herbert as to the V-shape belt, my experience has been that it runs much better with no dressing applied at all, than with even the Lincon dressing. During fine weather I never touch my belt; a very small amount of lubricating oil gets off the pulley and makes a beautiful "tacky" surface. In this condition there is absolutely no slip, even on the steepest hill, with a 2½ h.p. motor, and with the belt quite loose. In wet weather, however, this belt will slip, so whenever I expect wet (and I ride practically every day, in all weathers) I scrape the belt clean with an old blunt knife, and perhaps take it up a little if it is very loose. I think, however, it is more often the motor pulley that is at fault than the belt. It is most important that it should be grooved to exactly the same angle as the belt (many pulleys on the market are not so), and the groove should be so deep that even after some wear there is no chance of the belt getting to the bottom

of it. As to a patent pulley, my experience has been that it is not necessary. The mistake makers so often make is in the ribbing or roughening of the surfaces of the pulley, which is supposed to prevent slipping. This only makes the pulley wear out faster, and actually diminishes the friction surface for the belt. The ribs or corrugations are generally worn quite smooth in 500 miles. It is often best to fit a new pulley when getting a new belt, instead of running a new belt on an old pulley. I may state that my experience has been with rather an exceptionally long belt drive, and perhaps this may partly account for my complete absence of belt troubles of late.—Yours faithfully,

NORMAN H. JOY.

Merits of the Chain Drive.

Sir,—In your issue of the 9th September a correspondent writes inviting experiences of chain-driven machines. I note that he is the lucky possessor of a 2½ h.p. Humber chain-driven motor-bicycle, and as I ride a similar machine, standard pattern, £55, I have much pleasure in endorsing his remarks as to the splendid manner in which the chains are wearing. I have ridden considerably over 1,000 miles, and have only had to adjust the chains once, and as for snapping, I cannot see how it is possible for that to happen if your spring clutch is "adjusted to your weight." The omission of this I believe to be the real cause of chains snapping which I read of occasionally, but have not yet experienced. Whilst on this subject I should like to mention that I do not think there is a more reliable machine than the Humber on the market; I have had mine now five months, and I may say that, beyond the inlet valve breaking once, I have not had the slightest trouble on the road. I must say, however, that I look after it well. I find it pays me, and the consequence is that when I start from here on my run down to Hastings (a run which I take nearly every Sunday morning, and return Monday morning to business at nine, taking three hours to come up, which, considering the road, you will agree is good going). I know I am going right through all right, and have on several occasions made non-stop runs. I have never had any carburettor troubles, very few punctures, and can go up any hill in the country.—Yours faithfully,

London.

T. WELSHMAN.

Releasing Compression by the Inlet Valve.

Sir,—In a reply to "Simplex" in a recent number, you say that you think it dangerous to open the inlet valve for starting. I will tell you my experience. I have frequently started a two-cylinder engine (cyl. 100 by 130 mm.), both cylinders on the same crank, and spark plugs in series, the cylinders firing alternately, by holding both inlet valves open with the spark on, giving the engine a few sharp turns to draw in gas, and then releasing the inlet valves. The fly-wheel would have sufficient momentum to carry the piston over the first compression, and the engine would start without trouble or danger. I may say I was rather afraid of the experiment at first. I should not hesitate now to fit an inlet valve lifter to a machine that was sluggish in starting. Regarding the new Act, the following definition of a motorcycle is the result or combination of all the definitions I could find in the papers or think of. The term motorcycle to include all wheeled light locomotives, and such as are of less than 300 lbs. weight and three feet in breadth. Any addition to such motorcycle to be deemed part of such motorcycle, unless the above limits be exceeded, and the whole vehicle to be treated as one under all laws and bye-laws relating to the use of motor vehicles on highways, and for taxation purposes also.—Yours faithfully,

"MOORMAN."

Locating a Misfiring Trouble.

Sir,—I should have written ere this to thank you for the reply to my queries through "THE MOTOR" as to misfiring difficulties which I had been having with my Trimo. Fortunately, with the assistance of a very kind friend, we located the trouble before your reply appeared, and now possibly my experience may be of value to others in like difficulties. To begin with, everything about the engine was in perfect order—compression, gas, petrol and air supply, electrical equipment rewired, and battery freshly charged, wipe contact and trembler coil. Every part was thoroughly examined right up to the contact, and that is where the trouble was ultimately found to exist: it was caused by caked oil on the axle in between the brush contact, thus insulating contact piece from motor or frame. To avoid this in future I drilled and tapped a hole half in the axle and the other half in the brass ring, and inserted a tight-fitting screw, and since this was done I have had no trouble whatever. I might add that carburettor is a Longuemare spray, and over the air holes of spray chamber I have fitted a copper gauze shield, and now when out in storm or calm there is no upsetting of mixture. I would strongly advise others who experience difficulty with this kind of carburettor to try this shield of gauze.—Yours faithfully,

J. A. BLEURS.

B17

"The Motor" Show Specials

will be the feature at Show time.
The dates of their appearance
will be as follows:—

Tuesday, Nov. 10th.

Tuesday, Nov. 17th.

Tuesday, Nov. 24th.

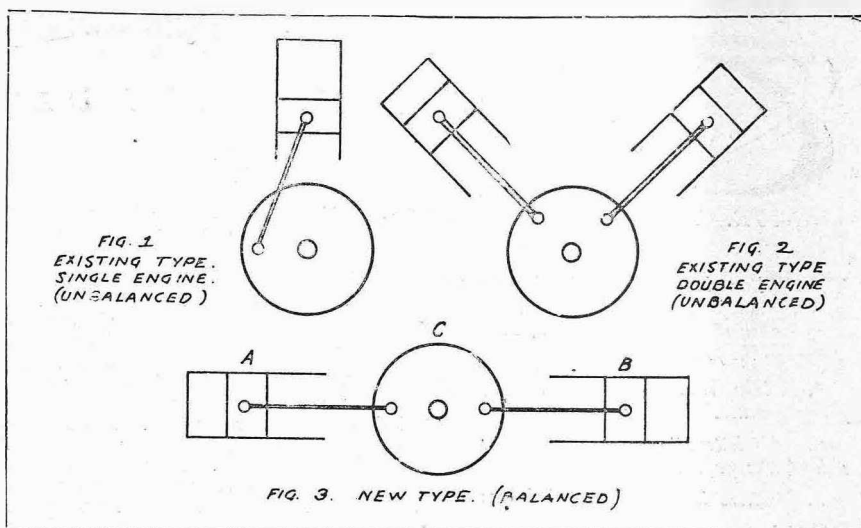
DOUBLE VALUE! ONE PENNY.

Police Trap.

Sir,—I write to inform your readers of a police trap in High Street, Egham. I am told that six motorists were stopped by the police before mid-day, on a recent Sunday. One, whom I saw stopped, could not have been going more than eight to ten miles an hour. I tried to warn him but was just too late. I avoided the usual enquiry by putting on low gear, retarding sparking, and crawling past at about three miles per hour, which procedure I should advise every motorist passing through Egham to carry out.—Yours faithfully,
"VOITURETTE."

Concerning Fore-Carriage Construction.

Sir, Thinking of purchasing something in the nature of a motorcycle and fore-carriage, and not seeing anything that quite satisfies me, I should be glad to have criticisms of the following specification, and to know if a machine built to order on these lines would prove satisfactory. Also the name of any machine already on the market that nearest approaches my ideas:—The frame to be of heavier gauge than is generally used, the whole being a fixture, only the coach built front seat being removable: the front hubs and band brakes to be a little less flimsy than those as a rule supplied: the motor to be a first class make of not less than $2\frac{1}{2}$ h.p., air-cooled assisted by wind scoops: transmission by combined chain and belt drive, somewhat on the lines of the Clement-Garrard cycle, but with the engine placed low down and vertical, and a wide flat belt (such as Dicks'): a two-speed gear with free engine and hand-starter to be fitted: carburettor to be a Longuemare or other good spray type, and the silencer to be of the "Oldsmobile" type, of ample dimensions, fitted with cut-off: two-inch Palmer tyres to be fitted to front wheels, and either a reinforced $2\frac{1}{2}$ in. Palmer, or a Hutchinson-Samson patent tyre (as described in No. 84, page 135), to the back. Other points are: sensible mud-guards and luggage accommodation: saddle on spring seat pillar with back rest: all levers working on racks: petrol gauge and sight-feed lubricator: carburettor supplied with hot air by a pipe from exhaust and fitted with throttle: means of easily injecting petrol into combustion chamber, also air release to crank chamber: and I should prefer engine with mechanical inlet: ignition to be by wipe contact and trembler coil. I should be greatly obliged for any reader's advice upon the above, and for answers to the following questions:—(1) Provided machine has two-speed gear, what powered engine is required before one may safely discard pedals? If these could be done away with the rear rider might be provided with a more comfortable seat—something after the style of the Century and Eagle tandems. (2) What is the most reliable type of two-speed gear to fit to machine as described above? (3) Should not a machine on these lines be obtainable for about £60? In conclusion, is it not about time that some less clumsy name than "motorcycle and fore-carriage" was found? Might I suggest calling these three-wheelers for two persons "carettes"? "Tri-car" and "motette" naturally suggest two particular makes of vehicles, and "tandem" is certainly rather vague!—Yours faithfully,
London, S.W. "CARETTE."



Illustrating letter from Jas. T. Towlson.

The Vibration Question.

Sir,—In reading a recent issue of "THE MOTOR" my attention was drawn to the remarks of your correspondent "Spark" (page 102), in which he gives his ideals of motorcycles. He seriously complains of the unpleasant vibration of the machine, and there are many riders besides him who devoutly wish that this apparently inseparable objection to motorcycles—and also motorcars—could be eliminated. As an engineer, sir, and not a rider, I would like to say that it appears to me no matter what is introduced into the manufacture of the machine in the way of spring handlebars, and spring saddles, and resilient tyres, the vibration complained of will never be entirely removed, because the incipient cause is still retained, viz., the unbalanced engine, and whether the "one-cylinder" or two-cylinder type is used, a dynamic balance of reciprocating parts is still unsecured. It is unreasonable, from an elementary mechanical standpoint, to expect it, and I would like to ask your readers what they would think of a person, on purchasing an oil or a gas engine, who fixed it on a boarded floor, or any other similar foundation, without first of all strengthening such foundations, with the view of distributing the vibration (which does and must exist) over a larger area. I know you will agree with me when I assert that in a motorcycle all vibration caused by the motor has to be absorbed by the machine itself, excepting a small percentage that is conducted by way of the tyres to the earth, and you will bear with me when I remark that it is too much to expect a machine weighing a few score pounds to run sweetly with a two or three horse-power unbalanced motor pounding away in the centre of it. What I suggest, and that which I would like to see makers do, is to construct an engine possessing a mechanical and dynamic balance of all reciprocating parts. Let all motions and actions have reactionary motions equal and in opposite directions, so that, no matter what speed the motor is driven—80 revolutions per minute or 800—no vibration would be created. To assist in an explanation of my meaning I give the accompanying sketches. Now, sir, if reference is made

to them it will be seen at once that in Figs. 1 and 2 the reciprocating piston and rod and other attachments are, when working, in a state of unbalanced action, and no matter what elaborations are resorted to in the way of bob-weights or cranks, or other of the usual balancing accessories, the vibration accruing from this unbalanced action of reciprocating parts can never be totally eliminated. But a reference to Fig. 3 will show that an altogether different set of conditions exists, for cylinders A and B are on exactly diametrically opposite sides of the crank shaft, pressures of gas are equal and on opposite sides of crank shaft axis, and the motive pressure, that is, pressure of exploded gas, is equal and in opposite directions, resulting in a perfectly balanced and non-vibratory action of all the parts of the gear; and as the pressure on the area of each piston impels them towards the crank shaft axis, the main journal friction is entirely neutralised, which will obviously result in a higher mechanical efficiency of the motor.—Yours faithfully,
JAS. T. TOWLSON.

Hill-climbing with Kerry Motor.

Sir,—I was particularly interested in a letter which appeared in a recent issue from C. M. Holloway regarding the hill-climbing powers of his Kerry motor-bicycle. I am the possessor of a bicycle of the same make, and the only fault (if it can be called one) is that I cannot get it to take any reasonably steep hill. Your correspondent tells us how "he rides the hills"; does this mean that he takes every hill, for there are hills and hills? I managed to get my machine up Chislehurst Hill, but only by dint of violent pedalling, which made me feel a terrible wreck for some minutes. With regard to raising the exhaust down hill, surely your correspondent does not expect to go as fast as when the valve is shut and the motor going. I often have to pedal my machine down gentle slopes, and this is, I think, a great characteristic of good compression and condition generally. Your correspondent does not mention the horse-power of his machine. I presume it is the $2\frac{1}{2}$ h.p. pattern.—Yours faithfully,
B. H. PALMER.

Carburettor and Starting Troubles.

Sir,—In reply to your correspondent "Carburettor's" letter in your issue of the 23rd September, my suggestion to him would be to have a surface carburettor fitted to his machine. I experienced exactly the same trouble myself as he does in starting with a spray carburettor upon my 1903 "Ariel-Minerva" machine, and upon having an Ariel surface carburettor substituted my starting troubles entirely disappeared. I have no difficulty whatever in starting in the coldest weather by taking the precaution before mounting to release the needle valve and let a little fresh petrol drop into the carburettor, at the same time shaking the machine to agitate the petrol; and I always inject a little paraffin into the cylinder if the machine has been standing for some time. Besides finding the surface carburettor advantageous in this respect, it is without doubt, to my mind, far more economical; the speed of my machine has been improved; and another point which I look upon as most important is that with a surface carburettor I can run the machine very much slower—a great advantage in traffic riding. With my spray carburettor it was impossible to reduce the speed of the machine below 20 miles an hour without switching on and off.—Yours faithfully,

J. S. HUBBARD.

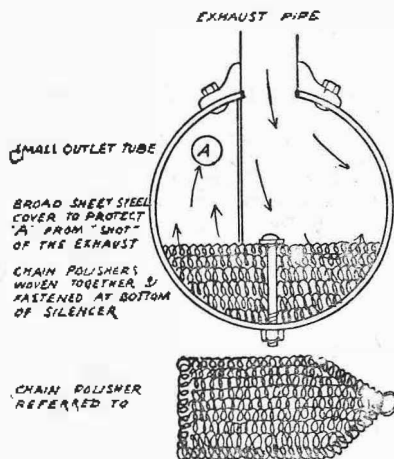
The Olympia Tandem.

Sir,—Recently one of your readers wrote expressing the difficulty he had in starting his 2½ h.p. Olympia tandem, and as there has been a deal written about fore-carriages, I would like to give a few experiences with the above machine. I hold no brief for any maker, so I trust I may speak freely. A correspondent has been advising users of the above machine to have compression taps fitted as an aid to starting. This, I think, is a mistake. If intending purchasers will only buy a machine from a reliable maker, and then thoroughly study that particular machine, I am sure success will follow. After my Olympia tandem had been locked up in the motor house for four weeks during a holiday at Douglas, I found it started at the second stroke of the pedals. I say, do not alter the machine in any way until you have mastered it. I have had my present machine for six months, and during my first three months I had many anxious times, but when I look back I can see that it was all my own fault. I cannot speak too highly of Messrs. Humber's chain drive. I have now driven my machine over 1,500 miles, and I have yet to touch the chains; and let me here say that my 2½ in. Dunlop back tyre has never been re-inflated although in the middle of the tread it has worn smooth. My machine is fitted with a Longuemare carburettor, and with this I have never had any trouble. I do not think anyone can enjoy motoring properly until he gets to understand every detail of the machine: after that, to keep the mechanism in order becomes a pleasure instead of a mystery. On very steep hills, with a 10-stone passenger, I have to pedal a little, but I do not mind this as it saves my engine. In conclusion, let me advise those who have purchased any reliable type of machine not to despair during the first few weeks, but to persevere as I have done, and success and pleasure is bound to follow.—Yours faithfully,

WM. COCHRANE.

Effective Silencing.

Sir,—Permit me, in reply to Mr. P. S. Sheardown's recent question concerning the silencer on my Werner motor-bicycle, to say that it is a 2½ h.p. size, and, therefore, No. 3 in the Fairfax price list. Let me suggest to Mr. Sheardown to have a very large exhaust tube fitted to motor, as the Werner exhaust tube is, to my thinking, ridiculously inadequate, and causes back pressure on account of inside bolt at bend of stem. Cover exhaust tube with two layers of closely wound asbestos string, to prevent its firing the petrol in carburettor in case the latter floods. After some little experimenting I found a plan by which my Fairfax silencer was rendered quite as silent as that made by Mr. Dunlop. Here is the idea. Buy four pieces of steel chain polishers, such as are used by the cooks and grooms for cleaning metal objects. Weave them together by means of heavy copper wire



into a sort of stiff pad, and bolt the latter to bottom of silencer, as shown in sketch. With ordinary mixture and throttle half closed the noise of the exhaust becomes quite inaudible, and only the "clicking" of the valves are heard. When thus fitted, the Fairfax silencer becomes so thoroughly effective, and without any noticeable back pressure, that I have discontinued my experiments with other models of exhaust boxes, and now consider the problem of silencing bicycle motors as satisfactorily and practically solved. I recently found out a fact in connection with this silencer question which, as a physician, I had suspected for a long time, and which has not yet, I believe, been mentioned in the columns of "THE MOTOR." That the constant "banging" of a noisy muffler plays a very important role in causing the nervous exhaustion and headaches which some motorcyclists complain of after a long ride, can be demonstrated very easily. If any of your readers who suffer in this way will take the trouble to have their motors altered so as to run silently, they will find their machines about 50 per cent. less tiring to ride.—Yours faithfully,

CHARLES WOOD MCMURTRY, M.D.

Mysterious Accumulator.

Sir,—I think that if "No Charge," who writes in a former issue "O.P.V.," will thoroughly clean out his accumulator and add only pure sulphuric acid mixed to a sp. gr. of 1.170 at 60 deg. he will find his trouble disappear. The only cause I can attribute his trouble to is local action in the cell itself, due either to impurities in the electrolyte or in the manufacture of the plate itself; the plate may be the only bad one in a thousand, but it appears that "No Charge" has been unlucky enough to secure it. If this does not cure the trouble, the only way to remedy it is for "No Charge" to take out the positive plate from the defective cell, knock out all the paste, clean thoroughly, and paste afresh with red lead (pure) mixed with dilute sulphuric acid sp. gr. 1.185 at 60 deg.; mix to a thick paste and press thoroughly into the grid with a wood spatula or knife, and put aside to dry for about two weeks in a nice warm temperature, after which it should be immersed in a saturated solution of chloride of lime for 48 hours; then be taken out, washed thoroughly, allowed to dry, and replaced in cell. After being charged and discharged half-a-dozen times the cell will be in perfect condition. As to "Noel Paton's" reply, I beg to differ; in the first place, it is impossible to form part of a complete circuit, and if the electrolyte in the two cells were in communication the voltage would be reduced to two, but the capacity would be doubled. I should like to hear further as to how "No Charge" gets on with the cell.—Yours faithfully,

"RADIO."

The "Ixon" Two-stroke Bicycle Motor.

Sir,—Seeing that some of your correspondents are in difficulty with the Ixon motor, my experience with the same might be acceptable. About two years ago I had a strong light bicycle built, 26 and 28 in. wheels, to take a light motor. I had a light Precision motor put to it: the cylinder being badly bored the piston did not fit; the lugs not being of sufficient substance, the motor fell off the machine. Then I had a light Hercules motor put on with a fly-wheel outside, which very soon worked loose and the cogs broke out of the timing gear, and the whole concern was made of very soft metal. Then I had an Ixon motor put to the machine. For enjoyment, comfort, simplicity and freedom from vexatious worries, give me a pony Ixon. As to getting the best results, the following points must be observed:—(1) Before starting, empty the petrol out of the carburettor, put it back into tank and put half a pint of fresh petrol into carburettor. (2) Take out sparking plug, which ought to be an E.I.C. make, and put in a little lubricating oil on top of piston (I use best gas engine oil). The drop feed should be three or four drops to the minute. (3) See that the lubricator is upright with the cylinder; if it has shifted loosen the little bolt underneath and put it upright. (4) Take off the silencer occasionally and clean the exhaust ports of the cylinder; also the holes in silencer. Get Derby and Co.'s real platinum rivets and put in your trembler blades—which it is important to keep clean. It is best to have a spare accumulator; do not expect good sparking below three volts. I charge my own accumulator by a P. and R. battery.—Yours faithfully,

W.A.S.

"The Motor Manual"

is the standard work on Motorcycles and Light Cars.

1s.

Motorcyclists and the New Act.

Sir,—I would suggest the following as a suitable definition of a motorcycle:—“A vehicle propelled by mechanical means, with two, three or four road wheels. This vehicle must be capable of propulsion by pedals operated by a rider, independently of the motor (whether internal combustion, steam or electric); must not exceed 3 cwt. in weight, and must not exceed 40 inches (over all) in width, an exception as to pedal propulsion being made in the case of a two-wheeled vehicle.” The last clause I would insert, as there are certain bicycles made which have not pedals provided, and as they are of the “one track” variety of vehicle, they are, as your correspondent Mr. Leonard Bell says, automatically less dangerous than a three or four-wheeler. With regard to illuminating a number at night, the only way I can see to do so with due safety is to have a small lantern, with ground glass panes, on which the number is painted, and lit by an electric glow-lamp. This could be attached to the off handlebar or step, and would probably be visible from front or rear. If the “16ft.” road clause is put in force, most of the West of England will be closed to motorists: in fact, a motorist will be unable to leave this town by road! The country roads in the immediate district are all, at some part or other, less than 16ft. wide. What a delightful prospect!—Yours faithfully,

ARTHUR J. CAREY, L.R.C.P.I.

Weston-super-Mare, Somerset.

Vulcanising Patches on Inner Tubes.

Sir,—If any of your readers could give such instructions as would enable amateur car owners to vulcanise the patches on their inner tubes, the subject would, I think, interest a large number of your subscribers. At present I find that home repaired inner tubes are of but little use, except, perhaps, for pottering about in town. As soon as the tyres get warm with a fast run on a country road, then the solution is liable to soften with the heat and the patch to leak. It does not always do so, but the repair, however well done, cannot be relied on. Among the reasons why it would be desirable to do the vulcanising oneself is that, given the proper method, one could probably do the work more conscientiously. I have tried several firms, and have found that their repairs will sometimes give way under the heat and friction quite as readily as if they had not been vulcanised at all, and the charge for vulcanising is by no means nominal. The opening of the joint of the two ends of the tube is also a common fault. Another reason is that in the season it is difficult to get the tube back from the repairers; one firm this last summer refused to accept any more work for a time, having already more than their plant and staff could cope with. Finally, if this work is within the scope of the amateur, it would give an agreeable occupation to many who, like myself, realise greater pleasure out of work which has been successfully done at home. Trusting this letter may be the means of bringing an article on the art of vulcanising.—Yours faithfully,

E. V. LIFTER.

[Our correspondent should get an outfit called the “Necessaire Autovulcanisateur,” just put on the market by M. G. A. le Roy, a chemist, of Rouen, France].

The Motor Launch.

Sir,—As a regular reader of your paper I would beg to suggest that a column be devoted each week to the interests of those who use motor launches. I own a 6 h.p. Daimler launch, and being comparatively a novice I am naturally anxious to gain any information I can that concerns the working of the boat, and I am sure with the development of this pastime there are many others in a like position. Perhaps some of your readers can explain a little trouble I had with my accumulators. Almost immediately after charging the cells I found that they leaked considerably: I mentioned this to two friends who have launches and they informed me that they had had a similar experience. This happened in the month of August last, when we had so many thunderstorms and consequently so much electricity in the air, and to this cause they assigned the trouble. Do you think this would be so?—Yours faithfully,

“LAUNCH.”

[The atmospheric electrical charges are in no way responsible in our opinion.—Ed.]

Exhaust Valve Lead and Sluggish Carburetters.

Sir,—I have received so much useful information from “THE MOTOR,” that I should like to add my motor experiences. I have read over and over again that the distance between the tappet which lifts the exhaust valve and the valve stem itself should not be more than 1-32 inch at the most. Now, many riders might, after reading this, and finding upon examination the distance between these two points to exceed this space, be tempted to make an alteration so that the clearance might not exceed the space mentioned. This, with some machines, may be allowable and good, but, with others, a greater distance can be made without in the least affecting the proper scavenging of the gases. I do not consider that there is anything gained by giving a lift to the exhaust valve greater than one quarter the diameter of the valve itself; many motors do not even give this amount of lift; many that I have seen only give $\frac{1}{16}$ in., which, however, is not sufficient to effect a proper clearance of the burnt charge, 3-16ths to $\frac{1}{4}$ inch being better to ensure a thorough scavenging of the waste products of combustion. If, therefore, it is found that the tappet, whatever the distance between it and the valve stem, will give this amount of lift, there is no need whatever to alter it; in fact, making such an alteration will often throw the proper working of the motor out of gear; increasing the lift means later closing and earlier opening, and it may be found, by making the alteration, that the valve will not shut dead upon completion of the exhaust stroke, and will commence to open too early in the firing stroke, causing a loss of a considerable amount of the energy created by the explosion, this being often the cause of the great amount of noise made by small cycle engines. Of course, the above remarks are subject to the timing of the engine being correctly set, as it should be by the exhaust valve, this being the most important point; the sparking cam, being set in the correct position on the shaft, of course acts in sympathy with the exhaust valve itself, so that if this is set to close and open correctly the sparking is bound to occur at the proper moment. It is therefore absolutely necessary that the exhaust valve closes dead on the seating when the pis-

ton reaches the end of the exhaust stroke, and does not commence to open before $\frac{1}{16}$ ths of the firing stroke has been completed. The distance between the tappet and the valve stem is of little consequence as long as the lift is at least 3-16ths of an inch. I read so much about sluggish carburetters that, allow me to point out that extra air holes of 1-16th, say three or four altogether, drilled round the top of cover to float chamber will more often than not put an end to the trouble. This has often given the best results, and I have tested its efficiency for a long period. There is not a quick enough outlet for the compressed air in float chamber with the one hole as usually drilled, and this causes a sluggish action of the float. With the extra outlet the float acts well, and never gives the least trouble, so that those of your readers who are troubled with a sticking float cannot do better than try this cure.—Yours faithfully,

E. H. W. CLARIDGE.

Front Driver Tips.

Sir,—As a number of readers seem to possess front driving machines of an early design, a few suggestions as to their improvement may be acceptable. It should be remembered that although the position over steering head is certainly the best for cylinder cooling, the valve box and exhaust attachments will get hot. I would first suggest carrying out a dodge mentioned by one of the readers of “THE MOTOR,” viz., on the opposite side of the valve box to that on which is attached the exhaust pipe bore out a hole, equal in size, if possible, to the exhaust orifice, and fit another pipe on exhaust box, thus providing twice the area of escape for the exhaust gases, with a consequent improvement in cooling, and therefore in power. I know of one case where the exhaust orifice was very small, and it was brought up to normal by this means. Then the control may be greatly improved by fitting a special lever to the exhaust valve lift. This should be in length, say, 6 in., and about half an inch from the end have it pivoted so that a large top movement results in a small bottom movement. If a sector with small and continuous notches, as in 2 h.p. Minerva, be fitted, a nice adjustment will result. An old-fashioned method could be used for obtaining, at will, a free engine. A lever, working in a big-notched sector, with an easy running pulley at its arm's end, would allow of an adjustment of the belt from dead tight to quite free, thus giving all the advantages of a free engine. These two fittings would have to be attached to the handlebar, so as not to interfere with the steering. Lastly, a matter demanding experiment is a dodge recently described in a contemporary, viz., boring a few holes in the cylinder, which shall be uncovered at the extreme downward position of the piston, thus releasing most of the pressure, and also back pressure of the exhaust. Oil ejection might be overcome by some sort of valves. This matter requires investigation.—Yours faithfully,

C. S. SROCK.

* * * A large number of interesting letters on a variety of subjects have been held over through lack of space, and the Editor desires to inform those correspondents whose letters have not yet been published that they will appear as soon as possible. In consequence of the mass of correspondence it has been found necessary to limit the number of letters on any one subject.—ED. “THE MOTOR.”



OUR INFORMATION BUREAU.



SPECIAL NOTICE.

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

1. Plain writing. Type writing for preference.
2. All letters to be written on one side of the paper only.
3. Questions to be clear, terse, and to the point, without tedious preamble or needless flattery.
4. Should an immediate reply be required, an envelope must be enclosed bearing a penny stamp, and the name and full address of the sender. NOT a stamped undirected envelope.

R.E.G. (Swansea).—Nothing of any value in idea submitted: an enormous number of patents have been taken out on similar lines, practically all failures commercially.

P. E. Dowson (Hyde).—(1) State your requirements to J. Lacoste and Co., 176a, Shaftesbury Avenue, London, who have special lines in brush contacts. (2) "Castle" accumulator supplied by United Motor Industries, 45, Great Marlborough Street, London. (3) We have had no experience of the silencer you enquire about.

Sluggish Petrol Supply.

A. G. Richmond (Southport) writes:—I have a 2 h.p. "Minerva" motor-bicycle which is giving considerable trouble. If the sparking plug is well advanced and throttle kept fairly wide open the machine goes very well, but with spark retarded for slow running it misfires badly, often two or three explosions in succession: I find this misfiring is still worse on the stand than on the road: whether the engine is hot or cold makes little difference, so it cannot be caused by overheating. I think the trouble is in the carburettor (spray F.N. type) as the motor runs well with a friend's carburettor substituted: all passages of carburettor are clear, and petrol comes through jet when needle valve is raised; there is no tendency to flood in float chamber, though I have found a few drops of petrol in the inverted cone above the jet; variations in air supply seem to make no difference; the ignition I have found by spark gap to be perfect, while the motor is misfiring. I have also noticed that the motor seems to slow up gradually and then rush forward for no apparent reason: is jet likely to be too large?—We do not think there can be anything amiss with the ignition if you can advance the sparking without the engine missing. It is practically certain that the carburation is at fault: it is not improbable that your spray jet is a shade too small from the fact that with throttle full open the engine runs well, and that when adjusted for slow running it misses; this

seems to point to the fact that there is not sufficient pull or suction on the jet to draw the petrol through the sprayer: any enlargement of the jet must be carefully done. Another explanation is that the float is rather light and does not keep the petrol at a sufficiently high level in the chamber, or feeds too slowly; this latter point seems to be borne out by the fact that, as you state, the motor slows up gradually and then suddenly rushes forward.

Constructive Details.

L. R. Knight (London, S.E.).—(1) Compression 65 lbs. per square inch. (2) Not possible: a certain volume of the burnt charge must remain. (3) Yes; all spaces in combustion head must be taken into account. (4) Cylinder walls to be barely 5-32 inch thick. (5) Make the flywheels 18 lbs. weight each. (6) Quite impossible to say how much petrol per minute your engine will use at full power: a lot depends on the mechanical efficiency. One engine may absorb more of the energy developed by the explosion than another: it depends on how much friction there is to overcome. (7) Make exhaust valve 1 and 5-32 in diameter, and make the lift 3/16 in.

A Reply.

J. Bell writes as follows:—In answer to "C.A.W." (Epsom), it is not the belt that is in fault but the pulleys. I think if he chisels them in grooves across the face, and uses tallow and resin dusted on while running, which fills the grooves like ebonite, and gives it two dressings the first day, and does not climb any hills till the belt has had a chance of getting in trim, he will be able to do the staircase trick. The Dicks' belt, with Jackson's fasteners, running on wooden pulleys, gives the finest drive that I know; and I think if the cycle engine had a mahogany pulley flanged with steel and beaded edges, an inch flat belt (good leather, or Dicks' canvas), with the above dressing, would be worth trying.

The Risk of Side-slip

A. W. Jarrett (Tiverton) requires an absolute preventer of side-slip to fit to his 2 h.p. Quadrant machine, as he has had several unfortunate experiences in which his front wheel has shot under him instantaneously. He asks us if we consider that the fact is due to the wheels being 26 in. diameter instead of 28 in.—We can speak favourably of the Empire B.P. support, and the Parson's non-skid, as devices that minimise the risk considerably; but we contend that skilful driving of the machine on greasy roads, and when crossing tram lines, must be the main safeguard. Tyres must be almost brick hard, even at the risk of some personal discomfort from vibration. A slack tyre simply floats on the grease, as it were, whilst a hard tyre would bite through it. Tram lines must be crossed at an acute angle; and, above all, speed must be kept down to, say, 10 or 12 miles an hour, and even less on very treacherous roads. A little pedalling often helps the balance when taking corners.

Belt Slipping on Back Wheel.

H. S. Harrison (Walton-on-Thames) writes:—I shall be greatly obliged if you will let me know the best way of preventing my motorcycle Lycett's V-shaped belt from slipping. The slipping only occurs on the large rim of the back wheel, which has become as smooth as glass. No oil gets on the belt, and the smoothness of the rim is due to the friction of the belt rivets which slightly protrude from the belt. Would it be advisable to have a strip of leather fixed inside the pulley at the bottom? The top of the belt is at present on a level with the top of the rim and the belt runs dead true all round. If a strip of leather would be satisfactory, how should it be fixed? If this method would not answer could the rim be bent inwards or pieces of metal about 1-32nd inch or less on each side be brazed on inside of the rim, or would grub screws be the most satisfactory? The bicycle is an Ormonde 2 1/2 h.p.—The simplest way out of the difficulty would be to have an ordinary Lincon belt minus the rivets. The suggestions you make would not prove satisfactory and cost would be more than that of a new belt. Much will depend, of course, on the condition of the belt. A hard undressed belt will invariably give trouble.

Carburation and Timing Problems.

P.P.B. (London) writes:—In the article by "Magneto" on "Timing an Engine," instructions are given that the exhaust valve should commence to act upon completion of 3/4ths of the outward firing stroke, and should close when the piston reaches the dead point on the following upward stroke. Reckoning four piston strokes to one cycle of movements, this means that the valve acts during 1 1/4th strokes of the piston. With my engine I find that the exhaust valve acts during the length of one stroke only, and as I have timed in accordance with the instructions it is consequently closed upon the completion of 3/4ths of the upward or return stroke of the piston. Is this good enough, or should I divide the 1/4th lead, so that the valve opens later in the outward stroke and closes later in the upward stroke? I may mention that the motor does not give the power it did before I had it apart, and also more easily overheats. As regards the overheating, I should like to know if this is more liable to occur in cold weather? It appears paradoxical, I admit; but when we consider that it is necessary to use much more gas (I find I have to shut off the air supply in the two-way tap of my surface carburettor), and that the petrol probably enters the combustion chamber not properly vaporised, the overheating of the engine is not so unlikely. To sum up: (1) Is the loss of power due to incorrect timing? (2) Is the overheating due to incorrect timing? or (3) To the cold and damp atmosphere, causing imperfect vaporisation?—Evidently the profile of the cam is such that no "lead" can be

given on the exhausting stroke, but it would be as well to see that there is not an undue space between valve stem and lifter. If this is right we should set the cam to shut the valve dead on completion of exhausting stroke. Of course, a certain loss of power would occur by closing valve too soon, as a considerable amount of the burnt charge would remain. You will generally find that in cold weather more air has to be shut off at the twin tap, and practically all has to come down the chimney and pass through and over the petrol, owing to vaporisation taking place more sluggishly. In warmer weather vaporisation takes place easily, and a comparatively small volume of air passing down the chimney will become strongly impregnated with petrol; so much so, in fact, that a large amount of air has to be added at the twin-tap to dilute it and get a perfect explosive charge.



1. 7 a.m. The rapid car with dashing driver files down the high road.

A Carburetter Puzzle.

E.S. (Cheshunt) writes:—I have just passed through a difficulty with my machine which, though remedied, I fail to understand, and solicit your opinion, while hoping that my experience may be of help to others. I am riding a machine fitted with a $2\frac{1}{2}$ h.p. M.M.C. engine with a Longemare carburetter, which till a week ago worked with air tap nearly full open and throttle one-eighth open, taking my 17 stone weight at about 22 miles per hour. After a day at the Army manoeuvres it was necessary to clean out the carburetter, and this was done by a competent man. I then filled up with Carless' petrol—having previously used Pratt's "A" spirit. I found that even when running I could admit very little air—the engine misfired and I had to pedal up the smallest incline. I naturally imagined the carburetter had been disturbed in the process of cleaning, but could find nothing wrong. As a last resource I emptied out the Carless' and filled up with Pratt's "A" with complete success. Am I right in supposing that a lighter spirit would be sucked more rapidly through the jet and consequently require more air—instead of less as happened with me. Can you kindly inform me also whether more petrol is used for a given distance at a slow pace or at a fast pace, given a constant position of advance spark lever? Is it permissible for me to recommend to your readers Goodlad's speed indicator?—I have no connection

with the patent—I find it perfectly reliable up to 25 miles per hour, but above that I find it registers too low a speed owing to its occasionally jumping off the rim.—We really think the solution of the difficulty would be a simple one, namely, that there was either an obstruction somewhere in the petrol supply pipes or the needle valve had got stuck in some matter, or it might have been that air was getting in at some joint and preventing a partial vacuum occurring in carburetter. Presuming that the Carless' spirit was good and clean—that is, not containing any water—you should, if anything, have been able to use full air supply. The difference in density between the petrol and motor spirit does not really make any appreciable change in the running in a good spray carburetter. We have got equally as good results with Pratt's "B" .730 as with Carless' .690. Of course, to a small extent, the lighter the spirit the quicker does the float respond to a variation in level of the spirit as it would sink quicker and open the valve and thus the petrol would come through jet in greater volume and allow of a larger air supply. Difficult to say without experimenting and testing

A NOVEMBER IDYLL.



2. 12 noon The cheerful navigator has completed a nice deep, broad trench across the road.

the density if this was the true explanation. From our own tests we have found that the faster the motor can be run by keeping the throttle as much shut as possible and spark well forward the greater the economy in petrol. The spraying is not so good with a weak suction and it is difficult to avoid a small amount of flooding, hence the waste.

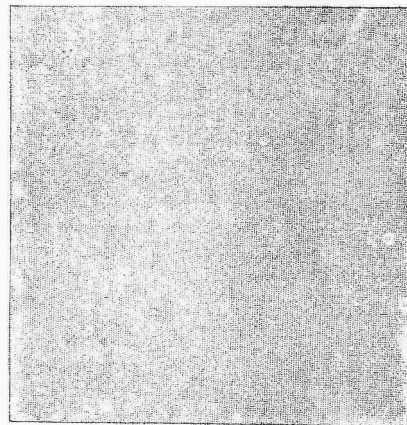
Two-cylinder Car Difficulty.

E.J.M. (Peckham) writes:—I have a small 6 h.p. car, two cylinders, with wipe contact and trembler coil, and ordinary float feed spray carburetter. I recently put new piston rings in, thinking the compression rather weak. I was careful not to alter timing wheels; but since putting combustion heads, etc. back, I cannot get the engine to run smoothly. At first it occasionally fired in the silencer; now it runs very irregularly. It will run for about two minutes in jerks, and then stop. As far as I am able to judge, the following are perfect: plugs, accumulator, coil, carburetter, strength of mixture, and wiring.

Your opinion as to cause of trouble will greatly oblige.—Erratic running we generally put down to a fault on the ignition circuit; we advise you to carefully overhaul same and look out for an exhausted accumulator, cracked porcelain in the plug, contacts of coil out of adjustment, or a bad connection somewhere. If you can convince yourself ignition is perfect we should conclude the trouble was caused by weak supply of gas from carburetter, or that something was amiss with the inlet valve.

Rated Power of Motors, etc.

J.N.G. (New Wanstead) writes:—(1) I constantly hear of 2 and $2\frac{1}{2}$ h.p. motors. Is this brake horse power? and, if so, why is it that such high-powered motors often fail to take one man and a light bicycle up hills where an ordinary horse would easily draw a four-wheeled trap and four or six



3. 8 p.m. A rich fog has settled down and the car is returning, feeling its way and sounding the fog-horn—A grave situation!

men? (2) In answering a correspondent in a recent issue you put the life of a bicycle motor at 8,000 to 10,000 miles. At the end of this time what parts of engine would require renewing beyond rebushing bearing surfaces? Would a new cylinder be necessary? What would probably be the cost of complete overhaul? (3) What is your opinion of the respective merits of a flat and a V belt drive? Do you consider that a flat belt is as good as a V belt for transmitting the power on a motor-bicycle? (4) What is the cost, reckoning petrol and lubricating oil, of running a $2\frac{1}{2}$ h.p. motor-bicycle per 100 miles over average roads and country. (5) I understand that the little platinum tipped screws used on the make and break contact require frequently renewing, and that they cost 1s. 6d.? Am I right here, and what number of miles should one screw last? (6) What speed would a 2 h.p. motor do on the average over an ordinary day's run on average roads? Would it negotiate most of the hills met with on such a run without pedalling? (7) Is an outside fly-wheel as good as two inside fly-wheels with crank pin between them? I am assuming that a forged crank shaft is used with the outside fly-wheel.—(1) Brake horse power is what is meant, but it is as well not to take some makers' statements too literally. Certain engines when accurately tested by a brake apparatus are

found to give three-fourths or less of rated power and it is only at a very high speed they give this. Hence, on hills, where power is most wanted, it is impossible to get the necessary revolutions and the power falls off in a much greater proportion than the speed. Thus, if a motor is rated to develop its 2 h.p. at 1,800 revolutions and when climbing a hill the speed gradually falls off to 800 revolutions the power might only be seven-tenths of a horse-power. (2) The bushes would be the main parts to be renewed and you might require a new exhaust cam and piston rings. The cylinder should last much longer than 10,000 miles, and even if worn a shade out of truth, could easily be relapped. Difficult to say cost of total renewals; with a good motor £1 should easily cover it. (3) This query is worn threadbare, and has been exhaustively discussed in "Bureau" and "O.P.V." Look up your back numbers. (4) With careful driving the cost should not exceed 2s. per 100 miles, and much less has been recorded. (5) A lot depends on the quality of the coil and the attention paid to the contact tips. We have managed 1,500 miles on one trembler blade and screw without renewing platinum, but we practically ran the make and break in an oil bath. This quite suppresses the sparking at platinum. (6) You should average 18 miles per hour, and a good engine would take hills up to 1 in 12 without help providing they were not of great length. (7) We should say equally as good if not better; as a lighter fly-wheel can be used and there are less parts to go wrong, and crank case can be made much more compact.

Motor Run with Paraffin.

G. T. Richards (Manchester) writes:—I am about to build a 4 h.p. engine for a light car and am undecided as to type. I have always been keenly in favour of a development of the Diesel system, but find from experiments that with the high compression necessary to fire the injected charge automatically it becomes a serious matter to keep piston rings gastight both in cylinder and auxiliary pumps. Will you please advise me as to whether the following would answer:—A carburetter arranged with a hot surface (heated from exhaust pipe and for starting heated by an auxiliary burner) on to which ordinary paraffin (cheapest) is sprayed in ordinary way by air suction past jet? What volume of air of gas at normal running, from paraffin or kerosene vapour, will give good sootless explosion? And what compression would be most suitable to same? Also, my engine is to be 4 in. stroke and to develop 4 h.p. at 600 revs. per minute, with compression as advised by you; what diameter piston shall I need?—To use paraffin to drive the motor is entirely a question of having sufficient heat in the carburetter to vaporise it. But why not try one of the "Trusty" carburetters advertised? The makers claim that this simply requires the use of petrol to start with, and then works well afterwards with ordinary paraffin. It is difficult to give the exact proportions of air and paraffin vapour to give perfect combustion and strongest explosion, as these depend on variable conditions: approximately we might put at from one part paraffin vapour to 10 or 12 of air. We do not think you will get 4 h.p. from the dimensions given: you require a longer stroke, as the explo-

sion from paraffin and air is not so abrupt as that of petrol and air, and consequently a longer stroke is necessary to allow of sufficient expansion: piston should be 4 in. diameter, and compression 60 lbs. per square inch: the speed will be from 800 to 1,000 revolutions per minute.

F. Barker (Southend).—You can use a single pole switch and frame return for De Dion coil by connecting up as follows:—Disconnect M wire from trembler and join trembler by a flexible wire to motor; leave contact screw connection as it is at present; then the negative pole to accumulator must be disconnected from the double pole switch handle and joined to a single pole switch: the current will then pass via frame to trembler.

Suitable Gear for Quad.

L.B. (Enniscorthy) writes:—I have an Ariel quad, 34 h.p., with water-cooled head and two-speed gear. I find that the low gear is not quite strong enough for the very steep hills in this neighbourhood; and also that when it is sometimes necessary to stop on hills, owing to horses that are unduly frightened, etc., I cannot start again owing to the positive clutch on the machine; or if I have the engine going, I cannot start the quad without either pushing or pedalling. I should be glad to hear details from any reader who has successfully applied the gear to an Ariel quad having two or three speeds and a friction clutch, and also if there are any changes that have been successfully made in a machine of this description with the object of making the position of the rider a little more comfortable, and less exposed to the weather. On anything like decent roads, I can go faster than the ordinary voiturettes; but I suffer very much from want of a friction clutch, and a means of starting the machine without pedalling or pushing.

Brush Contact Difficulty.

A.L.F. (London, W.) writes:—I have a Humber motor-bicycle with trembler coil and wipe contact, and have had considerable trouble with it owing to misfires. I have satisfied myself that accumulator coil and wiring are correct, and have adjusted the brush to make good contact with accumulator. I can only think that the return connection to the motor is not good. The commutator is not connected to the base plate, but is fixed to the 2 to 1 shaft, so that it would not be any use to connect base plate with motor by a wire. Can you suggest a way of making a better return connection to frame? Also, can you tell me where to obtain some fibre for insulating purposes? I have inquired of several accessory houses, but have only got a material very similar in appearance to fibre, but which easily splits.—We are not so certain that the trouble is due to an imperfect connection between the brush segment and motor, unless it actually occurs in the fibre disc; otherwise the shaft is in good contact with many parts of the motor—an especially good one, for instance, at the exhaust cam. You might take the disc off and see if the segment is in really good contact. If you cannot obtain the vulcanised fibre through an accessory firm it is just possible the Crypto Works Company, 29, Clerkenwell Road, London, would supply you with some, as they use a lot of it in the construction of small dynamos and motors.

A Humber Difficulty.

A.S. (Blackheath).—The difficulty you experience with your 24 h.p. Humber appears to be one that could only be solved by close investigation. You say: (1) Engine power has dwindled down to practically nothing, and yet compression is perfect. (2) If ignition is advanced slightly engine fires back and stops. (3) With throttle partly closed you cannot start engine at all. (4) Petrol supply runs into carburetter, even when supply tap is shut off. (5) Ignition, as far as you can judge, is in perfect order.—From these facts it is possible to point out the probable direction in which the fault lies. We should say that the carburetter was flooding for one thing, and giving too strong a mixture, which causes overheating. Supply tap is obviously defective, and may require regrinding in its socket to make it petrol tight; and probably needle valve of carburetter could do with regrinding. We do not know, of course, if you have had the timing gear apart; but if so, you have probably reset it a tooth or so out. (Read the article on "Timing," issue 73). You had better try what sort of a spark you get from the end of high tension cable, as it is not easy to judge at the plug points: the spark should not be less than 3 in. long, and should make a fierce crackling sound: if it does this there is nothing much amiss with the ignition.

Broken Tricycle Axles.

W.J.G. (London) writes:—I have a De Dion tricycle, 24 h.p., gear driving, air-cooled engine. It has been in existence for two years, and in my possession 13 months, during which time I have ridden it about 1,500 miles. I have been through all the minor troubles of the novice, short circuits, overheating, etc., but my principal complaint is broken axles: I have suffered with no less than five, and am now laid up with the sixth. The machine weighs about 300 lbs., and I am 16 stone; some motorists say it is my weight; others say that is nonsense, and that it is back firing or having spark lever too far advanced when endeavouring to climb hills, which causes a twist in the axle. Be all this as it may, my only idea to get out of the difficulty is to have the machine converted into a Trimo, without seat in front, I also suggest having engine placed well up to catch all air possible, and having a water-cooled head, as I also require more power for hill climbing. It is useless trying to sell with view of buying something else, as there is no market for tricycles. I do not wish to spend more than £15 upon the alteration; ought I to get it done for this sum, and would you advise chain or belt driving, or would you suggest any other means to help me out of my trouble? As a constant reader of your paper I have picked up many most useful hints, for which I am grateful and I should be much obliged for your advice in this matter.—We can only suggest that the trouble arises from a combination of causes. (a) The motor is overloaded. (b) Running uphill with spark too much advanced. (c) Axles have not been made of a suitable grade of steel to stand the twisting strain. Of course, 16 stone weight is severe on a 24 h.p. motor; arranged to drive as a Trimo by belt and low gear it might do the work. The belt drive, of course, saves both the frame and engine; whilst a gear drive or chain has not this advantage. Avoid water-cooling if possible, it means extra

complication and all incidental worries of water-cooling systems. We cannot say if the conversion could be done at the figure named; it depends on how far you could utilise the old parts.

A.D. (Hanwell).—We cannot suggest any accurate reason for your motor sticking every third revolution: we presume you have the exhaust lifter working properly. We notice you say motor has recently been "overhauled," but you do not mention who by: there are many so-called "repairers and adjusters" who really do more harm than good to a machine, and we should not be surprised to find the 2 to 1 gear damaged, judging from numerous complaints we have received from various readers.

"Outlook" (Moffatt) suggests that possibly luminous paint could be used to paint the letters with on cars to meet the requirements of the new Act; and he asks us what our opinion is on the matter. —Well, from our experience of luminous paint preparations, they give altogether too feeble a light to be of practical use for the purpose named. Many attempts have been made to utilise them for other commercial purposes, but with no measure of success. (2) In reply to the other query, the combination would prove a good one, unless it came to climbing severe gradients, when a 2½ h.p. motor would not suffice.

Worn Bearings.

"Motette" (Birmingham).—The most likely reason for motor working with a "curious rattling noise," as you put it, is that the bearings have worn considerably; especially as you say you have had several thousands of miles' hard work out of it. The bearing that suffers most is the end of the connecting rod inside the piston: unless this is made of very hard metal it wears oval from the thrust, and in time the connecting rod may strike against the piston. The main bearing on the pulley side of the motor also has hard work. Loose bearings invariably mean lost motion and rattling. We should advise you to inspect them and replace if necessary.

A Carburettor Defect.

G.H.S. (Sutton) writes:—I have all along been troubled with perpetual overheating uphill or on level. Carburettor (Clement) repeatedly cleaned; float weight varied; needle valve ground in: no signs of flooding. I find it is practically impossible to drive on throttle because, with gas lever about four notches on, machine gives best speed and power; opening throttle further, even before engine has time to get hot, does not increase it, while two notches less stops the motor. Machine will take hardly any air, whatever throttle position: no power on hills, and machine dies off on slightest rises if spark is not kept well advanced. It has been suggested to me that unresponsive throttle and inability to use reasonable amount of air are possibly signs of a spraying tube not large enough to pass an adequate supply of petrol plus the proper proportion of air, and so I get only a scanty but over rich mixture.—You can easily unscrew the jet from underneath and enlarge the hole with a very fine broach or drill—say 1/16th inch; this will doubtless improve matters. We suspect that your compression is at fault and some leakage occurs at carburettor throttle connections.

C. J. Holt (Didsbury).—The great majority of sparking plugs are certainly not fitted with platinum points: with the exception of the E.I.C. plug we believe nickel wire is invariably used.

"Experiment" (Cambridge).—(1) The size of cylinder you mention should give ½ to 5 h.p. (2) Exhaust valve 1½ in.; inlet 1¼ in. (3) The motor would work with ordinary coal gas, but you would not get more than two-thirds power that you would with petrol.

H. Harvey (Bury).—There is no objection to your having the free engine wheel replaced by a fixed wheel. Personally, we believe the engine would cool quicker, especially if you do not open the exhaust valve to its full extent and so allow the inlet valve to act. In this way you get charges of mixture drawn in which have a good cooling effect.

Dimelmain (Felton).—We can speak favourably of the type of motor vehicle you enquire about. Minor drawbacks, however, are the considerable wear on the driving tyre, and difficulty in starting uphill due to there not being a free engine and hand starter. We should certainly have a 3 h.p. motor. The workmanship in the machine is particularly good.

A Carburettor Query.

C. A. Palmer (Hadleigh) writes:—I have just converted my roadster bicycle into a motorcycle, but have one difficulty. The first day I took it out it went splendidly, but now it will slow down and stop after about half a mile run. The engine does not overheat, as I can only just feel the heat with the hand 1½ in. away from cylinder. The only thing I can think of is the carburettor, which is a suction disc type, because, if I get off and hold my hand round it for about five minutes, the motor will go on for about half a mile, when it will get covered with frost. No alteration of the air lever makes any difference. Would it remedy matters if I fitted a hot air jacket from exhaust? Would you advise me to get a new carburettor? If so, what make do you recommend—one that will not freeze? Or do you think that the fault lies elsewhere? —Should certainly fit a hot air jacket, and provide several more holes in base of vaporising chamber. It is also probable that your spring is not of the most suitable strength. You will have to experiment carefully on this point. Either an F.N. or Longuemare carburettor will give good results.

ANSWERS BY POST.

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

Thursday, October 22nd.—J. E. Wood (Eccles), J. S. Hucker (London, S.W.), A. L. Cobb (Sydenham), G. A. Slade (Canning Town), V. J. Watson (Sheffield), M. Stuart (Weybridge), T. H. Cole (Southsea), A. J. Sheen (Aberdare), E. Farrington (Hammersmith), J. H. Curle (London, S.W.), A. B. Nichol (London, S.W.), C. A. Palmer (Hadleigh), F. W. Goad (Bath), A. Shrimpton (Mitcham), F. G. Keene (London, W.), W. Onslow (Dudley), A. Adams (York), H. Radford (Barnsley), H. Davies (Wandsworth), T. P. Throssel (Warrington).

Friday, October 23rd.—W. Cowley (Port Talbot), T. Harvey (Birmingham), W. H. Oulton (Liverpool), S. M. Massey (Ealing), J. J. Morrin (Naas), P. A. Bristow (Sidcup), H. W. West (London), C. A. Coote (Holloway, N.), H. G. Rashleigh (Wadhurst), E. A. Harris (Newquay), J. H. Emmerson (Biggleswade), F. C. Pilling (Liverpool), J. A. Plowman (Shefford), W. H. Plover (Liverpool), C. R. Allen (Cardiff), C. Osborn (Leyton), W. A. Wood (Dublin), W. W. Hayward (Dorset), J. Edge (London, W.), R. Ford (Sevenoaks), J. Aston (Birmingham).

Saturday, October 24th.—C. R. Wood (Frome), A. Cunningham (Cardigan), J. K. Entwistle (Liverpool), G. L. Wells (Drogheda), S. E. Amos (Ashford), J. B. Cooke (Ellesmere), T. Leigh Bryan (Kirkby-Stephen).

Sunday, October 26th.—C. S. Stock (Wimbleton), D. F. Jones (Jhansi, India), A. Bertram (Rothbury), H. Tattersall (London), J. E. Stephenson (Youghal), E. T. Mahoney (Blarney), T. Kannish (Winslow), H. Goldman (Birmingham), H. G. Innes (Maidstone), W. Exell (Bristol), G. H. Hedley (London), C. B. Gervis (Seaford), J. Chapman (Hammersmith), T. Hall (Bacup), T. Newton (Oxford), J. F. Stuart (Wexford), A. Roby (London, N.), R. Grayrigge (Cambridge), L. E. Cook (Alderley Edge), F. A. Morgan (Chilwell), E. S. Langdale (Blackburn).

Tuesday, October 27th.—P. J. Warman (London), J. A. Wolfe (Exeter), P. M. Lambert (London), L. N. Evans (London), W. Norman (Plymouth), J. G. Brookes (Dudley), E. J. Middleton (Wandsworth), T. Davison (Darlington), J. H. Hingston (Forest Hill), F. Richardson (Gateshead), E. Goldburgh (Forest Gate), T. Shaw (Wellington), R. Ricardo (Durham), A. Robinson (Manchester), E. S. Angove (Haxby), A. Hewitt (Ealing), B. Nutford (Honiton), J. Murrin (Torquay), G. Pohlmann (Redford), W. Gardner (Wimbleton), W. Dunn (London).

Wednesday, October 28th.—C. Osborne (Leyton), J. S. A. Jewell (London), R. A. Hooper (Richmond), T. Evans (Birmingham), J. A. Yates (Shrewsbury), J. Perkins (Leyton), H. C. Hall (Portsmouth), G. Langrish (Taunton), J. L. Kerr (Biddenden), A. Coe (London, W.), J. Deville (Wandsworth), A. F. Jones (Carlisle), G. W. Hayter (Coventry), C. E. Hulton (Bolton).

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