The Motor
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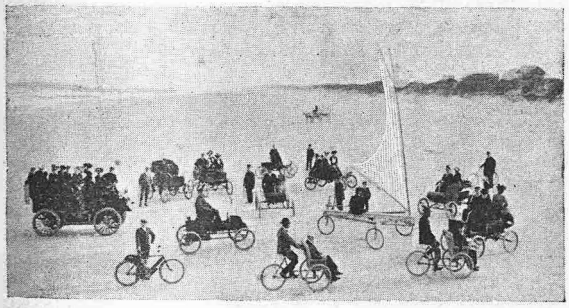
AMERICAN TOPICS.

NEW YORK, *December 22nd*, 1903.

Speed Trials at Florida.

There is every promise of a record-breaking entry list for the Florida meet next month. Last year's entry list will be more than doubled. The most prominent entry will, of course, be that of W. K. Vanderbilt, jun., who is expected to lower not only his own one mile record of forty-eight seconds, but also the world's record of forty-five seconds. Many believe that Mr. Vanderbilt will do as low as forty-two seconds. In Europe they consider Mr. Vanderbilt the greatest American driver. While in Europe W. J. Morgan asked a number of prominent Frenchmen whom they thought the best American, and all mentioned Mr. Vanderbilt. Henri Fournier said that in all his experience he had never seen a man



Motoring on the Beach at Dayton, Florida.

doff his hat while going at a mile a minute clip as did Mr. Vanderbilt at Newport over a very rough track. Fournier said that even he would never have dared to do such a thing. The dates of the meet are January 27, 28, and 29, and the events include one, ten and fifty mile championships for automobiles and five mile championship for motorcycles. There are in all twenty-three contests on the programme, made up of handicaps and scratch races, at one, five, ten and twenty miles, and kilometre and mile record trials. There will be besides record trials at all distances and for all types, weights and prices of machines for two days preceding and a week following the regular race days. Several match races of American and International interest are being arranged.

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Trophy for Collegians.

An invitation has been extended to the Automobile Clubs at Yale, Harvard, Columbia, and Princeton colleges to hold an Inter-collegiate race during the tournament and as soon as favourable replies have been received a trophy will be offered for the collegians. The expense of installing the Mors timing apparatus for the Florida races along the fifteen mile stretch of beach at Dayton and Ormonde is considerable. One of the promoters of the meet said yesterday that the thirty miles of copper wire and poles would entail an expense of at least $1,200, and possibly much more Secretary Butler of the Automobile Club of America, Chairman Pardington, of the A.A.A. Racing Board, and others of high standing in the automobile world will handle the apparatus.

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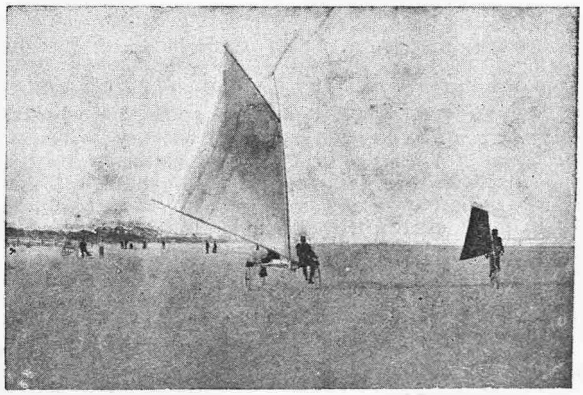
Sir Thomas Dewar to be There.

One of the prominent visitors from Europe will be Sir Thomas Dewar, ex-Sheriff of London, who is an enthusiastic automobilist, and considered a future Lord Mayor of London. Sir Thomas drives an American car. Frederick Glassup, of the Automobile Club of America, will entertain Sir Thomas during his Florida trip, taking with him his automobile to enable the famous Scotchman to view the races from all portions of the beach.

* * *

Era of Automobile Racing.

That 1904 is to usher in a great era of automobile racing in the United States seems assured. The American Automobile Association is the only organisation controlling this branch of sport, and so far it has kept it clean. Officers and members of the organisation, who realise their responsibility in the matter, are planning for the treatment of motor competition of the future on a broad and healthy basis. It has been brought to their attention that there will be an invasion in the winter and early spring of racing machines of foreign build. The number has been placed as high as 20, but 15 may be nearer the mark. In most cases these are to



Land Yachting on the Beach at Dayton, Florida.

be brought over by the American agents of French and German automobiles. In the list are mentioned Panhard, Renault, Darracq, Georges-Richard, Mercedes, Mors, Clement, De Dietrich, and Decauville. In some cases there will be more than one racer of each make, and in that of one, the Darracq, it is said there will be four, of different horse-powers and weights. Added to these, several powerful machines ordered in Europe for American owners may be available for speed competition.

Handling the Sport.

It is when they contemplate this formidable array and hear of race meets planned in all parts of the country that the few workers in the A.A.A. and their legion of counsellors realise that the great new sport must be handled in a clean, capable, and gentlemanly manner. In the past it has been so handled, though practically the entire work of its Racing Board has devolved upon R. Pardington, its chairman. It is now proposed to prepare a more adequate table of race rules and to reorganise the Racing Board, increasing its membership to seven, representative of the four sections of the United States, and giving Mr. Pardington three coworkers in the East, who can meet at short notice and give a decision on any point not thoroughly covered in the new rules.

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Trade in Second-hand Autos.

It may surprise persons who have not closely followed the trend of the automobile trade in this country to learn that the business in secondhand machines has grown to considerable proportions. It is estimated that in New York City between 2,500 and 3,000 automobiles that have seen more or less service have changed hands within the last year. About two-thirds of these have been American built vehicles, principally of the runabout type, costing when new from $600 to $1,000, and selling for the second time for from $150 to $800. A fair proportion have been American touring vehicles, built to sell for from $1,500 to $2,500, and bringing, after use, from $600 to $1,400. The other third have been foreign built machines, principally of the touring type, brought into this country at a cost to customers of from $3,500 to $20,000, and resold at figures ranging from $900 to $15,000. Age, condition, style, and demand are factors in determining prices at second sales.

* * *

The Prices they Fetch.

Inquiries yesterday at garages where both new and secondhand machines are sold brought out some interesting facts concerning the newer branch of the trade. There is a steady demand for automobiles that have seen service, though this naturally is greatest in the spring and early summer. It is then that the best prices are obtained for machines of cheaper grade. As a rule machines of foreign construction and well-known makes, such as Panhard, Mercedes, Mors, Rochet-Schneider, and Renault resell for from seventy to eighty per cent. of their original price if of the latest model, in use not more than one season, and in good running condition. American built machines of the higher grade under similar conditions bring in the second sale from 50 to 70 per cent. of the catalogue prices. The same is true of the better known domestic runabouts driven by gasolene motors, such as the Oldsmobile, Cadillac, Northern and Rambler. A machine in use two seasons further depreciates in value from 10 to 20 per cent., those of foreign manufacture being less influenced by age than the home product.

Wheel.

CHAIN DRIVE SUGGESTIONS.

By G. H. NORMAN.

Now that chain-driven machines occupy such a prominent position in the various Shows, it may not be out of place to consider whether the present principles on which the modern chain-drive is designed are absolutely correct.

The faults of the rigid chain-drive are fairly well known, but I venture to think that one fault at least is generally overlooked. I refer to the vibration of the chain itself, and its effects. This vibration results from the power transmitted by the chain rapidly varying from the full power of the motor to zero, or even to a negative quantity at low speeds. The amount of this vibration is further increased owing to the following fact: A chain in any given condition of tightness, etc., has a natural period of vibration. That is to say, if the chain be set in vibration by a sudden shock

IT WILL VIBRATE AT A FIXED RATE.

Under normal conditions this rate would be well within the limits of the rate at which the impulses of the engine succeed one another, so that the two rates will often be nearly the same. When this occurs the amount of vibration will be greatly increased, and if not sufficient to break the chain will be quite large enough to cause very great stretching. That a vibration of this kind causes a very high tensile stress in the chain may be easily shown. Take an ordinary pedal bicycle and press the top and bottom sides of the chain together with one hand. It will be found that, even with the stiffest machines, the centres of the bottom bracket and back wheel

WILL BE FORCED OUT OF ALIGNMENT.

To get rid of this effect is is necessary (1) that the pull on the chain shall remain constant between each consecutive impulse of the engine; and (2) that the chain shall travel at a constant speed between each impulse. This first condition is more or less satisfied by fitting a spring chain-wheel on the rear wheel or on an intermediate countershaft, as in the Singer and Princeps machines. But this in no way satisfies the second condition, since the chain must travel at a speed proportional to the speed of the engine; and the speed of the engine, particularly when running slowly, varies greatly between two consecutive impulses. But if the spring chain-wheel be fitted on the engine, the problem is solved. For since the first condition is satisfied by this method, the back wheel will travel at a constant speed, and therefore the chain will do likewise, and thus the second condition is fulfilled. In order that the spring chain-wheel may fulfil its functions it must be able to move through at least half a revolution relative to the engine shaft, so that for small movements the force exerted by the spring will not vary greatly.

A SMALLER MOVEMENT IS SUFFICIENT

if fitted elsewhere than on the engine, and this is probably the reason that it is not usually fitted there. But there is no real difficulty in designing a chain-wheel to have a movement of two or three revolutions relative to the engine.

I therefore suggest the following as a good scheme for a chain-drive: Spring chain-wheel on engine, for reasons already stated; short single chain from engine to back wheel, since the efficiency of one chain is obviously higher than that of two, and less complications result; friction clutch on rear, to take up exceptional shocks and to allow of coasting down hill. I have proved by practical experience that coasting with the engine at rest is as efficient

A MEANS OF COOLING THE CYLINDER

as running with the exhaust valve open, and is twice as fast and enjoyable. Such a chain-drive as this would be almost vibrationless, even at the lowest speeds. I say nothing here about two-speed gears, since they are outside the scope of this article. Of course, the champions of the belt-drive will say at once, "We obtain an elastic drive with a belt and can have a free engine if we choose without a quarter of the complications suggested." While not entering into the belt versus chain-drive controversy, I may point out that the elasticity of the belt drive is as the elasticity of leather compared with spring steel, and that in all belt-drives I have ever seen the belt had to remain in motion, although the engine might be at rest.

TO READERS.

Although we have a large staff of regular contributors, we are always pleased to consider contributions from readers, either literary, artistic or photographic. MSS. should be on one side of the paper only, type-written for preference, and if return is desired in case of rejection a stamped directed envelope should be enclosed. Snapshots by the roadside of interest to motorists are particularly solicited, and, if used, will be paid for at usual rates.

THE NEW MACHINE.

DRIVING AND CONTROL.

By "Petrolia."

We will suppose our novice the proud possessor of a brand new mount, be it high or low powered, carefully chosen according to his requirements in the manner indicated. If he has not already done so, he should first of all thoroughly acquaint himself with the action of the internal combustion engine working on the Otto cycle, a full and comprehensive explanation of which will be found in "The Motor Manual," with which he should furnish himself.

Having grasped the essential fact that the power of the motor is obtained by the explosion of a gaseous mixture by means of an electric spark, it will be further comprehensible that this power can be regulated by controlling—

1. The ignition.
2. The mixture of gas and air.

The ignition is controlled by two devices—

1. The switch.
2. The advance spark lever.

The first of these enables the rider to turn the electric current on or off. When the current is turned off the mixture can be no longer ignited, and the engine ceases working. For this reason the switch may be regarded as an emergency stop, as its use for regulating speed in actual driving is always to be strongly deprecated for reasons which will be indicated later.

The advance spark lever has for its object

THE TIMING OF THE ELECTRIC SPARK

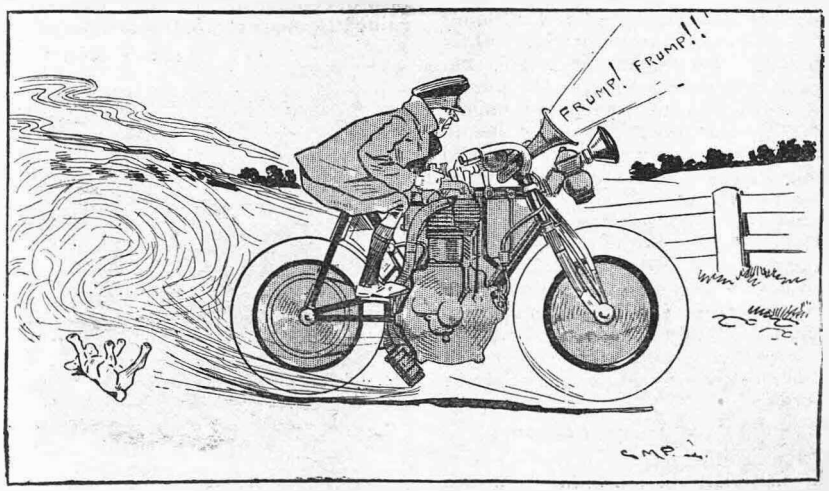
to occur precisely at the moment in the travel of the piston best suited to the actual conditions under which the engine is working.

It has been found that this variation in the point at which the spark takes place has the effect of decreasing or increasing the speed, and consequently the power of the engine. The exact explanation of this fact need not trouble the novice at the moment, being of a somewhat complicated nature. It will be sufficient if he grasps the actual fact. It cannot, however, be too clearly understood that it is the speed of the engine which should regulate the position of the advance spark lever, and not vice-versa. The mixture can be regulated both as regards quality and quantity, but the first of these methods is now entirely obsolete, owing to the inadequacy of the control thereby afforded and its harmful nature. Control by regulating the quantity of mixture admitted to the cylinder is the best of all methods, and has rapidly gained in favour, owing to the many advantages it presents.

The quantity of mixture admitted is controlled by the throttle, which is simply a species of tap actuated by a lever readily accessible by the rider. This lever is usually placed well forward on the top bar of the machine, the advance spark lever being close at hand. As

THE EFFICIENT CONTROL OF THE MACHINE

depends almost entirely on these two levers, the rider should make sure that they are at all times readily accessible when he is mounted.



"OTHER PEOPLE'S VIEWS."
The Nervous Pedestrian's view of the Motorcyclist.

The switch is usually actuated by the rotation of the left handle grip, although in some cases it is combined with one of the brake levers. Nevertheless, the rotating handle or some similar device which can be actuated instantaneously and independently should always be fitted.

The throttle, by regulating the amount of mixture admitted from the carburetter (which may be regarded as a mixture-making machine) alters the power of the explosion. Its action is therefore entirely different to that of the advance spark lever, which simply insures that the explosion shall so take place as to produce its maximum effect on the piston.

A clear understanding of this essential difference is necessary, in order to get the best results from the engine.

The momentum of the machine is controlled by two brakes, one usually acting on each wheel. It will be obvious that at no time should the brakes be applied when the engine is driving the machine. A most excellent means of control is the exhaust valve lifter, nowadays fitted to most machines. This is simply a device for lifting the exhaust valve from its seating, and holding it up temporarily, thus relieving the compression and permitting the machine to be easily started. It is superior to a compression tap on account of the larger opening it affords. The exhaust lifter, as it is usually called, is in most cases actuated by a small lever conveniently placed on the handlebar, and the Bowden wire mechanism. In some cases the exhaust lifter is combined with the advance spark lever in such a manner that when the spark is retarded the valve is lifted.

SEPARATE CONTROL OF THE EXHAUST LIFTER

is, however, to be recommended.

Although the exhaust lifter was primarily intended to enable the machine to be started more easily, it was found that, by raising the valve slightly when the motor was running the full force of the explosion did not take effect entirely within the cylinder, part of the charge escaping. Moreover, on the suction stroke, a diminished charge was taken in, owing to the reduced vacuum, the inlet valve, where automatic, remaining open for a lesser period. This latter action is in some respects akin to that of the throttle. But, as has been pointed out, by raising the exhaust valve both suction and compression are relieved, so that the explosions in the cylinder, while still taking place, are weakened more or less according as the valve is raised more or less by the lifter. If the valve be raised to its full opening, the engine will be capable of neither suction nor compression, and will consequently cease running. From all this the range of control afforded by the intelligent use of the exhaust lifter will be evident. Having now described the means of control, it remains to show how they should be used to attain the best results in actual running. The only other lever which needs mention is the mixture lever, which regulates the quality

or richness of the explosive mixture, by altering the amount of air allowed to commingle with the petrol vapour, but this lever is in no sense to be regarded as a means of control for the machine itself.

Assuming our novice to have adopted the advice given him with regard to the choice of his machine, the mixture will be furnished by a spray carburetter of sound design and construction and the latest type. If

ONE OF THE NEW TYPES OF SEMI-AUTOMATIC CARBURETTERS

be fitted, a certain amount of manipulation of the mixture lever will be avoided, but it is still necessary to fully understand its action. The ignition is likewise supposed to be the usual high tension system, by accumulator and coil.

The rider should first of all make certain that the petrol and lubricating oil tanks are filled, and that the caps closing these receptacles are screwed well home. If the habit of examining the tanks before starting out on a ride be once acquired, much annoyance will be saved. Want of petrol is a fruitful cause of breakdown, and may occasionally not be due to carelessness on the part of the rider, a leaky tank or union or a fractured pipe being the cause. For this reason it is always wise to carry a reserve of the spirit, and if an extra tank is not fitted for the purpose, one of the small cans sold in various sizes specially for this purpose should be strapped to the combined stand and carrier. In the type of machine under consideration the engine is always in gear with the cycle, being connected to the rear or driving wheel by means of the belt, which runs over a small pulley on the engine and a large one on the wheel. The ratio of the pulleys is about 13 : 2, varying, of course, according as the machine is geared higher or lower. The reason of the disparity in the sizes of the pulleys is that the engine runs at an enormously high rate of speed, the normal in most cases being some 1,700 revolutions of the crankshaft per minute. But if the 26 inch wheel of the bicycle were to turn at anything like the same speed, the lowest pace it would be capable of would be utterly impracticable on the road. Hence the necessity for gearing down. The rider will be well advised to mount the machine on the stand

PREPARATORY TO STARTING OUT ON THE ROAD.

Having fixed the machine securely, the " touche " or interrupter plug, which is simply a device enabling the current to be turned off by the removal of a small metal plug conveniently interposed in the electric circuit, should be placed in position. The " touche " is useful as enabling waste of current and harmful running down of the accumulator to be avoided. For this reason the rider should accustom himself to remove the " touche " immediately after each ride, and on all occasions on which the machine is left unattended. Another point to which he should always attend is the turning on of the petrol tap when starting and the turning off when stopping. It may, perhaps, seem unnecessary to insist on these points, and yet it is extraordinary how much trouble can be avoided by acquiring the habit of doing these apparently insignificant actions automatically. Having then inserted the "touche," turned on the petrol, and given the engine a charge of lubricating oil from the pump, the rider may get into the saddle and turn the switch handle till contact is established. The exhaust lifter lever should now be pressed so as to lift the valve, and the pedals rotated vigorously, the lever being released when a fair speed is attained. Very probably the motor will not start working, and it will be necessary to manipulate the air lever till the correct mixture is found. As the position of this lever varies in the case of each carburetter, it is impossible to give any exact indication as to how it may be found, but it may be roughly stated that the aperture should be almost entirely closed at starting and gradually opened as the speed of the engine increases. In other words, a somewhat rich mixture, being rather more easily ignited, is advisable at starting and for slow speeds.

THEORETICALLY THERE IS ONLY ONE CORRECT MIXTURE

for all speeds, supposing the igniting power of the spark to remain constant, and the fact that this variation is necessary is only due to the imperfect action of even the best specimens of the best type of carburetter—the spray. This

defect is, however, now being gradually overcome by the introduction of automatic and semi-automatic carburetters of varying degrees of merit. The full consideration of the subject of carburation, being of a somewhat abstruse nature, would be out of place here, and will be dealt with later. Meanwhile the rider should carefully note the position of the air lever necessary to enable the motor to be started, and also the degree to which the aperture may be increased when the machine is running, without lessening the power, owing to weaker explosions caused by an excess of air. The mixture must also be varied to compensate for various degrees of opening of the throttle, all of which will be learnt by experience in actual running. We are at present assuming that the throttle is fully opened and the spark advance lever pulled back to retard the sparking. In some machines the lever is pushed forward to effect the same object.

The sparking should always be retarded at starting, this being a rule admitting of no exception. The throttle must be fully opened to allow of strong suction on the carburetter, thus admitting a full charge to the cylinder. If, then, the charge be rightly proportioned, and the spark allowed to pass at the right moment, the engine, having completed the suction and compression strokes, will fire on the explosion stroke, and the motor will commence running with powerful explosions (owing to the full charge) and at a comparatively low number of revolutions (due to the retarded sparking).

If the throttle be now partially closed, the explosions will be less powerful, the piston speed and

THE MOMENTUM OF THE FLY-WHEELS WILL GROW LESS,

and the number of revolutions will decrease. It may also be found necessary to vary the mixture. At this stage the air lever should be manipulated till the correct mixture is found. There are several means by which the rider can tell when this is the case, the principal being that the engine will run at the highest number of revolutions for that particular degree of throttle opening and spark advance, thereby giving off the best possible power under the given conditions. The rider is in some degree enabled to judge the speed of the engine by the frequency of the explosions. The ear, in fact, is the best of guides in judging the proper working of the engine, a further estimate of the correctness of the mixture being arrived at by noting the sound of the explosion. Only practice and experience can aid the rider in this respect, but it may be roughly stated that the explosion of a perfect mixture gives a sharper resultant sound than that of a mixture imperfect by reason of a want of or excess of air. Hence practice with the air lever is advisable while the machine is still on the stand, and the rider's attention can be fully concentrated on its working, which would not be the case if he ventured out on the road.

It may be mentioned here that an air-cooled engine should never be run for more than a minute or so on the stand, without allowing a few minutes to elapse for the purpose of cooling the cylinder. The engine may be irretrievably ruined by neglect of this precaution.

(To be concluded).

"Something gone wrong?"

MAGNETO'S POINT OF VIEW.

Better Lamps Wanted.

I have recently come to the conclusion that we have not yet got the perfect motor-bicycle lamp. It has struck me as strange that our best-known makers of lamps have never yet seriously tackled the problem of how to make a lamp specially suitable for a motor-bicycle. The features of such a lamp, in my opinion, would be these: (1) It should give a light of at least 20 c.p., actual c.p. that is; (2) it should not be big or unsymmetrical in design, or looking like a slightly reduced facsimile of a motorcar headlight; (3) it should be easy to clean and light; (4) it should keep alight even in a gale, or when travelling over the roughest of pavè; (5) it should have a substantial and closely-built spring back to avoid a big leverage on the lamp bracket. Oil lamps can be made that will keep lit even in a hurricane, as witness the masthead lights of ships, but up to now I have not been fortunate enough to come across a motorcycle lamp that I could honestly say had not at some time or other jolted out, or perhaps a gust of wind would insinuate its way through the ventilating holes when rounding a corner, and out it would go. The light given by some of the special lamps sold as suitable for motorcycles is out of all proportion to their size. It is really very little consolation to have a gorgeous lamp for daylight use, and a feeble 2½ c.p. of light at night. Given a good light in front of him at night, the motorcyclist feels vastly safer, and hasn't to be nervously clutching his switch handle all the while.

Paraffin v. Acetylene.

I am not particularly enamoured of acetylene. I grant that it holds the field as the most brilliant light-giver, but it is a system that necessitates constant attention in the way of cleaning the carbide reservoir of the lamp on every run, whether it be for one hour only or six hours' duration. Paraffin, it seems to me, must ultimately prove the motorcyclist's illuminant, if only we can get the right kind of lamp to burn it in. It is an oil one can get anywhere, even in the remotest village: it is clean in use, as compared with the sticky colza and sperm oils, and there is never any trouble in getting it to light. With colza or sperm one has to be careful of the wick: it must be the right texture, and not too tight a fit in the holder. With paraffin any wick will do; in fact, if you run short of a wick a piece of felt or flannel will do for the time being.

A Suggestion.

I have been wondering whether it would be possible for lamp makers to design a lamp with, say, a set of three parallel wicks on the principle of the ordinary optical or magic-lantern. If there were three wicks, say, ¾ inch or one inch wide each, a very fine light should result, and there would be the advantage that if one wick did blow or jolt out, there would be the others left alight, and it would not be necessary to jump off the machine there and then to relight. I know there would be difficulties to contend with in the constructing of such a lamp that would at the same time be reasonably small in size. There would be the heat given off by the multiple wicks to contend with, and everyone knows that paraffin gives off very much more heat than other oils. Then there would be the air draught to provide to ensure smokeless combustion, and very probably a glass chimney would have to be provided.

Some Drawbacks.

I do not consider that the fact of the lamp having a glass chimney would be a drawback. Of course, many will say that the chimney would always be breaking. Honestly, I don't think a chimney of the right kind of glass would break in a season's use, unless it was dropped or broken by force. Lamp chimneys made of the best annealed Jena glass will stand very sudden changes of temperature, and not even crack. The reflector of the lamp I have in mind would be something on the locomotive headlight principle, not giving too divergent a beam. The finish of the lamp should either be black enamel with gun metal, or, if a polished lamp was desired, I would suggest it be made of aluminium, by reason of its non-oxidizing or tarnishing property.

Radium and Motors.

At first sight it may not be apparent what radium has to do with motors of any kind, but there is no doubt about it according to the halfpenny dailies. I was fully prepared for the advent of the radium-propelled motorcar, but I scarcely expected it would come so soon. I read that it is simply a question of getting the wonderful element in somewhat larger quantities than at present. A 100 h.p. car will be driven incalculable distances on an ounce of the stuff, all the details are worked out, and as soon as that ounce of radium comes along the present motor system is as good as dead. Nothing has astonished me of late so much as the fact that radium has proved to be the best space filler the popular dailies have had for many a long day. The yards and yards of clap-trap they publish about its properties and what it is to do are more astonishing than the properties of the stuff itself. The question was put to me the other day by a practical motorist—in all seriousness—if I did not think that radium would prove ultimately to be the magic substance to solve the ignition problem, and get over the everlasting trouble with spark plugs, batteries, and magneto machines. I asked him why. He said he understood from the papers that radium gave out perpetual heat, and if it could only be concentrated why should it not be used to explode the gas in the engine cylinder? If Mons. Curie, who knows more about radium than any scientist living, reads his "Motor" and sees this, I think he will smile. The amount of heat given out by a fair quantity of the stuff, that is to say, about 1-100th part of an ounce, raises the temperature of the surrounding air by about two degrees, if I remember rightly. To explode the charge in a petrol engine requires a temperature approaching a white heat.

Futile Expectations.

It is a curious fact that there are any number of motorists who always firmly believe that we are on the threshold of some marvellous invention to do away at one stroke with electric ignition of every type. As a rule, I find that motorists of this class have never had the patience to study even the rudiments of what is undoubtedly the most fascinating part of the petrol engine. Then they have a slight trouble through a loose wire, perhaps, and don't know exactly what to look for, and they condemn the whole thing. I don't think there is much chance of the electric spark being ousted from the field. Since Lenoir first used the spark on his gas engine in 1862 nothing better has turned up in the intervening 40 years, and we are not likely to go back to tube ignition at any rate. Radium just now is a name to conjure with. I shall be disappointed if some accessory firm does not give us a radium spark plug shortly.

Keep the Driving Pulley Tight.

Driving pulleys unless screwed up quite tight and "solid" with the shaft are liable to be destroyed—at least the keyway in the bore of the pulley may be stripped. The intermittent impulses of the engine loosen a badly fitted pulley in a very short time, and it is well worth while before riding a new machine to specially see that there is no trace of a slack fit in the pulley, and that the nut on the shaft is screwed up tight and a lock nut fitted when possible.

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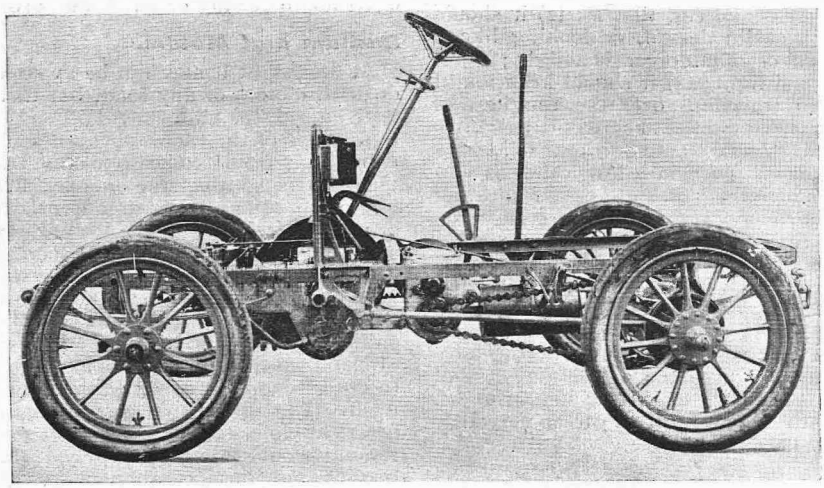
THE WOLSELEY LIGHT CAR.

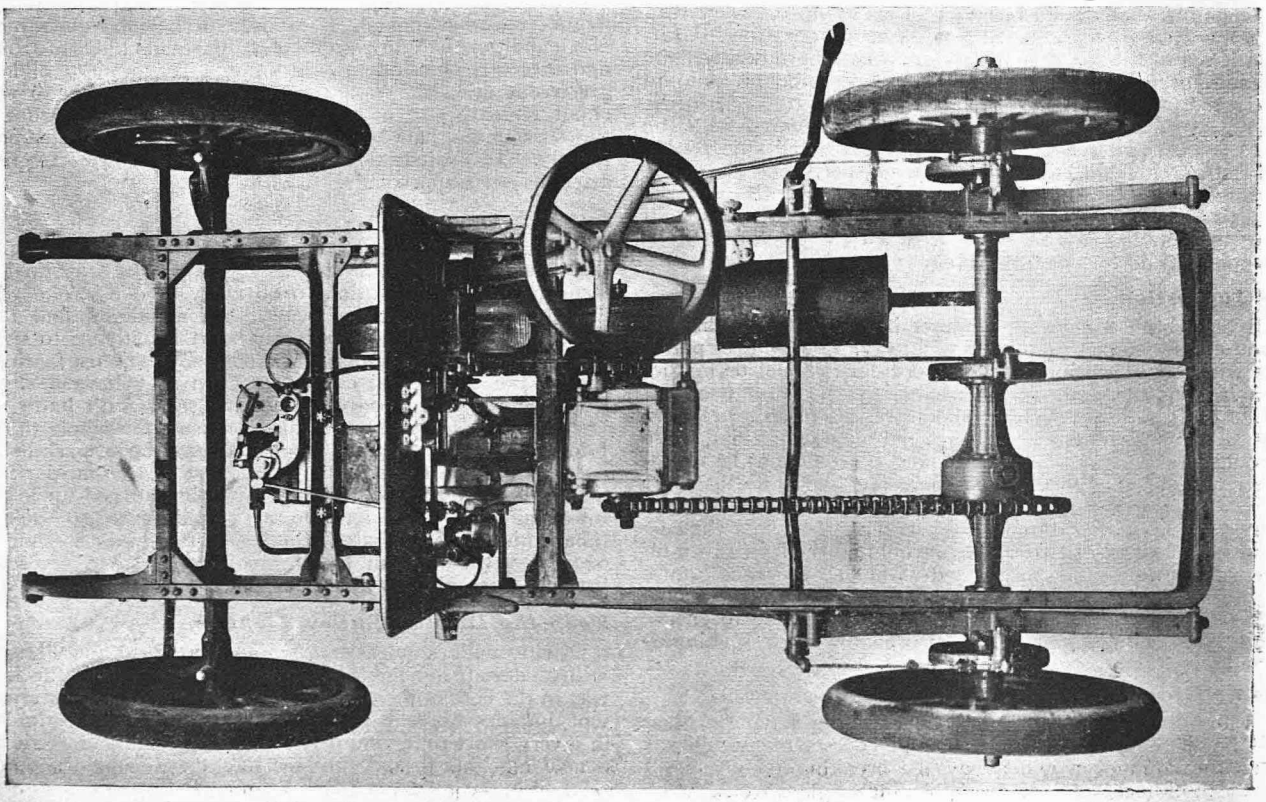
As we reported in our last issue, the handsome little two-seated 6 h.p. Wolseley car which was exhibited at the Paris Salon attracted an extraordinary amount of attention and created a most favourable impression. In every respect it is a miniature Wolseley (and what a great deal lies behind this definition!) and is in every respect worthy of the great Birmingham house which has done so much to prove to Britishers that it is not necessary to go out of this country in order to secure a reliable up-to-date and highly finished automobile. The Wolseley Company are certainly wise in their generation to cater for the man of moderate means, and that same man requires no assurance from us that this famous firm are able to give him all that is best for his money. That they are going seriously into the business is evident by the fact that they are opening commodious works at Crayford, Kent, which will be given over entirely to light car construction. Costly plant is being laid down so as to ensure an output of twelve cars per week, and a large track is being made for testing purposes.



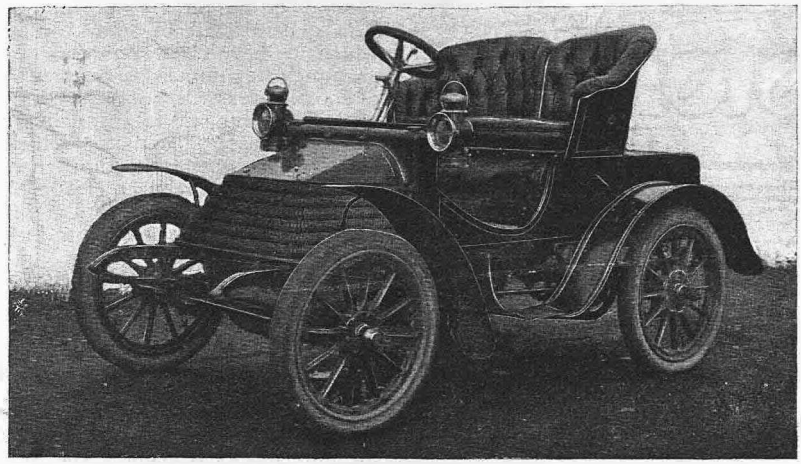
Chassis of the New 6 h.p. Wolseley Car.

We are in a position to supplement the recent report by further particulars regarding this little car and also to give various illustrations of it.

The 6 h.p. engine is of the single-cylinder horizontal type. It is placed in front under a standard pattern Wolseley bonnet, and has a 4½ in. bore and 5 in. stroke. Normally it runs at 800 revolutions per minute, but no governor is provided and the motor is capable of acceleration to about 1,000 revolutions per



CHASSIS OF THE NEW 6 H.P. WOLSELEY CAR (In Plan).

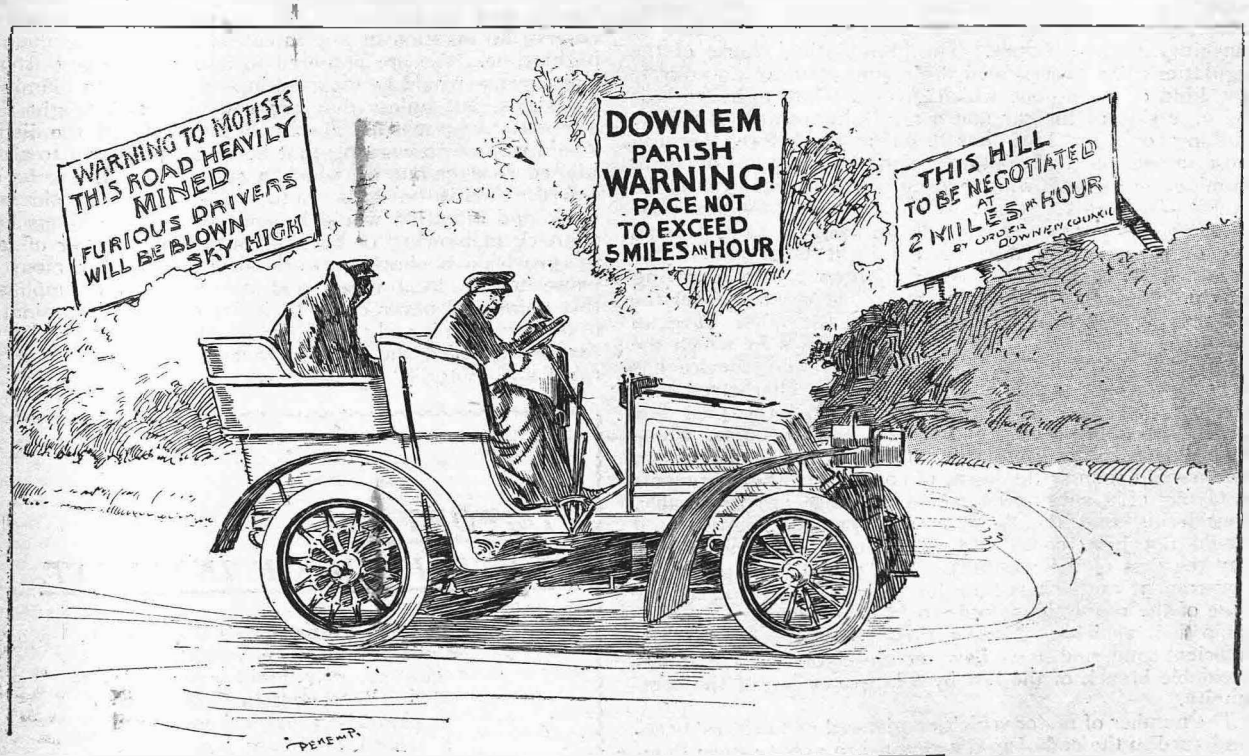


The 6 h.p. Wolseley Light Car.

minute. Great care has been taken to perfectly balance the moving parts in order to reduce the vibration, and a heavy fly-wheel is provided. The gear-box is placed immediately behind the engine, and the gearing, which is of the usual Wolseley type, provides for three forward speeds and one reverse. The forward speeds are respectively 7, 13 and 20 miles per hour, the maximum accelerated speed being about 25 miles per hour. The friction clutch is of the leather-faced cone type, and is easily operated by a foot pedal in the usual way. It is driven from the engine shaft by a Renold silent chain. The lubrication is by gravity from a reservoir fitted on to the dashboard. The reservoir has a gauge glass, and separate pipes with independent sight-feeds lead to all important bearings. The framework, which is exceedingly strong, is of steel channel section and all the springs are semi-elliptic and extra long and flat. The back of the car is mounted on a transverse spring. Accumulators and a high tension coil provide the electric ignition, and the contact breaker is gear-driven. The timing is effected by rotating the contact breaker about its shaft. A float-feed spray carburetter is employed. This is controlled by a hand-operated throttle, the petrol being fed to it by gravity. A new design of back live axle is fitted, and it is claimed that it embodies many of the advantages of a dead axle. It is driven by a central chain from the countershaft. A sheet metal screen shields the engine and gear from rust and dirt. The car is powerfully braked. The brake pedal actuates a band brake on the differential box and the side hand lever operates equalised band brakes acting on drums on the driving wheels. It is stated that both retarders act equally well in either direction. Artillery wheels of 28 in. diameter are fitted, and these are shod with 3 in. pneumatic tyres. The wheel base is 5ft. 6in., and the track 4 ft. As we remarked in our opening sentence, the body, which has a very attractive appearance, possesses two seats. These are of the bucket type. A tool box is provided at the back, the coach-work is really excellent and the enamelling all that can be desired. Any colour can be used to suit the purchaser's requirements.

THE RADIATORS

are of the usual neat Wolseley design, the water circulation being maintained by a rotary pump. The total weight of the vehicle is 8¼ cwt., and its price (which includes two side lamps, oil can, horn, and kit of tools) is only £175. Altogether this elegant little automobile is a noteworthy addition to the light cars of this country, and we have no hesitation in stating that it will speedily leap into popularity, and so prove another Wolseley success.



MOTOR SPEED.

THE GOVERNOR: "What are we to do now, Chaffers?"
CHAFFERS: "I'm sure I don't know, sir. I'm afraid to move!"
THE GOVERNOR: "So am I; you'd better get down and wire to town for an auctioneer, and we'll sell the car, on the spot, as it stands."

The Motor
INCORPORATING Motor Cycling & Motoring

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

Conducted by
EDMUND DANGERFIELD
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OPINION

The Act and Its Delays.

The new Act came into force on New Year's Day, but we have not yet heard of any attempt to enforce it on the part of the police. The County and Borough Councils are, in a good many cases, greatly behind with the work of registration and the issue of numbers and licences, and it has been mainly owing to this fact that so many cars and cycles are still to be seen about without the identifying label. Another cause for delay is the fact that number plates, lamps and lamp brackets are as difficult to obtain as a gleam of sunshine in these islands. The illuminating clause of the regulations has necessitated the manufacture of an entirely new kind of lamp—one which gives a white light towards the near side of the car and a red light towards the rear. Nothing of that kind has been made before, because those made on the Continent for the purpose of plate illumination have shown the white light towards what is the "off" side in this country. They would be useless for use on our roads because, having to be fixed on the left-hand side of the car, the warning red light would be in the wrong place, and would mislead the driver of a following vehicle. Very few makers are really prepared to meet the demands of car owners, especially as the latter have an almost bewildering number of different ways in which the lamp is to be supported, and so the clamping device has to be in various positions and of various characters. Altogether, the accessory trade has, during the past few weeks, had more worry and trouble than enough, whilst the profits have not been large enough to compensate them. Matters will soon settle down, of course, but the arguments in favour of a substantial period of grace are irrefutable. Considering that the Act was only passed in August, it should not have come into force until about next April (say the first of the month!). This would have given the Government authorities time for their vacation and for the issue of the regulations, and would have enabled owners to equip their vehicles. As it is, there has altogether been insufficient time, and so we have the unwelcome fact of an unavoidable breach of the law by a large portion of the community.

The number of motor vehicles registered and drivers' licences issued to the end of 1903 amounted to about fifteen thousand, London showing by far the largest figure, namely, a little over two thousand five hundred. The proportion of motorcycles in these figures is curiously small, amounting in England and Wales to only one-third of the total. In Ireland, on the other hand, motorcycles have a slight lead. This general state of affairs does not warrant the opinion which we have elsewhere seen expressed, that motorcycles are much less numerous than was thought. Many owners of motorcycles will, in the next two months, be disposing of their mounts and taking delivery of their new machines, and as each specific motor vehicle must be registered, a rider would rather wait and then register his new machine, and leave the purchaser of the old one to carry out that formality for himself. So the influx of motorcycle registration will not take place until about March.

Road Signs—and a Moral.

That the new Act is not to be allowed to become a dead letter in any one of its particulars is amply proved by the fact that, at the instance of the Local Government Board, a conference of representatives of the County Councils and Municipal Corporations of this country was called last Thursday to consider various proposals and designs for the new notice-boards and warnings which are to be erected by the local authorities under the Act. It is satisfactory that the authorities are showing no inclination to shirk their new responsibilities, but instead are getting early to work and are attaching due importance, not only to the need for uniformity in the character of the signs to be erected, but to a general agreement upon the conditions or circumstances which shall justify the erection of a warning board. It has been decided that a red solid disc eighteen inches in diameter shall be used to notify drivers of cars that the road in front is prohibited to their vehicles. For ourselves, we think that a warning should also be placed at the previous fork road, so that a driver who desires to pass right through should be able to turn off and so avoid driving on to a road which, so far as he is concerned, will prove a *cul de sac*. Where the speed of motors is to be limited over a certain stretch of road the fact will be denoted by a round white ring with a plate below giving the limit in figures. A green equilateral triangle will be used to mark dangerous corners, cross roads and precipitous places, and all other notices under the Act are to be on diamond-shaped boards. Various matters in connection with the position of the boards were settled, but we observe no mention of any intention to illuminate them at night time. We are prepared to admit that great trouble and expense would be incurred in any attempt to illuminate the signs, but unless they are conspicuous at night time a motorist who was not absolutely familiar with the district would receive no warning that he was running on to a prohibited road or one on which a speed limit had to be observed. And if the signs are to be illuminated, considerable work and attention would be entailed because lamps have a knack of blowing or burning out. As a matter of fact, the provision is almost unworkable except at enormous expense to the local rates, and motorists must emphasise this point and never cease to insist upon the illumination of the speed limit and prohibition discs. For the greater the expense entailed the smaller becomes the chances of the rabid anti-motorist.

IMPORTANT LATE ITEM OF INTEREST.

Just as we go to press it occurs to us to inform our readers that the anniversary number of "The Motor" will contain many startling surprises, and will constitute a record in penny journalism.

NEWS.

Watch for the Anniversary Number.

It will contain some startling surprises, and will be a revelation to those who now think "THE MOTOR" a wonderful penny-worth.

The King of Italy has accepted the honorary presidency of the Italian Motor Club whose headquarters are in Milan.

Henri Fournier, the well-known motor-cyclist and motorist, has been appointed sole agent for Paris for the Mercedes cars.

A new London manager of the Daimler Motor Co., Ltd., has been installed in the person of Mr. U. Stratton. He was formerly of Wolverhampton and Bexhill-on-Sea.

A headline in an American paper reads "Strikes Brisk Gait." When you have read the par through you realise that it means that the motor industry is flourishing in that particular locality.

It is rumoured that the proprietors of the Selden patent will seize W. K. Vanderbilt's Mercedes car on its arrival in America. This car was one of the exhibits at the recent Paris Show and was bought by the Yankee millionaire.

Owing to a small error in the Minerva Company's advertisement the address of the company's spare parts and repairs depot is given as Farringdon Street, whereas it should have been Farringdon Road. Will readers please note this correction.

The sole agency in Great Britain for Tony-Huber cars has been secured by The Paddington Motor Co., Ltd. The company has a large garage, repair works and electric charging station at Banister Road, Kensal Rise, W., and will shortly open West-end show rooms.

A Midland automobilist was fined last week 20s. and costs for exceeding the twelve miles an hour limit. He denied the charge, and after the conviction asked, "Am I judged to have lied?" The magistrate's clerk merely replied that the Bench had decided the case. Verb. sap.

The great inventor, Hiram P. Maxim, despite his Titanic brain, is subject to the same sensations of cold as ordinary mortals. When trying the new Columbia Runabout recently in America on a cold day he wore three pairs of trousers, one pair of socks, one pair of golf stockings, one pair of leather breeches, two undershirts, one overshirt, one vest, three coats—the outside one being of leather.

"In general," says a writer in the "Motor Age," "roads in California are not good, although there are some excellent runs. That from San Francisco to San Jose is one. This is an oil road, quite a number of which are found in California. These roads are made by using quantities of oil which, combined with the sand, form a surface almost as smooth and hard as asphalt. I easily made the trip over this road from San Francisco to San Jose—a distance of 43 miles—in an hour and a half."

The Hon. Leopold Canning has been touring in Spain on a Clement car.

The Bath Rural District Council proposes to fix the speed limit at 12 miles an hour over the whole of their district.

An enterprising "number plate" agent did some good work in distributing circulars in Spring Gardens last week.

The second annual dinner of the Motor Cycling Club was held on Tuesday last. Mr. S. F. Edge presided over 80 members and friends.

Two important motor shows in America will take place during the first and the second weeks of March, at Cleveland and Buffalo respectively.

Though we are never short of material with which to fill our columns, it is as well that readers should know we are always open to consider contributions.

"Cycling" introduces an interesting new feature this week in its "Round Table Conference." The first topic discussed by a quartette of the staff is "Motor Registration and its effect upon the future of Cycling."

One of the most interesting motor events of the near future is the anti-side-slipping trial organised by the Automobile Club of Seine-et-Oise in France. This will last for four days and will include circular daily runs from Versailles and back, averaging 140 miles. The date of the event is February 24th to 27th.

Subscriptions to the Ripley Road-Menders' Dinner Fund are solicited from those motorists who use the Portsmouth Road. Mr. J. Burden Barnes, 68, Victoria Street, Westminster, S.W., will gratefully acknowledge donations.

It is rumoured that an Italian military genius, Capt. Cantimo, has discovered a practicable method of applying electromotive power to the wheels of baggage waggons, and that the Italian War Minister has authorised experiments in this direction.

The late Count Zborowski, whose tragic death last year from a motor accident will be remembered, was a considerable owner of land, house and theatre property in America, and has left over half a million of money to his widow and son.

Tourists in Southern Europe will soon be able to avail themselves largely of the motor vehicle in travelling. A service of cars is to be established between Switzerland and Italy along the Valmer-Lucarno route, and connecting Pallanza and Gravellona on Lake Maggiori.

About 15,000 motor vehicles have already been registered.

The first Scotch number S1 appropriately fell to Sir H. Macdonald, K.C.B., the president of the Scottish Automobile Club.

A humorist writes that he prefers a motor-bicycle to the ordinary pedal-propelled kind because there is more spirit in it.

New York motorists want a 5 or 10 mile macadam speedway, where road races can be held without danger to spectators or other users of the road.

A large number of Midland motor-cyclists are keen golfers, and are frequently to be seen—particularly on Sunday morning—riding to the links with their sticks (carried in baskets) strapped to the forks and handlebars.

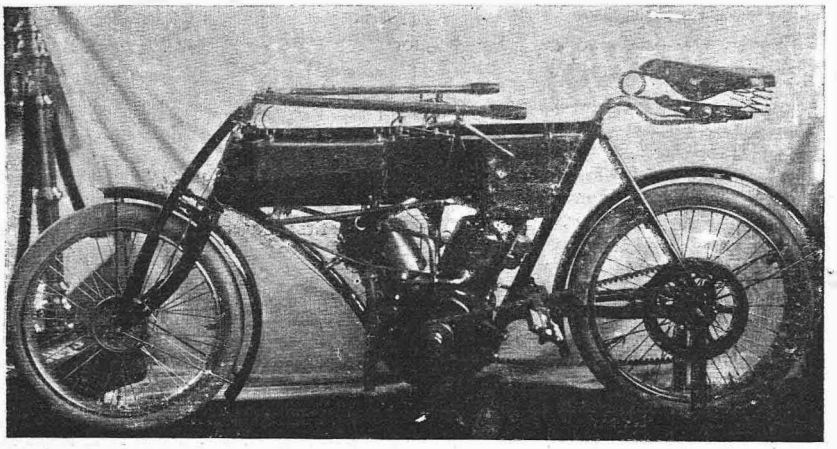
The heavy snowstorms experienced in America in December provided a good test for the reliability of the motorcar. Street cars and railroad trains were frequently "held up," horses were continually "coming down" or "stuck fast," but the automobile came through without a hitch.

In spite of protests from the Yorkshire Automobile Club and the Leeds Motor-cycling Club, the Leeds Watch Committee has decided to apply for powers to restrict the speed of motor vehicle to ten miles an hour within a two-mile radius of the middle of Briggate, and to seven miles an hour within a one-mile radius of the same centre.

PARKER: "Have you seen the latest daily? 'Traps,' fine idea, gives early morning telegrams of police traps all over the kingdom, only 1d. !!"

SPARKER: "By Jove, what a grand idea! If I only had seen that yesterday I should have saved a fiver !!!"

D5



The N.S.U., a racing freak exhibited at the Paris Show.

The Industry of the Future.

"The automobile industry is the young man's chance," says the Chicago "Motor Age." "There is room for a whole lot of good men in the business. There are good men in it now, but not enough to go around the hundreds and hundreds of positions to be filled, or which are now poorly filled. The industry is still new and it has yet to branch into scores of new fields."

The L.G.B. and Speed Limits.

At the conference of the County Councils' Association and the Municipal Corporations' Association, reported in this issue, no general discussion took place as to the desirability of establishing a lower speed-limit than the ten-miles limit suggested by the Local Government Board; but Mr. Monro stated that the Local Government Board desired that, although under section 8 a lower limit than ten miles could be fixed, such low limits should not be adopted.

Roadside Warnings for Motorists.

The County Councils' Association and the Municipal Corporations' Association met at Parliament Mansions, Westminster, on Thursday, January 7th, to discuss the question of the signs and notice boards which, in view of the powers given to local councils by the new Act, may have to be erected on certain roads. It was felt that uniformity of design and signification in the notice boards themselves at least was desirable, although the question of material, size and colour of the posts was left to the individual councils to decide. The following signs—which will have to be submitted for the approval of the Local Government Board—were adopted:—

(1) For ten miles or lower limit of speed: A round, white ring, eighteen inches in diameter, with plate below giving limit in figures.

(2) For prohibition: Red, solid disc, eighteen inches in diameter.

(3) For caution, dangerous corners, cross-roads or precipitous places: Hollow, green equilateral triangle.

(4) All other notices under the Act to be on diamond-shaped boards.

All notices to be on one side of the road and facing approaching driver. All prohibition or caution boards to be fifty yards from spot to which they apply.

D6

The Association of Austrian Cycle and Motorcycle Dealers proposes to organise a long-distance run for cyclists, touring-cyclists, and motorcyclists. Vienna-Brünn, a stretch of 140 kilometres, will in all probability be the course.

A very large number of motorcar and cycle speed and reliability trials, exhibitions, etc., are fixed for the early months of this year on the Continent. All the great nations of Europe are displaying unusual activity, under the auspices of their automobile clubs and motor journals in developing the industry.

The P. and R. Terminal Cap.

The new cap and connection for low tension wires which we referred to last week as having been introduced by Messrs. Peto and Radford, of 55, Hatton Garden, London, E.C., is illustrated by the accompanying woodcuts, which give an exterior view of the cap in position on the terminal of an accumulator and also a sectional view. The cap is of vulcanite, into which is securely fastened a metal plug, the latter being threaded so that the cap can be screwed on to the terminal of the battery. The vulcanite bedding down on to the indiarubber plug of the battery, the whole of the metal portion is protected from acid fumes and splashes, and in this way corrosion of the positive terminal is prevented. The sectional view shows the insulated wire being carried through the cap and soldered to the metal plug. The result is that there is no exposed metal near the battery. The makers are selling the cap complete with wires of any desired length, but the standard article has attached a foot of rubber-covered wire ending in a small connecting piece. The price for the cap and wire has not yet been fixed, but the arrangement is so simple that it cannot be otherwise than inexpensive. With terminal caps of this kind at the battery end of the wires and the "Perfect" connection at the other end for the coil and switch, the motorcyclist can overcome most of the minor troubles attaching to the use of electric ignition.

The "Electrical Times" Directory (cloth 2s.) contains particulars of upwards of 700 places in the United Kingdom, where batteries and accumulators may be recharged. It should prove of service to motorcyclists and motorcarists. A useful map is also included.

The Wearwell Motor Carriage Co., Ltd., Wolverhampton, have a small number of their last year's 2¼ h.p. motor-bicycles unsold. Some are shop soiled and a few are secondhand. All, however, are, we understand, in perfect running order, and are being offered at very low prices with a view to effecting a clearance.

Motor-cycling in Austria.

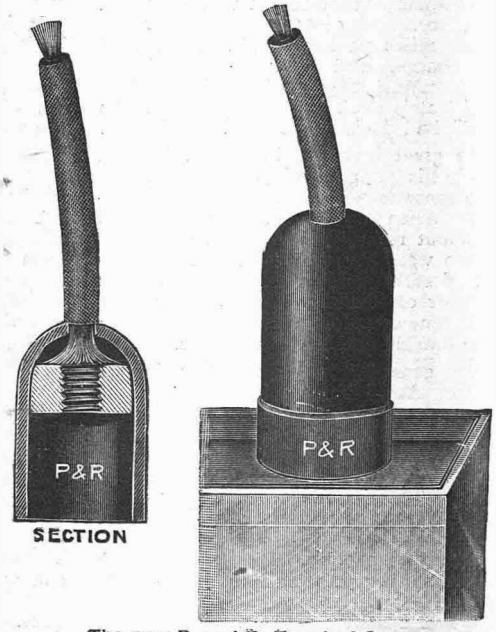
A new motorcycle association has been formed in Austria under the name Verband der Motorzweiradfahrer fuer Oesterreich. Like the Motor Cycling Union of the Austrian Motor Club, it is an offshoot of the Austrian Touring Club. There are thus two associations at present looking after the motorcycling interest in Austria.

Its Fourteenth Year.

"Cycling" is entering on a new lease with its 27th volume, which was started last week. The only English cycling paper appealing to the public has mapped out a strong programme for 1904, and a number of interesting new features are introduced. Those who follow cycling as a recreative pastime or an athletic pursuit will find "Cycling" a most attractive journal.

The Gordon-Bennett.

The German "Sportverein" (Berlin), whose President is Prince Aribert von Anhalt, has decided to organise a "Concours hippique" and a "Blumencorso" in connection with the Gordon-Bennett race. A special committee of the "Sportverein" will co-operate to this end with the Gordon-Bennett Commission of the German Motor Club. Our correspondent understands that Switzerland has entered an 80 h.p. Dufaux, to be made by the Dufaux firm at Amélie-les-Bains.



The new P. and R. Terminal Cap.

The Motor Cycling Club Dinner.

The second annual dinner of the Motor Cycling Club was held at Frascati's Restaurant, Oxford Street, London, on Tuesday evening, January 5th. The number of members and friends present on this occasion was much larger than last year, no less than 80 being present. The function was held in the large Banqueting Hall. There were present many of the leading spirits in London automobilism, including Mr. S. F. Edge, Lt.-Col. Mark Mayhew, Mr. J. W. Stocks and others. After the toast of "The King," Mr. T. McDonald Rendle gave a speech cast in a humorous strain in which he touched lightly and frivolously on various phases of the progress of motorcycling and the curious ideas of the death-dealing powers of the new machine entertained by many of the public. He proposed the toast of the success and prosperity of the club. The president of the club, Mr. S. F. Edge, then replied, and in an interesting speech told how the club had progressed, its membership being over a hundred and a substantial bank balance remaining. He dealt with the 200 miles non-stop runs held during the past season, and thought that the passenger trials should be made a special feature in the 1904 programme. He said he would be pleased to offer another cup for competition with this object in view. He then mentioned the value of the "Gazette" as a feature of the club and paid a well-deserved tribute of praise to the editor (Mr. S. H. Fry). He trusted that motorcyclists would loyally observe the regulations of the New Act, so that there would be a chance of getting further concessions from the Government and, perhaps, the ultimate abolition of the number plates. He thought that it was perfectly reasonable to claim that motorcycling had progressed in England very much more than in any other country, and that the trade was increasing in a very satisfactory manner. The next speaker was Lt.-Col. Mark Mayhew, who proposed the toast of "The Executive." As head of the Motor Volunteer Corps, he was able to bear testimony to the great value of the motorcyclist in the military manœuvres, and trusted that more members of the club would join the corps. He then mentioned the excellent work done by the executive in promoting the interests of the club. Mr. J. A. Jackson replied on behalf of the committee, and in a very humorous speech eulogised various members thereof, creating much laughter by throwing a sidelight on their personal weaknesses and virtues. He thought the secretary, Mr. Roberts, deserving of special praise. The cup and medals won by the members in the 200 miles' trials were distributed. The display of lantern pictures by Mr. van Hooydonk then followed, and was exceedingly well received, loud applause greeting the various pictures depicting stirring motorcycling events on road and track. Mr. E. Perman then proposed the toast of "The Visitors," and mentioned the good work being done by the Auto-Cycle Club as a body which in no way came into competition with the Motor Cycling Club. He stated that the special feature of the Motor Cycling Club was the social side, which would be more and more developed. Mr. Candler then replied as a member of the C.T.C. and Auto-Cycle Club and stated that it would be in his opinion a good thing next season to hold a run from London to Edinburgh, starting at midnight, and in which members of the Motor Cycling Club, C.T.C. motorcycle section and Auto-Cycle Club would join, and he would be pleased to do anything he could to help such a proposal being carried out. The next speaker was Mr. S. H. Fry, editor of the club "Gazette," who in a speech bristling with humour replied to the sallies of Mr. J. A. Jackson, and then toasted the chairman, who made a brief response. The proceedings terminated with "Auld Lang Syne." The musical part of the programme was ably rendered by Miss E. Andrews, Miss B. Freeman, Messrs. Stewart Gardner, W. Rouse and W. Anning.

Interesting Figures.

Mr. H. Hewitt-Griffin's interesting statistical return of the number of bicycles exhibited at the two London Shows includes the following figures relating to motor-bicycles exhibited. In 1899 only one motor-bicycle was exhibited and that at the Stanley Show. In 1900 there were 11 on view, one only being shown at the Stanley, and ten at the National. In 1901 the two Shows contained 166; in 1902, 316; and in 1903, 585. Of course, the number of ordinary or "push" bicycles correspondingly decreased as space had to be found for the newcomers. In 1899 there were 2,522 "push" against one motor-bicycle: and in 1903 there were 1,038 "push" against 585 motor-bicycles. The comparison is interesting, though in our opinion it does not necessarily point to a decline in the public interest in ordinary cycling as a recreative pastime or an athletic pursuit

Photo by] FLASHLIGHT PHOTOGRAPH TAKEN AT THE MOTOR CYCLING CLUB DINNER. *[Campbell and Gray.*

Stretching It.

Overhead in Long Acre. (A fact).

Energetic saleswoman (to hesitating customer who is doubtfully handling a "new regulation" tail lamp): "Oh, yes, sir, I can assure you that that lamp will give you every satisfaction; we have been supplying those lamps for forty-five years, and have never had a single complaint against them!"

Who says new pattern tail lamps after that?

Post Office Motors.

Lengthy trials on the part of the Berlin Post Office with benzine and electric-driven mail carts have brought the authorities to the conclusion that the utilisation of one kind of motor to the exclusion of the other is not practical. They find that benzine motors are better suited for long distances, and electric for short; so that both kinds will have to be adopted. With the electric motor there is no loss of power when the car stops and the current is switched off, and that is why this class of motor is peculiarly adapted to short runs. In the case of benzine motors it is contended there is less economy.

A Fair-minded Dog Owner.

It is not often that the owner of a dog is found willing to pay for damage caused by the animal; we are, therefore, all the more gratified to be able to chronicle the generous action of a Crouch End gentleman, whose terrier was the means of upsetting a motor-bicyclist. The motorist in this case was a youth who could ill-afford to pay for the repairs to his machine, which suffered a bent crank and broken pedal, the lad himself having to visit a doctor to get his arm (which was hurt in the fall) dressed. The motor-cyclist wrote to the owner of the offending canine, asking him to contribute towards his expenses, and received a most courteous reply, enclosing eleven and sixpence. The dog's master was well aware that the cyclist had no legal claim against him, but said he would be sorry to think that anybody was the worse off for the actions of his pet, and consequently had pleasure in sending the youth a small voluntary donation. Would that there were more like him!

£230 is the estimated total of Sergeant Jarrett's "furious driving" fines during 1903

Local motorists are protesting against the application of the Ealing Borough Council to limit the speed of motor-cars on the roads in the Borough to ten miles per hour.

On Thursday next, January 14th, there will be a smoking concert at the Automobile Club, 119, Piccadilly, at which it is expected the members and their friends will be present in strong force; dinner 7.30; concert begins 9.30.

The Roots Oil Motor and Motor Car Company are holding an auction sale on February 10th at their premises, Chicheley St., York Road, Westminster Bridge Road, S.E. Included in the sale will be motorcars, engines, rough bodies, frames and other parts. Cars intended to be included in the sale should be despatched at once.

A Minerva Motor-Bicycle which has been used in the Belgian Army Manœuvres during 1903 with great success.

A Miscarriage of Justice.

Mr. Arthur McCormack, of Messrs. Panhard and Levassor, has been the victim of a gross miscarriage of justice. One evening in Christmas week he was driving up Oxford Street, going West: as he approached the Marble Arch a heavy two-horsed hooded van rushed out of Park Lane, and would have run into the motor-car had Mr. McCormack not swerved over to his wrong side of the road to save himself. The policeman on point duty took his name, and in due course he received a summons for driving on the wrong side of the "refuge." Knowing that he had—though unwillingly—only committed a technical offence, Mr. McCormack did not go to the expense of engaging legal assistance, or even bringing his witnesses to the Marylebone Police Court, where, greatly to his surprise, he was fined £1 and costs! The policeman who witnessed the occurrence brought two more constables to back up his story, neither of whom could possibly have seen what happened, as they were both on duty more than 50 yards away at the time. Presumably it is better to stay on one's near side and be run down rather than to trespass for a few seconds.

A Praiseworthy Hill-climbing Feat.

An interesting and excellent performance was accomplished a few days ago on Anerley Hill—the steep gradient which runs up from the Low Level station to the Crystal Palace. The Duryea Company, Coventry, having to deliver two cars in the neighbourhood sent them by train to the station and finding petrol difficult to obtain the drivers concluded it would save time if they drove one of the vehicles only and towed the other. Now, whilst one was a capacious waggonette with hood—indeed, the heaviest car the firm has yet turned out—and moreover, loaded up with close on two hundredweight of baggage, the other was a light two-seated phæton of 8 cwts. and of 10 h.p. Instead of driving the larger car and towing the smaller one, as the latter was ready for working, the reverse was done and the feat performed on the low gear. The road was very greasy and when the party got to the worst part of the gradient, which is in parts in the neighbourhood of 1 in 8, they struck a particularly bad bit of grease and the procession came to a stop. Not for want of power, however, but simply because the driving wheels were spinning round in the mud. The little car kept at it, however, and gradually slid sideways until it got out of the mud patch and then, securing a hold on firmer ground, got both itself and its heavy charge once more moving. After a couple of similar experiences it finally reached the top. When it is remembered that the weight of the towed vehicle exceeded that of the towing one by some 70 or 80 per cent. some idea of the real efficiency of the Duryea as a hill climber may be obtained. The test was certainly of the severest kind taking the condition of the roads into consideration.

A very Light Car.

The Unlucky Number!

(Motorists are said to be "fighting shy" of the number 13).

List to the tale of a car that was numbered thirteen!
Hear what befell to this strangely unlucky machine.

Thirteen per hour, when the local speed limit was ten—
Held up by P.C. 13—most ill-omened of men.

Thirteen days passed, ere the owner was called to appear,
Thirteenth his case on the list for the justice to hear.

Words of the charge mounted up to exactly thirteen,
"Drove at a speed which was more than it ought to have been."

Fined 13 bob—which, the victim refusing to pay,
Cell A13 was his lodging the rest of that day.

"First thing to-morrow I get a new number," said he.
Get it he did—they awarded him 1313!

Motor Tracts.

The Austrian Motor Club has commissioned one of its members, Herr Theobald Harmsen, to prepare motor tracts for the enlightenment of the Austrian yokels on the true inwardness and purpose of automobiles, a subject upon which they seemingly entertain hazy, not to say totally erroneous, notions. These brochures will be scattered broadcast over darkest Austria, and it is hoped that they will convert Hodge to sounder and less motophobic views.

Latest about the Gordon-Bennett.

The committee of the German Motor Club has decided conjointly with the police officials that every car entered for the race shall bear a plate marked "G.B.," as well as a number. The race programme appears to be in an advanced stage, but it will not be made public until stamped with the Emperor's approval. Baron J. de Crawhez, Messrs. Hautvasts and Guders will, in all likelihood, be the trio selected to drive the Pipe cars representing Belgium. The Baron was victorious in the Ardennes circuit run last year. The Austrian cars are already in hand, being built at the works of the Austrian Daimler Co. at Vienna-Neustadt.

Extremely Funny!! Petrol from Potatoes.

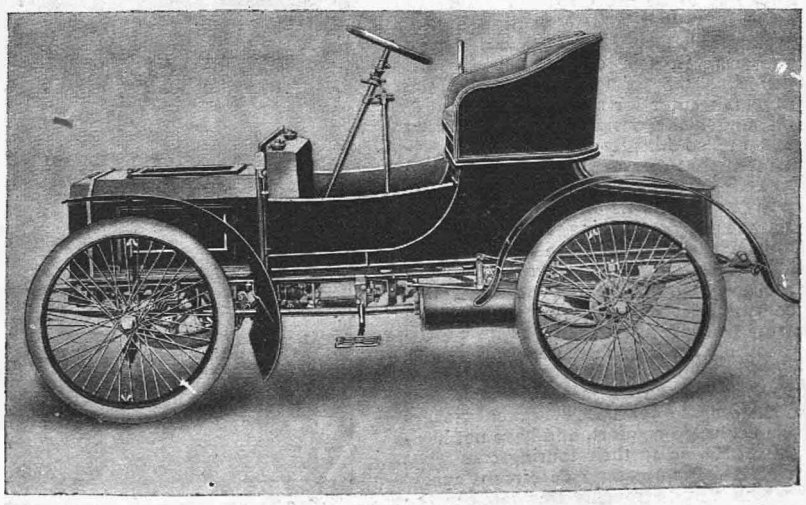
The popular papers from time to time afford the motoring public much amusement—mostly unintentional. In the "Daily News" for December 31st there appeared an article entitled, "The Study of the Potato." How to Make Petrol!! It is a long time since anything so humorous as this has appeared we should think. Just fancy, petrol which is a purely mineral product obtained by the distillation of crude petroleum is now likely to be obtained from the common potato. We should not be at all surprised if someone does not find out how to extract radium from turnips. The article in question makes the statement that it is the opinion of an eminent professor that petrol could be made out of potatoes. If he meant alcohol we could credit it.

The Werner Action: The Real Situation.

A very careful reading and study of the verbatim report and judgment in the case of Werner versus Gamage makes it absolutely clear that the patents held by the plaintiffs were not brought into the case at all except for reference. It was on the registered design that an injunction was granted against the defendants, and the judgment itself showed that, in order to infringe Messrs. Werner's rights, it was necessary to produce or sell an exact copy of the Werner motorcycle specified in the registration. The effect on the trade, therefore, need not be so disconcerting as many makers and designers have alleged to us that it must be, because, although the vertical position for the engine was originated by Messrs. Werners, there are many ways of securing it without absolutely copying the Werner design, and Messrs. Werners, we feel certain, will be only too glad to assure any interested person that any attempt to secure more than is contained in the registered design is quite foreign to their intentions. We believe, but are not able to say so authoritatively, that it is only the importation of Werner motorcycles through sources other than themselves that they intend to prevent, and they will do this in order to protect their agents and to avoid price cutting.

An Up-to-Date Motor Emporium.

A blaze of light attracted our attention in Poland Street the other evening, and judging therefrom that the old Long Acre Motor Car Co. had their new premises in full swing, we called, and had the pleasure of being shown over the extensive works and showrooms by Mr. Claud Browne. The new move was necessitated by the fact that the business had completely outgrown the building in Long Acre, and the difficulty which would be created in the matter of the title of the company if the business were removed from that thoroughfare has been overcome by a slight but sufficient change in the title, which will in future be the Lacre Motor Car Co., Ltd. The new premises are of substantial size, and extend back in a square block to Livonia Street. They are within a minute's walk of Oxford Street, and a couple of minutes from Regent Street, so that the situation is exceedingly central and convenient One enters the large showroom on the street level, and in one portion new cars will be displayed, the company being London agents for Wolseley cars, as well as dealers in other makes. The rear of the ground floor is devoted to offices and showrooms for motor clothing, accessories, etc.; whilst the other half of the space will be utilised for the display of secondhand cars. These showrooms are to be equipped with lounges, and to be made simple and comfortable for the customers of the company. In various convenient positions are placed electric inspection lamps, which can be used for the inspection of any part of a car. A large lift, with some ingenious precautionary devices, fills a corner of the premises, and is reached by a straight clear run from the street. Down in the basement is a large garage, with a washing place, and a corner is given up to a number of forges and benches for the metal workers, who were busy shaping aluminium panels, making bonnets, and metal fittings for car bodies. One of the upper floors is devoted to car repairs, and when fully equipped with the benches and fittings, which were being completed at the time of our visit, this will be one of the best repairing shops in London. The motor body factory is exceedingly complete, and there is every evidence that the company has made a most thorough study of this branch of the motor business. We saw bodies in every conceivable shape and style, and for all conditions and purposes, passing through the various stages of manufacture, the rooms for painting and varnishing being isolated and maintained at an even temperature. On the roof we found the wood store, where the timber is left to season before being put to use. Another floor is devoted to the manufacture of electric broughams, of which the Lacre Co. make a speciality. The premises are most complete, and with their electrically driven plant, their perfect telephone system, and their modern methods, we should say that they are not to be excelled anywhere. As an instance of this thoroughness we were shown the stores for spare parts and sundries. Properly numbered and classified will be found almost every possible fitting, and on receipt of a wire or telephone message, any article which a motorist may require for a car can be dispatched at once.



The 1904 Humberette.

Record Lowered.

Nestman, on a Stevens' racing car, lowered the American straight mile record on the last day of the old year at the Ormond Beach track. The time was 57⅗ secs.—just under 63 miles an hour. On January 2nd, Schmick, on the famous "Gray Wolf," lowered the five mile record by 2⅘ secs., covering the distance in 4 mins. 43⅘ secs.—nearly a mile an hour faster than Nestman.

French Sporting Editor's Appreciation of the Gordon-Bennett.

"It needs no prophetic mantle," writes Mr. Victor Breyer in "Le Velo," "to predict that the whole world will follow, next May and June, the fortunes of this gigantic battle with an interest deeper even that that taken in the American Cup races. And I think that never a trophy symbolised a keener and more Titanic struggle than does that little car of bronze which James Gordon-Bennett placed in the keeping of the Automobile Club of France four years ago."

American Motor Industry.

In reply to an insinuation that the American motor industry was in danger of producing a glut of manufactured cars, manufacturers state that whereas their total output for 1904 cannot much exceed 25,000 cars, the public demand will probably reach to more than 30,000. Detroit, Michigan, is the leading "car" city with such firms as Oldsmobile, Ford, Cadillac, Packard and Reid. Cleveland runs it close with the well-known works of Winton, Peerless, White, Baker, Stearns, etc., and Toledo turns out a large numbers ot cars "of that ilk."

Inconvenience of the French Touring Car.

A writer in one of the French motor papers draws attention to the very unsatisfactory condition of the average touring car of that country in respect of convenience and comfort. Resorting to a play on words, which loses none of its force in translation, he accuses the French manufacturer of devoting too much attention to the racing car, and of regarding the motor vehicle as "a vehicle of sport rather than transport." He points out that, in the majority of so-called touring car bodies, the passengers are crowded up together on seats miserably inadequate for "what has to be put on them," and can only stretch their legs by getting out of the car altogether. He describes a four hours' run in one of these mis-named vehicles as "a torment." Some of the cars which enter for speed and reliability trials under the designation of "touring cars" are so flimsily "bodied" and upholstered that one wonders how this part of the car survives the ordeal. The "step" usually manifests its objection to be used as a means of entering the car by an ominous crack, and those whose youth and physical agility permits are better advised to jump in without troubling this "convenient" accessory. A six-mile run in one of these touring cars is an experience which the French writer would pause before consigning his deadliest enemy to. In short, the writer makes it clear that in their craze for speed French makers have neglected comfort, and have not hesitated to fit on to their touring cars what he calls a "carrosserie de circonstance" —which may be roughly translated in the idiom of the stage "a *property* body."

Motor Fire Engines.

The municipal authorities of Frankfort have voted a sum of £3,000 towards the fund for providing the city with motor fire engines and apparatus. So satisfied are they with the results of the experimental vehicles in use that they are reported to be anxious to substitute the motor for the horse throughout the fire department.

A Large Entry.

For the launch motor meeting which takes place at Monaco about Easter, 70 entries had been received on December 31st last. Under special conditions entries may still be received as late as Friday next, January 15th. Competing boats will be divided into two sections racers and cruisers; each section being further subdivided into four classes according to length of hull.

Not Universally Popular.

The lady motorcyclist is one of the features of the entertainment provided by the management of the Velodrome d'Hiver in Paris. Mdlle. Herveux (who competed in the Paris reliability runs last November) and Mme. Clouet had a 10 kilometre match the other day, which according to the French papers, was not the success anticipated, the fair sportswomen being treated by the public to a "mixed reception."

Jenatzy and the Gordon-Bennett.

A rumour having obtained currency to the effect that Jenatzy would not be selected by the German Automobile Club for this year's race, and would in all probability be found driving a Pipe for Belgium—the land of his birth the German Automobile Club have informed the Press that "they accept Jenatzy as a driver, and that he will drive a German car in the race if one can be found." The closing words of this statement are at least suggestive, and it may be that, after all, last year's winner will be found driving for his native country.

A factory for the manufacture of light car engines is being established at 272, King Street, Hammersmith. The title of the company is The Hammersmith Engine Works.

In consequence of the early date fixed for the Gordon-Bennett race, the date of the "Circuit of the Ardennes"—one of the chief annual events in Belgium—will have to be altered.

American Gordon-Bennett Trials.

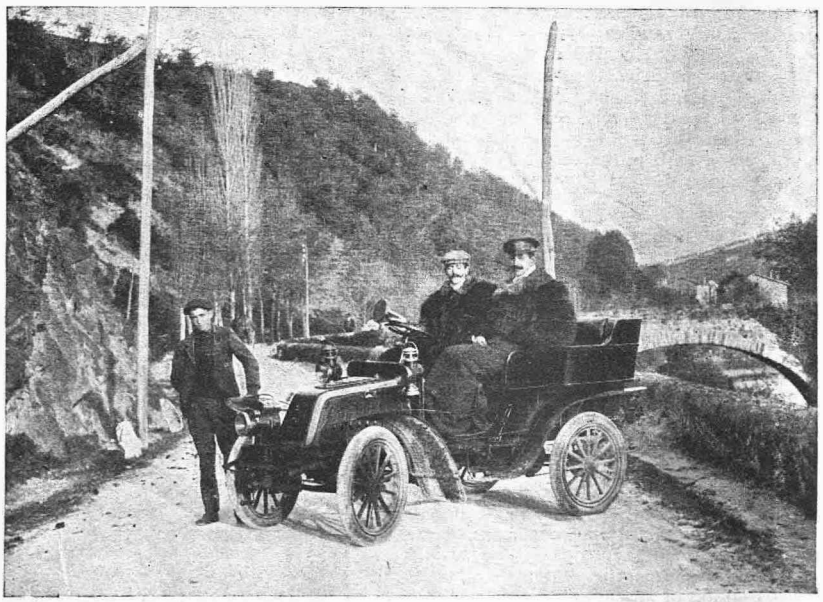
For the Gordon-Bennett trials in America the plan proposed is to test the cars as follows:—A mile uphill, a mile or five miles straightaway on a level course, and 100 or 200 miles on a track, the last being a test of the machine, the tyres, and the operator. There seems to be too much track and too little country road about the test, 200 miles on a track is a very different experience from 200 miles on give-and-take roads.

Nothing New, etc.

The old truism that there is nothing new under the sun was exemplified to us the other day when calling at the Wearwell Cycle Company's Works in Wolverhampton. Mr. J. Clarke produced from an old cupboard a sample of contact maker made seven years since. It was modelled out of a rough piece of wood, and the make and break was effected by two large nails, one of which was actuated by a spring. It was a crude looking object, but is said to have been satisfactory.

The Motorcycle in Army Service.

The following announcement appears in Austrian papers:—"Reserve men who are willing to perform their military exercise as riding ordorlios or cyclists in a higher commando with their motors are to send in their names to the Supplementary District-Commando. For the use of a motorcar 30 crowns per day will be allowed, for a motorcycle 6. Cost of transporting chauffeurs and motors, likewise of maintaining the chauffeurs, will be borne by the Military Exchequer." (Order of War Ministry, December 15, 1903).



The Hon. Leopold Canning and his two-cylinder Clement car on the road to Santander, Spain.

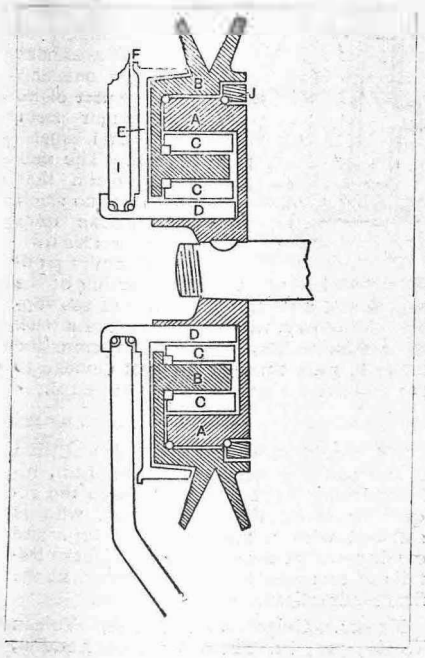
SOME INTERESTING NOVELTIES.

The Electrical Cycle and Motor Co., Swadlincote, Burton-on-Trent, have brought out a new belt fastener for V-section motorcycle belts. It is chiefly remarkable for its ease of detachment.

The Quadrant Cycle Co., Ltd., Birmingham, are supplying number plates, enamelled and painted, in accordance with the new regulations. They are made to readily fix on motorcycle or car lamps. Two patterns are made—one for fixing rigidly and the other for detaching. The company are also selling lamps and numbers complete.

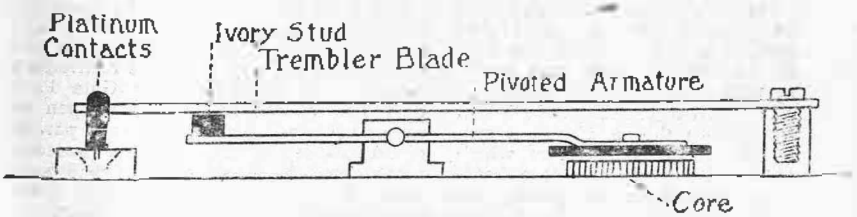
The "Cobb" Two-Speed Gear and Free Engine Pulley.

The illustration depicts a section of a two-speed pulley giving a free engine applicable to motor-bicycles. The inventor is A. Leslie Cobb, 1, Station Approach, Sydenham. The following are the details of the construction:—There is a wheel, A, which is keyed to the motor shaft, this wheel having internal teeth. Riding on the outside of this wheel on ball bearings is a drum, B, the external surface of which is formed to carry the belt or gear chain for the transmission of the driving effort to the driving wheel of the machine. This



same drum, B, has a face plate which carries four equally spaced studs, on which are mounted pinions, C, C, C, C, which gear with the internal teeth on wheel A. The pinions C, C, C, C, also gear with the external teeth of a spur wheel, D, which is mounted concentrically with A, so that it may turn with it, be retained at rest, or otherwise move relatively to A. When the wheel D is clutched by the cone E, to the drum B, all the wheels, A, B, C, and D, rotate together *en bloc*, without relative motion with one another. This condition corresponds to the higher speed and in which the driving drum B turns at the speed of the motor. When the spur wheel D is held stationary by the band brake F, so that it cannot make complete revolutions, the mechanism will move as an epi-cyclic gear giving a reduced speed, the drum B running at a less speed than the wheel A and motor; providing the spur wheel D is allowed to slip by easing the band brake F, which is operated by a lever. Connected by a wire to the handlebar is a simple device which can be regulated by the cone E, this being allowed to slip when in traffic or for slowing up. When the spur wheel D is not held by the band brake F, the drum B is not clutched by cone E, and the motor will be able to run freely without necessarily rotating the driving drum B, thus giving a free motor; or conversely the drum B can run whilst the wheel A and motor remain at rest, giving a free-wheel. To facilitate the attachment of the mechanism to existing machines, a lever is fixed by a plate secured to the engine, and the clutching action is effected by a bracket being fixed to the frame of the machine with a notch to receive and hold the lever when high speed is required, and when not in notch and the spur wheel D is not clutched by the band brake F, it gives a free motor. A key can be attached to the engine shaft to enable the engine to be started independently, as with a car. Provision is made for long bearings on the engine shaft by the section B being made to fit over any sized boss, thus obtaining the belt line.

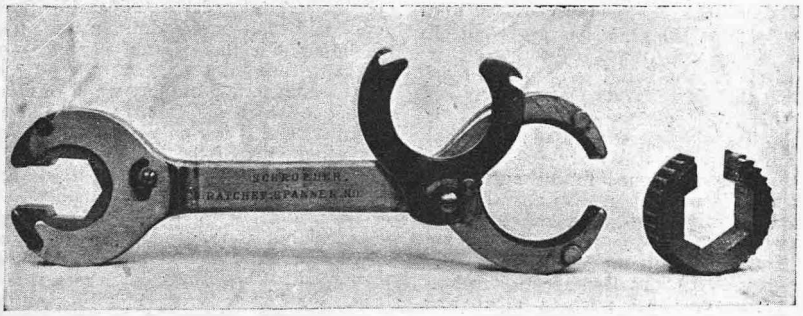
Readers of "The Motor" desiring information as to patents can obtain same on stating full particulars required and addressing to "'Patent,' c/o Editor 'The Motor,' Rosebery Avenue, London, E.C."



The latest B. and M. Coil Trembler.

The B. and M. Auto-Trembler Coil.

The United Motor Industries, Ltd., have the latest B. and M. auto-trembler coil now in stock, one of which we have recently inspected. This coil is specially intended for motorcycles. The special feature about it is that with the auto-trembler being fitted it enables the machine to be easily started, as the trembler is so designed that it only comes into action when the motor is moving slowly, and once it reaches a good speed the auto-trembler ceases to act, and the coil works as a plain non-trembler type. From the diagram an idea of the construction of the auto-trembler can be obtained. There is no adjustment provided, and the makers claim that this prevents the motorist spoiling his trembler by injudicious attempts at adjustment. The coil is fitted in a specially designed hard wood case for fixing in a compartment of the tank.



A new Ratchet Spanner.

A New Tool.

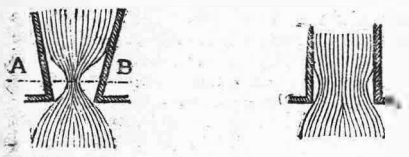
A clever application of the principle of the ratchet has been made in the Schroeder ratchet spanner, invented and patented by Mr. F. W. Schroeder, 126, Copthall House, E.C. Each spanner is provided with a series of tumblers of various sizes (one is shown fitted and one removed) in the illustrations. To tighten up a nut, a tumbler to fit it is placed in the jaws of the spanner, the fixing plate put into position, and the tool is ready to do its work. Once on the nut it is not necessary to remove the spanner until its work is completed. To unscrew, all that is required is to remove the spanner and replace it with the face, which was previously outwards, inwards. Some of the many merits of the tool are its quick action, its protection of the nuts from injury, and its sureness of grip. Tumblers can be extended to any required length, and by this means nuts in positions difficult to reach can be easily got at. In an emergency the tool can be used as a ratchet brace for roadside repairs, and in certain circumstances as a fixed spanner. It is to be made in all sizes, from that required for a cycle to that for use on a large car; and in one form it will be adapted for use on spoke nipples, to facilitate the building and truing up of wire wheels. The illustration shows an experimental pattern. The article as manufactured for the public will be improved in several ways; the fixing plate, for instance, will be let into the face of the tool, so that it lies flush with the surface, and has no projections to get in the way.

The New Sthenos Carburetter.

It is claimed that the Sthenos carburetter (patent) is constructed on scientific principles. Experiments with the flow of liquids across orifices of different shapes have proved that the slightly tapered hollow cone produces a violent contraction of the stream of gas to about one-third of the diameter of the small base of the cone. The figures below show the difference between the contractions produced by a conical tube and a plain cylinder.

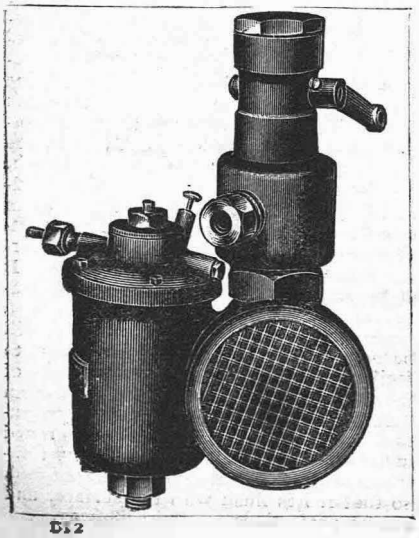
The result is that the volume of air which passes by the small section AB is not only greater than that attained by the other method, but has more force behind it.

The inventor of the Sthenos carburetter claims that the adoption of such a pulveriser, as the cone has proved itself to be, allows the petrol to be thoroughly vaporised by the rapid in-draught of air without the aid of baffle plates of any description whatever. Experience, it is stated, has also demonstrated: (1) That the spray produced is very fine indeed; (2) that the resistance to the suction is reduced to a minimum, thus allowing the maximum charge to be taken into the cylinder; (3) that the excellent spraying and mixture permits the Sthenos to be employed without any modification whatever for heavier fuels such as alcohol or paraffin. In his experimental work, however, the designer of the Sthenos carburetter found that, despite the relative constancy of the carburation at different speeds of the motor, which his system secured, the mixture became impoverished at slow and too rich at high speeds. In other words the suction of the petrol was augmented too rapidly by the speed of the passage of the air through the carburetter. It became necessary, therefore, to discover some device which would prevent the excessive flow of petrol, and vice-versa, at different speeds of the motor. Amongst the patented methods for attaining this end the inventor has adopted a coarse threaded screw placed in a cylinder between the float chamber and the spray nipple. The petrol having to travel all the threads of the screw has thus to perform a longer journey, and so the desired loss of charge is secured. It will be gathered that the Sthenos is a very ingenious device, and, moreover, it is one which, after it has been fitted and regulated, is entirely automatic in action.



Principle of the Sthenos Pulveriser.

As regards the details of construction, attention may be drawn to the following. Before the petrol can enter the carburetter it has to pass through a filter in the cover of the float chamber, composed of fine wire gauze (so fine that water will only penetrate under considerable pressure), and as it passes through this from the under side there is no possibility of the gauze becoming choked. A plug is provided for letting out any water or solid substance which may collect in the filter chamber, and it is rarely needful to open any other part of the carburetter. It is not necessary to warm the air at the intake, as with many systems, but there is a jacket round the cone provided for heating with hot water from the circulation. The temperature of hot water being more regular than hot air from the exhaust makes the former more preferable, but the latter may be used by those who favour this method. The Sthenos carburetter is manufactured at Liege, Belgium, by Messrs. Jules Fagard et Cie, and the sole agent for Great Britain and the Colonies is Mr. J. A. Ryley, 23, Martineau Street, Birmingham, who will doubtless be pleased to give any information that may be required regarding it.



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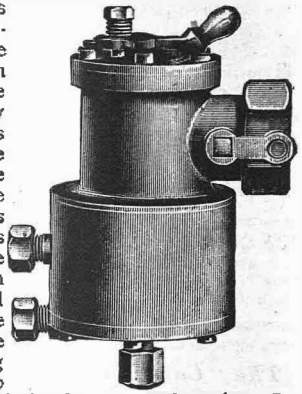
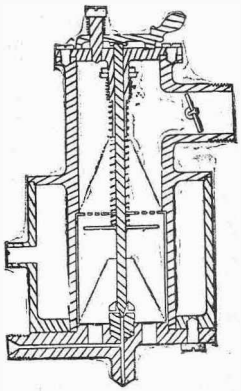
A New Carburetter.

When visiting the works of the New Revolution Cycle Co., Ltd., Vauxhall Street, Birmingham, last week, Mr. W. Lloyd, the managing director, allowed us to inspect the new carburetter which the company are now turning out in large quantities. This has been designed and manufactured with the object of reducing the outlay for petrol, and it is stated it can be used satisfactorily and without loss of power on a mixture of equal parts of petrol and paraffin. The design is clearly shown in the accompanying illustrations. The carburetter (which is surrounded by a hot air jacket, heated by the exhaust) has a circular casting at the bottom provided with a lug drilled out to form the spirit supply. This casting has a number of holes through which passes the air necessary for atomisation. Attached to this casting and held in place by the lug is a circular plate which is also drilled with holes; this may be revolved when desired so as to regulate the amount of air entering the carburetter. On the inner side of the casting a nipple is screwed provided with a central hole (countersunk so as to form the seat for a needle valve which passes through to the top of the carburetter) and a series of fine holes extending from the centre to the side. These are intended to spray the spirit. Operating with the spraying cone is a circular gauze funnel which effects the initial atomising. Above this is placed a suction plate, fixed to the needle valve, which is assisted to rise by means of a baffle plate having perforations permitting the gas to enter the engine. A second gauze funnel (as shown) completes the atomisation and frees the gas from any dust particles which may be present. The needle valve is held to its seat by means of a fine spring which is tensioned between the suction plate and a lug which also forms the guide for the stem of the valve. In order that the pressure of the spring may be determined by experiment, a small lever is placed on the top of the carburetter, and this is so designed that its movement backwards or forwards varies the distance between the side and the top of the needle valve, thus permitting more or less spirit to be used. There is no doubt that the carburetter is a well-designed one, and users speak highly of it. We are about to test one and will report of its behaviour from actual experience. The makers claim that there is no smell or smoke from the exhaust, that it provides for the instantaneous starting of the engine and a perfect regularity of gas supply. Moreover, that in the event of a back fire occurring, its construction permits the flame to pass through without damage to the carburetter or access to the petrol.





We would call our readers' attention to the fact that Phœnix Motors, Ltd., intend devoting special attention to the requirements of the motorcyclist who is satisfied with a machine of 2 h.p. and coming out at a reasonable weight. Details of this machine will be found in the firm's advertisement in this issue.

Messrs. Geipel and Lange, Vulcan Works, 72a, St. Thomas Street, London, S.E., ask us to state that they are the only accredited representatives in this country for Messrs. Chauvin and Arnoux and handle all the specialities made by this firm, including the Vulcan Auto-trembler hot-wire voltmeters and electrical speed indicator.

San Francisco can hardly be termed a happy hunting ground for motorists. The authorities extend few privileges to the automobile, and many are the restrictions placed upon it. In Golden Gate Park only one of the fine drives is open to motor vehicles. During a recent parade of over 200 cycles and cars which preceded a race meeting, some of the riders were stoned by mischievous lads on the roadside, the police offering no protection.

CYCLOMOT'S CAUSERIE.

The Next Upward Step.

It seems but the other day when I sat me down to write my first page of notes in the first issue of this journal and, as the opening paragraph dealt with the period of transition from cyclist to motorcyclist in which I at that time found myself, so the general title which I gave to my weekly page was "In Transit." But as the weeks and months went by the conviction gradually grew that the title was no longer *a propos*, the transition having been fully completed, and for this reason the heading was altered, so that it might cover more extended matters. Short as has been the period—just a shade under two years, as a matter of fact—I realise, almost with a start, that I have not allowed myself to be content with the simplest form of mechanical locomotion, but have been flirting with the light car to such an extent that my affections have become somewhat entangled. The first love, the motor-bicycle (following upon a youthful affection—to continue the simile—for the motor-tricycle) seems to have established for itself a firm place in my heart, and yet the ordinary push-cycle still has its charms, and as there are two of the latter breed in my stable besides the motorcycle and car, my flirtation with the four-wheeled vehicle cannot be advanced as a proof of inconsistency. As a matter of fact, the man who has once caught the infection of rapid independent locomotion, whether by cycle or motor, will never go back to the slow methods provided by Nature, or be satisfied with the trifling results derived therefrom. I remember that we used to consider that we had done fairly well if we, by getting up early in the morning, tramping for most of the day and getting back home too tired and fagged out to do aught but have a bath and turn in, managed to cover thirty miles. But for me that distance would only take me a little way beyond the suburbs and back, and I reckon not to have started my ride until the last of the tramlines and the bricks and mortar are behind me. So it is that, having once tasted the joy of this rapid independent locomotion, the soul craves for as much of it as the pocket can afford and, moreover, every form and branch of it is enjoyable in the varying climatic conditions prevailing in this country.

Winter Riding Loses its Terrors.

If I may be allowed—that is to say, if the subject is one which readers would care to be treated of on this page—I hope to deal from time to time with my experiences, joys and troubles with the more pretentious vehicle and, incidentally, it may be possible to apply the lessons learned in the new school to the motorcycle. Just now, the point which appeals to me is the relegation to an obscure position of all consideration about the weather, for, despite the recent atrocious atmospheric conditions, I have been able to get out and about, to take friends and relatives on visits, to pay calls and to make the most of the festivity period in a way which would otherwise have been impossible. Some of the trips which I have tackled lately it would have been useless and even absurd to attempt on a motor-bicycle; and even if the roads had not been so slimy as to conduce to side-slip, the fear of that wretched bugbear would always have been present, whilst a careful picking of one's way would have been constantly necessary. I know that the result of a ride of this character extending to any substantial length is far from pleasant. The nerves are at constant tension, and one reaches home with a sigh of relief and without experiencing any of that sense of exhilaration which constitutes so large a proportion of the enjoyment of motorcycling. So, for bad weather or for muddy roads, give me four wheels, for the sense of security is marvellous, provided one has learned that the brakes are only to be used with the greatest of caution.

I have been rather interested in the question of side-slip and, in fact, have regarded, for the first time in my life, this bugbear from a point of view which had no aspect of terror. While driving along one morning over suburban roads which were in the wickedest possible condition, I thought I detected various efforts to skid on the part of the car, but, by instinct, I had altered my steering in such a way every time that the attempts were entirely nullified. On one occasion, however, on a broad cobble road, and nearly at the top of a hill with a gradient of about 1 in 30, I felt the rear of the car swerve, and as I could see the roadway ahead was clear for some distance, and I also knew that it was all clear behind, I held my steering wheel steady and did not turn it one whit, the idea flashing through my mind that I would like to see what would happen with the driver sitting quite neutral. The car seemed to pivot slowly on the front wheels (the back wheels actually gaining on the front *up hill*) and then it turned at right angles to the original course and stopped in the middle of the road right across the tramlines. Of course, my clutch had been taken out the moment the first portion of the slip had been observed. This lesson had enabled me to thoughtfully study the action with a mind which was not distracted by any surroundings. About half a mile farther on I felt the back go again, but as there was a tramcar coming towards me I steered against the slip, and had the satisfaction of feeling the car right itself. During Christmastide there were plenty of opportunities of experimenting with the brakes, and my own experience (which I will confess has but been brief and insufficient) is this, that the brakes, particularly the differential brake applied by the foot-pedal, if used with extreme gentleness, need not be regarded as being put out of court by a greasy road. So side-slip in itself has no great terrors for me, but I fully recognise that the results may be awkward and even disastrous when other traffic is about, and so I have decided to make sure, and have therefore obtained a pair of Parson's non-skids. With those on the rear wheel driving in muddy weather should be perfectly safe.

The Rending of Rendle.

We had a humorist at the Motor Cycling Club's dinner the other night in the person of T. McDonald Rendle, of the "Daily Telegraph." Pressmen know him well, and he is often looked to at the Press Club for a rollicking but harmless speech. Mr. Rendle took the sins and offences of the motorcyclist and the motor vehicle, and hit out, with glorious disregard for our feelings, provoking roars of laughter with his sallies and his good-humoured well-aimed blows. The fact that many of his remarks were chestnuts to those of us who have been long at the game did not spoil the joke, for they were put with so much frankness and *bonhommie* that not a single shaft from the Rendle bow stung. Mr. Rendle twitted us with taking a fiendish delight in driving an unregistered machine without possessing a licence, knocking over the aged, the infirm and the helpless, polluting the atmosphere with noxious fumes, frightening innocent people away from the roads and monopolising the highways; but he must admit that these are but the finer qualities of our nature, and in reality we are much blacker that he has painted us. He could prove this by purchasing a second-hand machine (will somebody kindly work off on him some old, out-of-date, out-of-order mangle?) and then, if he does not discover to what depths of infamy and demoralisation the wretched motorcyclist descends as he spends half his waking hours at the roadside and the other half in the repairer's, I should have hope even for Mr. Rendle. It is more than likely, however, that six months' personal experience would make him acknowledge that the average motorcyclist is the most vicious, unprincipled and abandoned rogue that ever disgraced the highway or dishonoured petrol.

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.

Weight of Motorcycles.

Sir,—In "Magneto's" article on the high-power engine he asks how many 3 h.p. motor-bicycles there are on the market which come out at less than 170lbs. when carefully weighed. We should like to call his attention to the fact that the 3 h.p. Quadrant machine, with all fittings complete, does not exceed 130 to 135lbs.—Yours faithfully,

THE QUADRANT CYCLE CO.

Are High-powered Motorcycles a Mistake?

Sir,—Having read the excellent article by "Magneto" in a recent issue, "Is the high-powered motorcycle a mistake?" kindly allow us to shed a different light on the question, which will answer some of his objections, and assist your readers to form a right conclusion. He says "Many authorities hold it is not possible to adopt air-cooling to give good results with motors of more than 2½ to 2¾ h.p." This is quite correct in regard to single-cylinder motors, but is not so in regard to twin-cylinder motors, if the cylinders are placed sufficiently far apart so as not to interfere with the radiation. The reason for this is obvious; having double the amount of radiators, and the power of each explosion being only half that of a single-cylinder motor developing the same energy, the heat generated is not so great and is more readily parted with through the extra radiating surface. Now it follows, if we take the conclusions above, that a motor of 5 h.p. can be made so as not to overheat, provided we put it into two cylinders. With such a high-powered engine as this at command, the "gas can be cut down," as pointed out in that well-considered article by "Cyclomot" in the same issue on "Water-cooling," and "so put a stop to the trouble." The second point we have to draw attention to is the conclusion that increased power means increased weight; this does not follow as a matter of course, for half the dead weight in the fly-wheels can be dispensed with in a twin-cylinder motor, as they have only to overcome one compression, instead of two, when each cylinder is made to fire alternately: we have weighed such a motor developing 5 h.p. and find it to be only 48½lbs., whereas another 2¾ h.p. of well-known make weighs 70lbs. We heartily endorse "Magneto's" experience, that vibration is less from a motor developing its power from a high speed than from one at a lower speed, the explosions being comparatively light and rapid; but this argument against high-powered motors cannot be used against double-cylindered motors, where explosions are doubled and the power of the impulse is only half that of a single cylinder of same horse-power, making it far easier to go through traffic at a slow rate, and to mount hills without taking them at a rush. All the objections "Magneto" has advanced against high-powered cycles, viz., excessive weight, increased vibration, and overheating difficulties, do not apply to this type of machine. Why, then, should we demand motors to work up to their utmost limit of power and suffer inconveniences?—Yours faithfully,

THE ECLIPSE MOTOR AND CYCLE CO.

Solid Filling for Accumulators.

Sir,—Messrs. Thompson are perfectly correct when they say that jelly electrolyte lowers the capacity of accumulators. In my opinion there is no jelly or dry paste which is indigenous to accumulator plates. Consideration for one moment will show that very dense electrolytes are detrimental to the proper working of an accumulator. First, it offers a high resistance to the hydrogen gas which is anxious to hurry out of the cells; this gas is a non-conductor, and wherever a globule of this adheres to the plate—and there are thousands—that part of the plate is cut out, and is then said to be polarised; of course the same action takes place with fluid electrolyte, but as hydrogen is the lightest body known it readily escapes, on account of the electrolyte being less dense. Second, whenever chemical action is taking place (and an accumulator is a chemical apparatus, for there is not a particle of *electricity* in it) the products of such action should be removed as rapidly as formed. High resistance is again offered to the heavier products which should drop to the bottom of the cell, and be washed out, so as to keep the accumulator in a healthy looking condition, and not as if it were filled with yellow ochre and brass polish. Now who could agree with solidified acid if it will neither allow the gas to leave at the top of the cell or the heavier products to drop to the bottom of the cell as it should do? Third, solidified electrolytes sulphates more quickly than fluid electrolytes under the same charging or discharging conditions, because they contain soda which neutralises acid, and when the charge is all used up it is further robbed of acid. A fluid electrolyte is only robbed once, that is when there is no charge left in the cells; therefore, a fluid electrolyte will stand longer without sulphating than its more dense brother. Recharging makes the acid stronger, which cures sulphating, but to cure sulphating you must not put acid in with the tundish, but by E.M.F. I certainly see testimonials from users of solidified electrolyte accumulators, but I have also seen testimonials from highly delighted users of the spark gap, which I consider is about on a par with the idea of having a gap in a fire hose to make the water reach a floor higher.—Yours faithfully,

"GOLDMAN."

Motor Launches.

Sir,—Re J. F. Hastie's query as to motor launch details. If he will write me I shall be pleased to send him particulars of a 2 h.p. launch engine that I have had running all last season without a hitch. This was made by a firm who were making launch motors years before they were used in this country. It will run on paraffin, petrol, benzoline or naphtha, is fitted with tube and electric ignition and the price is only £[illegible]. If "J. F. H." feels interested he can see this engine any time he likes at Chiswick. While writing may I be permitted to suggest your devoting a page to launch details and queries every week? I am sure there are many of us who buy your paper for this purpose, and it will be appreciated. What have other readers to say on the subject?—Yours faithfully,

F. E. WILSON.

36, Great Russell Street, London, W.C.

The Horse-Power Definition.

Sir,—In reply to the letter of "Sparker" in your issue of the 9th December last, we should like to point out that a "horse-power" is already a definite standard of work done, just the same as a gallon is a definite standard of measure. This standard was defined by James Watt about a century ago as the power required to lift a weight of 33,000lbs. to a height of one foot in one minute. Engineers have used this standard ever since. Engines have two kinds of horse-power, one is known as i.h.p. (indicated horse-power), and the other as b.h.p. (actual or brake horse-power). The brake horse-power is the actual power given off by the engine at the crank shaft, or in other words the i.h.p. less the amount of energy taken up by the friction of the engine. If "Sparker" will specify his engine to be four "brake" horse-power he will be certain of getting what he requires, as the b.h.p. of a motor can be tested, whereas it is not so easy to test the i.h.p. of a small motor owing to its high speed. Probably the difference in the sizes of cylinders and the horse-power given by different makers of motor

engines is that some run at more revolutions per minute than others. We do not at all see why there should be another standard of horse-power any more than there should be different standards in measures of capacity.— Yours faithfully,

THE MOTOR CAR AND LAUNCH CO.

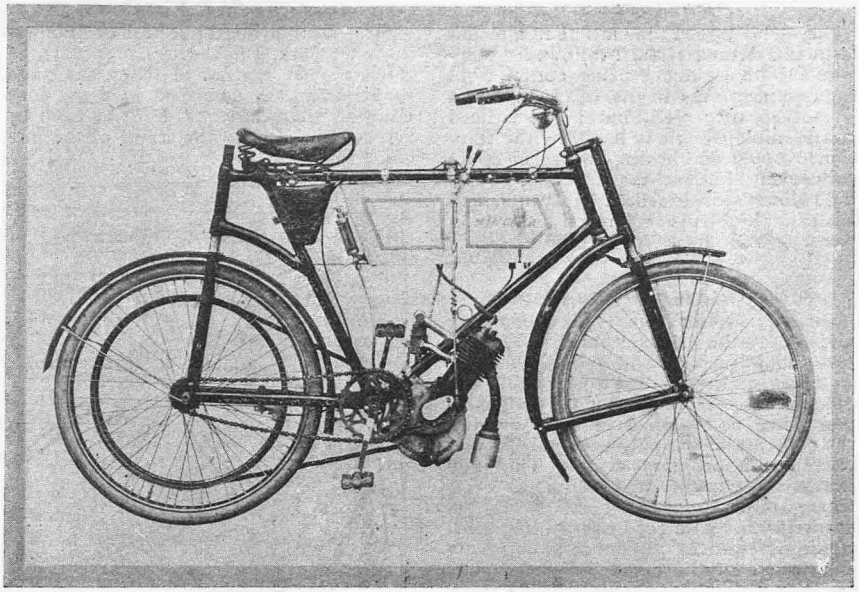
Petrol Gauge and Densimeter.

Sir—As many makers are now fitting glass petrol gauges to their motor-bicycles, it would be a very simple matter to insert an unbreakable densimeter into the gauge. I presume this could be made out of celluloid or some such tough substance, and marked in colours into, say, four divisions with red somewhere over .720 and green at, say, .680. I presume there is a stop valve to all gauges in case of breakage.— Yours faithfully, R. E. GOLD.

Spring Frame for Motor-Bicycles.

Sir,—I beg to send you a photograph of a spring frame for motor-bicycles, which I consider very essential from the point of view both of ease of running and greatly lessened vibration. On examination it will be seen that a short length of tubing is fixed in front of the steering head or stem, giving the bicycle somewhat the appearance of having two heads. In this extension a tubular prolongation of the fork crown is allowed to work up and down with a piston or telescopic action, its movements in either direction being checked by means of buffer springs. To allow of the staying of the lower ends of the front fork tubes, these latter are attached by means of two hinged tubular stays to the lower end of a member or support made of two lengths of D tubing, these being affixed to a lug on the lower end of the steering pillar. The two D tubes in question are built apart to allow of the steel mudguard being fitted. It will also be seen that a similar telescopic movement is arranged for the back fork, the chain stays being hinged near the bottom bracket. It will be noticed from the illustration that there are very few working joints, and these have been so arranged as to reduce the movement to a minimum. The frame and fork can also be used as a rigid machine at will. I might mention that during the tests through which the bicycle has been put it has been fitted with ordinary Clipper 1¾in. cycle tyres. I have so arranged my invention that every part of the fork, etc., is a strengthening part or support for the other, and the experimental machine is built up of light gauge material. Therefore, I claim that it can be ridden with every confidence; and even if it should happen that the springs give way, which is not at all likely, the rider can still continue his journey safely, as though on a rigid frame. The advantage of a spring frame and fork for motor-bicycles is that it can be ridden during the winter months fitted with solid tyres, thus preventing any fear of skidding, or side-slip; and I am convinced it would give every satisfaction, as I have allowed of a vertical movement of an inch and a half. The frame is suspended between springs, these being fixed at the extreme ends, thereby avoiding any vibration at the handlebar, saddle and pedals. It is also perfectly rigid laterally. For light engines up to 2 h.p. I have a design slightly different from the one mentioned above. In this the front fork telescopes in the steering stem, which gives the bicycle the appearance of an ordinary bicycle and this class of fork is also adaptable to ordinary pedal propelled cycles. The frames can be built for either position of engines, vertical or inclined, as desired. The cycle illustrated above has been in daily use for the past six months and during that time it has been ridden by experts and has given entire satisfaction.—Yours faithfully, THOS. ASHBURN.

115, Sommerville Road, Small Heath, Birmingham.



Spring frame Bicycle referred to in letter from Thos. Ashburn.

Static Electricity for Ignition.

Sir,—I think this question may as well be settled for good: A static machine does not give a fraction of the power or pressure given by a good induction coil. It gives *static* electricity and not *voltaic*. The machine, if small, would not be capable of overcoming the compression resistance; and, if of the necessary size, would defy the somewhat inferior insulation of the machine. Fancy having glass (?) or ebonite drums or plates about 15in. diameter fixed to the machine! Again, the wet weather would prove fatal and thus entirely banish the static machine.—Yours faithfully,

"ELECTROMETER."

[Our correspondent's contention will not we are afraid, stand expert criticism. The effects produced by an induction (static) machine are identical in many respects with those produced by a coil, whether this be worked by the current obtained from a primary battery or accumulator, or from a dynamo. When a spark occurs between the positive and negative balls of a Wimshurst machine, for instance, it is an actual *high voltage current* produced by the discharge of accumulations of static electricity in the condensers of the machine. So far this corresponds exactly with the secondary of a coil. Where the spark from the Wimshurst machine differs in effect from the coil spark is in the *heating* effect. The amperage of the Wimshurst spark is exceedingly small although the voltage necessary to jump a given space under compression can be produced by coil or Wimshurst machine.—ED.]

Ball Bearings for Motor Crank Axles.

Sir,—In looking round the recent Shows I failed to observe a single motor-bicycle with ball bearings on the crank shaft, and it would be rather interesting to learn why these bearings are not more used. Is it because the motor-bicycle business is in its infancy yet, and parallel bearings are accepted by the public because they do not know better? Up to quite recently the use of ball bearings on the crank shaft of engines was not considered good practice, and especially might it be considered so with an explosive engine. I have a four-cylinder motor-bicycle, in which I have fitted single ball bearings at each end of the crank shaft and on the cam shaft, and from the experience I have had with them, I am not at all disposed to revert to the older type. It seems to me that they are one of the things that should be used on motor-bicycles. I have had the opportunity this year of examining some hundreds of different makes of motor engines that have had some considerable use, and in every case there has been a considerable amount of wear on the ends of the crank shafts, whereas if a properly designed ball bearing (which I consider should be of the parallel variety) had been used, the motors referred to would still be equal to new in this particular part. I was somewhat interested to notice that in the Paris Show some of the high-powered cars had single rows of ball bearings on the main crank shaft, and probably this is the beginning of a movement which will make motors without ball bearings practically obsolete. Of course, the only danger or objection is the case of a broken ball; but as balls are made now and tested there is very slight danger of an occurrence of this sort, as I believe in the most modern method of testing a crack in the ball even is disclosed in the test, and as the crushing strain of a certain size of ball can be easily ascertained, together with the thrust of the piston on it at its highest point, it is the easiest thing in the world to allow a very large margin of safety.—Yours faithfully, C.B.

Tyre Repairs.

Sir,—Having read the article in a recent issue concerning tyres, I followed "Magneto's" advice about using cotton wool for repairing cuts in the tread. I found it worked very well, but I experienced considerable trouble in handling the solutioned wool; and having no French chalk convenient, I found that common household flour is an excellent substitute, and it cleans the hands very much better than petrol or paraffin.—Yours faithfully,

"PETROLITE."

Accumulator Management.

Sir,—The letter from T. W. Thompson and Co. on the management of accumulators should prove useful to many, as well as a warning against the "jelly-acid" accumulators. They are not the only firm who have been requested to empty out the contents of the jelly accumulator and to fill with ordinary acid. The jelly lowers the capacity at least 30 per cent. There are plenty of very good cells on the market, fitted with good non-spilling vent-plugs, screwed in. I cannot too strongly disapprove of the use of jelly-acid cells for long distance motorists.—Yours faithfully,

"ELECTROMETER."

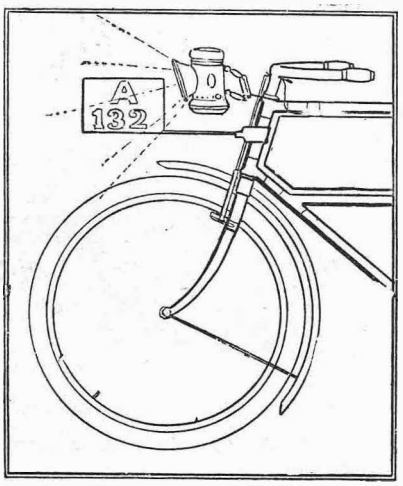
Paraffin Carburetters.

Sir,—I would like to ask Mr. James Gibson who gave, in your "Other People's Views" in "THE MOTOR" of December 23rd, a description of a carburetter for petrol, paraffin and water, whether he has tried a carburetter such as he describes and if he has, what were the results of the trial? It would also be interesting to have a sketch of the carburetter as tried. I am the more interested in this subject as I have been experimenting with the use of ordinary paraffin for the past two years in various forms of carburetter. I have found no difficulty whatever in using paraffin in almost any kind of carburetter excepting the surface, but even with petrol I think Mr. Gibson will find a difficulty in using a layer of air as a throttle valve as he proposes. I have invariably found, both with paraffin and petrol, that as soon as you let more than a certain proportion of air into the mixing chamber, or in amongst the mixed gas, you get back explosions; in fact, this is the first proof one gets of excessive attenuation. It is true that you can of course, for the purpose of checking the speed, go on letting more air in and so stop the back explosions, but I do not think it would be at all a satisfactory accompaniment. I know that in my neighbourhood my friends and neighbours all voted me an absolute nuisance while I was passing through this stage of experimenting. There is one thing that has always struck me as being curious about these back explosions, and that is that in this attenuated condition the mixture is evidently much more inflammable than when it is stronger. I thought at first that my inlet valve springs were weak, and used stronger ones, but this made no difference. As soon as I had opened my extra air inlet sufficiently I could see the mixture firing right back to the spraying chamber. The only difference I could find in my experiments was that it did not occur so readily with electric firing as with tube ignition: this I attributed to the fact that I could retard the former until the valve was closed.—Yours faithfully,

WM. CAMPBELL WILSON.

Illuminating Numbers.

Sir,—*Re* this vexed question of numbering after dark, I have three proposals, as follows:—(1) Instead of fixing the plate to the lamp, as described in a previous issue of "THE MOTOR," let it be fixed by a rod, with clip, to the frame of the machine thus:—

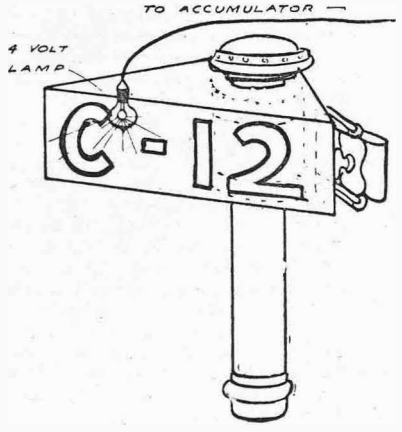


So that when the lamp is not wanted the number plate is still there. Personally, I never carry a lamp on my motorcycle unless obliged to, for I find very few stand the vibration, and an expensive lamp wants taking care of.

(2) Would it not be possible to illuminate the plate fitted, say, midway between the crown head and the lamp bracket, by means of a reflector fixed upon the front mudguard extension? (3) Could a plate be manufactured with transparent numbers, so that, if it were fitted on the mudguard extension, part of the light from the lamp could be deflected thereon, and so provide the necessary illumination? If either of the above arrangements is practicable, the same front plate would suffice for both day and night, which appeals to me as a consideration.—Yours faithfully,

"BENTINCK."

Sir,—The enclosed sketch may be of help to some of your readers. I have tried illuminating numbers by reflected light in front of the lens of the lamp, and at a distance of about 20 yards. I could not read the numbers when I wanted to. What would be the result when some cantankerous P.C. did not want to try! I tried the following method and it answers perfectly, I made a tin box of triangular



shape, the sides the size of my number plate, cut out the letters and figures as a stencil, put opal inside both sides and enamelled the tin black. Opal gives white letters by daylight and a light inside box does duty by night; I am using a 4-volt electric lamp supplied with current from the ignition accumulator: this requires .25 amp.—not an excessive amount. Lest the lamp might fail when some distance from home, and could not be replaced, I have also utilised some parts of a candle lamp, as you will see; this makes me doubly sure of a light and provides a ready means of attachment to the bicycle on an extra bracket. A Lucas is fastened to the neck of machine low enough to keep clear of the bottom of the ordinary lamp. If anyone cannot understand thoroughly write to—Yours faithfully,

R. A. BELLAMY.

16, Oxford Place, Doncaster.

Sir,—I see by the L.G.B. regulations that a motorcycle may have either the back or the front number illuminated, and whilst I have read many suggestions for illuminating the front number plate, I have not seen any for illuminating the back one, although I think this can be more satisfactorily accomplished. Front numbers illuminated must, I think, be unsatisfactory more or less, particularly with the method so much advocated of fixing a plate down the centre of the light. Few motorcyclists ride nowadays without a combined stand and carrier. This, when turned up as a carrier, forms a good fixture for a number plate, and also for a lamp bracket, on which can be placed a cheap lamp for illuminating purposes, and to form at the same time a red back light, which is an advantage. I am illuminating my back number, and Devereux, of Euston Road, is making the plates and fittings for me. Across the back of the stand, when turned up as a carrier, he is fixing a plate 2¼in. deep, which runs across the entire width of the back of the stand. The numbers will be painted as far on one side of the plate as the length will allow, and on the side nearest to the blank portion a short lamp bracket is fixed to the downward arm of the stand, so that when the lamp is put into position the light nicely illuminates the numbers and shows also a red back light. When the carrier is required for a stand the lamp can be easily removed, and neither the number plate nor the lamp bracket interferes with its use. One of the cheapest lamps made will suffice for the purpose. Perhaps this suggestion will be of use to some of your readers.—Yours faithfully,

R.G.W.

Machine Out of Control.

Sir,—I beg to relate to you an incident I witnessed on a recent Saturday in London. I noticed a motorcyclist about to mount his machine after he had run a few yards with it and started the engine. Before he had time to jump into the saddle the machine, which appeared to be a very good one, was racing along the road dragging the rider with it till it finally smashed into a lamp post and was rendered unrideable. The fault was that the rider was unable to stop the engine. I fully sympathised with him as I know how I should have felt in his position. I think the above accident ought to be a caution to other riders.—Yours faithfully.

W. WAFFORD.

Motors in Malta.

Sir,—Could any of your readers tell me anything about Malta as a place for motoring? What are the roads like, and is there a repairer of any sort? Any information would be welcome. I may say that my car is a small voiturette.—Yours faithfully,

M.H.

A Converted Quadricycle.

Sir,—I beg to send you an illustration of a quadricycle which I have converted to wheel steering: it formerly had tiller steering. The engine is a 3½ h.p. De Dion water-cooled. The transmission is by chain from a nine-tooth sprocket on the engine on to a 20-tooth chain wheel on a countershaft which has a series of three wheels engaging with another set which can be moved along a squared shaft. The speed changing mechanism is practically on the same principle as a Panhard gear. Keyed on the sliding shaft is a nine-tooth sprocket wheel which drives direct by Hans Renold chain to a 28-tooth chain wheel on the rear axle. The engine is started by a handle which engages with the reducing gear shaft. I intend to fix the friction clutch on the engine shaft instead of having it on the half-speed shaft. This clutch is 8in. diameter and is leather-faced and operated by pedal. I have been successful in reducing the total weight of the machine by ¾cwt., and find the wheel steering a great improvement on the tiller, which was very difficult to steer with at anything over 15 miles per hour.—Yours faithfully,

A. J. BLYDE.

Two-speed Gears, Belts, etc.

Sir,—You will have received my communication of the 21st December last, with reference to two-speed gear for Trimo. I see from a recent issue of "THE MOTOR" that a gear on the lines mentioned in my letter is illustrated and described, and further I notice that Messrs. Seal and Ellis ask for readers' opinions: I should, therefore, like to venture a remark. The illustration shows the sprocket wheel on the countershaft for the high speed smaller in diameter than that on the engine; therefore, in gearing up would it not be preferable to have both these chain wheels on the countershaft as large in diameter as possible, so that the belt pulley could be from 6in. to 8in. diameter: surely this would make the belt drive more efficient. I should also like to ask the inventors if this gear will be put on the market; if so, will it be applicable to a 1903 2½ h.p. Minerva machine? I am ready to give such an attachment a good trial, providing it will not be too costly. Will the chains be able to be so arranged that the belt pulley on the countershaft will be in line with the rim on the driving wheel? I would add one word to any motorist who is troubled with a V belt slipping, breaking or stretching: purchase a "Dicks'" manufactured by Messrs. R. and J. Dick, Corporation Street, Manchester. I have now used one on my 2½ h.p. Phœnix Trimo for between 600 and 700 miles and it looks as good as on the day I received it, and has given me no trouble whatever. I have no interest whatever in the manufacture or sale of this belt, and only give the tip to fellow motorists in the hope that it may assist some, as the many tips received through your excellent paper have assisted me.—Yours faithfully, HUGH ROBERTS.

Two-speed Gears.

Sir,—I should like to say how very pleased I am with the system of the two-speed gear for motorcycles described by Messrs. Seal and Ellis in your issue of the 23rd of December last. This question of variable gear for motorcycles seems to me of the first importance and I have been on the look-out for a satisfactory type of gear for a long time. Unless a two-speed gear is fitted, it is necessary for the engine to be overpowered for ordinary work in order to climb hills at a reasonable pace and without assistance. The only criticism I have to make on the design is that the lubrication of the sprockets when running loose would want special attention. If this point is attended to I think the type of gear should meet with great success. Yours faithfully,

S. E. HODGKIN, M.I.E.E.

Chain v. Belt.

Sir,—I was very pleased to see "A.B.'s" letter on the above, in which he mentions some of the marked disadvantages consequent upon the use of chain transmission for motor-bicycles. He speaks of broken spokes, troubles with tyres, constant side-slip, etc., all resulting from the use of chains. To these evils let me add the jerking at starting, ruinous to motor and machine; the necessity of having a clutch and resultant complications; shocks and jars to the engine, especially when going slowly, and when negotiating hills; strong tendency to pull the back wheel out of line, buckle the rim, and break the spokes; liability to break the piston rod if ignition is too much advanced; difficulties of dealing with a broken chain by the roadside; trouble of adjusting the chains, keeping them clean and oiled, etc., etc. A motor-bicycle is, to my mind, too small and too delicate a machine for a chain drive. With a well-made belt and proper pulleys I am firmly of opinion that you get perfect transmission of power on a bicycle. Look at the letters of Mr. R. J. Lisle and many others who have done thousands of miles in all weathers without touching their belts.—Yours faithfully,

Italy. LEOPOLD CANNING.

Chain Driving.

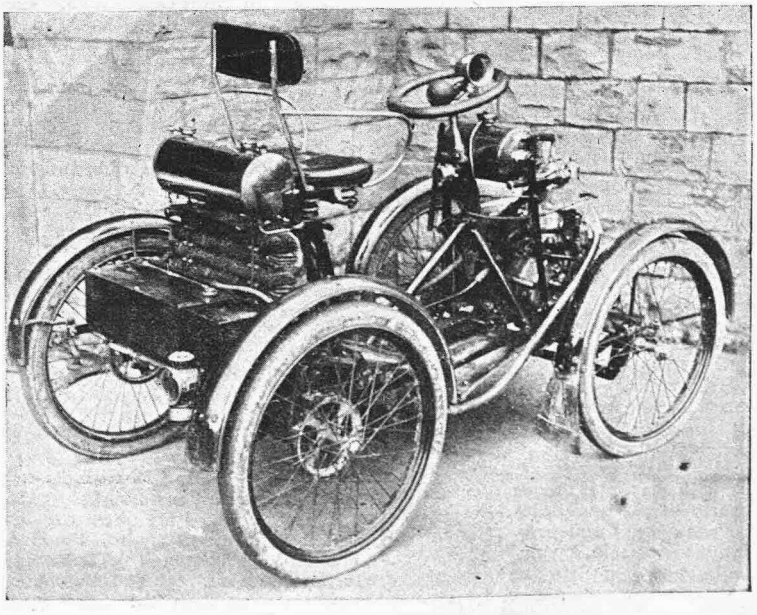
Sir,—We received from clients of ours—Messrs. Root and Clark—the following letter, which may interest those of your readers who are concerned with chain drives:—

"Three years ago we converted an ordinary Allard gear-driven tricycle, with a cylinder 3½in. by 3½in., into a chain drive, with an ordinary 1in. by ½in. block chain, and ordinary Chater Lea sprockets. This has been running ever since, doing between 4,000 and 5,000 miles every year, often with an additional load of three-quarters of a hundredweight. It has the original tyres, which have only been recovered once, and the sprockets have not been renewed. The chain has never broken, but three new ones have been fitted, which we consider is chiefly due to the shortness of the chains, and to the big loads it has to transmit, as the reduction in speed takes place before the load comes on the chain. This proves to our entire satisfaction, and that of our customer, the efficiency of a chain drive, the alteration giving him a free engine." Yours faithfully, THE JEHU MOTOR CO.

Clutches for Motor-Bicycles.

Sir,—Mr. Clayton and I had a friendly argument on the above subject at the Stanley Show, with which I need not weary you; but in self-defence you will allow me to say that my article in your columns was in part stultified by the printer's omission of a vital word—"motor-bicycles." No sane man would deny there are moments when a clutchless tri-car is not a joy for ever. My point is they do not go towards simplicity. I have some dozen friends who have good reason to abuse their motor-bicycle clutches. But did I, or did I not, once see Mr. Clayton wrestling with his outside a country inn? That was a long while ago, though, and, of course, we are not going to have any roadside troubles in 1904. But I wish Mr. Clayton had been with me one wet night in the dreary wold of Kent, when my clutch fork snapped and I had a permanent free engine!—Yours faithfully,

BASIL DAVIES.



Converted Quadricycle referred to by A. J. Blyde.

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.

S.J. (Southport).—To determine accurately the horsepower of the two motors you mention would necessitate making a brake test. We should say No. 1 would work out at something like 5½ h.p., and No. 2 (running at 800 revs.) at 4½ h.p.

S. H. Dean (Blackburn).—We have considered your suggestion for constructing a paraffin carburetter. The idea would not prove successful for the reason that you make no provision for spraying the oil on to the pipe carrying the hot exhaust gases. You would get scarcely any gas given off. The only thing that would happen would be the warming of the air drawn into the carburetter, and practically no vapourisation.

Making a Coil.

G. Pinsent (London, N.W.) writes :—I want to make a small coil to give a ¼in. or ⅓in. spark; could you kindly answer me the following requirements and questions :—(1) Length and diameter of core and gauge of iron wire to be used. (2) Length or weight, gauge and number of layers for (a) primary winding; (b) secondary winding. (3) Approximate diameter of coil when finished. (4) Price of the amount of platinum necessary for the trembler and screw. (5) Size, number, gauge and material of condenser plates. (6) Will candle grease do as well as paraffin wax for insulation? (7) I hope to be able to work it with two dry cells coupled in series.—(1) Make the core ⅝ths diameter by 6in. long. Gauge of iron wire 22s. (2) For primary three layers No. 16s. single cotton covered wire. For secondary ¾s lbs. No. 36 double silk covered wire each layer insulated by one turn of thin foreign note paper, previously soaked in melted paraffin wax. (3) About 2¾in. (4) 2s. 6d. worth of platinum wire (No. 16s) should suffice. (5) Condenser 45 sheets thin foil (tin) about 4½in. by 3in. separated by thin note paper. (6) No, you must use the best paraffin wax obtainable. (7) Two cells will not work it, you require three.

"Contributor" (Burnley).—(1) You will require to take out a separate 15s. license if you intend to have an ordinary cycle attached. (2) The strength of the acid is one part strong acid to five of water. The level must be kept constant by the addition of water only.

"Oil Slinger" (Coventry).—The idea of the vacuum valve being fitted to the crank case is to keep a partial vacuum inside when the engine is running. There is then not the same tendency for the oil to get blown out through the bearings. Of course, if your bearings are worn to any considerable extent, the valve is not of very much use, as the air and oil find their way along the shaft very freely.

Lamps as Resistances.

L. Dixon (Littleborough) writes :—Will it take longer to charge my accumulator through a 16 c.p. or 25 c.p. lamp? All the lamps are 16 c.p. If I purchase a 25 c.p. lamp and allow the current to pass through this, will the current be stronger or weaker than through a 16 c.p.?—The higher the candle-power the stronger the current passing through the cells. With a 16 c.p. 100-volt lamp it is 6-10ths ampere, and with a 25 c.p. it is 9-10ths ampere. The time of charging will be less in proportion to candle-power of lamp used. It comes to the same thing if you arrange two lamps in parallel. Thus two 16's equal one 32, and so on.

Exhaust Lead, etc.

W. Clark (Walton-on-Thames) writes : (1) I have had my 1½ h.p. Minerva motor in pieces and put together again, but do not get the power I should. I find that the exhaust valve shuts dead on the end of the stroke, and opens exactly on the completion of the firing stroke. Can I give the valve any "lead" with good results? (2) I am charging my accumulators from a battery of 30 E.P.S. cells through two 60-volt lamps, arranged in parallel. What puzzles me is that if I remove one lamp from the charging board the other remains alight. I thought that if the connections were right, removing one lamp would break the circuit. Please say how the connections should be made. (3) I had a broken wire in the coil, which I repaired. What material must I refil the coil case with?—(1) The most you can do, assuming the valve has the correct amount of lift, will be to move the large gear wheel back one tooth. This will give a small amount of lead at the expense of the valve closing a little earlier. A trial will prove whether this gives better results than the previous setting. (2) The connections are quite correct as you have them now arranged. With the lamps in parallel each of them has an independent connection across the mains, so that disconnecting one does not affect the circuit except in so far that only half the amount of current passes through the accumulator with one lamp on. (3) You cannot use a better material than the finest quality paraffin wax

W. Cochrane (Salford).—(1) There may be several reasons for the stripping of the gear wheel. It is most probably due in your case to unskilful changing of the speeds. (2) The tyres you name are considered reliable enough for the steering wheels. (3) The C.-G. 1¾ h.p. motor is equal to taking a gradient of 1 in 12 without pedalling, providing it is skilfully driven. With the two-speed gear it will take almost any hill. We do not know of a lighter motor for the power.

Oil Splashing.

E. C. Ellis (Ilford) writes :—I have a 2¾ h.p. De Dion engine on my motor-bicycle which throws oil badly from the pulley side. I have tried a leather washer inside the face plate but this makes matters even worse when it is on. I should be thankful if you could suggest any way of stopping this.—We should say that either the bearing is badly worn or the air release valve—if one is fitted—is not acting properly. Another point is, are you flooding the crank case with oil through a defective lubricator? Over-lubrication, of course, would account for the trouble.

The New Act.

F.B. (Manchester) writes :—I should be glad if you could help me with some information as to what I require to do under the new Act in the matter of licences, registration, etc.; I not only ride a motor-bicycle now and again, but sometimes I shall want to drive a fore-car (which I do not think will exceed 3cwts. complete). I am given to understand that by paying £3 for registration I shall be supplied with five distinctive plates, but whether it would be necessary for me to take out a licence for a motorcar in order to drive a tri-car, I am not quite certain.—It will be necessary for you to register the motor-bicycle and the fore-carriage separately. This latter is classed as a motorcycle, but you do not require two separate licences. The tax of 15s. each must be paid of course. The total cost will be £2 5s.

Over-lubrication.

E. Ward (Byfleet).—(1) The frequent sooting up of the spark plug may be due to over-lubrication or an excessively strong mixture. See that the carburetter is working properly and not flooding. The explosions in the exhaust are most probably due to charges missing fire, passing into the silencer, and exploding there by the next fired charge. Fouling of the plug points or want of adjustment of the make and break will cause this. (2) You say the cells show 2 volts after they come back from being charged. If by this you mean that each distinct cell shows a good 2 volts there is nothing much wrong with them : strictly speaking each cell should show 2 2-10ths volts. It is quite right that the acid should be perfectly clear : the milkiness that occurs during charging is merely due to the minute bubbles of gas suspended in the acid.

"Subscriber" (Newcastle-on-Tyne).—You must not expect to be able to make as good a job of the re-enamelling of your frame as would be done by a professional enameller, as the process is a special one known as stoving. You can make the machine look presentable by carefully touching up with "Club" black enamel. The rims you could do up with Kay's "Silverskin."

C.W. (Clitheroe).—It would be as well to make sure that the sooting up of the spark plug is not due to over-lubrication. Another likely reason is over-carburation, i.e., a mixture too rich in petrol. Very probably the float valve requires attention. It would be an advantage to enlarge the additional air inlet to ¼in., and fit a larger cap over it. You may not have enough air at full speed.

A. K. Jardine (Westgate-on-Sea) asks for a good formula for recharging a Fuller type charging battery.—The following will be found much superior to using bichromate of soda or potash, which are liable to form very objectionable crystals on the carbon plates:—Dissolve 5 ozs. crystallised chromic acid, common quality, to each quart of water in the outer vessel; and then add 2 ozs. strong sulphuric acid to each outer vessel. For the inner porous pot use dilute sulphuric acid—one part acid to eight of water.

New Act Queries.

A. E. Rushford (Chester) writes:—Please assist me on the following details:—(1) Respecting the New Act, does a motorcycle licence enable me to drive a light car having three wheels only? (2) If I drive a motor vehicle pending the arrival of my number plates, am I liable to be stopped by the police? (3) When driving my car in the evenings the motor has stopped on three occasions, which I found was caused by the choking of the gas supply pipe by a white substance like snow: what is this, and how can I prevent it? (4) I am told by a local motorist of considerable experience that if I add another accumulator to my present one it will make the engine run faster; another motorist tells me not to do this on any account as it will fuse the contact breaker. Which is correct?—(1) The law distinctly states that a motorcycle is a vehicle having not more than three wheels and weighing under three hundredweight. If your "car" conforms to this rule then you can take out a motorcycle licence, unless the authorities consider the vehicle otherwise than a cycle. (2) We should say you certainly are liable to be stopped: you will be well advised to have your numbers and licence before taking the car out—that is after January 1st, 1904. (3) The substance in the supply pipe is in fact snow as you state. This comes about by the freezing up of the moisture contained in the air taken into the carburetter. The intense cold from the evaporation or spraying of the petrol causes it. The remedy is to provide a constant supply of heat to the carburetter: this is best effected by jacketing the carburetter and having a by-pass connected up to it from the exhaust box. (4) Our advice is for you *not* to experiment by increasing the voltage on the coil by extra cells. You may get a stronger spark, but it will most likely be at the expense of the insulation of the coil—which will be strained and you will find the contacts damaged by the sparking.

"Hibernia" would be glad if any reader who has had experience with a light car of modern design fitted with solid tyres would give some particulars of same—especially as to the effect of the vibration on the car mechanism, and loss of speed compared with pneumatics.

E. Ledward (Bristol).—It is really not possible for us to say whether the heavy consumption of petrol by your machine is due to a defective carburetter, poor condition of the engine, or a leakage in the petrol tank or connections. A very common reason is a defective float valve in the carburetter, with the result that the petrol is continually trickling out of the jet. Poor compression also means an abnormal petrol consumption, as it is necessary to have the throttle full open to get any power out of the engine.

A Crank Case Explosion.

G.S.A. (London, W.) writes to say that a curious fault has developed in his 2 h.p. motor. On several occasions there has been a distinct explosion in the crank case of the motor whilst running at a good speed. This has caused a violent jerk to be given to the machine, and a great quantity of lubricating oil is blown out. "G.S.A." would be glad if we could explain this and say if we have heard of similar cases before.—We can say that we have known of several similar cases and the explanation is a simple one. In the first place the accumulation of a charge of gas in the crank case must be caused by a leakage of the compressed charge past the piston rings, and this accumulated charge will become ignited by the flame of the explosion getting past the rings. This results in an almost simultaneous explosion taking place on each side of the piston; hence the jerk. It is fortunate that nothing worse occurred as we have recollections of a similar case in which the crank case was blown into small fragments. The remedy is obviously to have the piston rings replaced by new ones. If the cylinder is taken off the motor and the piston examined the defective ring will readily be seen from the fact that a brown mark on the ring will show where the charge has leaked past. There is more risk of an occurrence of this kind with only two rings on the piston instead of three.

Double Carburetter, etc.

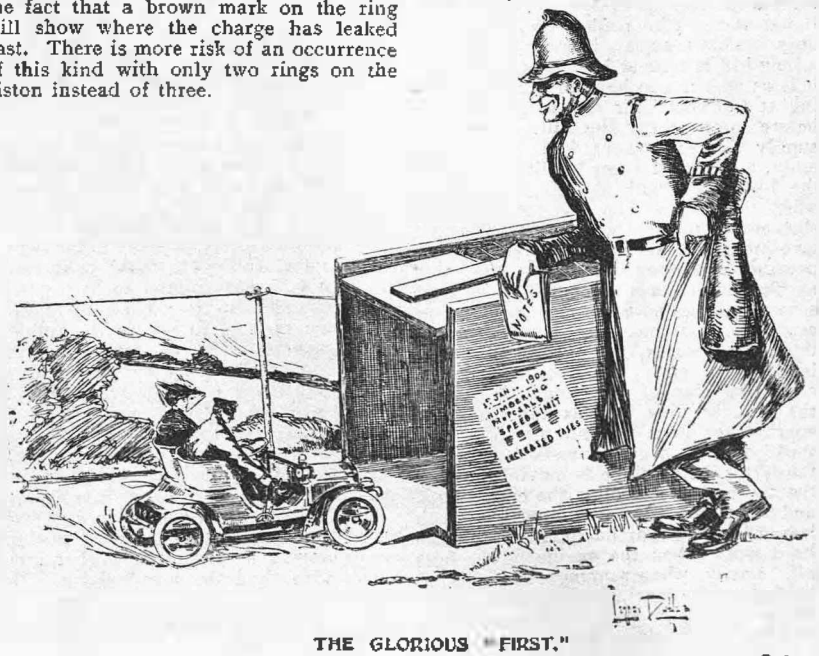
"New Reader" (London, N.)—We should say that there is either a badly worn bearing or something loose inside the motor to make the clanking sound you speak of. We came across a case somewhat similar to this in a practically new motor which, on being taken to pieces, was found to have the crank pin slightly loose in one of the fly-wheels. As the clearance in the crank case was very small the fly-wheel was thrown sufficiently out of truth to make a rasping sound at every downward stroke of the piston.

On Lubrication.

"Lubricator" (Barnet).—Under no circumstances must a vegetable or animal oil be used for lubricating the cylinder of an internal combustion motor. It is quite true that castor oil is used for the crank cases of high speed steam engines, but not for the cylinders, even though the temperature is very much lower than in a petrol motor. The effect of the heat from the exploded charge on these oils would be to char them at once, and even a slight amount of heat thickens and decomposes them. The oils used for internal combustion engines are derived from crude petroleum, treated by a special process.

Noise from Tricycle.

"Tricyclist" (Stratford) complains of the screeching noise made by the gearing of his 2¾ h.p. De Dion tricycle, and asks if we can suggest any remedy. Would a hide or fibre pinion fitted on the motor shaft be an improvement? With the exception of this noise the machine is perfectly satisfactory and has never yet failed in 3,000 miles' running.—The noise complained of is present in every tricycle, especially after it has had a considerable amount of wear and a certain amount of backlash in the gears becomes apparent. Short of fitting a new steel pinion and bronze gear we do not think much can be done except keeping the gear-case well provided with a thick grease. A hide or fibre pinion would not last very long and would be difficult to get in the small size necessary for a tricycle.



THE GLORIOUS "FIRST."

Testing an Engine.

A.H. (Liverpool).—We consider £22 about the right figure to give for the machine you specify. After 2,000 miles the tyres may or may not be in good condition—it depends how they have been looked after. You can get a fair idea of the condition of the engine by trying the bearings for side-play or wear. If there is any back-lash or lost motion between the crank and piston it will show that the bushes in the connecting rod are worn oval and require replacing. You should also look out for a ricketty contact breaker, loose regulating levers, or wheels loose in the frame. If all seems right—especially the electrical gear—test the machine up a long hill for power.

Driving on Hills.

C.W. (Woolwich) writes:—I should be obliged if you would explain the best method of regulating the engine of a 2 h.p. motor-bicycle, so as to get the most economical running, firstly, on the level; secondly, on a short but steep hill; thirdly, on a long steep hill; fourthly, on the level, but with a good wind behind to help the machine.—The regulating of a motor is effected by the joint action of the throttle valve and the spark advance lever. The question of carburation, of course, is also important, as it is obviously necessary to get a good explosive mixture, that is, one in which the proportions of air and gas are constant, no matter what the conditions the machine is working under. There can only be one particular proportion of air and gas to give an explosion of maximum force. Now, as to the first condition, that is, on the level, the motor can then work under light load, and requires a minimum amount of gas only, and the spark well forward. Secondly, to climb a short but stiff hill, give the engine more gas, and rush the hill at top speed, still keeping the spark well forward. If the gradient rises towards the crest of the hill, a few smart turns of the pedal will assist and keep the engine going at a high speed. Thirdly, for taking a long steep hill the most skilful manipulation is necessary. First of all the start must be made with a cool engine. That is to say, if one is aware that a long hill is near at hand when on a run it is as well not to have the engine working at top speed for any length of time before approaching the hill. The gas supply should be kept down to a minimum, and the first few hundred yards of the hill taken with the spark well forward. On the first sign of the pace slackening, retard the spark a little and give more gas, and keep in mind the importance of gradually retarding the spark as the work on the engine gets more severe, and increase the gas supply very gradually. If the engine commences to thump or "labour," pedal assistance must be given at once. In fact, some riders adopt the plan of pedalling lightly from the first, keeping the gas down and the spark lever in a medium position, and thus go up at a good constant speed, as the faster the machine is moving through the air the better cooling the engine gets, and light pedalling all the way is much less exhausting than having to put in some hard work when the engine power falls off. Lastly, when running with the wind behind on the level, the conditions are of the best, and the spark can be advanced and the gas cut down to the merest whiff.

C10

Starting a Heavy Machine.

W. F. Taylor (London) writes:—I have a 3 h.p. motorcycle, and I should like to know if there is any sort of contrivance to allow the belt to run freely over the pulley when starting, as it is a great exertion to start the machine by pedalling, even with the exhaust valve raised. If I could get something like this I should be able to pedal the machine, and when sufficient momentum had been obtained tighten the belt on the pulley and so start the engine.—You could fit a jockey pulley and tightening lever. This would be the simplest method. Another way would be to have a free engine clutch fitted and throw the clutch in when the machine has sufficient momentum. Most riders of heavy machines do not start by pedalling, but run alongside, drop the valve, and then vault into the saddle.

Engine Fails to Gather Speed.

"One in Trouble" (Scarborough) writes.—I have an engine 2½ by 2½ inches, air-cooled, which I can run up to twelve miles an hour. If I pedal so as to increase the speed the motor misfires. It will not even pick up speed when running on the stand. The carburetter is a Roubeau spray pattern, and the coil is a trembler. What is likely to be wrong with the engine?—There are numerous possible reasons for the engine failing to pick up speed. The points we should specify in brief that should be attended to are: (1) Accurate timing of the exhaust. (2) Good compression. (3) Inlet valve with a suitable spring—neither too strong nor too weak. (4) Make and break and coil trembler perfectly adjusted—the latter especially is important. (5) Carburetter giving sufficient gas and not flooding. It may be that you have not sufficient air in the mixture. (6) See that the exhaust valve has the full amount of lift. (7) Silencer not of too small dimensions and thus choking the exhaust. If these matters are seen to the engine should speed up to 20 miles an hour easily.

Steel Cylinders, etc.

"Steel" (London) writes to know (1) the reason that steel tube cylinders are not used to any great extent in place of cast iron, thus giving a lighter and better finished article, besides being less costly to make. (2) Is it possible to connect up, say, a couple of dry batteries with an accumulator in the event of this becoming exhausted whilst on a run? Because if so, it would be an easy matter always to carry a couple of small dry cells in any odd space on a motor-bicycle.—(1) There are certain disadvantages in the way of using steel tubing to make cylinders of. It is not an easy matter to fit a combustion chamber to it. Then there is the question of how to secure the radiators. This has to be done either by brazing them on or else pressing them on. Another drawback is the fact that steel surfaces working together are not so satisfactory as cast iron surfaces. (2) If you connect the accumulator up to the dry cells in series you will get a certain increase of voltage for a time, but there will be less current and consequently a weaker spark produced: this is owing to the dry cells having a very much higher internal resistance than the accumulator. Better than doing this would be to use a small spare accumulator, or else a set of three dry cells alone.

ANSWERS BY POST.

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

Thursday, December 31st, 1903.—J. C. Herbert (Wolverhampton), G. W. Foster (Madeley), W. W. Odell (Newport), T. Darlow (Sheffield), H. Hutton (Warminster), F. N. Campin (Henley), W. Goodman (London, S.W.), T. and R. Carlisle (Waterbeck), W. B. Hart (Hampstead), J. H. Potter (Exmouth).

Friday, January 1st, 1904.—W. Ward (Wickham Bishops), J. A. Briggs (Whitby), T. W. Daw (Ebbw Vale), T. F. Hunt (Warwick), A. Rumsey (Oporto, Portugal), H. Gander (Banbury), H. W. Smith (Nottingham), Banks and Park (Keswick), E. S. Buck (Sutton-in-Ashfield), C. H. Home (Egham Hill), H. Hilliard (Bletchingly).

Saturday, January 2nd.—W. S. Orr (Guthrie), A. Osborn (Martock), W. Martin (Ramsgate), S. B. Murray (Kells), G. J. Dowse (London, N.E.), W. B. Conquest (Gravesend), R. Warwick (Salisbury), E. N. Follwell (Bristol), A. Stanton (Rushden), D. Kenisk (Deptford), B. G. Dye (London, S.E.), F. Stuart (Weybridge), A. W. Hamilton (Belfast), C. N. Parkin (Wolverhampton).

Monday, January 4th.—V. W. Laithwaite (Bromley Cross), P. Fraser (Arbroath), H. C. Argyle (Hales Owen), C. Coley (Wolverhampton), A. L. Furrow (Oldham), S. I. Brown (Market Hill), G. F. Palmer (Stroud Green), G. Bartholomew (Gloucester), J. Baker (Guildford), J. T. Spittle (Newport), C. Parsons (Hendon), J. Y. Broderip (Cossington Manor), Cassell and Co. (London), F. Watson (Ashford), J. Bennett (Northampton), H. N. Edge (Bilston), W. Atkinson (Dublin), R. A. Burdett (Manchester), W. Paull (Colchester), H. S. Murray H. Barton (Little Eaton), W. Teago (South Lowestoft), T. L. Carpenter (Eye), T. Gisling (Putney), W. Hanton (Rugby), H. Guard (Romsey), C. Merington (South Norwood).

Tuesday, January 5th.—H. Silverlock (Upper Norwood), H. Nurse (Erdington), A. J. Sproston (Tunbridge Wells), A. E. Foster (Liverpool), J. C. Parker (Thame), R. Dollery (Reading), H. Giles (Wimbledon), J. H. Wilkinson (Doncaster), W. E. Raven (Halstead), A. E. Brown (London, E.), C. B. Gervis (Seaford), E. Maynard (St. Leonards), A. Young (Frundon Grange), C. Hatton (Morecombe), C. B. Cumberland (Perry Bar), G. C. Colmore (Bishopstoke), C. Read (Suffolk).

Wednesday, January 6th.—S. W. Mounter (London), A. M. Crichton (Lisburn), F. Rowland (Frome), G. Stobie (Pitlochry), W. Mitchell (Bradford), W. Allingham (Salisbury), S. A. Achille (Coventry), J. H. Baxter (Bristol), J. W. Bird (Thirsk), J. Horswell (Chester), H. Lester (Penrith), J. H. Potter (Taunton), W. J. Russell (Kingston), W. Peek (Lingfield).